X. Public Health

Introduction

The Public Health chapter of the Existing Conditions Report reviews a subset of community-level indicators from the Healthy Development Measurement Tool (HDMT; www.TheHDMT.org) that are known to influence individual and population-level health. The HDMT is a comprehensive evaluation metric to consider health needs in urban development plans and projects. The HDMT explicitly connects public health to urban development planning in efforts to achieve a higher quality social and physical environment that advances health.

Included in this analysis are indicators for six overarching domains: environmental stewardship, sustainable and safe transportation, access to goods and services, adequate and healthy housing, health economy and social cohesion. Many of the indicators reported in this section draw on data reported in other sections of the Existing Conditions Report. They are also discussed here to provide a composite picture of the health-related social and environmental conditions within the Plan Area. We also briefly review limited health data to provide information on health burdens in Oakland.

Summary of Findings

The Plan Area currently includes numerous and diverse industrial and commercial uses that provide good-quality employment for local and regional residents. Residential uses in the Plan Area are in adequate proximity to neighborhood and public infrastructure supportive of community health, including higher quality parks/open space and local schools. As a whole however, to promote optimal health for residents and workers, the Plan Area requires significant improvements in the areas of environmental quality and transportation. The lack of safe pedestrian/bicycle networks and the presence of industrial and mobile sources of air pollution and noise reflect the most significant public health hazards in the area. Any residential growth in the Plan Area should be accompanied by high-quality community design strategies and environmental technologies that can mitigate these health hazards. There is also an overall lack of access to goods and services for the East and West Subareas in particular.

Significant findings by domain are as follows:

Environmental Stewardship

- **Assets:** *Plan Area residents have good access to high-quality shoreline and to a good amount of high-quality open space.* Open space access can confer benefits to health by facilitating physical activity, restoring cognitive and mental health, and by encouraging social interaction.
- **Challenges:** *Current and future Plan Area residents and workers face environmental burdens particularly from traffic-related air pollution and noise stemming from the I-880 freeways, arterial streets, and freight traffic, as well as from proximity to stationary sources of air pollution and noise stemming from intense industrial uses in the Area.* Specifically, 81% of households in the Plan Area live within 1,000 feet or less of busy roadways; virtually all residents live within close proximity to some stationary source of air pollution; and, 100% of households in the Central-West and East Subareas, and 94% of households in the Central-

East live within 500 feet of a designated truck route. Air pollutants from proximity to mobile sources impact lung growth in children, asthma hospitalizations, and premature death. Traffic noise can impact heart disease and hypertension. Feasible environmental mitigation technologies exist to assess and mitigate each of these concerns. These technologies should be used, to the extent feasible, to accommodate new residential growth in the Plan Area. Additionally, environmental contamination of soil and water throughout the Plan Area should be evaluated and mitigated.

Sustainable and Safe Transportation

- **Assets:** The Plan Area contains a network of streets to accommodate vehicular traffic, including freight traffic to support industrial businesses. The majority of households in the Central-East and Central-West Subareas live within ¼ mile of a local transit stop, and most of Central-East residents live within ½ mile of BART.
- **Challenges:** From the standpoint of health, the transit, pedestrian and bicycle networks in the Plan Area are currently inadequate. There is a general lack of safe pedestrian and bicycle routes between the Plan Area and surrounding Oakland neighborhoods where schools, community facilities, and transit stops are located. Only three local transit routes and one regional route directly serve the Plan Area. The entire Plan Area only has five bus stops, and the bus stop amenities are lacking. Next to no households living in the East and West Subareas live in close proximity to either local or regional transit. There is poor pedestrian connectivity to Fruitvale BART and International Blvd. (a major transit corridor). The lack of adequate connections and long exposed walking distances from the Plan Area to the rest of Oakland reduces the area's overall walkability. Factors contributing to the poor pedestrian environment include missing sidewalks; large block sizes, which can increase walking distances; wide, difficult to cross roads designed to accommodate heavy vehicles and maximize traffic flow; few marked crosswalks and several prohibited pedestrian crossings at busy intersections; a lack of pedestrian destinations, particularly outside of employment hours; insufficient street trees and other amenities; and movement barriers created by I-880, Union Pacific / Capital Corridor railroad, BART and the Oakland Estuary. Freeway, on- and off-ramps and truck routes present particular safety hazards for pedestrians and bicyclists and may deter participation in physical activity among residents and workers. Finally, the existing bicycle environment is also poor within the Plan Area. The area's industrial character, traffic congestion, and the lack of adequate east-west connections all contribute to the overall poor pedestrian/bicycle environment within the Plan Area. There are also inadequate crossings for bicycles on the three bridges spanning the Oakland Estuary, and major north-south arterial streets such as International Boulevard and E. 12th Street lack designated bike lanes.

