

10 ENVIRONMENTAL ISSUES

This chapter presents existing conditions for all the different environmental issues that must be studied in the Environmental Impact Report. The topics cover hazardous materials, biological resources, geology, hydrology and creeks, water quality, noise, air quality, and climate change/greenhouse gas emissions. It is important to resolve all environmental issues prior to proceeding with future development over the next 25 years.

10.1 Hazardous Materials

The provisions in Government Code Section 65962.5, enacted in 1985, are commonly referred to as the “Cortese List.” A site’s presence on the list has bearing on the local permitting process as well as on compliance with the California Environmental Quality Act (CEQA). Those requesting a copy of the Cortese list are now referred directly to the appropriate information resources contained on the Internet web sites of the boards or departments that are referenced in the statute, including the Department of Toxic Substances Control, State Department of Health Services, and State Water Resources Control Board. The State Department of Health Services regulates public drinking water wells, and no hazards are identified in the Planning Area by that agency.

The California Department of Toxic Substances Control (DTSC) regulates hazardous waste, clean-up of existing contamination, and ways to reduce the hazardous waste produced. DTSC regulates hazardous waste in California primarily under the authority of the federal Resource Conservation and Recovery Act of 1976, and the California Health and Safety Code. Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning.

DTSC establishes and implements clean-up programs for properties such as former industrial properties, school sites, military bases, small businesses and landfills that are contaminated, or believed contaminated, with some level of toxic substances. Table 10.1 lists the DTSC clean-up sites in the Planning Area.

The California State Water Board regulates Leaking Underground Tank (LUST) cleanup sites. A LUST site is undergoing cleanup due to an unauthorized release from an underground storage tank (UST) system. An UST is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. UST regulations apply only to underground tanks and piping storing either petroleum or certain hazardous substances. The California State Water Board also regulates Spills, Leaks, Investigation, and Cleanups (SLIC) sites. The SLIC program investigates and regulates non-permitted discharges.

Table 10.2 lists the open LUST clean-up sites and SLIC sites in the Planning Area. Most open LUST sites in the Planning Area are designated as Open - Site Assessment, which means those sites are undergoing site assessment for potential contaminants

of concern and the extent of contamination. Sites that are designated as Open - Site Remediation are sites that may still be undergoing site assessment but may also have a remedial system currently being planned or in operation. Sites that are designated as Open - Verification Monitoring have undergone remediation

and contamination levels are currently being monitored. Most open SLIC sites in the Planning Area are designated as Open - Inactive and no action has been taken at the site. If the site is to be redeveloped, further investigation has to be done regarding potential contaminants and level of contamination. SLIC sites

designated as Open - Site Assessment are currently being evaluated for contaminants and/or level of contamination at the site. SLIC sites designated as Open - Remediation currently have a remedial system being planned or in operation. Sites described in Tables 10.1 and 10.2 are shown in Figure 10.1.

TABLE 10.1: DEPARTMENT OF TOXIC SUBSTANCES CONTROL: CLEAN-UP SITES

SITE	ADDRESS	DESCRIPTION	POTENTIAL CONTAMINANTS OF CONCERN	STATUS
STATE RESPONSE SITES				
Oakland Area Hospital (Hotel Oakland)	270 13th St	The US Army used this site as a hospital between 1943 and 1947. According to a 2008 letter from Department of Toxic Substances Control (DTSC), potential sources of contamination include fuel tanks for emergency power generators, transformers, or other electrical equipment associated with the hospital, and releases of contamination could include solvents, fuels, and metals related to motor pool operations. Based on this letter, this site may or may not pose health risks for occupants but it is not anticipated to pose health risks to residents and employees residing outside of the building.	TPH-Diesel; TPH-Gas; TPH-Motor Oil	INACTIVE - NEEDS EVALUATION AS OF 7/1/2005 As of 6/30/2008, DTSC did not concur with the Corps request for No Further Defense Action Indicated. The site has potential releases from tanks and piping, maintenance activities, and solvents.
A. Bercovich 2nd Street	127 2nd Street	The A. Bercovich Company operated a junkyard, junk storage, and scrap metal business at the site from 1926 to 1963. Soil on the site is impacted with elevated levels of metals (such as lead), polychlorinated biphenyls (PCBs), and petroleum hydrocarbons. The “Aqua Via” apartment complex currently on site contains remaining contaminants beneath the building foundation and paved surfaces. There is a potential increased risk of exposure and subsequent health concerns to building occupants.	Metals; Petroleum, Polychlorinate D Biphenyls (PCBS); Lead	ACTIVE AS OF 6/19/2006 As of 6/19/2006, soil under building foundation determined to be impacted by lead, TPH, and PCBs. Deed restriction recommended.
EVALUATION SITE				
Lakeside Non-Ferrous Metals Corp	412 Madison Street	Lakeside began its recycling business approximately 60 years ago. The company buys and sells various types of recyclable metal materials including aluminum cans, copper wire, radiators, lawn chairs and other assorted metals. Soil at the site is reportedly impacted by elevated levels of lead and nickel. As groundwater is not used for any municipal or domestic purposes, the site is completely paved, access is controlled by buildings and fences, no residences are within 200 feet of the site, and all operations are conducted indoors, public health concerns are not anticipated. However, the site remains under state oversight.	Lead; Nickel	INACTIVE - NEEDS EVALUATION AS OF 6/30/2003 As of 6/30/2003, the Preliminary Endangerment Assessment Report was approved by U.S. EPA. No further action is required under CERCLA. However, elevated levels of metals are present. Further action required by the State.
SCHOOL INVESTIGATION				
Downtown Education Complex	1029 4th Avenue, 1100 3rd Avenue, and 314 East 10th Street	Throughout its history, this 5.5-acre property was occupied by the California Jute Mill Co, residences, a trade school, an auto body shop, and a parking lot. Potential contaminants of concern in soil, soil gas, and/or groundwater include metals, methyl-tert-butyl-ether (MTBE), organochlorine pesticides, petroleum, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs). Contaminant concentrations are potentially unsafe for human health. In early 2010, DTSC entered into a school cleanup agreement with the school district to remediate contamination.	Metals; Methyl Tertbutyl Ether (Mtbe); Organochlorine Pesticides (8081 Ocps); Petroleum; Polychlorinated Biphenyls (Pcbs); Polynuclear Aromatic Hydrocarbons (Pahs) Under Investigation	ACTIVE AS OF 5/13/2009
Dewey Downtown School	1102 2nd Avenue	Dewey High School is a high school within the Oakland Unified School District. Benzo(a)pyrene has been identified as a potential contaminant at the school. While this chemical can pose health risks, the DTSC has concluded that soil and groundwater have not been affected and no remedial action is required at this site. Based on information included on the DTSC website, this contamination at this school is not anticipated to pose a public health risk to students or the general public	Benzo[A]Pyrene	NO ACTION REQUIRED AS OF 5/16/2001

Source: California Department of Toxic Substances Control Envirostor, <http://www.envirostor.dtsc.ca.gov>, accessed on January 12, 2010; Dyett & Bhatia, 2010.

