Chapter 4 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

4.1 Land Use

4.1.1 Existing and Future Land Use

4.1.1.1 AFFECTED ENVIRONMENT

This section describes the land use setting or "affected environment" for the East Bay BRT Project, presenting an overview of corridor land use and development patterns in the areas and activity centers surrounding the 17.5-mile arterial route for the proposed project through the cities of Berkeley, Oakland, and San Leandro (the corridor). Land use is broadly defined to encompass types of land use and land use mix, development patterns and activity centers, population and employment levels, growth potential and trends, local and regional land use policies, and other factors that influence corridor growth.

The setting conditions and projections for the analysis are based on land use, development, employment, and population data from the U.S. Census Bureau; the Association of Bay Area Governments (ABAG); Alameda County; the cities of Berkeley, Oakland, and San Leandro; and the *AC Transit East Bay BRT Project Land Use Report* (Hausrath Economics Group, 2005). The land use database and growth scenario were developed specifically for analysis of the proposed project, and the database was set up for Traffic Analysis Zones (TAZs) for use in the transportation modeling. As a result, for the purpose of land use analysis, the specific boundaries of the corridor are defined by TAZ boundaries.

For the purposes of this analysis, the corridor has been divided into nine subareas: the Berkeley subarea in the City of Berkeley; the North Oakland, Central Oakland, San Antonio, Fruitvale, Central East Oakland, and Elmhurst subareas in the City of Oakland; the San Leandro subarea in the City of San Leandro; and the Ashland subarea in unincorporated Alameda County, south of the San Leandro city limit.

Cities and subareas in the corridor are shown in Figure 4.1-1 and described below.

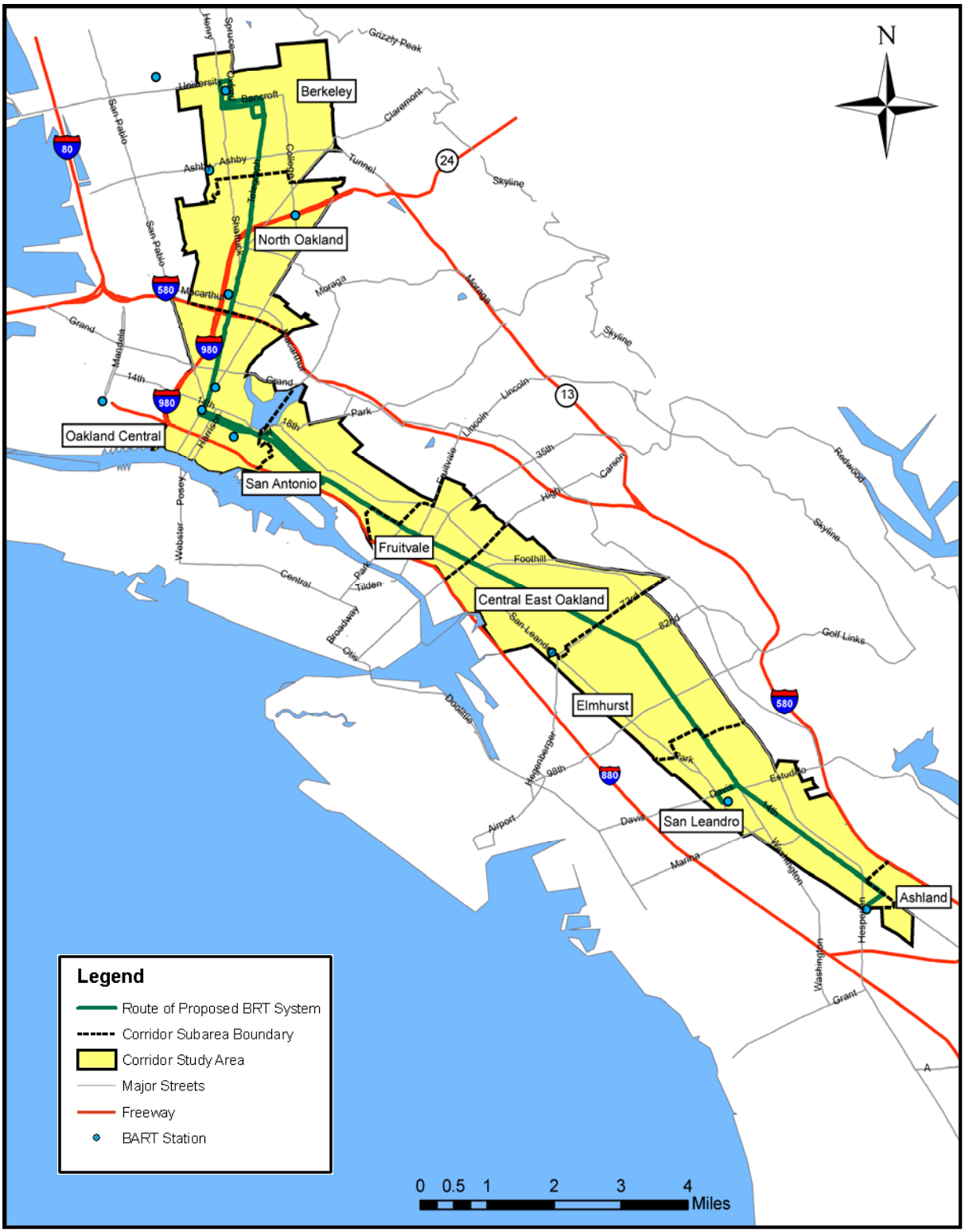


Figure 4.1-1: Cities and Subareas in the Corridor

Major Land Uses in the Corridor

The corridor is a densely developed, highly urbanized area located at the center of the larger San Francisco Bay Area region. As of 2000, the corridor had a population of 261,100 residents and included employment of 179,400 jobs. Table 4.1-1 shows the distribution of jobs and population by percentage through the corridor segments.

Table 4.1-1: Distribution of Employment, Population, and Land Area in the Corridor

Corridor Subarea	Employment (2000)	Population (2000)	Percentage of Total Land Area
City of Berkeley			
Berkeley	26%	15%	14%
City of Oakland			
North Oakland	7%	13%	14%
Central Oakland	43%	10%	13%
San Antonio	3%	14%	8%
Fruitvale	3%	8%	6%
Central East Oakland	4%	12%	13%
Elmhurst	3%	15%	15%
City of San Leandro			
San Leandro	11%	10%	15%
Unincorporated Alameda County			
Ashland[1]	0.1%	2%	2%

Notes:
[1] This subarea applies to Alternatives 1 and 3 only. Project alternatives are described in Chapter 2.
Source: Hausrath Economics Group, 2005

Major centers of activity within the corridor are characterized by concentrated amounts of population and employment and a mixed-use, higher-density development pattern that is pedestrian-friendly and supportive of transit use. Major activity centers include the downtown central business districts of all three cities, as well as the large campuses of the University of California at Berkeley (UC Berkeley) in Berkeley and Laney College in Oakland. In addition to these major centers, several smaller but notable activity nodes are located throughout the corridor, including such destinations as major hospital complexes, shopping districts, community colleges, high school and junior high school campuses, churches, civic centers, and entertainment/recreation facilities.

A large amount of residential development also exists throughout the corridor, in higher-density, mixed-use areas along the major arterial and commercial streets as well as in lower-density residential neighborhoods surrounding the major streets and activity centers. Compared to commercial activity, which is focused in major centers, residential development is generally more evenly distributed throughout the corridor.

Major land uses in the corridor are described, by city segments, below.

City of Berkeley

The segment of the corridor that runs through the City of Berkeley is home to major activity centers including Downtown Berkeley, with business, retail, and cultural uses, and the UC Berkeley campus, with its high concentration of university-related employment and activity. Berkeley also includes commercial activity along the entire length of Telegraph Avenue, south of UC Berkeley, as well as neighborhood commercial activity in the Elmwood shopping district on College Avenue and in the Berkeley Bowl area near the intersection of Shattuck Avenue and Adeline Street. There are two major medical centers with four hospitals and concentrations of supporting medical offices nearby, including the Alta Bates and Herrick campuses of the Alta Bates Summit Medical Center. Berkeley has very dense concentrations of population in the areas just south of the UC Berkeley campus, including student dormitories and other student housing, and in the Elmwood and Southside neighborhoods.

City of Oakland

The Oakland segment of the corridor includes a very large concentration of high-density employment and related activities, with 43 percent of overall corridor employment located in Downtown Oakland on just 13 percent of the total land within the corridor. Office activities focused in the greater City Center and Kaiser Center areas include corporate headquarters, professional service businesses, major federal and state government buildings, the University of California Office of the President, the Alameda County Courthouse and several County administrative buildings, and the Oakland City Hall and administrative buildings. Also located in the downtown area are the headquarters of several regional agencies, including ABAG, Bay Area Rapid Transit (BART), the East Bay Municipal Utilities District (EMBUD), and the Metropolitan Transportation Commission (MTC).

Other employment and business activities downtown include retail, restaurant, entertainment, hotel, and convention center activities, educational and cultural activities, as well as service and light industrial uses. Districts and destinations downtown include Oakland's Chinatown, Jack London Square, the Amtrak train station, Laney College, Sears, and the Paramount Theatre. In addition to its role as an employment center, Downtown Oakland is becoming increasingly desirable for higher-density new housing development.

In the area from Interstate 580 (I-580) south to Grand Avenue, there are additional business activities and employment including the Summit campus of the Alta Bates Summit Medical Center, Oakland's Broadway Auto Row, and additional office and retail uses. In addition, there is commercial activity in the Rockridge, Temescal, and Piedmont Avenue neighborhoods in north Oakland, along College Avenue, Telegraph Avenue, and Piedmont Avenue, as well as the neighborhoods along West MacArthur Avenue and Martin Luther King, Jr. Way, west of State Route 24 (SR 24).

East of Downtown Oakland, the Lake Merritt neighborhood lies on the southern shore of Lake Merritt and offers a mix of entertainment, dining, and shopping. The area attracts many joggers, walkers, and cyclists who recreate around the lake. The Eastlake neighborhood, located along International Boulevard and East 12th Street between 1st and 14th Avenues, comprises an eclectic collection of small businesses, including many Southeast Asian-owned stores. The Fruitvale neighborhood, located

between I-580 and I-880 in the area of the Fruitvale BART Station, has emerged as a thriving multicultural commercial area with a strong Latino identity. Community-sponsored cultural events such as the annual Dia de los Muertos festival attract tens of thousands of people annually. The 255,000-square-foot, mixed-use Fruitvale Transit Village provides housing, retail, and office space surrounding a pedestrian plaza at the Fruitvale BART Station.

City of San Leandro

The San Leandro segment of the corridor includes high-density employment areas in Downtown San Leandro, centered along East 14th Street from Davis Street to Dolores Street, which has a large concentration of business and retail sector activities. The area surrounding Bayfair Center includes a large amount of retail and service employment. Additional nodes of employment are located in the area of East 14th Street at Georgia Way/Begier Street, site of the San Leandro City Hall, theater and government center, and East 14th Street and 135th Avenue around San Leandro Hospital.

Unincorporated Alameda County

The Ashland area of Alameda County, at the southernmost end of the corridor, is included in the service area of Alternatives 1 and 3, which both terminate at the BayFair BART station. (See Chapter 2 for a description of the four Build Alternatives.) The Ashland area has capacity for future growth and development. Much of the potential in this part of the corridor is for additional residential development. The East 14th Street corridor through the area is within a redevelopment area, with the goals of increasing densities and promoting transit-oriented development.

Population and Residential Densities

The corridor is home to a large population of residents who travel to work, school, and shopping areas as well as travel for a variety of personal service, medical, child care, entertainment and recreational purposes. Population densities in the corridor are high, and socioeconomic characteristics of residents are supportive of transit use.

Residential development exists throughout the corridor, as shown by the distribution of corridor population in Figure 4.1-2. Population in the corridor resides in higher-density, mixed-use areas as well as in residential neighborhoods surrounding the major arterial and commercial streets. A relatively large share of the corridor population resides in multifamily housing. Compared to commercial activity, residential development is more evenly distributed throughout the corridor and less focused in major centers.

Population densities in the corridor are substantially higher than in the surrounding East Bay region. As shown in Table 4.1-2, 77 percent of the corridor population live in areas with densities greater than 20 persons per acre and 47 percent live in areas with densities greater than 30 persons per acre. At the high end, population densities for corridor areas range up to 108 persons per acre.

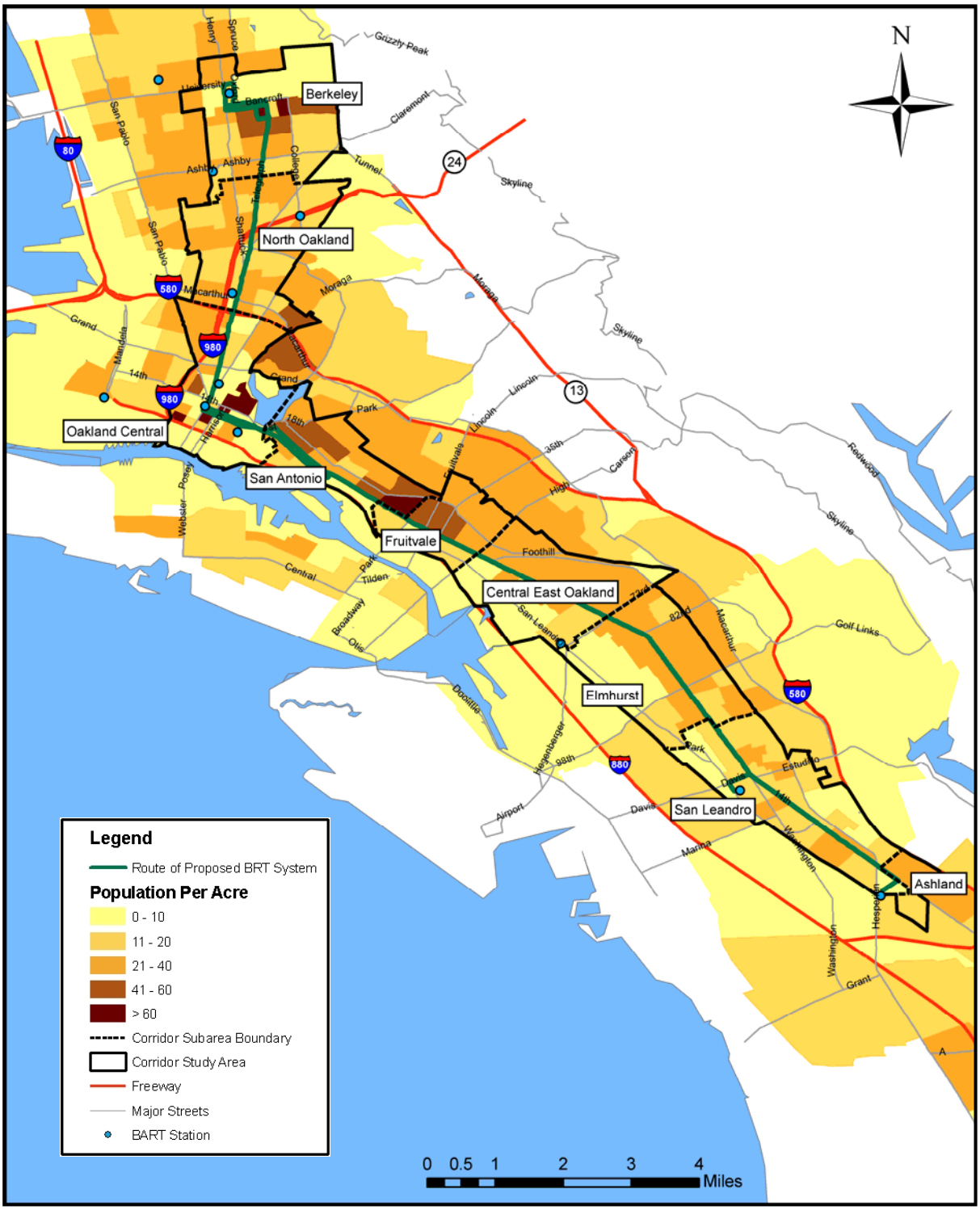


Figure 4.1-2: Population Density in the Corridor and Vicinity, 2000

Table 4.1-2: Population Densities in the Corridor, 2000

Corridor Location	Population Density (Residents/Acre)						Population 2000
	<20	20 – 29	30 – 39	40 – 49	50 – 59	60+[1]	
Berkeley	7,750	9,940	4,140	10,190	2,460	4,380	38,860
North Oakland	9,830	21,750	--	2,530	--	--	34,110
Downtown Oakland	3,790	9,740	2,610	2,020	--	7,630	25,790
San Antonio	2,140	570	9,440	10,610	10,450	4,560	37,770
Fruitvale	3,500	1,950	9,020	7,520	--	--	21,990
Central East Oakland	3,630	10,990	17,340	--	--	--	31,960
Elmhurst	9,340	12,820	15,340	1,110	--	--	38,610
San Leandro	18,140	7,170	1,570	--	--	--	26,880
Ashland[2]	1,660	3,480	--	--	--	--	5,140
Corridor Total	**59,780**	**78,410**	**59,460**	**33,980**	**12,910**	**16,570**	**261,100**
Percentage of Corridor Population	**23%**	**30%**	**23%**	**13%**	**5%**	**6%**	**100%**

Notes:
1. Densities in this category range from 61 to 108 persons/acre.
2. Alternatives 1 and 3 only.
Source: US Census Bureau, 2000; ABAG *Projections 2002*; Hausrath Economics Group, 2005 (Population Densities defined by TAZ boundaries).

Employment/Activity Centers and Major Destinations

This section describes employment and activity centers throughout the corridor, including major activity centers such as central business districts (CBDs) and universities, as well as smaller, but still important activity notes such as shopping and hospital clusters. The activity centers discussed below are characterized by their higher density, mixed-use development patterns; pedestrian friendliness; and support for transit use. Employment densities in the corridor are shown in Figure 4.1-3. The locations of the major employment/activities centers and destinations in the corridor are shown in Figure 4.1-4 and listed in Table 4.1-3.

Downtown Oakland's CBD is the largest center of employment activity in the corridor. In fact, Downtown Oakland, at the heart of the corridor, has the largest concentration of business activity and employment in the Bay Area outside of Downtown San Francisco. (Concentration is measured in terms of total amount and density of employment within a definable area.) Downtown Oakland includes employment in both private sector and government office activities; in entertainment, retail, restaurant, and hotel activities; in educational and cultural uses; and in service and light industrial uses.

The next largest concentrations of corridor employment and related activity are at the far northern end of the corridor, in Downtown Berkeley and at the UC Berkeley campus. These major centers include a mix of activities and employment in business, educational, and medical uses, and in entertainment, retail, and cultural uses. In addition to the relatively high density of employment in these areas, the large student population at the UC Berkeley, with an enrollment of approximately 31,350, contributes substantially to the overall concentration of people and activity in this part of the corridor.

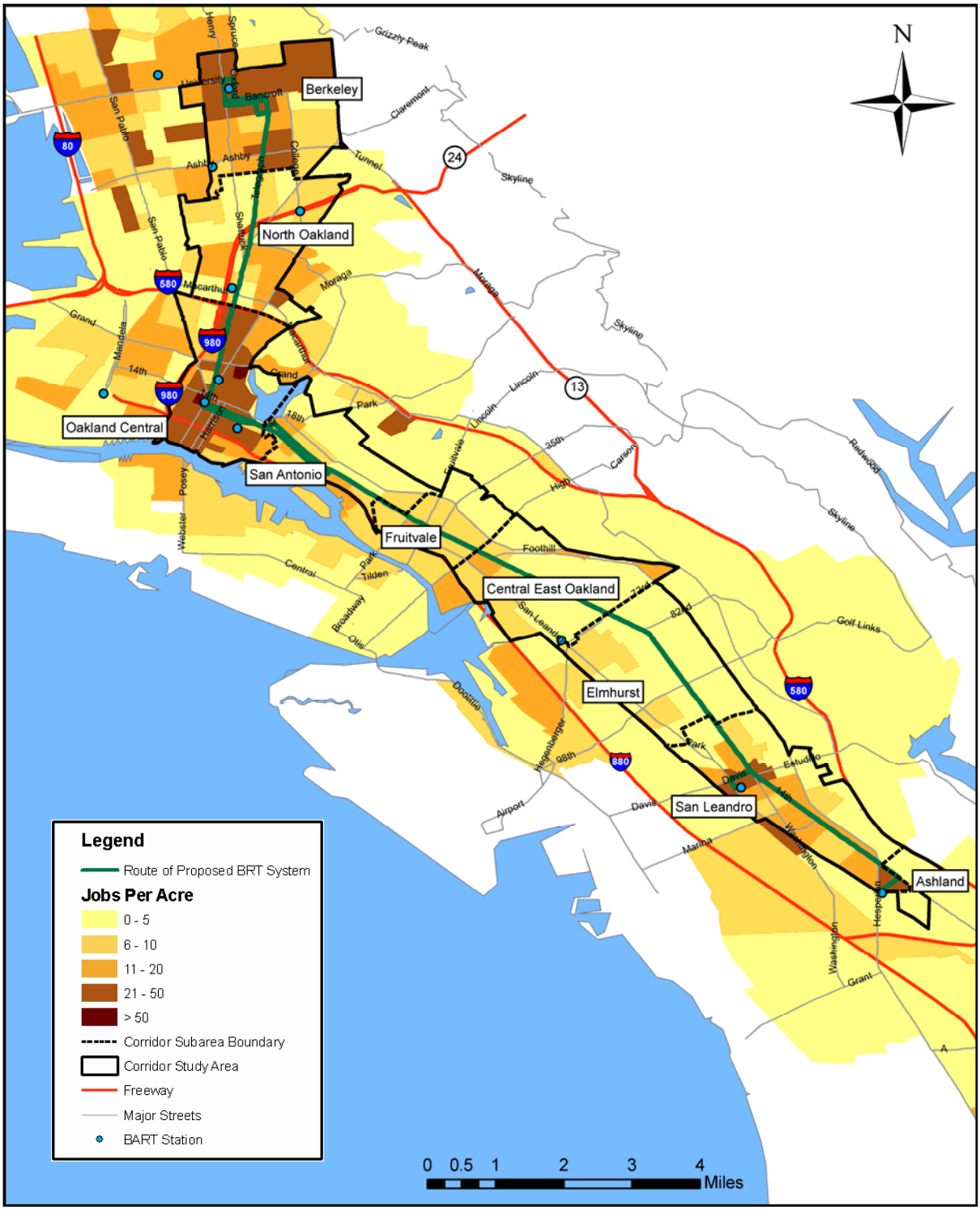
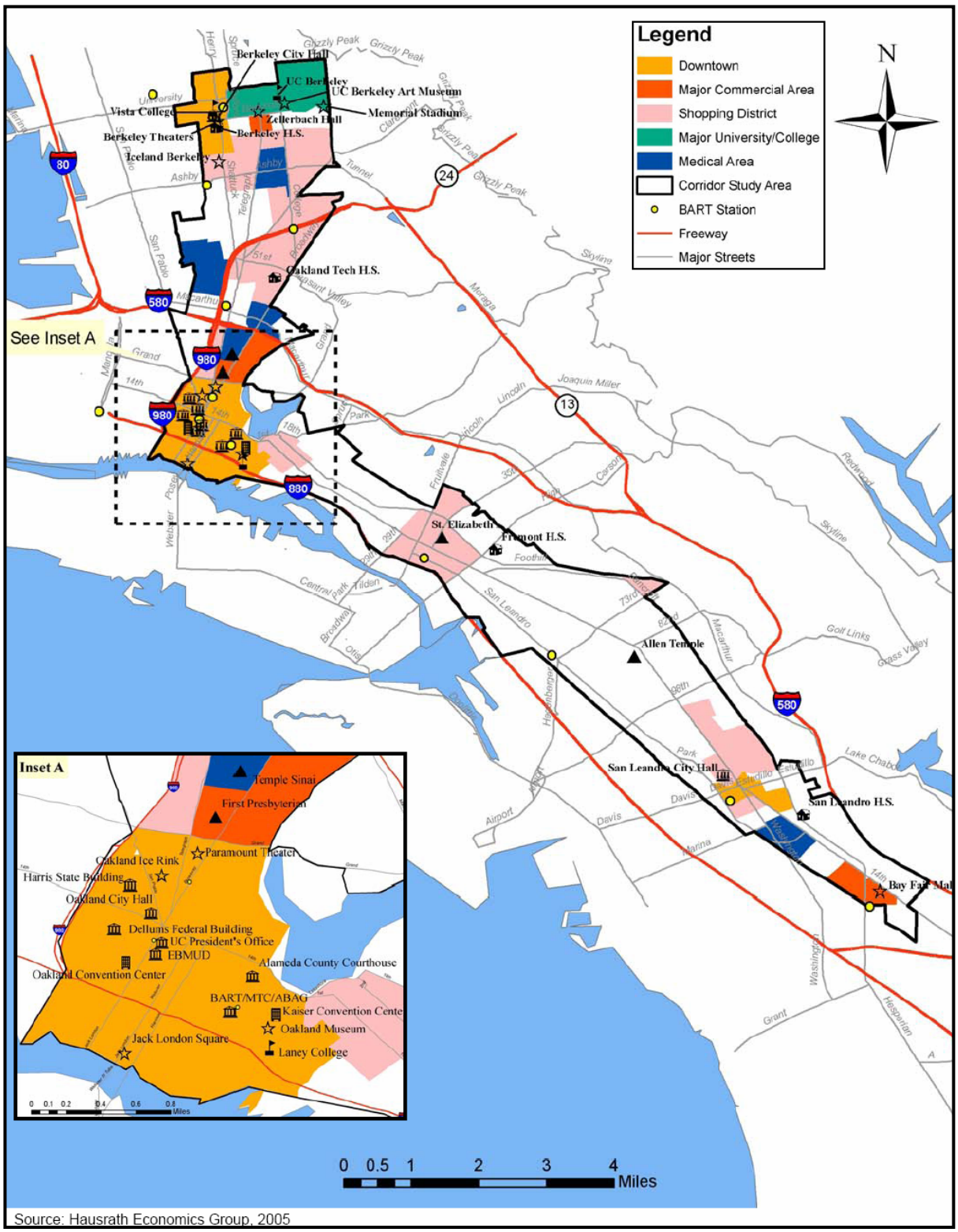


Figure 4.1-3: Employment Density in the Corridor and Vicinity, 2000



Source: Hausrath Economics Group, 2005

Figure 4.1-4: Activity Centers and Major Destinations in the Corridor, 2000

Another large concentration of activity occurs in the area just north of Downtown Oakland from Grand Avenue to I-580 that includes the Alta Bates Summit Medical Center and associated medical facilities and offices, and nearby commercial activity along Broadway, including Oakland's Broadway Auto Row.

There are four additional concentrations of activity and employment in the corridor that stand out due to their relatively high densities. These include the Alta Bates Summit Medical Center area above Telegraph Avenue in Berkeley, Downtown San Leandro and the Bayfair Center area in San Leandro (both at the southern end of the corridor), and the commercial areas surrounding Telegraph Avenue immediately south of the UC Berkeley campus.

Table 4.1-3: Major Employment/Activity Centers in the Corridor

Corridor Location	Jobs (2000)	Density (jobs/acre)
City of Berkeley		
University of California, Berkeley	15,360	35
Downtown Berkeley	13,520	38
Alta Bates Summit Medical	5,350	40
Telegraph Avenue near UC Berkeley	3,050	76
Telegraph Near Alta Bates Summit	2,220	20
Elmwood District	1,660	6
Berkeley Bowl Area	1,610	17
Telegraph Avenue (Dwight to Derby)	1,010	10
City of Oakland		
Downtown Oakland (below Grand Avenue)	64,990	74
Oakland City Center/Government Center	21,050	133
Kaiser Center/Uptown Oakland	19,500	119
Chinatown/Old Oakland	9,750	76
Alta Bates Summit Medical/South Auto Row	9,170	36
County Buildings, Metro Center, Laney College	7,570	40
Jack London District	7,120	30
Fruitvale District	3,830	8
Children's Hospital Area	3,160	10
Rockridge District	2,730	7
Kaiser Hospital Area	1,550	15
Eastlake District	1,500	10
51st & Broadway/North Auto Row (west of Broadway only)	1,330	11
Telegraph Avenue below Summit	1,070	22
Temescal District (51st Avenue/Telegraph Avenue)	1,010	6
Eastmont Town Center	995	19
City of San Leandro		
North/South of Downtown San Leandro	2,620	11
Bayfair Center Area[1]	2,180	35
San Leandro Hospital[1]	1,810	12

Notes:
[1]Alternatives 1 and 3 only.
Source: 2000 U.S. Census Data; ABAG *Projections 2002*; Hausrath Economics Group, 2005.

Population and Employment Growth

Substantial growth and development is occurring in the study area and is projected to continue through 2025. Employment growth of about 40,920 jobs, or 23 percent, is anticipated in the study area between the years 2000 and 2025, as shown in Table 4.1-4.

The population of the study area is expected to grow by about 43,310 residents between 2000 and 2025, an increase of approximately 17 percent. The Central Oakland subarea will experience the largest population growth due to substantial new housing construction underway in Downtown Oakland. Substantial population growth will also occur in the southern end of the study area, primarily within Oakland but also in San Leandro. Growth is also expected in areas surrounding UC Berkeley and in Downtown Berkeley.

As the study area is an already developed urban area, growth and development will include infill development on underutilized and vacant sites and increased occupancy and intensity of activity in existing buildings. Much of the growth is expected to be in the existing, mixed-use downtown areas, in other major activity centers in the study area, and in locations along the major roadways and transit routes. As growth continues, population densities will continue to increase and a greater mix of land uses will result. Overall, the current pattern and future trend of study area development is very supportive of transit use.

Table 4.1-4. Projected Population and Employment Growth in Study Area

	Population				Employment			
	2000	**2025**	**Growth 2000-2025**	**Percent Growth**	**2000**	**2025**	**Growth 2000-2025**	**Percent Growth**
Alameda County	1,443,741	1,714,200	270,459	19%	751,680	1,014,190	262,510	35%
City of Berkeley	102,743	111,600	8,857	9%	77,200	86,220	9,020	12%
City of Oakland	399,484	449,500	50,016	13%	193,950	243,500	49,550	26%
City of San Leandro	79,452	87,600	8,148	10%	54,230	64,080	9,850	18%
Study Area, by Subarea								
Berkeley	38,864	46,774	7,910	20%	46,662	52,279	5,617	12%
North Oakland	34,111	35,951	1,840	5%	12,281	13,636	1,355	11%
Central Oakland	25,786	45,540	19,754	77%	77,553	102,646	25,093	32%
San Antonio	37,773	38,462	689	2%	4,984	5,369	385	8%
Fruitvale	21,990	23,476	1,486	7%	4,639	5,360	721	16%
Central East Oakland	31,954	35,796	3,842	12%	8,057	10,852	2,795	35%
Elmhurst	38,613	41,589	2,976	8%	6,135	6,574	439	7%
San Leandro	26,877	31,426	4,549	17%	18,982	23,444	4,462	24%
Ashland[1]	5,141	5,405	264	5%	104	154	50	48%
Study Area Total	**261,109**	**304,419**	**43,310**	**17%**	**179,397**	**220,314**	**40,917**	**23%**

Notes:
[1] Area served by Alternatives 1 and 3 only.
Sources: U.S. Census Bureau, 2000. *ABAG Projections 2002;* Hausrath Economics Group, 2005 (Projected Population and Employment defined by TAZ boundaries).

Developable Land and Development Trends

This section describes land available for development and development trends in the project corridor and the associated cities and counties as a baseline for assessing the growth potential of the affected area.

The Association of Bay Area Governments (ABAG) prepares projections of the region's growth in housing and employment. ABAG's *Projections 2005* estimates that between 2000 and 2025, Alameda County is expected to gain an additional 124,004 households, a 19.1 percent increase. During the same period, Berkeley, Oakland, and San Leandro are projected to gain an additional 4,845, 34,880, and 5,658 households, an increase of 9.7 percent, 18.8 percent, and 15.6 percent, respectively.

According to its *General Plan*, the City of Berkeley, with its well-established land use pattern, has experienced little change in population or housing supply in the last 30 years. From 1970 to 2000, the citywide population has dropped from 116,532 to approximately 102,743 and the number of housing units has increased from 46,160 to 46,875. Due to the scarcity of available land, all new development in Berkeley will be infill development.

The *City of Oakland General Plan*, adopted March 1998, supports the addition of an average of almost 600 housing units per year through 2005, as compared with about 400 per year added from 1980 to 1995. Land uses, densities, and transportation systems have been planned to support increased development along the city's major transportation corridors, in downtown, in transit-oriented districts near BART stations, along the waterfront, or as part of infill projects.

The *City of San Leandro General Plan*, adopted in May 2002, projected a total residential increase of 920 housing units from 2000 to 2015 on sites that are currently vacant. The *General Plan* indicated the possibility of adding "hundreds more multi-family units" along East 14th Street, San Leandro Boulevard, MacArthur Boulevard and Washington Avenue on currently underused commercial sites. Over the same period, the population was anticipated to rise to 84,960 residents, a 7 percent increase.

Transit-Supportive Growth and Development Factors

Transit-supportive growth and development is expected to continue in the corridor due largely to three factors: positive market forces, supportive land use policies, and capacity for growth and supportive public investments.

Positive Market Forces

Market support for corridor development is part of a larger trend toward renewed interest and reinvestment in older central city areas. The central areas in Oakland in particular are desirable because of several positive factors: a central location in the region; good transportation accessibility via the freeway network, rapid transit, and air, rail, and water transportation; relatively affordable space costs and land prices; relatively affordable housing and a desirable, urban lifestyle at lower cost than nearby San Francisco; accessibility to a well-educated workforce; proximity to a major university (UC Berkeley); a fiber-optic network for business; and the availability of space and land for expansion and development with basic infrastructure already in place. The corridor economy is

diverse, attracting technology industries, while maintaining strengths as a location for traditional business activities. The housing market also is diverse, offering rental and for-sale housing over a range of rents and prices.

Supportive Land Use Policies

Local land use policies support growth and development and the intensification of activity within the corridor. Land use and zoning policies in Berkeley, Oakland and San Leandro promote higher-density, transit-oriented development in the downtown areas and along major arterial streets and transit corridors. In fact, much of the opportunity for growth and change in these already developed cities exists in the downtown areas and along the major corridors as these areas have underutilized property and substantial opportunities for higher-density, infill development. As a result, there are similarities in the land use policies in all three cities.

Regional land use policies support "Smart Growth" objectives to increase densities and the amount of development in the already developed areas of the region, focusing substantially more growth in existing cities and along transit corridors in the central parts of the region. Smart Growth policies call for infill development, intensification of land uses in urban areas, and the utilization of existing infrastructure. The policies place an emphasis on building substantial new housing in higher-density activity centers in downtowns and along major transportation corridors in order to relieve pressures on housing prices, provide opportunities for people to live near their workplace, and promote a better balance between jobs and housing. In addition, Smart Growth promotes the mutually supportive relationship between higher-density land use patterns and quality public transit as a means toward relieving regional traffic.

To promote increased use of public transit, transit-oriented development objectives call for the development of higher-density, mixed-use activity nodes around rapid transit stations and along major transit corridors in the region. Transit-oriented development is consistent with the Smart Growth policies discussed above, and may be thought of as a subset of the Smart Growth planning framework. Transit has the potential to allow higher density development than would be possible if development were designed around access by the private car. As compared to rail transit, bus transit allows many more trips to be made without a car. Most trips are non-work-related, but the region's rail system is geared toward serving employment destinations. The existing and proposed bus network is finer grained and provides greater access to shopping, school, and recreational destinations.

MTC has released a draft transit-oriented development policy that would be applied to transit extension projects throughout the Bay Area. ABAG is studying potential for transit-oriented development along major transit corridors in the region. In addition, the Strategic Plan adopted by BART in 1999, which provides the overall framework for the Agency's planning efforts, includes the goals for transit-oriented development around its stations.

Growth and development in the corridor meet many of the regional Smart Growth objectives for land use and transit-oriented development. Development in the corridor would be supportive of a compact, city-centered regional development pattern. Growth and development in the corridor would

increase densities for the region and mean less land would be required to accommodate the same amount of growth in outlying locations. Less growth and development in outlying parts of the region mean greater protection of open space and agricultural lands. Growth at the center means intensification of activity in existing buildings and infill development on underutilized and vacant sites already served by infrastructure. Corridor growth and development also mean benefits in terms of improving and revitalizing the older areas of the region, parts of which were once passed over in the leap to the suburbs. Growth in the corridor also represents growth in areas well-served by transit and in mixed-use, higher-density patterns of development that support pedestrian activity and transit use.

Capacity for Growth and Supportive Public Investments

Existing infrastructure is already in place to support growth within the corridor, as it is already a developed urban area. There are differences among the cities, however, in terms of capacity and opportunities to accommodate growth and development and in the extent of public support for growth.

Within Berkeley, there is capacity for growth and intensification of land use at the northern end of the corridor, primarily in the downtown and along the larger commercial corridors. This latent capacity for growth can be accommodated in several ways, including increasing activity in existing buildings by converting to new, more intensive uses and occupying formerly vacant spaces (occurring in Downtown Berkeley) and by building new development on underutilized sites. There also have been public efforts to further the revitalization of Downtown Berkeley. Berkeley has taken the lead in the creation of a downtown arts district that includes theaters, restaurants, studios and educational facilities. There also has been public investment in the seismic retrofitting and expansion of the main library and City Hall.

The largest capacity to grow and intensify within the corridor exists in Oakland. As the largest city in the East Bay, Oakland has the highest densities, and it has a large downtown and several large-scale commercial areas, all with substantial opportunities for growth and development. Much of the corridor in Oakland falls within the boundaries of one of the city's Redevelopment Project Areas (RPAs), including the Central District RPA in Downtown Oakland, the Broadway/MacArthur/San Pablo RPA in north Oakland, and the Central City East RPA and Coliseum RPA, both in East Oakland. In addition, a large part of the corridor is within Oakland's Enterprise Zone and Empowerment Zone. Oakland supports growth and development downtown and along the major transit corridors by investing in streetscape improvements (planting, street lighting, sidewalk furniture, etc.), façade improvement programs, business recruitment efforts, the use of redevelopment to facilitate private sector investment and development, the provision of parking, investment in public development with revitalization benefits for surrounding areas (such as the development of the City Administration Buildings at a key location in Downtown Oakland), and the investment of funding for new affordable housing.

There is strong civic commitment and leadership for development, particularly in Downtown Oakland, where housing and employment growth has been promoted and encouraged by the 10K

Downtown Housing Initiative (10K Initiative). Launched by former Mayor Jerry Brown when he took office in 1999, the 10K Initiative is realizing its goal of attracting 10,000 new residents to Downtown Oakland by encouraging the development of 6,000 market-rate housing units. As of January 2006, the 10K Initiative has resulted in the start and completion of 61 residential projects with 7,925 units. Seventeen projects (1,663 units) have been completed, fifteen projects (2,144 units) are in construction, 20 projects (2,196 units) have received planning approvals, and 12 projects (1,922 units) are in the planning process. The 10K Initiative has altered Oakland's skyline with the construction of The Essex on Lake Merritt, the first high-rise residential construction in Downtown Oakland in 20 years. To date, the number of units necessary to house 10,000 new residents has been surpassed.

A large number of development projects are underway in Oakland, including numerous residential and commercial projects in the corridor that are under construction or in the planning and development process. Examples of large projects within the corridor, often involving both private and public sector participation, include the Uptown Project, the redevelopment of the Jack London Square District; additional City Center development in Downtown Oakland; the MacArthur BART Transit Village project in North Oakland; and the Fruitvale BART Transit Village project in East Oakland. Rebuilding and expansion of Oakland's major hospitals and medical centers also are anticipated.

There is capacity for growth and intensification within the San Leandro subarea at the southern end of the corridor. There is new focus on the East 14th Street corridor as an opportunity for future mixed-use and higher-density infill development. The corridor is entirely within redevelopment project areas and includes the city's downtown and civic center, San Leandro Hospital, and the Bayfair Center and surrounding retail area. The San Leandro BART Station area is adjacent to downtown and is being planned for transit village development. City redevelopment and economic development activities and planning are currently underway and anticipated to assist in streetscape enhancements, façade improvements, tenant recruitment, and land assembly to improve the area and facilitate its redevelopment. While much of San Leandro's growth has been along the I-880 corridor to the west, there is new interest in the East 14th Street corridor and the potential for growth and development there in the future.

The Ashland subarea, included in the service area of Alternatives 1 and 3 at the southernmost end of the corridor, also has the capacity for future growth and development. Much of the potential in this part of the corridor is for additional residential development. The East 14th Street corridor through the area is within a redevelopment area, with the goals of increasing densities and promoting transit-oriented development.

Corridor Development Projects, Plans, and Policies

The corridor is experiencing significant infill development and revitalization as a result of targeted public investments, private sector development projects, and supportive land use plans and policies as described above. This intensification of land uses along the corridor is expected to continue through the year 2025. Tables 4.1-5 to 4.1-7 highlight key development projects and plans that will continue to shape land use in the corridor.

Table 4.1-5: Projects, Plans, and Policies—City of Berkeley: Berkeley Subarea[1]

- At the northern end of the corridor, public efforts have led to **continued revitalization of Downtown Berkeley**.
  - Seismic retrofitting and expansion of the **main public library** and **Berkeley City Hall** are renewing the civic role of Downtown Berkeley.
  - A **Downtown Arts District** is creating a critical mass of arts, entertainment, educational, and eating and drinking establishments.
  - In 2001 the **Berkeley Repertory Theater** added a new 600-seat theater to its main 400-seat stage, at the center of the new Arts District. Other projects include the **Aurora Theater** (150 seats), **Nevo Education Center** (in former 1905 bakery), **Jazzschool** and office space (in a newly renovated, former department store), a new home for **Freight & Salvage**, and **Capoeira Arts Café**.
- Mixed-use commercial and residential projects are adding **new housing in Downtown Berkeley**, as called for by the Berkeley *General Plan* adopted 2001-02.
  - An estimated **450 new housing units** were completed downtown from 2000 to 2005. An additional 680 units are in the pipeline and scheduled for completion through 2010.
  - Lower-floor space in new projects is accommodating theater uses, offices for cultural groups and other non-profits, and café and retail uses.
  - **Oxford Plaza**, an environmentally-conscious mixed-use project currently in the permit phase, will include 96 housing units and 60,000 square feet of commercial space, including a 33,000 square foot David Brower Center with office space for non-profit environmental groups.
  - The Seagate Building, to be located on Center Street and currently in predevelopment, will provide 149 housing units and 10,000 square feet of theater space. Across the street, Berkeley City College undergoing a 160,000 square foot expansion.
- The ***Draft Southside Plan*** for areas in the vicinity of the UC Berkeley campus proposes **increased density** and encourages the **development of additional housing** for students and others **along transit corridors** close to the campus.

  The Plan will be incorporated into the City's *General Plan*, zoning ordinance, and other planning policy.
- The **$100-million-plus Underhill Area Projects** are underway on five blocks just south of the campus. Development projects expected to occur in phases over the next five to 10 years include rooms for up to 995 students, a modern dining commons, a student services building, a recreational sports field, and a parking garage.
- **University of California Berkeley's *Long-Range Development Plan* (LRDP)**, approved by the UC Regents in January 2005, presents a new physical plan for **accommodating increased and changing campus activity** through 2020. The LRDP update addresses increased enrollment demand, the need to seismically retrofit or replace existing campus buildings, physical growth demand, and new interdisciplinary research initiatives.
- Major efforts have been focused on **improving Telegraph Avenue** in the vicinity of the UC Berkeley campus to make it a cleaner, safer, and more attractive place for people to visit and shop. Joint efforts involve the City, UC Berkeley and local businesses and property owners.
- **Investments in major hospital and medical facilities** continue within to accommodate modernizations and affiliations with nearby hospitals:
  - **Alta Bates** Summit Medical Center, **Ashby campus** along Telegraph Avenue; and
  - **Alta Bates** Summit Medical Center, **Herrick campus** in Downtown Berkeley.

Notes:
[1] Project status as of 2005
Source: Hausrath Economics Group, 2005.

Table 4.1-6a: Projects, Plans, and Policies—City of Oakland: North Oakland Subarea[1]

- Oakland's *General Plan* policies identify **major corridors in North Oakland for higher-density, multifamily housing with concentrations of commercial uses**, including Broadway, Telegraph Avenue, MacArthur/West MacArthur Boulevard, Martin Luther King, Jr. Way, and Grand/ West Grand Avenue.
- **Investment in higher-density, infill housing** in **North Oakland**:
  - 60 new units built 2000-2005; and
  - 125 new units anticipated for development 2005-2010, in addition to housing in MacArthur BART Transit Village.
- **MacArthur BART Transit Village** project currently in the planning stages. Mixed-use development includes:
  - New Housing: up to 700 units; and
  - Commercial//Medical/Retail: 90,000-150,000 sq. ft.
- **Additional new housing** development being planned for sites on **west side of MacArthur BART Station** and State Highway 24.
- **Broadway/MacArthur/San Pablo Redevelopment Project Area** established to further revitalization in North Oakland by targeting **investments in catalyst projects, infrastructure improvements, and infill development**. The project area includes portions of Upper Broadway and Telegraph Avenue, including Broadway Auto Row, the Alta Bates Summit medical area, the Kaiser medical area, and the MacArthur BART Station area.
- **Neighborhood commercial revitalization** efforts underway in North Oakland to strengthen smaller commercial districts.
  - Business attraction and façade improvements efforts underway in **Temescal Neighborhood Commercial District** along Telegraph Avenue in vicinity of 51st Street.
  - **Telegraph-Northgate Neighborhood Plan** completed for area just north of Downtown Oakland, addressing neighborhood-serving retail, affordable housing, streetscape and traffic calming strategies, and community service uses. Expansion of Korean-oriented retail along Telegraph Avenue in vicinity of 25th Street.
- **Investments in major hospital and medical facilities** occurring and in planning stages:
  - **Kaiser Permanente** planning replacement of hospital and expansion of outpatient facilities at its Oakland Medical Center.
  - **Children's Hospital** recently expanded research activities into renovated, historic Martin Luther King Campus, and completed Hospital western wing addition. Now planning to replace hospital. Some growth of research and outpatient services also likely over time.
  - **Summit Medical Center** completing consolidation with Alta Bates and planning to replace hospital and expand medical services at Summit campus.
- Substantial investment along **Broadway Auto Row**.
  - Public investments in **streetscape and façade improvements**.
  - **Building renovations** to strengthen auto sales and repair businesses and to attract neighborhood retail and service uses.
  - **New housing development** underway and being planned for sites along Broadway.
- **Investment in higher-density, infill housing north of Grand Avenue**, some as part of Mayor's 10K Housing Initiative:
  - 240 new units built 2005-2005; and
  - 920 new units under construction or in planning for development 2005-2010.

Notes:
[1] Project status as of 2005
Source: Hausrath Economics Group, 2005.

Table 4.1-6b: Projects, Plans, and Policies—City of Oakland: Oakland Central Subarea[1]

- **Downtown Oakland continues to grow** as a major employment center in the region and as a high-density urban residential neighborhood.
- Oakland *General Plan* policies focus on Downtown Oakland as a vibrant, mixed-use "showcase" district of the City. **High densities, mixed uses, pedestrian-friendly access to** multiple **transit** systems and stations, and the **growth in office activities and new downtown housing** are all part of the Plan's vision for the future of downtown.
- Continued downtown revitalization is a major theme of Oakland's Mayor Jerry Brown. The goal of the **Mayor's 10K Housing Initiative** is to develop housing to accommodate 10,000 new residents downtown.
- **Central District Redevelopment Project Area** continues to support the ongoing revitalization of Downtown Oakland.
- **Major government office buildings** have expanded the downtown's role as a government center.
  - **Federal Building, State Building, Caltrans Building, and University of California's Office of the President's Building** added 2.2 million sq. ft. of space during the 1990s.
  - Major renovation of earthquake-damaged **City Hall** and development of **City Administration Buildings and City Hall Plaza** re-established city government in the heart of Downtown Oakland, after being dispersed by Loma Prieta Earthquake. Public investment has been a catalyst for further revitalization nearby.
  - Construction of a new four-story office building at 20th Street and San Pablo Avenue, which will house **Alameda County's Social Services Agency** and the **North Alameda County Self Sufficiency Center**, a welfare job training program.
- **Major private sector investment in office building development and renovation** has been occurring in Downtown Oakland.
  - About 990,000 sq. ft. completed in **downtown City Center** in mid-1990s and 2003, 111,000 sq. ft. under construction in the **Uptown** district, plus additional 1.7 million sq. ft. in approved office building projects.
  - About 800,000 sq. ft. office space added through renovation of earthquake-damaged and other vacant buildings, including historic **Tribune Tower, Rotunda Building, Plaza and Wakefield Buildings, and former State Building/1111 Jackson**.
- Encouraged by the Mayor's 10K Housing Initiative, new housing is being built downtown. About **1,960 new housing units** built 2000-2005 and **2,070 new units** approved and/or anticipated by 2010. **An additional 4,350 housing units** are under review or identified on opportunity sites for future housing development.
  - **The Essex**, a new high-rise development, recently added 270 units on the **shores of Lake Merritt**.
  - About 1,500 units of urban housing and loft units completed since 2000 or currently under development in the **Jack London District**.
  - Substantial new housing transforming **Old Oakland** into a new downtown neighborhood.
  - About 1,000 units planned for the **Uptown district** with 700 additional units likely.
- **Jack London Square has become a regional destination** for retail, dining and entertainment activities. New development to substantially expand the area was recently approved.
- **Expansion of hotel uses downtown** recently added a 150-room Marriott Courtyard hotel.
- ***Downtown Oakland Streetscape Master Plan*** program is underway, with a focus on the Broadway Corridor.
- **Fox Theater Renovation** seeks to revitalize historic theater as part of downtown arts and entertainment district in combination with nearby Paramount Theater.

Notes:
[1] Project status as of 2005
Source: Hausrath Economics Group, 2005.

Table 4.1-6c: Projects, Plans, and Policies—City of Oakland: San Antonio, Fruitvale, Central East Oakland, and Elmhurst Subareas[1]

- Oakland Redevelopment Agency efforts in support of Oakland revitalization and economic development in the San Antonio, Fruitvale, Central East Oakland, and Elmhurst subareas:
  - **Coliseum Redevelopment Project Area** covers areas on south side of International Boulevard, from about 23rd Avenue to city border;
  - **City Center East Redevelopment Project Area** covers most of the rest of the Oakland portion of the corridor.
- Large part of the Oakland portion of the corridor is within **Oakland's Enterprise Zone and Empowerment Zone**.
- Joint **Oakland-San Leandro Revitalization Effort** is underway to coordinate efforts of adjoining cities, with focus on transit corridors.
- Ongoing **neighborhood commercial revitalization (NCR)** efforts focused on areas along International and MacArthur Boulevards.
  - **NCR efforts** include façade improvement programs, business attraction, streetscape and banner programs, technical assistance, and code enforcement.
  - **East Lake Commercial District** and **Fruitvale Commercial District** along International Boulevard **designated California Main Street areas**. City NCR program working in partner-ship with local development corps to revitalize commercial areas. Each received MTC/ Transportation for Livable Communities funding for pedestrian and streetscape improvements.
  - Streetscape improvements currently underway to support revitalization at commercial activity nodes and gateways along International Boulevard (40th Avenue to the Oakland-San Leandro city limits) and MacArthur Boulevard (73rd Avenue to the Oakland-San Leandro city limits).
- **Investments in higher-density housing** occurring in the Oakland portion of the corridor bringing underutilized properties back into productive use. About **890 new units** developed 2000-2005 and about 720 **additional units** anticipated 2005-2010.
  - **Privately-developed, Durant Square** project added 260 housing units and 48,000 sq. ft. retail/commercial space including a grocery store, on site of former auto assembly plant, on International Blvd.
  - **Affordable housing being developed** on underutilized and vacant sites with the corridor. Area along International Boulevard from 55th to 98th Avenues designated as Neighborhood Target Areas for investment of public funds for affordable housing.
  - **Oakland Housing Authority renovating older projects** in area to improve quality of housing and services. Lockwood Gardens and Coliseum Gardens received major investment of federal HOPE VI funds to provide about 700 rehabilitated and new units.
- **Investments in transit-oriented districts** in the area providing mixed-use development at transit nodes and stations.
  - **Fruitvale Transit Village** under development at Fruitvale BART Station area. Includes retail opportunities, about 200-250 housing units, and community/health service uses.
  - **Eastmont Town Center** being revitalized from former shopping mall into center for health and social services, public uses, and neighborhood-serving retail, at site of AC Transit Center. New housing underway in vicinity.