Access to Goods and Services

This aspect of the assessment looked at schools, child care, parks and recreational facilities, libraries, retail food, banks/credit unions and fire/police stations.

- **Assets:** Overall, the Plan Area has very good access to parks given its proximity to the shoreline and two large parks in the West and East Subareas. The Central-West and Central-East Subareas, where 88% of the Plan Area population resides, have very good-to-excellent proximity-based access to schools, retail food, libraries, banks/credit unions and police/fire stations. Both the West and East Subareas have excellent police and good library access. With respect to child care, there are a number of facilities in the area but the capacity of these facilities to accommodate new children is unknown.

- **Challenges:** There are no recreational facilities in the Plan Area or within ¼ mile. The West and East Subareas lack good access to schools and grocery stores. While far fewer residents live in these areas (especially the East Subarea) currently, it is important to recognize that capacity to support future growth in these areas is more compromised. The closest schools, libraries and common retail services exist on the other side of the I-880 and in Alameda. Access to destinations via walking and bicycling may be limited by both street infrastructure and safety hazards as described above. Research illustrates that being within walking distance of neighborhood goods and services promotes physical activity, reduces vehicle trips and miles traveled, and increases neighborhood cohesion and safety. Assessment of current transportation behaviors and identification and mitigation of barriers to walking and bicycling to common destinations would support access to goods and services for area residents.

Adequate and Healthy Housing

- **Assets:** Plan Area households are generally not more cost-burdened in comparison to Oakland households, though this varies to some degree by Subarea.
- **Challenges:** Given the current environmental quality, varied levels of access to goods and services and transportation network, the suitability of expanding residential uses in the Plan Area must be further assessed based on the improvements expected to accompany development. Plan Area households appear to be living in greater overcrowded conditions when compared to Oakland, with West and Central-East households the most overcrowded. There is also variation between Subareas in terms of income segregation and the concentration of low-income households in the Plan Area, particularly in the Central-East Subarea.

Healthy Economy

In this section, we only assess two indicators: income diversity and income self-sufficiency.

- **Assets:** *It is important to note that the Central Estuary industries provide a significant number of jobs for Oakland and other residents.* Given the importance of employment and income to health, the loss of these jobs would pose significant threats to individual health. A number of indicators could be considered to assess the safety of these jobs, including occupational injury rates. However, that assessment is not included in this report due to resource limitations. In general, the Plan Area has varying degrees of income diversity among residents across Subareas.
- **Challenges:** The West and Central-West Subareas appear to have a wider range of income diversity among residents, while *the Central-East Subarea has the least amount of income diversity and is a low-income area.* Generally, the greater the degree of income diversity, the better it is for health. Concentrated poverty and income-related residential segregation are correlated with many poor health outcomes. Developing mixed-income housing provides one approach to alleviating the adverse health and social effects of income-related segregation. *With respect to the wages provided by jobs in the Plan Area, it is likely that the average wages provided by industries are not sufficient to support household self-sufficiency.* Income self sufficiency supports health by ensuring resources for food, shelter, clothing, transportation, childcare and other basic needs. For example, a review of average wages for Plan Area jobs against the "family economic self-sufficiency standard" developed by the Insight Center for Community Economic Development illustrates that jobs in the Plan Area do not consistently provide wages to support families in Oakland. Most jobs provided in the Plan Area provide wages to support a single adult; however, wages are not necessarily high

Social Cohesion

- **Assets:** The Planning Area contains numerous resiliency factors that may contribute to violence prevention including accessible parks, a range of goods and services in close proximity such as retail food, public transit, libraries, and schools. The Plan Area is also relatively diverse in terms of housing mix, income and race/ethnicity.
- **Challenges:** The Plan Area is plagued with high violent crime and property crime rates. Overall, all census tracts that contain the Plan Area have significantly higher violent and property crime rates when compared to Oakland. Known risk factors for crime in the Plan Area include poor pedestrian and bicycle environments, freeway on and off-ramps, high volume roadways and noise levels, and a relatively low population density.