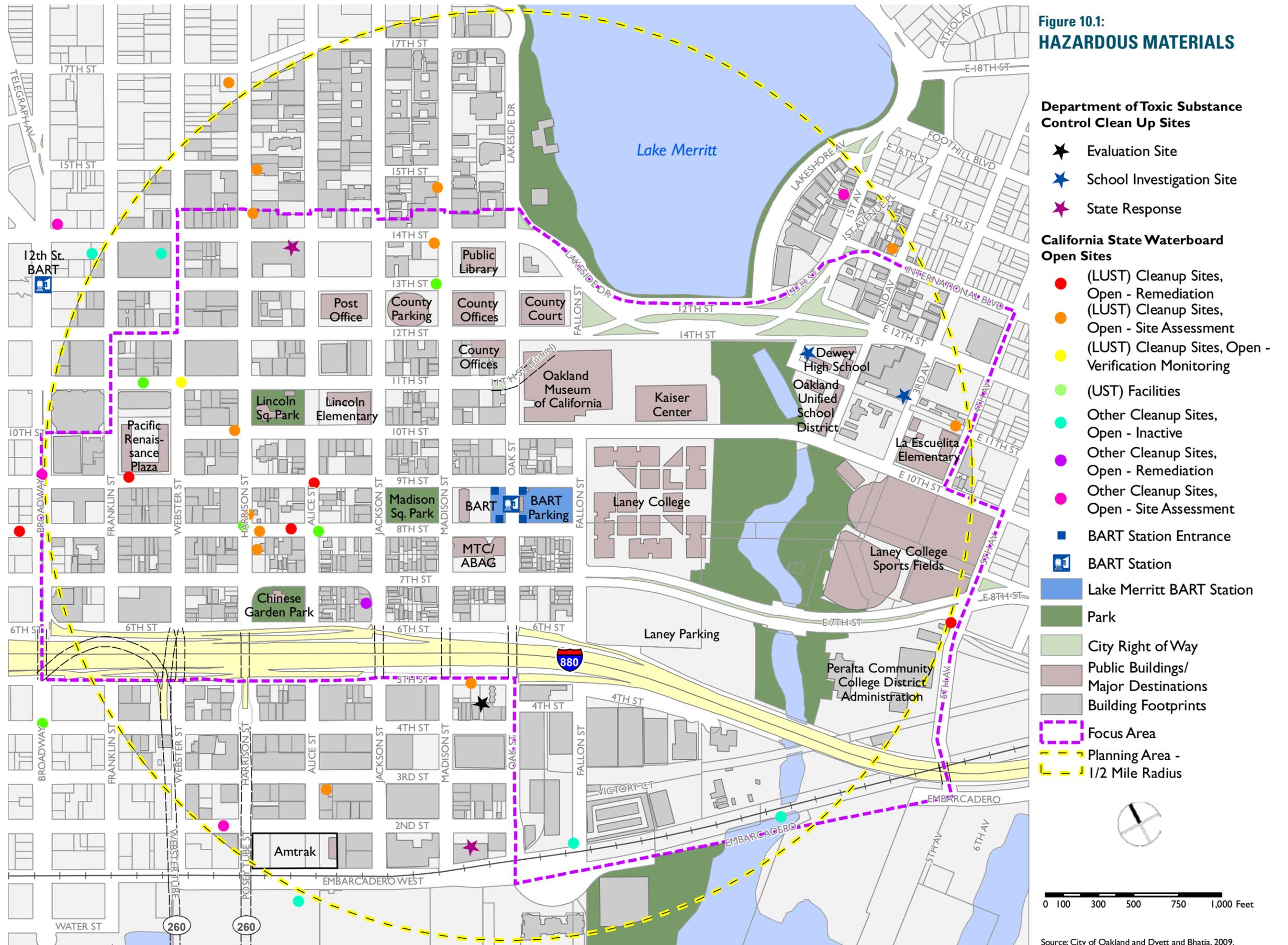
TABLE 10.2: CALIFORNIA STATE WATER BOARD OPEN CLEANUP SITES

SITE NAME	CLEAN UP STATUS	ADDRESS	DESCRIPTION	IMPEDIMENTS TO CLOSURE
OPEN LEAKING UNDERGROUND TANK OPEN CLEAN-UP SITES				
A Bacharach Trust & B Borsuk	Open - Site Assessment	1432 Harrison	This site is a former retail gasoline station and parking lot with a fuel leak affecting groundwater. There is a risk of future indoor air impacts due to vapor intrusion, but this hasn't been fully evaluated.	Off-site investigation is ongoing. The potential for vapor intrusion has not been fully evaluated. Following cessation of remediation, groundwater concentrations increased downgradient from source area. A soil boring is planned for evaluation of effectiveness of source control remediation. Proposed change in land use to residential may need additional clean up
Alco Park Garage	Open - Site Assessment	165 13th Street	The Alco Park Garage operates a fueling station to fuel Alameda County Vehicles. Previous water sampling results indicated the presence of benzene, toluene, ethyl-benzene, xylenes, and total petroleum hydrocarbons in the groundwater. The site is no longer under regulatory oversight, and the closure letter indicated that corrective actions were completed. Thus, it is unlikely that this site is of public health concern.	Assessment ongoing. Potential Contaminants of Concern: Gasoline.
Bill Louie's Auto Service	Open - Remediation	800 Franklin	The site operated as a gasoline service station with up to five underground storage tanks on site until 1989. Recent groundwater sampling revealed elevated concentrations of petroleum hydrocarbons and benzene. This site is currently undergoing remediation. Potential health risks are unknown.	Extent of contamination has not been defined. Large mass of petroleum hydrocarbons remains in the source area. Concentration of dissolved phase petroleum hydrocarbons has increased in downgradient well.
Chan's Service Station / Shell	Open - Site Assessment	726 Harrison	In October 1995, five underground storage tanks were removed and contamination of the soil beneath the site resulted from the removal. Subsequent investigations detected significantly elevated levels of petroleum hydrocarbons, benzene, and methyl tertbutyl ether (MTBE) in groundwater beneath and down-gradient of the site. Remedial action is proposed to remove contamination. The public health implications of this contamination are unclear at this time.	Site assessment ongoing. Potential Contaminants of Concern: Gasoline Site is part of commingled plume and remedial action is proposed to remove contamination.
City Of Oakland Redevelopment Agency / EBMUD	Open - Verification Monitoring	383 11th Street	Significantly elevated concentrations of soil and groundwater contamination were discovered at this site when four underground storage tanks were removed in April 1987. Groundwater extraction has been conducted to remediate contamination. The site was later redeveloped into a multi-story office complex with sub-grade parking. Public health risks at this site are unknown.	Verification monitoring ongoing. Potential Contaminants of Concern: Gasoline
Lim Property Gas Station	Open - Remediation	250 8th	The site was formerly occupied by a retail gasoline station and is currently occupied by a parking lot. Contaminated soil and groundwater surrounds former underground storage tanks. Public health risks associated with this site are unknown.	Free product remains at the site. Source control is feasible and planned but has not been implemented. Delay in reimbursements has slowed progress on case. Regulatory agency and RP would like to move forward with remediation. UST Cleanup Fund has requested additional site investigation.
Mobil; Mobil #10-Mhg	Open - Site Assessment	160 14th St	Three underground storage tanks were removed from this former gasoline service station site in May 1986. Elevated petroleum hydrocarbons and volatile organic carbons were subsequently detected in soil and groundwater samples. Following remediation and removal of soil, the site was converted to a condominium building with parking and commercial use on the lower floor. While residents and merchants currently occupy this site, the extent of subsurface contamination has not been determined and the potential for vapor intrusion to indoor air has not been evaluated. There may be health risks to building occupants that have not yet been identified.	Site assessment ongoing. Potential Contaminants of Concern: Gasoline
Oakland Auto Parts	Open - Site Assessment	706 Harrison	In February 1991, six underground storage tanks were removed and sampling detected elevated levels of hydrocarbon and benzene in soil and groundwater beneath the site. The site is still under regulatory oversight because the extent of contamination and associated health and environmental risks has not been adequately identified.	Site assessment ongoing. Potential Contaminants of Concern: Benzene and Gasoline Site is part of commingled plume and remedial action is proposed to remove residual mass beneath the sites.
Oakland Port Of Amtrak Site	Open - Site Assessment	Unknown Alice St & 2nd St	There is no available information about this site.	Site assessment ongoing. Potential Contaminants of Concern: Gasoline
Shell #13-5700	Open - Site Assessment	105 5th	The site is currently a gas service station. Soil and groundwater contamination related to former underground storage tanks, gasoline and diesel dispensers, and piping remain on the site. Although this site has remaining soil and groundwater contamination, associated public health risks are not anticipated during its use as a gas station.	Elevated concentrations of petroleum hydrocarbons remain in soil and groundwater in the source area. Source control is feasible but has not been performed.

SITE NAME	CLEAN UP STATUS	ADDRESS	DESCRIPTION	IMPEDIMENTS TO CLOSURE
Sparks Property	Open - Site Assessment	1424 Harrison	Soil and groundwater contamination at this site is related to leakage from former underground storage tanks. Because this site has not been adequately investigated, health risks associated with this contamination are unknown.	Site investigation has been conducted as part of site investigation for fuel leak case at adjacent site; however, no investigation has been completed to date for this case. The extent of contamination from this site and the contribution to an extensive off-site plume has not been defined.
Unocal #0752	Open - Site Assessment	800 Harrison	Soil and groundwater contamination related to former underground storage tanks remain at this gas station site. Public health risks are not anticipated at this site in its current use as a gas station. However, the contaminant plume is migrating into adjacent, down-gradient sites, and thus there is potential for health risks at adjacent properties.	Site assessment ongoing. Potential Contaminants of Concern: Gasoline Site is part of commingled plume and remedial action is proposed to remove residual mass beneath the sites
Vic's Automotive Service	Open - Remediation	245 8th	Seven underground storage tanks were removed from the site, and free-phase gasoline was observed on the water table below. Remediation and monitoring at the site are ongoing. Potential health risks are unknown.	Off-site extent of contamination not fully defined. Additional monitoring wells planned. Remedial system is currently in operation.
Willie D Harper Building	Open - Site Assessment	314 10th	There is no available information about this site.	Site assessment ongoing. No information regarding Potential Contaminants of Concern.
OPEN SPILLS, LEAKS, INVESTIGATION OPEN CLEAN-UP SITES				
East Basin Marina	Open - Inactive	Embarcadero @ Alice St, Jack London Square	There is no available information about this site.	No action ongoing.
Frank Mar Community Housing Project	Open - Inactive	383 13th St	This site is listed as a clean-up program site, but no contaminants of concern are specified and no actions are ongoing.	No action ongoing.
Oakland Tribune	Open - Inactive	409 13th St	This site is listed as a clean-up program site, but no contaminants of concern are specified and no actions are ongoing.	No action ongoing.
Port Of Oakland Crowley Dry Dock Yard1 2	Open - Inactive	321 1441 Embarcadero	A solvent leak was reported in March of 1995, and the site is currently under investigation. The public health implications are unclear at this time.	No action ongoing.
Southern Pacific Transport Vukasin	Open - Inactive	54 Embarcadero	This site is listed as a clean-up program site, but no contaminants of concern are specified and no actions are ongoing.	No action ongoing.
Seabreeze Yacht Center	Open - Remediation	280 Sixth Street	This 5-acre parcel was used as an oil-fired electrical generating plant and as a ship repair yard. Soil and groundwater have been impacted by petroleum hydrocarbons and metals. Unless surface soil has been impacted or subsurface excavation occurs without remediation, this is not anticipated to impact public health.	Remediation ongoing. No information regarding Potential Contaminants of Concern.
City Of Oakland Parking Lot	Open - Site Assessment	910 Broadway	This site is listed as a clean-up program site, but no contaminants of concern are specified and no actions are ongoing.	Site assessment ongoing. Notice to Comply letter sent to City of Oakland on July 28, 2009. No information regarding Potential Contaminants of Concern.
The Colony / The Olson Company	Open - Site Assessment	311 2nd	Potential groundwater contaminants of concern include diesel, gasoline, and lead. This site is currently occupied by a residential building. Additional information is unavailable and health risks are unknown.	Site assessment ongoing. Potential Contaminants of Concern: Diesel, Gasoline, Lead

Source: California State Water Resources Board Geotracker, <http://www.geotracker.waterboards.ca.gov/>, accessed January 22, 2010; Dyett & Bhatia, 2010.

Figure 10.1:
HAZARDOUS MATERIALS



Source: City of Oakland and Dyett and Bhatia, 2009.

10.2 Biological Resources

The Planning Area is located within an urbanized area of Oakland. With the exception of areas adjacent to Lake Merritt, Lake Merritt Channel and the Oakland Estuary, the area is generally paved with asphalt and concrete. Areas that include diverse vegetation and offer open water habitat for a variety of wildlife, such as waterbirds and several amphibian and reptiles species are limited to Lake Merritt, Lake Merritt Channel, and the Oakland Estuary. In 1869, the Mayor of Oakland, Dr. Merritt, declared the Lake as a wildlife refuge.

According to the Measure DD Implementation EIR, there are 56 special-status species (24 plants, 32 animals) that are known to occur, or have the potential to occur, in the general vicinity of the Lake. However, only six special status species have been observed at or near Lake Merritt and/or the Lake Merritt Channel. Table 10.3 summarizes the status and potential for occurrence of these species within the project area. The six special status species that have been observed at or near Lake Merritt and/or the Lake Merritt Channel are listed as “present” in potential for occurrence. Other species are listed as “low” which means the species is unlikely to be found within the Planning Area, or “moderate,” which means that the habitat at Lake Merritt and/or Lake Merritt Channel may be a suitable habitat for the species but species have not been observed.

Plants

None of the 24 special-status plant species identified in the records search are expected to occur around Lake Merritt, due to a lack of suitable habitat and the extent of historical disturbance in the vicinity. Many of the species records in the California Natural Diversity Database (CNDDDB) date from the late 1800’s or early 1900’s. Furthermore, the native habitats upon which these species depend (e.g., coastal dunes, alkali soils, serpentine outcrops) are completely absent from the Lake Merritt area due to its highly urbanized location. Thus, these species are assumed to be extirpated in the project vicinity.

Animals

Of the 32 special-status animal species, 25 were found to have low to present potential to occur around Lake Merritt and are listed in Table 10.3. The remaining six special-status bird species have all been observed at or near Lake Merritt and/or the Lake Merritt Channel.

TABLE 10.3: SPECIAL STATUS SPECIES: LOW OR MODERATE POTENTIAL TO OCCUR IN THE VICINITY OF LAKE MERRITT AND THE LAKE MERRITT CHANNEL