Coliseum BART Station area being planned as **transit-oriented district** that adds about 300-400 housing units and provides transition between nearby neighborhoods and regional facilities and intermodal connections linking BART to Coliseum Complex, Oakland International Airport and future BART/Oakland Airport Connector Project, and Capitol Corridor Intercity Rail Station (completed in 2005).

Notes:
[1] Project status as of 2005
Source: Hausrath Economics Group, 2005.

Table 4.1-7: Projects, Plans, and Policies—City of San Leandro and Unincorporated Alameda County: San Leandro and Ashland Subareas[1]

- The San Leandro *General Plan* identifies the **East 14th Street Corridor as San Leandro's highest priority for civic improvement**.
  - The *General Plan* **envisions reshaping the East 14th Street Corridor** from a three-mile commercial strip **to a series of "districts"** focused around the downtown, Bayfair Center, San Leandro Hospital, the Bal Theater, and other important destinations.
  - The **East 14th Street South Area Development Strategy**, adopted in 2004, includes:
    - Definition of districts and strategies for promoting **mixed-use, pedestrian- and transit-friendly, infill** development;
    - Recommended **public investments** in streetscape improvements, façade and site improvements, and tenant recruitment; and
    - **Design guidelines** for promoting a consistent design scheme in the corridor.
  - **San Leandro Redevelopment Agency efforts** support East 14th Street corridor improvement:
    - **Plaza Project Area** includes much of Downtown San Leandro; and
    - **Joint Project Area** includes East 14th Street south of downtown and into Ashland.
- Downtown is San Leandro's CBD and civic center. **Downtown San Leandro and the adjacent BART station area are** identified as **high priority Focus Areas** in the *General Plan* Land Use Element.
  - *The **Downtown Plan and Urban Design Guidelines*** were adopted in 2001 to foster a revitalized pedestrian-friendly downtown and improved connections to BART.
  - Building on concurrent efforts to revitalize downtown, a **design program focused on the San Leandro BART Station** and surrounding blocks provides transportation, land use, and urban design recommendations.
  - Plans for a **San Leandro BART transit village** include:
    - Up to 200 new housing units;
    - Several new office buildings, to establish a regional office district in San Leandro;
    - New parking structure;
    - New public plazas and open space; and
    - Changes in streetscapes and pedestrian amenities surrounding the station.
- **Bayfair Center** is the largest **shopping center** in San Leandro and the hub of a **130-acre retail area** along East 14th Street at the city's southern end.
  - A **multi-phase renovation** is currently underway to adapt the 600,000 square foot mall to the East Bay's changing retail market.
  - A **150,000 square foot Target store** and **16-screen multiplex cinema** have been added.
  - **Capital improvements** are planned in the Bayfair Center area as a further catalyst for revitalization.
- **San Leandro Boulevard Corridor**, on the western fringe of the area, is transitioning from an older industrial area to higher-value uses. The new Cherrywood subdivision has **350 homes**, and other sites provide some of the largest **future development opportunities** in San Leandro.
- South of San Leandro, Alameda County's land use plan designates the **East 14th Street Corridor in the Ashland/Cherryland areas** for mixed-use, infill development.
  - The ***Ashland-Cherryland Business District Specific Plan*** emphasizes revitalization and includes an action plan for specific public improvements.

The **Joint City-County Redevelopment Project Area** extends south from San Leandro. Improvement of the East 14th Street Corridor is underway in the vicinity of Bay Fair, south of San Leandro.

Notes:
[1] Project status as of 2005
Source: Hausrath Economics Group, 2005.

4.1.2 Environmental Consequences

This section analyzes the land use impacts of the proposed project, including effects on the overall land use pattern of the project corridor, consistency with local and regional land use policies, effects on population and housing growth, and effects on local businesses and commercial districts in the corridor.

Overall Land Use Impacts

The existing pattern of land use and development in the corridor is supportive of transit use. Substantial growth and development is underway in the corridor and is projected to continue into the future. Economic market forces in the corridor are positive, and local land use policies and public investments are supportive of higher-density, mixed-use, transit-oriented development. There is also capacity to grow and intensify throughout the corridor.

In combination with the factors and trends in evidence in the corridor, the East Bay BRT Project would further enhance the appeal of the corridor for higher-density development and overall land use intensification by providing the following types of benefits:

- Faster transit service and reduced travel times;
- More reliable service;
- More frequent service with shorter wait times;
- Improved bus stops (No-Build Alternative) or new transit stations (Build Alternatives) that improve services for riders and focus activity in station areas;
- More prominent and improved station areas and transit rights-of-way (Build Alternatives) that enhance the image of the corridor, promote a more pedestrian-friendly environment, and establish a more permanent presence for the transit system; and
- A “new look” that modernizes the transit system and enhances its overall image.

The land use benefits would vary as a function of the transit service and facility capital investments included in each of the alternatives.

Land-use Impacts under the No-Build Alternative

Future transit services in the corridor under the No-Build Alternative are projected to provide faster travel times, more reliable service, and improved bus stops compared to existing conditions (see Table 4.1-8). These improvements would make it more convenient and attractive for people to use the transit system and would result in higher ridership in the future. From a land use perspective, more ridership and greater accessibility would provide support for a more intensified land use pattern in the corridor. Higher densities in the corridor would, in turn, provide increased support for transit service. To some extent, the benefits of the Rapid Bus service would be focused in the vicinity of the express bus stops and in the higher-density downtown areas in the corridor.

Land-use Impacts under the Build Alternatives

The proposed East Bay BRT Project would result in greater land use effects in the corridor in the future compared to the No-Build Alternative because of greater improvements in transit services and transit system performance with the proposed project and the more substantial investments to be made in new capital facilities in the corridor (i.e. stations, transitways, streetscapes, etc).

Future transit services in the corridor with the proposed project would provide faster travel times, substantially more reliable service, and shorter wait times compared to the No-Build Alternative, as shown in Table 4.1-8. These improvements in transit service would greatly enhance the convenience and attractiveness of transit services in the corridor, would result in higher ridership than under the No-Build Alternative, and would provide greater transit access within the corridor, thereby enhancing market conditions in support of a higher-density land use pattern in the future, to a greater extent than under the No-Build Alternative.

Table 4.1-8: Transit Service and Facilities Characteristics with Implications for Land Use

Service and Facilities Characteristics[1]	Existing Conditions	No-Build Alternative	Alt 1 Separate BRT and Local Service to BayFair BART	Alt 2 Separate BRT and Local Service to San Leandro BART	Alt 3 Combined BRT and Local Service to BayFair BART	Alt 4 Combined BRT and Local Service to San Leandro BART
Improved Transit Accessibility and Reliability	**O**	**+**	**++**	**++**	**++**	**++**
Bus Travel Times (minutes)[2]						
• Peak	92	78	59	66	66	72
• Midday	90	74	57	62	63	68
• Evening	75	59	53	56	58	61
Weekday Wait Times/Headways (minutes)						
• Peak	12-15	12	5	5	3.6	3.6
• Midday	15	15	7.5	7.5	5	5
• Evening	20	20	20	20	10	10
Increase in Ridership	**O**	**+**	**++**	**++**	**+++**	**+++**
AC Transit Boardings[3]						
• Average Weekday	23,910	28,050	43,750	42,050	49,230	47,540
• Annual	7.2 million	8.4 million	13.1 million	12.6 million	14.8 million	14.3 million
Transit Facility Capital Investments[1]	**O**	**+**	**++**	**++**	**++++**	**+++**
Dedicated Rights-of-Way	No	No	Most of Corridor	Most of Corridor	Most of Corridor	Most of Corridor
Transit Stations	No	35 improved Rapid Bus stops	35 new BRT stations	31 new BRT stations	51 new BRT stations	44 new BRT stations

Notes:
1. Overall evaluation of the relative differences between future conditions under the No-Build Alternative and the Build Alternatives, as compared to existing conditions. A "0" represents existing conditions or no change; a "+" indicates improvement over existing conditions.
2. Travel times for the entire project alignment, from Downtown Berkeley to the BayFair BART Station.
3. Boardings along project alignment. Future boardings for No-Build Alternative and Build Alternatives are for 2025.
Source: Hausrath Economics Group, 2005.

The proposed project also would include much more substantial investment in capital facilities in the corridor, including new BRT stations, dedicated BRT transitways, and associated street and streetscape improvements. The capital improvements would establish the permanence of the transit system to workers, residents, and visitors in the corridor, to businesses and property owners in the corridor, and to developers and investors. It also would signal a long-term commitment to provide transit services in support of further density and development in the corridor. The capital improvements would concentrate pedestrian activity in newly created station areas, improve the desirability and image of the corridor overall, and provide the appeal of a new, modern system.

The importance and permanence of the new BRT capital facilities in combination with the improvements in transit services would support further densification of land uses in the corridor including higher-density residential and commercial infill development and intensification of existing uses. The project may foster development activity focused around distinct nodes of activity. Higher densities in the corridor would, in turn, provide increased support for transit services over time.

There is strong evidence of the mutually supportive dynamic between transit and land use playing out in urban transit corridors throughout the country. In fact, it was demonstrated with the original development of the BRT corridor along early streetcar lines. High-volume transit service, in the form of frequent streetcar service, attracted higher-density development along the trolley lines, which, in turn, supported high transit use up to the present. Similar types of effects would be expected to take place with the proposed project.

Within the corridor, the benefits of the proposed project would be strongest in the downtown centers where densities are highest and where there are both a strong potential and large capacity for more intense land use development. In particular, there would be potential land use benefits in Downtown Oakland, given its location at the center of the new BRT system, as well as in Downtown Berkeley. The improved transit system would also be supportive of land use intensification and a denser, pedestrian-oriented land use pattern in Downtown San Leandro and along both the north and south corridor areas in all three cities. Overall, the largest capacity to grow and intensify development within the corridor and take advantage of the benefits of the proposed project would be in Oakland. (See also Section 4.2, Growth Inducement, for analysis of the estimated direct effects of the East Bay BRT Project on population and employment growth in the corridor.)

While the land use effects of the proposed project would encourage land use intensification and a denser, pedestrian-oriented land use pattern throughout the corridor, the East Bay BRT Project would also have other effects that would make corridor locations less desirable for lower-density land uses dependent on easy automobile access. The analyses of transportation and parking impacts of the proposed project identify how the project would adversely affect automobile access along parts of the corridor as a result of the need to remove traffic lanes and some on-street parking to provide dedicated rights-of-way and transit stations for the BRT system. These effects would occur primarily along Telegraph Avenue in the north and International Boulevard/East 14th Street in the south. To some extent, adverse impacts on automobile accessibility are part of the trade-offs involved in evolving from lower-density, more automobile-oriented land use patterns to higher-density, more

pedestrian-oriented and transit-oriented land use patterns – as could occur along the corridor in the future under the proposed project along with economic market factors and supportive land use policy.

Consideration of Build Alternatives and Alignment Variations

The East Bay BRT Project includes four Build Alternatives, each with alignment variations that are still under consideration. The overall conclusions about land use implications of the proposed project compared to the No-Build Alternative would apply to all Build Alternatives and also would not be substantially affected by the eventual choice of particular alignment variations. The overall evaluations of the Build and No-Build Alternatives incorporate the effects of these variations.

The range of transit service improvements and new capital facilities identified for the proposed project reflect the four alternatives under consideration. Alternatives 3 and 4, which propose Combined BRT and Local Service, would provide slower door-to-door express bus travel times but greater bus frequencies. They would also include more BRT stations and result in the greatest increase in transit ridership. As a result, Alternatives 3 and 4 would have somewhat more beneficial implications for land use than Alternatives 1 and 2, which propose Separate BRT and Local Service. Under Alternatives 3 and 4, all buses would operate in the BRT transitway and use the new BRT stations. Under Alternatives 1 and 2, the BRT vehicles alone would operate in the designated BRT transitway and with new BRT stations as an express service. Local buses would operate in the adjacent mixed-flow traffic lanes and stop at curb stops, less developed than BRT stations.

Land Use Impacts as Long-term Effects on the Development Pattern

The land use effects of the proposed project are not expected to result in large changes in land use patterns due solely to the transit system improvements. Rather, the proposed project would be one factor supporting land use change, combining with market forces, local land use policies, public investments, and capacity for growth, to influence land use change over time. As described earlier in this section, the proposed project would have the most pronounced land use effects in situations where the potential for land use change is the greatest, i.e., where the other factors supporting growth and development are strongly in place.

Given the evolving process of land use change, the effects of the proposed project on land use patterns in the corridor may not be immediately apparent. Land use patterns in developed areas change slowly over time as new development projects are built and activity patterns change in existing buildings.

4.1.3 Consistency with State, Regional, and Local Plans

This section evaluates the consistency of the proposed project with local and regional land-use planning goals and policies.

Support of Local Policies

As described in Section 4.1.1.1, above, local land-use policies are supportive of growth and development and the intensification of activity within the corridor. The *General Plan* land use and zoning policies in Berkeley, Oakland and San Leandro encourage higher-density, transit-oriented

development in the downtown areas and along major arterial streets and transit corridors. In fact, much of the opportunity for growth and change in these already developed cities exists in the downtown areas and all along the BRT corridor.

The *General Plan* land use policies of all three corridor cities share the common goal of creating a higher-density, mixed-use development pattern in the downtowns and major transportation corridors that is both pedestrian-friendly and well-serviced by transit. An essential element of this vision is that high population densities will support frequent transit service and that high-quality transit will promote increased ridership.

Support of Regional Policies

Regional land use policies that promote Smart Growth in the Bay Area seek to achieve a more compact regional development pattern. Regional Smart Growth objectives and policies seek to increase densities and infill development in existing cities and along transit corridors in the central parts of the region. This is intended to help reduce the outward expansion of the region and achieve more balance between accommodating growth, facilitating regional transportation, and protecting the environment and preserving open space. Smart Growth promotes the mutually supportive relationship between high-density land use patterns and high quality public transit as a means toward focusing substantially more growth at the center of the region.

Both the No-Build Alternative and the Build Alternatives would complement and support local and regional land use policies for the study area, as described below.

No-Build Alternative

The No-Build Alternative would be consistent with and supportive of local and regional land use policies. However, compared to any of the Build Alternatives, the No-Build Alternative would be less supportive of land use policies and the growth and change they envision, consistent with the differences in transit system improvements and the differences in overall effects on land use described in previous sections.

Build Alternatives

By providing a high-quality transit system along the BRT corridor, improving access, reducing travel times, and increasing ridership, as well as improving the overall image of the corridor, the proposed project would provide the important transit component of the corridor jurisdictions' land use vision for the BRT study area, as well as promoting the further intensification of land use. As such, the proposed project would complement and support local land use policies for the corridor, as shown in Tables 4.1-4 through 4.1-6.

While supporting local objectives for land use, the proposed project could also result in adverse impacts on automobile accessibility. Reductions in convenient on-street parking and adverse impacts on local traffic circulation could be detrimental to certain types of business activity in certain locations, which could be counter to local policies for corridor commercial areas that encourage retail activity and economic development. There may be trade-offs between two transportation/development strategies: a transit-oriented strategy and an auto-oriented strategy.

Improved transit accessibility would support higher-densities, more pedestrian-oriented land use patterns in downtowns and development at commercial nodes along the corridor. The tradeoff would be less emphasis on automobile access and the discouraging of lower-density, more automobile-oriented land uses.

The proposed project would directly support the objectives and policies promoting regional Smart Growth and transit-oriented development. The proposed project would provide improved transit service along a major transportation corridor at the center of the region and serve the downtowns of three major cities. The project would result in better access for residents, workers, students and visitors in the higher-density activity centers that Smart Growth policies envision. The proposed project would support land use intensification in the corridor including, higher-density residential, commercial, and mixed-use development. The proposed project would foster development activity focused around distinct nodes of activity.

4.1.4 Avoidance, Minimization, and/or Mitigation Measures

Because the proposed project would be consistent with land use planning goals and policies, no mitigation measures are required.

4.2 Growth Inducement

4.2.1 Regulatory Setting

The Council on Environmental Quality (CEQ) regulations, which implement NEPA, require evaluation of the potential environmental consequences of all proposed federal activities and programs. This includes examining indirect consequences that may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations, 40 *Code of Federal Regulations* (CFR) 1508.8, refer to these consequences as secondary impacts. Secondary impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

CEQA also requires the analysis of the potential of a project to induce growth. CEQA Guidelines, Section 15126.2(d), require that environmental documents "…discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment…"

The growth inducement assessment examines the relationship of the project to economic and population growth or to the construction of additional housing in the project area. This includes the potential for a project to facilitate or accelerate growth beyond planned developments, or induce growth to shift from elsewhere in the region. The project's influence on area growth is considered within the context of other relevant factors, such as relative cost availability of housing, availability of amenities, local and regional growth policies, and development constraints.

4.2.2 Affected Environment

The proposed project is aimed at improving transit service along the heavily-used corridor through the cities of Berkeley, Oakland, and San Leandro. This corridor includes areas surrounding the 14.7- to 16.8-mile alignment for the proposed project. The growth inducement assessment looks at growth due to the proposed project from a regional perspective as well.

The proposed project would increase transit system reliability, speed, comfort, and safety; improve access to important employment and educational centers in the East Bay; and raise transit ridership. The project also focuses on supporting transit-oriented development and better serving under-served travel markets.

Increases in automobile traffic on major roadways in the study area and traffic spillover onto local residential streets have eroded the livability of these areas. Increases in automobile traffic coupled with lack of Smart Growth principles lead to prevailing development of outward expansion in the region as a whole. This tendency adds to regional problems such as traffic congestion, high housing prices and diminishing open space.

Building upon strong existing transit-supportive land use patterns, the cities of Berkeley, Oakland, and San Leandro are carrying out extensive development and redevelopment efforts along Telegraph Avenue, International Boulevard/East 14th Street, and other areas in the corridor. As explained in Section 4.1.1, Existing and Future Land Use, the study area plans for development are influenced by Smart Growth principles that call for increasing densities, infill development, and utilization of existing infrastructure, focusing growth in existing cities and along transit corridors in the central parts of the region. Transit-oriented development, which can be considered as a subset of the Smart Growth planning framework, calls for the development of higher-density, mixed-use activity nodes around rapid transit stations and along major transit corridors in the region.

4.2.3 Environmental Consequences

Growth and development within the proposed project corridor meet many of the regional Smart Growth objectives for land use and transit-oriented development. The proposed project would also support the development policies of the three cities. Improved transit access within the corridor would make locations along the corridor more attractive to people and businesses. Hence, the East Bay BRT Project would support growth and development and intensification of land uses along a major transit corridor, including the downtowns of three of the region's center cities,[1] and would support a more compact regional development pattern with less growth at the fringes. The proposed project would reduce the chance for sprawl in the region in the long run.

While the proposed project would support and encourage growth and land use intensification in the corridor, such growth is already contemplated in the General Plans of the three cities in the corridor and has been previously considered and analyzed as to its impacts. The corridor is already experiencing significant infill development and revitalization as a result of targeted public investments, private sector development projects, and supportive land use plans and policies of the

[1] Source: AC Transit East Bay BRT Project Land Use Report, Hausrath Economics Group 2005

cities and the region. The East Bay BRT Project by itself would not be anticipated to induce growth directly. The proposed project would merely facilitate the planned growth that is already happening in the corridor. Concentrating this growth in the vicinity of BRT stations, assuming enabling city zoning and land use policies, would be a secondary effect of the project.

From a transportation perspective, the project is essential to improve transit travel times in the corridor. Currently, the proposed project corridor experiences traffic congestion during the peak hours. With growing population and corresponding traffic growth, the conditions would worsen by 2025 and the corridor would not be as efficient in serving existing and future populations. The improvements in transit conditions afforded by the proposed project would be helpful in serving planned growth along the transit corridor. With the proposed project, not only would travel time for BRT users be reduced but transit schedule reliability would be improved. The improved speeds and schedule reliability would offer incentives for auto users to shift to public transit. Traffic studies show that in 2025 under the Build Alternatives there would be a small reduction in auto vehicle miles traveled in the county when compared to the No-Build Alternative. This shows a shift by some auto-users to transit for certain trips by virtue of the proposed project. This reduction in auto trips, though small, would have a positive effect on transportation conditions in the area and would help support planned growth focused on the transit corridor.

In summary, given that the project is aimed at improving transit in one very urbanized and well developed corridor, it would not contribute to inducing growth beyond that already contemplated and anticipated. The East Bay BRT Project would support and encourage growth and land use intensification as planned by the three cities and the region in general. It would encourage in-fill and transit-oriented development in the corridor, thereby discouraging sprawl and improving air quality in the long run. The proposed project would be one factor supporting land use change, combining with market forces, local land use policies, public investments, and capacity for growth, to influence land use change over time.

4.2.4 Avoidance, Minimization, and/or Mitigation Measures

Since the growth induced by the proposed project would be both desirable and planned by the region, avoidance, minimization or mitigation measures are not required.

4.3 Farmlands/Agricultural Lands

There are no agricultural lands within the project corridor.

4.4 Community Impacts

This section analyzes existing and projected study area social conditions in terms of population characteristics such as age distribution, income, race, ethnicity; household size and compositions; employment and labor force; community/neighborhood characteristics, including public services and facilities; and economic and business characteristics. Data or existing socioeconomic conditions are based on U.S. Census, census block groups.

4.4.1 Community Character

4.4.1.1 AFFECTED ENVIRONMENT

Demographic characteristics of the affected environment are derived from 2000 U.S. Census Data, *ABAG Projections 2002: Forecasts for the San Francisco Bay Area to the Year 2030*, the general plans of Alameda County and the cities of Berkeley, Oakland, and San Leandro; and the AC *Transit East Bay BRT Project Land Use Report* (Hausrath Economics Group, 2005). The socioeconomic study area is defined by census tract block groups adjacent to and within one-half mile of the proposed project study area, as shown in Figures 4.4-1a and 4.4-1b.

Ethnic Composition

The ethnic profile of the existing population is derived from U.S. Census Bureau 2000 data. The ethnic categories used are White, Black or African American, American Indian and Alaskan Native, Asian, Native Hawaiian or Other Pacific Islander, Hispanic, and Other.

As shown in Table 4.4-1, 76 percent of the study area population is part of an ethnic minority. The ethnic composition in the study area is comparable to that of the City of Oakland. The relative percentage of ethnic minority residents is higher than for Alameda County as a whole and for the cities of Berkeley and San Leandro.

Within the study area, Blacks or African-Americans represent the largest ethnic minority, with 27 percent of the population. The percentage of Black or African-American residents is somewhat less than that for the City of Oakland, where they constitute 35 percent of the population, and higher relative to that found in Alameda County as a whole and in the cities of Berkeley and San Leandro, they constitute less than 15 percent of the population.

Hispanic residents make up approximately 27 percent of the total population within the study area. This is higher than the percentages of Hispanic residents in Alameda County as a whole and in the cities of Berkeley, Oakland and San Leandro, where Hispanic residents make up between 10 and 22 percent of the population.

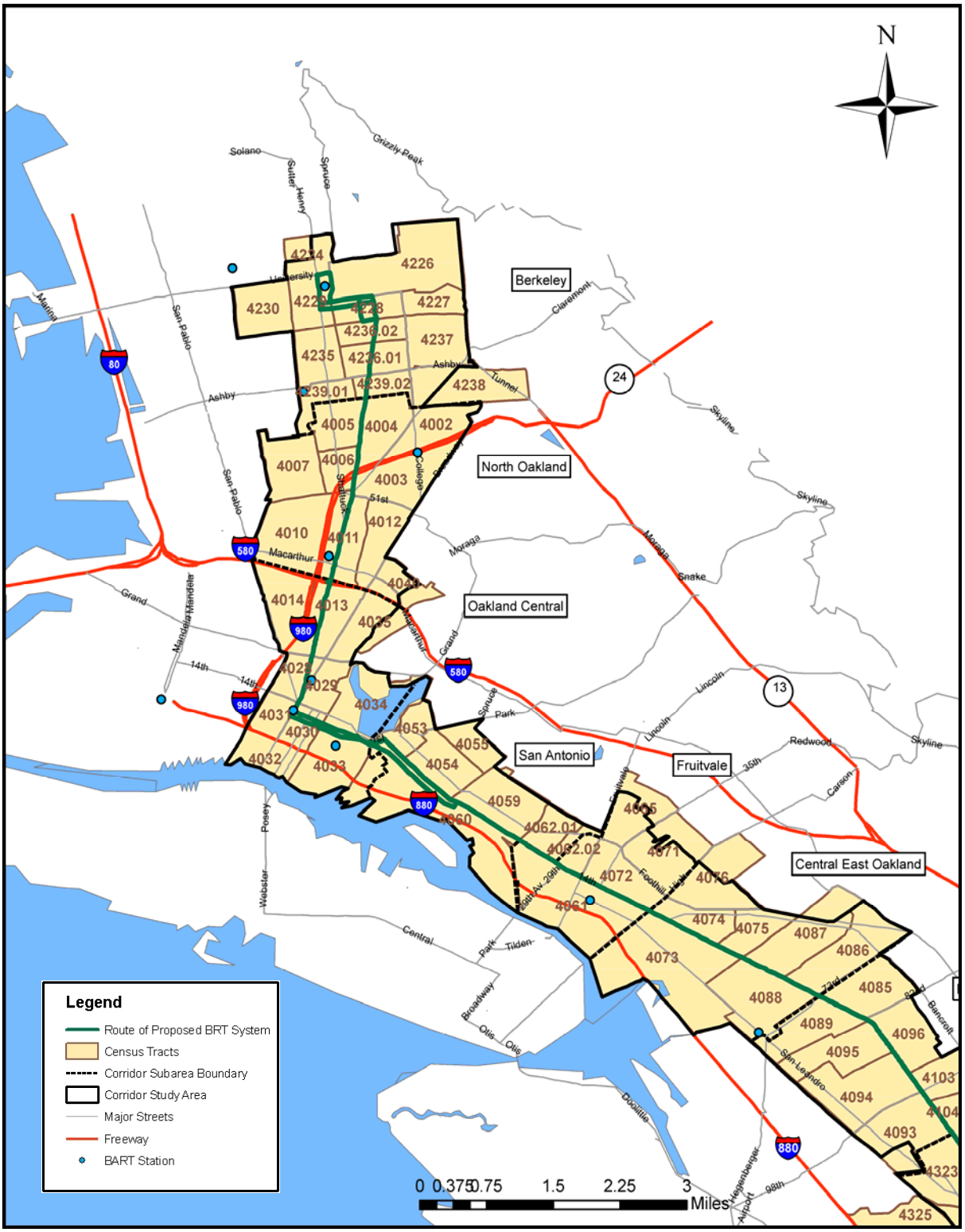


Figure 4.4-1a: Study Area Socioeconomic Census Tracts

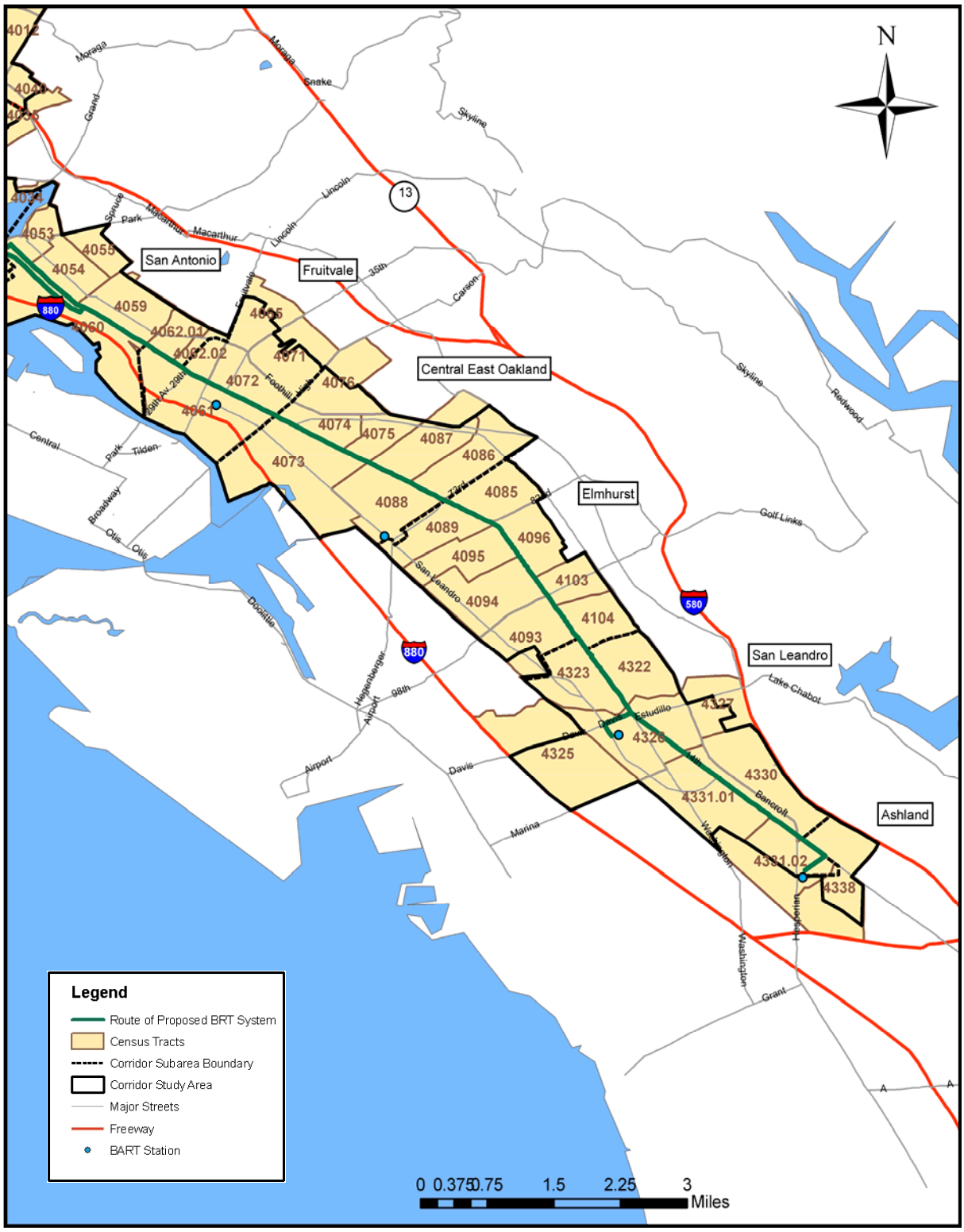


Figure 4.4-1b: Study Area Socioeconomic Census Tracts

Table 4.4-1: Ethnic Composition

Location	Total Persons	White		Black/African-American		Hispanic		Asian		American Indian or Alaskan Native		Native Hawaiian or Other Pacific Islander		Other	
		Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
Alameda County	1,443,741	591,095	41%	211,124	15%	273,910	19%	292,673	20%	5,306	< 1%	8,458	< 1%	7,637	< 1%
City of Berkeley *(Berkeley Study Area)*	102,743	56,691	55%	13,707	13%	10,001	10%	16,740	16%	293	< 1%	121	< 1%	61,175	60%
City of Oakland	399,484	93,953	24%	140,139	35%	87,467	22%	60,393	15%	1,471	< 1%	1,866	< 1%	5,190	< 1%
City of San Leandro *(San Leandro Study Area)*	79,452	33,646	42%	7,622	10%	15,939	20%	18,064	23%	360	< 1%	627	< 1%	14,195	18%
Study Area, by Subarea															
Berkeley	37,558	20,015	53%	2,574	7%	3,309	9%	9,389	25%	99	< 1%	51	< 1%	2,121	6%
North Oakland	33,114	13,525	41%	12,663	38%	2,747	8%	2,368	7%	115	< 1%	45	< 1%	1,651	5%
Oakland Central	21,754	3,394	16%	8,276	38%	2,047	9%	7,050	32%	112	< 1%	39	< 1%	836	4%
San Antonio	45,091	4,592	10%	8,598	19%	15,792	35%	14,327	32%	246	< 1%	130	< 1%	1,406	3%
Fruitvale	15,718	1,117	7%	2,379	15%	9,354	60%	2,324	15%	86	< 1%	84	< 1%	374	2%
Central East Oakland	32,134	1,352	4%	14,072	44%	13,252	41%	2,227	7%	102	< 1%	307	< 1%	762	2%
Elmhurst	27,556	777	3%	13,574	49%	11,440	42%	790	3%	84	< 1%	290	< 1%	601	2%
San Leandro	30,997	13,269	43%	3,967	13%	7191	23%	4,890	16%	160	< 1%	215	< 1%	1,305	4%
Ashland[1]	5,313	1,307	25%	911	17%	1,635	31%	1,139	21%	36	< 1%	37	< 1%	248	5%
Study Area Total	**249,235**	**59,348**	**24%**	**67,014**	**27%**	**66,767**	**27%**	**44,504**	**18%**	**1,040**	**< 1%**	**1,198**	**< 1%**	**9,304**	**4%**

Notes:
[1] Area served by Alternatives 1 and 3 only.
Source: U.S. Census Bureau, 2000.

Household Size and Composition

The U.S. Census Bureau defines a household as one or more people, related or otherwise, who live together in a dwelling unit. According to U.S. Census Bureau 2000 statistics, there were 102,928 households in the study area, with an average size of 2.42 persons per household. Compared to the study area, Alameda County had a slightly larger average household size of 2.76 persons. The cities of Oakland and San Leandro also have slightly larger average household sizes. Average household size in the City of Berkeley was somewhat smaller than the average for the study area.

Table 4.4-2 compares household characteristics in the study area to those in Alameda County and the cities of Berkeley, Oakland and San Leandro.

Table 4.4-2. Household Size and Composition

Geographic Area	Number of Households	Average Household Size
Alameda County	523,366	2.76
City of Berkeley *(Berkeley Study Area)*	44,955	2.29
City of Oakland	150,790	2.65
City of San Leandro *(San Leandro Study Area)*	30,642	2.59
Study Area, by Subarea		
Berkeley	16,425	2.29
North Oakland	15,195	2.18
Oakland Central	10,188	2.14
San Antonio	14,607	3.09
Fruitvale	4,120	3.82
Central East Oakland	9,365	3.43
Elmhurst	7,787	3.54
San Leandro	12,851	2.41
Ashland[1]	1,872	2.84
Study Area Total	**102,928**	**2.42**

Notes:
[1] Area served by Alternatives 1 and 3 only.
Source: U.S. Census Bureau, 2000.

Household Income

Table 4.4-3 below provides information on household income for Alameda County, the cities of Berkeley, Oakland and San Leandro, and the study area. The 2000 median household income was $34,094 in the study area, lower than in Alameda County and the cities of Berkeley, Oakland and San Leandro.

A total of 17.4 percent of households lived below the poverty level in the study area, more than in Alameda County, with 9.8 percent; the City of Oakland, with 16.1 percent; and the City of San Leandro, with 6.5 percent. The City of Berkeley had a slightly higher percentage of households below the poverty level with 18.4 percent.

Table 4.4-3. Household Income

Location	Median Household Income	% Households Below Poverty Level
Alameda County	$55,946	9.82%
City of Berkeley *(Berkeley Study Area)*	$44,485	18.35%
City of Oakland	$40,055	16.09%
City of San Leandro *(San Leandro Study Area)*	$51,081	6.47%
Study Area, by Subarea		
Berkeley	$34,686	22.19%
North Oakland	$41,677	12.87%
Oakland Central	$19,132	28.57%
San Antonio	$32,039	20.98%
Fruitvale	$35,289	18.35%
Central East Oakland	$29,944	25.54%
Elmhurst	$33,500	26.17%
San Leandro	$46,927	7.60%
Ashland[1]	$42,075	9.51%
Study Area Total	**$34,094**	**17.41%**

Notes:
[1] Area served by Alternatives 1 and 3 only.
Source: U.S. Census Bureau, 2000.

Households without Private Transportation

Transit dependent populations are defined as households without private transportation. Individuals in these households rely on public transportation services for access to employment, school, social/recreation functions, medical appointments, and mobility in general. Table 4.4-4 and Figure 4.4-2 shows the concentrations of transit-dependent populations in the project study area based on 2000 U.S. Census data. Twenty percent of the households in the study area are without private transportation (e.g. cars, trucks, motorcycles), compared to 11 percent for Alameda County as a whole. The census block groups in the Oakland Central neighborhood have the highest incidence of households without private transportation, with almost 50 percent of households not having direct access to private forms of transportation at the time of the 2000 Census.

Table 4.4-4. Households without Private Transportation

	Total Households	Households Without Private Transport	% Households Without Private Transport
Alameda County	523,366	57,287	11%
City of Berkeley *(Berkeley Study Area)*	44,955	7,649	17%
City of Oakland	150,790	29,584	20%
City of San Leandro *(San Leandro Study Area)*	30,642	2,850	9%
Study Area, by Subarea			
Berkeley	16,425	3,068	19%
North Oakland	15,195	2,782	18%
Oakland Central	10,188	4,963	49%
San Antonio	14,607	3,770	26%
Fruitvale	4,120	846	21%
Central East Oakland	9,365	2,287	24%
Elmhurst	7,787	1,396	18%
San Leandro	12,851	1,603	12%
Ashland[1]	1,872	162	9%
Study Area Total	**102,928**	**20,877**	**20%**

Notes:
[1] Area served by Alternatives 1 and 3 only.
Source: U.S. Census Bureau, 2000.

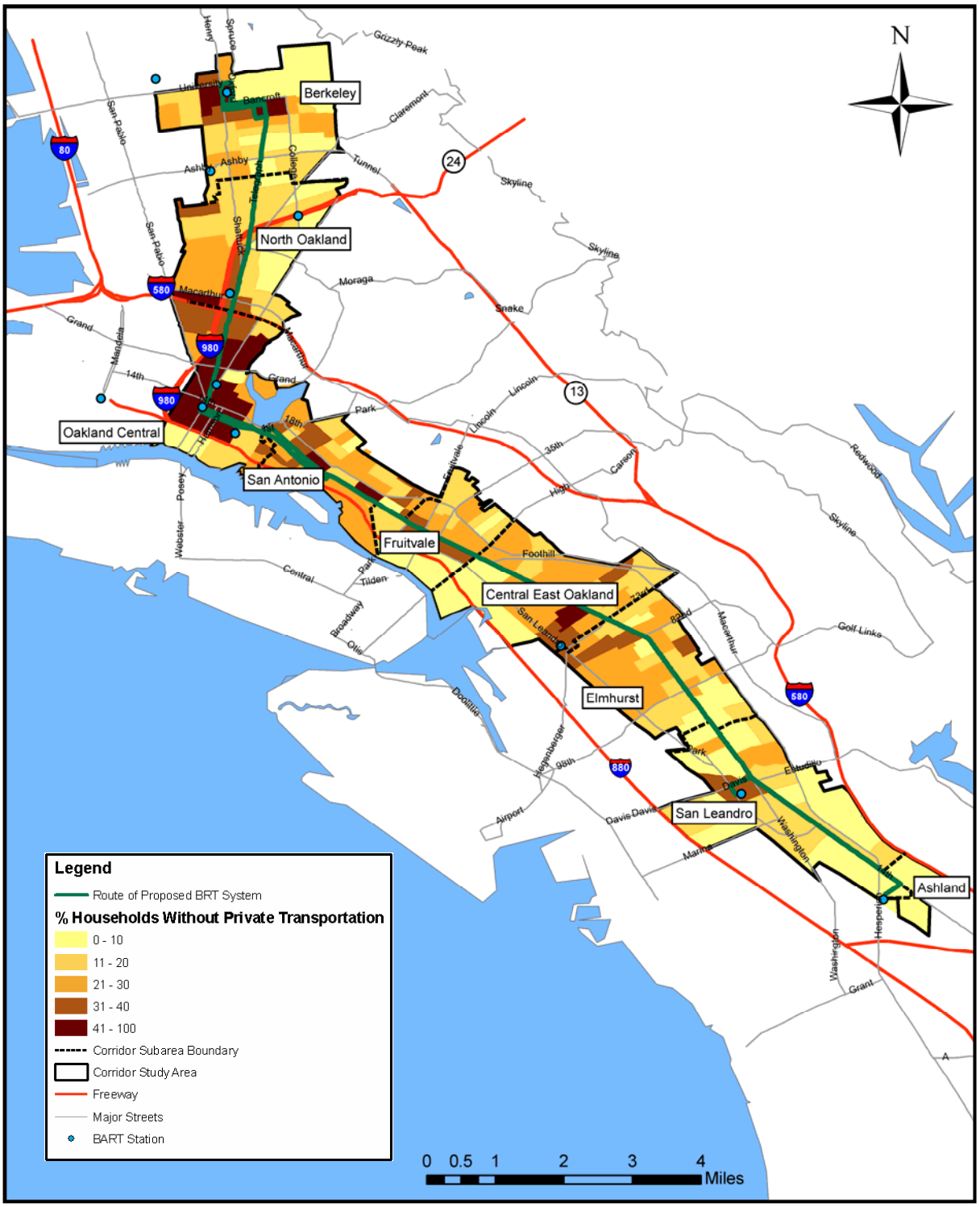


Figure 4.4-2: Housholds without Private Transportation

Planning Areas and Neighborhoods

The project corridor extends through portions of unincorporated Alameda County and the cities of Berkeley, Oakland, and San Leandro. Planning areas of these jurisdictions, as set forth in their general plans, are described below and shown in Figure 4.4-3.

Alameda County Planning Areas

Alameda County is made up of fourteen cities (Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City) and surrounding unincorporated areas. The planning areas within the corridor are in the cities of Berkeley, Oakland, and San Leandro, discussed below.

City of Berkeley Planning Areas

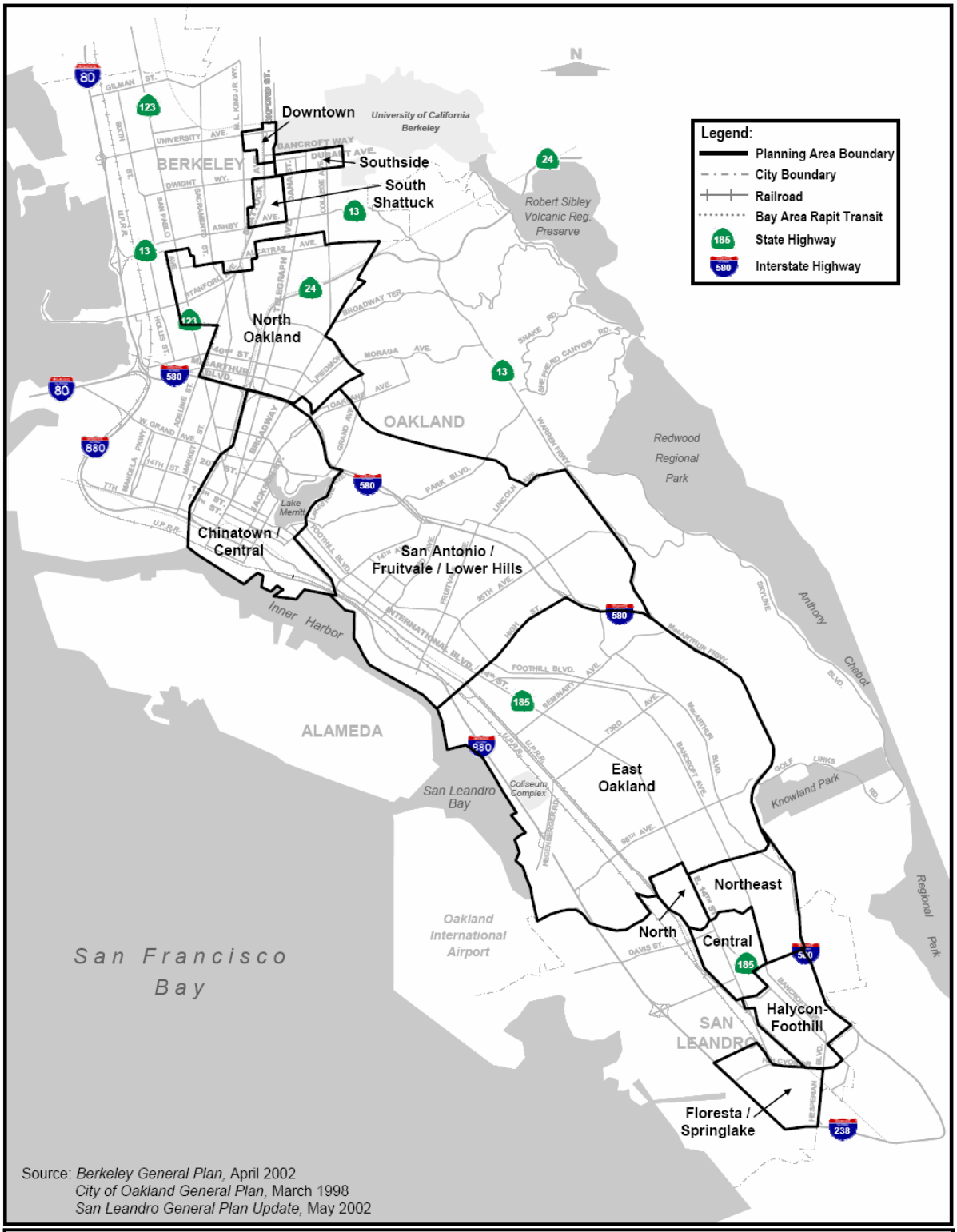
As described in the *Berkeley General Plan*, the city is divided into several planning areas that help to regulate growth and development in the communities and neighborhoods under their jurisdiction. The *General Plan* is designed to work in concert with the City's more detailed Area Plans, which were adopted as amendments to the 1977 Master Plan. Area plans already have been developed for the Waterfront, West Berkeley, University Avenue, Downtown, South Shattuck, and South Berkeley planning areas and are still in progress for the Southside and Marina planning areas.

The planning areas encompassing or adjacent to the corridor include:

- **Downtown:** Bounded by Martin Luther King Jr. Way, University Avenue, Berkeley Way, Oxford Street, and Durant Avenue;
- **South Shattuck:** Bounded by Dwight Way, Silvia Street, Ellsworth Avenue, and Ashby Avenue; and
- **Southside:** Bounded by Fulton Street, Bancroft Way, Dwight Way, and Piedmont Avenue.

City of Oakland Planning Areas The Oakland planning areas that are located along or intersected by the corridor include:

- **North Oakland:** The North Oakland Planning Area has six key study areas, including San Pablo Avenue, Martin Luther King Jr. Way, Telegraph Avenue, Broadway, College Avenue, and Piedmont Avenue.
- **Central/Chinatown:** The Central/Chinatown Planning Area contains the Downtown Showcase, Jack London Square, and segments of the Telegraph Avenue and Broadway corridors and neighborhoods in and around downtown.
- **San Antonio/Fruitvale/Lower Hills:** This planning area stretches from Lake Merritt to High Street and from State Highway 13 to the San Francisco Bay. The San Antonio and Fruitvale neighborhoods, which would be most directly affected by the project, are comprised largely of mixed housing types. Commercial activity is concentrated along MacArthur Boulevard, Foothill Boulevard, International Boulevard/East 14th Street, East 12th Street, and San Leandro Street, and in the transition areas along and south of the I-880 corridor.



Source: *Berkeley General Plan*, April 2002
City of Oakland General Plan, March 1998
San Leandro General Plan Update, May 2002

Figure 4.4-3: Berkeley, Oakland, and San Leandro Planning Areas

- **East Oakland, including Central East Oakland, Elmhurst, and the Airport:** The planning area known as East Oakland, which is bounded by High Street to the west and the San Leandro border to the east, provides a mix of residential and industrial commercial areas, easy access to the regional transportation network, and the Metropolitan Oakland International Airport. It features a number of commercial nodes along major corridors, such as Foothill Boulevard, Bancroft Avenue, and International Boulevard.

City of San Leandro Planning Areas

The official planning areas described in the *City of San Leandro General Plan* that are located along or intersected by East 14th Street within the corridor, include:

- **Northeast:** This area encompasses the neighborhoods lying east and northeast of Downtown, extending between East 14th Street to I-580 and from Oakland on the north to Sybil Avenue on the south. Several commercial districts serve the neighborhood, including the MacArthur study area and the Bancroft/Dutton shopping area. The area also contains concentrations of multi-family housing along Bancroft and close to East 14th Street.
- **North:** This area encompasses the neighborhoods lying between San Leandro Boulevard and East 14th Street from Downtown north to the Oakland border.
- **Central:** The Central area includes the residential areas surrounding Downtown San Leandro. The area contains a diverse and eclectic mix of housing and commercial uses.
- **Halcyon-Foothill:** Halcyon-Foothill is one of the largest residential areas in San Leandro, extending almost three miles south and southeast from Downtown to the Bayfair Area.
- **Floresta/Springlake:** The Floresta/Springlake neighborhoods extend east from I-880 to Hesperian Boulevard in the southern part of San Leandro. Washington Avenue is the neighborhood's major commercial study area, with a cluster of shopping centers at Washington and Floresta Boulevard.

4.4.1.2 ENVIRONMENTAL CONSEQUENCES

Community cohesion is defined as the degree to which residents have a sense of belonging to their neighborhood or experience attachment to community groups and institutions as a result of continued association over time. The proposed project potentially would have a positive impact on community cohesion, as it would provide focal points for community activity and development in the vicinity of proposed BRT stations. Because the proposed project would be constructed along existing transportation facilities, the communities and neighborhoods adjacent to the corridor would not experience a disruption in cohesion. Some existing crosswalks would be blocked by the BRT transitway, which potentially would decrease access or lengthen travel time to a particular community focal point. However, it is not anticipated that the impacts to crosswalks as a result of the proposed project would result in a substantial physical or psychological barrier that would divide, disrupt, or isolate neighborhoods, individuals, or community focal points. No displacements or relocations would occur as a result of the proposed project.

4.4.1.3 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The communities and neighborhoods in the immediate vicinity of the proposed project would not experience a disruption in cohesion; therefore, no mitigation measures are required. Nevertheless, AC Transit proposes to continue an extensive public involvement process throughout the detailed design and construction of the East Bay BRT Project, should it be approved for implementation. Input would be requested on design (stations and transitway) and operational features (bus operations, traffic, local access, and parking) of the project that would minimize community disruption. This is especially important in communities with high concentrations of minority and low income households and small businesses. These communities are often not as able as other communities to voice their concerns about project impacts (see Section 4.4. 4, Environmental Justice, for additional detail on minority and low income communities in the corridor.)

4.4.2 Public Services and Community Facilities

4.4.2.1 AFFECTED ENVIRONMENT

Public services and community facilities located in the corridor, including police and fire, hospital and medical, educational, and cultural are listed in Tables 4.4-5 through 4.4-7 and shown in Figures 4.4-4a and 4.4-4b.

Police and Fire Services

Police protection and traffic enforcement in the corridor are provided by the Alameda County Sheriff's Office, the cities of Berkeley, Oakland, and San Leandro's Police Departments, and the California Highway Patrol. Fire protection services and emergency medical rescue services are provided by the Oakland Fire Department for the City of Oakland and the Alameda County Fire Protection District for the cities of Berkeley and San Leandro. There are 15 fire stations within the corridor, including two in Berkeley, 10 in Oakland, and three in San Leandro.

Schools and Universities

Fifty-nine elementary and middle schools, 11 secondary schools, and seven charter/alternative schools are present in the corridor. Public schools are within the jurisdiction of the Berkeley Unified School District, the Oakland Unified School District, or the San Leandro Unified School District.

Other educational facilities located within the corridor include UC Berkeley; Berkeley City College; Laney College; Merritt College; and Samuel Merritt College. In addition, there are three adult education centers: Neighborhood Centers Adult Education and Oakland Evening Adult Education in Oakland and San Leandro Adult Education in San Leandro.

Cultural Facilities

Ten library branches and 16 museums, exhibition halls, and performance venues are located within the corridor. Fifteen community centers are also located within the corridor, including Berkeley Iceland, Berkeley Senior Center, Berkeley YWCA, Tang Center, and Civic Center YMCA in Berkeley, and four branches of the Boys and Girls Club of Oakland, North Oakland Senior Center, Seton Senior Center, the Oakland YWCA, and three branches of the YMCA in Oakland. Other

cultural facilities include H.J. Kaiser Convention Center, Oakland Convention Center, and Oakland Ice Center in Oakland; Martin Luther King, Jr. Civic Center in Berkeley; and San Leandro City Hall and Casa Peralta in San Leandro.