Methodological Note: The household and population data provided by Strategic Economics provides more information than available in the County Assessor's parcel data; however, the household and population data are summarized by Plan Area. Because parcel-level household and population data are unavailable, the percent of households and population covered by various HDMT facilities has been calculated as a percentage of each Plan Area that falls within 1/4, 1/2, and 1-mile distances from the various facilities studied.

Health Outcomes

Health status and health outcome data are currently unavailable at the Plan Area level. For health outcomes, including asthma, diabetes and obesity, the Alameda County Public Health Department is currently working to geocode all hospitalization data for Alameda County to be able to assess health at much smaller geographic units. It is expected that these data will become available by the late summer of 2009. Nonetheless, it is important to have an understanding of the "health" context in which this Existing Conditions analysis was undertaken. Oakland faces significant burdens with respect to heath outcomes, as well as large place-based disparities in health. Findings for life expectancy, mortality rates, self-reported health status, health insurance and various chronic disease indicators are described below.

For the census tracts[19] that contain the Plan Area, the life expectancy rate of residents was 77.1 years, while for Oakland it was slightly higher at 77.7 years. The age-adjusted death rate was 756 deaths per 100,000 population per year; for Oakland, the rate was slightly higher with 784 deaths per 100,000 population per year. With respect to health insurance and health status among Oakland residents, in 2003, 18% of residents age 18 and over lacked health insurance. This percentage was higher than that for

[19] Census tracts = 4060.00, 4061.00, 4073.00.

Alameda county (14%). Furthermore, a higher percentage of persons in Oakland (5%) reported poor health status as compared to Alameda County (4%).

Ambulatory care sensitive (ACS) conditions (such as asthma, diabetes, and coronary heart disease) are conditions for which hospitalization can usually be prevented when conditions have been effectively managed in outpatient settings. High rates of ACS conditions indicate poor access to or use of outpatient health care. More and more, inter-disciplinary research indicates that the "built environment" (e.g., land use, transportation systems and community design) is associated with health outcomes such as these ACS conditions – in particular asthma, diabetes and obesity.

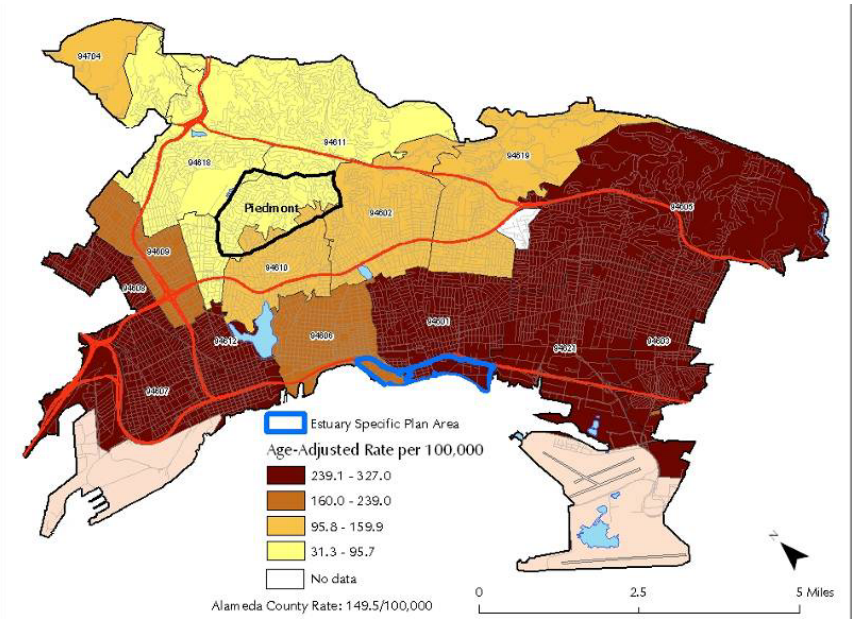
Table 10.1 presents data from the California Office of Statewide Health Planning and Development (OSHPD) for the Plan Area's residential zip codes. These include zip codes 94601 and 94606; zip code 94606 mostly includes the West Subarea, while zip code 94601 mostly includes the Central-West, Central-East and East subareas. Overall, these Oakland zip codes have high rates of hospitalization for asthma, coronary heart disease, diabetes and obesity (see Figures 10.1 and 10.2). Zip code 94606, however, has lower hospitalization rates for all conditions when compared to Oakland, while zip code 94601 has higher rates of hospitalization than Oakland as a whole. While the rate of hospitalizations for these conditions among Plan Area residents is currently unknown, the majority of residents in the Plan Area reside in zip code 94601 where hospitalization rates are higher.