SPECIES	STATUS	HABITAT	POTENTIAL FOR OCCURRENCE
PLANTS			
Pallid Manzanita (<i>Arctostaphylos pallida</i>)	FT, SE, 1B	Shale or thin chert substrates in deciduous and coniferous forests and woodlands, chaparral, or coastal scrub	Low: seven of 11 known occurrences on or adjacent to Sausal Creek watershed, but unlikely at creek restoration sites due to lack of suitable substrate
Presidio clarkia (<i>Clarkia franciscana</i>)	FE, SE, 1B	Serpentine outcrops in grassland or scrub	Low: known to occur in the Oakland hills; serpentine occurs at some creek restoration areas.
Western leatherwood (<i>Dirca occidentalis</i>)	1B	Brushy slopes and mesic sites, mostly in mixed evergreen forest or oak woodland	Moderate: known to occur in Sausal Creek watershed
Most beautiful jewel-flower (<i>Streptanthus albidus</i> ssp. <i>Peramoenus</i>)	1B	Serpentine outcrops in chaparral, grassland, and woodland	Low: known to occur in the Oakland hills; serpentine occurs at some creek restoration areas.
Fish			
Chinook salmon (Sacramento River winter-run ESU ¹) (<i>Oncorhynchus tshawytscha</i>)	FE	Anadromous: spawns in Sacramento River system; occurs in small numbers in Central Bay	Low: possible occasional visitor to Bay waters adjacent to Waterfront Trail
Chinook salmon (Central Valley spring-run ESU) (<i>Oncorhynchus tshawytscha</i>)	FT	Anadromous: spawns in Sacramento River system; occurs in small numbers in Central Bay	Low: possible occasional visitor to Bay waters adjacent to Waterfront Trail
Steelhead (Central California Coast ESU) (<i>Oncorhynchus mykiss</i>)	FT	Anadromous: spawns in coastal streams in fall and winter; occurs in small numbers in Central Bay	Low: possible occasional visitor to Bay waters adjacent to Waterfront Trail
Coho salmon (Central California ESU) (<i>Oncorhynchus kisutch</i>)	FE	Anadromous: spawns in coastal streams in fall and winter	Low: possible occasional visitor to Bay waters adjacent to Waterfront Trail
AMPHIBIANS			
California red-legged frog (<i>Rana aurora draytonii</i>)	FT, CSC	Ponds, streams, drainages and associated uplands	Low: marginal habitat in Oakland watershed, but no recent records west of crest of Berkeley Hills (CNDDDB)
Foothill yellow-legged frog (<i>Rana boylei</i>)	CSC	Partly shaded, shallow streams and riffles with a rocky substrate	Low: marginal habitat in Oakland watershed, but no recent records west of crest of Berkeley Hills (CNDDDB)
REPTILES			
Pacific (western) pond turtle (<i>Actinemys marmorata</i>)	CSC	Ponds, streams, drainages and associated uplands	Present: known from Sausal Creek watershed
Alameda whipsnake (<i>Masticophis lateralis Euryxanthus</i>)	FT, ST	Chaparral and sage scrub with rock outcrops and an abundance of prey species such as western fence lizard (<i>Sceloporus occidentalis</i>)	Low: suitable habitat present in upper Oakland watershed, but unlikely to occur at creek restoration sites
BIRDS			
California brown pelican (<i>Pelecanus occidentalis Californicus</i>)	FE, SE, CFP	Coastal shorelines and bays; rarely found on fresh water	Present: known to forage and roost at Lake Merritt and adjacent to Waterfront Trail during fall-winter
Double-crested cormorant (rookery) (<i>Phalacrocorax auritus</i>)	CSC	Nests on coastal cliffs and offshore islands, usually on ground with sloping surface; or in tall trees near water	Present: known rookery on islands near Rotary Nature Center, Lake Merritt
Barrow’s goldeneye (nesting) (<i>Bucephala islandica</i>)	CSC	Lagoons, brackish lakes, and bays of central-northern California	Present: regularly observed at Lake Merritt and LMC in late fall/early winter
Sharp-shinned hawk (nesting) (<i>Accipiter striatus</i>)	CSC	Coniferous forests and Coast Range oak woodlands. Usually nests in dense conifers or tops of live oaks.	Moderate: known to occur in upper Oakland watershed; suitable nest trees likely present at some creek restoration sites
Cooper’s hawk (nesting) (<i>Accipiter cooperi</i>)	CSC	Woodlands, riparian habitats, and urban areas with abundant tree cover	Moderate: suitable nest trees present at most project sites
Golden eagle (<i>Aquila chrysaetos</i>)	CSC, CFP	Rolling foothills and mountain areas; nests in cliff-walled canyons or large trees in open areas	Low: may occasionally forage over upper Oakland watershed and Waterfront Trail; recent nest site at Round Top not located in project area

SPECIES	STATUS	HABITAT	POTENTIAL FOR OCCURRENCE
American peregrine falcon (<i>Falco peregrinus anatum</i>)	SE, CFP	A variety of open habitats including coastlines, mountains, marshes, bay shorelines, and urban areas; nests on cliffs, bridges, and tall buildings	Present: observed regularly near Lake Merritt in recent winters
California black rail (<i>Laterallus jamaicensis Coturniculus</i>)	ST, CFP	Salt marshes bordering larger bays, also found in brackish and freshwater marshes	Low: suitable habitat adjacent to 66th Ave Gateway (Damon Marsh); may occasionally use uplands during extremely high winter tides, if present
California clapper rail (<i>Rallus longirostris obsoletus</i>)	FE, SE, CFP	Tidal salt marshes with sloughs and substantial cordgrass (<i>Spartina</i> sp.) cover	Low: suitable habitat adjacent to 66th Ave Gateway (Damon Marsh); may occasionally use uplands during extremely high winter tides, if present
California least tern (<i>Sterna antillarum browni</i>)	FE, SE, CFP	Sandy beaches, alkali flats, hard-pan surfaces (salt ponds)	Low: suitable foraging habitat over Bay waters in project vicinity, but no suitable nesting habitat
Salt marsh common yellowthroat (<i>Geothlypis trichas sinuosa</i>)	CSC	Salt, brackish, and freshwater marshes and riparian woodlands; nests on or near ground in low vegetation	Low: only small patches of marginal habitat present; unlikely to nest in project area
Alameda song sparrow (<i>Melospiza melodia pusillula</i>)	CSC	Tidal salt marshes dominated by pickleweed; nests primarily in pickleweed (<i>Salicornia</i> sp.) and marsh gumplant (<i>Grindelia stricta</i>)	Present: observed at Lake Merritt Channel (LMC) and adjacent to 66th Ave Gateway; marginal nesting habitat along LMC
MAMMALS			
Pallid bat (<i>Antrozous pallidus</i>)	CSC	Most common in open, arid habitats, but occurs in a wide variety of habitats	Moderate: suitable foraging habitat in Oakland watershed, but no known roosts; steel bridges along Waterfront Trail unlikely to support roosting bats
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	CSC	Mesic habitats, habitat edges	Moderate: suitable foraging habitat in Oakland watershed, but no known roosts; steel bridges along Waterfront Trail unlikely to support roosting bats
Western mastiff bat (<i>Eumops perotis</i>)	CSC	Open, arid habitats	Low: limited habitat in Oakland watershed
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	CSC	Coastal and montane forests; roosts in hollow trees or beneath exfoliating bark	Low: suitable habitat in Oakland watershed, but species' rarity likely precludes occurrence
Salt marsh harvest mouse (<i>Reithrodontomys raviventris</i>)	FE, SE, CFP	Tidal salt marshes of San Francisco Bay and its tributaries; requires tall, dense pickleweed for cover	Low: suitable habitat adjacent to 66th Ave Gateway (Damon Marsh), may occasionally use grasslands on project site as escape cover during high winter tides, if present

1 ESU = Evolutionarily Significant Unit. National Marine Fisheries Service (NMFS) considers an ESU a "species" under the Endangered Species Act.

Status Codes

FE = federally listed as endangered

FT = federally listed as threatened

SE = state-listed as endangered

ST = state-listed as threatened

SR = state-listed as rare

CSC = California Species of Special Concern

CFP = California Fully Protected Species

1B = California Native Plant Society (CNPS) List 1B: species considered rare or endangered in California and elsewhere

2 = CNPS List 2: species considered rare or endangered in California, but more common elsewhere

2 Although marginal or suitable habitat may be present in the Oakland watershed, these species are not expected to occur at creek restoration sites, where habitat is expected to consist of riparian woodland and/or landscaped/developed.

Source: City of Oakland, Measure DD Implementation Project EIR Chapter F: Biological Resources, 2007.

10.3 Geology

The City of Oakland includes the mountainous uplands of the Oakland-Berkeley Hills and an alluvial plain that slopes gently westward away from these hills to meet the flat marginal baylands of the San Francisco Bay. Oakland lies within the geologic region of California referred to as the Coast Ranges geomorphic province. Much of the Coast Range province is composed of marine sedimentary and volcanic rocks that form the Franciscan Assemblage, which in this region of California consists primarily of greenstone (altered volcanic rocks), basalt, chert (ancient silica-rich ocean deposits), and sandstone that originated as ancient sea floor sediments.

The San Francisco Bay Area region contains both active and potentially active faults and is considered a region of high seismic activity. The U.S. Geological Survey (USGS) Working Group on California Earthquake Probabilities has evaluated the probability of one or more earthquakes of Richter magnitude 6.7 or higher occurring in the San Francisco Bay Area within the next 25 years. The result of the evaluation indicated a 63% likelihood that such an earthquake event will occur in the Bay Area between 2006 and 2036.¹

The closest active fault to the Planning Area is the Hayward fault, which runs east of the Planning Area along Highway 13 and I-580. The Planning Area will experience a modified mercalli intensity shaking severity level of Violent (IX) to Very Violent (X).² The Modified Mercalli (MM) intensity scale is commonly used to measure earthquake effects due to ground shaking. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X could cause moderate to significant structural damage.

During an earthquake, liquefaction can occur which can cause ground displacement and ground failure such as lateral spreads (essentially landslides on nearly flat ground next to rivers, harbors, and drainage channels) and flows. Areas along existing and filled stream channels and flood plains, particularly those areas with deposits less than 10,000 years old are most vulnerable to liquefaction.

According to ABAG liquefaction susceptibility, the area west of the channel has moderate liquefaction susceptibility and the area east of the channel has low liquefaction susceptibility.³ However, the areas that are adjacent to the channel and estuary have very high liquefaction susceptibility. Liquefaction problems in past earthquakes have not been as significant as shaking, but can cause extensive damage. Categories of susceptibility to liquefaction were based on Geologic map units in the digital Quaternary map; and were grouped into typical ground water levels, typical sediment properties, and occurrences during past earthquakes.⁴ Liquefaction susceptibility is shown on Figure 10.2.



The areas adjacent to the channel and estuary has high liquefaction capacity.



The area west of the channel has moderate liquefaction susceptibility.



The area east of the channel has low liquefaction susceptibility.

1 U.S Geological Survey Working Group, <http://earthquake.usgs.gov/regional/nca/ucerf/images/2008probabilities-lrg.jpg>, accessed January 11, 2010.

2 ABAG, <http://gis.abag.ca.gov/website/Shaking-Maps/viewer.htm>, accessed January 11, 2010.

3 ABAG, <http://gis.abag.ca.gov/website/Shaking-Maps/viewer.htm>, accessed January 11, 2010.

4 ABAG, *The Real Dirt on Liquefaction*, Appendix A, 2001.

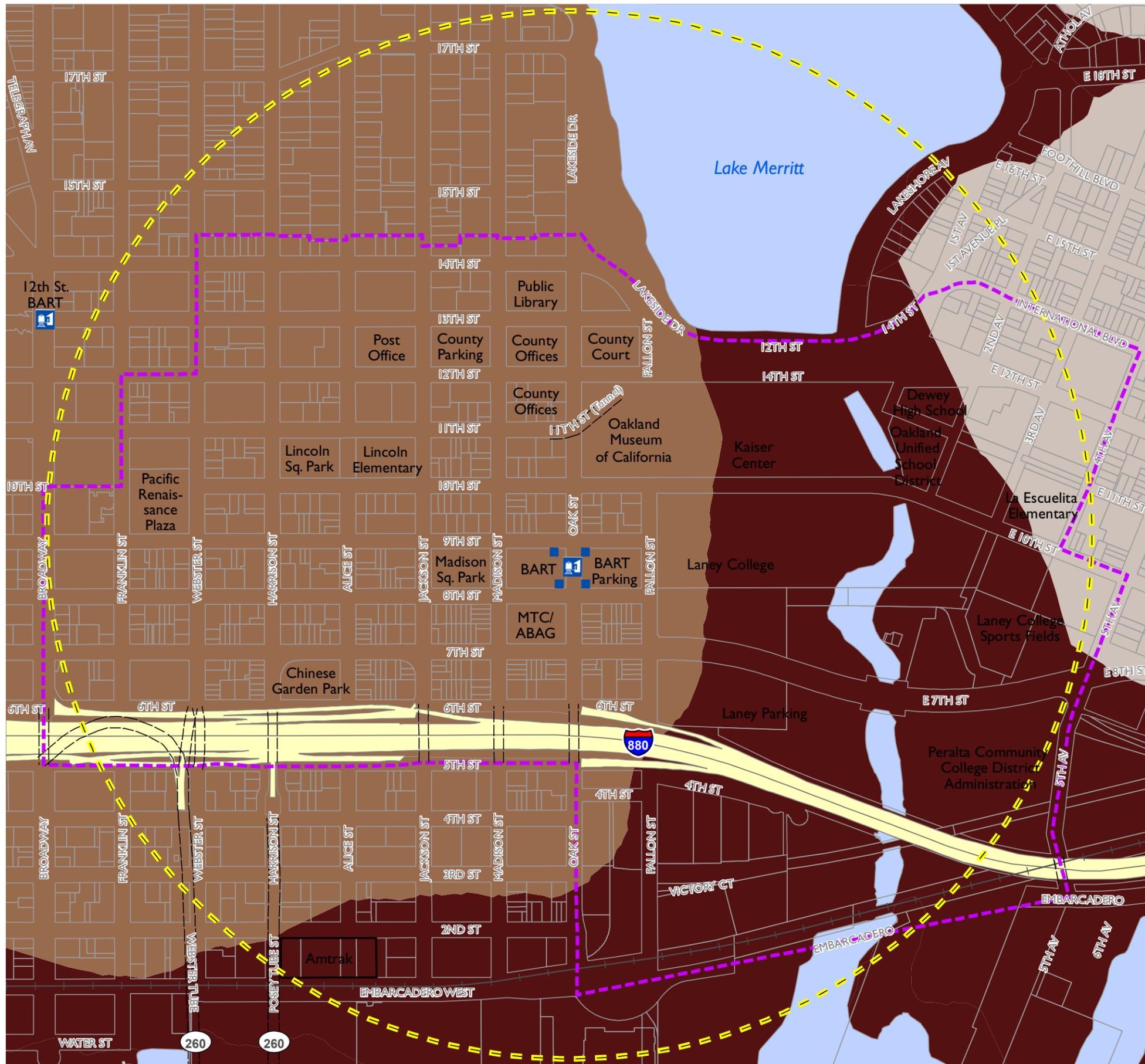


Figure 10.2:
LIQUEFACTION

- BART Station Entrance
- BART Station
- Very High
- Moderate
- Low
- Focus Area
- Planning Area - 1/2 Mile Radius



0 100 300 500 750 1,000 Feet

Source: Liquefaction Susceptibility data, United States Geological Survey, 2000; City of Oakland and Dyett and Bhatia, 2009.