Hospital and Medical Facilities

There are several hospitals and medical facilities within the corridor, including Alta Bates Summit Medical Center and Alta Bates Summit Medical Center Herrick Campus in Berkeley; Alta Bates Summit Medical Center and Children's Hospital in Oakland; and San Leandro Hospital in San Leandro.

Table 4.4-5: Existing Public and Community Facilities in the Corridor - City of Berkeley

No.	Name	Address	No.	Name	Address
Schools					
Elementary/Middle Schools - Public			**High Schools - Public**		
S1	Le Conte Science Magnet School	2241 Russell Street	S7	Berkeley Alternative High School	2701 Martin Luther King Jr. Way
S2	Willard Middle School	2425 Stuart Street	S8	Berkeley High School	2223 Martin Luther King Jr. Way
Elementary/Middle Schools - Private			**High Schools - Private**		
S3	New Age Academy	2921 Adeline Street	S9	Arrowsmith Academy	2300 Bancroft Way
S4	Shelton's Primary Education Center	3339 Martin Luther King Jr. Way	S10	Maybeck High School	2362 Bancroft Way
S5	Spectrum Center	2855 Telegraph Avenue	**College/University**		
S6	The Academy	2722 Benvenue Avenue	S11	University of California, Berkeley	2200 University Avenue
			S12	Berkeley City College	2020 Milvia Street
Emergency Services					
Hospital			**Fire Stations**		
H1	Alta Bates Summit Medical Center	2450 Ashby Avenue	F1	Berkeley Fire Station #2	2029 Berkeley Way
H5	Alta Bates Summit Medical Center – Herrick Campus	2001 Dwight Way	F2	Berkeley Fire Station #5	2680 Shattuck Avenue
Police Station					
P1	Berkeley Police Department	3140 Martin Luther King Jr. Way			
Other Community Facilities					
Cultural Facilities			**Community Centers**		
CU1	Berkeley Community Theater	1930 Allston Way	CC1	Berkeley Iceland	2727 Milvia Street
CU2	Berkeley Historical Society	1931 Center Street	CC2	Berkeley Senior Center	1901 Hearst Avenue
CU3	Berkeley Repertory Theatre	2025 Addison Street	CC3	Berkeley YWCA	2600 Bancroft Way
CU4	Habitot Children's Museum	2065 Kittredge Street	CC4	Tang Center	2222 Bancroft Way
CU5	Hall of Health	2230 Shattuck Way	CC5	Civic Center YMCA	2001 Allston Way
CU6	Julia Morgan Theatre	2640 College Avenue	**Libraries**		
CU7	UC Berkeley Art Museum	2575 Bancroft Way	L1	Main Library	2098 Kittredge Street
Post Offices			L2	Library - Claremont Branch	2940 Benvenue Avenue
PO1	Berkeley Main Office	2000 Allston Way	L3	Library - South Branch	1901 Russell Street
PO2	Post Office	3175 Adeline Street	**Other Community Facilities**		
PO3	Sather Gate Station	2515 Durant Avenue	O1	Martin Luther King Jr. Civic Center	2180 Milvia Street
Transportation Facilities					
T1	Ashby BART Station	3100 Adeline Street			
T2	Berkeley BART Station	2160 Shattuck Avenue			

Source: Parsons, 2005

Table 4.4-6: Existing Public and Community Facilities in the Corridor – City of Oakland

No.	Name	Address	No.	Name	Address
Schools					
Elementary Schools - Public					
S13	Dolores Huerta Learning Academy	1936 Courtland Avenue	S28	Lockwood Elementary	6701 International Boulevard
S14	E. Morris Cox Elementary	9860 Sunnyside Street	S29	Marcus A. Foster Elementary	2850 West Street
S15	Elmhurst Middle	1800 98th Avenue	S30	Melrose Elementary	1325 53rd Avenue
S16	Emerson Elementary	4803 Lawton Avenue	S31	Melrose Leadership Academy	1325 53rd Avenue
S17	Franklin Elementary	915 Foothill Boulevard	S32	Monarch Academy	1445 101st Avenue
S18	Garfield Elementary	1640 22nd Avenue	S33	Oakland Charter Middle School	3001 International Boulevard
S19	Havenscourt Middle	1390 66th Avenue	S34	Oakland School for the Arts	1428 Alice Street
S20	Hawthorne Elementary	1700 28th Avenue	S35	Peralta Elementary	460 63rd Street
S21	Highland Elementary	8521 A Street	S36	Stonehurst Elementary	10315 E Street
S22	Hoover Elementary	890 Brockhurst Street	S37	Verdese R. Carter Middle School	4521 Webster Street
S23	International Community School	2825 International Boulevard	S38	Washington Elementary	581 61st Street
S24	Jefferson Elementary	2035 40th Avenue	S39	Webster Academy	8000 Birch Street
S25	La Escuelita Elementary	1100 3rd Avenue	S40	Westlake Middle	2629 Harrison Street
S26	Lazear Elementary	824 29th Avenue	S41	Whittier Elementary	1638 17th Street
S27	Lincoln Elementary	225 11th Street	S42	Woodland Elementary	1025 81st Avenue
Elementary Schools – Private					
S43	Acts Christian Academy	1034 66th Avenue	S51	Park Day School	370 43rd Street
S44	Agnes Memorial School of God	2372 International Boulevard	S52	St. Andrews Missionary Baptist	2624 West Street
S45	Dr. Herbert Guice Christian School	6925 International Boulevard	S53	St. Anthony's Elementary School	1500 East 15th Street
S46	Fairfax Lighthouse Deliverance	5341 Foothill Boulevard	S54	St. Augustine School	410 Alcatraz Avenue
S47	Ile Omode Preschool	8924 Holly Street	S55	St. Bernard's School	1630 62nd Avenue
S48	Masjidul Waritheen Public	1652 47th Avenue	S56	St. Elizabeth Elementary School	1516 33rd Avenue
S49	Montessori School My Own	5723 Oak Grove Avenue	S57	St. Martin De Porres Catholic School	675 41st Street
S50	Oakland Emiliano Zapata Academy	417 29th Street			
High Schools – Public			**Charter/Alternative Education**		
S58	Fremont Senior High	4610 Foothill Boulevard	S67	ASCEND	3709 East 12th Street
S59	Life Academy High School	2111 International Boulevard	S68	Growing Children Charter School	8000 International Boulevard
S60	MetWest High	900 Fallon Street	S69	Lighthouse Community Charter	1920 Telegraph Avenue
S61	Oakland Technical Senior High	4351 Broadway	S70	North Oakland Community Charter	5951 College Avenue
S62	Street Academy Senior High	417 29th Street	S71	Rudsdale Academy	1180 70th Avenue
High Schools – Private			S72	School of Social Justice	1025 2nd Avenue
S63	St. Elizabeth High School	1530 34th Avenue	S73	Urban Promise Academy	2825 International Boulevard
College/University			**Adult Education**		
S64	Laney College	900 Fallon Street	S74	Neighborhood Centers Adult Education	750 International Boulevard
S65	Merritt College	12500 Campus Drive	S75	Oakland Evening Adult Education	750 International Boulevard
S66	Samuel Merritt College	370 Hawthorne Avenue			
Emergency Services					
Fire Stations					
F3	Fire Station #2	100 Jack London Square	F8	Fire Station #13	1225 Derby Avenue

Table 4.4-6: Existing Public and Community Facilities in the Corridor – City of Oakland

No.	Name	Address	No.	Name	Address
F4	Fire Station #4	1235 East 14th Street	F9	Fire Station #15	455 27th Street
F5	Fire Station #5	934 34th Street	F10	Fire Station #18	1700 50th Avenue
F6	Fire Station #8	463 51st Street	F11	Fire Station #20	1401 98th Avenue
F7	Fire Station #12	822 Alice Street	F12	Fire Station #29	1061 66th Avenue
Police Stations			**Hospitals**		
P2	Alameda County Sheriff's Office	1401 Lakeside Drive	H2	Alta Bates Summit Medical Center	350 Hawthorne Avenue
P3	California Highway Patrol	3601 Telegraph Avenue	H3	Children's Hospital	747 52nd Avenue
P4	Oakland Police Department	455 7th Street			
Other Community Facilities					
Community Centers			**Cultural Facilities**		
CC6	Boys + Girls Club of Oakland	4801 Shattuck Avenue	CU8	African-American Library + Museum	659 14th Street
CC7	Boys + Girls Club of Oakland	1327 65th Avenue	CU9	Asian Branch Library	388 9th Street
CC8	Boys + Girls Club of Oakland	6809 Brentford Street	CU10	Camron-Stanford House	1418 Lakeside Drive
CC9	Boys + Girls Club of Oakland	8530 East 14th Street	CU11	Malonga Casquelourd Center for the Arts	1428 Alice Street
CC10	North Oakland Senior Center	5714 Martin Luther King Jr. Way	CU12	Museum of Children's Art	538 9th Street
CC11	Seton Senior Center	211 Foothill Boulevard	CU13	Oakland Museum	1000 Oak Street
CC12	M. Robinson Baker YMCA	3265 Market Street	CU14	Paramount Theatre of the Arts	2025 Broadway
CC13	Downtown Oakland YMCA	2350 Broadway	CU15	Pardee Home Museum	672 Eleventh Street
CC14	Eastlake YMCA	1612 45th Avenue	CU16	Studio One Art Center	365 45th Street
CC15	Oakland YWCA	1515 Webster Street	**Post Offices**		
Government Facilities			PO 4	Byron Rumford Station	1301 Clay Street
G1	Alameda County Juvenile Court	400 Broadway	PO 5	Civic Center Station	201 13th Street
G2	City Admin Building	Clay + 14th Street	PO 6	Kaiser Center Station	300 Lakeside Drive
G3	Federal Building	1301 Clay Street	PO 7	Main Office Station	1675 7th Street
G4	Oakland Chamber of Commerce	475 14th Street	PO 8	Marcus Foster Finance Station	9201 East 14th Street
G5	Oakland City Hall	1 Frank H. Ogawa Plaza	PO 9	Station B	1446 Franklin Street
G6	State Building	Clay + 14th Street	**Transportation Facilities**		
G7	Wiley W. Manuel Courthouse	661 Washington Street	T3	12th Street/Oakland BART Station	1245 Broadway
Convention Centers			T4	19th Street/Oakland BART Station	1900 Broadway
CO1	H.J. Kaiser Convention Center	10 10th Street	T5	Amtrak Station	245 2nd Street
CO2	Oakland Convention Center	475 14th Street	T6	Bus Station	San Pablo + Castro
Libraries			T7	Coliseum BART Station	7200 San Leandro Boulevard
L4	City of Oakland Main Library	125 14th Street	T8	Fruitvale BART Station	3401 East 12th Street
L5	Cesar Chavez Branch Library	1900 Fruitvale Avenue	T9	Lake Merritt BART Station	800 Madison Street
L6	Martin Luther King Branch Library	6833 International Boulevard	T10	MacArthur BART Station	555 40th Street
L7	Melrose Branch Library	4805 Foothill Boulevard	T11	Park + Ride Lot	27th + I-980
L8	Temescal Branch Library	5205 Telegraph Avenue	T12	Park + Ride Lot	Derby + 12th
Other Facility			T13	Rockridge BART Station	5660 College Avenue
O2	Oakland Ice Center	519 18th Street			

Source: Parsons, 2005

Table 4.4-7: Existing Public and Community Facilities in the Corridor – City of San Leandro

No.	Name	Address	No.	Name	Address
Schools					
Elementary/Middle Schools - Public			**Elementary/Middle Schools - Private**		
S76	Jefferson Elementary	14311 Lark Street	S82	Assumption School-San Leandro	1851 136th Avenue
S77	John Muir Middle	1444 Williams Street	S83	Principled Academy	2305 Washington Avenue
S78	McKinley Elementary	2150 East 14th Street	S84	St. Leander School	451 Davis Street
S79	Washington Elementary	250 Dutton Avenue	**Adult Education**		
S80	Woodrow Wilson Elementary	1300 Williams Street	S85	San Leandro Adult Education	2255 Bancroft Avenue
High School - Public					
S81	San Leandro High	2200 Bancroft Avenue			
Emergency Services					
Fire Stations			**Police Station**		
F13	County Fire Department #9	450 Estudillo Avenue	P5	San Leandro Police Department	901 East 14th Street
F14	County Fire Department #10	2194 Williams Street	**Hospital**		
F15	County Fire Department #12	1065 143rd Avenue	H4	San Leandro Hospital	13855 East 14th Street
Other Community Facilities					
Libraries			**Transportation Facilities**		
L9	Main Library	300 Estudillo Avenue	T14	Bayfair BART Station	15242 Hesperian Boulevard
L10	South Branch	14799 East 14th Street	T15	San Leandro BART Station	1401 San Leandro Boulevard
Other Facilities			**Post Offices**		
O3	San Leandro City Hall	835 East 14th Street	P10	Estudillo Station	1319 Washington Avenue
O4	Casa Peralta	384 West Estudillo Avenue	P11	South San Leandro Station	14500 East 14th Street

Source: Parsons 2005

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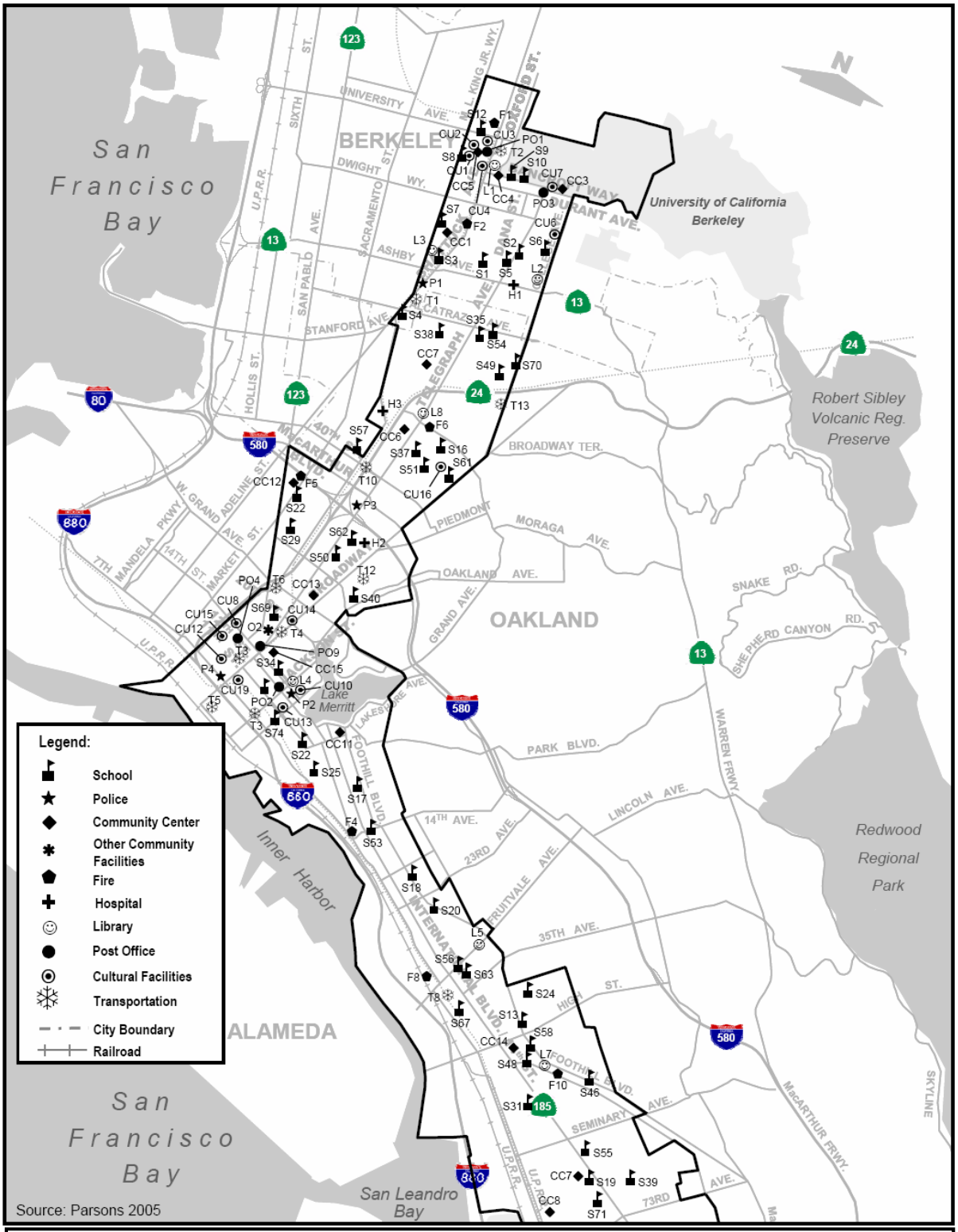
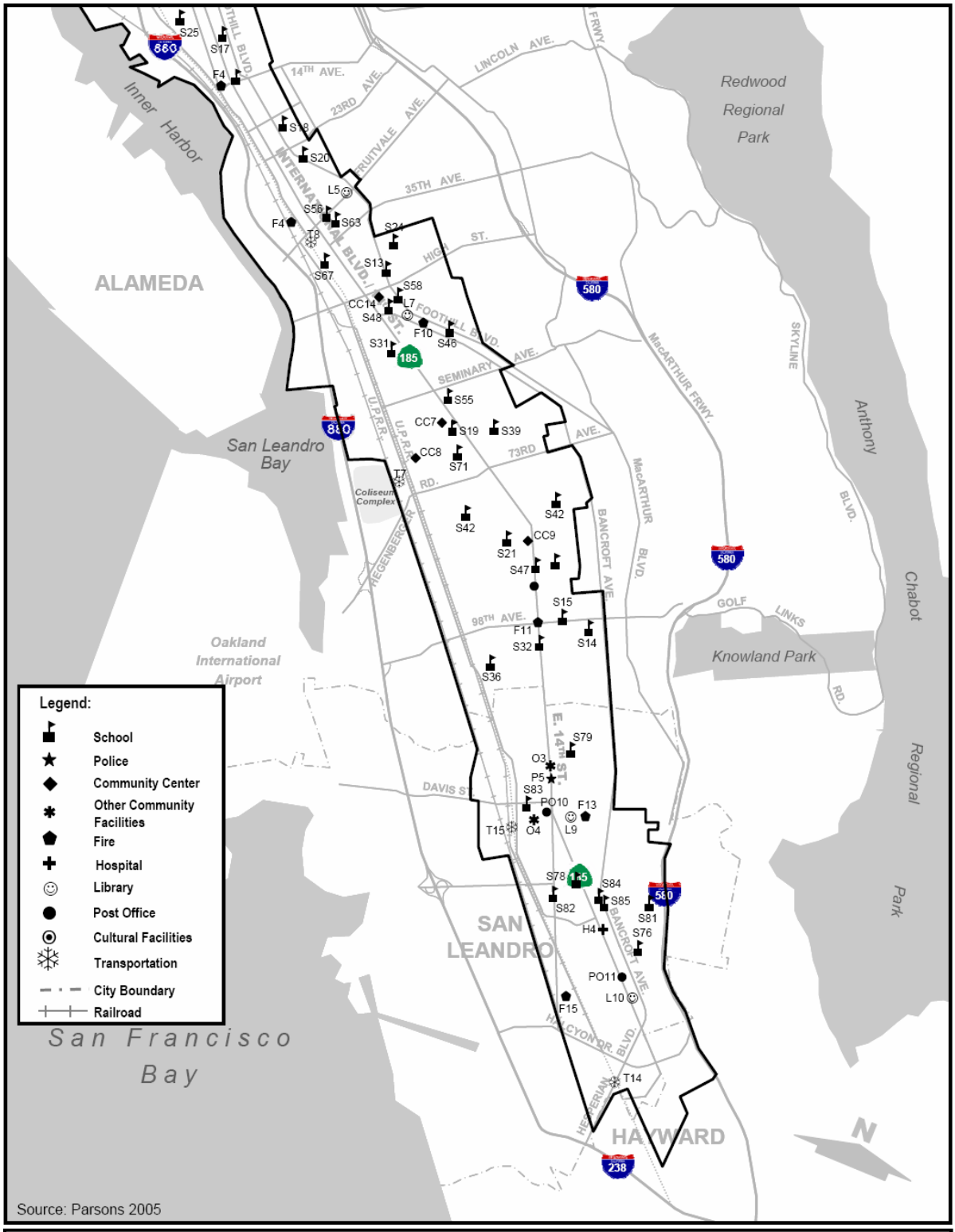


Source: Parsons 2005

Figure 4.4-4a: Public and Community Facilities



Source: Parsons 2005

Figure 4.4-4b: Public and Community Facilities

Houses of Worship

There are a number of houses of worship of various denominations in the corridor. These facilities, which serve as community focal points, are listed in Tables 4.4-8 through 4.4-10 and shown in Figures 4.4-5a and 4.4-5b.

Table 4.4-8: Existing Houses of Worship in the Corridor – City of Berkeley

	House of Worship	Address		House of Worship	Address
B1	All Nations Church Of Christ	2003 Woolsey Street	B20	First Baptist Church	2345 Channing Way
B2	Berkeley Gospel Church of Christ	2138 Cedar Street	B21	First Congregational Church	2345 Channing Way
B3	Berkeley Presbyterian Mission	2918 Regent Street # G	B22	First Presbyterian Church	2407 Dana Street
B4	Berkeley Seventh Day Adventist	2236 Parker Street	B23	Found For Spiritual Freedom	2650 Telegraph Avenue
B5	Bethlehem Ethiopian Church	3102 Telegraph Avenue	B24	Grace North Church	2138 Cedar Street
B6	Bethlehem Lutheran Churches	3100 Telegraph Avenue	B25	International Society-Krishna	2334 Stuart Street
B7	Buddhist Temple Of Berkeley	2121 Channing Way	B26	Living Water Fellowship	2840 College Avenue
B8	Calvary Presbyterian Church	1940 Virginia Street	B27	New Church of Berkeley	2640 College Avenue
B9	Canterbury House	2334 Bancroft Way	B28	New Spirit Community Church	2140 Shattuck Avenue
B10	Christian Science Church	2619 Dwight Way	B29	Orthodox Institute	2311 Hearst Avenue
B11	Church By The Side Of The Road	2108 Russell Street	B30	Presbytery Of San Francisco	2024 Durant Avenue
B12	Church In Berkeley	2430 Dana Street	B31	St John's Russian Church	1900 Essex Street
B13	Church Of Christ	2320 Dana Street	B32	St Joseph Of Arimathea Chapel	2316 Bowditch Street
B14	Church Of Divine Man	2018 Allston Way	B33	St Mark's Episcopal Church	2300 Bancroft Way
B15	Deliverance Temple Holiness	1918 Blake Street	B34	St. Paul A.M.East Church	2024 Ashby Avenue
B16	Dharmadhatu Berkeley Shambhala	2288 Fulton Street	B35	Thai Buddhist Temple	1911 Russell Street
B17	Durant Avenue Presbyterian Church	2024 Durant Avenue	B36	Trinity United Methodist Church	2362 Bancroft Way
B18	Dzogchen Community West Coast	2748 Adeline Street	B37	Unitarian Universalist Fellowship	1924 Cedar Street
B19	Eckankar	3052 Telegraph Avenue	B38	Vedanta Society Of Berkeley	2455 Bowditch Street

Source: Parsons, 2005

Table 4.4-9: Existing Houses of Worship in the Corridor – City of Oakland

	House of Worship	Address		House of Worship	Address
O1	37th Street Baptist Church	915 37th Street	O121	Jesus Cristo Es La Respuesta	3256 International Boulevard
O2	Abundant Life New Generation	9711 International Boulevard	O122	Jesus Ministries Christian Center	355 Grand Avenue
O3	Abyssinian Missionary Baptist	528 33rd Street	O123	King Solomon Baptist Church	4322 Martin Luther King Jr. Way
O4	Acts Full Gospel Church	1034 66th Avenue	O124	Korean Agape Mission Church	9634 International Boulevard
O5	Agnes Memorial Church Of God	2372 International Boulevard	O125	Korean Baptist Church	1216 21st Avenue
O6	Ahmadyya Movement in Islam	449 W. Macarthur Boulevard	O126	Korean Community Christian Church	2505 Telegraph Avenue
O7	Al-Iman Masjid	4606 Martin Luther King Jr. Way	O127	Korean Methodist Seminary	737 East 17th Street
O8	All National Pentecostal Church	1601 83rd Avenue	O128	Korean United Methodist Church	737 East 17th Street
O9	All Nations Christian Fellowship	9925 Sunnyside Street	O129	Lake Merritt United Methodist	1330 Lakeshore Avenue
O10	Allen Temple Baptist Church	8501 International Boulevard	O130	Lakeside Baptist Church	219 East 15th Street
O11	American Indian Baptist Church	1315 102nd Avenue	O131	Lakeside Temple of Practical Christianity	144 Athol Avenue
O12	Amos Temple C.M.E. Church	1500 90th Avenue	O132	Landmark Ministries	2000 40th Avenue
O13	Anointed-God Christian	5540 East 17th Street	O133	Lily Of The Valley	1010 91st Avenue
O14	Apostolic Church	3715 Foothill Boulevard	O134	Little Temple	8733 B Street
O15	At Thy Word Ministries	8909 International Boulevard	O135	Living Word Christian	678 26th Street
O16	Baha'i Faith Oakland	1434 35th Avenue	O136	Love Center Church	10440 International Boulevard
O17	Beautiful Gate Holy Church	5699 Shattuck Avenue	O137	Love Temple Missionary Church	8401 Birch Street
O18	Beebee Memorial Cathedral	3900 Telegraph Avenue	O138	Macedonia Baptist Church	925 107th Avenue
O19	Berkland Baptist Church	332 Alcatraz Avenue	O139	Madame Jackson Spiritualist	490 Alcatraz Avenue
O20	Bethel Missionary Baptist Church	6901 Rudsdale Street	O140	Mary Help Of Christians Church	2611 East 9th Street
O21	Bethlehem Christian Center	9400 International Boulevard	O141	Melrose United Methodist	54th Avenue + Wentworth Avenue
O22	Bethlehem Institutional Baptist	9330 Holly Street	O142	Memorial Tabernacle Church	514 58th Street
O23	Bethlehem Missionary Baptist	8721 East 14th Street	O143	Metropolitan Church Of God	1700 84th Avenue
O24	Bible Faith Church	5787 Foothill Boulevard	O144	Midrasha Oakland	2808 Summit Street
O25	Bible Fellowship Missionary	1520 8th Avenue	O145	Millennium Ministries Group	959 33rd Street
O26	Bible's Way Church Of God	3918 Foothill Boulevard	O146	Minh Yueh Jiu Shyh Buddhist	2267 Telegraph Avenue
O27	Bibleway Fellowship Church	3828 Martin Luther King Jr. Way	O147	Ministerios Internacionales La	4109 Foothill Boulevard
O28	Brookins A.M.E. Church	2201 73rd Avenue	O148	Miraculous Foundation	1642 Fruitvale Avenue
O29	Brotherhood Of The Cross Star	2014 San Pablo Avenue	O149	Moriah Christian Fellowship	3354 San Pablo Avenue
O30	California Northwest Church	874 36th Street	O150	Mount Calvary Missionary Church	1445 23rd Avenue
O31	Calvary Baptist Church	2711 Havenscourt Boulevard	O151	Mount Carmel Missionary Church	1343 81st Avenue
O32	Calvary Temple Church	1000 82nd Avenue	O152	Mount Olive Missionary Baptist	1840 East 14th Street
O33	Cathedral Of Christ The Light	180 Grand Avenue	O153	Mount Sinai Baptist Church	1970 86th Avenue
O34	Chinese Independent Baptist	280 8th Street	O154	Mt Pilgrim Metropolitan Church	5210 East 14th Street
O35	Chinese Revival Christian Church	380 8th Street	O155	Mt Pisgah Missionary Baptist	2059 64th Avenue
O36	Christ Chapel Baptist Church	9319 International Boulevard	O156	Mt Zion Prayer Tower	9615 International Boulevard
O37	Christian Science Church	1701 Franklin Street	O157	Muhammad Mosque	5277 Foothill Boulevard
O38	Christian Science Practitioners	1611 Telegraph Avenue	O158	New Birth Church	1015 East 11th Street
O39	Christian Science Reading Room	1749 Broadway	O159	New Faith Chapel Cogic	2111 Seminary Avenue
O40	Church Of Christ	531 25th Street	O160	New Greater Faith Baptist Church	1103 Seminary Avenue
O41	Church Of Christ	7811 International Boulevard	O161	New Heights Christian Church	1251 98th Avenue
O42	Church Of Christ	7401 Halliday Avenue	O162	New Hope Baptist Church	892 36th Street
O43	Church Of God Evening Light	9330 Walnut Street	O163	New Hope Church Of God	9248 International Boulevard
O44	Church Of God In Christ	9248 International Boulevard	O164	New Life Church of God In Christ	4450 International Boulevard
O45	Church Of God Seventh Day	1200 71st Avenue	O165	New Mt Herman Missionary	1649 12th Avenue

Table 4.4-9: Existing Houses of Worship in the Corridor – City of Oakland

House of Worship	Address	House of Worship	Address
O46 Church Of The Good Shepherd	799 52nd Street	O166 New Testament Church	1421 92nd Avenue
O47 Church of the Living God	819 37th Street	O167 North American Guan Yin Tusa	1127 Webster Street
O48 Church Of The True Living God	2009 International Boulevard	O168 Oakland Buddhist Society	5212 East 10th Street
O49 City Of Refuge Tabernacle	8637 East 14th Street	O169 Oakland Greater New Bethel	751 47th Street
O50 College Avenue Presbyterian	5951 College Avenue	O170 Oakland Islamic Center	515 31st Street
O51 Concord Baptist Church	1744 11th Avenue	O171 Oakland Seventh Day Adventist Spanish	2410 East 15th Street
O52 Cosmopolitan Baptist Church	1022 85th Avenue	O172 Olivet Institutional Baptist Church	807 27th Street
O53 Cosmopolitan Baptist Church	988 85th Avenue	O173 Our Savior Episcopal Church	1011 Harrison Street
O54 Dancey Memorial Church Of God	7900 East 14th Street	O174 Parks Chapel A.M.E.	476 34th Street
O55 East Bay Church of Religious Science	4130 Telegraph Avenue	O175 Pathway Of Truth Apostolic	5845 Foothill Boulevard
O56 East Bay Korean Baptist Church	2000 East 12th Street	O176 Philippian Church	3334 Webster Street
O57 East Bay Vietnamese American	8237 International Boulevard	O177 Pilgrim Rest Baptist Church	659 16th Street
O58 East Oakland Church Of Christ	7811 International Boulevard	O178 Pilgrim Temple Church Of God	588 61st Street
O59 East Oakland Deliverance Center	7425 International Boulevard	O179 Praises Of Zion Missionary Church	1722 55th Avenue
O60 El Buen Pastor Mission	4759 International Boulevard	O180 Prayer Tower Temple	2742 Havenscourt Boulevard
O61 El Monte Sinai	1834 38th Avenue	O181 Prince Of Peace Church Of God	1062 50th Avenue
O62 Elijah Cultural Center	1700 47th Avenue	O182 Rainbow Church Of God	6119 East 14th Street
O63 Elmhurst Presbyterian Church	1332 98th Avenue	O183 Refreshing Fountain Church	1156 East 12th Street
O64 Elmhurst United Methodist Church	1659 83rd Avenue	O184 Restoration Apostolic Church	7800 International Boulevard
O65 Emmanuel Independent Christian	1845 East 15th Street	O185 Resurrection Concord Christian	8901 International Boulevard
O66 Emmanuel Temple Church	780 54th Street	O186 Rice Temple	904 East 12th Street
O67 Ephesian Baptist Church	1423 34th Avenue	O187 Riley Chapel	1302 80th Avenue
O68 Eritrean Orthodox Church	5917 International Boulevard	O188 Rising Star Missionary Baptist	3209 Martin Luther King Jr. Way
O69 Evergreen Baptist Church	408 W Macarthur Boulevard	O189 River Of Life Christian Fellowship	1587 Franklin Street
O70 Fairfax Lighthouse Deliverance	5341 Foothill Boulevard	O190 Rock Of Truth Baptist Church	900 34th Street
O71 Faith Mission Fellowship Church	3651 Martin Luther King Jr. Way	O191 Rock Truth Baptist Church	459 61st Street
O72 Faith Temple Church Of God	1628 Seminary Avenue	O192 Rockridge United Methodist	303 Hudson Street
O73 Faith United Presbyterian Church	430 49th Street	O193 Sacred Heart Church	4025 Martin Luther King Jr. Way
O74 First A.M.E. Church	530 37th Street	O194 Saint's Rest Missionary Church	1401 57th Avenue
O75 First Baptist Church	534 22nd Street	O195 Seafares Ministry-Golden Gate	534 22nd Street
O76 First Christian Church of Oakland	111 Fairmount Avenue	O196 Second Bethel Missionary Church	2325 Martin Luther King Jr. Way
O77 First Congregational Church	2501 Harrison Street	O197 Second Mt Nebo Missionary Church	7635 Arthur Street
O78 First Corinthian Missionary	5650 Shattuck Avenue	O198 Seventh Avenue Baptist Church	1740 7th Avenue
O79 First Korean Christian Church	111 Fairmount Avenue	O199 Shattuck Avenue United Church	6300 Shattuck Avenue
O80 First Morning Star Baptist Church	1501 90th Avenue	O200 St Andrews Missionary Baptist	2624 West Street
O81 First Presbyterian Church	2619 Broadway	O201 St Anthony's Church	1535 16th Avenue
O82 First Spanish Baptist Church	1660 23rd Avenue	O202 St Augustine Episcopal Church	525 29th Street
O83 First Trinity Lutheran Church	1431 17th Avenue	O203 St Augustine's Catholic Church	400 Alcatraz Avenue
O84 Foothill Missionary Baptist	1530 Foothill Boulevard	O204 St Bernard's Church	1620 62nd Avenue
O85 Getsemani	7701 International Boulevard	O205 St Elizabeth Church	1500 34th Avenue
O86 Glad Tidings Community Church	1800 East 12th Street	O206 St James Church Of God	4564 International Boulevard
O87 Glorious Kingdom Primitive Church	479 42nd Street	O207 St James Episcopal Church	1540 12th Avenue
O88 Good Hope Missionary Baptist	5717 Foothill Boulevard	O208 St John's Lutheran Church	1800 55th Avenue
O89 Good Samaritan Cathedral	625 W Macarthur Boulevard	O209 St LaSalle Community	655 40th Street

Table 4.4-9: Existing Houses of Worship in the Corridor – City of Oakland

House of Worship	Address	House of Worship	Address
Church			
O90 Grace Temple Baptist Church	1433 12th Avenue	O210 St Louis Bertrand Church	1410 100th Avenue
O91 Grand Avenue Seventh Day Church	278 Grand Avenue	O211 St Patrick's Abbey Church	3700 East 12th Street
O92 Greater Bethesda Church Of God	5045 Foothill Boulevard	O212 St Patrick's Oakland	3700 East 12th Street
O93 Greater Good Shepherd Church	5263 Foothill Boulevard	O213 St Paul's Episcopal Church	114 Montecito Avenue
O94 Greater Jerusalem Baptist Church	4076 Foothill Boulevard	O214 St. Patrick's Episcopal Church	1011 Harrison Street
O95 Greater Miracle Temple Church	5726 International Boulevard	O215 Starlight Baptist Church	1256 71st Avenue
O96 Greater New Faith Worship Center	9925 International Boulevard	O216 Starlight Spiritual Temple	939 35th Street
O97 Greater Refuge Church Of God	2001 73rd Avenue	O217 Sweet Home Baptist Church	5114 East 10th Street
O98 Greater St James Missionary	4331 Martin Luther King Jr. Way	O218 Telegraph Community Center	5316 Telegraph Avenue
O99 Greater St Paul Missionary Church	1827 Martin Luther King Jr. Way	O219 Temple Sinai	2808 Summit Street
O100 Greek Assembly Of God Church	1771 36th Avenue	O220 Templo Bethania	1845 East 15th Street
O101 Harmony Baptist Church	4113 Telegraph Avenue	O221 Templo Getsemani	1927 6th Avenue
O102 Harvest Fellowship Church	620 42nd Street	O222 Trinity Missionary Baptist Church	Oakland Army Base
O103 Havenscourt Community Church	1444 Havenscourt Boulevard	O223 True Faith Baptist Church	626 W Grand Avenue
O104 High Street Presbyterian	1945 High Street	O224 True Fellowship Church	1587 Franklin Street
O105 Hines Memorial Oakland Christ	5029 International Boulevard	O225 True Holiness Church of God in Christ	9941 D Street
O106 Holy Temple Church Of God	717 54th Street	O226 Truth Gospel Church	1601 13th Avenue
O107 Hosana Church Of God	735 Sycamore Street	O227 Twenty-Third Avenue Church Of God	1940 23rd Avenue
O108 House Of Prayer Evangelistic	306 15th Street	O228 Union Baptist Church	949 71st Avenue
O109 House Of Truth	8835 International Boulevard	O229 United Outreach Church	1200 75th Avenue
O110 Iglesia De Dios Pentecostes	1421 25th Avenue	O230 Unity Community Church	5746 International Boulevard
O111 Iglesia De Jesu Cristo	1022 East 12th Street	O231 Victory Mission Church	441 East 18th Street
O112 Iglesia Macedonia	5253 Foothill Boulevard	O232 Wagoner Memorial Church Of God	2714 Havenscourt Boulevard
O113 Iglesia Presbiteriana Hispana	1941 High Street	O233 Westminster House	500 E 8th Street
O114 Immanuel Missionary Baptist	3700 Martin Luther King Jr. Way	O234 Williams Chapel Baptist Church	1410 10th Avenue
O115 Islamic Center of Northern California	1433 Madison Street	O235 Wof Church Of God + Christ	9620 International Boulevard
O116 Jehovah's Witness-East	1627 61st Avenue	O236 Word Of Faith Church	1655 54th Avenue
O117 Jehovah's Witnesses	5915 Racine Street	O237 Wo'se Community Church	8924 Holly Street
O118 Jehovah's Witnesses	1739 8th Avenue	O238 Young Nak Church Of Oakland	111 Fairmount Avenue
O119 Jehovah's Witnesses Broadmoore	1057 98th Avenue # B	O239 Zion Tabernacle Baptist Church	3945 San Juan Street
O120 Jehovah's Witnesses-Elmhurst	1057 98th Avenue # B	O240 Zion's Tabernacle Church of God	2147 East 15th Street

Source: Parsons, 2005

Table 4.4-10: Existing Houses of Worship in the Corridor – City of San Leandro

	House of Worship	Address		House of Worship	Address
SL1	Badarikashrama	15602 Maubert Avenue	SL18	Jehovah's Witnesses	1605 Mono Avenue
SL2	Bay Area Family Church	2305 Washington Avenue	SL19	Eden Korean Presbyterian Church	1484 156th Avenue
SL3	Bethel Presbyterian Church	14235 Bancroft Avenue	SL20	Living Waters Assembly of God	97010 East 14th Street
SL4	Broadmoor Community Church	301 Dowling Boulevard	SL21	Metropolitan Spiritual Church	6629 Bancroft Avenue
SL5	Castro Valley Alliance Church	136 Farrelly Drive	SL22	Romanian Baptist Church	14871 Bancroft Avenue
SL6	Christian Life Church	1699 Orchard Avenue	SL23	Saint Leander's Church	550 W Estudillo Avenue
SL7	Church Of Jesus Christ Of Latter Day Saints	13901 Bancroft Avenue	SL24	San Leandro Community Church	1395 Bancroft Avenue
SL8	Church Of The Assumption	1100 Fulton Avenue	SL25	Siloam Church	1484 156th Avenue
SL9	Euphrates Missionary Church	301 Dutton Avenue	SL26	Simpson Temple Church of God in Christ	2258 62nd Avenue
SL10	Faith Bible Church Of Oakland	238 Castro Street	SL27	St Alban's Episcopal Church	1501 Washington Avenue
SL11	First Apostolic Church	1190 Davis Street	SL28	St Leander's Church	474 W Estudillo Avenue
SL12	First Christian Church	1190 Davis Street	SL29	St Peter's Lutheran Church	172 Breed Avenue
SL13	First New Jerusalem Missionary	1710 24th Avenue	SL30	Start + Finish With God	2287 Washington Avenue
SL14	First United Methodist Church	1600 Bancroft Avenue	SL31	Temple Beth Sholom	642 Dolores Avenue
SL15	Grace Baptist Church	16105 Mateo Street	SL32	Triumph Ministries	15950 East 14th Street
SL16	Halcyon Baptist Church	2860 Halcyon Drive	SL33	True Love Christian Center	5234 Foothill Boulevard
SL17	International Bible Baptist	15963 Marcella Street	SL34	Unity Church Of San Leandro	501 Joaquin Avenue

Source: Parsons, 2005

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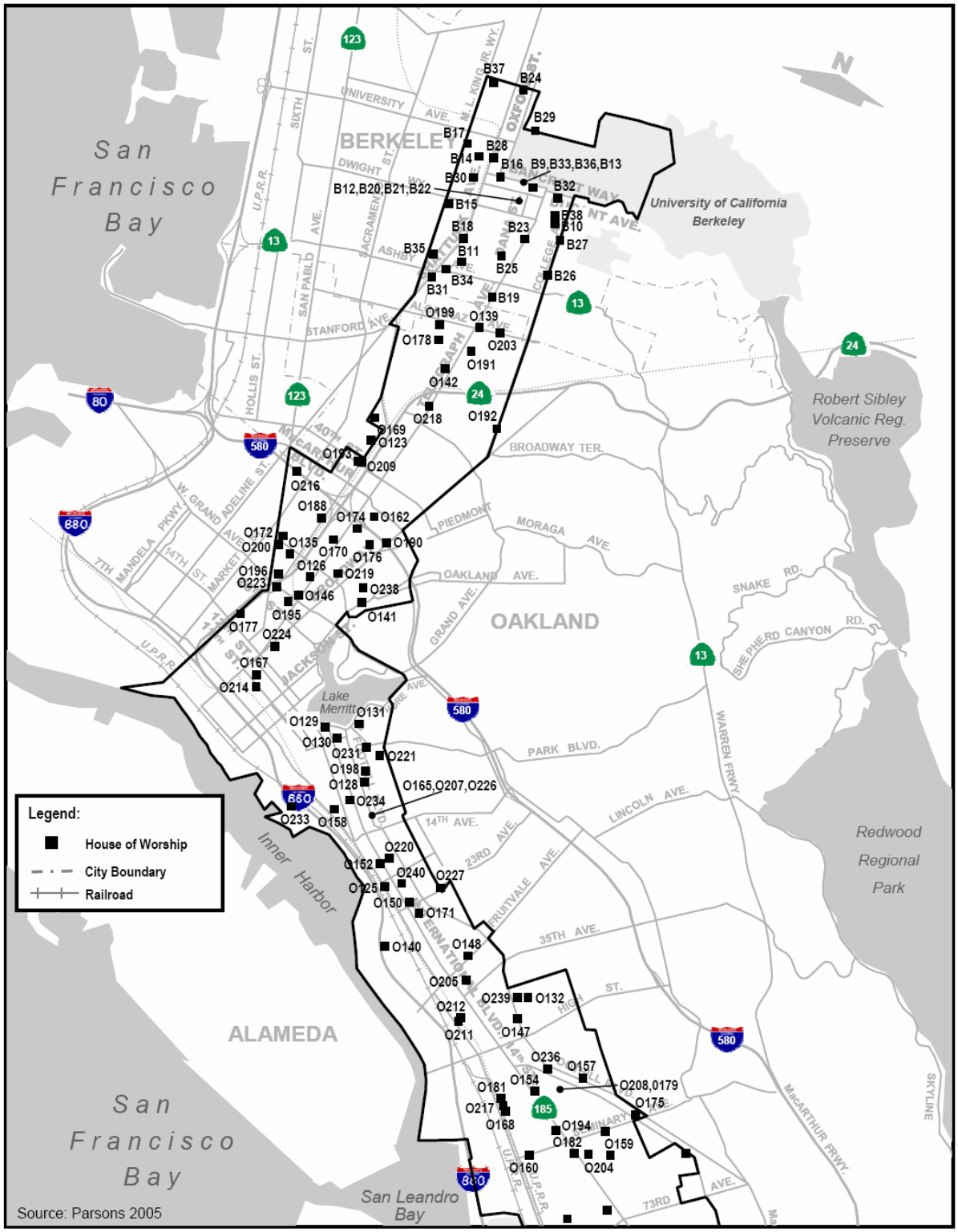


Figure 4.4-5a: Houses of Worship

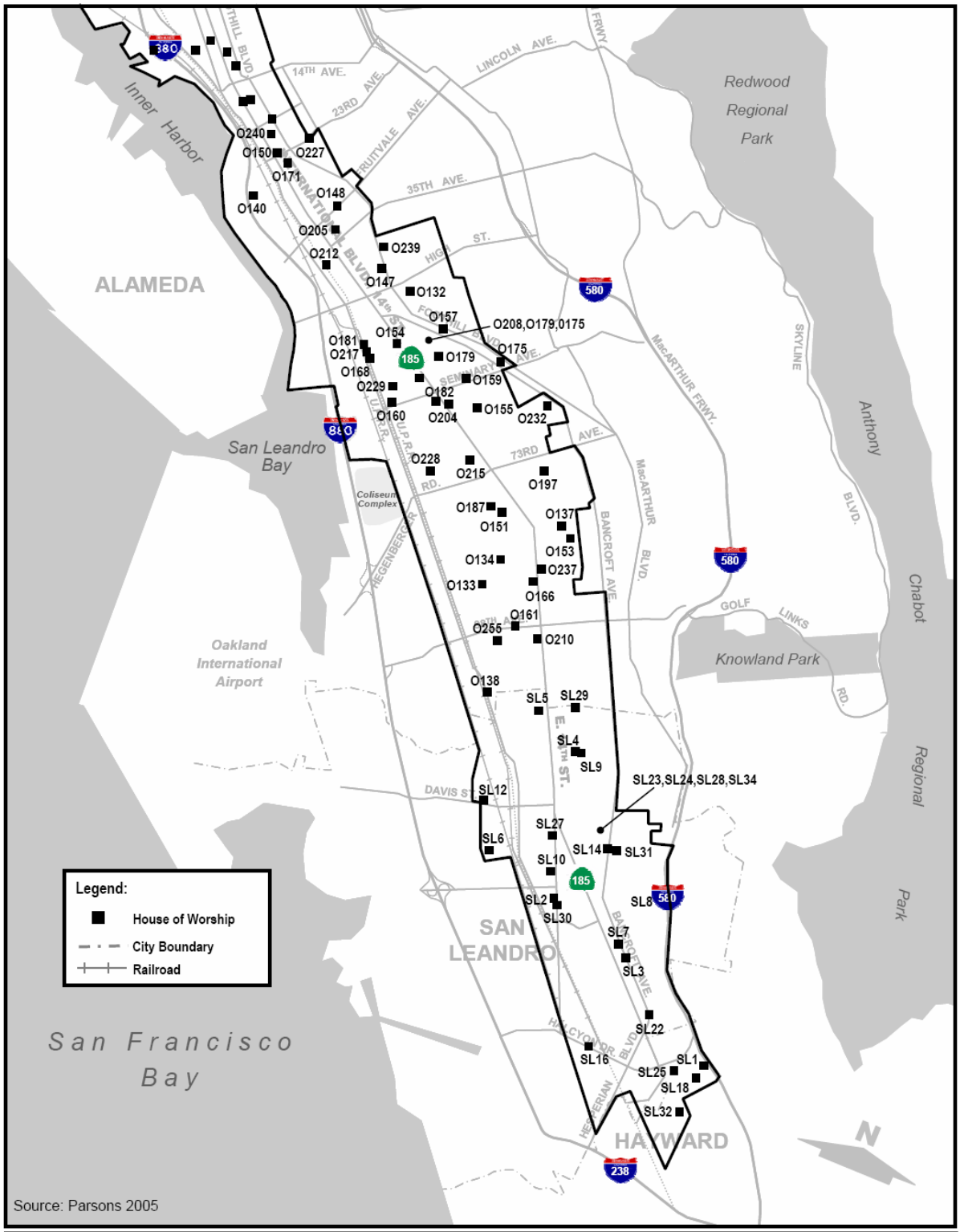


Figure 4.4-5b: Houses of Worship

Parks and Recreation

As listed in Table 4.4-11 and shown in Figures 4.4-6a and 4.4-6b, there are 45 parks, 13 recreational facilities, and five public pools within the corridor. Numbers on the table are keyed to locations shown in the figure.