Table 10.1. Rate of Hospitalizations for Ambulatory Care Sensitive Conditions, 2005-2007, Age-Adjusted per 100,000

	Asthma	Coronary Heart Disease	Diabetes	Obesity
94601	251.9	366.3	1456.8	333.5
94606	179.0	315.7	937.9	182.5
Oakland	210.7	348.8	1119.1	305.2

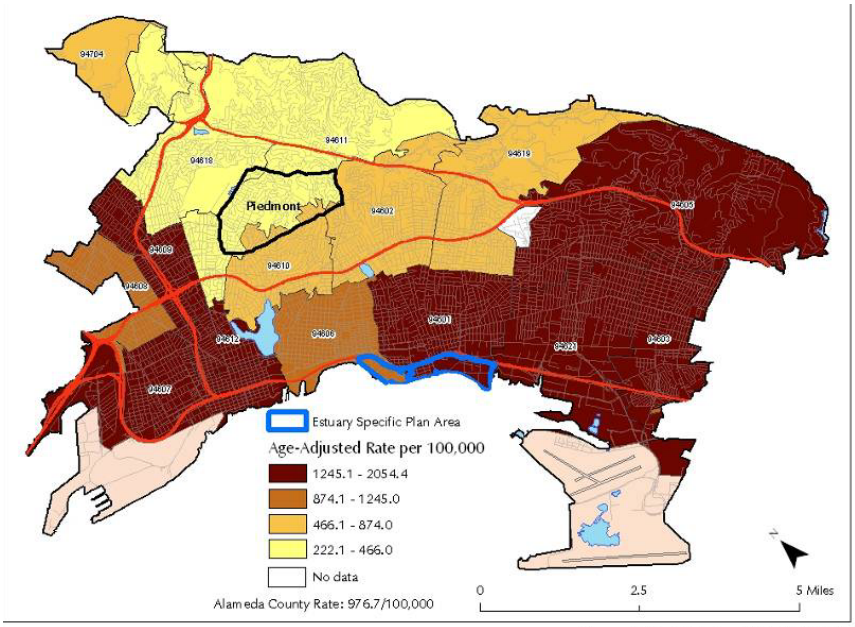
Source: Office of Statewide Health Planning and Development, 2007 – 2007; Alameda County Public Health Department, 2009.

Figure 10.1: Oakland Asthma Hospitalization Rate



Source: CAPE, with data from OSHPD 2005-2007

Figure 10.2: Oakland Diabetes Hospitalization Rate



Source: CAPE, with data from OSHPD 2005-2007

Environmental Stewardship

The following indicators are reviewed to assess environmental stewardship within the Plan Area: 1) mobile sources of air pollution, 2) stationary sources of air pollution; 3) noise; 4) environmental contamination, and 5) shoreline access and open space. Some of these data are also described in the Transportation section of the existing conditions analysis.

Mobile Sources of Air Pollution

Table 10.2 illustrates the proximity of households in each Subarea to various types of heavily-trafficked roadways. The distance thresholds used vary according to the amount of traffic on the roadway, with a larger distance used for roads that carry higher volumes of traffic. The majority of households (81%) living in the Plan Area live within 1,000 feet of a roadway carrying 100,000-150,000 vehicles per day (Interstate 880). This varies by Subarea, with the West Subarea least impacted by heavy traffic, and the Central-West and East Subareas most heavily impacted. Fewer households live in close proximity to less heavily-trafficked streets, such as local arterial streets that carry 10,000 - 50,000 vehicles per day. (There are no streets present in the study area that carry 50,000 - 100,000 vehicles per day.) Finally, 100% of households in the Central-West and East Subareas and 94% of households in the Central-East live within 500 feet of a designated truck route.

Table 10.2. Proportion households living in close proximity to a busy roadway

	1,000 feet of roadways carrying 100,000+ vehicles p/day	150 feet of roadways carrying 10,000 - 50,000 vehicles p/day
West	14%	0%
Central-West	100%	46%
Central-East	94%	16%
East	100%	33%
Planning Area	81%	31%

Source: Arup, 2009.