10.4 Air Quality

Health Risks for Sensitive Land Uses Relative to Freeways

California Environmental Protection Agency and California Air Resources Board (ARB), in their Air Quality and Land Use Handbook: A Community Health Perspective (2005), recommend standards for sensitive land uses relative to roads. Housing is recommended to be located at least 500 feet away from a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day. The basis for this recommendation was on a review of traffic-related studies, which found that the additional non-cancer health risk was strongest within 300 feet, and very minimal within 1000 feet. California freeway studies show about a 70 percent drop off in particulate pollution levels at 500 feet.

Figure 10.3 shows a 300 foot buffer, a 500 foot buffer, and a 1,000 foot buffer from I-880. Currently there are existing sensitive uses, primarily residential uses, located within 500 feet of I-880.⁵

State and Federal Air Quality Standards

The Planning Area is located in Oakland and is within the boundaries of the San Francisco Bay Area (Bay Area) Air Basin. The Bay Area Air Basin is currently designated as a nonattainment area for federal and State ozone standards. The Bay Area Air Basin is also currently designated as a nonattainment area for particulate matters PM-10 and PM-2.5 standards, but listed as unclassified under federal PM-10 and PM-2.5 standards. The standards for carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead are being met in the Bay Area.⁵

Existing future levels of air quality in the Planning Area can generally be inferred from ambient air quality measurements for the City of Oakland. Table 10.4 summarizes the air quality data for the Planning Area, as monitored by a station located at 9925 International Boulevard in Oakland, which is eight miles south of the Planning Area. PM-10 data was not available from the Oakland monitoring station, so data from the monitoring station located at Chapel Way in Fremont, which is approximately 27 miles away from the Planning Area, was used.

⁵ California Air Resources Board. The California Almanac of Emissions and Air Quality, 2009.

Although the Bay Area Basin as a whole is designated as nonattainment area for ozone standards, the monitoring station in Oakland shows that ozone levels in 2007 and 2008 were under the State and National standard. In addition, the monitoring station shows PM-2.5 levels in 2008 were under the State annual average even though the Bay Area Air Basin is currently designated as a nonattainment area for PM-2.5. PM-10 levels in 2007 exceeded the State standard (as shown in bold in Table 10.4); however they were below the State standard in 2008.

Ozone

Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NOx. ROG and NOx are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NOx under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Particulate Matter (PM10 and PM2.5)

PM10 and PM2.5 consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively (a micron is one-millionth of a meter). PM10 and PM2.5 represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM10 and PM2.5, are a health concern particularly at levels above the federal and state ambient air quality standards.

TABLE 10.4: AIR QUALITY DATA COLLECTED IN OAKLAND (2007-2008)

POLLUTANT	STANDARD	2007	2008
OZONE			
Highest 1-hr Average (ppm) ¹		0.040	0.086
Days over State Standard	0.09	0	0
Highest 8-hr Average (ppm) ¹		0.036	0.064
Days over State/National Standard	0.07	0	0
Days over National Standard	0.075	0	0
CARBON MONOXIDE			
Highest 8-hr Average (ppm) ¹		1.40	1.63
Days over State/National Standard	9	0	0
PM10²			
Highest 24-hr Average (ug/m3) ¹		60.6	38.7
Estimated Days over State Standard	50	6	*
Estimated Days over National Standard	150	0	*
Annual Average		19.6	*
PM2.5			
Highest 24-hr Average (ug/m3) ¹		22.8	30.1
Estimated Days over National Standard	35	*	0
State Annual Average	12	*	9.5

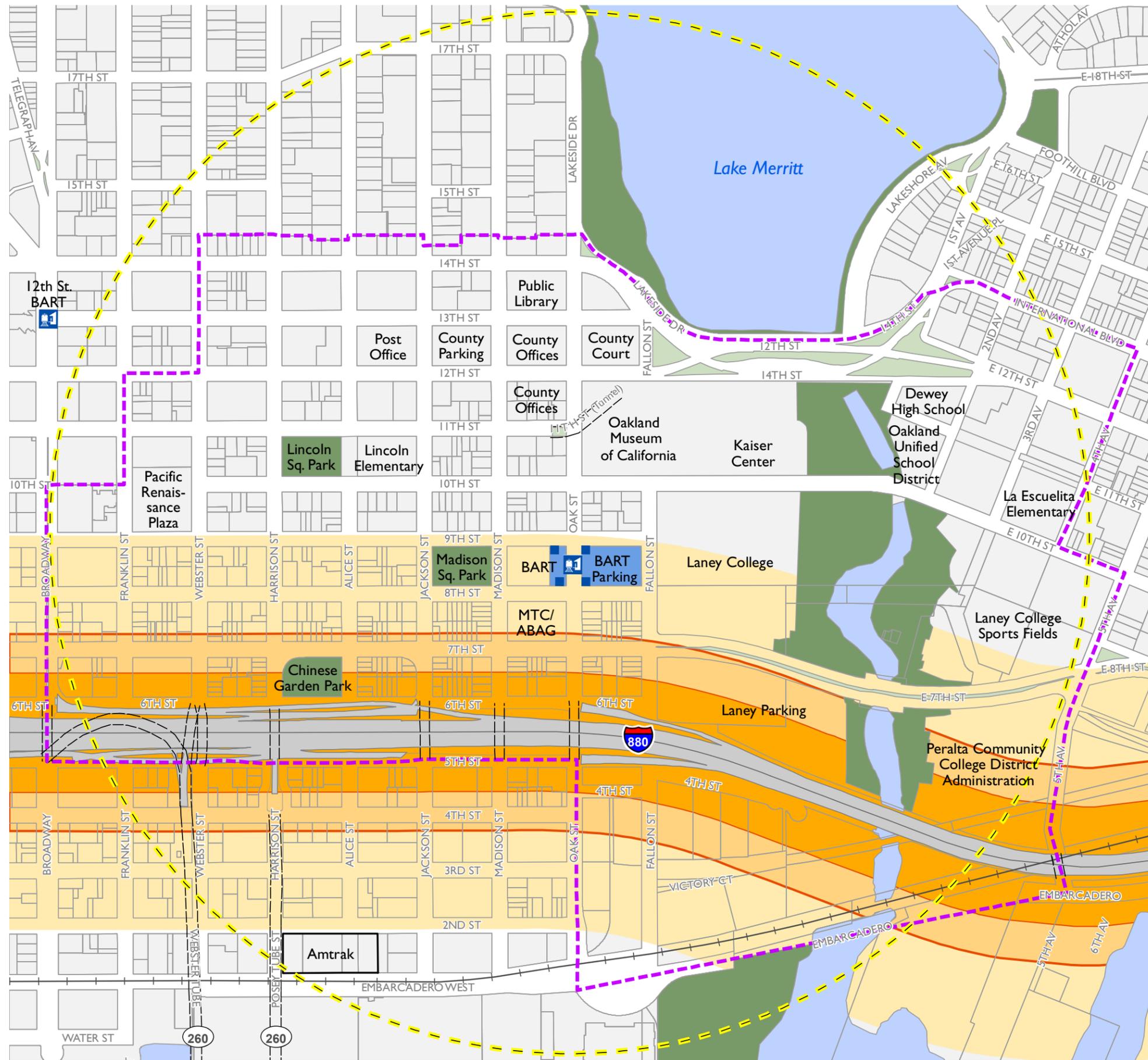
¹ Ppm= parts per million; ug/m3 – micrograms per cubic meter.

² Monitoring data from Fremont-Chapel Way.

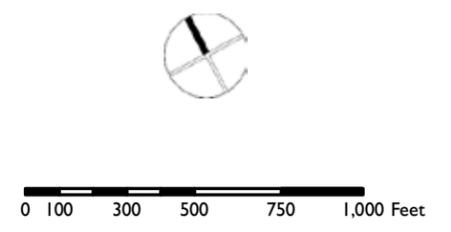
* There was insufficient (or no data) available to determine value

Source: California Air Resources Board, <http://www.arb.ca.gov/adam/>, accessed January 11, 2010.

Figure 10.3:
AIR QUALITY HEALTH RISKS
RELATED TO FREEWAY



- BART Station Entrance
- BART Station
- Highest Health Risk
- Recommended No Sensitive Uses
- Some Health Risk
- Lake Merritt BART Station
- Park
- City Right of Way
- Focus Area
- Planning Area - 1/2 Mile Radius



Source: City of Oakland and Dyett and Bhatia, 2009.

PM2.5 (including diesel exhaust particles) is thought to have greater effects on health, because these particles are so small and thus are able to penetrate to the deepest parts of the lungs.

Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath, and painful breathing. Recent studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM10 and PM2.5 because their immune and respiratory systems are still developing.

Mortality studies since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge and continued reasons for some skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health.⁶ The California Air Resources Board has estimated that achieving the ambient air quality standards for PM10 could reduce premature mortality rates by 6,500 cases per year.⁷

Toxic Air Contaminants (TACs)

Non-criteria air pollutants or TACs are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or cancer causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. TACs may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes approximately 200 compounds, including particulate emissions from diesel-fueled engines.

In 2001 the ARB assessed the statewide health risks from exposure to diesel exhaust and to other TACs. It is difficult to distinguish the health risks of diesel emissions from the other air toxics, since diesel exhaust contains approximately 40 different TACs. The ARB study (California ARB, 2000) detected diesel exhaust by using ambient air carbon soot measurements as a surrogate for diesel emissions. The ARB study reported that in 2000, the statewide cancer risk from exposure to diesel exhaust was approximately 540 per million (i.e., 540 cancers per million people) as compared to a total risk for exposure to all ambi-

ent air toxics of 760 per million. This estimate of risk from diesel exhaust, which accounts for approximately 70 percent of the total risk from TACs, included both urban and rural areas in the state. This calculation can be considered as an average worst-case for the state, since it assumes constant exposure to outdoor concentrations of diesel exhaust and does not account for expected lower concentrations indoors, where most people spend most of their time.

Impacted Communities

In the Bay Area, there are a number of urban or industrialized communities where the exposure to TACs is relatively high in comparison to others. These same communities are often faced with other environmental and socio-economic hardships that further stress their residents and result in poor health outcomes. To address community risk from air toxics, the Air District initiated the Community Air Risk Evaluation (CARE) program in 2004 to identify locations with high levels of risk from TACs co-located with sensitive populations and use the information to help focus mitigation measures. According to the findings of the CARE Program, diesel PM, mostly from on and off-road mobile sources, accounts for over 80 percent of the inhalation cancer risk from TACs in the Bay Area. The Planning Area is part of the Western Alameda County Impacted Community.