Table 4.4-11: Existing Park and Recreational Facilities in the Corridor

No.	Facility Name	Location	No.	Facility Name	Location
Parks					
City of Berkeley					
1	Greg Brown Mini Park	1907 Harmon Street	5	Ohlone Park	1701 Hearst Avenue
2	Halycon Commons	Halycon Court + Prince Street	6	People's Park	2556 Haste Street
3	Le Conte School Park	2221 Russell Street	7	Willard Park	2730 Hillegass Avenue
4	Martin Luther King Jr. Civic Center Park	2151 Martin Luther King Jr. Way			
City of Oakland					
8	Elmhurst Lyons Field	1800 98th Avenue	22	Frank Ogawa Plaza	1 Frank Ogawa Plaza
9	Oak Park		23	Fruitvale Bridge Park	3205 Alameda Avenue
10	85th Avenue Mini Park	1712 85th Avenue	24	Garfield Park	Foothill Boulevard + 23rd Avenue
11	88th Avenue Mini Park	1722 88th Avenue	25	Grove Shafter Parks	Martin Luther King Jr. Way + 36th St.
12	Oak Glen Park		26	Hardy Park	491 Hardy Street
13	Cesar Chavez Park	3705 Foothill Boulevard	27	Holly Mini Park	9830 Holly Street
14	Channel Park	21 7th Street	28	Josie de la Cruz Park	1637 Fruitvale Avenue
15	Chinese Garden Park	7th + Harrison Streets	29	Lafayette Square Park	635 11th Street
16	Clinton Square Park	1230 6th Avenue	30	Lakeside Park	Lakeside Drive at Lake Merritt
17	Colby Park	61st + Colby Streets	31	Madison Square Park	810 Jackson Street
18	Coliseum Gardens Park	966 66th Avenue	32	Mini Park	24th Street
19	Durant Mini Park	1651 Adeline Street	33	Snow Park	19th + Harrison Streets
20	Elmhurst Plaza Park	9700 C Street	34	Stonehurst Park	10315 E Street
21	Estuary Park	5 El Embarcadero	35	Temescal Creek Park	Couvour + Clifton Streets
City of San Leandro					
36	Cherry Grove Park	1600 Williams Street	41	Root Park	East 14th + Hays Streets
37	Grover Cleveland Park	O'Donnell + Wrin Avenues	42	Siempre Verde Park	455 Park Street
38	Halycon Park	1220 147th Avenue	43	Thrasher Park	1300 Davis Street
39	McCartney Park	399 Breed Avenue	44	Toyon Park	1500 Bancroft Avenue
40	Memorial Park	1105 Bancroft Avenue	45	Victoria Park	Victoria + Bancroft Avenues
Recreation Centers					
City of Oakland					
46	Arroyo Viejo	7701 Krause Avenue	53	Lincoln Square	250 10th Street
47	Bushrod	560 59th Street	54	Mosswood	3612 Webster Street
48	Carmen Flores	1637 Fruitvale Avenue	55	Rainbow	5800 International Boulevard
49	FM Smith	1969 Park Boulevard	56	San Antonio	1701 East 19th Street
50	Franklin	1010 East 15th Street	57	Tassafaronga	85th Avenue + E Street
51	Greenman	1390 66th Avenue	58	Verdese Carter	9600 Sunnyside Street
52	Jefferson Square	7th Avenue + Grove Street			
Public Pools					
City of Berkeley			**City of Oakland**		
59	Berkeley High School Swim Center	Milvia Street + Durant Avenue	61	Fremont Pool	4550 Foothill Boulevard
60	Martin Luther King Jr. Swim Center	2701 Telegraph Avenue	62	Temescal Pool	371 45th Avenue
City of San Leandro					
63	Boys + Girls Club Pool	401 Marina Boulevard			

Source: Parsons, 2005

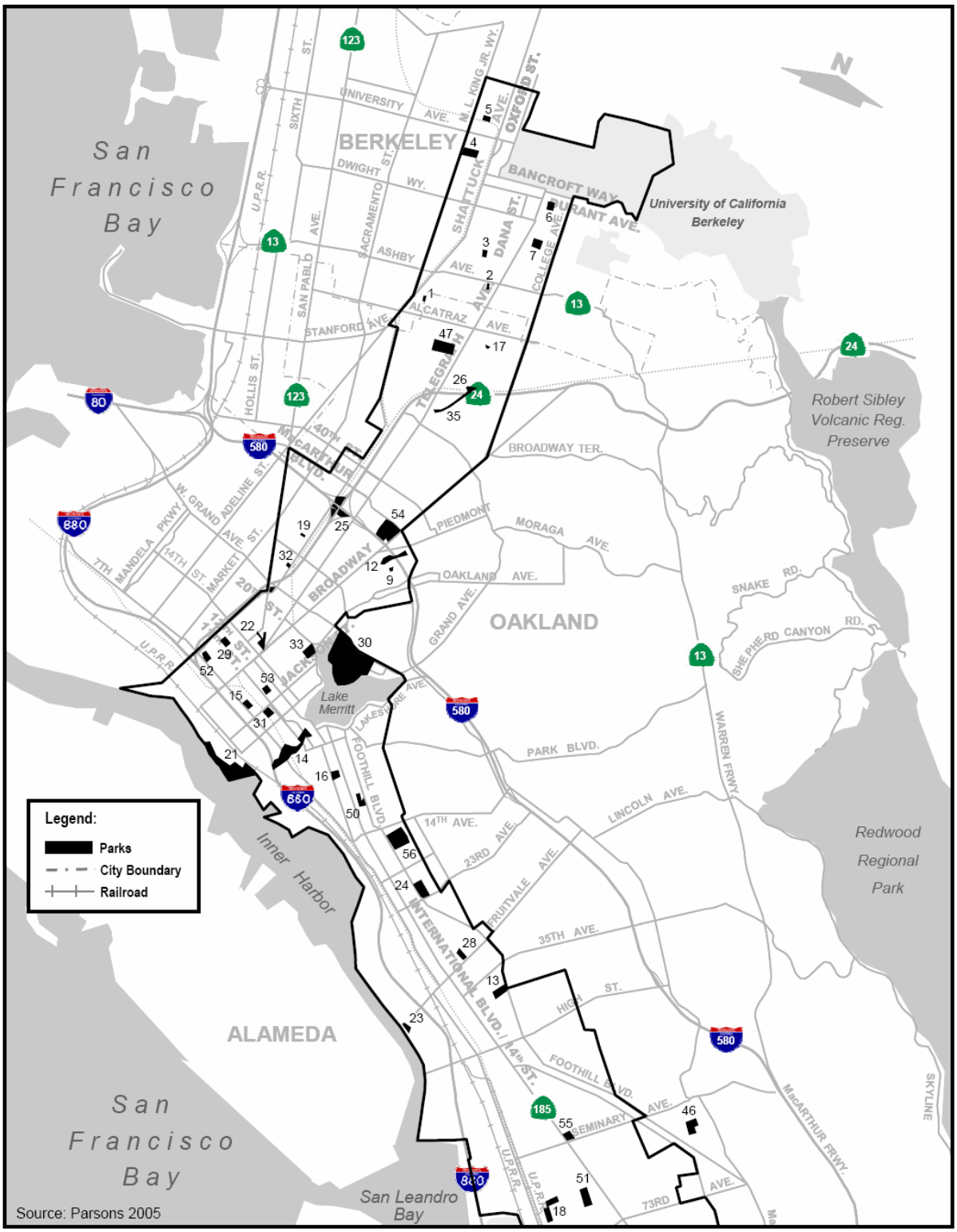
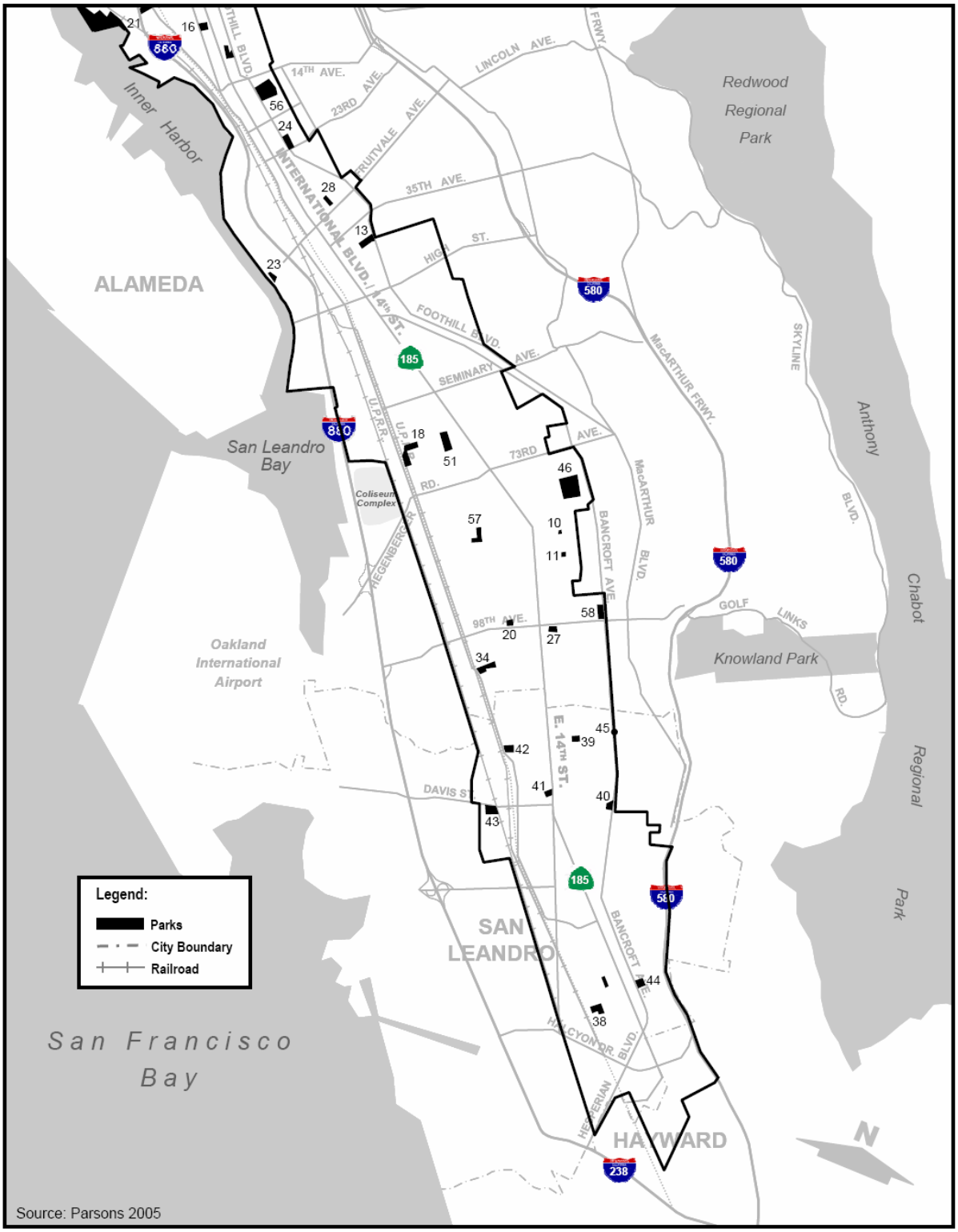


Figure 4.4-6a: Parks and Recreational Facilities



Source: Parsons 2005

Figure 4.4-6b: Parks and Recreational Facilities

4.4.2.2 ENVIRONMENTAL CONSEQUENCES

Improved transit access to community facilities (shown in Tables 4.4-5 through 4.4-7 and Figures 4.4-4a and 4.4-4b) would occur as a result of the Build Alternatives, which would benefit these facilities. None of these facilities would be displaced by the proposed project.

4.4.2.3 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

As there would be no adverse effects on community facilities, no mitigation measures are proposed. Avoidance and minimization measures to be implemented during the construction phase are described in Section 4.17.3, Community Impacts.

4.4.3 Relocations

No residential units or businesses would be relocated as a result of the proposed project; therefore, no mitigation is proposed.

4.4.4 Environmental Justice

4.4.4.1 REGULATORY SETTING

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), dated February 11, 1994, calls on federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of federal programs, policies, and activities on minority and low-income populations. The U.S. Department of Transportation (DOT) has published a Final DOT Order to establish procedures for use in complying with EO 12898 for its operating administrations, including FTA. If disproportionately high and adverse impacts would result from the proposed action, mitigation measures or alternatives must be developed to avoid or reduce the impacts, unless the agency finds that such measures are not practicable.

Impacts and benefits of transportation projects result from the physical placement of such facilities, and also from their ability to improve or impede access to and from neighborhoods and other portions of the region. The environmental justice analysis examines whether ethnic minority and/or low-income populations in the project area would experience disproportionately adverse accessibility or other impacts, and if the impacts experienced by such populations would be inconsistent with the benefits created.

4.4.4.2 AFFECTED ENVIRONMENT

The corridor comprises a multi-ethnic population and a range of income groups, as summarized in Table 4.4-12 and Figures 4.4-7 and 4.4-8. The ethnic composition for the corridor, as described in Section 4.4-1, Community Character, is comparable to that of the City of Oakland as a whole. Alameda County and the cities of Berkeley and San Leandro as a whole are somewhat less diverse than the corridor, with minority populations representing less than 60 percent in each municipality. Minority populations are highest in the Oakland Central through Elmhurst subareas, with minority

populations exceeding 80 percent. The Berkeley subarea is the only area with a minority population of less than 50 percent.

Low-income populations are defined as having a median household income at or below Department of Health and Human Service poverty guidelines. The percentage of low-income residents is slightly higher in the corridor (22 percent) than the cities of Berkeley and Oakland as a whole (19 percent). The percentage is twice as high as Alameda County (11 percent) and substantially higher than City of San Leandro (six percent). Within the corridor, the percentage of low-income residents is greatest in the Oakland Central, Central East Oakland and Elmhurst subareas with 32, 27 and 26 percent respectively. The percentage of low-income populations is lowest in the San Leandro subarea, with approximately 6 percent.

Table 4.4-12: Minority and Low-Income Populations in the Corridor

Location	% Minorities	% Low-Income
Alameda County	59%	11%
City of Berkeley	45%	19%
City of Oakland	77%	19%
City of San Leandro	58%	6%
Study Area, by Subarea		
Berkeley	47%	21%
North Oakland	59%	17%
Oakland Central	84%	32%
San Antonio	90%	25%
Fruitvale	93%	20%
Central East Oakland	96%	27%
Elmhurst	97%	26%
San Leandro	57%	8%
Ashland[1]	75%	12%
Corridor Total	**76%**	**22%**

Notes:
[1] Area served by Alternatives 1 and 3 only.
Source: 2000 U.S. Census; U.S. Department of Health and Human Services, 1999.

For the purposes of this analysis, the potential for environmental justice impacts was identified when the population in any subarea met or exceeded either of the following criteria:

- The subarea contained 50 percent or more minority or low-income population; or
- The percentage of minority or low-income population in any subarea was more than 10 percentage points greater than the average in the county in which the neighborhood is located.

Based on the above criteria, eight of nine subareas qualify as environmental justice communities based on minority population and five subareas qualify as environmental justice communities based on income level.

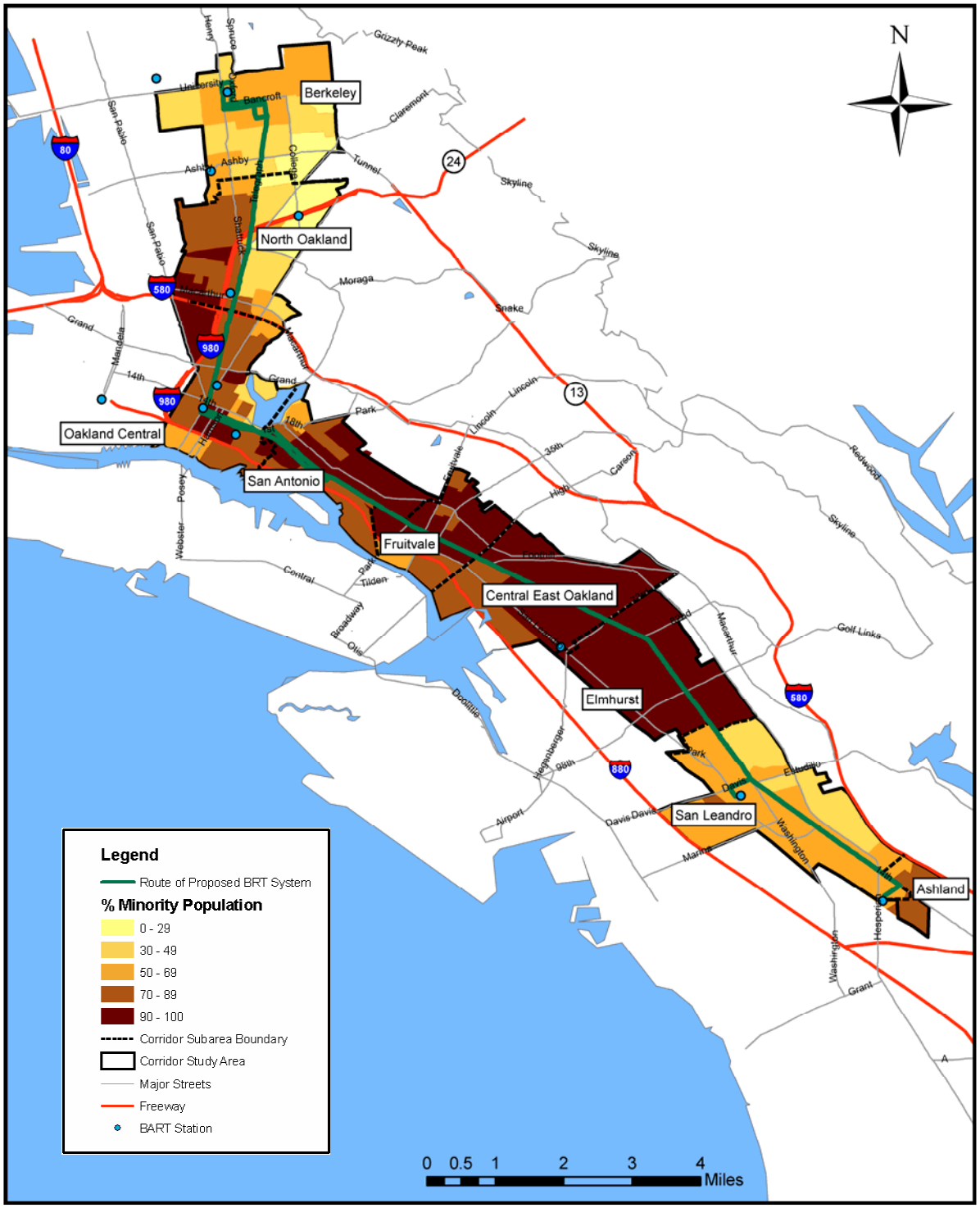


Figure 4.4-7: Minority Populations

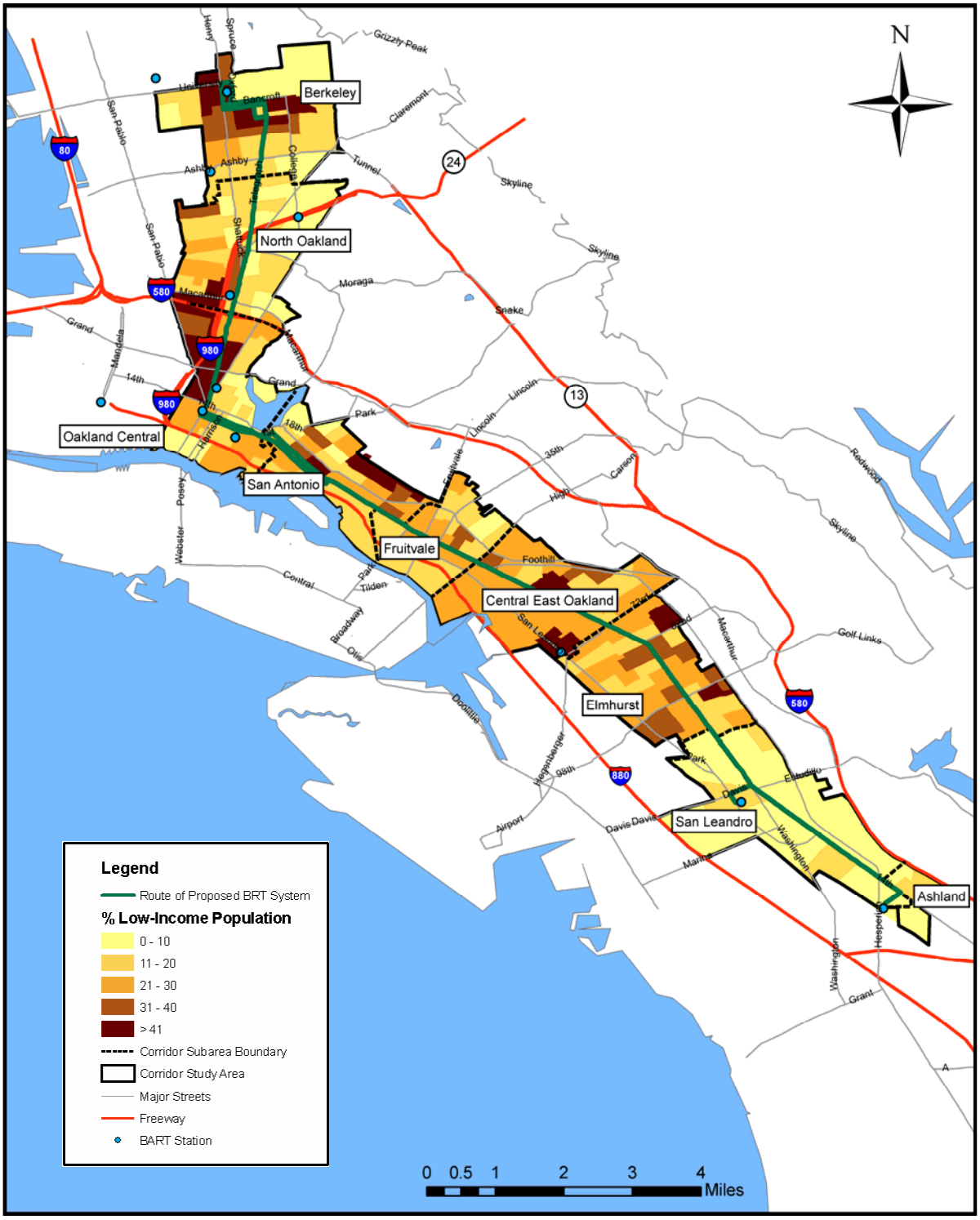


Figure 4.4-8: Low-Income Populations

All nine of the corridor subareas are potential environmental justice communities based on minority population and/or income level, as described below.

- **Berkeley:** Located at the northernmost portion of the corridor, the Berkeley subarea has a low-income population of approximately 21 percent.
- **North Oakland:** Located just south of the City of Berkeley city limits, the North Oakland subarea has a minority population of over 59 percent.
- **Oakland Central:** The Oakland Central subarea of the corridor is located between I-580 to the north and Lake Merritt to the south, encompassing Downtown Oakland. In this subarea, the minority residents represent 84 percent and low-income residents represent 32 percent of the population.
- **San Antonio:** Located southeast of Lake Merritt and northwest of Fruitvale Avenue, the San Antonio subarea of the corridor has a low-income population of approximately 25 percent and a minority population of over 90 percent.
- **Fruitvale:** The Fruitvale subarea of the corridor, located south of Fruitvale Avenue and north of High Street, has a minority population of over 93 percent.
- **Central East Oakland:** Located between High Street and 73rd Avenue, Central East Oakland subarea of the corridor has a minority population of nearly 96 percent. The low-income population for this neighborhood is 27 percent.
- **Elmhurst:** The Elmhurst subarea of the corridor, located just north of the City of San Leandro, has the highest percentage of minority population in the corridor with 97 percent. The percentage of low-income residents is approximately 26 percent.
- **San Leandro:** The San Leandro subarea of the corridor at the south end of the proposed project alignment has a minority population of 57 percent.
- **Ashland:** Located south of the San Leandro city limits in unincorporated Alameda County and included only in Alternatives 1 and 3, the Ashland area has a minority population of 75 percent.

4.4.4.3 ENVIRONMENTAL CONSEQUENCES

As discussed in Section 4.4.1.1, the corridor is home to a large population of minority and low-income residents. The proposed project is expected to result in substantial benefits to these populations by providing higher quality transit service measured in travel time and service frequency,. Depending on the Build Alternative selected, service frequency would increase from between 7 to 11 buses per hour during peak periods and travel times between Downtown Berkeley and the BayFair BART station would decrease from 6 to 19 minutes during peak periods. For detailed information on service frequency and travel times, refer to Chapter 8, Financial Analysis and Alternatives Evaluation, Table 8.7-1. Service reliability, convenience and safety would improve substantially under all Build Alternatives compared to the No-Build condition. Transit capacity would be expanded for all potential users. The major adverse effects of the project are temporary and would occur during construction, when traffic and, to some extent, bus service are disrupted by transitway, BRT station and roadway construction. Local access to businesses along the project alignment would also be

temporarily disrupted although detours and reroutes would be designated. Over the long term, however, the mobility benefits—from higher bus frequencies, shorter transit travel times, and increased transit capacity, among other benefits—are considerable. Transportation benefits of the proposed project would accrue to all area residents.

4.4.4.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Construction phase impacts would be mitigated with Best Management Practices (BMPs) to control noise and fugitive dust. These mitigation measures would serve to ensure that there would be no disproportionate adverse effects on minority and low-income residents.

4.4.5 Economic and Business Environment

This section evaluates potential impacts of the proposed project on business and commercial districts in the corridor.

4.4.5.1 AFFECTED ENVIRONMENT

Major employment and activity centers are located throughout the corridor, including the central business districts of the cities of Berkeley, Oakland, and San Leandro as well as smaller activity areas such as shopping centers and hospital clusters. These employment and activity centers are described in Section 4.1.1.1 and shown in Figure 4.1-4, above.

4.4.5.2 ENVIRONMENTAL CONSEQUENCES

No-Build Alternative

Beneficial impacts to transit services under the No-Build Alternative would include improved transit access and higher transit ridership as compared to existing conditions, which would support higher levels of business activity and enhanced desirability of corridor locations for retail, commercial, medical, and other types of businesses. To some extent, the benefits of the No-Build Alternative would be focused in the downtown business districts in the corridor and in activity centers in the vicinity of the express bus stops. There would be some adverse effects of the No-Build Alternative for businesses and business districts; however, these effects would be minor because the extent of capital improvements would be limited and are not anticipated to noticeably affect traffic circulation or parking availability.

Build Alternatives

The Build Alternatives would result in substantially greater effects on businesses and commercial districts in the corridor compared to the No-Build Alternative.

Beneficial Impacts of the Proposed Project

Improved transit services and higher transit ridership with the proposed project would provide greater support for increased business activity in the corridor. There would be benefits to corridor retail, service, restaurant, and entertainment businesses from larger numbers of people using transit to access commercial areas and entertainment facilities as well as from larger numbers of people moving through business districts and commercial areas on BRT buses and becoming familiar with the

businesses and shopping and entertainment opportunities available along the BRT route. Improved transit access with the proposed project would also provide greater benefits for the major hospitals and medical centers in the corridor through more improved transit services for patients, visitors, and employees. Similarly, the proposed project would provide benefits for office businesses, government centers, and the large educational institutions along the corridor through improved transit services for workers, students, and visitors.

There also would be more positive effects of the BRT transit improvements themselves as they would enhance the image and desirability of commercial areas along the corridor and promote a more pedestrian-oriented environment. The proposed project would provide new BRT stations and other street and streetscape improvements along new dedicated transitways that would not be provided under the No-Build Alternative. There would also be positive effects on the pedestrian environment on several of the widest streets in the corridor due to slower traffic speeds and easier street crossings for pedestrians where reductions in automobile traffic lanes are necessary for the East Bay BRT Project. Increased transit ridership could also reduce the demand for parking, freeing up land for commercial and residential uses.

The benefits of increased accessibility and enhanced desirability and image would generally apply to commercial districts and activity centers throughout the corridor. They would be most focused, however, in the vicinity of BRT stations where increased foot traffic would be concentrated and where there would be the most obvious capital investments in station structures and associated improvements.

In the short term, the positive effects of the proposed project would benefit existing businesses in the corridor. Over the longer term, the positive effects on commercial districts overall would become more obvious as business activity expanded and intensified and, pedestrian-oriented business districts became more accessible .

Adverse Impacts of the Proposed Project

The proposed project would require the removal of convenient on-street parking along parts of the corridor and would affect local traffic circulation due to lane reductions and turning restrictions. These types of traffic and parking impacts would adversely affect overall auto accessibility to commercial areas and the convenience of access to specific businesses, and could deter people from shopping at and visiting the affected commercial areas.

Businesses for which the convenience of auto accessibility is particularly important in attracting customers and those without off-street parking lots would be the most affected by the traffic and parking impacts of the proposed project. Such businesses are more likely to be located in lower-density, free-standing commercial developments along corridor streets outside of the downtown areas and higher-density commercial districts where customers already anticipate traffic congestion and the need to walk from parking places to one or more places of businesses. The greater the extent of adverse effects on auto access, the more likely that customers would be deterred and encouraged to seek businesses in other locations where parking and traffic are less problematic.

The removal of convenient, on-street parking would potentially have the most effects on business activity in parts of the corridor where parking demand is high. The amount of on-street parking removed in a particular area, the demand for parking in that area, and the availability of off-street parking nearby would determine the extent that parking problems would increase and inconvenience customers, visitors, and employees.

Effects of the proposed project on local traffic circulation would also potentially affect business activity in the corridor. However, the adverse impacts of the proposed project on traffic circulation would primarily occur during evening and morning peak travel hours when total traffic is heaviest. The effects on traffic circulation would be much less at other times of the day and night and on weekends when shopping, eating out, entertainment, and other commercial activities often occur. Thus, the potential for adverse effects on business activity due to project impacts on traffic circulation are anticipated to be limited to the late afternoon and evening hours from 4 p.m. to 6 p.m. in particular, when total traffic is the heaviest. Potential adverse effects on retail, service, entertainment, and similar types of businesses would be minimized by the differences in timing between peak traffic levels and most commercial activity. Adverse effects on traffic circulation could be more problematic for offices and other businesses where employee access during commute hours is an important locational criteria and access for shoppers and visitors is of less importance.

In the short term, the negative effects of the proposed project would affect existing businesses along the alignment, particularly those located along more auto-oriented areas. Over the longer term, the negative effects would influence the types and intensity of businesses and commercial areas along the corridor, away from lower-intensity, more dispersed uses focused on the convenience of auto accessibility and toward more pedestrian-oriented centers of activity.

4.4.5.3 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

As described above, the proposed project could have adverse effects on businesses and business districts, resulting from the displacement of on-street parking, impacts on traffic operations, and/or other effects that reduce the convenience of auto access for businesses in the study area. In many instances, parking and traffic impacts would be mitigated to substantially reduce their severity. A detailed analysis of project-related impacts to parking, access, and circulation and measures to mitigate these impacts are addressed in Chapter 3, Transportation Analysis.

4.5 Utilities

4.5.1 Affected Environment

Utilities in the East Bay BRT corridor include:

- Underground electrical, gas, water, sanitary sewer, TV/cable, fiber optics and telephone,
- Above ground street lights and electrical, telephone, and TV/cable lines suspended from utility poles.

With the possible exception of street lighting, the majority of utilities in the corridor have been placed underground. Underground utilities are more likely to be encountered and affected by proposed

project improvements. Their locations were identified through field surveys. The field surveys focused on potential conflicts in the vicinity of proposed BRT stations, since these areas are where construction would be extensive and possibly require utility adjustments and relocations.

The main utility providers in the corridor include Pacific Gas and Electric Company (PG&E) for gas and electric service, AT&T (formerly SBC) for local telephone service, Comcast for cable TV service, and the East Bay Municipal Utility District for water and sanitary sewer services. AT&T and Comcast lines also support internet access.

Tables 4.5-1 and 4.5-2 list the types of utilities in the vicinity of proposed BRT stations for each Build Alternative.

4.5.2 Environmental Consequences

The project corridor contains primarily underground utilities, within existing streets, that would not need to be relocated to construct the BRT transitway. A few fire hydrants in the path of the proposed BRT transitway would be relocated to the sides of the existing street. There would be limited displacements of manholes, vault openings or other surface access facilities such as valve boxes. Should access to these facilities remaining in the transitway be necessary after BRT construction, scheduled BRT service would be temporarily rerouted.

Underground utilities at station locations would be relocated where surface penetrations fall within the limits of platforms, the BRT transitway adjacent to the platform and access paths to the platforms from crosswalks. Facilities in this context include manholes, pull boxes, vaults, valves and similar items where maintenance activity could interfere with passenger access and bus operation.

The BRT improvements proposed to be constructed in existing streets would not create any new demand for water supply, storm water or wastewater transport or treatment or solid waste disposal capacity or facilities.

4.5.3 Avoidance, Minimization and/or Mitigation Measures

Planning and continuous coordination with local utility providers during the preliminary engineering and final design would be necessary to minimize or eliminate utility conflicts. This includes submitting a set of plans for the BRT project to the utility providers for their use in preparing their utility relocation plans. This close coordination would be necessary during the preliminary engineering, final design and construction phases of the project to identify any potential conflicts and formulate strategies to overcome them. No additional mitigation is anticipated.

Table 4.5-1: Utilities Located in the Vicinity of Station Areas Proposed under Alternatives 1 and 2: Separate BRT and Local Service to BayFair and San Leandro BART

Station	City	Cross Street	Direction	Platform Type	Potentially Affected Utilities
Downtown Berkeley	Berkeley	Shattuck Avenue/Center Street.	North/South	Side	Water Hydrant* (3)
Bancroft/Durant	Berkeley	Shattuck Avenue/Bancroft Way	South	Median	Water Hydrant* (3)
Sather Gate	Berkeley	Bancroft Way/Telegraph Avenue	East/West	Side/Median	Electric, Water Hydrant*
Dwight/Haste	Berkeley	Telegraph Avenue/Haste Street	North/South	Side	Electric, Gas, Sanitary Sewer, Streetlight*, Water
Derby	Berkeley	Telegraph Avenue/Derby Street	North/South	Median	
Ashby	Berkeley	Telegraph Avenue/Webster Street	North/South	Median	Telephone
Alcatraz	Berkeley	Telegraph Avenue/North Street	North/South	Median	Gas
Temescal	Oakland	Telegraph Avenue/49th Street	North/South	Median	
40th Street	Oakland	Telegraph Avenue/40th Street	North/South	Median	Electric, Water
Pill Hill	Oakland	Telegraph Avenue/29th Street	North/South	Median	
Koreatown	Oakland	Telegraph Avenue/24th Street	North/South	Median	
Uptown	Oakland	20th Street/Telegraph Avenue	East/West	Side	Electric, Gas, Sanitary Sewer, Water, Water Hydrant*
14th Street	Oakland	Broadway/14th Street	North/South	Side	
City Center	Oakland	11th Street/Broadway	North/North	Side	Gas, Streetlight*, Telephone, Water, Water Hydrant*
Harrison	Oakland	11th Street/Harrison Street	North/South	Side	Gas, Water, Water Hydrant*
Madison	Oakland	11th Street/Madison Street	North/South	Side	Cable TV, Electric, Signal Box*, Telephone
5th Avenue	Oakland	International Boulevard/5th Avenue	North/South	Side	Cable TV, Electric, Water
15th Avenue	Oakland	International Boulevard/15th Avenue	North/South	Median	
22nd Avenue	Oakland	International Boulevard/22nd Avenue	North/South	Median	
28th Avenue	Oakland	International Boulevard/28th Avenue	North/South	Median	Sanitary Water
Fruitvale	Oakland	International Boulevard/35th Avenue	North/South	Median	Electric, Water
High	Oakland	International Boulevard/High Street	North/South	Median	Electric, Gas
Seminary	Oakland	International Boulevard/60th Avenue	North/South	Median	Sanitary Sewer, Telephone, Water
72nd Avenue	Oakland	International Boulevard/72nd Avenue	North/South	Median	
82nd Avenue	Oakland	International Boulevard/82nd Avenue	North/South	Median	Water
90th Avenue	Oakland	International Boulevard/90th Avenue	North/South	Median	
98th Avenue	Oakland	International Boulevard/98th Avenue	North/South	Median	Electric, Telephone
Durant	San Leandro	East 14th Street/Durant Avenue	North/South	Median	Telephone
Begier	San Leandro	East 14th Street/Begier Avenue	North/South	Median	Electric, Sanitary Sewer, Telephone
Davis[1]	San Leandro	East 14th Street/Davis Street	North/South	Side	Telephone
San Leandro[1]	San Leandro	San Leandro Boulevard BART Access	Terminus	Side	Electric, Streetlight*
Estudillo[2]	San Leandro	East 14th Street/Estudillo Avenue	North/South	Side	Electric, Gas, Water
Dolores[2]	San Leandro	East 14th Street/Dolores Avenue	North/South	Side	Sanitary Sewer, Storm Drain, Telephone, Water
136th Avenue[2]	San Leandro	East 14th Street/136th Avenue	North/South	Median	

Table 4.5-1: Utilities Located in the Vicinity of Station Areas Proposed under Alternatives 1 and 2: Separate BRT and Local Service to BayFair and San Leandro BART

Station	City	Cross Street	Direction	Platform Type	Potentially Affected Utilities
150th Avenue[2]	San Leandro	East 14th Street/150th Avenue	North/South	Median	Electric, Sanitary Sewer, Storm Drain, Telephone, Water
Bayfair Center[2]	San Leandro	Bayfair Center	North/South	Median	Streetlight*, Sanitary Sewer, Storm Drain, Water
Bay Fair BART[2]	San Leandro	Bay Fair BART	Terminus	Side	

Notes:
* = Above Ground
[1] Station serving Alt 2: Separate BRT and Local Service to San Leandro BART
[2] Station serving Alt 1: Separate BRT and Local Service to BayFair BART
Source: Parsons, 2005

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Table 4.5-2: Utilities Located in the Vicinity of Station Areas Proposed under Alternatives 3 and 4: Combined BRT and Local Service to BayFair and San Leandro BART

Station	City	Cross Street	Direction	Platform Type	Potentially Affected Utilities
Downtown Berkeley	Berkeley	Shattuck Avenue/Center Street.	North/South	Side	Water Hydrant* (3)
Bancroft/Durant	Berkeley	Shattuck Avenue/Bancroft Way	South	Median	Water Hydrant* (3)
Ellsworth	Berkeley	Bancroft Way/Ellsworth Street	East/West	Median/Side	Electric, Water Hydrant* (4)
Sather Gate	Berkeley	Bancroft Way/Telegraph Avenue	East/West	Side/Median	Electric, Water Hydrant*
Dwight/Haste	Berkeley	Telegraph Avenue/Haste Street	North/South	Side	Electric, Gas, Sanitary Sewer, Streetlight*, Water
Derby	Berkeley	Telegraph Avenue/Derby Street	North/South	Median	
Ashby	Berkeley	Telegraph Avenue/Webster Street	North/South	Median	Telephone
Alcatraz	Berkeley	Telegraph Avenue/North Street	North/South	Median	Gas
57th Street	Oakland	Telegraph Avenue/57th Street	North/South	Median	Water
Temescal	Oakland	Telegraph Avenue/49th Street	North/South	Median	
42nd Street	Oakland	Telegraph Avenue/42nd Street	North/South	Median	Telephone
40th Street	Oakland	Telegraph Avenue/40th Street	North/South	Median	Electric, Water
34th Street	Oakland	Telegraph Avenue/34th Street	North/South	Median	Water
Pill Hill	Oakland	Telegraph Avenue/29th Street	North/South	Median	
Koreatown	Oakland	Telegraph Avenue/24th Street	North/South	Median	
Uptown	Oakland	20th Street/Telegraph Avenue	East/West	Side	Electric, Gas, Sanitary Sewer, Water, Water Hydrant*
14th Street	Oakland	Broadway/14th Street	North/South	Side	
City Center	Oakland	11th Street/Broadway	North/North	Side	Gas, Streetlight*, Telephone, Water, Water Hydrant*
Harrison	Oakland	11th Street/Harrison Street	North/South	Side	Gas, Water, Water Hydrant*
Madison	Oakland	11th Street/Madison Street	North/South	Side	Cable TV, Electric, Signal Box*, Telephone
2nd Avenue	Oakland	International Boulevard/2nd Avenue	North/South	Side	Signal Box*, Streetlight*, Water, Water Hydrant*
5th Avenue	Oakland	International Boulevard/5th Avenue	North/South	Side	Cable TV, Electric, Water
10th Avenue	Oakland	International Boulevard/10th Avenue	North/South	Side	Water
15th Avenue	Oakland	International Boulevard/15th Avenue	North/South	Median	
19th Avenue	Oakland	International Boulevard/19th Avenue	North/South	Median	Telephone, Water
22nd Avenue	Oakland	International Boulevard/22nd Avenue	North/South	Median	
28th Avenue	Oakland	International Boulevard/28th Avenue	North/South	Median	Sanitary Water
31st Avenue	Oakland	International Boulevard/31st Avenue	North/South	Median	
Fruitvale	Oakland	International Boulevard/35th Avenue	North/South	Median	Electric, Water
High	Oakland	International Boulevard/High Street	North/South	Median	Electric, Gas
54th Avenue	Oakland	International Boulevard/54th Avenue	North/South	Median	
Seminary	Oakland	International Boulevard/60th Avenue	North/South	Median	Sanitary Sewer, Telephone, Water
Havenscourt	Oakland	International Boulevard/Havenscourt Boulevard	North/South	Median	Telephone
72nd Avenue	Oakland	International Boulevard/72nd Avenue	North/South	Median	

Table 4.5-2: Utilities Located in the Vicinity of Station Areas Proposed under Alternatives 3 and 4: Combined BRT and Local Service to BayFair and San Leandro BART

Station	City	Cross Street	Direction	Platform Type	Potentially Affected Utilities
78th Avenue	Oakland	International Boulevard/78th Avenue	North/South	Median	Storm Drain, Telephone, Water
82nd Avenue	Oakland	International Boulevard/82nd Avenue	North/South	Median	Water
90th Avenue	Oakland	International Boulevard/90th Avenue	North/South	Median	
98th Avenue	Oakland	International Boulevard/98th Avenue	North/South	Median	Electric, Telephone
104th Avenue	Oakland	International Boulevard/104th Avenue			
Durant	San Leandro	East 14th Street/Durant Avenue	North/South	Median	Telephone
Stoakes	San Leandro	East 14th Street/Stoakes Avenue	North/South	Side	
Begier	San Leandro	East 14th Street/Begier Avenue	North/South	Median	Electric, Sanitary Sewer, Telephone
Davis[1]	San Leandro	East 14th Street/Davis Street	North/South	Side	Telephone
San Leandro[1]	San Leandro	San Leandro Boulevard BART Access	Terminus	Side	Electric, Streetlight*
Estudillo[2]	San Leandro	East 14th Street/Estudillo Avenue	North/South	Side	Electric, Gas, Water
Dolores[2]	San Leandro	East 14th Street/Dolores Avenue	North/South	Side	Sanitary Sewer, Storm Drain, Telephone, Water
Blossom[2]	San Leandro	East 14th Street/Blossom Way	North/South	Median	
136th Avenue[2]	San Leandro	East 14th Street/136th Avenue	North/South	Median	
143rd Avenue[2]	San Leandro	East 14th Street/143rd Avenue	North/South	Median	Electric, Signal Box*
148th Avenue[2]	San Leandro	East 14th Street/148th Avenue	North/South	Median	
150th Avenue[2]	San Leandro	East 14th Street/150th Avenue	North/South	Median	Electric, Sanitary Sewer, Storm Drain, Telephone, Water
Bayfair Center[2]	San Leandro	Bayfair Center	North/South	Median	Streetlight*, Sanitary Sewer, Storm Drain, Water
Bay Fair BART[2]	San Leandro	Bay Fair BART	Terminus	Side	

Notes:
* = Above Ground
[1] Station serving Alt 4: Combined BRT and Local Service to San Leandro BART
[2] Station serving Alt 3: Combined BRT and Local Service to BayFair BART
Source: Parsons, 2005

4.6 Visual/Aesthetics

The *Visual Impact Assessment* (CirclePoint, July, 2005) for the AC Transit East Bay BRT Project was conducted in accordance with the guidelines provided in the *FHWA Approach to Visual Assessment of Highway Projects* (FHWA, 1986). The visual analysis characterizes the project corridor in terms of "landscape units" that are distinct segments of the corridor and have a consistent or cohesive visual or physical character. The analysis identifies visual quality, prominent features, and scenic resources within the landscape units. Representative viewpoints along the proposed BRT corridor where the project could affect existing visual quality are identified and evaluated. In addition, physical changes attributable to the proposed project that would cause changes to views currently experienced by pedestrians, motorists, transit users, employees, residents, and other users of the corridor are evaluated. Existing and proposed in-street transit infrastructure landscaping and other urban design features are described. Avoidance and minimization measures to address visual effects are described in Section 4.6.4.

4.6.1 Regulatory Setting

NEPA establishes that the Federal Government use all practicable means to ensure all Americans safe, healthful, productive and aesthetically and culturally pleasing surroundings (42 USC 4331[b][2]). In its implementation of NEPA (23 USC 109 [h]), the FHWA directs that final decisions regarding projects are to be made in the best overall public interest, taking into account adverse environmental impacts, including the destruction or disruption of aesthetic values.

Likewise, CEQA establishes that it is the policy of the State to take all action necessary to provide the people of the State "with…enjoyment of aesthetic, natural, scenic and historic environmental qualities." [CA Public Resources Code Section 21001 (b)].

4.6.2 Affected Environment

The existing visual conditions in the project corridor consist of visual resources (described in terms of visual character and quality), the characteristics of viewers, namely viewer exposure (the ability to see the project area), and viewer sensitivity.

4.6.2.1 Existing Visual Character and Context

The East Bay BRT Project is located in Alameda County, California and traverses the cities of Berkeley, Oakland and San Leandro as well as some unincorporated areas within Alameda County. The overall visual character of the project is urban and the proposed BRT guideway of the project is located entirely within existing streets. The corridor is approximately 14.7 to 16.8 miles long, depending upon alternatives with many different visual characteristics. The *Visual Impact Assessment* identifies 18 separate landscape units emphasizing the diversity of the corridor.

4.6.2.2 Existing Visual Image Types and Viewer Groups

Each landscape unit has a distinct visual character based upon the land uses and features that comprise it. These smaller scale land uses or features within each landscape unit are called "image

types." Nineteen visual image types are located within the project corridor, including: transportation, storefront, highrise, streetscape, historic buildings, recessed street parking, university/institutional, mature trees/landscaping, open space/recreational, distant hills, vacant buildings, strip mall, residential storefront, residential (single-family and multi-family), murals/street art, religious structures, signs/billboards, freeway overpass and street vendors.

Six viewer groups were identified: pedestrians, bicyclists, motorists, employees, transit users, and residents. Viewer groups are groups of people who regularly travel through the project corridor, or who have a certain degree of sensitivity to changes in the visual environment.

A viewer group's sensitivity to visual change is affected by several variables, such as distances separating viewers from visual resources, the visibility of resources within a landscape unit, frequency and duration of views and type and expectations of the viewer groups. Visual sensitivity is generally higher for viewer groups that are driving for pleasure, engaging in recreational activities such as hiking and biking, or living in the vicinity. Visual sensitivity tends to be lower for viewer groups who are commuting or driving as part of their work. These viewer groups typically have fleeting views and tend to focus on commute traffic, not on surrounding scenery; therefore, they are generally considered to have low visual sensitivity. Residential viewers typically have extended viewing periods and are concerned about changes in the views from their homes; therefore, they are generally considered to have high visual sensitivity.

The viewer groups identified in the corridor, with the exception of residents, generally would have a low to moderate sensitivity to change in the visual environment. The majority of people within each viewing group utilize the corridor for functions such as commuting, working and shopping. As described above, these viewer groups are generally not using the corridor for purposes that would raise their sensitivity to visual change beyond the low to moderate level.

4.6.2.3 LANDSCAPE UNITS

Landscape units are geographically discrete areas that are often separated by sight distance or natural features such as bodies of water, ridges, changes in vegetation or, as in this case, neighborhoods. The East Bay BRT corridor has been divided into 18 landscape units that encompass distinct spatial areas. To facilitate the discussion of the visual impacts to the corridor, each neighborhood is discussed as a landscape unit. Each neighborhood is delineated by specific intersections or changes in the proposed BRT alignment.

The existing visual quality of the landscape units, including image types encompassed within each landscape unit and viewer groups with a degree of sensitivity to the visual environment, are shown in Table 4.6-1. A comparison of the image types and viewer groups within each of the landscape units is shown in Table 4.6-2.

Table 4.6-1: Summary of Landscape Units

Landscape Unit	Description	
Downtown Berkeley (University Avenue to Oxford/Fulton Streets)	Image Types	Transportation, storefront, highrise, streetscape, historic buildings, university/institutional, mature trees/landscape, open space/recreational, distant hills.
	Viewer Groups	Pedestrians, bicyclists, motorists, employees, transit users.
	Visual Resources	UC Berkeley campus, open space, historic, athletic stadium, historic buildings.
	Overall Visual Character	Along Shattuck Avenue is a well-maintained business district with consistent streetscape. In the Oxford/Fulton Street area are storefronts, historic buildings, and university facilities.
Berkeley Southside (Oxford/Fulton Street to Dwight Way)	Image Types	Transportation, storefront, highrise, streetscape, historic buildings, recessed street parking, university/institutional, mature trees/landscaping, open space/recreational, distant hills, residential/single- and multi-family, murals/street art, religious structures, signs/billboards, street vendors.
	Viewer Groups	Pedestrians, bicyclists, motorists, employees, transit users, residents.
	Visual Resources	Sather Tower, street art, bright orange structural entrance to parking lot, church.
	Overall Visual Character	Character changes from university campus to eclectic storefronts to residential.
Telegraph, Berkeley (Dwight Way to Woolsey Street)	Image Types	Historic buildings, mature trees/landscaping, open space/recreational, distant hills, vacant buildings, strip mall, residences/single- and multi-family, murals/street art, religious structures, signs/billboards, freeway overpass.
	Viewer Groups	Pedestrians, bicyclists, motorists, employees, transit users, residents.
	Visual Resources	Sather Tower, church steeple, mural on Willard Middle School.
	Overall Visual Character	Busy urban thoroughfare with moderately high vehicle traffic.
North Telegraph, Oakland (Woolsey Street to Highway 24/55th Street)	Image Types	Historic buildings, mature trees/landscaping, open space/recreational, distant hills, vacant buildings, strip mall, residences/single- and multi-family, murals/street art, religious structures, signs/billboards, freeway overpass.
	Viewer Groups	Pedestrians, bicyclists, motorists, employees, transit users, residents.
	Visual Resources	Berkeley/Oakland Hills, State Route 24 overpass, apartment building with windmill, mural on side of apartment building, church.
	Overall Visual Character	Commercial corridor
Temescal (Highway 24/55th Street to Shattuck Avenue/44th Street)	Image Types	Storefronts, historic buildings, university/institutional, distant hills, strip mall, residences/single- and multi-family, religious structures, freeway overpass.
	Viewer Groups	Pedestrians, bicyclists, motorists, employees, transit users, residents.
	Visual Resources	Children's Hospital, religious structures, residence landscaped with large palm trees, library, Berkeley Hills.
	Overall Visual Character	Busy urban thoroughfare with mix of residences, storefronts, and churches.
Telegraph/MacArthur (Shattuck Avenue/44th Street to I-580/34th Street)	Image Types	Transportation, streetscape, historic buildings, mature trees/landscaping, distant hills, residences/single- and multi-family, vacant buildings, strip mall, religious structures, signs/billboards, freeway overpass.
	Viewer Groups	Pedestrians, bicyclists, motorists, employees, transit users, residents.
	Visual Resources	Two large historic churches with towers, distant hills north and west.

Table 4.6-1: Summary of Landscape Units

Landscape Unit	Description	
	Overall Visual Character	Busy urban thoroughfare with mix of single- and multi-family residences, storefronts, and churches.
South Telegraph, Oakland (I-580/34th Street to 20th / Thomas Berkley Way)	Image Types	Transportation, streetscape, historic buildings, university/institutional, mature trees/landscaping, vacant buildings, strip mall, residential storefront, residences/single- and multi-family, religious structures, signs/billboards.
	Viewer Groups	Pedestrians, bicyclists, motorists, employees, transit users, residents.
	Visual Resources	Interstate 980, Downtown Oakland skyline, Courthouse Athletic Club, Mount Sinai Memorial Hospital, Alta Bates Summit Medical Center, and Paramount Theater.
	Overall Visual Character	Busy urban thoroughfare with mixed use residential, residential storefronts, dominated by medical and treatment facilities.
Downtown Oakland (20th /Thomas Berkley Way to 11th/12th Streets)	Image Types	Transportation, highrise, streetscape, historic buildings, university/institutional, vacant buildings, strip mall, religious structures.
	Viewer Groups	Pedestrians, bicyclists, motorists, employees, transit users.
	Visual Resources	Large historic church, Fox Theater, Newberry and Sears buildings, historic triangular building, Marshall Latham Fountain, PG&E smokestack, City Hall and clock tower, Frank H. Ogawa Plaza.
	Overall Visual Character	Transitions from a busy urban thoroughfare to a historic downtown district.
Downtown Oakland/Lake Merritt (Broadway to 1st Avenue)	Image Types	Transportation, highrises, streetscape, historic buildings, open space/recreational, freeway overpass, street vendors.
	Viewer Groups	Pedestrians, bicyclists, motorists, employees, transit users.
	Visual Resources	Madison Square Park, Oakland skyline, Jack London Square brick buildings, boats in inner harbor, I-880 overpass, Chinatown facades.
	Overall Visual Character	Busy commuting corridor, urban downtown, industrial warehouses. I-880 divides the area into Chinatown and Oakland Harbor.
Oakland−Eastlake District (1st Avenue to 14th Avenue)	Image Types	Transportation, highrise, streetscape, historic buildings, university/institutional, mature trees/landscaping, open space/recreational, distant hills, vacant buildings, strip mall, murals/street art, religious structures, signs/billboards.
	Viewer Groups	Pedestrians, motorists, employees, transit users.
	Visual Resources	Distant hills-north, hills-east, church tower. Palm trees along roadway.
	Overall Visual Character	Busy developed road, low visual quality, residences and residential storefronts.
International− San Antonio (14th Avenue to 30th Avenue)	Image Types	Transportation, streetscape, historic buildings, university/institutional, mature trees/landscaping, distant hills, vacant buildings, strip mall, religious structures, signs/billboards, freeway overpass.
	Viewer Groups	Pedestrians, bicyclists, motorists, employees, transit users.
	Visual Resources	Caesar Chavez Education Center and St. Joseph's Professional Center dominate the visual resources.
	Overall Visual Character	Developed roadway with strip malls, vacant buildings, signs, billboards, freeway overpass, and BART facilities.
Fruitvale (30th Avenue to 42nd Avenue)	Image Types	Transportation, storefront, streetscape, historic buildings, recessed street parking, mature trees/landscaping, distant hills, strip mall, residential storefront, residential/single- and multi-family, religious structures, signs/billboards.