The Plan Area contains known significant mobile sources of air pollution including freeways, freeway on- and off-ramps, main arterial streets, and truck routes. As a result, residents in the Plan Area likely face increased air pollution exposure and associated health hazards. Health effects from exposure to sources of pollution vary depending on the pollutant, distance from the sources, and how the emissions are released into the air and dispersed by the wind. Extensive research demonstrates that living in proximity to a busy roadway is linked to negative health outcomes. Adverse health outcomes associated with proximity include exacerbation of respiratory diseases, cardiovascular disease, sleep disruption and cognitive disturbance, and unintentional (traffic) injuries. Mediating these effects are motor vehicle emissions, including diesel engine emissions, road traffic noise, and pedestrian injury hazards. The research on proximity to roadways and health effects is particularly robust for the exacerbation of respiratory disease.

Epidemiologic studies have consistently found that proximity to high traffic density or flow results in reduced lung function and increased asthma hospitalizations, asthma symptoms, bronchitis symptoms, and medical visits. Children appear to be most sensitive to adverse effects. California freeway studies

show that exposure levels are strongest within 300 feet and that there is a 70% drop off in particulate pollution levels after 500 feet. Designated truck routes present a particular air pollution problem as trucks typically use diesel engines. Diesel particulate matter (PM) has been identified by California Air Resource Board (CARB) as a toxic air contaminant and represents 70% of the known potential cancer risk from air toxics in California. Specific epidemiologic research findings include:

- Reduced lung function in children associated with traffic density, especially trucks, within 1,000 feet and the association was strongest within 300 feet.
- Increased asthma hospitalizations associated with living within 650 feet of heavy traffic and heavy truck volume.

Stationary sources of air pollution

Virtually all residents within the Plan Area live within close proximity to some stationary source of air pollution. Based on a review of the 2007 Bay Area Air Qualtiy Management District (BAAQMD) database, 29 stationary sources with toxic air contaminant (TAC) emissions within the study area region exceeded BAAQMD regulated emissions levels. Additionally, 33 stationary sources have criteria pollutant (i.e. carbon monoxide, nitrous oxide, sulfur dioxide, and particulate matter) emissions that exceed the BAAQMD standard thresholds.

In the CARB "Air Quality and Land Use Handbook: A Community Health Perspective", a significant amount of evidence is cited describing the relationship between health and stationary sources of air pollution such as distribution centers, rail yards, ports, refineries, chrome platers, dry cleaners using perchloroethylene, and gasoline dispensing facilities. (http://www.arb.ca.gov/ch/landuse.htm)

Noise

Virtually all residential and other sensitive uses within the Plan Area exist in a high noise environment (65 Ldn to 75 Ldn in the Plan Area, with the noise levels increasing with closer proximity to I-880). Sensitive receptors (populations who are particularly susceptible to an environmental hazard) within the plan area include existing residential areas, including Jingletown, residences along I-880 south of Fruitvale Avenue, and residential lofts near the Beacon Day School.

The health impacts of environmental noise depend on the intensity of noise, on the duration of exposure, and the context of exposure. The Environmental Protection Agency identifies a 24-hour exposure level of 70 decibels as the level of environmental noise which will prevent any measurable hearing loss over a lifetime. Long term exposure to moderate levels of environmental noise can adversely affect sleep, school and work performance, and cardiovascular disease. Noise affects sleep both by waking people up and reducing the quality of sleep. According to the World Health Organization, reductions of noise by 6-14 dBA result in subjective and objective improvements in sleep. Chronic road noise can affect cognitive performance of children including difficulty keeping attention, concentrating and remembering, poorer reading ability, and poorer discrimination between sounds. The combination of noise and poor quality housing can have additive effects. In one study, a combination of these factors was associated with higher stress and stress hormone levels.

Environmental Contamination

As per the Phase I Hazardous Materials Assessment (HMA), there are 24 identified properties of high to moderate concern with regards to hazardous materials. The particular area of concern is within the southern portion of the Plan Area, where two properties of concern and a historical lumber yard

operations are located. It is anticipated that this area has been contaminated with hazardous materials, such as motor-oil, volatile organic compounds, and other solvents.

Living near or on contaminated land can pose health threats, especially for vulnerable populations, if there are opportunities for human exposure. Promoting productive use of previously contaminated sites can improve neighborhood quality of life by removing health hazards from historic contamination. Adequate removal of contamination can increase perceptions of safety and foster healthier productive uses, including parks and industry.