In many cases, air quality conditions in impacted communities result in part from land use and transportation decisions made over many years. The Bay Area Air Quality Management District (BAAQMD) encourages comprehensive, community-wide strategies to achieve the greatest reductions in emissions of and exposure to TAC and PM2.5.⁸

Permitted Sources

Figure 10.4 shows all the facilities in the Planning Area that have permits to operate and that emit one or more toxic air contaminants as of 2008. The types of permitted sources include, but are not limited to: refinery sources, gasoline dispensing facilities, dry cleaners, diesel internal combustion engines, natural gas turbines, crematories, landfills, waste water treatment facilities, hospitals and coffee roasters.⁹

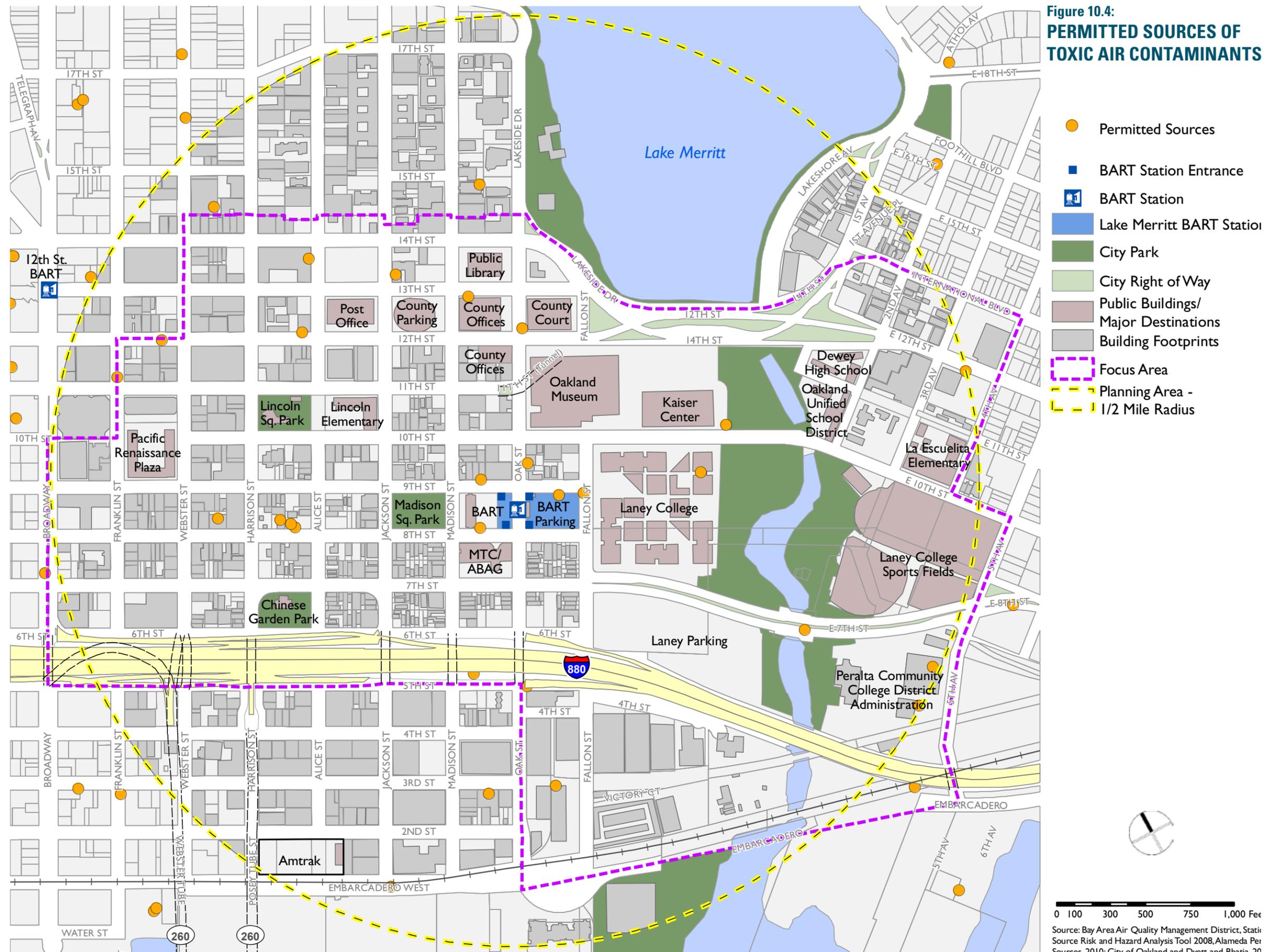
6 Dockery and Pope, 2006.

7 Air Resources Board, 2002.

8 Bay Area Air Quality Management District, California Environmental Air Quality Act Air Quality Guidelines, May, 2010.

9 Bay Area Air Quality Management District, Recommended Methods for Screening and Modeling Local Risks and Hazards, May 2010.

Figure 10.4:
PERMITTED SOURCES OF TOXIC AIR CONTAMINANTS



10.5 Noise

The major noise sources in Oakland, as in most cities, are transportation activities, specifically motor-vehicle traffic on major thoroughfares, which generates noise throughout the city continuously; truck traffic on local streets; rail operations (including those of the Bay Area Rapid Transit, or BART), which produce significant noise levels intermittently along railroad alignments; and operations at the Port of Oakland.

The major noise sources in the Planning Area are vehicular traffic on I-880 and major roadways and Amtrak operations. The BART runs underground through the Planning Area and therefore does not result in noise impacts.

For I-880, distance from roadway center to the 70 Ldn noise contour is approximately 1,200 feet. The distance from the roadway center to the 65 Ldn noise contour is approximately 2,500 feet (0.5 miles). The distance from the roadway center to the 60 Ldn noise contour is approximately 5,500 feet (1 mile).¹⁰ These distances are shown in Figure 10.5.

The Oakland Municipal Code regulates noise in the City of Oakland. These noise standards, contained in Chapter 17.120.050 Noise of the Municipal Code, are shown in Tables 10.6 through 10.9.

¹⁰ City of Oakland, Noise Element Update Environmental Noise Background Report, December 16, 2004.

TABLE 10.5: EXISTING (2006) BASELINE TRAFFIC NOISE LEVELS IN AND AROUND THE PLANNING AREA

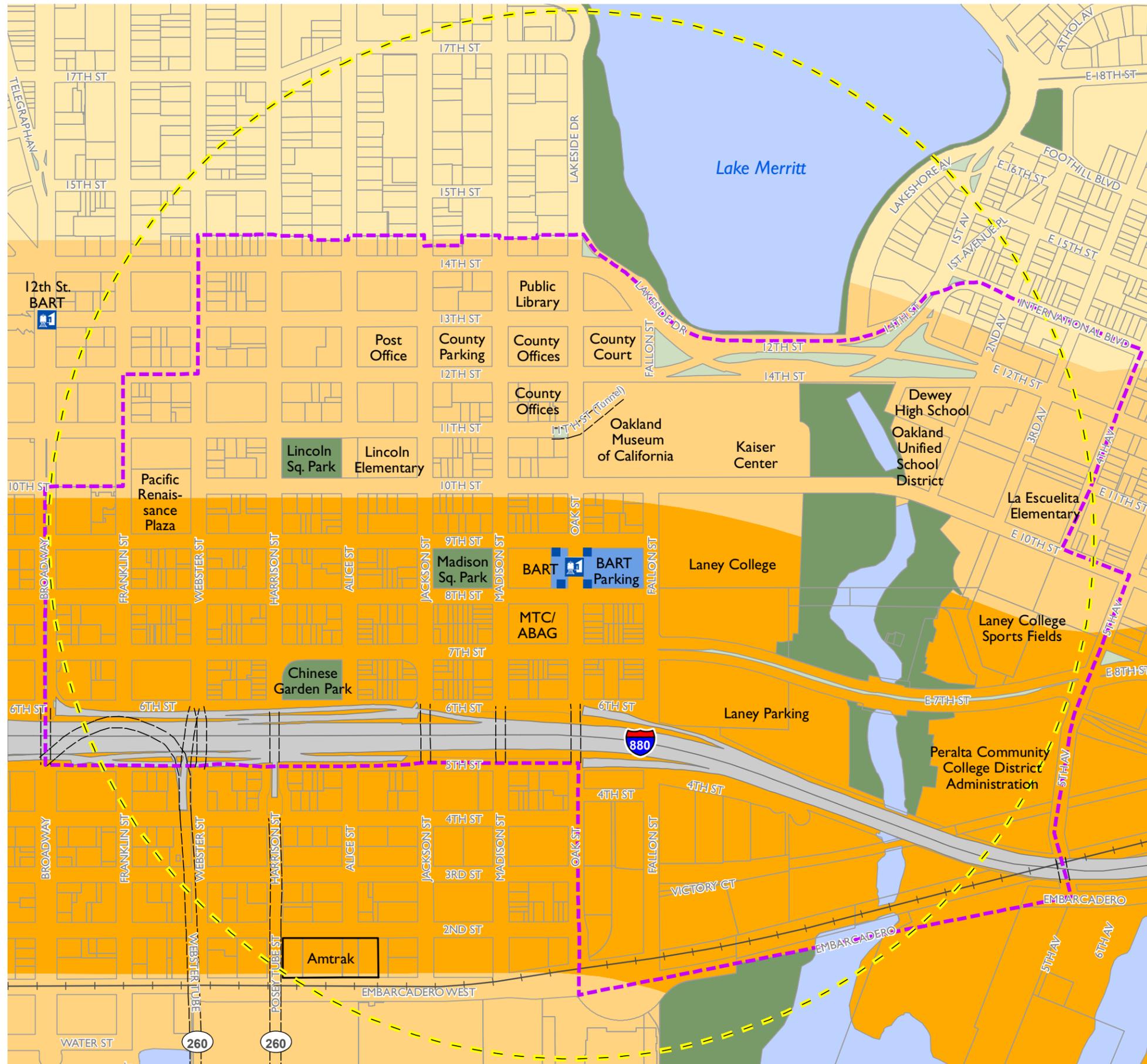
ROADWAY SEGMENT	ADT ¹	CENTER-LINE TO 70 LDN (FEET) ²	CENTER-LINE TO 65 LDN (FEET)	CENTER-LINE TO 60 LDN (FEET)	LDN (DBA) 50 FEET FROM CENTERLINE OF OUTERMOST LANE
Grand Avenue (MacArthur Boulevard to El Embarcadero)	22,500	< 50 b	81	171	66.2
Grand Avenue (El Embarcadero to Euclid Avenue)	21,800	< 50	79	167	66.1
El Embarcadero (Lakeshore Avenue to Grand Avenue)	4,600	< 50	< 50	60	60.1
Lakeshore Avenue (MacArthur Boulevard to El Embarcadero)	15,800	< 50	65	135	64.7
Lakeshore Avenue (El Embarcadero to Boden Way)	19,800	< 50	75	157	65.6
Harrison Street (Grand Avenue to 20th Street)	29,500	< 50	106	208	65.6
Lakeside Drive (19th Street to 20th Street)	16,700	< 50	67	140	64.9
Lakeside Drive (14th Street to 17th Street)	9,000	< 50	< 50	94	62.2
19th Street (Lakeside Drive to Harrison Street)	1,200	< 50	< 50	< 50	54.2
Madison Street (19th Street to 17th Street)	7,400	< 50	< 50	82	61.9
17th Street (Madison Street to Lakeside Drive)	900	< 50	< 50	< 50	53
14th Street (Oak Street to Madison Street)	12,400	< 50	56	115	63.6
12th Street (Oak Street to Madison Street)	9,600	< 50	< 50	98	62.5
10th Street (Oak Street to Madison Street)	3,600	< 50	< 50	53	58.2
14th Street (East of Oak Street)	13,600	< 50	59	123	64
1st Avenue (East 16th Street to Foothill Boulevard)	21,300	< 50	82	166	65.1
12th Street (Fallon Street to Oak Street)	9,100	< 50	< 50	95	62.3
Oak Street (11th Street to 12th Street)	8,600	< 50	< 50	91	62
1st Avenue (East 15th Street to East 14th Street)	13,900	< 50	58	124	64.6
12th Street (3rd Avenue to 2nd Avenue)	10,900	< 50	< 50	106	63
2nd Avenue (12th Street to 14th Street)	6,900	< 50	< 50	78	61.8
5th Avenue (12th Street to 14th Street)	6,300	< 50	< 50	73	61.4
10th Street (4th Avenue to 2nd Avenue)	5,400	< 50	< 50	66	60.8
10th Street (2nd Avenue to Fallon Street)	5,400	< 50	< 50	66	60.8
8th Street (5th Avenue to Lake Merritt Channel)	13,300	< 50	58	121	63.9
Embarcadero East (5th Avenue to Lake Merritt Channel)	7,100	< 50	< 50	79	62

¹ Average Daily Traffic volume.