Table 4.6-1: Summary of Landscape Units

Landscape Unit	Description	
	Viewer Groups	Pedestrians, bicyclists, motorists, employees, transit users, residents.
	Visual Resources	Distant hills, mature trees, landscape, streetscape.
	Overall Visual Character	Transit oriented development, well presented to complement historic uses.
International−Central East Oakland (42nd Avenue to 73rd Avenue)	Image Types	Storefront, historic buildings, open space recreational, distant hills, vacant buildings.
	Viewer Groups	Motorists, employees, transit users.
	Visual Resources	Brick tower, Oakland Hills, Boys and Girls Club, recreation center, vacant buildings.
	Overall Visual Character	Commercial/industrial urban corridor.
International−Elmhurst (73rd Avenue to Oakland-San Leandro City Limit)	Image Types	Streetscape, historic buildings, university/institutional, mature trees/landscaping, open space/recreational, distant hills, religious structures.
	Viewer Groups	Motorists, employees, transit users.
	Visual Resources	Churches, clock tower, Arroyo Viejo Creek, historic structures, in north section transitions to Oakland Hills; fire station and shopping mall in the south.
	Overall Visual Character	Commercial/industrial urban corridor.
San Leandro North (Oakland-San Leandro City Limit to Davis Street and San Leandro BART) – terminus for Alternatives 2 and 4	Image Types	Storefront, streetscape, historic buildings, university/institutional, mature trees/landscaping, open space/recreational, residential storefront, residential/single- and multi-family.
	Viewer Groups	Pedestrians, motorists, employees, transit users, residents.
	Visual Resources	Grassy median, decorated entry gate, large trees, city hall, police department, Roof Park, San Leandro Creek.
	Overall Visual Character	Historic, well maintained downtown area with medium overall quality.
Downtown San Leandro (Davis Street to Blossom Way) – Alternatives 1 and 3 only	Image Types	Storefront, streetscape, historic buildings, mature trees/landscaping, strip mall, religious structures.
	Viewer Groups	Pedestrians, motorists, employees, transit users.
	Visual Resources	Large white historic structure, church with steeple, mature trees line road, storefronts.
	Overall Visual Character	Older downtown commercial/industrial corridor.
San Leandro South (Blossom Way to Bayfair Center Access Drive) – Alternatives 1 and 3 only	Image Types	Storefront, recessed street parking, mature trees/landscaping, distant hills, residential/single- and multi-family.
	Viewer Groups	Pedestrians, motorists, transit users, residents.
	Visual Resources	Oakland Hills, post office, Bal Theater, mature trees line road, older storefronts.
	Overall Visual Character	Older commercial/industrial uses, low visual quality.
BayFair BART (Bayfair Center and BayFair BART Access) – Terminus Alternatives 1 and 3 only	Image Types	Transportation, mature trees/landscaping.
	Viewer Groups	Pedestrians, motorists, transit users.
	Visual Resources	Bayfair Center, BART station, mature landscaping.
	Overall Visual Character	Shopping and transit oriented center; low visual quality.

Source: *Visual Impact Assessment for the AC Transit Berkeley-Oakland-San Leandro Corridor Bus Rapid Transit (BRT) Project Technical Memorandum*, CirclePoint, July 2005.

Table 4.6-2: Comparison of Landscape Units

	Landscape Units	Image Types																			Viewer Groups					
#	Name	Transportation	Storefront	Highrise	Streetscape	Historic Buildings	Recessed Street Park	University/ Institutional	Mature Trees/Landscaping	Open space/recreational	Distant Hills	Vacant Buildings	Strip mall	Residential Storefront	Residential/single- & multi-	Murals/ street art	Religious structures	Signs/ billboards	Freeway overpass	Street vendors	Pedestrians	Bicyclists	Motorists	Employees	Transit Users	Residents
1	Downtown Berkeley	X	X	X	X	X		X	X	X	X										X	X	X	X	X	
2	Berkeley Southside	X	X	X	X	X	X	X	X	X	X				X	X	X	X		X	X	X	X	X	X	X
3	Telegraph Avenue, Berkeley					X			X	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X
4	North Telegraph Avenue, Oakland					X			X	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X
5	Temescal		X			X		X			X		X		X		X		X		X	X	X	X	X	X
6	Telegraph Avenue/MacArthur Blvd.	X			X	X			X		X	X	X				X	X	X		X	X	X	X	X	X
7	South Telegraph Avenue, Oakland	X			X	X		X	X			X	X	X	X		X	X			X	X	X	X	X	X
8	Downtown Oakland	X		X	X	X		X				X	X				X				X	X	X	X	X	
9	Downtown Oakland/Lake Merritt	X		X	X	X				X									X	X	X	X	X	X	X	
10	Oakland – Eastlake District	X		X	X	X		X	X	X	X	X	X			X	X	X			X		X	X	X	
11	International Blvd – San Antonio	X			X	X		X	X		X	X	X				X	X	X		X	X	X	X	X	
12	Fruitvale	X	X		X	X	X		X		X		X	X	X		X	X			X	X	X	X	X	X
13	International Blvd–Central East Oakland		X			X				X	X	X											X	X	X	
14	International Blvd– Elmhurst				X	X		X	X	X	X						X						X	X	X	
15	San Leandro North		X		X	X		X	X	X				X	X						X		X	X	X	X
16	Downtown San Leandro		X		X	X			X				X				X				X		X	X	X	
17	San Leandro South*		X				X		X		X				X						X		X		X	X
18	BayFair BART*	X							X												X		X		X	

Notes:
* Landscape units 17 and 18 apply only to Alternatives 1 and 3. Alternatives 2 and 4 terminate at the San Leandro BART station.
Source: *Visual Impact Assessment for the AC Transit Berkeley-Oakland-San Leandro Corridor Bus Rapid Transit (BRT) Project Technical Memorandum*, CirclePoint, July 2005.
CirclePoint, 2005

4.6.2.4 VISUAL QUALITY

The existing visual quality for each of the landscape units was evaluated based on indicators of the level of visual relationships, rather than judgments of physical landscape components. This approach provides a set of three evaluative criteria: vividness, intactness, and unity. These criteria are defined as follows:

> **Vividness** is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns.
>
> **Intactness** is the visual integrity of the natural and man-made landscape of the immediate environs and its freedom from encroaching elements.
>
> **Unity** is the visual coherence and compositional harmony of the viewshed. The viewshed entails all natural and man-made features found within the normal view range. In man-altered landscapes, it frequently attests to the careful design or fit of individual components in the landscape.

Representative viewpoints along the proposed BRT corridor where the project could affect existing visual quality were identified and evaluated, as presented in Section 4.6.3.

4.6.2.5 ROADWAY LANDSCAPING AND OTHER URBAN DESIGN FEATURES

A number of roadway segments along the BRT corridor include traffic channelization and landscaping treatments. The treatments vary from curbside bulb-outs to raised paved or planted medians. Landscaping is primarily provided in roadway medians but is also included in some of the curbside bulb-outs. There is a public monument (San Leandro) and art structure (Downtown Berkeley) along the BRT corridor.

In addition to existing streetscape treatments, there are roadway segments, mainly in east Oakland and San Leandro, where new treatments are proposed by the cities. In east Oakland, in various segments of International Boulevard (40th to 44th Avenue, 72nd to 75th Avenue, and 80th to 89th Avenue), new curbs and gutters for bulb-outs at intersections, sidewalk and pedestrian ramp improvements, bus pads, traffic signal and lighting improvements, and street median improvements, among other urban design modifications, are being implemented.[2] In San Leandro, as part of the East 14th Street South Area Development Strategy, various combinations of improvements would be made in the segment of East 14th Street from Maud and Thornton Avenues to 150th Avenue. These improvements include the reconfiguration of traffic lanes, provision of bulb-outs at street corners to shorten pedestrian crossing distances, widening of sidewalks, and replacement of a center turn lane with a tree-lined, raised median.

Table 4.6-3 lists the areas along the BRT corridor where landscape and other special design improvements exist or are proposed (by others). The number of trees in each area is indicated.

[2] International Boulevard Streetscape Project (Parts 1 and 2).

Table 4.6-3: Existing and Proposed In-Street Landscaping Along the BRT Corridor[1]

Geographic Area/ Roadway Segment	Description[3]	Number of Trees and Diameter			
		6" or Less		Over 6"	
		In Median	Curbside[2]	In Median	Curbside[2]
Downtown Berkeley					
Shattuck Avenue, University Avenue to Bancroft Way	Landscaped median (grass, shrubs, trees) extends from Center Street to Bancroft Way; small diameter trees planted to replace large trees in poor condition. Landscaped bulb-outs provided at intersections and along east leg of Shattuck Avenue, west curb, Addison Street to Center Street.	6	11	5	
Shattuck Avenue, Bancroft Way to Durant Avenue	Landscaped median (grass, shrubs, trees) extends from Bancroft Way to Durant Ave. Landscaped bulb-outs provided at intersections.	2	4		
Berkeley--Telegraph Avenue					
Telegraph Avenue, Dwight Way to north of Blake Street	Landscaped median (grass, trees) with pedestrian crossing located immediately south of Dwight Way.			2	
Telegraph Avenue, Blake Street to Howe Street	Raised concrete median dividers provided at intersections to channel traffic.				
North Oakland--Telegraph Avenue					
Telegraph Avenue, Aileen Street to 55th Street	Raised concrete median divider extends along Telegraph Ave. under SR 24 to channel traffic.				
East Oakland--International Boulevard					
International Boulevard, 1st Avenue to 14th Avenue	Pedestrian and landscaped bulb-outs constructed on both sides of International Blvd.		?		
International Boulevard, Fruitvale Avenue to 35th Avenue	Landscaped raised median with vegetation in planters and street furniture extends from 33rd Ave. to 35th Ave.	28			
International Boulevard, 39th Avenue to 44th Avenue	Non-continuous raised paved or bare median provided.				
International Boulevard, 66th Avenue to 67th Avenue	Raised paved/bare median provided.		9		
International Boulevard, 72nd Avenue to 74th Avenue	Discontinuous raised paved and planted median provided.	4			
International Boulevard, 81st Avenue to 100th Avenue	Landscaped median (grass, shrubs, trees) provided.	3		55	
International Boulevard, 106th Avenue to 107th Avenue	Raised paved median provided.				
International Boulevard, 40th-44th, 72nd-75th, 80th-89th Avenues	*Bulb-outs, sidewalk and ramp improvements, medians, bus pads, street furniture, modifications to traffic signals and road signs under construction.*				
San Leandro					
East 14th Street, Bristol Avenue to Broadmoor Boulevard	Landscaped median (grass, shrubs) extends between intersections; city monument at Broadmoor Blvd. intersection.				
East 14th Street, at San Leandro Boulevard and at 137th Avenue	Landscaped median islands constructed north of San Leandro Blvd. and south of 137th Ave. intersections to channel traffic.				
East 14th Street, 143rd Avenue to 144th Avenue	Raised paved median provided to channelize northbound left turns.				
East 14th Street, Hesperian Boulevard to 151st Avenue	Raised paved median provided from just north of Hesperian Blvd. to south of 150th Ave. to channelize left-turn traffic.				
East 14th Street, Fairmont Drive to Bayfair Drive	Raised paved median provided from just north of Fairmont Dr. to Bayfair Dr. to channelize left-turn traffic.				
East 14th Street, Thornton Street/ Maud Avenue to 150th Avenue[4]	*Bulb-outs and lane reconfiguration proposed Thornton St. to 135th Ave; tree-lined median, sidewalk widening and curb extensions to 150th Ave*				
Total Corridor		**43**	**24**	**62**	

Notes:
[1] Landscape and other design treatments within the normal curb-to-curb area of roadways.
[2] In areas extending from the curb, such as bulb-outs or landscaped pockets; figures do not include trees and vegetation in the area between the normal curb line and the right-of-way or property line.
[3] Text in italics describes proposed in-street landscaping.
[4] Landscaping from Thornton Street/Maud Avenue to 150th Avenue would not be affected by Alternatives 2 and 4, which terminate at the San Leandro BART station.
Source: Parsons, 2005

4.6.3 Environmental Consequences

4.6.3.1 ANALYSIS OF VISUAL CHANGES AT ELEVEN VIEWPOINTS

The following section analyzes the visual impacts of the proposed project at 11 specific viewpoints that are representative of the overall visual character within the landscape units. The visual impact assessment considers two principal visual impact components: visual resource change and viewer response to that change. "Visual Resource Change" is analyzed in terms of visual dominance and other visual effects of facilities that would be constructed in the proposed project, together with the change in visual quality. Viewer responses to these changes are interpreted on the basis of viewer types.

The criteria used to determine effects on viewers include: visual dominance of the project; view obstruction or view expansion; effects on community disruption; viewer orientation; and design quality issues, such as changes in vividness, intactness and unity. The ratings used for determining the extent of impacts are defined as follows:

- Strongly Beneficial − substantial visual change and considerable increase in the overall visual quality, with the likelihood of strongly positive viewer responses.
- Beneficial − moderate degrees of visual change and an increase in the overall visual quality, with the likelihood of positive viewer responses.
- Slightly Beneficial − tangible visual changes and a minimal increase in overall visual quality, with the likelihood of moderately positive viewer responses.
- Negligible − little or no visual change and no tangible reduction or increase in visual quality, without negative or positive viewer responses expected.
- Slightly Adverse − a tangible degree of visual change and a minimal reduction in overall visual quality, with the likelihood of some moderately negative viewer responses.
- Adverse − moderate degrees of visual change and a reduction in the overall visual quality, with the likelihood of negative viewer responses.
- Strongly Adverse − substantial visual change and considerable reduction in the overall visual quality, with the likelihood of strongly negative viewer responses.

An analysis of visual changes with the proposed East Bay BRT Project at each of the 11 viewpoints is described below. Figures 4.6-1 through 4.6-11 depict each viewpoint under existing and proposed conditions.

Viewpoint 1: Shattuck Avenue at Bancroft Way

The character of this view would change with the proposed project. However, certain parking configurations and transitway design proposals for Shattuck Avenue would minimize the change in character of the viewpoint. Under Shattuck Avenue parking configurations *a.Unbuffered Angle Parking* and *b. Unbuffered Parallel Parking,* the existing median would be removed but in large part replaced with new landscaping alongside the median transitway. For example, Figure 4.6-1 shows the existing median landscaping near Bancroft Way. A portion of the median, including some mature trees (in poor condition and proposed for replacement), and the planting strip that separates parking

spaces along the outer edges of Shattuck Avenue would be removed. New median landscaping would be added under parking configurations "a" and "b." The bus platform and associated station elements would partially obscure views of storefronts that are currently visible through the trees along Shattuck Avenue. The change in overall visual quality would be slightly adverse because of the decrease in vegetation and increase in paved surfaces along the roadway. Under parking configuration *c. Buffered Angle Parking*, however, median landscaping alongside the transitway would not be provided due to lack of space. The change in overall visual quality would be adverse in this instance due to the complete loss of vegetation and increase in paved surfaces along this segment of Shattuck Avenue.

Table 4.6-4: Summary of Visual Effects from Viewpoint 1

Alternative	Visual Dominance of Project	View Obstruction	Community Disruption/ Orientation/ Privacy	Vividness	Intactness	Unity	Overall Visual Quality
Change with Proposed Project, Parking Configurations "a" and "b"	Slightly Adverse	Slightly Adverse	Negligible	Slightly Adverse	Slightly Adverse	Slightly Adverse	Slightly Adverse
Change with Proposed Project, Parking Configuration "c"	Adverse	Negligible	Slightly Adverse	Adverse	Adverse	Adverse	Adverse

Viewpoint 2: Bancroft Way at Telegraph Avenue; Sather Gate (view of station)

The character of this view would change substantially with the proposed project improvements. The trees that line Bancroft Way would be removed to widen the sidewalk on the north side. On the south side the recessed street parking would be removed. A station would be constructed in the existing street, as shown in Figure 4.6-2. The addition of more structural elements to the street would change the visual character to a busy urban thoroughfare with large buses and associated stations and platforms. Due to the loss of vegetative screening through the removal of sidewalk trees, and the obscuring of views of the storefronts along Bancroft Way, between Dana Street and Telegraph Avenue, the overall change in visual quality from this viewpoint would be slightly adverse.

Table 4.6-5: Summary of Visual Effects from Viewpoint 2

Alternative	Visual Dominance of Project	View Obstruction	Community Disruption/ Orientation/Privacy	Vividness	Intactness	Unity	Overall Visual Quality
Change with Proposed Project	Slightly Adverse	Slightly Adverse	Slightly Adverse	Slightly Adverse	Slightly Adverse	Slightly Adverse	Slightly Adverse

Viewpoint 3: Bancroft Way at Telegraph Avenue; Sather Gate Station (looking east)

The character of this view would not change substantially from the existing condition. One lane of traffic would be removed and one dedicated to BRT, leaving one lane of westbound traffic for vehicular travel on the south side of Bancroft Way.

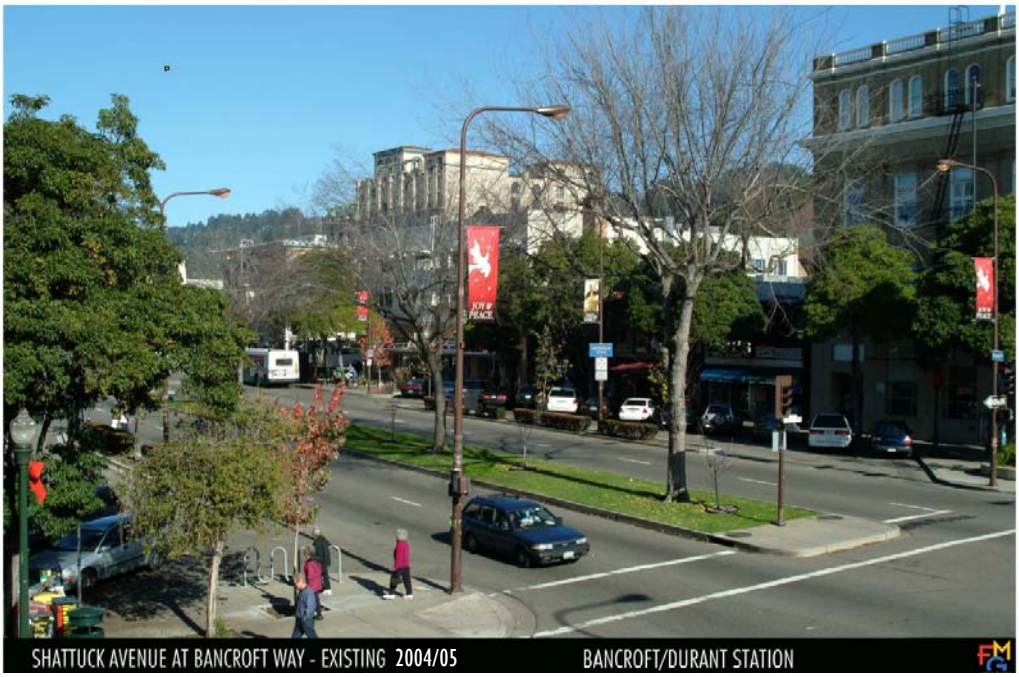

Figure 4.6-1: Viewpoint 1—Shattuck Avenue at Bancroft Way

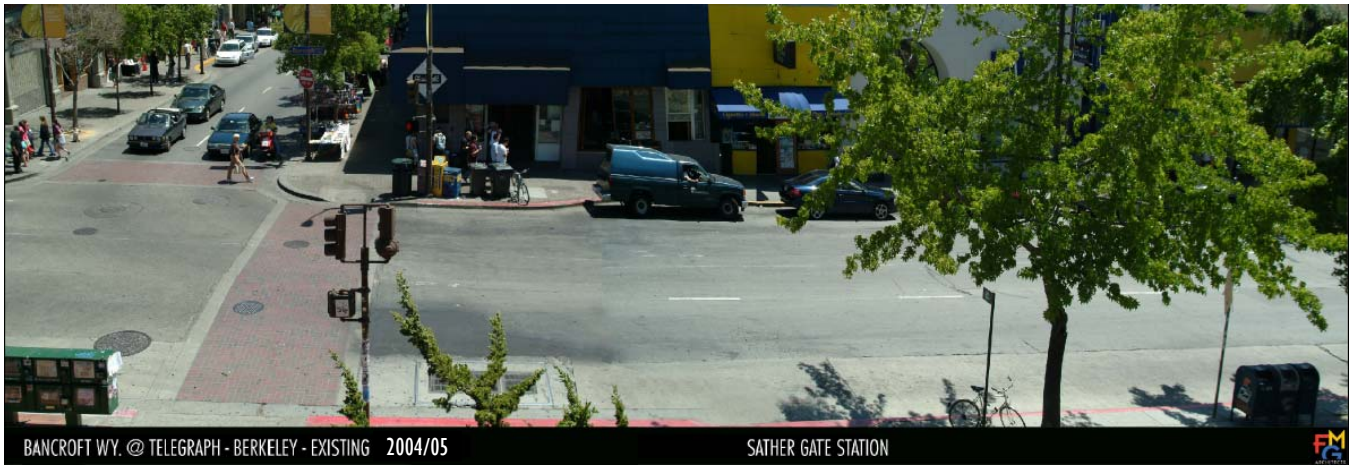

Figure 4.6-2: Viewpoint 2–Bancroft Way at Telegraph Avenue; Sather Gate (view of station)

Figure 4.6-3: Viewpoint 3–Bancroft Way at Telegraph Avenue; Sather Gate Station (looking east)

Where the traffic lane would be removed, the sidewalk would be extended and trees planted, as shown in Figure 4.6-3. Overall, the proposed project would result in a slightly beneficial effect on the visual quality due to the addition of streetscape elements and landscaping along Bancroft Way.

Table 4.6-6: Summary of Visual Effects from Viewpoint 3

Alternative	Visual Dominance of Project	View Obstruction	Community Disruption/ Orientation/ Privacy	Vividness	Intactness	Unity	Overall Visual Quality
Change with Proposed Project	Negligible	Negligible	Negligible	Slightly Beneficial	Slightly Beneficial	Slightly Beneficial	Slightly Beneficial

Viewpoint 4: Telegraph Avenue and Webster Street

The proposed project would not substantially alter the visual environment in this view. Street parking along both sides of Telegraph Avenue would be removed and station platforms along with the BRT lanes constructed, as shown in Figure 4.6-4. Mature trees along the sidewalks would remain. Overall, the change in vividness, intactness, unity and overall visual quality would be negligible.

Table 4.6-7: Summary of Visual Effects from Viewpoint 4

Alternative	Visual Dominance of Project	View Obstruction	Community Disruption/ Orientation/ Privacy	Vividness	Intactness	Unity	Overall Visual Quality
Change with Proposed Project	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Viewpoint 5: 49th Street at Telegraph Avenue

The proposed project would have a slightly beneficial impact on the overall visual character from this viewpoint. The project would construct BRT lanes in the center of Telegraph Avenue with one lane of local traffic in each direction, as shown in Figure 4.6-5. Street parking would be removed to accommodate the new bus lanes and a landscaped median would be installed. The construction of the dedicated bus lanes, landscaped median, and station with related amenities, would reduce the visual dominance of Telegraph Avenue by visually breaking up the wide expanse of pavement. Construction of the station and amenities would also partially block views of the Telegraph Avenue corridor; however, this would be considered a negligible effect.

Table 4.6-8: Summary of Visual Effects from Viewpoint 5

Alternative	Visual Dominance of Project	View Obstruction	Community Disruption/ Orientation/ Privacy	Vividness	Intactness	Unity	Overall Visual Quality
Change with Proposed Project	Slightly Beneficial	Negligible	Negligible	Negligible	Slightly Beneficial	Slightly Beneficial	Slightly Beneficial

Figure 4.6-4: Viewpoint 4—Telegraph Avenue and Webster Street

Figure 4.6-5: Viewpoint 5–49th Street at Telegraph Avenue

Viewpoint 6: Telegraph Avenue and 31st Street

The overall change produced by the proposed project in this viewpoint would be negligible. The project would locate a station with two platforms on Telegraph Avenue, combined with the BRT guideway. These improvements would have the effect of breaking up the expanse of pavement in this area, as shown in Figure 4.6-6. The station would also block the view of the I-580 overpass which would be considered a beneficial effect.

Table 4.6-9: Summary of Visual Effects from Viewpoint 6

Alternative	Visual Dominance of Project	View Obstruction	Community Disruption/ Orientation/ Privacy	Vividness	Intactness	Unity	Overall Visual Quality
Change with Proposed Project	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Viewpoint 7: 20th Street Between Broadway and Telegraph Avenue (Uptown Station)

The proposed project would not have a measurable effect on the overall visual quality of this viewpoint. The Uptown Transit Center, currently in construction, would provide a bus station for Rapid Bus Route 1R and other bus routes at this location. The East Bay BRT Project would make minor improvements to the Center, mainly in the form of passenger amenities, including fare vending.

Table 4.6-10: Summary of Visual Effects from Viewpoint 7

Alternative	Visual Dominance of Project	View Obstruction	Community Disruption/ Orientation/ Privacy	Vividness	Intactness	Unity	Overall Visual Quality
Change with Proposed Project	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Viewpoint 8: International Boulevard at 34th Avenue

The proposed project would remove a portion of the existing median and trees on International Boulevard south of 34th Avenue to accommodate a BRT station, as shown in Figure 4.6-8. Removal of the landscaped median and construction of the bus station and related amenities would adversely affect the intactness, unity, and over all visual quality of the view.

Table 4.6-11: Summary of Visual Effects from Viewpoint 8

Alternative	Visual Dominance of Project	View Obstruction	Community Disruption/ Orientation/ Privacy	Vividness	Intactness	Unity	Overall Visual Quality
Change with Proposed Project	Adverse	Negligible	Negligible	Adverse	Adverse	Adverse	Adverse

Figure 4.6-6: Viewpoint 6–Telegraph Avenue and 31st Street

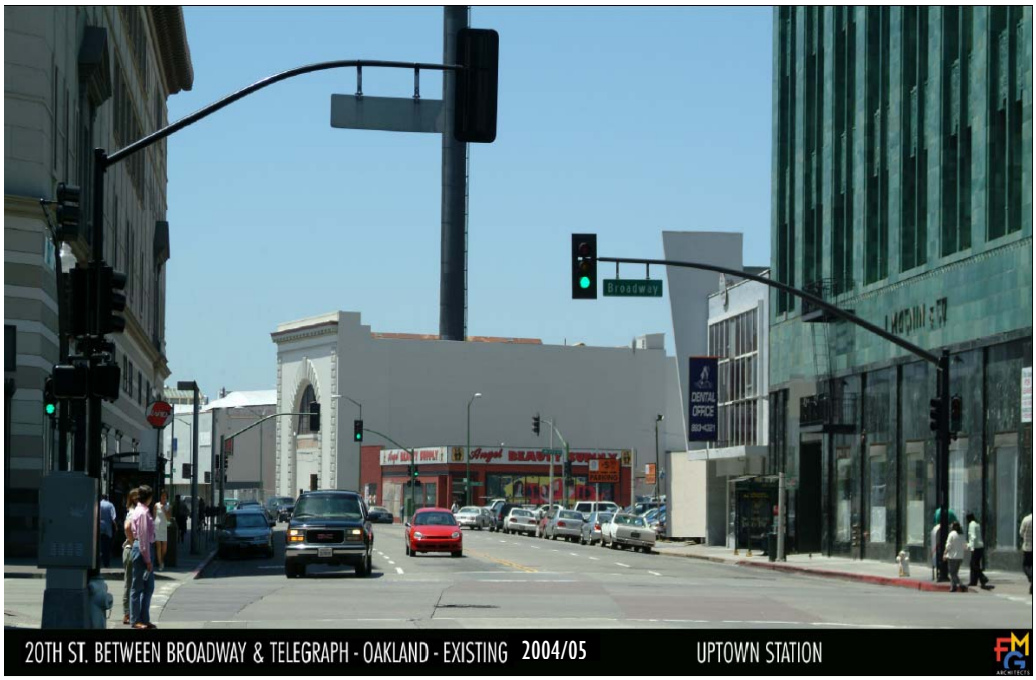

Figure 4.6-7: Viewpoint 7—20th Street between Broadway and Telegraph Avenue

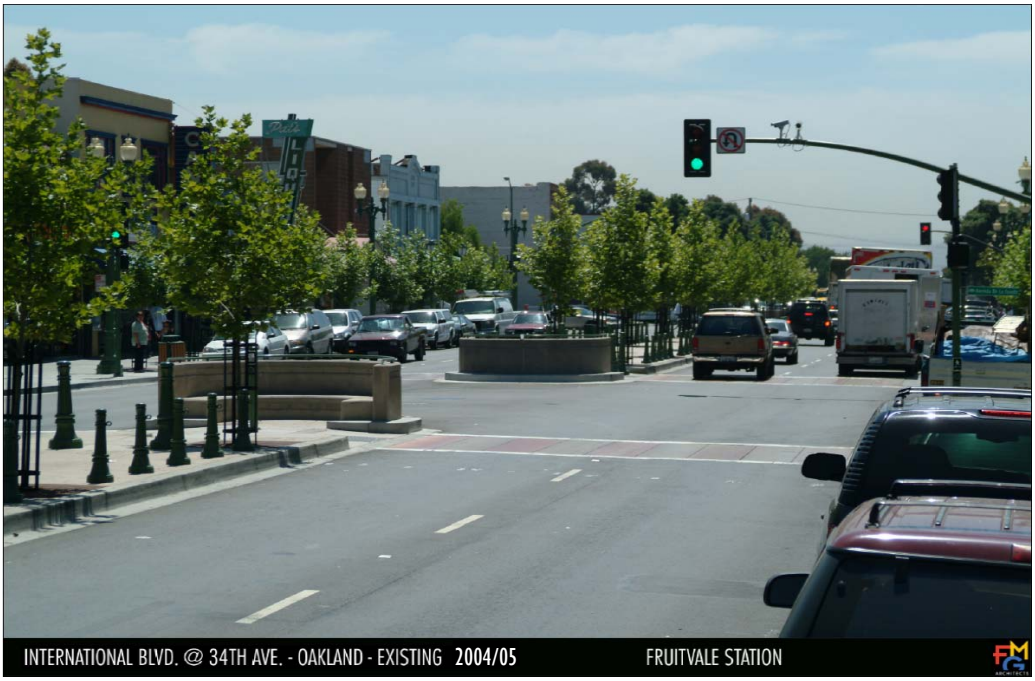

Figure 4.6-8: Viewpoint 8—International Boulevard at 34th Street

Viewpoint 9: International Boulevard at 98th Avenue

The proposed project would have a slightly adverse effect on the overall visual quality of this viewpoint. The existing landscaped median would be removed and replaced with BRT lanes and a station platform, as shown in Figure 4.6-9. In some locations the BRT lanes would be separated from traffic lanes by a raised landscaped median and replacement landscaping, including trees, would be provided where feasible.

Table 4.6-12: Summary of Visual Effects from Viewpoint 9

Alternative	Visual Dominance of Project	View Obstruction	Community Disruption/ Orientation/ Privacy	Vividness	Intactness	Unity	Overall Visual Quality
Change with Proposed Project	Slightly Adverse	Slightly Adverse	Negligible	Slightly Adverse	Slightly Adverse	Slightly Adverse	Slightly Adverse

Viewpoint 10: East 14th Street Between Davis and Estudillo Streets

Viewpoint 10 applies only to Alternatives 1 and 3, each of which terminates at the BayFair BART station. Alternatives 2 and 4 turn off of East 14th Avenue and onto Davis Street to terminate at the San Leandro BART station.

The proposed project would construct a BRT station on East 14th Street and reconstruct the existing sidewalk. BRT would travel on an outside shared lane and would not have a dedicated bus lane. Reconstruction of the sidewalk would include landscaping, decorative brick pavement, and a fountain, as shown in Figure 4.6-10. These amenities would increase the vividness of the view, but would only have a negligible effect on the intactness, unity and overall visual quality as the main elements of the existing view (mature trees, bus shelter, sidewalk) would not change dramatically.

Table 4.6-13: Summary of Visual Effects from Viewpoint 10

Alternative	Visual Dominance of Project	View Obstruction	Community Disruption/ Orientation/ Privacy	Vividness	Intactness	Unity	Overall Visual Quality
Change with Proposed Project	Negligible	Slightly Adverse	Negligible	Slightly Beneficial	Negligible	Negligible	Negligible

Viewpoint 11: East 14th Street at 143rd Avenue

Viewpoint 11 applies only to Alternatives 1 and 3, each of which terminates at the BayFair BART station. Alternatives 2 and 4 turn off of East 14th Avenue and onto Davis Street to terminate at the San Leandro BART station.

The proposed project could result in negligible impacts to the overall visual character and quality of the viewpoint, assuming implementation of the city's *East 14th Street South Area Development Strategy*. BRT lanes and platform stations would be constructed in the median of East 14th Street with raised landscaped medians on each side. The landscaped medians would visually improve the

view, as shown in Figure 4.6-11, compared to existing conditions. However, the City of San Leandro has approved a program to improve this area as part of the *East 14th Street South Area Development Strategy*, which would add a landscaped median on East 14th Street through Viewpoint 11. The East Bay BRT Project would replace center median landscaping with side median landscaping (adjacent the BRT transitway) where feasible. The East Bay BRT Project would slightly obstruct views but the overall visual impact would be considered negligible.

Table 4.6-14: Summary of Visual Effects from Viewpoint 11

Alternative	Visual Dominance of Project	View Obstruction	Community Disruption/ Orientation/ Privacy	Vividness	Intactness	Unity	Overall Visual Quality
Change with Proposed Project	Negligible	Slightly Adverse	Beneficial	Negligible	Negligible	Negligible	Negligible

4.6.3.2 CONSISTENCY WITH GENERAL PLAN POLICIES

Tables 4.6-15, 4.6-16 and 4.6-17 present the consistency of the proposed project with relevant scenic/visual plans and policies as set forth in the following documents:

- City of Berkeley General Plan
- Downtown Berkeley Specific Plan
- City of Oakland General Plan, Open Space Conservation and Recreation Element
- City of San Leandro General Plan

In general, the proposed project would result in changes to the existing visual quality and character of the project corridor only in locations where characteristic landscaping or streetscape elements would be removed to accommodate station platforms or the BRT transitway. Potential inconsistencies with relevant plans or policies would occur where the removal of landscaping or streetscape elements would have an adverse impact on the overall visual character of certain locations along the project alignment, particularly in Downtown Berkeley under parking configuration *c. Buffered Angle Parking*, and the Fruitvale and International-Elmhurst Districts in Oakland. (In Downtown Berkeley, project alternatives incorporating *a.Unbuffered Angle Parking* or *b.Unbuffered Parallel Parking* would replace most median landscaping and therefore have only a minor effect on the overall visual character.) In most cases, the inconsistencies determined in Tables 4.6-15, 4.6-16 and 4.6-17 would be cleared at the design review phase prior to project approval. Appropriate mitigation for potential inconsistencies would include wherever possible the replacement of streetscape elements and landscaping, including landscaped medians or sidewalks, crosswalks, and street furniture.

Figure 4.6-9: Viewpoint 9—International Boulevard at 98th Avenue

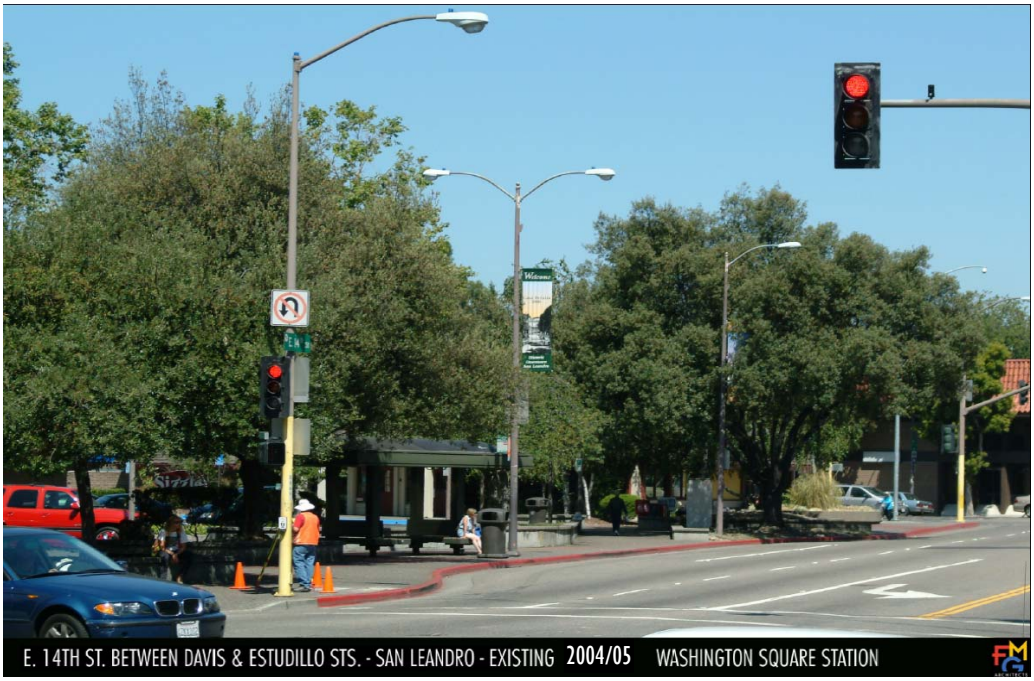

Figure 4.6-10: Viewpoint 10—East 14th Street between Davis and Estudillo Streets

Figure 4.6-11: Viewpoint 11—East 14th Street at 143rd Avenue

Table 4.6-15: City of Berkeley Policies	
Policy	**Consistency**
City of Berkeley General Plan	
Policy LU-20 Downtown Pedestrian and Transit Orientation Reinforce the pedestrian orientation of the Downtown. Actions: A. Continue to explore options for the partial or complete closure of Center Street, Addison Street or Allston Way to automobiles to promote the pedestrian and commercial vitality and enhance Civic Center Park use and appearance. When exploring options, carefully consider the experiences of other cities where closures have proven to be successful and where closures have proven to be unsuccessful or detrimental. B. Continue to explore costs and plans for the daylighting of Strawberry Creek. (Also see Environmental Management Policy EM-27.) C. Implement capital improvement projects that reinforce the pedestrian, transit, commercial, arts, and entertainment orientation of the Downtown and improve the quality of life for visitors and residents of the area. D. Reconstruct the Downtown BART Station and Plaza to be more pedestrian-friendly and visually attractive. E. Encourage development of public spaces, plazas, and restoration of natural areas in the Downtown and other areas of the city where appropriate to enhance the pedestrian environment.	**Consistent.** The project would include the addition of BRT platforms, pedestrian facilities and streetscape elements such as planter boxes, light posts, and banners at stations in important neighborhoods (i.e. Sather Gate Station in Berkeley) that would enhance the pedestrian-friendly character of these locations.
Policy UD-5 Architectural Features Encourage, and where appropriate require, retention of ornaments and other architecturally interesting features in the course of seismic retrofit and other rehabilitation work. Action: A. Use design review and establish new effective means to protect architectural features and ornaments that have historical value or visual interest.	**Consistent.** Urban Design Guidelines for the project have been developed in consultation with the City of Berkeley.
Policy UD-19 Visually Heterogeneous Areas In areas that are now visually heterogeneous, a project should be responsive to the best design elements of the area or neighborhood.	**Consistent.** The station platforms would not detract from the overall visual character of any of the landscape units within the project area, as the stations would be one story in height and would not be solid structures.
Policy UD-8 Public Works Projects In public works projects, seek to preserve desirable historic elements such as ornamental sidewalk features, lampposts, and benches. Actions: A. Carefully review planned utility undergrounding, sidewalk repair, and other public works projects to avoid unnecessary removal of light fixtures, planting, and other features with historic or aesthetic value. B. Establish procedures for the review of work by PG&E, EBMUD, and other agencies responsible for work in the public right-of-way. C. Provide for review by the Landmarks Preservation Commission of public works projects involving potential change to desirable historic elements.	**Potentially Inconsistent.** The project would involve the removal of some streetscape elements, and possibly some historic streetscape elements.

Table 4.6-15: City of Berkeley Policies

Policy	Consistency
Historic Preservation and Urban Design Element	
Objective 1: Provide continuity between the old and the new in the built environment. Retain the scale and the unique character of the downtown.	**Consistent.** The proposed project would introduce various station platforms and bus shelters that would be one-story in height and would not detract from the scale and character of the neighboring buildings downtown.
Policy DT-9 Create a visually cohesive district, which retains its early 20th century characteristics.	**Consistent.** Urban Design Guidelines for the project have been developed in consultation with the City of Berkeley.
Objective 3: Improve the visual and environmental quality of the downtown, with an emphasis on the pedestrian environment.	**Consistent.** Urban Design Guidelines for the project have been developed in consultation with the City of Berkeley.
Policy DT-11 Develop a detailed streetscape plan. Create plazas and other urban spaces as identified in the Downtown Public Improvements Plan (1997), to enhance the pedestrian environment and increase the number of people who will use downtown. Enhance sidewalks and streetscapes to reflect the scale and early 20th century historic quality of downtown architecture.	**Consistent.** Urban Design Guidelines for the project have been developed in consultation with the City of Berkeley.
Policy DT-12 As part of private and public development and renovation projects, attempt to maximize green spaces, natural surfaces, plants and streetscaping in the development plans.	**Potentially Inconsistent.** Some options in the proposed project would decrease the amount of landscaped area within the project area. The removal of mature vegetation without replacing it would be inconsistent with this policy of maximizing green spaces and streetscaping. Appropriate mitigation is discussed in Section 4.6.4, Avoidance, Minimization and/or Mitigation Measures.
Policy DT-17 Development along the Oxford edge should incorporate open spaces to provide a transition between the Oxford edge and the more dense areas of the downtown. Maintain visual openness along Oxford Street.	**Potentially Inconsistent.** The proposed project would require the removal of some median strips with mature vegetation. The removal of these medians would make the transition from the UC Berkeley open space to the Downtown Berkeley/Shattuck Avenue corridor area more distinct, and would decrease the overall visual continuity of the Oxford/Fulton Street environment. Mitigation measures as described in Section 4.6.4 Avoidance, Minimization and/or Mitigation Measures would reduce potential impacts.

Table 4.6-15: City of Berkeley Policies	
Policy	**Consistency**
Policy DT-34 Provide a variety of outdoor spaces for pedestrians, particularly gathering spaces.	**Consistent.** The project would include the addition of some streetscape elements, including wider sidewalks and pedestrian gathering areas near some significant stations (such as the Sather Gate station).
Downtown Berkeley Design Guidelines Historic Preservation and Urban Design Element of the Berkeley Downtown Plan	
Open Spaces − Views of the hills and bay from Downtown locations provide a visual connection between natural and manmade environments. Inviting open spaces should be provided throughout the Downtown in order to reinforce this connection. These spaces should be suitably scaled to their surroundings, and sited in locations which reinforce rather than disrupt pedestrian flow. The most successful open spaces are those which are strongly defined by building forms and/or landscaping, and designed to encourage public use.	**Consistent.** The project would include the construction of one-story bus shelters that would not substantially obscure views of the distant hills.
All Buildings − 1. Preserve views of the hills and bay from Downtown.	**Consistent.** The project would include the construction of one-story bus shelters that would not substantially obscure views of the distant hills.
Important Vistas 0 1. Preserve important vistas within the downtown area. Important vistas include: University Avenue in both directions; streets with views of the hills to the east; the west termination of Center Street; the east and west termination of Kittredge Street; and the portion of Shattuck Avenue that terminates at University Avenue.	**Consistent.** The BRT corridor would not adversely affect the scenic vista along Telegraph Avenue looking north toward the UC campus and distant hills.
Source: *Visual Impact Assessment for the AC Transit Berkeley-Oakland-San Leandro Corridor Bus Rapid Transit (BRT) Project Technical Memorandum*, CirclePoint, July 2005. CirclePoint, 2005	

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Table 4.6-16: City of Oakland Policies

Policy	Consistency
City of Oakland General Plan	
Policy D2.1 Enhancing the Downtown Downtown should be visually interesting, harmonize with its surroundings, respect and enhance important views in and of the downtown, respect the character, history, and pedestrian-orientation of the downtown, and contribute to an attractive skyline.	**Consistent.** The project would not substantially affect the visual character of areas with distinct historic resources or historic character. The platforms would be one story in height, and would not substantially affect the visual quality of the skyline in the project area.
Open Space Conservation and Recreation (OSCAR)	
Action OS-10.2.1: Visual Analysis for New Development On an on-going basis, the Office of Planning and Building will require visual analysis for new developments which could significantly impact views and vistas.	**Consistent.** Urban Design Guidelines for the project have been developed in consultation with the City of Oakland.
Policy OS 10-3: Underutilized Visual Resources Enhance Oakland's underutilized visual resources, including the waterfront, creeks, San Leandro Bay, architecturally significant buildings or landmarks, and major thoroughfares.	**Potentially Inconsistent.** The project would result in the removal of some streetscape elements such as landscaping, median strips, lightposts, and banner posts, especially in the Fruitvale area along International Boulevard. The replacement of displaced streetscape elements and redesign of the median would mitigate any adverse effects.
Policy T6.2 Improving Streetscapes The City should make major efforts to improve the visual quality of streetscapes. Design of the streetscape, particularly in neighborhoods and commercial centers, should be pedestrian oriented, include lighting, directional signs, trees, benches, and other support facilities.	See above.
Policy D2.1 Enhancing the Downtown Downtown development should be visually interesting, harmonize with its surroundings, respect and enhance important views in and out of the downtown, respect the character, history, and pedestrian orientation of the downtown, and contribute to an overall attractive skyline.	**Consistent.** The project would not substantially affect the visual character of areas with distinct historic resources or historic character, as the stations would not be solid structures and would not be large enough to substantially detract from the visual quality of any historic or visually interesting areas. The platforms would be one story in height, and would not have a major adverse impact on the visual quality of the skyline.

Source: *Visual Impact Assessment for the AC Transit Berkeley-Oakland-San Leandro Corridor Bus Rapid Transit (BRT) Project Technical Memorandum*, CirclePoint, July 2005. CirclePoint, 2005

Table 4.6-17: City of San Leandro Policies

Policy	Consistency
San Leandro General Plan	
8.03 AESTHETICS Upgrade the City's commercial corridors by building upon their existing strengths and improving their aesthetic qualities. The City should implement programs to underground utilities, abate weeds and graffiti, eliminate litter, improve buffers to adjacent residential uses, control excessive signage, and provide streetscape amenities and landscaping along the corridors.	**Consistent** - Throughout the landscape units in San Leandro, the visual character is maintained, particularly in the Downtown area where little roadwork will occur as there will be no dedicated BRT lane.
Action 42.01-B: Neighborhood Gateways Expand the neighborhood gateway sign program and explore funding sources, potential sites, and potential designs for additional gateway signs.	**Potentially Inconsistent.** The project would involve the relocation of some streetscape elements, such as the San Leandro entry gate at the Oakland border under Alternatives 1 and 3. Design mitigation is proposed to maintain the gateway by including a landscaped median in the transitway north of Broadmoor Boulevard. East 14th Street would be widened by approximately one foot along each curb. As a result, the mitigated project would not be inconsistent with this action.
Goal: A More Visually Attractive City Create a more visually attractive City, with well-landscaped and maintained streets, open spaces, and gathering places.	**Consistent** - Within the City of San Leandro, where dedicated bus lanes are proposed, landscaping is also included.
44.01 GREENING SAN LEANDRO Promote landscaping, tree planting, and tree preservation along San Leandro streets as a means of improving aesthetics, making neighborhoods more pedestrian-friendly, providing environmental benefits, and creating or maintaining a park-like setting.	**Consistent** - Mature landscaping will be preserved in San Leandro and landscaping will be included in several areas along the route.
44.03 TREE REMOVAL AND REPLACEMENT Discourage the removal of healthy trees and require replacements for any trees that are removed from street rights-of-way. Where healthy trees must be removed, consider their relocation to other suitable sites instead of their disposal. Encourage the preservation and proper care of mature trees throughout the City, particularly those which may have historic importance or contribute substantially to neighborhood character.	**Consistent** - Mature landscaping will be preserved in San Leandro and landscaping will be included in several areas along the route.
44.05 STREET BEAUTIFICATION Upgrade the City's commercial thoroughfares by building upon their existing strengths and improving their aesthetic qualities. The City should implement programs to underground utilities, abate weeds and graffiti, eliminate litter, improve buffers to adjacent residential uses, prohibit excessive or out-of-scale signage, remove billboards, and provide streetscape amenities and landscaping along these thoroughfares.	**Consistent** - Throughout the landscape units in San Leandro, the visual character is maintained, particularly in the Downtown area where little roadwork will occur as there will be no dedicated BRT lane.
Policy 3.10 - Consider the introduction of a raised, tree-lined median at the center of East 14th Street south of San Leandro Blvd. (Southern Downtown and McKinley Residential Districts excluded).	**Consistent** - The portion of the project on East 14th Street, south of San Leandro Boulevard would include a dedicated bus lane and landscaping.

Source: *Visual Impact Assessment for the AC Transit Berkeley-Oakland-San Leandro Corridor Bus Rapid Transit (BRT) Project Technical Memorandum*, CirclePoint, July 2005. CirclePoint, 2005

4.6.3.3 REMOVAL/RELOCATION OF ROADWAY LANDSCAPING AND OTHER URBAN DESIGN FEATURES

Areas of existing and proposed (by others) in-street landscaping along the BRT alignment are identified in Table 4.6-3. The proposed East Bay BRT Project would remove or relocate landscaping and other urban design treatments in several locations within the areas listed below:

- Shattuck Avenue, Berkeley
- Telegraph Avenue, Berkeley
- Telegraph Avenue, Oakland
- International Boulevard, Oakland
- East 14th Street, San Leandro

Minor median treatments for channeling traffic, such as along Telegraph Avenue in South Berkeley and North Oakland, would not be replaced. The proposed project would include substantial landscape improvements that would replace the landscaped features removed in all but two locations. The locations where landscaping would not be replaced are:

- Shattuck Avenue between Allston Way and Bancroft Avenue in Berkeley. Median landscaping would not be provided by the East Bay BRT Project under Build Alternatives that incorporate parking configuration "c", which retains buffered angled parking along the east and west curbs of Shattuck Avenue. The existing landscaped median in Shattuck Avenue would be removed. (Replacement landscaping in the median of Shattuck Avenue, alongside the proposed BRT transitway, would be provided under Build Alternatives that incorporate parking configuration *a.Unbuffered Angle Parking* or *b.Unbuffered Parallel Parking.* See Chapter 2, Section 2.2.3.1, for additional information on Shattuck Avenue parking configurations.)
- East 14th Street median landscaping between Bristol Boulevard and Broadmoor Boulevard in San Leandro. The median would not be replaced under Alternatives 1 and 3 except in the vicinity of the City of San Leandro monument just north of Broadmoor Boulevard. The project proposes to avoid moving the monument by designing the BRT transitway to go around the monument (see Section 4.6.4). Existing landscaping would not be affected by Alternatives 2 and 4.

At both of these locations there is insufficient roadway width to provide, in the same section, traffic lanes, the BRT transitway, and landscape improvements. Roadway widening and right-of-way acquisition would be necessary but are not considered practicable. Therefore, landscaping cannot be replaced.

Figure 4.6-12: San Leandro Monument

Overall, the total area of landscaping to be provided as part of the project would be substantially larger than the total area removed. One of the design objectives of the East Bay BRT Project is to enhance the attractiveness of the street section, making it more appealing to users and local businesses and residents.

In addition to the removal and replacement of landscaping, the proposed project would require the relocation of one art structure:

- A public art structure at the Shattuck Square sidewalk along Shattuck Avenue (southbound) would be removed and relocated to another site designated by the City of Berkeley.

4.6.4 Avoidance, Minimization and/or Mitigation Measures

The East Bay BRT Project would be designed with streetscape elements similar to those being removed, including decorated medians and landscaping, to maintain the existing visual character. Additionally, all stations and related amenities would be designed in coordination with the cities of Berkeley, Oakland and San Leandro. It is anticipated that city guidelines would include requirements and limitations on height, bulk, setback, landscaping and character. Compliance with these guidelines would help to ensure the visual character and quality of the corridor is not adversely affected.

The project design would be modified to avoid removing the city of San Leandro monument at Broadmoor Street. A short landscaped area that includes the monument would be located in the median of the transitway (i.e. between the southbound and northbound BRT lanes). This would require widening the street slightly, by approximately two feet. No further mitigation of landscaping impacts is proposed beyond the treatments that would be included in the basic design of the East Bay BRT Project.

4.7 Cultural Resources

4.7.1 Regulatory Setting

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to take into account the effects of their activities and programs on historic properties. Section 110 of the Act lays out affirmative agency responsibilities with respect to historic properties and establishes the National Register of Historic Places (NRHP) for identifying and listing historic properties of importance to the nation, the states, and local communities.