Shoreline Access and Public Open Space

In contrast to other parts of Oakland, shoreline access in the Plan Area is excellent, with 79% of the shoreline in the Plan Area being accessible by the public (Table 10.3). The West Subarea has the greatest proportion of the shoreline accessible to the public (93%) while a lesser extent of the Central-West Subarea shoreline is accessible to the public (56%).

Table 10.3. Proportion of the shoreline accessible to the public

West	Central-West	Central-East	East	Planning Area
93%	56%	82%	70%	79%

Source: Community Design + Architecture, 2009.

Because so few residents live in the Plan Area generally, and there are over 32 acres of open space in the area (the vast majority in the East and West Plan Areas), the open space acreage per resident is quite high. For example, there are 109 acres of open space per 1,000 people in the West Subarea and 3,062 acres per 1,000 people in the East Subarea (note there are only 6 residents and 18 acres of open space in the East Subarea). The bulk of residents live in the Central-East and Central-West Subareas where there is less open space, but the close proximity of these large Plan Area parks provides excellent resources to residents of adjacent Subareas. For more detailed information, see the Land Use and Urban Form Element.

Exposure to greenery and open space has significant benefits to health. Living in proximity to green space is associated with reduced self-reported health symptoms, better self-rated health, and higher scores on general health questionnaires. Trees and green space also improve the physical environment by removing air pollution from the air and mitigating the urban heat island effect produced by concrete and glass. Finally, studies also show that the presence of trees and other vegetation improves adult recovery from mental fatigue, leading to a reduction in socially unacceptable behavior and crime, as well as fewer behavior problems among children.

Sustainable and Safe Transportation

Vehicle Availability

Household vehicle availability and number of vehicles available per household are indicators of the expense invested in automobiles and indirect indicators of the use of automobiles for travel. As reported in the Resident Profile, a greater percentage of Plan Area households have access to at least one vehicle when compared to Oakland as a whole (88% and 80%, respectively). The rates vary significantly by Plan Area however; for example, virtually all Central-West households have at least one vehicle available (97%) while rates of ownership are actually below the city average in the West Subarea (70%).

Mode Split

As reported in the Resident Profile, the mode split for residents of the Plan Area was very similar to the rest of Oakland. In total, 54% of Plan Area residents drove to work alone as compared to 55% in Oakland. The rates were much higher among West and Central-East Subarea residents with 62% and 63% driving to work alone; only 38% of those in the Central-West Subarea drove to work alone. In contrast a higher proportion of Central-West Subarea residents carpooled (21%), took public transportation to work (22%) and biked or walked to work (9%). Overall, a higher proportion of Planning Area residents biked/walked to work (7%) in comparison to Oakland (4%).

Transit Network:

As extensively described in the transportation section of the existing conditions analysis, "AC Transit operates numerous routes through the study area and along the International Boulevard corridor, just to the north of the CEP study area. These routes include local, Rapid, and Transbay Express routes. Only three local routes and one Transbay route directly serve the CEP study area." The entire study area only has five bus stops, and the bus stops lack amenities such as shelters. Also, there is no direct late-night route that serves the Plan Area. Transit facilities are limited within and around the Plan Area and include curbside bus stops and bus bays at the Fruitvale station. Most stops consist of flagpoles and possess limited covered protection from the elements and/or benches. Stops also lack real-time arrival information and schedules.

Table 10.4 highlights household proximity to transit; 78% of Plan Area residents live within ¼-mile of local transit (AC transit) and 40% of households live within ½ mile of regional transit (BART). Households living in the Central-West and Central-East Subareas have the best access to local transit routes, and Central-East residents have excellent proximity to regional transit.

Table 10.4. Proportion households living within 1/4 mile of local transit and 1/2 mile of regional transit

	AC Transit	BART
West	3%	0%
Central-West	100%	40%
Central-East	94%	94%
East	0%	0%
Plan Area	78%	40%

Source: Arup, 2009.

While proximity to transit is good for households in the Central-East and Central-West Subareas, there are major inhibitors to accessing the regional transit in particular. As stated in the Transportation Chapter, "With the International Boulevard being one of the primary transit corridors in Oakland and the

presence of a major transit rail station at Fruitvale BART station, areas directly west of the Plan Area have a high level of transit service and capacity. These routes operate outside of the limits of the CEP study area. The walk distance from the CEP study area to International Boulevard is approximately one-third to one-half of a mile. This distance and the poor pedestrian environment limit the effectiveness of these routes to serve the CEP study area's existing population." With respect to accessing BART, the Transportation Chapter highlights that there is "poor pedestrian connectivity that is the result of physical barrier formed by I-880 and the railroad tracks. The lack of crossings results in indirect and circuitous walking routes from the CEP study area to destinations such as the BART station and the International Boulevard transit corridor."