² Traffic noise within 50 feet of the roadway centerline requires site-specific analysis.

Source: City of Oakland, Measure DD Implementation Project EIR E: Noise, July 2007.

**Figure 10.5:
I-880 NOISE CONTOURS (2004)**



- BART Station Entrance
- BART Station
- 70+ Ldn, 1,200 Ft.
- 65+ Ldn, 2,500 Ft.
- 60+ Ldn, 5,500 Ft.
- Lake Merritt BART Station
- Park
- City Right of Way
- Focus Area
- Planning Area - 1/2 Mile Radius



0 100 300 500 750 1,000 Feet

Source: City of Oakland and Dyett and Bhatia, 2009.

Health Impacts of Noise

Human reaction to noise ranges from annoyance, to interference with various activities, to hearing loss and stress-related health problems. The effects of noise on people can be placed into three categories:

- Subjective effects of annoyance, nuisance, dissatisfaction;
- Interference with activities such as speech, sleep, learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no complete satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

People in residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, natural areas, parks and outdoor recreation areas are generally more sensitive to noise than are people at commercial and industrial establishments. Consequently, the noise standards for sensitive land uses are more stringent than for those at less sensitive uses.

TABLE 10.6: MAXIMUM ALLOWABLE RECEIVING NOISE LEVEL STANDARDS, RESIDENTIAL AND CIVIC, DBA

CUMULATIVE NUMBER OF MINUTES IN EITHER THE DAYTIME OR NIGHT TIME ONE HOUR TIME PERIOD	DAYTIME 7 A.M. TO 10 P.M.	NIGHTTIME 10 P.M. TO 7 A.M.
20	60	45
10	65	50
5	70	55
1	75	60
0	80	65

TABLE 10.7: MAXIMUM ALLOWABLE RECEIVING NOISE LEVEL STANDARDS, DBA

CUMULATIVE NUMBER OF MINUTES IN EITHER THE DAYTIME OR NIGHTTIME ONE HOUR TIME PERIOD	ANYTIME
20	65
10	70
5	75
1	80
0	85

TABLE 10.8: MAXIMUM ALLOWABLE RECEIVING NOISE LEVEL STANDARDS, DBA

CUMULATIVE NUMBER OF MINUTES IN ANY ONE HOUR TIME PERIOD	ANYTIME
20	70
10	75
5	80
1	85
0	90

TABLE 10.9: MAXIMUM ALLOWABLE RECEIVING NOISE LEVEL STANDARDS, DBA

	DAILY 7 A.M. TO 7 P.M.	WEEKENDS 9 A.M. TO 8 P.M.
SHORT-TERM OPERATION		
Residential	80	65
Commercial, Industrial	85	70
LONG-TERM OPERATION		
Residential	65	55
Commercial, Industrial	70	60

Source Tables 10.6 - 10.9: City of Oakland Municipal Code, Chapter 17.120.050 Noise, Accessed January 22, 2010

10.6 Hydrology and Water Quality

Hydrology

Surface water features in the Planning Area include Lake Merritt, Lake Merritt Channel and the Oakland Estuary. The Oakland Estuary was a tidal slough that originated in a vast marsh that stretched from Lake Merritt to Brooklyn Basin. At the turn of the century, the estuary was dredged, separating Oakland from Alameda and forming the estuary as it is today. Lake Merritt remains hydrologically connected to the estuary through tidal gates at the Seventh Street Pump Station. The estuary is influenced by both freshwater and marine water. The estuary receives freshwater inflow from a combination of natural creeks, human-made stormwater drainage facilities, and direct surface runoff. The estuary is also influenced by the marine waters of the Bay and is subject to tidal currents. Sediment from Oakland's shoreline and creeks is carried by the tidal current to shoals and sandbars, causing siltation of the shipping channels.¹¹

Flooding

The Federal Emergency Management Agency (FEMA), through its Flood Insurance Rate Mapping program, designates areas where urban flooding could occur during 100-year and 500-year flood events. The 100 year flood zone identifies an area inundated by 1% annual chance flooding (100 yr. Flood) and the 500 year flood zone identifies areas inundated by 0.2% annual chance flooding (500 yr. Flood); an area inundated by 1% annual chance flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from 1% annual chance flooding.

The edges of the Channel are designated as 100 year flood zones, which is a high risk area. The edges of Lake Merritt are designated as 500 year flood zones, which are areas of moderate flood hazard.¹²

The City of Oakland is part of the Alameda County Flood Control and Water Control District (ACFCWCD) Zone 12. Zone 12, the largest zone in western Alameda County, covers both Oakland and Emeryville. Storm water collected from these cities (some 51,200 acres) is directed to the San Francisco Bay through natural waterways and both cities' and ACFCWCD

storm drainage facilities. Four pump stations – Ettie, McKillop, Temescal, and Lake Merritt – lift stormwater flows for discharge into the Bay. The District also protects and maintains 12 creeks totaling seventeen miles of natural waterway.

Urban flood control becomes ever more important as Oakland development grows. Flood channel capacity to convey stormwater from the hills, through the city, and out to the Bay must be carefully monitored to promote stewardship of local creeks and watershed management as well as encourage pollution prevention practices.

The District is currently working with the City of Oakland to study the feasibility of relocating the Lake Merritt Pump Station. If all operating concerns can be addressed, the City would like to have the pump station relocated to create an open boating channel from Lake Merritt to the Bay. In the meantime, the City has proceeded with proposals for a bridge over the channel to replace the existing culverts at 12th Street.

Stormwater Drainage and Management

Stormwater runoff is collected from within the Planning Area through various storm drain systems and culverts, as well as direct surface flow to the San Francisco Bay, via the Oakland Estuary or by way of Lake Merritt. Fourteen culverts and outfalls drain directly to Lake Merritt from the northern half of the Planning Area, and seven (observable) to the estuary from the southern half.

The City of Oakland is responsible for the construction and maintenance of the local storm drainage system within Oakland's public areas and roads, while the Alameda County Flood Control and Water Control District (ACFCWCD) constructs, operates, and maintains major trunk lines and flood control facilities in Oakland.

Existing infrastructure around and serving the project site includes pipes ranging from 10 inches to over 30 inches in diameter. Several box culverts of various sizes serve as connectors in the east-west direction towards the southern half of the Planning Area. Following the natural drainage patterns of the terrain, most storm drain pipes run north to south, with the majority of the flow direction to the south. There are several (five observable) outfalls draining directly into the San Francisco Bay.

The City makes structural improvements as necessary to ensure that the system is able to reasonably handle stormwater flow. However, due to recent financial constraints, it is generally assumed that the storm drain system is aged and would not be able to handle increased runoff flows. Furthermore, new National Pollution Discharge Elimination System (NPDES) regulations will be in place by July 2010, enabling more stringent standards to be applied on new developments one-acre or greater.

On February 19, 2003, the Regional Water Quality Control Board, San Francisco Bay Region, issued a municipal stormwater permit under the National Pollutant Discharge Elimination System (NPDES) permit program to the Alameda Countywide Clean Water Program (ACCWP). The purpose of the permit is to reduce the discharge of pollutants in stormwater to the maximum extent practicable and to effectively prohibit non-stormwater discharges into municipal storm drain systems and watercourses. The City of Oakland, as a member of the ACCWP, is a co-permittee under the ACCWP's permit and is, therefore, subject to the permit requirements.

Provision C.3 of the NPDES permit is the section of the permit containing stormwater pollution management requirements for new development and redevelopment projects. Among other things, Provision C.3 requires that certain new development and redevelopment projects incorporate post-construction stormwater pollution management measures, including stormwater treatment measures, stormwater site design measures, and source control measures, to reduce stormwater pollution after the construction of the project. These requirements are in addition to standard stormwater-related best management practices (BMPs) required during construction.

Beginning February 15, 2005, all new development and redevelopment projects for which the City has not received a complete Planning and Zoning permit application that create or replace one acre or more of impervious surface are required to incorporate post-construction stormwater pollution management measures. Beginning August 15, 2006, all new development and redevelopment projects for which the City has not received a complete Planning and Zoning permit application that create or replace 10,000 square feet or more of impervious surface are required to incorporate post-construction stormwater pollution management measures.

11 City of Oakland, Oak to Ninth DEIR, September 1, 2005.

12 ABAG, <http://gis.abag.ca.gov/website/floodplain/viewer.htm>, accessed January 11, 2010.

10.7 Utilities and Service Systems

Figures 10.6-10.10 show utilities systems in the Planning Area.

Water Service

The East Bay Municipal Utility District (EBMUD), a publicly owned utility, supplies water to parts of Alameda and Contra Costa counties, including the city of Oakland. EBMUD supplies water to nearly 1.3 million people within its estimated 325-square-mile service area. The city of Oakland comprises slightly less than one-third of EBMUD's customer base.

On an average annual basis, approximately 90% of the water used by EBMUD comes from the 577 square mile protected Mokelumne River watershed. EBMUD has water rights that allow for the delivery of up to a maximum of 325 million gallons per day (MGD) or approximately 364,000 acre-feet per year, subject to the availability of the Mokelumne River runoff and senior water rights of other users upstream and riparian rights downstream. In normal years, EBMUD reservoirs in the East Bay (described below) receive an additional 30,000 acre-feet of local water from runoff annually. In dry years, evaporation and other losses can total more than the local runoff. Runoff from the Mokelumne watershed is not sufficient to meet EBMUD customer needs in times of severe drought.

Average daily system wide demand is approximately 220 MGD. In 1929, when EBMUD began delivering water to its customers, the average daily per capita consumption was 60 gallons. Today's average daily per capita consumption is 162 gallons. EBMUD's current water demand projections are based on the 2000 Districtwide Update of Water Demand Projections. The 2000 Demand Study used a land use-based method to forecast water demands. The Demand Study forecasts a customer demand of 281 MGD for the year 2030, which is then adjusted to take into account projected savings to be achieved through EBMUD's conservation and recycled water programs. Assuming that the projected savings of 35 MGD can be achieved through conservation efforts and the projected savings of 14 MGD can be achieved through recycled water programs, the 2030 planning level of demand forecast as adjusted by these factors is 232 MGD.¹³

The Planning Area is serviced by a network of transmission and distribution lines ranging from 4 inches in diameter to above 24

inches. Transmission lines, ranging from 16 inches in diameter and above, traverse mainly on 5th Street and 9th Street through the Planning Area just west of Laney College. A 24-inch main travels south on Alice Street from the intersection of Alice and 9th Street and crosses into Alameda. The condition of this main is unknown, although shown on EBMUD's base map to have been constructed in 1946. Another transmission system is established from the connections made at the intersection of Fallon Street and 7th Street, and the intersection of Oak Street and 10th Street, also traversing east-west, and is then rerouted to the northeast along 4th Avenue, and to the east along East 10th and East 11th Street.

Feeder mains (secondary mains) are those with diameters of 12-inches or greater. They traverse both easterly-westerly directions as well as from north to south. Within the Planning Area, the most notable feeder pipes are located on 7th, 12th and 13th streets (east-west) and on Madison and Webster streets (north-south). Distribution mains are located on every street throughout the Planning Area.

Recycled Water

EBMUD has been recycling water for landscape irrigation and in-plant processes at its main wastewater treatment plant since 1971 and it is EBMUD's current practice to promote recycled water to its customers for appropriate non-potable uses. Recycled water use that meets a portion of water supply demands increases the availability and reliability of the potable water supply and lessens the effect of extreme rationing induced by a prolonged severe drought.