Guidelines for implementing Section 106 requirements are promulgated by the Advisory Council on Historic Preservation (ACHP) in “Protection of Historic Properties” (36 CFR Part 800). These guidelines require agencies to comply also with other federal laws related to historic preservation, including the National Environmental Policy Act of 1969; the Archaeological and Historic Preservation Act of 1979; and Executive Order 11593 (1971), addressing “Protection and Enhancement of the Cultural Environment.” Other agency-specific legislation requires consideration of the impacts of federal actions on cultural resources. Transportation projects must comply with the provisions of Section 4(f) of the Department of Transportation (DOT) Act of 1966.

23 CFR Part 771.135 of the DOT Regulations implementing NEPA (citing Title 49 of the United States Code, Part 303) states that the Administration may not approve the use of land from a significant publicly owned public park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless there is no feasible and prudent alternative to the use of land from the

property and the action includes all possible planning to minimize harm to the property resulting from such use. This provision is commonly termed, "Section 4(f)."

The State of California references cultural resources in the California Environmental Quality Act (CEQA—Public Resources Code (PRC) Division 13, Sections 21000-21178); archaeological and historical resources are specifically treated under Sections 21083.2 and 21084.1, respectively. California PRC 5020.1 through 5024.6 (effective 1992) creates the California Register of Historical Resources (CRHR) and sets forth requirements for protection of historic cultural resources.

City-designated structures and districts are presumed historic resources under the California Environmental Quality Act (CEQA) as they are on a local register. In addition, resources listed or determined eligible for listing in the CRHR or in the NRHP are also considered historic resources under CEQA.

4.7.2 Archaeological Resources

4.7.2.1 AFFECTED ENVIRONMENT

Archaeological Area of Potential Effects

An Area of Potential Effects (APE) for archaeological resources was delineated by FTA in consultation with the State Historic Preservation Officer (SHPO). This APE was defined as the extent of proposed construction for the project — that is, the project "footprint" or Area of Direct Impact.

Research

An archaeological field survey was conducted on November 18, 22, and 26, and December 2, 2004. During the archaeological survey, both sides of the entire length of the proposed project alignment and alignment variations were inspected. Sources at the Bancroft, Anthropology, and Map Libraries, the Archaeological Research Facility, and the Phoebe Hearst Museum at the University of California, Berkeley were consulted for background historical, archaeological, and anthropological information. In addition original records for sites recorded by U.C. Berkeley archaeologists in the 1940s and 1950s were reviewed at the Hearst Museum. An archaeological record search was also conducted in November 2004 at the Northwest Information Center of the California Historic Research Information System, Sonoma State University, Rohnert Park. A report of archaeological sites and studies within one-half mile of the project area was requested. The National Register of Historic Places, the California Inventory of Historic Resources, and the California Historic Landmarks lists were also consulted.

Native American Consultation

In November 2004, a letter was sent to the Native American Heritage Commission (NAHC) and to eight Native American contacts from a list supplied by the NAHC. The letter solicited information and concerns about Native American cultural resources within the project area. (Copies of these letters are in Appendix G, Correspondence.) Only Andrew Galvan of the Ohlone Indian Tribe replied by telephone. He knew of no resources in the specific project area. Follow-up calls were made to the other seven contacts in July 2005. Ella Rodriguez requested further information, which was sent to

her on July 19, 2005. The remaining contacts were not reachable by listed phone numbers or had no further comment on the project.

Recorded Resources

One report was on file at the Northwest Information Center for a prehistoric Indian burial that is immediately adjacent to the APE in Berkeley. This site is covered by commercial buildings, and no cultural materials were observed. Three more prehistoric sites were recorded 0.5 mile from the project area in Berkeley.

Six archaeological sites have been recorded in or immediately adjacent to the project alignment in the Downtown Oakland area. These include a human burial and a large animal tooth; a sandy midden with some shell, a skull, and a mortar; a well, a sewer line, a privy, a pit feature, and two mortared brick foundations associated with a building erected in 1900 (evaluated and judged not eligible for the National Register); elements of the old urban railroad system; and an abandoned concrete masonry manhole.

At least six other archaeological sites are recorded within a half-mile of the project corridor in Downtown Oakland. None appear to be close enough to be affected by the project. Note also that in the early 1880s two early Oakland cemeteries were reported to be located not far from the project area. No archaeological sites were recorded in the southern half of the project area. None should be affected by this project.

4.7.2.2 ENVIRONMENTAL CONSEQUENCES

The project corridor passes through areas that are highly sensitive for archaeological resources. These areas are under highly built environments with little open space in or adjacent to the proposed BRT alignment. The project would be constructed largely on the surface of existing streets and sidewalks with little disturbance of existing pavement; therefore, the potential for impacts to archaeological resources would be low.

4.7.2.3 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Although the likelihood of impacts is low, precautions would be taken to reduce the potential for shallow construction activities to affect archaeological sites. The highly built environment makes testing for buried resources impractical. Therefore, an archaeologist would monitor any construction work within the project alignment in sensitive locations identified in the *Site Treatment Plan for the Alameda–Contra Costa Transit District's East Bay Rapid Transit Project in Berkeley, Oakland, and San Leandro* (Archaeological/Historical Consultants, January 2005). If buried cultural materials (either prehistoric or historic) are encountered during construction, work would stop and measures would be taken as specified in Section 4.16.6, Construction Impacts – Cultural Resources, of this EIS/EIR.

4.7.3 Historic Resources

4.7.3.1 AFFECTED ENVIRONMENT

The APE for historic architectural resources was delineated by FTA and AC Transit in consultation with the State Historic Preservation Officer (SHPO). The APE was defined to take into account the two categories of potential impacts associated with the various project components: those involving minor changes to city streets within the existing curb-lines and those that propose construction of BRT stations, alterations to existing sidewalks and curb-lines, or construction of new traffic signals at selected intersections. The boundary of the APE was established at the existing curb-line wherever the project would be completely confined within the existing curb-line of a major thoroughfare and restricted to re-striping or minor construction of traffic control hardscape (i.e., median separation curbing, left turn curbing and cut-outs, etc.). The APE has been expanded beyond the existing curb-line to include parcels adjacent to the proposed work at all proposed BRT stations, even those completely within the existing curb-lines, because their construction would affect the over-all streetscape in each location, and may have the potential to obstruct the view of historic resources at their locations. In downtown locations of Berkeley or Oakland the APE was set to take in parcels on both sides of the street at BRT station locations to account for the streetscape. In mixed residential/commercial areas (such as along Telegraph Avenue or along International Boulevard) the APE was set to take in parcels on the side of the street where the BRT station is to be located. Finally, any area in which the existing curb-line would be altered was included in this category, owing to the potential for indirect visual effects on historic resources. The architectural APE encompasses 441 buildings, groups of buildings, structures or objects, of which 339 contain resources constructed in or before 1960. These 339 resources make up the known historic-era resources, or "survey population," for this project. The inventory and evaluation efforts conducted for this project address each resource of the survey population by applying the appropriate National Register and California Register evaluation criteria. Although resources evaluated for these programs are usually 50 years old or older, this survey includes all resources within the APE that are 45 years old or older as of 2005 to account for the passage of time between the period of project review and project completion. The remaining 102 properties contained only buildings, structures or objects that were constructed in or after 1961 and were not subject to evaluation. The APE also included 51 properties that were vacant at the time of the survey. These non-historic and vacant parcels required no further study.

A Historic Property Survey Report (HPSR) that identifies and summarizes eligible and cultural resources within the area was submitted to the SHPO on December 12, 2005. Although the APE contains properties that are eligible for the National Register, these properties would not be affected by the project. The SHPO concurred with this determination on March 15, 2006. A copy of the SHPO's letter with these findings is provided in Appendix D, Agency Correspondence.

4.7.3.2 ENVIRONMENTAL CONSEQUENCES

None of the Build Alternatives under the East Bay BRT Project propose the physical destruction or alteration of any historic property; thus, there are no direct effects on any of the historic properties within the proposed project. There are no cumulative impacts (i.e. no known past, present, or future

projects that, together with this undertaking, would affect historic properties within the APE). Under indirect effects, the proposed project would not result in auditory, vibration, or neglect of historic properties. There would be indirect effects in that platforms, medians, landscaping, and traffic signals would be visible from historic properties and, therefore, would change the setting at each location. As these historic properties are located in a dense, urban setting, these indirect effects would not substantially alter the features of the properties eligible for listing in the NRHP and/or CRHR, and there would be no adverse effect under this criterion.

4.7.3.3 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Because the proposed project would have no adverse impact on historic architectural resources, no mitigation is necessary.

4.8 Hydrology and Floodplain

This section summarizes the regulatory setting; affected environment; environmental consequences; and measures to avoid, mitigate, or compensate for long-term, permanent impacts to hydrologic resources and floodplains as a result of the proposed project. Construction-phase impacts and avoidance measures are presented in Section 4.16.7. Documents reviewed in support of this study include the *East Bay Bus Rapid Transit Project for the Alameda Contra Costa Transit District Water Quality, Hydrology, and Floodplain Technical Memorandum* (Parsons, 2005).

4.8.1 Regulatory Setting

Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless there is no other practicable alternative. The Federal Highway Administration requirements for compliance are outlined in 23 CFR 650, Subpart A.

4.8.2 Affected Environment

Hydrologic studies were done for the various drainages within the project area. The results are summarized below.

4.8.2.1 STRAWBERRY, DERBY AND TEMESCAL CREEKS

Strawberry, Derby and Temescal Creeks are located in the north project area. In each case, construction should minimally impact these drainages. Since the area has been fully developed, little to no change to the impervious area is anticipated and no construction is anticipated within the water courses in this area.

4.8.2.2 MERRITT CHANNEL

The Merritt Channel is a tidal channel that conducts flow from Lake Merritt directly to San Francisco Bay. It is considered a flood channel by the Federal Emergency Management Agency (FEMA) and is listed as Floodplain Zone A1 in the Flood Insurance Rate Map (FIRM) panel 065048-0015B (1992). No adverse impacts or encroachments to the floodplain are anticipated as a result of the proposed project.

4.8.2.3 14TH AVENUE, SAUSAL, PERALTA, ARROYO VIEJO AND ELMHURST CREEKS

The 14th Avenue, Sausal, Peralta, Arroyo Viejo and Elmhurst creeks are located in the central portion of the project area within the city of Oakland. Since the area has been fully developed, little to no change to the impervious area is anticipated due to this project in this vicinity, and no construction is anticipated within the water courses.

4.8.2.4 SAN LEANDRO CREEK AND ESTUDILLO CANAL

The San Leandro Creek and Estudillo Canal are located in the southern portion of the project area within the City of San Leandro. Since the project in this area would primarily utilize the median for additional traveled ways, no widening of the structure over San Leandro Creek is anticipated. Therefore, no impact to flood flows in this channel is anticipated. The Estudillo Canal, which routes storm drain and surface runoff westerly toward the bay, is located at the southernmost portion of corridor for Alternative 1 and Alternative 3, which would extend BRT service to BayFair BART. Alternative 2 and Alternative 4 terminate north of the canal area. Alternatives 1 and 3 would be utilizing a previously paved area adjacent to the canal and would have little to no impact on the canal itself or the floodplain since little to no grading and no increase in impervious area are anticipated.

4.8.3 Environmental Consequences

No significant encroachments or impacts to the floodplain are anticipated as a result of the proposed project; therefore, no mitigation measures are proposed.

4.9 Water Quality and Storm Water Runoff

This section summarizes the regulatory setting; affected environment; impacts; and measures to avoid, mitigate, or compensate for impacts to water quality as a result of the proposed project. Documents reviewed in support of this study include the *East Bay Bus Rapid Transit Project for the Alameda Contra Costa Transit District Water Quality, Hydrology, and Floodplain Technical Memorandum* (Parsons, 2005).

4.9.1 Regulatory Setting

The primary federal law regulating water quality is the Clean Water Act. Section 401 of the Act requires a water quality certification from the State or Regional Water Resources Control Board when a project: 1) requires a federal license or permit, and 2) would result in a discharge to waters of the United States. Section 402 of the Clean Water Act establishes the National Pollutant Discharge Elimination System (NPDES) permit system for the discharge of any pollutant (except dredge or fill material) into waters of the United States. To ensure compliance with Section 402, the State Water Resources Control Board has developed an NPDES Statewide Storm Water Permit to regulation storm water and non-storm water discharges both during and after construction.

4.9.2 Affected Environment

4.9.2.1 HYDROLOGIC SETTING

The north section of the project, within the cities of Berkeley and Oakland, crosses various storm drain systems that convey flows from three water bodies: Strawberry Creek, Derby Creek, and Temescal Creek. The central section of the project, within the city of Oakland, crosses the Merritt Channel, 14th Avenue Creek Culvert, Sausal Creek Culvert, Peralta Creek Culvert, Seminary Avenue Drain, Arroyo Viejo Creek, and Elmhurst Creek Culvert. The south portion of the project, within the city of San Leandro, crosses San Leandro Creek and terminates immediately north of the Estudillo Canal. More information on these watercourses appears in Section 4.8, Hydrology and Floodplain.

Most of the water courses have been covered to well outside the project construction limits, with the exception of San Leandro Creek, the Lake Merritt Channel, Arroyo Viejo Creek, and the Estudillo Canal. None of these four water courses is anticipated to be affected by project construction. Therefore, the project should not require a Section 401 Water Quality Certification, a Section 404 Permit (required for any placement of fill within the federal waters), or 1601 Streambed Alteration Agreement (required if the project includes any alterations within the streambeds).

4.9.2.2 REGIONAL WATER QUALITY

The project corridor is part of the *1995 Water Quality Control Plan for the San Francisco Bay Basin* set forth by the San Francisco Bay Regional Water Quality Control Board (RWQCB). The north segment of the project corridor falls within the Central Basin Hydrologic Planning Area while the central and south segments of the project corridor fall within the South Bay Basin Hydrologic Planning Area. The only inland surface water crossing the project alignment that maintains any beneficial use is the Lower San Leandro Creek, used for freshwater replenishment, fish spawning and migration, recreation, warm freshwater habitat and wildlife habitat.

The East Bay Plain Groundwater Basin is a large groundwater regime found under the entire project area, in both the Central and South Bay Basins. Groundwater of the East Bay Plain Basin is used for municipal, agricultural, and industrial service. Because the groundwater basin is so expansive, a special plan was developed that divided the groundwater basin into seven subareas, three of which are based on the overlying cities of Berkeley, Oakland, and San Leandro.[3]

In accordance with the 2002 Clean Water Act, Section 303(d) List of Water Quality Limited Segments (impaired water bodies), the only water body within the project area that is considered impaired is the Lower San Leandro Creek, where diazinon is listed as the only pollutant of concern. To date, there are no special requirements or concerns raised by the San Francisco Bay RWQCB regarding this project.

[3] San Francisco Bay Regional Water Quality Control Board Groundwater Committee, *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report, Final Report,* June 1999.

4.9.3 Environmental Consequences

4.9.3.1 WATER QUALITY IMPACTS

The proposed project traverses areas that are entirely urbanized. Within the project limits, existing pavement drainage flows to catch basins that convey flow to an underground storm drain system located within the existing arterials. Because the proposed project would include only median paving with little to no widening of the pavement along the shoulders, the increase in impervious service is extremely minor. Moreover, although there would be some paving of landscaped medians, there also would be an equal or greater amount of landscaping added. Areas adjacent to the BRT platforms and new medians adjacent to the BRT lanes would be landscaped as part of the project. Therefore, there would be no net increase in impervious surface.

Potential pollutants found on city streets that could enter the storm drain systems that ultimately discharge into the San Francisco Bay include heavy metals, organic compounds (including petroleum hydrocarbons), sediments, trash, debris, oil, and grease. Concentrations of such pollutants are generally highest during the "first flush" of an initial rain storm, after which concentration levels decrease rapidly.

4.9.4 Avoidance, Minimization, and/or Mitigation Measures

Best Management Practices (BMPs) would be designed and implemented to reduce the discharge of pollutants from the storm drain system to the maximum extent practicable. Due to site constraints within the narrow project corridor, the drainage system must balance pollutant removal with economic factors related to maintenance, right-of-way, and construction costs. Landscape areas provided by the project would be designed to minimize and reduce total run-off. Consideration would be given to drought-tolerant or native plants to minimize water use.

4.10 Geology/Soils/Seismic/Topography

This section describes the geologic resources along the study area and describes the anticipated effects that could result from the East Bay BRT Project. Geologic resources include geology, topography, subsurface soil conditions, groundwater, and seismicity. Geologic resources are discussed in more detail in the *Geologic Assessment Technical Report* (September, 2005).

4.10.1 Geologic Setting

4.10.1.1 GEOLOGY AND SOILS

The East Bay BRT Project lies entirely on the Bay Plain, which extends from the eastern margin of San Francisco Bay to the base of the Oakland-Berkeley Hills. This plain, along with the greater San Francisco Bay Area, constitutes the portion of coastal California that is known as the Coast Range Geomorphic Province. This province forms a nearly continuous barrier between the Pacific Ocean to the west and the San Joaquin Valley to the east.

Natural landforms within the Bay Plain have resulted from the interaction of erosion of a lithologically complex bedrock terrain along the eastern Bay margin and the adjacent hills, and

deposition of alluvial and marine sediments on the low-lying ground between the hills and the Bay, combined with changing sea levels and tectonics related to ongoing fault movements associated with the San Andreas Fault system. The natural landforms present along the project corridor generally consist of low-lying undulating topography, which generally slopes gently toward the south and west, with local variations in slope caused by the numerous streams draining the hills to the east.

The topography along the project corridor is generally gently to moderately sloping toward the Bay, with elevations ranging from a high of 268 feet in Berkeley to about 8 feet near Jack London Square in Oakland. The project corridor generally lies in an oblique angle to the direction of local stream drainages, and passes transversely across the slopes of the surrounding terrain.

These landforms have been modified along the Bay Plain by the grading and placement of fill materials to varying extent along the entire length of the project corridor during urban development and to a larger extent south of Lake Merritt and along the Bay margin to reclaim usable land from the Bay. The project alignment follows existing paved streets and parking areas, which are predominantly underlain by varying thicknesses of artificial fill overlaying native materials.

The project area is underlain at depth by mélange of late Mesozoic era bedrock of the Franciscan Complex. Beneath the Bay Plain on the eastern margin of San Francisco Bay, the Franciscan bedrock is overlain directly by an unconsolidated sedimentary sequence, which in places exceeds 400 feet in thickness.

The *Geologic Assessment* indicates that encountered groundwater was restricted to coarse-grained layers within finer grained materials within the Temescal and San Antonio Formations. The groundwater in these units is described as shallow, confined or partially confined, and exhibiting slightly elevated piezometric conditions. Groundwater levels near the project area at the time of the geologic assessment ranged from 4 to 30 feet, with an average depth at about 8 to 11 feet.[4] None of the geologic formations at the surface along the project corridor are considered aquifers, primarily due to the poor quality of the water found in these deposits.

4.10.1.2 SEISMICITY

The project corridor is located in a seismically active region which has been subjected to a history of strong earthquakes. No active faults are known to cross the project corridor. The Hayward Fault lies between 0.64 and 7.0 km northeast of the project corridor, closest at both the northern and southern ends, and dominates the seismic hazard due to its proximity. The other major active faults that could cause significant shaking of the project area are the San Andreas, Concord, Calaveras, Rodgers Creek, and San Gregorio Faults.

The maximum moment magnitude earthquake (Mmax) is defined as the largest earthquake that a given fault is calculated to be capable of generating. The Mmax on the Hayward Fault would be a magnitude 7.1 event and the Mmax on the San Andreas Fault would be a magnitude 7.9 event. The controlling Mmax that could affect the project area would be a magnitude 7.1 earthquake along the

[4] Groundwater levels reported are representative of conditions within the survey area at the time of drilling and are expected to vary both seasonally and annually based on regional rainfall, local conditions, and localized pumping.

Hayward Fault at approximately 0.64 km from the project corridor. The duration of strong shaking from this earthquake would be approximately 15 to 25 seconds, with a predominant period of approximately 0.25 to 0.35 seconds at the ground surface.

Correlations of the distance from a causative fault and mean values of the peak bedrock accelerations and the effects of local soil conditions on peak ground accelerations have been developed by Seed and Idriss (1982), Joyner and Boore (1988), Idriss (1990), and Campbell (1997). These correlations indicate that, if a Mmax 7.1 event were to occur on the Hayward Fault, the mean peak ground surface acceleration within the project area would range from 0.50 to 0.60 g.

Table 4.10-1 lists the major active faults that may affect the project area in order of proximity to the project corridor.

Table 4.10-1: Active Fault Seismicity

Fault	Distance to Project Area (km)	Maximum Moment Magnitude Earthquake (Mmax)
Hayward	0.64-7.0	7.1
Calaveras	15-27	6.8
Concord	17-29	6.9
San Andreas	26-35	7.9
Rodgers Creek	29-51	7.0
San Gregorio	31-40	7.3
Greenville	35-46	6.9

Source: Geologic Assessment, AGS Inc., September 2005

4.10.2 Environmental Consequences

Given that there is no evidence that the project area is located within identified active faults, damage due to surface fault rupture is considered unlikely. The project area, however, is expected to experience very strong to violent ground shaking during large earthquakes occurring on any of the major active faults.

The project corridor south of Lake Merritt and the portion of International Boulevard at 13th Avenue, which are underlain by artificial fill, are considered to have high susceptibility to liquefaction. All other portions are considered to have low to moderate susceptibility to liquefaction due to the density of the granular materials or the presence of stiff cohesive soils.

4.10.3 Avoidance, Minimization, and/or Mitigation Measures

The results of the preliminary geologic assessment indicate that there are no substantial geologic hazard impacts that would not be fully addressed by design requirements, and no additional mitigation measures are proposed.

4.11 Hazardous Waste/Materials

This section summarizes potential impacts from pre-existing hazardous wastes that could expose construction workers or the general public to health risks and that may require the implementation of special soil and/or groundwater management procedures. Section 4.16.8 discusses the potential impacts of hazardous materials that may be used or stored in conjunction with construction activities.

4.11.1 Affected Environment

AGS, Inc. (AGS) conducted a *Hazardous Waste Initial Site Assessment* (ISA) for the AC Transit East Bay BRT Project. The ISA identified previous and current land uses that could contribute to the contamination of the project area. AGS requested a corridor search for the project alternatives of standard Federal, State, and local regulatory databases by Track Info Services, LLC., of Environmental FirstSearch™ Network. Environmental FirstSearch™ integrates data from governmental agency lists into one database, which is continuously updated as data are released. The Environmental FirstSearch™ was used to review the records of each environmental risk site in the project vicinity and is included in the *Draft Hazardous Waste Initial Site Assessment, AC Transit East Bay BRT DEIS/R, Alameda County, California* (AGS, Inc., 2005) and are summarized below.

To determine which sites might pose an environmental risk to the project, AGS conducted a file review of sites with street addresses on each Build Alternative and on cross streets in close proximity to the alternatives. In addition, AGS reviewed sites with soil and groundwater contamination located ¼ mile or less and upgradient from the project alternatives. Since regional groundwater in the area of the project generally flows from the upland areas of the Oakland-Berkeley hills in the east towards the San Francisco Bay to the west, it was assumed that sites to the west of the corridor would not pose any environmental risk to the project and, therefore, they were not reviewed.

4.11.2 Environmental Consequences

The ISA identified a total of 80 potential environmental risk sites. Of these sites, 37 are on the project alignment for Alternatives 2 and 4, which terminate at the San Leandro BART station, and 44 are on the alignment for Alternatives 1 and 3, which terminate at the BayFair BART station. Thirteen sites were in close proximity to and possibly on Alternatives 2 and 4, and 14 sites near or on Alternatives 1 and 3. Twenty-two sites were ¼-mile or less upgradient from the Alternatives 1 through 4, as described below. These sites are described in Tables 4.11-1 through 4.11-3.

All of the identified sites are listed on the Leaking Underground Storage Tank (LUST) database provided by the California Environmental Protection Agency (CAL EPA). Two sites also are listed on State Sites Database (STATE), developed by the CAL EPA Department of Toxic Substances Control (DTSC), to provide information on sites that are contaminated with hazardous substances. Of these two sites, one additionally is listed on the EPA's Resource Conservation and Recovery Agency Corrective Action Order (RCRA COR) database, which contains information about RCRA facilities that have conducted or that are currently conducting a corrective action. A Corrective Action Order is issued pursuant to RCRA Section 3008(h) when there has been a release of hazardous waste or constituents into the environment from an RCRA facility.

4.11.2.1 ENVIRONMENTAL RISK SITES ON THE PROJECT ALIGNMENT

Of the 80 potential environmental risk sites, 37 are on the alignment for all four Build Alternatives; 36 of these sites are LUST sites, and one is listed as a STATE, RCRA COR, and LUST site. Seven sites in San Leandro are on Alternatives 1 and 3 only; these sites are all LUST sites. A summary of the file review identifying the name and location of each site, the type of hazardous material found, and action to date is presented in Table 4.11-1.

Table 4.11-1: Environmental Risk Sites on the AC Transit East Bay BRT Project Alternatives (44 sites total)

Identified Property	Property Address	Hazardous Material
Shell	2200 Durant Avenue, Berkeley	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1983. The substance leaked was diesel fuel affecting soil and groundwater. The abatement method was to remove free-floating product from the water table. Post remedial action monitoring is underway.
Tosco Facility #0852	3001 Telegraph Avenue, Berkeley	(LUST, updated 5/26/04). A leak was discovered during inventory control in 1994. The substance leaked was gasoline affecting soil and groundwater. No action has yet been taken.
Chevron Service Station	2996 Telegraph Avenue, Berkeley	(LUST, updated 5/26/04). A leak was discovered in 1965. The substance leaked was gasoline affecting soil and groundwater. Remedial action is underway.
Arco	6407 Telegraph Avenue, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1988. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to remove free-floating product from the water table, and pump and treat groundwater. A pollution characterization is underway.
Thrifty Oil	6125 Telegraph Avenue, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1986. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to remove free-floating product from the water table. A remediation plan is underway.
Telegraph Business Properties	5427 Telegraph Avenue, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1992. The substance leaked was waste oil affecting soil. The abatement method was to excavate and dispose of the contaminated soil. A preliminary assessment is underway.
Autopro	5200 Telegraph Avenue, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1991. The substance leaked was gasoline affecting soil. A preliminary assessment is underway and no action has yet been taken.
Chevron	5101 Telegraph Avenue, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1990. The substance leaked was gasoline affecting soil and groundwater. A preliminary assessment is underway and no action has yet been taken.
Kelley Auto Parts	4400 Telegraph Avenue, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1988. The substance leaked was Stoddard solvent affecting soil and groundwater. Post remedial action monitoring is underway.
Simas Brothers	4013 Telegraph Avenue, Oakland	(LUST, updated 7/11/02). A leak was discovered during tank closure in 1986. The substance leaked was gasoline. The leak is being confirmed and no action has yet been taken.

Table 4.11-1: Environmental Risk Sites on the AC Transit East Bay BRT Project Alternatives (44 sites total)

Identified Property	Property Address	Hazardous Material
Shell	2800 Telegraph Avenue, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1988. The substance leaked was gasoline. The abatement method was to excavate and dispose of the contaminated soil. A pollution characterization is underway.
Sears Auto Center #1058	2633 Telegraph Avenue, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1990. The substance leaked was waste oil. The abatement method was to excavate and dispose of the contaminated soil. A preliminary assessment is underway.
Dave's Station	2250 Telegraph Avenue, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1990. The substance leaked was gasoline. The abatement method was to excavate and treat or dispose of the contaminated soil. A pollution characterization is underway.
Exxon	2225 Telegraph Avenue, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1989. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to remove contaminated soil and free-floating product from the water table, pump and treat groundwater, and vent soil. Remedial action is underway.
Chevron 9-3600	2200 Telegraph Avenue, Oakland	(LUST, updated 5/26/04). A leak was discovered in 2000. The substance leaked was gasoline. A preliminary assessment is underway.
East Bay Packing Company	208 Jackson Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1990. The substance leaked was diesel fuel. The abatement method was to excavate and dispose of the contaminated soil. A preliminary assessment is underway.
Miller Packing Company II	206 2nd Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1989. The substance leaked was diesel fuel affecting soil. A preliminary assessment is underway.
Miller Packing	201 2nd Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1989. The substance leaked was gasoline. A preliminary assessment is underway.
Cooper Tire Shop Former	1220 East 12th Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1996. The substance leaked was gasoline affecting soil. The leak is being confirmed.
JR Used Auto Parts	823 East 12th Street, Oakland	(LUST, updated 7/11/92). A leak was discovered during tank closure in 1988. The substance leaked was mineral spirits affecting soil. The leak is being confirmed and no action has yet been taken.
Harley Davidson Motorcycle	744 East 12th Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during inventory control in 1996. The substance leaked was gasoline. The leak is being confirmed.
Mobil	14994 International Boulevard, Oakland	This site is listed on two LUST databases, both updated on 5/26/04. Leaks were discovered during tank closures in 1986 and 1987. The substance leaked was gasoline affecting soil and groundwater. Post remedial action monitoring is underway.
Quan's Automotive	10100 International Boulevard, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1994. The substance leaked was gasoline. The leak is being confirmed.
Arco #02185	9800 International Boulevard, Oakland	(LUST, updated 5/26/04). A leak was discovered in the piping during inventory control in 1989. The substance leaked was gasoline affecting soil and groundwater. A preliminary assessment is underway.

Table 4.11-1: Environmental Risk Sites on the AC Transit East Bay BRT Project Alternatives (44 sites total)

Identified Property	Property Address	Hazardous Material
Ms. Eddie M. Jones Property	8332 International Boulevard, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1991. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil. A preliminary assessment is underway.
General Electric Company	5441 International Boulevard, Oakland	(STATE, updated 11/9/04). The STATE database indicates that the General Electric Oakland plant manufactured electrical transformers from 1927 to 1975. Soil and groundwater are contaminated with volatile organic compounds, transit oil, and polychlorinated biphenyls. Abatement has been ongoing at the site since 1981. Contaminants have been detected in soil on private property off-site, as well as in the groundwater to depths of 351 feet. GE is conducting investigations at and downgradient from the site to investigate and characterize the nature and extent of contamination of soil and groundwater. GE prepared and submitted a draft Risk Assessment in 2002, which is under review by the California Department of Toxic Substances and Control. (RCRC COR, updated 9/13/04). The RCRA COR database lists six enforcement actions and 14 violations for the site. (LUST, updated 5/26/04). The LUST database indicates that a leak was discovered during tank closure in 1987. The substance leaked was miscellaneous motor vehicle fuels. The leak is being confirmed and no action has yet been taken.
Grand Auto	4240 International Boulevard, Oakland	(LUST, updated 7/11/02). A leak was discovered during tank closure in 1992. The substance leaked was mineral spirits. A preliminary assessment work plan is submitted and no action has yet been taken.
Continental Volvo	4030 International Boulevard, Oakland	(LUST, updated 7/11/02). A leak was discovered during tank closure in 1987. The substance leaked was waste oil affecting soil. The leak is being confirmed and no action has yet been taken.
Dorothy Day Trust	4028 International Boulevard, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1996. The substance leaked was waste oil. A preliminary assessment is underway.
Tony's Express Auto Service	3609 International Boulevard, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1993. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil. A preliminary assessment is underway.
Taxi Taxi Inc	2345 International Boulevard, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1988. The substance leaked was gasoline affecting soil. The abatement method was to excavate and dispose of the contaminated soil. A preliminary assessment is underway.
Shell	510 International Boulevard, Oakland	(LUST, updated 7/11/02). A leak was discovered during tank closure in 1988. The substance leaked was gasoline. The leak is being confirmed and no action has yet been taken.
Unocal *	15803 East 14th Street, San Leandro	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1989. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil. A pollution characterization is underway.
Unocal *	15008 East 14th Street, San Leandro	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1991. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and

Table 4.11-1: Environmental Risk Sites on the AC Transit East Bay BRT Project Alternatives (44 sites total)

Identified Property	Property Address	Hazardous Material
		dispose of the contaminated soil and to use enhance biodegration. A pollution characterization is underway.
Quality Tune Up *	14901 East 14th Street, San Leandro	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1998. The substance leaked was gasoline affecting soil and groundwater. A pollution characterization is underway.
Nella Oil Site *	14880 East 14th Street, San Leandro	(LUST, updated 5/26/04). A leak was discovered in 2001. The substance leaked was gasoline. A preliminary assessment is underway.
Maskell Oil Company *	14500 East 14th Street, San Leandro	This site is listed on two LUST databases, both updated 5/26/04. A leak was discovered during tank closure in 1985. The substance leaked was solvents. Another leak was discovered during tank closure in 1988. The substance leaked was diesel fuel. The leaks are being confirmed and a pollution characterization is underway. No action has yet been taken.
Simas Bros Service Station *	14180 East 14th Street, San Leandro	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1986. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil. A pollution characterization is underway.
Chevron *	1990 East 14th Street, San Leandro	(LUST, updated 5/26/04). A leak was discovered during subsurface monitoring in 1997. The substance leaked was gasoline affecting soil and groundwater. A pollution characterization is underway.
Roy's Auto Repair	806 East 14th Street, San Leandro	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1990. The substance leaked was gasoline. The leak is being confirmed and no action has yet been taken.
Minit Auto Care	497 East 14th Street, San Leandro	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1990. The substance leaked was waste oil affecting soil. The leak is being confirmed and no action has yet been taken.
German Autocraft	301 East 14th Street, San Leandro	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1990. The substance leaked was gasoline. A pollution characterization is underway and no action has yet been taken.
Former Service Station	111 East 14th Street, San Leandro	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1998. The substance leaked was gasoline affecting soil and groundwater. A preliminary assessment work plan is being submitted.
Port of Oakland Amtrak Site	Alice Street and 2nd Street, Oakland	(LUST, updated 6/31/01). A leak was discovered during tank closure in 1983. The substance leaked was miscellaneous motor vehicle fuels affecting soil. A preliminary assessment work plan is submitted and no action has yet been taken.

Notes:
* Indicates sites that are located on Alternatives 1 and 3 only.
Source: *Hazardous Waste Initial Site Assessment*, AGS, Inc., September 2005

4.11.2.2 ENVIRONMENTAL RISK SITES IN CLOSE PROXIMITY TO THE PROJECT ALIGNMENT

Of the 80 potential environment risk sites, 13 are in close proximity to and possibly on Alternatives 1 through 4, including 12 LUST sites and one site that is listed as a STATE and LUST site. One LUST site is located in close proximity to and possibly on Alternatives 1 and 3 only. A summary of the file review identifying the name and location of each site, the type of hazardous material found, and action to date is presented in Table 4.11-2.

Table 4.11-2: Environmental Risk Sites in Close Proximity and Possibly on the AC Transit East Bay BRT Project Alternatives (14 sites total)

Identified Property	Property Address	Hazardous Material
UC Berkeley Site Garage	1952 Oxford Street, Berkeley	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1988. The substance leaked was diesel fuel. A pollution characterization is underway and no action has yet been taken.
Chevron	2199 Berkeley Way, Berkeley	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1989. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to remove free-floating product from the water table and vent the soil. Post remedial action monitoring is underway.
Ronn Simpson	489 43rd Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1995. The substance leaked was gasoline. A preliminary assessment is underway.
Shell	500 40th Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1982. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to remove free-floating product from the water table. A remediation plan is underway.
August Manufacturing	1466 36th Avenue, Oakland	(LUST, updated 7/11/04). A leak was discovered during tank closure in 1990. The substance leaked was gasoline. A preliminary assessment is underway and no action has yet been taken.
Grant School	417 29th Street, Oakland	(LUST, updated 7/11/02). A leak was discovered during tank closure in 1992. The substance leaked was diesel fuel affecting soil. The leak is being confirmed and no action has yet been taken.
Benner Automotive	488 25th Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 2003. The substance leaked was gasoline. A pollution characterization is underway.
Catering by Andre	434 25th Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1994. The substance leaked was diesel fuel affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil. A preliminary assessment is underway.
United Beverage	105 Jackson Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1993. The substance

Table 4.11-2: Environmental Risk Sites in Close Proximity and Possibly on the AC Transit East Bay BRT Project Alternatives (14 sites total)

Identified Property	Property Address	Hazardous Material
		leaked was gasoline. A preliminary assessment is underway and no action has yet been taken.
Building H 209	271 8th Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1996. The substance leaked was diesel fuel. A preliminary assessment work plan is submitted.
Exxon	250 8th Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1992. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil and to use enhanced biodegradation. Remedial action is underway.
Shell	105 5th Street, Oakland	(LUST, updated 5/26/04). A leak was discovered in the piping in 1996. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil. A preliminary assessment work plan is submitted.
Lakeside Non-Ferrous Metals	412 Madison Street, Oakland	(STATE 4/30/03). The STATE database indicates that elevated levels of heavy metals were detected in soil samples. A preliminary endangerment assessment is required. (LUST, updated 5/26/04). A leak was discovered during tank closure in 1993. The substance leaked was gasoline. A preliminary assessment is underway.
Richards Automotive*	1495 Hays Street, San Leandro	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1999. The substance leaked was gasoline. A preliminary assessment is underway.

Notes:
* Indicates sites that are located on Alternatives 1 and 3 only.
Source: *Hazardous Waste Initial Site Assessment*, AGS, Inc., September 2005

4.11.2.3 ENVIRONMENTAL RISK SITES ¼-MILE OR LESS UPGRADIENT FROM THE PROJECT ALTERNATIVES

Of the 80 potential environment risk sites, 22 are located within a ¼-mile or less upgradient from the BRT project alignment, all of which are LUST sites. A summary of the file review identifying the name and location of each site, the type of hazardous material found, and action to date is presented in Table 4.11-3.

Table 4.11-3: Environmental Risk Sites ¼-Mile or Less Upgradient from the AC Transit East Bay BRT Project Alternatives (22 sites total)

Identified Property	Property Address	Hazardous Material
Shell	461 8th Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1987. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to remove free-floating produced from the water table. A pollution characterization is underway.
Kaiser Regional Parking	1901 Franklin Street, Oakland	(LUST, updated 7/11/02). A leak was discovered during tank closure in 1985. The substance leaked was gasoline affecting soil. The leak is being confirmed and no action has yet been taken.
Pacific Renaissance Plaza	1000 Franklin Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1988. The substance leaked was waste oil affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil, pump and treat groundwater, and use enhanced biodegradation. Remedial action is underway.
Pacific Bell	1519 Franklin Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1994. The substance leaked was diesel fuel. The abatement method was to excavate and dispose of the contaminated soil and to pump and treat groundwater. Post remedial action monitoring is underway.
Bill Louie's Auto Service	800 Franklin Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1989. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil. A preliminary assessment is underway.
Bacharach and Borsuk Property	1432 Franklin Street, Oakland	(LUST, updated 7/11/02). A leak was discovered during tank closure in 1994. The substance leaked was miscellaneous motor vehicle fuels affecting soil and groundwater. A preliminary assessment work plan is submitted.
Powlen Property	2939 Summit Street, Oakland	(LUST, updated 7/11/02). A leak was discovered during tank closure in 1991. The substance leaked was diesel fuel affecting soil. The leak is being confirmed and no action has been taken.
Unocal	800 Harrison Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1990. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil. A pollution characterization is underway.
Oakland Auto Parts	706 Harrison Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1991. The substance leaked was gasoline affecting soil and groundwater. A preliminary assessment is underway.
Shell	726 Harrison Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1995. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil. A pollution characterization is underway.
Chrysler Dealership	2417 Broadway, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1994. The substance leaked was gasoline. The leak is being confirmed.
Arco	731 West MacArthur Boulevard, Oakland	(LUST, updated 5/26/04). A leak was discovered due to overfilling in 1993. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to

Table 4.11-3: Environmental Risk Sites ¼-Mile or Less Upgradient from the AC Transit East Bay BRT Project Alternatives (22 sites total)

Identified Property	Property Address	Hazardous Material
		remove free-floating product from the water table, pump and treat groundwater, and use enhanced biodegradation. Remedial action is underway.
Unocal	411 West MacArthur Boulevard, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1989. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and dispose of contaminated soil. A preliminary assessment is underway.
YWCA	1515 Webster Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1994. The substance leaked was diesel fuel affecting soil. A preliminary assessment is underway.
Bacharach and Borsuk Property	1432 Harrison Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1990. The substance leaked was gasoline affecting soil and groundwater. A pollution characterization is underway and no action has yet been taken.
Chevron	301 14th Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1990. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to remove free-floating product from the water table, vent the soil, and use vacuum extraction. A pollution characterization is underway.
Mobil	160 14th Street, Oakland	(LUST, updated 7/11/02). A leak was discovered during tank closure in 1986. The substance leaked was gasoline. The leak is being confirmed and no action has been taken.
AlcoPark Garage	165 13th Street, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1988. The substance leaked was gasoline affecting soil and groundwater. A preliminary assessment is underway and no action has yet been taken.
Shell	4411 Foothill Boulevard, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank testing in 1991. The substance leaked was waste oil affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil. A remediation plan is underway.
BP	4280 Foothill Boulevard, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1989. The substance leaked was gasoline affecting soil and groundwater. A remediation plan is underway and no action has yet been taken.
Chevron	4265 Foothill Boulevard, Oakland	(LUST, updated 5/26/04). A leak was discovered during tank closure in 1987. The substance leaked was gasoline affecting soil and groundwater. The abatement method was to excavate and dispose of the contaminated soil. A remediation plan is underway.
BP	4250 Foothill Boulevard, Oakland	(LUST, updated 7/11/02). A leak was discovered during tank closure in 1992. The substance leaked was miscellaneous motor vehicle fuels. The leak is being confirmed and no action has yet been taken.

Source: *Hazardous Waste Initial Site Assessment*, AGS, Inc., September 2005

4.11.3 Avoidance, Minimization and/or Mitigation Measures

The following general avoidance and prevention measures are proposed to reduce or eliminate hazardous wastes-related impacts:

- Field surveys of identified environmental risk sites would be conducted prior to construction to verify the physical locations of the sites with respect to the preferred Build Alternative and observe the current conditions of the sites.
- A regulatory file review would be conducted for each of the identified environmental risk sites prior to construction to determine the current status of the sites and, if possible, the extent of the contamination.
- If construction of the project warrants, a subsurface exploration would be conducted of the preferred Build Alternative next to or downgradient from any environmental risk site.

If the pre-construction reviews of environmental risk sites identifies contaminated areas that would be disturbed by construction activities, a remediation plan would be developed as described in Section 4.16.8.2, Hazardous Waste (Construction: Avoidance, Minimization, and/or Mitigation Measures).

4.12 Air Quality

4.12.1 Regulatory Setting

The federal Clean Air Act (CAA) governs air quality in the United States. In addition to being subject to the requirements of the CAA, air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA). At the federal level, the United States Environmental Protection Agency (USEPA) administers the CAA. In California, the California Air Resources Board (CARB) administers the CCAA at the state level and the Air Quality Management Districts administer the CCAA at the regional and local levels.

USEPA is responsible for enforcing the CAA. USEPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS), which are required under the 1977 CAA and subsequent amendments. USEPA regulates emission sources that are under the exclusive authority of the federal government and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by CARB.

CARB, which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for meeting the state requirements of the federal CAA, administering the CCAA, and establishing the California Ambient Air Quality Standards (CAAQS). The CCAA, as amended in 1992, requires all air districts in the state to endeavor to achieve and maintain the CAAQS, which are generally more stringent than the corresponding federal standards. CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level.

The Bay Area Air Quality Management District (BAAQMD) is primarily responsible for assuring that the national and state ambient air quality standards are attained in the San Francisco Bay Area. The BAAQMD has jurisdiction over an approximately 5,600 square mile area, commonly referred to as the Bay Area Air Basin (BAAB). The District includes the nine San Francisco Bay Area counties: Alameda County, Contra Costa County, Marin County, San Francisco County, San Mateo County, Santa Clara County, Napa County, southwestern Solano County and southern Sonoma County.

4.12.1.1 NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS

Under the CAA and CCAA, areas are designated as either attainment or non-attainment for each criteria pollutant based on whether the NAAQS or CAAQS have been achieved. Areas are designated as non-attainment for a pollutant if air quality data show that a state or federal standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a state standard and are not used as a basis for designating areas as non-attainment. Table 4.12-1 summarizes the state and federal standards and lists the state and federal attainment status for Alameda County.

Table 4.12-1: State and National Ambient Air Quality Standards

Pollutant	Averaging Period	California		Federal	
		Standards	Attainment Status	Standards	Attainment Status
Ozone (O_3)	1 hour	0.09 ppm (180 µg/m^3)	Non-attainment	--	--
	8 hour	0.07 (137 µg/m^3)	Unclassified	0.08 ppm (157 µg/m^3)	Non-attainment
Respirable Particulate Matter (PM_{10})	24 hour	50 µg/m^3	Non-attainment	150 µg/m^3	Attainment
	Annual Arithmetic Mean	20 µg/m^3	Non-attainment	--	--
Fine Particulate Matter ($PM_{2.5}$)[1]	24 hour	--	--	35 µg/m^3	Unclassified
	Annual Arithmetic Mean	12 µg/m^3	Non-attainment	15 µg/m^3	Attainment
Carbon Monoxide (CO)	8 hour	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment
	1 hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	--	--	0.053 ppm (100 µg/m^3)	Attainment
	1 hour	0.18 ppm (470 µg/m^3)	Attainment	--	--
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	--	--	0.03 ppm (80 µg/m^3)	Attainment
	24 hour	0.04 ppm (105 µg/m^3)	Attainment	0.14 ppm (365 µg/m^3)	Attainment
	1 hour	0.25 ppm (655 µg/m^3)	Attainment	--	--

Source: CARB and United States Environmental Protection Agency, February 22, 2007.

Carbon Monoxide

CO, a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue, and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. Automobile exhausts release most of the CO in urban areas. CO dissipates relatively quickly, so ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions – primarily wind speed, topography, and atmospheric stability. Under the CAA and the CCAA, the Alameda County portion of the BAAB is in attainment for CO.

Ozone

O_3, a colorless toxic gas, is the chief component of urban smog. O_3 enters the blood stream and interferes with the transfer of oxygen, depriving sensitive tissues in the heart and brain of oxygen. O_3 also damages vegetation by inhibiting growth. O_3 forms in the atmosphere through a chemical reaction between reactive organic gas (ROG) and nitrogen oxides (NO_X) under sunlight. The greatest source of smog-producing gases is the automobile. Under the CAA and the CCAA, the Alameda County portion of BAAB is in non-attainment for O_3.

Nitrogen Dioxide

NO_2, a brownish gas, irritates the lungs. It can cause breathing difficulties at high concentrations. Like O_3, NO_2 is not directly emitted, but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NOx and are major contributors to ozone formation. NO_2 also contributes to the formation of PM_{10}. Under the CAA and the CCAA, the Alameda County portion of BAAB is in attainment for NO_2.

Sulfur Dioxide

SO_2 is a product of high-sulfur fuel combustion. Main sources of SO_2 are coal and oil used in power stations, and domestic heating, and industries, such as chemical manufacturing. SO_2 is an irritant gas that attacks the throat and lungs. SO_2 can also erode iron and steel and cause plant leaves to turn yellow. In recent years, SO_2 concentrations have been reduced to levels well below the state and federal standards, but further reductions in emissions are needed to attain compliance with standards for sulfates and PM_{10}, of which SO_2 is a contributor. Under the CAA and the CCAA, the Alameda County portion of BAAB is in attainment for SO_2.

Suspended Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Respirable particulate matter (PM_{10}) refers to particulate matter less than 10 microns in diameter, about one/seventh the thickness of a human hair. Fine particulate matter ($PM_{2.5}$) refers to particulate matter that is 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair. PM_{10} and $PM_{2.5}$ pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. Major sources of PM_{10} include motor vehicles; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning, industrial sources, windblown dust from open lands;

and atmospheric chemical and photochemical reactions. $PM_{2.5}$ results from fuel combustion (from motor vehicles, power generation, industrial facilities), residential fireplaces, and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_2, NO_X, and volatile organic compounds. Under the CCAA, the Alameda County portion of the BAAB is in non-attainment for PM_{10}, and $PM_{2.5}$.

Lead

Prior to 1978, mobile emissions were the primary source of lead resulting in air concentrations. Between 1978 and 1987, the phase-out of leaded gasoline reduced the overall inventory of airborne lead by nearly 95 percent. Currently, industrial sources are the primary source of lead resulting in air concentrations. Since the East Bay BRT Project does not contain lead admission sources, emissions and concentrations related to lead are not analyzed in this report.

4.12.1.2 AIR QUALITY PLANS

The BAAQMD, in coordination with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG), is responsible for preparing air quality plans pursuant to the CAA and CCAA. Under the CAA, State Implementation Plans (SIPs) are required for areas that are designated as non-attainment for O_3, CO, NO_X, SO_X, or PM_{10}. For the BAAB, a SIP is required for O_3 since the region is currently designated as a federal non-attainment area for O_3.

The most current SIP, called the Bay Area 2001 Ozone Attainment Plan, was adopted by the MTC, ABAG, and BAAQMD in October 2001. CARB adopted this Plan in November 2001, and EPA approved the associated emissions limits in February 2002.

Whereas the SIP is prepared pursuant to the CAA (federal requirement), the Bay Area Clean Air Plan (CAP) is prepared pursuant to the CCAA (state requirement). The CAP is the region's plan for reducing ground-level ozone. The CAP identifies how the BAAB would meet the state O_3 standard by its attainment date. The Bay Area 2005 Ozone Strategy focuses on identifying and implementing control measures that would reduce O_3. It was adopted by the BAAQMD in January 2006.

4.12.1.3 AIR QUALITY CONFORMITY

Under the 1990 CAA Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to CAA requirements. A conformity determination demonstrates that total emissions projected for a plan or program are within the emissions limits established by the air quality plan or SIP, and that transportation control measures are implemented in a timely fashion. Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) jointly make conformity determinations within air quality non-attainment and maintenance areas to ensure that federal actions conform to the "purpose" of SIPs. In late 1993, USEPA promulgated final rules for determining conformity of transportation plans, programs, and projects. These final rules, contained in 40 CFR Part 93, govern the conformity assessment for the proposed project. Section 4.12.4 (Transportation Conformity Analysis) of this EIS/EIR lists the conformity criteria that would apply to this project.

4.12.1.4 AFFECTED ENVIRONMENT

Climate

The Bay Area can be classified as Mediterranean, characterized by cool, dry summers and mild, wet winters. The Eastern Pacific High, which is a strong persistent anticyclone, is the major influence on the climate in the area. Seasonal variations in the position and strength of this system are a key factor in producing weather changes in the area. During the summer, the general area lies in the semi-permanent high-pressure zone of the northeastern Pacific Ocean. The high-pressure cell prevents storms from affecting the California coast. Thus, the area experiences little precipitation during the summer months. During the winter, the high-pressure cell weakens and shifts southward. Storms occur more frequently and winds are usually moderate; however, the Pacific high-pressure cell periodically becomes dominant, bringing light winds.

Temperature in the project area and its vicinity averages approximately 57 degrees Fahrenheit annually, with an average maximum summer temperature of approximately 70 degrees Fahrenheit and an average minimum winter temperature of approximately 44 degrees Fahrenheit. Total precipitation in the project area averages approximately 21 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer. Precipitation during the winter is approximately 11.5 inches and approximately 0.25 inches during the summer.

4.12.1.5 EXISTING CONDITIONS

Air Monitoring Data

Historical data from four BAAQMD monitoring stations were used to characterize existing conditions within the vicinity of the proposed project area and to establish a baseline for estimating future conditions. Three of the monitoring stations are located in close proximity to the proposed BRT alignment:

- Oakland—Alice Street Monitoring Station
- Oakland—International Monitoring Station[5]
- San Leandro Monitoring Station

The pollutants monitored at these stations and the distance of these stations from the proposed BRT alignment are shown in Table 4.12-2. The nearest monitoring station that monitors PM_{10} is the San Pablo–Rumrill monitoring station, located approximately 7.8 miles north of the proposed BRT alignment.[6] Because the San Pablo–Rumrill station is within the same climatological subregion as the project area, it accurately characterizes existing PM_{10} conditions in the project area.

The nearest monitoring station for $PM_{2.5}$ is the San Francisco—Arkansas station, located approximately 7.5 miles west of the proposed BRT alignment. It is within the same climatological subregion as the project area and therefore accurately characterizes existing $PM_{2.5}$ conditions in the project area.

[5] The Oakland-International Monitoring Station stopped collecting data in 2003. Data from this monitoring station is still considered to be representative of the project area and, as such, was included in this analysis.
[6] The San Pablo-Rumrill Monitoring Station stopped collecting data in 2003. Data from this monitoring station is still considered to be representative of the project area and, as such, was included in this analysis.

Table 4.12-2: Pollutants Monitored at Air Monitoring Stations Near Proposed BRT Alignment

Monitoring Station	Pollutants Monitored	Address	Distance to BRT Alignment
Oakland – Alice Street Monitoring Station	O_3, CO	822 Alice Street, Oakland	0.07 miles
Oakland – International Monitoring Station	O_3, CO, NO_2, SO_X	6701 International Boulevard, Oakland	Adjacent to Proposed BRT Alignment
San Leandro Monitoring Station	O_3	1544 Foothill Boulevard, San Leandro	0.45 miles
San Pablo – Rumrill Monitoring Station	PM_{10}, CO, NO_2, SO_x [1]	1865 Rumrill Boulevard, San Pablo	7.8 miles
San Francisco-Arkansas Monitoring Station	$PM_{2.5}$ [2]	10 Arkansas Street, San Francisco	7.5 miles

Notes:
[1] The San Pablo – Rumrill Monitoring Station also monitors O_3, CO, NO_X, and SO_X. This monitoring station is used to characterize existing PM_{10} conditions since monitoring stations that are closer to the proposed BRT alignment do not monitor PM_{10}. In addition, this monitoring station was used to characterize CO, NO_2, and SO_X conditions for years 2004 and 2005 because the Oakland-International Monitoring Station stopped operating after 2003.
[2] The San Francisco – Arkansas Monitoring Station also monitors O_3, CO, NO_X, and SO_X but is used only to characterize $PM_{2.5}$.
Source: CARB, Terry A. Hayes Associates LLC.

Summaries of the data recorded at the monitoring stations during the 2001-2005 period are shown in Table 4.12-3. The number of days that violations occurred is listed for each year. The 1-hour ozone standard was exceeded at least once each year from 2002 to 2005. In addition, the San Pablo Monitoring Station recorded a PM_{10} violation in 2002. The number of days these violations occurred is not available from CARB, as indicated by the n/a listing in the column.

Table 4.12-3: 2001-2003 Criteria Pollutant Violations

Pollutant	Concentrations/Exceedance of Standards	2001	2002	2003	2004	2005
Oakland - Alice Street Monitoring Station						
Ozone (1 hour)	Maximum 1-hr concentration (ppm)	0.069	0.053	0.081	0.080	0.068
	Days > 0.12 ppm (federal 1-hr standard)	0	0	0	0	0
	Days > 0.09 ppm (state 1-hr standard)	0	0	0	0	0
Ozone (8 hour)	Maximum 8-hr concentration (ppm)	0.043	0.043	0.054	0.057	0.045
	Days > 0.08 ppm (federal 8-hr standard)	0	0	0	0	0
Carbon Monoxide	Maximum 8-hr concentration (ppm)	3.98	3.34	2.78	2.64	2.44
	Days > 9.0 ppm (federal 8-hr. standard)	0	0	0	0	0
	Days > 9.0 ppm (state 8-hr standard)	0	0	0	0	0
Oakland – International Monitoring Station						
Ozone (1 hour)	Maximum 1-hr concentration (ppm)	0.038	0.084	0.073	n/a	n/a
	Days > 0.12 ppm (federal 1-hr standard)	0	0	0	n/a	n/a
	Days > 0.09 ppm (state 1-hr standard)	0	0	0	n/a	n/a
Ozone (8 hour)	Maximum 8-hr concentration (ppm)	0.034	0.56	0.052	n/a	n/a
	Days > 0.08 ppm (federal 8-hr standard)	0	0	0	n/a	n/a

Table 4.12-3: 2001-2003 Criteria Pollutant Violations

Pollutant	Concentrations/Exceedance of Standards	2001	2002	2003	2004	2005
Carbon Monoxide	Maximum 8-hr concentration (ppm)	3.20	5.13	4.41	n/a	n/a
	Days > 9 ppm (federal 8-hr. standard)	0	0	0	n/a	n/a
	Days > 9.0 ppm (state 8-hr standard)	0	0	0	n/a	n/a
Nitrogen Dioxide	Maximum 1-hr concentration (ppm)	0.062	0.080	0.056	n/a	n/a
	Days > 0.18 ppm (state 1-hr standard)	0	0	0	n/a	n/a
Sulfur Dioxide	Maximum 24-hr concentration (ppm)	0.004	0.006	0.009	n/a	n/a
	Days > .14 ppm (federal 24-hr standard)	0	0	0	n/a	n/a
	Days > .04 ppm (state 24-hr standard)	0	0	0	n/a	n/a
San Leandro Monitoring Station						
Ozone (1 hour)	Maximum 1-hr concentration (ppm)	0.093	0.101	0.097	0.104	0.999
	Days > 0.12 ppm (federal 1-hr standard)	0	0	0	0	0
	Days > 0.09 ppm (state 1-hr standard)	n/a	1	2	1	1
Ozone (8 hour)	Maximum 8-hr concentration (ppm)	0.056	0.061	0.071	0.066	0.061
	Days > 0.08 ppm (federal 8-hr standard)	0	0	0	0	0
San Pablo–Rumrill Monitoring Station						
PM_{10}	Maximum 24-hr concentration (µg/m^3)					
	Estimated days > 50 µg/m^3 (state 24-hr	n/a	69.6	49.4	n/a	n/a
	standard)	n/a	n/a	0	n/a	n/a
	Estimated days > 150 µg/m^3 (federal 24-hr	n/a	n/a	0	n/a	n/a
	standard)					
Carbon Monoxide	Maximum 8-hr concentration (ppm)	n/a	2.00	1.78	1.83	1.33
	Days > 9 ppm (federal 8-hr. standard)	n/a	0	0	0	0
	Days > 9.0 ppm (state 8-hr standard)	n/a	0	0	0	0
Nitrogen Dioxide	Maximum 1-hr concentration (ppm)	n/a	0.054	0.07	0.055	0.054
	Days > 0.18 ppm (state 1-hr standard)	n/a	0	0	0	0
Sulfur Dioxide	Maximum 24-hr concentration (ppm)	n/a	0.005	0.006	0.005	0.006
	Days > .14 ppm (federal 24-hr standard)	n/a	0	0	0	0
	Days > .04 ppm (state 24-hr standard)	n/a	0	0	0	0
San Francisco–Arkansas Monitoring Station						
$PM_{2.5}$	Maximum 24-hr concentration (µg/m^3)					
	Estimated days > 12 µg/m^3 (state standard,	76.6	70.2	41.6	45.8	43.6
	arithmetic mean)	n/a	n/a	n/a	n/a	n/a
	Estimated days > 35 µg/m^3 (federal 24-hr	n/a	n/a	n/a	n/a	n/a
	standard)					

Notes:
n/a – number of days are not available
Source: CARB.

Background Carbon Monoxide

CO concentrations are typically used as an indicator of conformity because CO levels are directly related to vehicular traffic volumes and can be modeled using USEPA methods. A review of data from the Oakland–Alice Street and Oakland–International monitoring stations for the 2001-2005 period indicates that the ambient eight-hour CO concentration is 2.4 ppm in the area surrounding the Alice Street monitoring station and 4.9 ppm in the area surrounding the Oakland–International monitoring station.[7] Ambient CO concentrations as monitored at the Oakland–International

[7] The *Caltrans Transportation Project-Level Carbon Monoxide Protocol* defines the ambient 8-hour CO concentration as the highest of the second highest maximum 8-hour CO reading in the last two years as reported

monitoring station were used since this monitoring station experiences higher CO concentrations than the Oakland–Alice Street monitoring station. Assuming a typical persistence factor of 0.7, the estimated one-hour background concentration is approximately 7.0 ppm. The existing eight-hour background concentrations do not exceed the state and federal eight-hour CO standard of 9.0 ppm. Additionally, the existing one-hour background concentration does not exceed the state and federal one-hour CO standards of 20 ppm and 35 ppm, respectively.

Localized CO Analysis Methodology for Project Area Intersections

CO is a localized gas that dissipates very quickly under normal meteorological conditions. The highest CO concentrations are typically found along sidewalks directly adjacent to congested roadway intersections and decrease substantially as distance from the intersection increases. The localized CO analysis was conducted in accordance to the guidelines provided in the *Caltrans Transportation Project-Level Carbon Monoxide Protocol* (Caltrans 1997).

A worst-case simulation of CO concentrations within the project area was modeled near ten intersections. The ten intersections that were analyzed in this air quality analysis were selected based on the following methodology. Of the intersections that would experience LOS E or F under the Build Alternatives, the three that would be most congested were selected. For the remaining intersections that would experience LOS E or F under the Build Alternatives, two to four intersections within each city were selected to provide a geographic representation. These intersections would experience the most change in delay or LOS when Build conditions are compared to No-Build conditions and/or would be located in close proximity to sensitive receptors. Both existing and future traffic-related CO contributions were modeled and added to the ambient CO concentration discussed in the previous subsection

Sensitive Receptors

The following categories of people, as identified by CARB, are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. Locations that may contain a high concentration of these sensitive population groups are called sensitive receptors and include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks.

The selected intersections are listed in Table 4.12-4, Carbon Monoxide Concentrations (Modeled for Existing Conditions). The state CO standards, more stringent than federal, are listed on the table for comparison to No-Build conditions.

by CARB. The second highest maximum 8-hour CO readings at the Alice Street Monitoring Station were 2.38 ppm in 2004 and 2.29 in 2005. The second highest maximum 8-hour CO readings at the International Boulevard Station were 4.89 ppm in 2002 and 4.30 ppm in 2003. CARB readings are listed in Appendix B of the *AC Transit East Bay BRT Project Air Quality Impact Technical Study* (Terry Hayes Associates, 2006). This conservative analysis utilized the data from the Oakland-International Monitoring Station.

Table 4.12-4: Carbon Monoxide Concentrations (Modeled for Existing Conditions)[1]

Intersection	Receptor	Parts Per Million	
		1-hour	8-hour
Federal CO Standard		**35**	**9**
California State CO Standard		**20**	**9.0**
Berkeley			
Fulton Street and Bancroft Way	Sidewalk Adjacent to Intersection	9.6	6.7
	UC Berkeley – Edwards Track Stadium	8.0	5.6
Adeline Street and Alcatraz Avenue	Sidewalk Adjacent to Intersection	10.2	7.1
	Residences on 63rd Street	8.1	5.7
Oakland			
College Avenue and Claremont Avenue	Sidewalk Adjacent to Intersection	8.9	6.2
	Residences on Florio Street	7.9	5.5
Telegraph Avenue and 40th Street	Sidewalk Adjacent to Intersection	9.1	6.4
	Residences on 40th Street	8.3	5.8
International Boulevard and Seminary Avenue	Sidewalk Adjacent to Intersection	8.6	6.0
	Residences on Seminary Avenue	8.3	5.8
International Boulevard and 66th Avenue	Sidewalk Adjacent to Intersection	8.9	6.2
	Lockwood Elementary School	8.3	5.8
Broadway and West Grand Avenue	Sidewalk Adjacent to Intersection	9.0	6.3
	Future Residences[2]	9.0	6.3
San Leandro			
East 14th Street and Dutton Avenue	Sidewalk Adjacent to Intersection	8.4	5.9
	Residences on Dutton Avenue	8.4	5.9
East 14th Street and Davis Street/Callan Street	Sidewalk Adjacent to Intersection	9.3	6.5
	Residences on Arroyo Avenue	7.6	5.3
East 14th Street and Fairmont Drive	Sidewalk Adjacent to Intersection	10.0	7.0
	Residences on Fairmont Avenue	8.8	6.2

Notes:
[1] All concentrations include one- and eight-hour ambient concentrations of 7.0 ppm and 4.9 ppm, respectively.
[2] During the preparation of the air quality analysis, a housing development was being constructed at the corner of Broadway and West Grand Avenue.

Source: Terry A. Hayes Associates LLC, 2006.

Modeled results representing existing CO concentrations at sidewalks adjacent to the selected intersections and at the sensitive receptors closest to the selected intersections are shown in the table. One-hour CO concentrations range from approximately 8.4 ppm to 10.2 ppm at worst-case sidewalk receptors; eight-hour CO concentrations range from approximately 5.9 ppm to 7.1 ppm at worst-case sidewalk receptors. At sensitive receptors closest to each intersection, one-hour CO concentrations range from approximately 7.6 ppm to 8.8 ppm, and eight-hour CO concentrations range from approximately 5.3 ppm and 6.2 ppm. Since CO is a localized gas that disperses quickly, CO concentrations at specific sensitive receptors are lower than concentrations immediately adjacent to the intersections. Presently, CO concentrations at sidewalks and sensitive receptors closest to the study intersections do not exceed the state and federal one-hour CO standards of 20 ppm and 35 ppm, respectively. CO concentrations at sidewalks and sensitive receptors closest to the selected intersections also do not exceed the state and federal eight- hour CO standard of 9.0 ppm.

4.12.2 Air Quality Impacts

4.12.2.1 METHODOLOGY

The following calculation methods and estimation models were used to determine air quality impacts:

- BAAQMD's construction emissions calculation formulas,
- CARB's EMFAC2002 emissions factor model,
- USEPA's CAL3QHC microscale dispersion model, and
- USEPA's Industrial Source Complex-Short Term (ISCST3) dispersion model.

The localized CO analysis was conducted in accordance with the guidelines provided in Caltrans' *Transportation Project-Level Carbon Monoxide Protocol* (Caltrans 1997). The ten intersections that were analyzed in this air quality analysis were selected based on the following methodology. First, intersections that would experience LOS E or F under the Build Alternatives were selected. Of these intersections, the three most congested intersections under the Build Alternatives were selected. For the remaining intersections that would experience LOS E or F under the Build Alternatives, two to four intersections within each city were selected to provide a geographic representation. These intersections would experience the greatest change in delay or LOS when Build conditions are compared to No-Build conditions and/or would be located in closest proximity to sensitive receptors.

The proposed project does not contain lead emissions sources. Therefore, emissions and concentrations related to this pollutant were not analyzed.

4.12.2.2 IMPACT ANALYSIS

The proposed project would have an adverse effect on air quality if one or more of the following conditions exist:

- The change (increase) in operational emissions exceed the BAAQMD daily operational emissions thresholds for CO, ROG, NO_X, or PM_{10}, as shown in Table 4.12-5;

Table 4.12-5: BAAQMD Daily Operational Emissions Thresholds for the BAAB

Criteria Pollutant	Pounds per Day[1]
Carbon Monoxide (CO)	550
Reactive Organic Gas (ROG)	80
Nitrogen Oxides (NO_X)	80
Particulates (PM_{10})	80
Particulates ($PM_{2.5}$)	n/a

Notes:
[1] Threshold is the increase in emissions (compared to the No-Build) attributable to the project.
Source: Bay Area Air Quality Management District.

- Operational emissions exceed federal daily or yearly emissions thresholds, as shown in Table 4.12-6;

Table 4.12-6: Federal Emissions Thresholds for Non-attainment Areas

Pollutant	Pounds per Day[1,2]	Tons per Year[1]
ROG	270	50
NO_X	550	100

Notes:
[1] Federal thresholds are expressed in tons per year. For ease of comparison, federal thresholds have been converted to pounds per day.
[2] Threshold is the increase in emissions (compared to the No-Build) attributable to the project.
Source: United States Code of Federal Regulations, Title 40, Part 93.

The proposed project causes CO, PM_{10}, or $PM_{2.5}$ concentrations to violate state or federal standards, shown in Table 4.12-1, in an area that is in attainment for the pollutant; or

Project-related CO, PM_{10} or $PM_{2.5}$ concentrations exceed five percent of the state or federal standards in an area where the ambient CO, PM_{10}, or $PM_{2.5}$ concentrations already exceed the state or federal standards. Five percent of the state and federal one-hour CO standard is 1 ppm and 1.75 ppm, respectively. Five percent of the state and federal eight-hour CO standard is 0.45 ppm. For PM_{10}, 5 percent of the state and federal 24-hour standard is 2.5 $\mu g/m^3$ and 7.5 $\mu g/m^3$, respectively. For $PM_{2.5}$, 5 percent of the federal 24-hour standard is 1.75 $\mu g/m^3$

No-Build Alternative

The No-Build Alternative is the basis against which the Build Alternatives are compared.

Criteria Pollutant Emissions. In the project area, mobile emissions are the primary source of air pollution. Table 4.12-7 compares the total mobile emissions in the project corridor under the No-Build and Build Alternatives. This analysis considers emissions from all vehicles in the corridor (not just buses).

Carbon Monoxide Concentration. Overall CO concentrations in year 2010 and 2025 are expected to be lower than existing conditions due to stringent state and federal mandates for lowering vehicle emissions. Although future traffic volumes would be higher, these increases would be offset by increases in cleaner-running cars as a percentage of the entire vehicle fleet on the road. Therefore, the decrease in pollutant levels from 2010 to 2025 can be attributed primarily to the change in ambient levels and not to the Build Alternatives. The actual difference in emissions between No-Build and Build is calculated in Table 4.12-7.

Table 4.12-7: Alameda County Criteria Pollutant Emissions Comparison

Scenario	Criteria Pollutant Emissions (pounds per day)					
	CO	ROG	NO_X	SO_X	PM_{10}	$PM_{2.5}$[1]
2010						
No-Build	388,481	45,101	88,593	381	3,698	3,565
Build	388,351	45,086	88,564	381	3,696	3,563
Build vs. No-Build	*-130 (-0.03%)*	*-15 (-0.03%)*	*-29 (-0.03%)*	*0 (0%)*	*-2 (-0.05%)*	*-2 (-0.05%)*
2025						
No-Build	130,470	19,486	31,057	439	3,754	3,619
Build	130,428	19,480	31,047	439	3,753	3,618
Build vs. No-Build	*-42 (-0.03%)*	*-6 (-0.03%)*	*-10 (-0.03%)*	*0 (0%)*	*-1 (-0.03%)*	*-1 (-0.03%)*

Notes:
[1] Regional operational $PM_{2.5}$ emissions were calculated as 96.4 percent of PM_{10} emissions.
Source: Terry A. Hayes Associates LLC, 2005.

Year 2010 CO concentrations at the ten selected intersections are shown in Table 4.12-8. Year 2025 CO concentrations are shown in Table 4.12-9. The state and federal one- and eight-hour CO standards would not be exceeded at worst-case sidewalk receptor locations or the sensitive receptors closest to the roadway intersections. Thus, no adverse impacts are anticipated for the year 2010 or 2025 for the No-Build Alternative.

PM_{10} Concentrations. The No-Build Alternative is anticipated to introduce 90 additional buses per day to each transit station. Buses idling as passengers board or leave the buses would likely increase PM_{10} concentrations in the area surrounding the transit stations. In 2010, the idling of buses under the No-Build Alternative would incrementally increase the 24-hour PM_{10} concentration at sidewalks adjacent to the transit stations by approximately 0.3 $\mu g/m^3$ over the 2010 ambient PM_{10} concentration without the additional 90 buses per day. In 2025, the idling of buses under the No-Build Alternative would incrementally increase the 24-hour PM_{10} concentration at sidewalks adjacent to the transit stations by approximately 0.2 $\mu g/m^3$ over the estimated 2025 ambient PM_{10} concentration without the additional bus trips. The 24-hour ambient PM_{10} concentrations in year 2010 and 2025 under the No-Build condition would therefore be 60.8 $\mu g/m^3$ and 60.5 $\mu g/m^3$, respectively.

The No-Build Alternative ambient PM_{10} concentrations in 2010 and 2025 would not exceed the federal 24-hour standard of 150 $\mu g/m^3$. However, ambient PM_{10} concentrations would exceed the state PM_{10} standard of 50 $\mu g/m^3$ in both years.

$PM_{2.5}$ Concentrations.[8] Ambient $PM_{2.5}$ concentrations in 2010 and 2025 are estimated to be 39.1 and 25.8 $\mu g/m^3$, respectively, under the No-Build Alternative. The 2010 concentration would exceed the federal standard of 35 $\mu g/m^3$. By 2025, because the ambient $PM_{2.5}$ concentration is expected to decrease, it would be below the federal 24-hour standard.

[8] Currently, there are few or no $PM_{2.5}$ emissions factors for combustion processes. Therefore, an indirect approach for calculating $PM_{2.5}$ emissions was conducted, which followed guidance provided by the South Coast Air Quality Management District (*Final—Methodology to Calculate Particulate Matter $(PM)_{2.5}$ and $PM_{2.5}$ Significance Thresholds*, October 2006.

Table 4.12-8: 2010 Carbon Monoxide Concentrations[1]

Intersection	Receptor	1-Hour		8-Hour	
		No-Build Alternative	Build Alternatives	No-Build Alternative	Build Alternatives
Federal CO Standard		**35**		**9**	
California State CO Standard		**20**		**9.0**	
Berkeley					
Fulton Street and Bancroft Way	Sidewalk Adjacent to Intersection	5.7	5.7	4.0	4.0
	UC Berkeley – Edwards Track Stadium	5.0	5.0	3.5	3.5
Adeline Street and Alcatraz Avenue	Sidewalk Adjacent to Intersection	6.3	6.4	4.4	4.5
	Residences on 63rd Street	5.0	5.1	3.5	3.6
Oakland					
College Avenue and Claremont Avenue	Sidewalk Adjacent to Intersection	5.7	5.8	4.0	4.1
	Residences on Florio Street	4.9	5.0	3.4	3.5
Telegraph Avenue and 40th Street	Sidewalk Adjacent to Intersection	5.7	5.8	4.0	4.1
	Residences on 40th Street	5.1	5.2	3.6	3.6
International Boulevard and Seminary Avenue	Sidewalk Adjacent to Intersection	5.5	5.4	3.9	3.8
	Residences on Seminary Avenue	5.3	5.2	3.7	3.6
International Boulevard and 66th Avenue	Sidewalk Adjacent to Intersection	5.6	5.4	3.9	3.8
	Lockwood Elementary School	5.5	5.3	3.9	3.7
Broadway and West Grand Avenue	Sidewalk Receptor and Residences at the Intersection[2]	5.5	5.7	3.9	4.0
San Leandro					
East 14th Street and Dutton Avenue	Sidewalk Adjacent to Intersection	5.3	5.4	3.7	3.8
	Residences on Dutton Avenue	5.3	5.4	3.7	3.8
East 14th Street and Davis Street/Callan Street	Sidewalk Adjacent to Intersection	5.8	5.7	4.1	4.0
	Residences on Arroyo Avenue	5.0	4.8	3.5	3.4
East 14th Street and Fairmont Drive	Sidewalk Adjacent to Intersection	6.2	6.2	4.4	4.4
	Residences on Fairmont Avenue	5.5	5.4	3.9	3.8

Notes:
[1] All concentrations include 2010 one- and eight-hour ambient concentrations of 4.5 ppm and 3.2 ppm, respectively.
[2] During the preparation of the air quality analysis, a housing development was under construction at the corner of Broadway and West Grand Avenue.
Source: Terry A. Hayes Associates LLC, Appendix

Table 4.12-9: 2025 Carbon Monoxide Concentrations[1]

Intersection	Receptor	1-Hour		8-Hour	
		No-Build Alternative	Build Alternatives	No-Build Alternative	Build Alternatives
Federal CO Standard		**35**		**9**	
California State CO Standard		**20**		**9.0**	
Berkeley					
Fulton Street and Bancroft Way	Sidewalk Adjacent to Intersection	2.0	1.9	1.4	1.3
	UC Berkeley – Edwards Track Stadium	1.6	1.6	1.1	1.1
Adeline Street and Alcatraz Avenue	Sidewalk Adjacent to Intersection	2.2	2.2	1.5	1.5
	Residences on 63rd Street	1.7	1.7	1.2	1.2
Oakland					
College Avenue and Claremont Avenue	Sidewalk Adjacent to Intersection	1.9	2.0	1.3	1.4
	Residences on Florio Street	1.6	1.7	1.1	1.2
Telegraph Avenue and 40th Street	Sidewalk Adjacent to Intersection	2.0	2.0	1.4	1.4
	Residences on 40th Street	1.7	1.8	1.2	1.3
International Boulevard and Seminary Avenue	Sidewalk Adjacent to Intersection	1.9	1.8	1.3	1.3
	Residences on Seminary Avenue	1.8	1.7	1.3	1.2
International Boulevard and 66th Avenue	Sidewalk Adjacent to Intersection	1.9	1.9	1.3	1.3
	Lockwood Elementary School	1.8	1.8	1.3	1.3
Broadway and West Grand Avenue	Sidewalk Adjacent to Intersection and Residences at the Intersection[2]	2.1	2.1	1.5	1.5
San Leandro					
East 14th Street and Dutton Avenue	Sidewalk Adjacent to Intersection	1.8	1.9	1.3	1.3
	Residences on Dutton Avenue	1.8	1.9	1.3	1.3
East 14th Street and Davis Street/Callan Street	Sidewalk Adjacent to Intersection	1.9	1.9	1.3	1.3
	Residences on Arroyo Avenue	1.5	1.5	1.1	1.1
East 14th Street and Fairmont Drive	Sidewalk Adjacent to Intersection	2.1	2.1	1.5	1.5
	Residences on Fairmont Avenue	1.9	1.9	1.3	1.3

Notes:

[1]All concentrations include 2025 one- and eight-hour ambient concentrations of 1.5 ppm and 1.1 ppm, respectively.

[2]During the preparation of the air quality analysis, a housing development was under construction at the corner of Broadway and West Grand Avenue.

Source: Terry A. Hayes Associates LLC, 2005.

Build Alternatives

The same Van Hool buses are assumed for No-Build and all Build Alternatives in the years 2010 and 2025 and therefore emission factors for buses would be the same under both the No-Build and Build Alternatives.[9] As shown in Table 4.12-7, criteria pollutant emissions for the Build Alternatives in year 2010 are anticipated to incrementally decrease by approximately 130 pounds per day (ppd) for CO, 15 ppd for ROG, 29 ppd for NO_X, 2 ppd for $PM_{2.5}$, and 2 ppd for PM_{10} compared to the No-Build Alternative. In year 2025, criteria pollutant emissions are anticipated to incrementally decrease by approximately 42 ppd for CO, 6 ppd for ROG, 10 ppd for NO_X, 1 ppd for $PM_{2.5}$,and 1 ppd for PM_{10} compared to the No-Build Alternative. SO_X emissions are not anticipated to change in years 2010 and 2025. The decrease in pollutant emissions would be considered a beneficial impact.

Carbon Monoxide Concentrations. Carbon monoxide concentrations were calculated as described in Sections 4.12.1.5, Existing Conditions, and 4.12.2.1, Methodology. Table 4.12-8, 2010 Carbon Monoxide Concentrations, and Table 4.12-9, 2025 Carbon Monoxide Concentrations, present the one- and eight-hour CO concentrations at the ten study intersections. The state and federal one- and eight-hour standards would not be exceeded at worst-case sidewalk receptor locations and at the closest sensitive receptor to the roadway intersections in year 2010 or 2025. Thus, no adverse impact is anticipated for the Build Alternatives.

PM_{10} Concentrations. The Build Alternatives are anticipated to introduce 250 additional buses (i.e. stops) per day to each transit station. Buses idling as passengers board or leave the buses would likely increase PM_{10} concentration in the area surrounding the transit stations. In 2010, the idling of buses would incrementally increase the 24-hour PM_{10} concentration at sidewalks adjacent to the transit station by approximately 0.8 $\mu g/m^3$ over the 2010 ambient PM_{10} concentration. In 2025, the idling of buses under the Build Alternatives would incrementally increase the 24-hour PM_{10} concentration at sidewalks adjacent to the transit station by approximately 0.5 $\mu g/m^3$ over the 2025 ambient PM_{10} concentration. Ambient PM_{10} concentrations in year 2010 and 2025 are 60.5 $\mu g/m^3$ and 60.3 $\mu g/m^3$, respectively. Ambient PM_{10} concentrations in 2010 and 2025 would not exceed the federal 24-hour standard, and PM_{10} contributions from the Build Alternatives, when added to the ambient PM_{10} concentrations, would not exceed the federal 24-hour standard.

Ambient PM_{10} concentrations would exceed the state 24-hour standard of 50 $\mu g/m^3$. If ambient PM_{10} concentrations exceed the state PM_{10} standard, an adverse impact would occur if the Build Alternatives cause PM_{10} concentrations to incrementally increase by 2.5 $\mu g/m^3$ or more. The incremental increase of 0.8 $\mu g/m^3$ in 2010 and 0.5 $\mu g/m^3$ in 2025 would not exceed the threshold. Thus, no adverse impacts are anticipated for the Build Alternatives.

$PM_{2.5}$ Concentrations. The additional bus stops per day proposed under the Build Alternatives would likely increase $PM_{2.5}$ concentrations in the areas surrounding BRT stations. As for PM_{10}, idling buses while stopped for passenger loading and unloading would increase the $PM_{2.5}$ concentration at stations and at sidewalks adjacent to the station by approximately 0.8 $\mu g/m^3$ in 2010 and by 0.5 $\mu g/m^3$ in

[9] Available emissions data on the Van Hool AG 300 bus, 2006 model year, are as follows:

- 2.5 grams NO_x and 0.01 grams PM_{10} per brake-horsepower (Cummins ISL engine).

2025. Total concentrations would be 39.9 μg/m^3 in 2010 and 26.3 μg/m^3 in 2025. The 2010 concentration would exceed the federal 24-hour standard while the 2025 would be below the federal standard. An adverse impact would occur if the projected 2010 increase in $PM_{2.5}$ concentrations attributable to the Build Alternatives exceeds 5 percent of the federal standard, or 1.75 μg/m^3. In 2010, the increase of 0.8 μg/m^3 would be less than the threshold for adverse impact. Thus, no adverse impacts are anticipated for the Build Alternatives in either 2010 or 2025.

NOX emissions. In 2025, under any of the proposed Build Alternatives, vehicle miles traveled per day and the speed of the buses would be higher than that under the No-Build Alternative. Consequently, NOX emissions from buses would be higher under the Build Alternatives than the emissions from buses under the No-Build Alternative. This increase in bus emissions would be offset by the decrease in emissions from fewer automobiles in the corridor under the Build Alternatives. Hence, as shown in Table 4.12-7, NOx emissions under any of the Build Alternatives would be slightly lower than those under the No-Build Alternative. Thus, no adverse impacts are anticipated under any of the Build Alternatives.

4.12.3 Avoidance, Minimization, and/or Mitigation Measures

Under the build alternatives, AC Transit would meet the CARB exhaust emissions standards for 2007-2009 model-year heavy duty urban bus engines and the Fleet Rule for Transit Agencies Urban Bus Requirements (pursuant to Title 13 CCR sections 1956.1, 2020, 2023, 2023.1, and 2023.4).

No adverse impacts to air quality are anticipated, and therefore, no minimization or mitigation measures are recommended.

4.12.4 Transportation Conformity Analysis

FTA cannot approve funding for project activities beyond preliminary engineering unless the project is in conformity with USEPA transportation conformity regulations (40 CFR Part 93). The criteria that the Build Alternatives must satisfy are discussed below. In addition to an operations analysis, a conformity analysis of construction emissions is required under certain scenarios (see Section 4.16.9). Project-related construction activity would not last more than five years at any single construction site. As such, consideration of a construction hotspots is not required as part of the federal conformity analysis.

§93.110 The conformity determination must be based on the latest planning assumptions.

The Association of Bay Area Governments (ABAG) is the Metropolitan Planning Organization responsible for determining areawide population and employment forecasts. Traffic forecasts for the proposed project were developed using the Alameda Countywide Travel Model (Alameda Model). The Alameda Model uses Projection 2002 information, which are ABAG's population and employment projections for the region. AC Transit also worked with the cities of Berkeley, Oakland, and San Leandro to ensure that the ABAG data were consistent with city and countywide totals.

§93.111 The conformity determination must be based on the latest emission estimation model available.

Emission estimates are based on CARB EMFAC 2002 model. USEPA CAL3QHC model was used for CO modeling. EMFAC2002 and CAL3QHC models are the most recent models approved by USEPA.

§93.112 Conformity determination must be made according to the consultation procedures of this rule and in the applicable implementation plan, and according to the public involvement procedures established in compliance with 23 CFR Part 450. The conformity determination must be made according to §93.105(a)(2) and (e) and the requirements of 23 CFR Part 450.

Consultation procedures in 20 CFR Part 450, 40 CFR Part 51, and 40 CFR Part 93 (§93.105(a)(2) and (e)) would be followed before making the final conformity determination for the proposed project. The environmental document for the proposed project would be available for public review and comment prior to adoption.

§93.114 There must be a currently conforming transportation plan and TIP at the time of project approval.

The most recent transportation plan in the project area is the Transportation 2030 Plan. The most recent TIP is the 2007 TIP. The Transportation 2030 Plan was adopted MTC on February 23, 2005. The 2007 TIP was adopted by MTC on October 2, 2006. FHWA and FTA made a conformity determination for the Transportation 2030 Plan on March 17, 2005 and for the 2007 TIP on October 2, 2006.

§93.115 The proposed project must come from a conforming transportation plan and TIP.

The proposed project is included in the Transportation 2030 Plan and 2007 TIP.

§93.116 The proposed project would not cause or contribute to any new localized CO, $PM_{2.5}$, or PM_{10} violations or increase the frequency or severity of any existing CO, $PM_{2.5}$ or PM_{10} violations in CO, $PM_{2.5}$, and PM_{10} non-attainment and maintenance areas.

The violations this criterion refers to are the NAAQS. Operations of the Build Alternatives would decrease vehicle miles traveled in the region. No CO violations would result from operations of the proposed project. As discussed previously, the proposed project would not contribute to any new federal $PM_{2.5}$ or PM_{10} violations.

§93.117 The proposed project must comply with PM_{10} and $PM_{2.5}$ control measures that are contained in the applicable implementation plan.

PM_{10} and $PM_{2.5}$ control measures are not available for the San Francisco Bay Area since BAAQMD does not have a SIP for PM_{10} and $PM_{2.5}$. Build Alternatives would decrease VMT in the region, which would result in lower PM_{10} and $PM_{2.5}$ concentrations. If a federal PM_{10} or $PM_{2.5}$ attainment plans were required in the future, AC Transit would identify appropriate control measures for PM_{10} and $PM_{2.5}$ emissions.

Based on the above, the proposed project satisfies USEPA's project-level conformity requirements (40 CFR Part 93).

4.13 Noise and Vibration

4.13.1 Methodology and Criteria

4.13.1.1 Noise Methodology and Criteria

Noise is typically defined as unwanted or undesirable sound. The loudness of sound is associated with its sound pressure level, most commonly measured in decibels (dB). Through a process known as "A-weighting," the measurement of loudness is adjusted to provide a single numerical descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called "A-weighted" sound levels, and are expressed in decibel notation as "dBA." The A-weighted sound level is widely accepted by acousticians as a proper unit for describing environmental noise. Figure 4.13-1 illustrates typical A-weighted sound pressure levels for various noise sources.

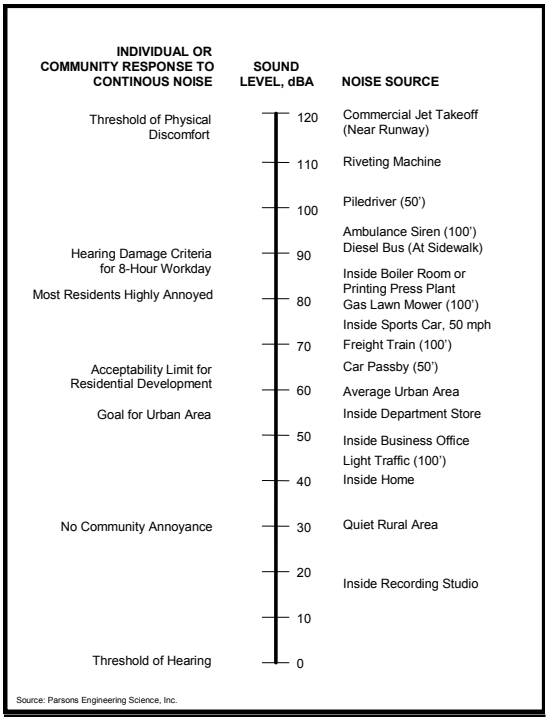

Figure 4.13-1: Typical Ldn Sound

Noise Metrics

Because environmental noise fluctuates from moment to moment, it is common practice to condense the wide fluctuations recorded over time into a single number, called the "equivalent" sound level

(Leq). Leq can be thought of as the steady sound level that represents the same sound energy as the varying sound levels over a specified time period (typically 1 hour or 24 hours). Noise in residential areas is characterized by measuring changes in day-night sound level (Ldn). Ldn is the A-weighted Leq for a 24-hour period with an added 10-decibel penalty imposed on noise that occurs during the nighttime hours (between 10 p.m. and 7 a.m.). Many surveys have shown that Ldn is well correlated with human annoyance, and therefore this descriptor is widely used for environmental noise impact assessment. The A-weighted decibel levels (dBA levels) given for the examples in Figure 4.13-1 represent the Ldn for typical noise environments.

Noise Impact Criteria

Noise impact for this project is based on the criteria defined in the U. S. Federal Transit Administration (FTA) guidance manual *Transit Noise and Vibration Impact Assessment* (FTA Report DOT-T-95-16, April 1995). The FTA noise impact criteria are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. Although more transit noise is allowed in neighborhoods with high levels of existing noise, smaller increases in total noise exposure are allowed with increasing levels of existing noise.

The FTA Noise Impact Criteria group noise sensitive land uses into the following three categories:

Category 1: Buildings or parks where quiet is an essential element of their purpose.

Category 2: Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.

Category 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, churches and active parks.

Ldn is used to characterize noise exposure for residential areas and hotels (Category 2). For other noise sensitive land uses, such as outdoor amphitheaters and school buildings (Categories 1 and 3), the maximum 1-hour Leq during the facility's operating period is used.

There are two levels of impact included in the FTA criteria, as summarized below:

Severe Impact: Severe noise impacts are considered "significant" as this term is used in the National Environmental Policy Act (NEPA) and implementing regulations. Noise mitigation will normally be specified for severe impact areas unless there is no practical method of mitigating the noise.

Impact (Moderate Impact): In this range of noise impact, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost effectiveness of mitigating noise to more acceptable levels. In this environmental document, noise impacts within the Impact range of the FTA criteria will be referred to as moderate impacts to clearly differentiate them from impacts within the Severe range.

Impact levels are based on the increase in the cumulative noise when the project noise is added to existing noise. More transit noise is allowed in neighborhoods were existing noise levels are already high, but the allowed level of noise increase is smaller than that permitted where existing noise levels are lower. The third column in Table 4.13-1 shows the allowable noise increases for Category 1 and 2 land uses, based on existing noise exposure. As shown in Table 4.13-1, an existing noise exposure of 45 dBA allows an increase of 7 dBA under Build conditions. At an existing noise exposure of 75 dBA, however, any noise increase under the project would constitute an impact. As the existing level of ambient noise increases, the allowable level of project noise increases, but the total allowable increase in community noise exposure is reduced. This reduction accounts for the unexpected result for project noise exposure levels that are less than the existing noise exposure and still cause impact. The project noise criteria for Category 3 land uses are 5 dBA higher than those shown in Table 4.13-1.

Table 4.13-1: Noise Impact Criteria: Effect on Cumulative Noise Exposure

L_{dn} or L_{eq} in dBA (rounded to nearest whole decibel)			
Existing Noise Exposure	**Allowable Project Noise Exposure**	**Allowable Combined Total Noise Exposure**	**Allowable Noise Exposure Increase**
45	51	52	7
50	53	55	5
55	55	58	3
60	57	62	2
65	60	66	1
70	64	71	1
75	65	75	0

Source: USDOT 1995

4.13.1.2 VIBRATION METHODOLOGY AND CRITERIA

Vibration is an oscillatory motion, which can be described in terms of displacement, velocity, or acceleration. Displacement, in the case of a vibrating floor, is simply the distance that a point on the floor moves away from its static position. The velocity represents the instantaneous speed of the floor movement and acceleration is the rate of change of the speed. The response of humans, buildings, and equipment to vibration is normally described using velocity or acceleration.

Vibration Impact Criteria

The FTA *Transit Noise and Vibration Impact Assessment* (USDOT 1995) provides a procedure to determine whether or not a transit project requires a vibration analysis. Transit projects that involve rubber-tire vehicles rarely show potential for vibration impacts and therefore do not require vibration analysis. Three factors are checked to determine if there is potential for vibration impacts from bus projects:

1. Will there be expansion joints, speed bumps, or other design features that result in unevenness in the road surface near vibration-sensitive buildings? Such irregularities can result in perceptible ground-borne vibration at distances up to 75 feet away.
2. Will buses, trucks, or other heavy vehicles be operating close to a sensitive building? Research using electron microscopes and manufacturing of computer chips are examples of vibration sensitive activities.
3. Does the project include operation of vehicles inside or directly underneath buildings that are vibration-sensitive? Special considerations are often required for shared use facilities such as bus stations located inside an office building complex.

Projects that do not include any of those three conditions are exempt from vibration analysis. Projects that do include one of the factors are then screened for distances from vibration-sensitive land uses. For bus projects, the vibration source must be a minimum of 100 feet from Category 1 land uses and 50 feet from Category 2 land uses. No distances are specified for Category 3.

4.13.2 Existing Conditions

4.13.2.1 Existing Noise

Sensitive receptors were selected by their proximity to the alignment and by land usage. Different categories of land uses are located along the East Bay BRT alignment. In general, the northern segment of the East Bay BRT Project, which includes Downtown Berkeley and University of California at Berkeley, has a higher concentration of school zones. The central segment consisting of Downtown Oakland is more commercial. The southern segment from Downtown Oakland to San Leandro contains stretches of commercial and residential areas, and school zones.

Noise measurements were conducted nearby sensitive receptors along the alignment between November 29 and December 3, 2004. A total of 18 short-term (typically 20-minute) and five long-term measurements (typically 24-hour) were taken along the East Bay BRT alignment. Tables 4.13-2 and 4.13-3 present the results of the long-term and short-term noise measurements, respectively. The long term measurements were used to adjust short term measurements to peak hour levels and to determine the time of peak traffic noise along East Bay BRT alignment. Once peak hours were determined for an area, short-term measurements could be taken without the need to be adjusted to peak hour levels.

4.13.2.2 Existing Vibration

The AC Transit East Bay BRT Project was screened for vibration impacts in accordance with the *FTA Transit Noise and Vibration Impact Assessment Manual*. Because buses have rubber tires and suspension systems that isolate vibrations from the ground, vibration impact assessment was not warranted (US DOT, 1995).

4.13.3 Environmental Consequences

4.13.3.1 NOISE IMPACTS

Noise levels were calculated for the following conditions:

- Existing traffic conditions along the East Bay BRT alignment,
- Traffic conditions in 2025 for the No-Build Alternative,
- Traffic conditions in 2025 for each of the four Build Alternatives.

BRT noise levels were projected based on field measurements of the Van Hool buses currently used by AC Transit. The operating times, headways, and other aspects of BRT and local bus operations are based on the operating plan described in Chapter 2.

This analysis considers two types of receptors for noise impacts: Category 2 (receptors that are sensitive to noise in both the day and night such as residences), and Category 3 (receptors that are not sensitive to noise at night such as schools and churches). There are no Category 1 receptors on the project alignment. Table 4.13-4 presents impacts for Category 2 receptors, and Table 4.13-5 presents impacts for Category 3 receptors. These tables indicate the existing noise level, the noise impact criteria, and the noise level generated by existing condition, the East Bay BRT future build alternatives, and the future no-build scenario. Tables also provide the distance from the outer traffic lane to the property line and the BRT maximum operating speed, which is equal to the speed limit for each segment with some of the segments having two posted limits due to school zones. The tables list predicted impacts by location, noise level (dBA), and FTA impact category of "none," "impact" (referred to as "moderate impact" in this environmental document), or "severe impact." The number of impacts was determined by plotting the impact contour lines on the East Bay BRT project layout aerials. An impact occurs if the impact contour line overlaps a noise sensitive property line.

Generally, the project would reduce noise levels along the alignment because future traffic volumes with the project are lower than existing traffic volumes and considerably lower than future traffic volumes without the project. (See Chapter 3, Traffic and Transportation.) Impacts would occur, however, in Berkeley with the *Two-Way Transitway via Bancroft Way* alignment variation, where bus dedicated center lanes would displace car traffic to other streets parallel to the alignment.

Table 4.13-2: Long-Term Noise Measurement Results

Site No.	Street Address, City	Land Use[1]	Meter Location	Measurement Dates	Start Time	Duration, No. of Hours	Measured Peak Hour Leq, dBA[2]	Peak-Hour Time
LT01	2330 Durant Ave (Durant House), Berkeley	Church	Front Yard	12/01 – 12/02	11:30 a.m.	26	65	11 a.m., 2 p.m.
LT02	5810 Telegraph Ave, Oakland	SFR	Front Yard	11/30 – 12/01	4:20 p.m.	24	67	8 a.m., 9 a.m.
LT03	Marriott Courtyard Downtown, Oakland	HOT	Room	12/02 – 12/03	3:10 p.m.	20[3]	65	8 a.m., 9 a.m.
LT04	328 East 14th St, San Leandro	SFR	Side Yard	11/29 – 11/30	3:23 p.m.	26	61	9 a.m.
LT05	1408 148th St, San Leandro	SFR	Side Yard	12/01 – 12/02	4:41 p.m.	24	62	5 p.m., 8 a.m., 9 a.m. to 11 a.m., 1 p.m. to 3 p.m.

Notes:
1. SFR = Single Family Residential; MFR = Multi-Family Residential, HOT = Hotel.
2. The highest measured hourly noise level recorded during the long-term measurement period.
3. Measurement ended early due to a time constraint.

Source: *Noise and Vibration Impact Assessment Technical Report*, Parsons, January 2006.

Table 4.13-3: Short-Term Noise Measurement Results

Site No.	Street Address, City	Land Use[1]	Meter Location[2]	Measurement Date	Start Time	Measured Leq, dBA[3]	Adjusted Peak-Hour Leq, dBA[4]	Adjusted to Long-Term Site
ST01	Bancroft Way and Dana St, Berkeley	MFR	Sidewalk	12/02	1:28 p.m.	66.8	69	LT01
ST02	2330 Durant Ave (Durant House), Berkeley	Church	Front Yard	12/02	1:52 p.m.	65.2	67	LT01
ST03	Telegraph Ave and Downing Ave, Berkeley	MFR	Sidewalk	12/02	12:37 p.m.	68.3	68	NLT
ST04	5810 Telegraph Ave, Berkeley	SFR	Side Yard	12/01	8:40 a.m.	66.9	67	LT02
ST05	5683 Telegraph Ave, Oakland	SFR	Sidewalk	11/30	2:06 p.m.	70.4	71	LT02
ST06	3139 Telegraph Ave, Oakland	SFR	Front Yard	12/01	12:40 p.m.	70.2	70	NLT
ST07	2800 Telegraph Ave, Oakland	COM	Sidewalk	12/02	7:51 a.m.	70.3	70	NLT
ST08	Telegraph Ave and 17th Street, Oakland	COM	Sidewalk	12/02	7:21 a.m.	69.9	70	NLT
ST09	Jackson Street and 12th Street, Oakland	COM	Sidewalk	12/01	6:25 p.m.	66.0	66	NLT
ST10	Franklin Street and 12th Street, Oakland	COM	Sidewalk	12/02	8:25 a.m.	70.0	70	NLT
ST11	Marriott Courtyard Downtown, Oakland	HOT	Sidewalk	12/03	10:01 a.m.	70.7	72	LT03
ST12	1327 International Blvd, Oakland	COM	Sidewalk	12/03	8:55 a.m.	69.4	69	NLT
ST13	6220 International Blvd, Oakland	COM	Sidewalk	12/01	5:40 p.m.	70.8	71	NLT
ST14	8102 East 14th Street, Oakland	COM	Sidewalk	12/01	5:11 p.m.	71.3	71	NLT
ST15	1471 Tucker Street, San Leandro	MFR	Front Yard	11/30	12:25 p.m.	61.4	64	LT04
ST16	645 East 14th Street, San Leandro	COM	Sidewalk	11/30	3:35 p.m.	73.0	76	LT04
ST17	1699 East 14th Street, San Leandro	COM	Sidewalk	12/02	10:08 a.m.	70.2	70	LT05
ST18	Bayfair Center, San Leandro	COM	Sidewalk	12/02	11:17 a.m.	71.3	71	LT05

Notes:
1. SFR = Single Family Residential; MFR = Multi-Family Residential; HOT = Hotel: COM = Commercial Building; NLT = Short-term measurement peak hour was not adjusted to a long-term measurement.
2. Some of the noise measurements were conducted on sidewalks due to outdoor use area access.
3. All short-term measured noise levels are a 20-minute Leq.
4. Measurements conducted during off-peak hours were adjusted to the peak-hour Leq based on a comparison with long-term noise levels which were measured at a nearby measurement site, listed in the last column.

Source: *Noise and Vibration Impact Assessment Technical Report*, Parsons, January 2006

Table 4.13-4: Summary of Noise Impacts for Category 2 Land Uses

Description	Side[1]	Distance from outer traffic lane to property line, feet	BRT Operation Speed mph	Existing Traffic Noise Levels, L_{dn}, dBA	Overall Future No Build Noise Levels[3], L_{dn}, dBA	Overall Future Build Levels[3] Alternatives 3 and 4, L_{dn}, dBA	Overall Future Build Levels[3] Alternatives 1 and 2, L_{dn}, dBA	Criteria, (Impact / Severe) dBA	Distance from Outer Lane to Noise Impact Contours, feet[2] Moderate	Distance from Outer Lane to Noise Impact Contours, feet[2] Severe	Degree of Impact[4]
Berkeley[5]											
Center St and Bancroft Way	East	44 (Existing and No Build) 31 (Build)	25	69	70	71	71	71/73	-	-	None
	West	44 (Existing and No Build) 31 (Build)	25	69	70	71	71	71/73	-	-	None
Durant St Between Shattuck Ave and Telegraph Ave	North	25	25	68	69	70	70	70/72	25	16	Moderate
	South	25	25	68	69	70	70	70/72	25	16	Moderate
Telegraph Ave Between Parker and Prince St	East	25	25	70	71	69	69	72/74	13	8	None
	West	25	25	70	71	69	69	72/74	13	8	None
Berkeley[6]											
Shattuck Ave Between Center St and Bancroft Way	East	44 (Existing and No Build) 31 (Build)	25	69	70	70	71	71/73	-	-	None
	West	44 (Existing and No Build) 31 (Build)	25	69	70	69	69	71/73	-	-	None
Bancroft Way Between Shattuck Ave and Telegraph Ave	North	25	25	68	70	70	70	71/73	22	17	None
	South	25	25	68	70	69	69	71/73	17	14	None
Durant St Between Shattuck Ave and Telegraph Ave	North	25	25	68	69	68	67	70/72	14	9	None
	South	25	25	68	69	69	69	70/72	18	11	None
Telegraph Ave Between Parker and Prince St	East	25	25	70	71	69	69	72/74	13	8	None
	West	25	25	70	71	69	69	72/74	13	8	None
North Oakland											
Telegraph Ave Between Alcatraz Ave and 52nd St	East	25	30	72	72	70	70	73/75	13	8	None
	West	25	30	72	73	71	71	73/75	14	9	None
Telegraph Ave Between 51st and 40th St	East	25	30 & 25	70	71	69	69	71/73	17	11	None
	West	25	30 & 25	70	71	69	69	71/73	17	10	None
Telegraph Ave Between 40th and 27th St	East	25	25	70	70	69	69	71/73	15	10	None
	West	25	25	69	70	69	69	70/72	18	11	None
Telegraph Ave Between 27th and 20th St	East	25	25	68	69	68	68	69/71	18	11	None
	West	25	25	68	69	68	68	69/71	18	11	None

Notes:
1. The direction shown indicates on which side of the alignment the receptor is located. East/North corresponds to northbound BRT and West//South to southbound BRT.
2. The distances shown in the Moderate Impact and Severe Impact columns represent how far the noise impact contour extends away from the outer traffic lane.
3. Overall noise levels in this column represent the combined noise sources (BRT, Rapid Bus and local traffic).
4. Degree of Impact, as defined by the FTA in its criteria for impacts can include None (No Impact), Impact, and Severe. The FTA "Impact" level of impact is referred to as "Moderate Impact" in this environmental document.
5. Berkeley alignment follows the *Two-Way Transitway via Shattuck Avenue*, *Two-Way Transitway via Bancroft Way*, and *Two-Way Transitway via Telegraph Avenue* alignment variations.
6. Berkeley alignment follows the *One-Way Transitway via Shattuck Avenue–Oxford Street Loop*, *One-Way Transitway via Bancroft Way–Durant Avenue Couplet*, and *One-Way Transitway via Telegraph Avenue–Dana Street One-Way Couplet* alignment variations.