As EBMUD continues to explore opportunities for implementing recycled water projects, it is faced with a number of technical challenges which could impact the economic feasibility of the projects. These challenges include the need for recycled water distribution systems that are separate from EBMUD's potable water distribution systems. As a potential solution, EBMUD considers re-use of pipelines, reservoirs, and other facilities which are no longer needed by other utilities for distributing recycled water to customers. The need for separate plumbing at each customer location is another technical and economic challenge that is an ongoing part of recycled water projects. It is more economical to install a separate plumbing system for a new project during the initial construction of the facility than it is to return at a later date to retrofit the project.

Within the study area, only 12,500 linear feet of recycled water mains have been placed. The recycled system originates from a source further west on 7th Street, with the majority of the pipe runs flowing east-west on 9th Street and 11th Street. A "loop" was provided on Market Street to link the two lines. Further east, the 11th Street pipe rerouted onto 10th Street at Harrison Street, and extends all around Laney College Sports Fields and ends midblock on East 7th Street. A notable extension is the 8-inch recycled main on Oak Street (Lakeside Drive) servicing the irrigation requirements at the recently-renovated Lake Challet and Lake Merritt Boathouse.

EBMUD's Policy 8.01 (consistent with California Water Code, Section 13550) allows EBMUD to require the use of recycled water for non-domestic purposes when it is of adequate quality and quantity, available at reasonable cost, not detrimental to public health and not injurious to plant life, fish and wildlife. To date, however, EBMUD has been effective in providing incentives to use recycled water, rather than mandating its use.

Sanitary Sewer

The City of Oakland owns, operates, and maintains a local sanitary sewer collection system covering approximately 48 square miles, and includes over 1,000 miles of sanitary sewer lines, 31,000 structures and seven pump stations, serving a population of about 400,000 people throughout the City. The city's sewer collection system is divided into basins and subbasins. Each numbered subbasin encompasses a specific physical area, and its sewer flows are assigned to a single discharge point from the City's collection system into the EBMUD's interceptor lines (described below).

Most of the sewer system is over 60 years old – some as old as 100 years. A twenty-five year capital improvement program was initiated in 1987 to rehabilitate up to 30% of the sewer system to eliminate wet weather overflows, which are caused by rainwater and groundwater infiltrating into old, leaky sewer pipes. This program is mandated under the City's sanitary sewer discharge permit with the Regional Water Quality Control Board, and is due for completion in 2014. This program does not address the remaining 700 miles of sewer system that continue to deteriorate with age. Only a small fraction of this remaining portion is rehabilitated on an as-needed basis each year.

13 East Bay Municipal Utility District, Urban Water Management Plan, 2005, p. 4-4.

There is currently a backlog of requests for cyclic replacement projects, with only the highest priority projects completed each year. These highest priority projects are those with ongoing overflows, backups and/or collapsed pipes. They do not include those lines that have deteriorated but have not yet caused overflows. The City's Capital Improvement Program identified over \$14M for cyclic sewer replacement and relief sewers for FY 2009 to 2011; however this amount also includes storm drainage upgrades.

Base maps for the Planning Area, obtained from the City of Oakland, indicate that the sewer pipes are in poor conditions. Many laterals are shown as "plugged" or "abandoned". Many pipes do not have any data associated (diameter, flow direction, material, etc.). Where information is available, sewer main pipe diameters are shown to range from eight to 12 inches.

EBMUD has two interceptor systems within the vicinity of the Planning Area. The South Interceptor system traverses east-west on 2nd Street (just outside the planning area limits). The Alameda Interceptor system begins at the pump station at the end of Alice Street. Though not verified, it is believed that most sewage in the Planning Area is collected at this point and conveyed to the Main Wastewater Treatment Plant through this system. Capacity to handle additional demands from full build-out is unknown, but based on the general existing condition of the collective system, upgrade and expansion are likely requirements.

Wastewater Treatment

EBMUD's wastewater service district (District No. 1 or SD-1) was established as a separate wastewater district within EBMUD's water service district. SD-1 treats domestic, commercial and industrial wastewater for the city of Oakland. Wastewater collected by interceptors flows to the EBMUD's Wastewater Treatment Plant, which is located in Oakland near the entrance of the Bay Bridge. The plant provides secondary treatment for a maximum flow of 168 million gallons per day (MGD). Primary treatment can be provided for up to a peak flow of 320 MGD. The average annual daily flow is approximately 80 MGD.¹⁴

¹⁴ East Bay Municipal Utility District, Urban Water Management Plan, 2005, p. 5-2..

Solid Waste

Non-hazardous waste in the city of Oakland is collected by Waste Management of Alameda County (WMAC), which provides curbside pickup for residential, commercial, and industrial non-hazardous waste and transports it to WMAC's Davis Street Transfer Station in the city of San Leandro. Transfer trucks haul waste to the Altamont Landfill and Resource Facility, located approximately 35 miles east of Oakland near Livermore. The Altamont Landfill has a daily permitted maximum disposal of 11,500 tons/day. The landfill closure date is January 1st, 2029 and in 2000, the landfill was at 26.3% capacity.¹⁵

In 2008, Oakland disposed of approximately 327,589 tons of solid waste or about 898 tons per day. The Integrated Waste Management Act (AB 939) requires jurisdictions to meet diversion goals of 50% by the year 2000. In 2006, Oakland's diversion rate was 59%.¹⁶

Sanitation

Sanitation can affect the health of a community. The community has identified trash and litter as an ongoing issue within the Planning Area. Litter and overflowing trash can harm the environment by providing areas for insects and rodents, and by damaging the appearance of a neighborhood.

Electricity and Gas

Electricity and gas service in the city of Oakland is provided primarily by Pacific Gas and Electric (PG&E), which owns the gas and electrical utility supply lines. Throughout most of Oakland, electrical power is delivered via overhead distribution and transmission lines, and natural gas is distributed through underground piping. Undergrounding efforts have been initiated as opportunities for new developments arise.

Within the Planning Area, two potential problems exist which may impact future developments: sub-sidewalk facilities (high voltage vaults, transformers) and a high water table. PG&E staff indicates that there is adequate capacity for any immediate planned development. When applications for new services are reviewed, staff may determine whether new circuits will be required, and there is typically a one and one-half to two year lead time for new developments. A new development must

¹⁵ California Integrated Waste Management Board, <http://www.calrecycle.ca.gov/Profiles/Facility/Landfill/LFProfile1.asp?COID=1&FACID=01-AA-0009>, accessed January 11, 2010.

¹⁶ California Integrated Waste Management Board, <http://www.calrecycle.ca.gov/Profiles/Facility/Landfill/LFProfile1.asp?COID=1&FACID=01-AA-0009>, accessed January 11, 2010.

exceed six to eight megawatts (MW) of power requirements before exceeding current capacity. For comparison purposes, one Walmart consumes approximately 0.9 MW. Power is generally supplied to a development site through underground vaults, ground-level vaults, or transformer pads.

Buildings constructed after June 30, 1977 must comply with standards identified in Title 24 of the California Code of Regulations. Title 24, established by the California Energy Commission (CEC) in 1978, requires the inclusion of state-of-the-art energy conservation features in building design and construction, including the incorporation of specific energy conserving design features, use of non-depletable energy resources, or a demonstration that buildings would comply with a designated energy budget.

Telecommunications

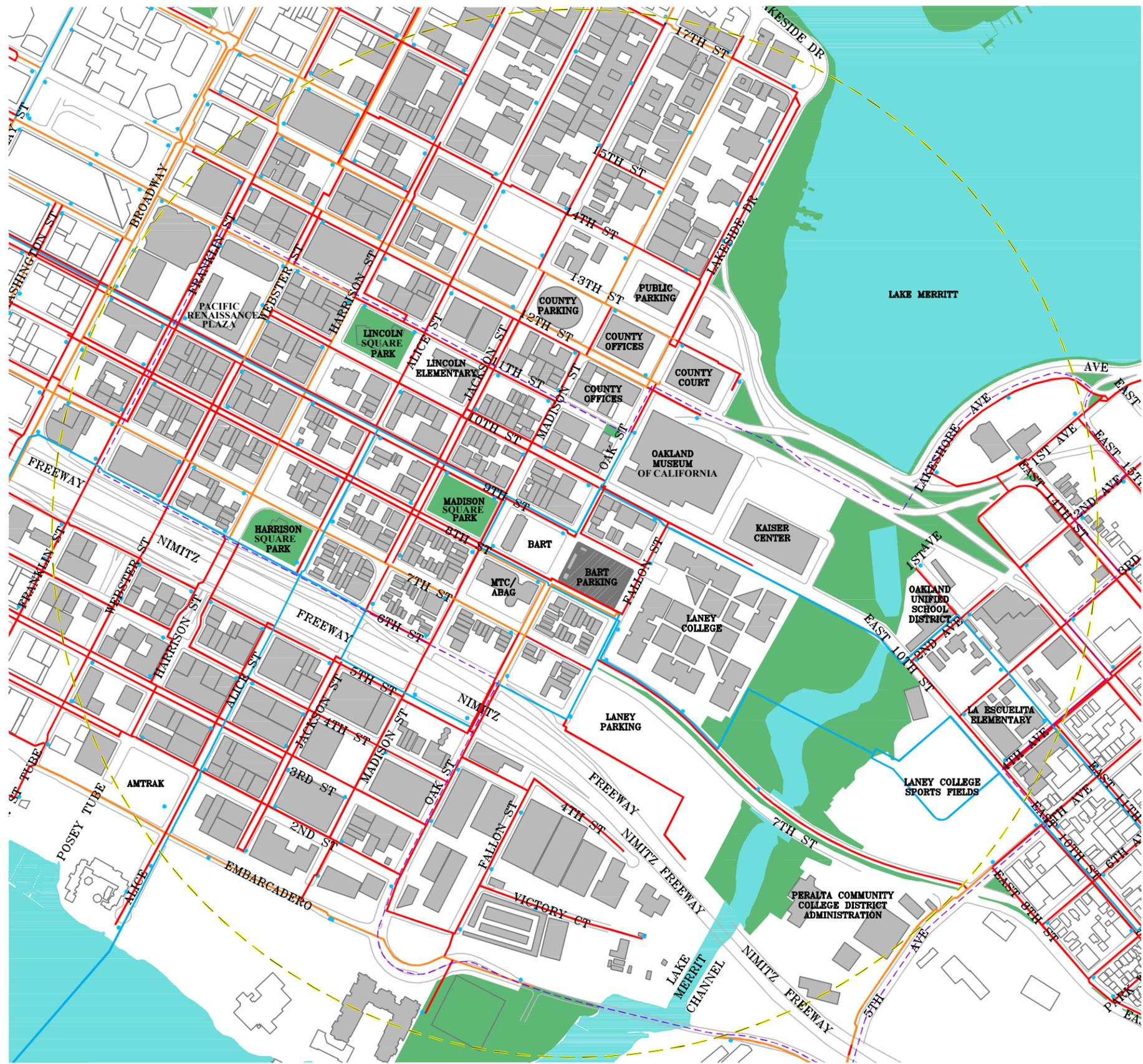
AT&T and Comcast are the telecommunications service providers for the Planning Area. Both overhead cables and underground conduits in joint trenches are present. Comcast typically leases spaces with occupancy agreements from either PG&E or AT&T, who owns the physical poles for installing telecommunication cables. For underground joint trenches, PG&E is typically the owner and conduit placement must follow PG&E's construction standards.

In every street within the Planning Area, there is a Comcast facility present. From the base map that Comcast provided, sub-sidewalk vaults are located fairly evenly throughout the Planning Area.



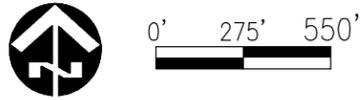
Figure 10.6:
STORM DRAIN

- STORM DRAIN MAIN LINE
- - - FOCUS AREA
- - - PLANNING AREA - 1/2 MILE RADIUS



**Figure 10.7:
POTABLE WATER SYSTEM**

- 4"-10" WATER MAIN
- 12" WATER MAIN
- 16" OR GREATER WATER MAIN
- FIRE HYDRANT (APPROXIMATE)
- - - FOCUS AREA
- - - PLANNING AREA - 1/2 MILE RADIUS



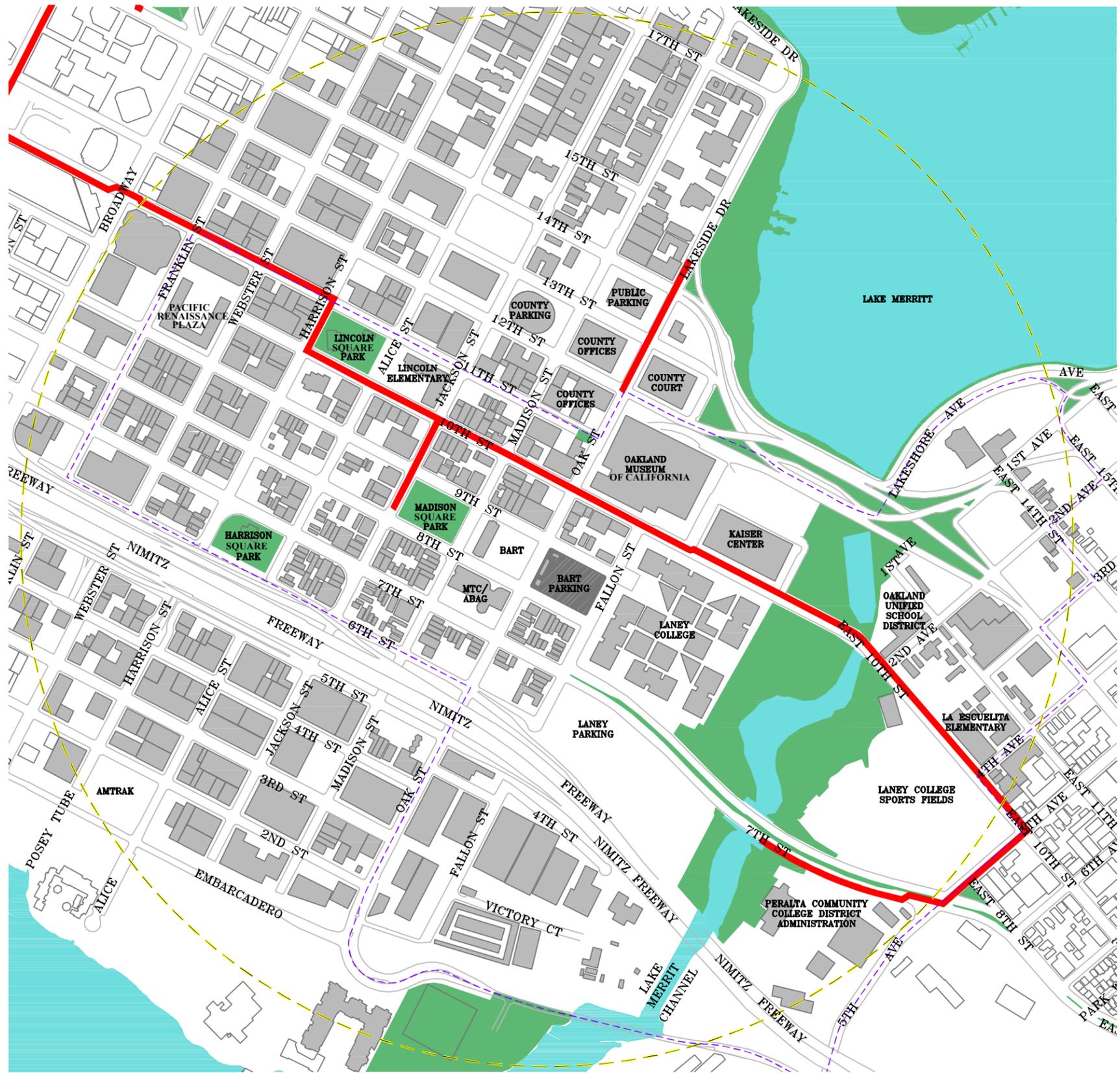
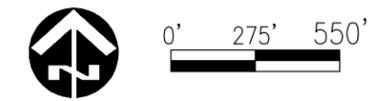


Figure 10.8:
RECLAIMED WATER SYSTEM

- RECLAIMED WATER MAIN LINE
- - - FOCUS AREA
- - - PLANNING AREA - 1/2 MILE RADIUS



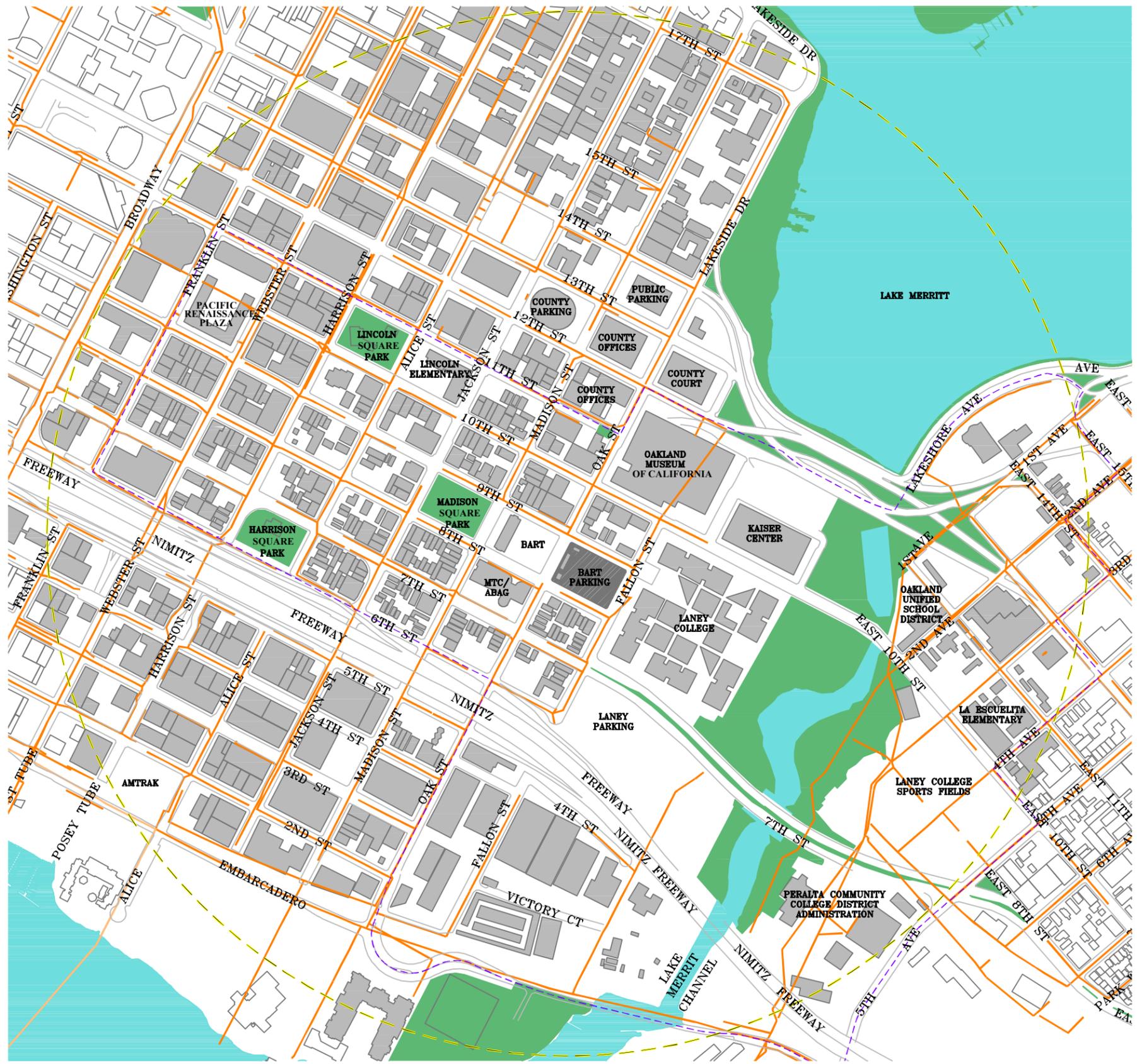


Figure 10.9:
SANITARY SEWER SYSTEM

- SANITARY SEWER MAIN
- SANITARY SEWER INTERCEPTOR
- - - FOCUS AREA
- - - PLANNING AREA - 1/2 MILE RADIUS



0' 275' 550'



Figure 10.10:
COMCAST SYSTEM

- COMCAST MAIN LINE
- - - FOCUS AREA
- - - PLANNING AREA - 1/2 MILE RADIUS



0' 275' 550'

10.8 Climate Change and Greenhouse Gases

Baseline Greenhouse Gas Emissions Inventory

In June 2006 the City of Oakland, along with 10 other local governments in Alameda County, committed to becoming a member of ICLEI and participating in the Alameda County Climate Protection Project. In December 2006, the City of Oakland completed their Baseline Greenhouse Gas Emissions Inventory Report which measured the amount of greenhouse gas emissions for base year 2005. Emissions are aggregated and reported in terms of equivalent carbon dioxide units, or eCO₂. Converting all emissions to equivalent carbon dioxide units allows for the consideration of different greenhouse gases in comparable terms. For example, methane is twenty-one times more powerful than carbon dioxide in its capacity to trap heat, so the model converts one ton of methane emissions to 21 tons of eCO₂.

In the base year 2005, the City of Oakland emitted approximately 2,248,667 tons of eCO₂ from the residential, commercial/industrial, transportation and waste sectors. Burning fossil fuels in vehicles and or energy use in buildings and facilities is a major contributor to Oakland’s greenhouse gas emissions. Fuel consumption in the transportation sector is the single biggest source of emissions, contributing 46.9% of total emissions. Table 10.10 summarizes Oakland community emissions.

Energy and Climate Action Plan

The City is currently developing an Energy and Climate Action Plan to identify, evaluate and prioritize opportunities to reduce energy consumption and GHG emissions in its own government operations and throughout the Oakland community. On July 7, 2009, the Oakland City Council directed staff to develop the draft Oakland Energy and Climate Action Plan using a preliminary planning GHG reduction target equivalent to 36% below 2005 GHG emissions by 2020, and annual benchmarks for meeting the target.

Green Building

Green buildings reduce energy use, conserve water and other natural resources, limit solid waste during construction and operation, and promote healthy indoor air quality. In 2005, Oakland adopted the Civic Green Building Ordinance which requires that City building projects meet minimum LEED™ “Silver” rating under the LEED Rating System and certified by the U.S. Green Building Council.

Further, proposed Green Standards have been developed that would prescribe minimum green building requirements for private development projects in Oakland. The regulations would apply to new construction, additions or alterations of a certain size, mixed-use, affordable housing, and large landscape projects, as well as the demolition of historic resources. The ordinance will become fully effective starting January 1, 2011, after which the project applicant will generally be required to submit a completed green building checklist, meet minimum green building requirements, and certify the project through a specific third-party green building rating system.

Zero Waste

Among the numerous plans and policies to help reduce GHG, the City completed the Zero Waste Strategic Plan. Oakland’s Zero Waste Goal is to cut the City’s current waste disposal to 40,000 tons per year – approximately a 90% reduction. This will require double the waste disposal reduction that Oakland has achieved over the past 15 years. Progress toward the Zero Waste Goal will be measured by the tons of annual waste land-filled, with key milestones at 5-year intervals between now and 2020.

TABLE 10.10: 2005 OAKLAND COMMUNITY EMISSIONS SUMMARY

POTENTIAL SOURCES	EQUIV ECO ₂ (TONS)	ENERGY (MMBTU)
Residential	580,710	8,838,214
Commercial/Industrial	709,199	0,282,046
Transportation	1,138,767	13,250,101
Total	2,248,667	32,370,361

Source: ICLEI, Baseline Greenhouse Gas Emissions Inventory Report, December 2006.

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