Source: *Noise and Vibration Impact Assessment Technical Report*, Parsons, January 2006

Table 4.13-4: Summary of Noise Impacts Category 2 Land Uses (Continued)

Description	Side[1]	Distance from outer traffic lane to property line, feet	BRT Operation Speed mph	Existing Traffic Noise Levels, L_{dn}, dBA	Overall Future No Build Noise Levels[3], L_{dn}, dBA	Overall Future Build Levels[3] Alternatives 3 and 4, L_{dn}, dBA	Overall Future Build Levels[3] Alternatives 1 and 2, L_{dn}, dBA	Criteria, (Impact / Severe) dBA	Distance from Outer Lane to Noise Impact Contours, feet[2] Moderate	Distance from Outer Lane to Noise Impact Contours, feet[2] Severe	Degree of Impact[4]
Downtown Oakland											
Broadway Between	East	25	25	67	68	68	69	69/71	22	14	None
20th and 11th St	West	25	25	67	69	69	69	70/72	18	11	None
12th St Between	North	25	25	68	70	68	68	69/71	18	11	None
Broadway and Oak St	South	25	25	68	69	69	69	70/72	19	12	None
11th St Between	North	25	25	66	67	66	66	67/69	21	13	None
Broadway and Oak St	South	25	25	66	67	65	65	67/69	17	11	None
South Oakland											
International Blvd Between	East	25	30	68	69	67	67	69/71	15	10	None
2nd and 14th Ave	West	25	30	68	69	67	67	69/71	15	9	None
12th St Between	East	25	30	68	69	67	67	69/71	15	10	None
2nd and 14th Ave	West	25	30	68	69	67	67	69/71	15	9	None
International Blvd Between	East	25	30 & 25	70	71	69	69	71/73	17	11	None
15th and Fruitvale Ave	West	25	30 & 25	70	71	69	69	71/73	17	11	None
International Blvd Between	East	25	30 & 25	71	72	71	71	72/74	18	11	None
35th and 59th Ave	West	25	30 & 25	71	72	71	71	72/74	18	11	None
International Blvd Between	East	25	30 & 25	71	72	71	71	72/74	18	11	None
66th and 82nd Ave	West	25	30 & 25	71	72	71	71	72/74	18	11	None
International Blvd Between	East	25	30 & 25	71	72	71	71	72/74	21	13	None
82nd and 98th Ave	West	25	30 & 25	71	72	71	71	72/74	21	13	None

Notes:
1. The direction shown indicates on which side of the alignment the receptor is located. East/North corresponds to northbound BRT and West//South to southbound BRT.
2. The distances shown in the Moderate and Severe columns represent how far the noise impact contour extends away from the outer traffic lane.
3. Overall noise levels in this column represent the combined noise sources (BRT, Rapid Bus and local traffic).
4. Degree of Impact, as defined by the FTA in its criteria for impacts can include None (No Impact), Impact, and Severe. The FTA "Impact" level of impact is referred to as Moderate Impact in this environmental document.

Source: *Noise and Vibration Impact Assessment Technical Report*, Parsons, January 2006

Table 4.13-4: Summary of Noise for Category 2 Land Uses (Continued)

Description	Side[1]	Distance from outer traffic lane to property line, feet	BRT Operation Speed mph	Existing Traffic Noise Levels, L_{dn}, dBA	Overall Future No Build Noise Levels[3], L_{dn}, dBA	Overall Future Build Levels[3] Alternatives 3 and 4, L_{dn}, dBA	Overall Future Build Levels[3] Alternatives 1 and 2, L_{dn}, dBA	Criteria, (Impact / Severe) dBA	Distance from Outer Lane to Noise Impact Contours, feet[2] Moderate	Distance from Outer Lane to Noise Impact Contours, feet[2] Severe	Degree of Impact[4]
San Leandro											
East 14th St Between Durant and Davis Ave	East	25	30	70	71	70	70	71/73	20	13	None
	West	25	30	70	70	70	70	71/73	19	12	None
San Leandro – Alternatives 1 and 3 Only											
East 14th St Between San Leandro and Hesperian Blvd	East	20	35	71	72	71	71	72/74	17	11	None
	West	20	35	71	73	72	72	74/76	11	7	None
East 14th St Between 150th Ave and Fairmont Dr	East	20	35	71	72	72	72	72/74	19	12	None
	West	20	35	72	72	72	72	73/75	15	10	None

Notes:
1. The direction shown indicates on which side of the alignment the receptor is located. East/North corresponds to northbound BRT and West//South to southbound BRT.
2. The distances shown in the Moderate and Severe columns represent how far the noise impact contour extends away from the outer traffic lane.
3. Overall noise levels in this column represent the combined noise sources (BRT, Rapid Bus and local traffic).
4. Degree of Impact, as defined by the FTA in its criteria for impacts can include None (No Impact), Impact, and Severe. The FTA "Impact" level of impact is referred to as Moderate Impact in this environmental document.

Source: *Noise and Vibration Impact Assessment Technical Report*, Parsons, January 2006

Table 4.13-5: Summary of Noise Impact for Category 3 Land Uses

Description	Side[1]	Distance from outer traffic lane to property line, feet	BRT Operation Speed mph	Existing Traffic Noise Levels, L_{eq}, dBA	Overall Future No Build Noise Levels[3], L_{eq}, dBA	Overall Future Build Levels[3] Alternatives 3 and 4, L_{eq}, dBA	Overall Future Build Levels[3] Alternatives 1 and 2, L_{eq}, dBA	Criteria, (Impact / Severe) dBA	Distance from Outer Lane to Noise Impact Contours, feet[2] Moderate	Distance from Outer Lane to Noise Impact Contours, feet[2] Severe	Degree of Impact[4]
Berkeley											
Shattuck Ave and	East	44 (Existing and No Build) 31 (Build)	25	69	70	71	71	71/73	-	-	None
Addison St	West	44 (Existing and No Build)	25	69	70	71	71	71/73	-	-	None
Shattuck Ave and	East	31 (Build)	25	69	70	71	71	71/73	-	-	None
Center St	West	44 (Existing and No Build)	25	69	70	71	71	71/73	-	-	None
Shattuck Ave and	East	31 (Build)	25	69	70	71	71	71/73	-	-	None
Allston Way	West	44 (Existing and No Build)	25	69	70	71	71	71/73	-	-	None
Shattuck Ave and	East	31 (Build)	25	69	70	71	71	71/73	-	-	None
Kittredge	West	44 (Existing and No Build)	25	69	70	71	71	71/73	-	-	None

Notes:
1. The direction shown indicates on which side of the alignment the receptor is located. East/North corresponds to northbound BRT and West//South to southbound BRT.
2. The distances shown in the Moderate and Severe columns represent how far the noise impact contour extends away from the outer traffic lane.
3. Overall noise levels in this column represent the combined noise sources (BRT, Rapid Bus and local traffic).
4. Degree of Impact, as defined by the FTA in its criteria for impacts can include None (No Impact), Impact, and Severe. The FTA "Impact" level of impact is referred to as Moderate Impact in this environmental document.

Source: *Noise and Vibration Impact Assessment Technical Report*, Parsons, January 2006

Table 4.13-5: Summary of Noise Impact for Category 3 Land Uses (Continued)

Description	Side[1]	Distance from outer traffic lane to property line, feet	BRT Operation Speed mph	Existing Traffic Noise Levels, L_{eq}, dBA	Overall Future No Build Noise Levels[3], L_{eq}, dBA	Overall Future Build Levels[3] Alternatives 3 and 4, L_{eq}, dBA	Overall Future Build Levels[3] Alternatives 1 and 2, L_{eq}, dBA	Criteria, (Impact / Severe) dBA	Distance from Outer Lane to Noise Impact Contours, feet[2] Moderate	Distance from Outer Lane to Noise Impact Contours, feet[2] Severe	Degree of Impact[4]
Berkeley											
Bancroft Way and Shattuck Ave	North	13	25	68	69	66	65	69/71	6	4	None
	South	25	25	65	66	65	65	66/68	21	13	None
Bancroft Way and Fulton	North	13	25	71	72	68	67	72/74	5	3	None
	South	25	25	69	70	68	68	70/72	17	11	None
Bancroft Way and Dana St	North	13	25	69	69	65	64	70/72	4	3	None
	South	25	25	66	67	65	64	70/72	7	4	None
Bancroft Way and Telegraph Ave	North	13	25	67	68	65	64	68/70	7	4	None
	South	25	25	65	65	64	64	66/69	17	8	None
Durant Ave and Shattuck Ave	North	25	25	61	61	64	64	62/64	-	-	None
	South	25	25	62	63	64	65	64/66	-	-	None
Durant Ave and Dana St	North	25	25	67	67	67	67	68/70	19	12	None
	South	25	25	67	67	67	67	68/70	19	12	None
Durant Ave and Telegraph Ave	North	25	25	66	67	67	67	68/70	19	12	None
	South	25	25	66	67	67	67	68/70	19	12	None
Telegraph Ave and Bancroft Way	East	19	25	66	66	62	62	67/69	6	4	None
	West	19	25	65	66	62	62	67/69	6	4	None
Telegraph Ave and Durant Ave	East	19	25	66	66	62	62	67/69	6	4	None
	West	19	25	65	66	62	62	67/69	6	4	None
Telegraph Ave and Channing Way	East	19	25	66	66	62	62	67/69	6	4	None
	West	19	25	66	66	62	62	67/69	6	4	None
Telegraph Ave and Derby St	East	25	25	69	70	69	69	70/72	20	13	None
	West	-	-	-	-	-	-	-	-	-	-

Notes:
1. The direction shown indicates on which side of the alignment the receptor is located. East/North corresponds to northbound BRT and West//South to southbound BRT.
2. The distances shown in the Moderate and Severe columns represent how far the noise impact contour extends away from the outer traffic lane.
3. Overall noise levels in this column represent the combined noise sources (BRT, Rapid Bus and local traffic).
4. Degree of Impact, as defined by the FTA in its criteria for impacts can include None (No Impact), Impact, and Severe. The FTA "Impact" level of impact is referred to as Moderate Impact in this environmental document.

Source: *Noise and Vibration Impact Assessment Technical Report*, Parsons, January 2006

Table 4.13-5: Summary of Noise Impacts for Category 3 Land Uses (Continued)

Description	Side[1]	Distance from outer traffic lane to property line, feet	BRT Operation Speed mph	Existing Traffic Noise Levels, L_{eq}, dBA	Overall Future No Build Noise Levels[3], L_{eq}, dBA	Overall Future Build Levels[3] Alternatives 3 and 4, L_{eq}, dBA	Overall Future Build Levels[3] Alternatives 1 and 2, L_{eq}, dBA	Criteria, (Impact / Severe) dBA	Distance from Outer Lane to Noise Impact Contours, feet[2] Moderate	Distance from Outer Lane to Noise Impact Contours, feet[2] Severe	Degree of Impact[4]
North Oakland											
Telegraph Ave and 50th St	East	25	25	69	71	69	69	70/72	20	13	None
	West	-	-	-	-	-	-	-	-	-	-
South Oakland											
International Blvd and 23rd Ave	East	-	-	-	-	-	-	-	-	-	-
	West	25	25	69	70	69	69	70/72	20	13	None
International Blvd and 29th Ave	East	-	-	-	-	-	-	-			-
	West	25	25	69	70	69	69	70/72	20	13	None
International Blvd and Seminary Ave	East	25	25	70	72	70	70	71/73	20	13	None
	West	-	-	-	-	-	-	-	-	-	-
International Blvd and 66th Ave	East	-	-	-	-	-	-	-	-	-	-
	West	25	25	70	71	70	70	71/73	20	13	None
International Blvd and 82nd Ave	East	25	25	70	71	70	70	71/73	20	13	None
	West	25	25	70	71	70	70	71/73	20	13	None
International Blvd and 98th Ave	East	25	25	70	71	70	70	71/73	20	13	None
	West	25	25	70	71	70	70	71/73	20	13	None

Notes:
1. The direction shown indicates on which side of the alignment the receptor is located. East/North corresponds to northbound BRT and West//South to southbound BRT.
2. The distances shown in the Moderate and Severe columns represent how far the noise impact contour extends away from the outer traffic lane.
3. Overall noise levels in this column represent the combined noise sources (BRT, Rapid Bus and local traffic).
4. Degree of Impact, as defined by the FTA in its criteria for impacts can include None (No Impact), Impact, and Severe. The FTA "Impact" level of impact is referred to as Moderate Impact in this environmental document.

Source: *Noise and Vibration Impact Assessment Technical Report*, Parsons, January 2006

Table 4.13-6 presents a summary of the traffic noise impacts from the AC Transit East Bay BRT Project in the year 2025. As shown in Table 4.13-6, project noise levels under the *Two-Way Transitway via Bancroft Way* alignment variation are predicted to exceed the FTA Category 2 Land Use moderate impact criteria at 23 buildings consisting of three single-family residences and 68 multi-family residences. Other alignment variations in Berkeley are not predicted to exceed Category 2 moderate impact criteria. The Category 2 severe impact criteria are not exceeded at any location. There are no moderate or severe impacts for Category 3 land uses with the project.

Table 4.13-6: Summary of Noise Impact Areas from East Bay BRT Operations (Year 2025)

Segment/Alternative	Type and Number of Sensitive Structures/Land Use Impacted[1]	
Berkeley to North Oakland		
East Bay BRT Build Alternatives:	Cat. 2	Cat. 3
No. of Moderately Impacted Buildings	3 SFR, 68 MFR (23 Buildings)[2]	0 SCH, 0 CH
No. of Severely Impacted Buildings	0 SFR, 0 MFR	0 SCH, 0 CH

Note:
[1] SFR: Single Family Residence; MFR: Multi Family Residence; SCH: School; CH: Church.
[2] Impacts would occur under the Two-Way via Bancroft Way alignment variation only.
Source: *Noise and Vibration Impact Assessment Technical Report*, Parsons, January 2006

4.13.3.2 VIBRATION IMPACTS

The East Bay BRT Project was screened for vibration impacts in accordance with the *FTA Transit Noise and Vibration Impact Assessment Manual*. Because buses have rubber tires and suspension systems that isolate vibrations from the ground, vibration impact assessment was not warranted (US DOT, 1995).

4.13.4 Avoidance, Minimization, and/or Mitigation Measures

4.13.4.1 NOISE

The East Bay BRT would use Van Hool buses, which are substantially quieter than conventional buses. Only one area along the alignment (Durant Avenue between Shattuck Avenue and Telegraph Avenue) would be affected by noise levels at the moderate level (FTA Impact level). This moderate impact would occur with the *Two-Way Transitway via Bancroft Way* alignment variation only, because bus-designated center lanes on Bancroft Way would displace car traffic to streets parallel to the alignment such as Durant Avenue. The increased traffic volume would increase noise levels. Because the affected streets are in an urban environment, using noise barriers to reduce noise is not a reasonable solution. Furthermore, the required noise reduction is minimal (less than 1 dB). The impact does not meet or exceed the FTA threshold for severe impacts.

4.13.4.2 VIBRATION

No vibration impacts are anticipated under the East Bay BRT Project, and therefore, no avoidance, minimization, and/or mitigation measures are proposed.

4.14 Energy

4.14.1 Energy Consumption

This section compares energy use under the No-Build and Build Alternatives to determine the effect of the proposed project on energy consumption as a result of anticipated changes in travel patterns within the project corridor. The focus is on direct energy use, which refers to the energy consumed in the operation of vehicles, including autos, buses, trains, and trucks.

4.14.2 Environmental Consequences

Direct energy impacts of the No-Build and Build Alternatives were estimated in terms of anticipated changes to auto and bus vehicle miles of travel (VMT) under 2025 conditions. VMT estimates were obtained from travel demand model forecasts for Alameda County, which offers a geographic area large enough to capture travel changes resulting from the No-Build and Build Alternatives. The difference in VMT under No-Build and Build conditions can be translated into a difference in energy use by applying factors for fuel efficiency.[10]

Travel forecasts indicate that auto VMT in Alameda County would decrease under the Build Alternatives as compared to the No-Build Alternative, since some individuals would switch travel modes from automobiles to BRT vehicles. As shown in Table 4.14-1, when compared to the No-Build Alternative, annual auto VMT under 2025 conditions is expected to be approximately four million less under Alternatives 1 and 2, seven million less under Alternative 3, and six million less under Alternative 4. By contrast, bus VMT under any of the Build Alternatives is expected to be approximately one million more than under the No-Build Alternative, due to the higher frequency of bus service in the project corridor.

Under build conditions, auto VMT would decrease more than bus VMT would increase. However, buses are not as energy efficient as autos; thus, the net effect of these changes on direct energy use within the project corridor would be modest. (Alternative fuel buses may be procured and designated for BRT service in the future. These vehicles are more energy efficient and would therefore have a positive effect on reducing energy use in the corridor. However, to be conservative, the impacts analysis was based on the current fuel economy of articulated buses.)

Table 4.14-1 compares energy consumption under the 2025 No-Build and Build Alternatives. Consumption is expressed in British Thermal Units (BTUs), a standardized measure of energy

[10] For energy calculations, the fuel efficiency of automobiles in 2025 was assumed to be 22.6 miles per gallon of gasoline, based on the assumption in the air quality model for auto fuel efficiency in 2025 for Alameda County. The fuel efficiency of articulated buses was assumed to be 4.5 miles per gallon. Generally, a 60-foot Van Hool bus has a fuel-efficiency of approximately four miles per gallon. On the other hand, fuel cell buses are more fuel-efficient at eight miles per gallon. By 2025, if the BRT fleet becomes more fuel efficient than what has been assumed in this study (for example, by acquiring more fuel cell buses), then the energy savings under the Build Alternatives would be greater.

content of the various fuels consumes by autos and buses.[11] The energy equivalent in gallons of gasoline is also shown.

Table 4.14-1: Estimated Energy Usage for Alameda County, No-Build and Build Alternatives (2025)

Alternative	Annual Auto VMT* (in millions)	Annual Bus VMT* (in millions)	Total BTUs* (in trillions)	Equivalent in Gallons of Gasoline* (in millions)
No-Project	11,136.5	2.3	54.5	493.3
Alternative 1	11,133.0	3.0	54.5	493.4
Alternative 2	11,133.4	3.0	54.5	493.4
Alternative 3	11,130.3	2.9	54.5	493.2
Alternative 4	11,131.2	2.9	54.5	493.3

Notes:
VMT = Vehicle miles of travel
BTU = British thermal unit, a measure of energy consumption.

Source: *Operating Plan and Cost Analysis, Technical Memorandum – East Bay BRT EIR/EIS* (Nelson Nygaard, 2005). Travel forecasts provided by Cambridge Systematics.

The energy impacts of the Build Alternatives as compared to the No-Build Alternative would be negligible. Total energy consumption under each Build Alternatives would be similar, about 54 trillion BTUs, which translates to about 493 million gallons of gasoline. Because energy consumption would be comparable under both No-Build and Build conditions, the proposed project is anticipated to have no adverse effect on direct energy use. No mitigation of impacts is warranted.

4.15 Biological Environment

4.15.1 Regulatory Setting

The following laws and regulations apply to biological resources:

4.15.1.1 FEDERAL

National Environmental Policy Act
Migratory Bird Treaty Act
Fish and Wildlife Coordination Act
Clean Water Act (33 U.S.C. 1344), Sections 401 and 404
Executive Order 11990 – Protection of Wetlands
Executive Order 13112 of February 3, 1999 – Invasive Species
Federal Endangered Species Act (FESA). See United States Code 16 (USC), Section 1531, et. seq. See also 50 CFR Part 402

[11] BTU, British thermal unit, is a standard English system unit of energy. One BTU is the amount of energy required to raise the temperature of one pound of water by one degree Fahrenheit.

4.15.1.2 STATE

California Environmental Quality Act, Public Resources Code, Sections 2100-21177
Department of Fish and Game (CDFG) Code Sections 1600-1607 and 4150-4152
California Endangered Species Act (CESA). See California Fish and Game Code, Section 2050
Native Plant Protection Act. See Fish and Game Code, Section 1900-1913

4.15.2 Affected Environment

The vicinity of the proposed project is fully developed and generally paved with concrete and asphalt. No sizable natural habitat for plant, animal, or bird species remains. Most creeks in the project area have been intercepted upstream of the project area and cross the proposed alignment in culverts underneath the pavement.

The San Leandro Creek flows under East 14th Street in an open unlined channel on the east and west sides of the street. The creek is the outflow channel for Lake Chabot and is highly vegetated. The structure over the creek would not be widened for the proposed project; alterations would be restricted to restriping of traffic lanes on the bridge.

The Estudillo Canal is at the southernmost portion of the alignment for Alternatives 1 and 3, routing storm drain and surface runoff westerly toward the bay. The proposed project would use a previously paved area adjacent to the canal, but would not otherwise cross or enter the canal itself.

No wetlands are present within the construction area.

4.15.3 Environmental Consequences

No impacts to biological resources are anticipated.

4.15.4 Avoidance, Minimization, and/or Mitigation Measures

None proposed. BMPs would be followed as described in Section 4.16.7, Construction Impacts (Hydrology and Water Quality), to avoid effects to surface water.

In compliance with the Executive Order on Invasive Species, E.O. 13112, the landscaping included in the proposed project would not use species listed as noxious weeds.

4.16 Construction Impacts

4.16.1 Construction Stages, Schedule, and Work Hours

Construction would remove existing street pavement, curbs, and sidewalks along the transitway and relocate some utilities at station locations. Transitway pavement, curbs, and medians would be constructed. Station construction would include platform slabs, walkways, utility feeds, platform shelters, and station amenities. Sidewalks and curbs removed along the alignment would be replaced as necessary. Signs, traffic signals, and pavement markings would be added along the alignment.

Construction would start with the advanced utility relocation in the identified station areas. (See Section 4.5-1, Utilities Located in the Vicinity of Proposed Station Areas.) Relocation of utilities

under the BRT transitway would not be necessary. Utility relocation in the station areas would consist of valves, fire hydrants, electric poles, utility boxes and vaults. Utility lines running under station platforms for which access is required would be relocated. This is localized work which would be completed within a few weeks at each station. During this time traffic would be restricted around the station area by closing one or two lanes.

BRT transitway construction would be accomplished by closing two lanes of traffic and maintaining traffic in the remaining lanes. Most work would be accomplished during day time hours; however, some night time work may be necessary.

To minimize the impacts and shorten the duration of the BRT transitway construction, several non-contiguous areas could be constructed at the same time. Within each area work would be sequenced so that no more than two or three contiguous blocks are under construction at any time. Consecutive intersections would not be closed at the same time. Access to driveways would be maintained except for short durations with agreement of the property owner and/or tenant. Pedestrian access, including wheelchair ramps and temporary sidewalks, would be maintained at all times.

The stages of the construction would begin with demolition of existing curb, gutter and sidewalk where necessary and reconstructing those facilities. Storm drain inlets would be reconstructed at the same time as the curbs. In these instances the demolished and excavated materials would be hauled away in trucks. New backfill materials and concrete would be delivered to the site.

Next, existing pavement in the BRT transitway would be saw cut along the outer edges, removed by impact hammers and front-end loaders and hauled away in trucks. Aggregate base delivered by trucks would be spread by machine and hand and watered to control dust. New Portland Cement Concrete pavement would be delivered to the site by mixer truck backing to the work area in the transitway from the nearest intersection.

Station platform areas would be similarly constructed with most of the work area accessed from the BRT transitway. Most of the other station work is to be done by hand or with assistance of small rubber tires cranes for heavy objects.

Traffic signals, signage and pavement markings constitute the final stage of the construction.

4.16.2 Traffic and Transportation/Pedestrian and Bicycle Facilities

During the construction of the BRT project, both the transitway and stations, there would be traffic disruption primarily due to the closure of two lanes of existing traffic. This is a condition, however, that would continue post construction as the BRT transitway permanently replaces the two existing traffic lanes. During construction and afterwards, two lanes (one in each direction) would remain open for vehicular traffic. This would allow motorists to adjust to lane availability after construction has been completed. Construction may require removal of curbside parking and closures of streets and intersections, but these measures would be temporary and of limited duration.

Pedestrian access including wheelchair accessible ramps and temporary sidewalks where needed would be maintained during construction. A separate bicycle project may be developed by others, but is not a part of this project.

4.16.3 Community Impacts

4.16.3.1 EFFECTS ON LOCAL ACCESS

Construction of the AC Transit BRT Project would involve temporary lane closures or detours in the vicinity of the project. However, auto access to public services and facilities and to businesses would be maintained during normal business hours either by maintaining one or more traffic lanes open or providing an alternate travel route. Similarly, pedestrian access to services and businesses affected by construction would be maintained by ensuring safe pathways are available.

In addition, AC Transit would undertake the following steps to mitigate the inconvenience of construction:

- Motorized and non-motorized traffic management plans would be prepared by the contractor and would need to be approved by AC Transit prior to beginning construction. The plans would demonstrate how safe access would be provided during business hours. Complete closures of roadways would be the exception, with times and locations to be identified in the traffic management plan and approval of closures required by AC Transit and the appropriate city in which the work is proposed.
- AC Transit would conduct public outreach in areas of construction to advise individuals and businesses of planned activities. Construction activity schedules would be publicly available and posted on a project status web site maintained by AC Transit.
- AC Transit would establish a database of property owners along the project corridor and of other individuals or agencies expressing interest in notification of construction activity. The database would allow AC Transit to contact property owners directly, by mail or phone, in advance of construction.
- AC Transit would provide signage in construction zones identifying travel routes and times and specific zones of construction activity. Community facilities and businesses would be provided signs indicating points of access, parking areas as appropriate, and hours of operation.

4.16.3.2 EFFECTS OF CONSTRUCTION STAGING

During the construction period, sites along the project corridor would be acquired for equipment and materials storage. These types of sites are designated staging areas. Temporary easements would likely need to be acquired by the contractor or by AC Transit on behalf of the contractor. Wherever possible, such staging areas would be vacant or underutilized parcels along the BRT alignment. Some sites might be temporarily converted from other uses, for example parking, to construction staging activities. AC Transit does not anticipate acquiring or removing existing structures (unless already planned for demolition by others) to establish staging areas. Any property owners providing a staging area would be financially compensated by AC Transit for temporary use of the property.

4.16.4 Utilities/Service Systems

Utilities would be relocated in advance of construction and would be localized to the area near each proposed station location. Relocation of parallel utilities under the BRT transitway is not planned. Valves, fire hydrants, electrical poles, utility boxes, and vaults would be relocated for gas, electric, telephone, wastewater, and fiber optic/cable TV facilities. Disruption at each area should be no more than a few weeks. Either the individual utility owners or AC Transit would relocate the utility. Responsibility for each relocation would be established during final design of the project.[12]

4.16.5 Visual/Aesthetics

Construction activity for the BRT project would involve the typical use of a variety of construction equipment and workers. It would be obvious that construction activity is underway. The project corridor is primarily urban in development and the construction would take place within the existing roadway. Materials would be temporarily stockpiled on site. The contractor would be required to maintain the site in an orderly manner and daily clear away any debris created by construction workers or activity.

To the degree possible, avoidance and minimization measures would be used to protect mature trees, other vegetation and existing streetscape. In some cases where the BRT transitway would be located in existing median, this may not always be possible and some streetscape and trees would be removed.

No major adverse impacts are anticipated; therefore, no mitigation would be necessary beyond the use of BMPs. Re-landscaping or replanting of trees would be undertaken where appropriate.

4.16.6 Cultural Resources

As described in Section 4.7, Cultural Resources, no historic structures would be disturbed during construction activities. Furthermore, it is not anticipated that construction activities would encounter or disturb buried cultural resources. In the unlikely event that cultural materials are unearthed during construction, AC Transit and FTA would comply with 36 CFR 800.13 regarding late discoveries. The following measures would be taken, as described in the *Site Treatment Plan for the Alameda–Contra Costa Transit District's East Bay Rapid Transit Project in Berkeley, Oakland, and San Leandro* (Archaeological/Historical Consultants, November 2005):

1. An archaeologist would monitor any construction work within the project alignment in sensitive locations (identified in the *Site Treatment Plan*).
2. If buried cultural materials (either prehistoric or historic) are encountered during construction, work would stop in that area until a qualified archaeologist can evaluate the nature and significance of the find. Depending on the type of feature, the archaeologist may recommend archaeological excavation to either evaluate, record, or remove the feature.

[12] The capital cost estimate for the proposed project assumes that AC Transit would fund utilities relocations and adjustments resulting from conflicts with the project. However, utility upgrades would be the responsibility of individual utilities. In addition, depending upon franchise agreements that utilities may have entered into with individual cities, private utilities may be responsible for funding relocation costs.

3. If human remains are encountered, construction work in the area would be halted and the Alameda County Coroner contacted. In addition, if the remains are Native American, the California Native American Heritage Commission (NAHC) would be immediately contacted. The NAHC would identify the most likely descendants who would be consulted on the disposition of Native American human remains and associated artifacts.
4. Arrangements would be made with an authorized facility for permanent curation of any recovered artifactual materials.
5. The archaeological monitor would inform construction crews, prior to construction work, of material types that might be encountered under the street. Prior to construction, contractors and workers would be informed of reporting requirements in the event that buried cultural materials or human remains were found, whether in monitored areas or not.

4.16.7 Hydrology and Water Quality

4.16.7.1 Environmental Consequences

Construction activity that disturbs ground conditions would potentially result in increased erosion and sedimentation. The No-Build Alternative would not substantially disturb existing ground conditions and would not impact water resources, including storm water runoff. The Build Alternatives would remove roadway pavement and excavate and grade along the transitway and in station areas. Excavated materials would be temporarily stored at various locations along the alignment. Exposure and loosening of soils and subsurface materials have the potential to affect the quality of water runoff into storm drains along the project alignment during the San Francisco Bay Area's rainy season if the materials are not contained.

4.16.7.2 Avoidance, Minimization, and/or Mitigation

Under the Build Alternatives, construction sites where subsurface materials are exposed would be controlled to prevent dust, debris, and sediment from entering runoff. Drain basins would be protected by devices to stop and collect any sediment and debris that does enter runoff.

AC Transit would require the contractor to develop and implement a Storm Water Pollution Prevention Plan (SWPPP). The plan would be prepared prior to beginning construction activities and detail the contractor's plan for controlling runoff. The SWPPP would specify the major storage locations for excavated materials and for any delivered materials not immediately set in place. Water quality control measures for these sites would be described.

The SWPPP would outline control measures to be taken as well as BMPs to be implemented to control and prevent to the maximum extent practicable the discharge of pollutants to surface waters and groundwater. Treatment BMPs that would be implemented for the project would mainly consist of mechanical devices such as catch basin inserts or other in-line filtering devices during construction. In addition, the SWPPP would include a plan for responding to and managing accidental spills during construction and a plan for the management and disposal of pumped ponded water or groundwater. The SWPPP would address overall management of the construction project, such as designating areas for equipment fueling, concrete washout, and stockpiles.

In support of or in addition to the above, AC Transit would implement the following measures to address drainage and runoff related impacts of East Bay BRT Project construction:

- AC Transit would require the contractor to submit and implement an approved Erosion and Sediment Control Plan (ESCP). The plan would emphasize standard temporary erosion control measures to reduce sedimentation and turbidity of surface runoff from disturbed areas during each rainy season (October 1 to May 1).
- AC Transit would require the contractor to submit a Spill Prevention, Contaminant and Clean-up (SPCC) plan for fuels, oils, lubricants, and other hazardous materials that may be used during construction.

No construction would be performed until both the ESCP and SPCC are accepted by AC Transit.

4.16.8 Hazardous Materials

4.16.8.1 Environmental Consequences

The potential for encountering pre-existing hazardous materials is present in the types of construction proposed for the project corridor. As described in Section 4.11, Hazardous Wastes/Materials, there are a number of environmental risk sites, primarily LUST sites, which potentially have resulted in contamination of soils along the proposed East Bay BRT alignment. Known potential contaminants include petroleum hydrocarbons (from gasoline and diesel fuels) and, at a few locations, heavy metals. There is also the potential to encounter unknown sources of contamination.

No impact would occur under the No-Build Alternative because of the very limited construction, almost entirely above ground, proposed to implement station and traffic signal improvements.

Construction of the Build Alternatives would remove the roadway pavement and subgrade materials in various locations. In most locations, the depth of construction would be shallow and not expose substantial subsurface areas, including previously undisturbed materials. In some locations, mainly stations, construction would be to greater depths to provide for the foundations of major above-ground facilities. The amounts of materials disturbed at these locations and removed to disposal sites would be greater. The potential for encountering hazardous materials is also greater as a result. The locations where hazardous materials have been previously identified along the East Bay BRT Project alignment are listed in Tables 4.11-1 and 4.11-2.

Hazardous materials impacts would occur if construction workers or members of the public were exposed to hazardous materials during excavation, grading and related construction activities or if the likelihood of hazardous waste migration were increased by construction activities.

4.16.8.2 Avoidance, Minimization, and/or Mitigation Measures

Impacts of the Build Alternatives would be mitigated by implementing the following measures:

Ongoing Reconnaissance. Walk-through level site reconnaissance would be conducted by the contractor and AC Transit construction engineers at sites where contamination is possible in order to determine if contamination is present or likely.

Site Evaluation. A site evaluation would be made of any known or suspected contaminated sites before soil is removed using the following procedure: 1) preparation of a health and safety plan; 2) preparation of a site specific work plan specifying the proposed locations for subsurface samples or borings or trenches; 3) soil boring or trenching and sample collection; 4) laboratory analysis of samples; and 5) preparation of a findings and recommendations report. If site-specific evaluations determine that contaminants are present, AC Transit would identify the type and extent of contamination and prepare and implement a remediation plan to avoid risks to public health and safety.

For contaminated groundwater, remediation would include measures such as the following:

- Extraction and disposal.
- In-situ treatment (bioremediation, chemical alteration, etc.).
- Leave in place (cap or contain with slurry walls, if necessary).

4.16.9 Air Quality

4.16.9.1 IMPACTS

The Bay Area Air Quality Management District's (BAAQMD's) approach to the analysis of construction impacts is to emphasize the implementation of effective and comprehensive control measures. According to the BAAQMD, if the appropriate construction controls are implemented, air pollutant emissions for construction activities would not be considered adverse.

PM_{10}, which is primarily emitted from earthmoving activities, is the pollutant of greatest concern with respect to construction activities. The BAAQMD Guidelines provide feasible control measures for construction emissions of PM_{10}. These control measures are listed in Section 4.16.9.2, Avoidance, Minimization, and/or Mitigation Measures, as are measures to reduce emissions from construction equipment. PM_{10} control measures would also limit $PM_{2.5}$ fugitive dust emissions. Under appropriate construction controls, there would be no adverse impacts from air pollutant emissions for construction activities.

No-Build Alternative

The No-Build Alternative would improve the bus fleet and enhance the current bus system. Selected bus stops (benches, shelters, maps/signs, and bus arrival information) would be improved. Although no major construction would occur, some construction would be necessary to make the improvements. Construction activities that would occur for the No-Build Alternative would implement feasible BAAQMD control measures as listed in Section 4.16.9.2, Avoidance, Minimization, and/or Mitigation Measures. Under these construction controls, there would be no adverse impacts from air pollutant emissions associated with construction activities.

Build Alternatives

Construction of the Build Alternatives includes utility relocation; removal of existing pavement for the width of the BRT transitway and curbs; construction of the BRT curbs, medians, and pavement; reconstruction of existing curbs and sidewalks; construction of platforms slabs and walkways; construction of station utility feeds; construction of platform shelters and amenities; and construction or modification of traffic signals, signing and pavement markings. The following construction activities would temporarily create emissions of dusts, fumes, equipment exhaust, and other air contaminants:

1. Removal of existing pavement,
2. Construction workers traveling to and from project sites,
3. Delivery and hauling of construction supplies and debris to and from project sites, and
4. Fuel combustion by on-site construction equipment.

To shorten the overall duration of construction, it is possible that two or three areas would be constructed simultaneously. Within each area, work would be sequenced so that only two or three contiguous blocks would be under construction at any one time. It is estimated, therefore, that approximately 1.65 acres would be under construction at one time, with the potential for approximately 84 pounds of PM_{10} emissions per day.

In addition to PM_{10} emissions, exhaust from construction equipment also contributes to pollutant emissions. Table 4.16.9-1 shows unmitigated and mitigated equipment exhaust emissions associated with construction of the Build Alternatives. The mitigated equipment exhaust emissions assume implementation of the emissions control measures listed in Section 4.16.9.2, Avoidance Minimization, and/or Mitigation Measures.

Table 4.16.9-1: Estimated Daily Construction Equipment Exhaust Emissions

Pollutants	Pounds per Day	
	Daily Emissions (unmitigated)	Daily Emissions (mitigated)
PM_{10}	9	<1
$PM_{2.5}$[1]	8	<1
CO	541	54
ROG	36	4
NO_X	166	76
SO_X	18	18

Notes:
[1] Construction exhaust $PM_{2.5}$ emissions were calculated as 89 percent of PM_{10} emissions.
Source: Terry A. Hayes Associates LLC

4.16.9.2 AVOIDANCE MINIMIZATION, AND/OR MITIGATION MEASURES

Emissions control measures, such as the following, would ensure that there would be no adverse air quality impacts during construction:

- All active construction areas shall be watered at least twice daily.
- All trucks hauling soil, sand, and other loose materials shall be covered and shall maintain at least two feet of freeboard.
- All unpaved access roads, parking areas, and staging areas in the construction area shall be watered at least three times daily or shall be applied with non-toxic soil stabilizers.
- All paved access roads, parking areas, and staging areas in the construction area shall be swept daily with water sweepers.
- Streets shall be swept daily with water sweepers if visible soil material is carried onto adjacent public streets.
- Non-toxic soil stabilizers shall be applied to inactive construction areas (previously graded areas that are inactive for ten days or more).
- Exposed stockpiles of dirt, sand, or debris shall be enclosed, covered, watered at least twice daily, or applied with non-toxic soil binders.
- Traffic speeds on unpaved roads shall be limited to 15 miles per hour.
- Wheel washers shall be installed on all trucks or tires/tracks of all trucks, and equipment leaving the construction area shall be washed.
- Excavation and grading activities shall be suspended when winds exceed 25 miles per hour.
- Construction equipment shall use cool exhaust gas recirculation.
- Construction equipment shall use aqueous diesel fuel.
- Construction contracts shall explicitly stipulate that all construction equipment shall be properly tuned and maintained.

4.16.10 Noise and Vibration

4.16.10.1 NOISE

Construction noise varies greatly depending on the construction process, type, and condition of equipment used, and layout of the construction site. Many of these factors are traditionally left to the contractor's discretion, which makes it difficult to accurately forecast levels of construction noise. Overall, construction noise levels are governed primarily by the noisiest pieces of equipment. For most construction equipment, the engine, which is usually diesel, is the dominant noise source. This is particularly true of engines without sufficient muffling. For special activities such as impact pile driving and pavement breaking, noise generated by the actual process dominates.

Construction Noise Ordinances

Local jurisdictions typically have noise ordinances that set limits on construction and other nuisance noises. The cities of Berkeley and Oakland have such ordinances, which are summarized in Table 4.16.10-1.

Table 4.16.10-1: Summary of Local Noise Ordinances

Jurisdiction	Maximum Allowable Levels or Exemption			
	Time	**Single Family Residences**	**Multi-Family Residences**	**Commercial**
Berkeley	Weekdays, 7:00 a.m. to 7:00 p.m.	75 dBA	80 dBA	85 dBA
	Weekends and legal holidays, 9:00 a.m. to 8:00 p.m.	60 dBA	65 dBA	70 dBA
	[It is prohibited to operate or cause] the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between weekday hours of 7 p.m. and 7 a.m., or 8 p.m. and 9 a.m. on weekends or holidays such that the sound therefrom creates a noise disturbance across a residential or commercial real property line.			
Oakland	The persistent maintenance or emission of any noise or sound produced by human, animal or mechanical means, between the hours of 9 p.m. and 7 a.m. that, by reason of its raucous or nerve-racking nature, disturbs the peace or comfort or be injurious to the health of any person shall constitute a nuisance. Construction Noise provisions. A. All construction equipment powered by internal combustion engines shall be properly muffled and maintained. B. Unnecessary idling of internal combustion engines is prohibited. C. All stationary noise-generating construction equipment are to be located as far as is practical from existing residences. D. Quiet construction equipment, particularly air compressors, are to be selected whenever possible. E. Use of pile drivers and jack hammers shall be prohibited on Sundays and holidays, except for emergencies and as approved in advance by the Building Official.			

Source: *Noise and Vibration Impact Assessment Technical Report*, Parsons, January 2006

The City of San Leandro does not have specific limitations for their construction noise ordinance other than construction work should be limited to daytime hours. The recommended FTA construction noise limits will be used instead to assess construction noise impacts. Table 4.16.10-2 presents the recommended FTA noise limits for 8-hour average noise levels (Leq) at the property line of the nearest location to the construction site.

Table 4.16.10-2: FTA Allowable Construction Noise Levels

Land Use	Daytime (7 a.m. to 10 p.m.) Leq[1], dBA	Nighttime (10 p.m. to 7 a.m.) Leq[1], dBA
Residential	80	70
Commercial	85	85
Industrial	90	90

Notes:
[1] Leq for 8 hours.
Source: USDOT, 1995.

Impacts

Table 4.16.10-3 summarizes typical construction noise emission levels (Lmax) of construction equipment operating at full power at a reference distance of 50 feet, and an estimated equipment usage factor (UF) based on experience with other similar construction projects.[13] The noise levels in the table represent typical values. Distance and operating conditions are considered as they cause wide fluctuations in the noise emissions of similar equipment. In all areas between the roadway and sensitive receptors, a ground factor (G) of 0.0 was used, as most of the ground cover along the alignment is acoustically hard. This factor represents an acoustically hard ground cover, which represents the ground effect as the sound propagates from the source to the receptor. This ground factor is representative of the majority of the areas along the East Bay project alignment.

Noise impacts from construction activities are anticipated at any residential location within 25 to 90 feet of the construction activity, depending on the construction phase. Most of the construction would consist of site preparation and paving and would occur only during daytime hours. Construction activities conducted during daytime hours will have a lesser noise impact than nighttime construction, due to the higher background noise levels present during the day. There may be locations, however, where nighttime construction would be unobtrusive, such as commercial areas where the land use is unoccupied during nighttime hours, or industrial districts which are generally not sensitive to noise.

Noise impacts could also occur at sensitive land uses that are adjacent to construction lay-down or staging areas, where construction equipment and materials are stored and accessed during the construction period. At the time of the noise analysis, specific locations and details of the lay-down areas were undetermined. If a lay-down area is selected that is within 90 feet of a residential area, it is possible that noise impacts could occur, and mitigation would be required.

4.16.10.2 VIBRATION

Vibration Methodology and Criteria

Ground-borne vibration can be described in terms of displacement, velocity or acceleration. Velocity is the preferred measure for evaluating ground-borne vibration from transit projects, because sensitivity to vibration typically corresponds to the amplitude of vibration velocity within the low-frequency range of most concern for environmental vibration (roughly 5-100 Hz). Peak particle velocity (PPV) is the measure typically used in monitoring blasting and other types of construction-generated vibration, since it is related to the stresses experienced by building components. Human response is better correlated to the average amplitude of the vibration velocity level. This measure is expressed as Vdb. The threshold at which humans perceive vibration is approximately 65 VdB. The threshold at which vibration is annoying to humans is approximately 70 VdB.

[13] The usage factor is a fraction that accounts for the total time during an eight-hour day in which a piece of construction equipment is producing noise under full power.

Table 4.16.10-3: Typical Construction Noise Levels

No. of Items	Equipment Type	Maximum Equipment Noise Level at 50 ft, dBA	Hourly Equivalent Noise Levels at 50 ft, dBA [1]	Hourly Equivalent Noise Levels at 100 ft, dBA [1]
Clear and Grub				
1	Excavator	83	80	74
1	Backhoe	75	72	66
1	Medium Duty Dump Truck	77	74	68
		Combined L_{eq}(h)	82	76
Earthwork				
1	Excavator	83	80	74
1	Backhoe	75	72	66
1	Front Loader	74	71	65
1	Blade	77	74	68
1	Asphalt Cutter	81	78	72
2	Heavy Duty Dump Trucks	82	79	73
		Combined L_{eq}(h)	86	80
Base Core				
1	Front Loader	74	71	65
1	Scraper	80	77	71
1	Blade	77	74	68
1	Smooth Drum Roller	76	73	67
1	Water Truck	73	70	64
2	Heavy Duty Dump Trucks	82	79	73
		Combined L_{eq}(h)	85	79
Paving				
1	Smooth Drum Roller	76	73	67
1	Backhoe	75	72	66
1	Asphalt Paver	74	71	65
1	Ready Mix Trucks	81	78	72
2	Heavy Duty Dump Trucks	82	79	73
1	Flatbed Truck	75	72	66
		Combined L_{eq}(h)	85	79
Curb and Gutter				
1	Excavator	83	80	74
1	Front Loader	77	74	68
2	Heavy Duty Dump Trucks	82	79	73
		Combined L_{eq}(h)	85	79

Notes: Calculated construction noise levels assume that all equipment operate for six hours out of an eight hour day. Calculations also assume that all equipment are operated at full load 70 % of the time.

1 - Predicted noise levels are from the center of the construction activity.

Source: Parsons 2005

Impacts

Two types of construction vibration impacts were analyzed: human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Fragile buildings such as historical structures or ancient ruins are generally more susceptible to damage from ground vibration. Buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet based on typical construction equipment vibration levels. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment.

The vibration produced by construction equipment was obtained from FTA's *Transit Noise and Vibration Impact Assessment* (USDOT, 1995) and from field measurements, and is shown in Table 4.16.10-4. The distances shown in Table 4.16.10-5 are the minimum distances at which short-term construction vibration impacts may occur. Mitigation would be required if construction equipment were to operate within the distances shown in Table 4.16.10-5 from wood-framed buildings, such as single family residences, located along the project alignment.

Table 4.16.10-4: Vibration Source Levels for Construction Equipment

Equipment	PPV [1] at 25 feet (in./sec)	Approximate Velocity Level [2] at 25 ft (VdB)
Large bulldozer	0.089	87
Loaded trucks	0.076	86
Excavator	0.11	89
Small bulldozer	0.003	58
Vibratory compactor/roller	0.55[3]	103[3]

Notes:
[1] Peak particle ground velocity measured at 25 feet unless noted otherwise.
[2] RMS ground velocity in VdB referenced to 1 micro-in/second.
[3] Measured at 15 feet by Parsons.

Source: USDOT, 1995.

4.16.10.3 Avoidance, Minimization, and/or Mitigation Measures

Construction impacts are of a temporary nature, and construction is a necessary part of the East Bay BRT Project. Measures may be required to minimize construction noise and vibration, and a noise variance may be required in certain municipalities.

Table 4.16.10-5: Construction Equipment Vibration Impact Distances

Equipment	Distance to Vibration Annoyance[1], feet	Distance to Vibration Building Damage[2], feet
Large bulldozer	45	--
Loaded trucks	40	--
Excavator	50	--
Small bulldozer	--	--
Vibratory compactor/roller	85	15

Notes:
[1] This is the distance at which the RMS velocity level is 80 VdB or less at the inside of the building structure. When propagating from the ground surface to the building structure foundation, there is a vibratory coupling loss of approximately 5 dB; however, this loss is offset by the building amplification in light-frame construction. Thus, no additional adjustments are applied.
[2] This is the distance at which the peak particle velocity is 0.50 in/sec or less.
"—" indicates distance is less than 10 feet.
Source: *Noise and Vibration Impact Assessment Technical Report*, Parsons, January 2006

Once details of the construction activities become available, the contractor would need to work with local authorities to develop an acceptable approach to minimize interference with the business and residential communities, traffic disruptions, and the total duration of the construction. Nighttime construction may be necessary to avoid unacceptable disruptions to street traffic during daytime hours. In the municipalities of Berkeley and Oakland, along the East Bay project alignment, a construction noise variance from their municipal code will be required to conduct nighttime construction activities outside the allowed time periods. Table 4.16.10-1 provides specific construction noise restrictions by jurisdiction.

There are a number of measures that can be taken to minimize intrusion without placing unreasonable constraints on the construction process or substantially increasing costs. These include noise and vibration monitoring to ensure that contractors take all reasonable steps to minimize impacts when near sensitive areas, noise testing and inspections of equipment to ensure that all equipment on the site is in good condition and effectively muffled, and an active community liaison program. The community liaison program should keep residents informed about construction plans so they can plan around periods of particularly high noise or vibration levels and should provide a conduit for residents to express any concerns or complaints.

Control measures, such as the following, would minimize noise and vibration disturbances at sensitive areas during construction:

1. Use newer equipment with improved noise muffling and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational. Newer equipment will generally be quieter in operation than older equipment. All construction equipment should be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding, etc.).

2. Perform all construction in a manner to minimize noise and vibration. Utilize construction methods or equipment that will provide the lowest level of noise and ground vibration impact. The contractor should be required to select construction processes and techniques that create the lowest noise levels.
3. During asphalt cutting, a temporary noise barrier should be placed between the cutting area and noise sensitive sites.
4. Conduct truck loading, unloading and hauling operations so that noise is kept to a minimum by carefully selecting routes to avoid going through residential neighborhoods to the greatest possible extent.
5. Construction lay-down or staging areas should be selected in industrially zoned districts. If industrially zoned areas are not available, commercially zoned areas may be used, or locations that are at least 90 feet from any noise sensitive land use such as residences, hotels and motels. Ingress and egress to and from the staging areas should be on collector streets or greater (higher street designations are preferred).
6. Turn off idling equipment.
7. Minimize construction activities during evening, nighttime, weekend, and holiday periods. Permits may be required in some cities before construction can be performed in noise sensitive areas between 7 pm and 7 am.
8. The construction contractor should be required by contract specification to comply with all local noise ordinances and obtain all necessary permits and variances.

It is expected that ground-borne vibration from construction activities would cause only intermittent localized intrusion along the East Bay BRT route. Processes such as earth moving with bulldozers, and the use of vibratory compaction rollers can create annoying vibration. There are cases where it may be necessary to use this type of equipment in close proximity to residential buildings. Procedures, such as the following, would be used to minimize the potential for annoyance or damage from construction vibration:

1. When possible, limit the use of construction equipment that creates high vibration levels, such as vibratory rollers and hammers, operating within 130 feet of residential structures.
2. Require vibration monitoring during vibration-intensive activities.
3. Restrict the hours of vibration-intensive equipment or activities such as vibratory rollers so that impacts to residents are minimal (e.g., weekdays during daytime hours only when as many residents as possible are away from home).

A combination of techniques for equipment noise and vibration control as well as administrative measures would be selected to provide the most effective means for reducing construction noise and vibration effects. Although, these measures would reduce construction impacts, temporary increases in noise would likely occur at some locations.

4.16.11 Biological Environment

No construction impacts are anticipated to the biological environment as there are few biological resources in the project area. BMPs described in Section 4.16.7, Hydrology and Water Quality (Construction Impacts) would avoid impacts to waterways connecting to biological resources outside the project area.

Iceland, Berkeley Senior Center, Berkeley YWCA, Tang Center, and Civic Center YMCA in Berkeley, and four branches of the Boys and Girls Club of Oakland, North Oakland Senior Center, Seton Senior Center, the Oakland YWCA, and three branches of the YMCA in Oakland. Other cultural facilities include H.J. Kaiser Convention Center, Oakland Convention Center, and Oakland Ice Center in Oakland; Martin Luther King, Jr. Civic Center in Berkeley; and San Leandro City Hall and Casa Peralta in San Leandro.

Hospital and Medical Facilities

There are several hospitals and medical facilities within the corridor, including Alta Bates Summit Medical Center and Alta Bates Summit Medical Center Herrick Campus in Berkeley; Alta Bates Summit Medical Center and Children's Hospital in Oakland; and San Leandro Hospital in San Leandro.