Pedestrian Network

As extensively described in the transportation section, "overall, the pedestrian environment across the CEP study area is generally quite poor. The CEP site's predominantly industrial character makes for an overall uncomfortable pedestrian experience. The lack of adequate connections and long exposed walking distances from the CEP study area to the rest of Oakland reduces the area's overall "walkability". The factors that have contributed to the poor pedestrian environment include:

- Missing sidewalks
- Large block sizes, which can increase walking distances
- Wide, difficult to cross roads designed to accommodate heavy vehicles and maximize traffic flow
- Few marked crosswalks and several prohibited pedestrian crossings at busy intersections
- A lack of activity generators, particularly outside of employment hours
- Insufficient street trees and other amenities
- Movement barriers created by I-880, Union Pacific / Capital Corridor railroad, BART and the Oakland Estuary

High Street in particular is described as having a poor quality pedestrian environment due to a large number of industrial uses, narrow sidewalks, a lack of bike lanes and shoulders, prohibited pedestrian crossings at some intersections, and a lack of pedestrian amenities such as street trees. Finally, in terms of accessing areas on the other side of the I-880, pedestrian undercrossings are severely restricted, with several closed due to safety issues, and overcrossings are described as lacking adequate sidewalks, having poor street-level access, and having abrupt grade changes. Specifically, the two bridge structures spanning I-880 at 23rd Avenue and the single bridge structure at 29th Avenue only have narrow sidewalks on one side. Pedestrian access from the street level to the bridge sidewalks occurs at the base of each bridge and via stairways which pose greater difficulties for pedestrians. Plans for reconstruction and reconfiguration of these bridges currently include a five-foot sidewalk on one side of each of the two bridges, as well as improved ADA access ramps.

Bicycle Network

As described in the Transportation Chapter of the Existing Conditions Report, "The existing bicycle environment is quite poor within the CEP study area. The area's industrial character, traffic congestion, and the lack of adequate east-west connections all contribute to the overall poor pedestrian/bicycle environment within the study area. A lack of attractive pedestrian and bicycle connections from the CEP area to the Fruitvale BART, E 12th Street, and International Boulevard east of I-880 and the freight rail

tracks discourages traveling by these modes. The Bay Trail, which travels along some sections of the shoreline is currently incomplete, although a number of proposals exist to complete a contiguous routing along the water." Specifically, the analysis describes "inadequate crossings for bicycles on the three bridges spanning the Oakland Estuary. All three bridges crossing the Oakland Estuary (Park Street, Fruitvale Avenue, and High Street) lack bicycle lanes. Bicyclists currently use the mixed-flow travel lanes and the narrow pedestrian paths on the sides of the bridges to cross from Alameda to Oakland." In addition, "Major north-south arterial streets such as International Boulevard and E 12th Street lack designated bike lanes. This makes bike commuting to downtown Oakland from areas in the vicinity of the CEP study area difficult." Reconstruction of the 23rd and 29th Avenue bridge structures will provide adequate width for five-foot wide bicycle lanes in both directions on both bridges. Alameda County Congestion Management Agency (ACCMA) staff indicated that they were planning to provide unmarked five-foot shoulders in lieu of bicycle lanes, due the lack of existing bicycle routes at either end of the structures. However, ACCMA staff indicated that they would consider the City of Oakland's Bicycle and Pedestrian Coordinator's request to provide the marked bicycle lanes along these routes, which are designated bikeways in the City's Bicycle Master Plan.

Traffic-related Collisions

Between 2002-2007, there were 414 reported motor-vehicle collisions in the Plan Area, six bike collisions and one pedestrian collision (these figures exclude collisions on I-880) (Table 10.5). Vehicle on vehicle collisions are the most significant of these, though total collisions do not represent a very high proportion of collisions in Oakland (around 1%). The Transportation Analysis includes a report of vehicle collision "hot-spots" within the Plan Area, including: 1) High Street / International Boulevard (133 incidents over the last five years), 2) E 12th Street / 23rd Avenue (123 incidents over the last five years); and 3) within the Park Street Triangle, the 23rd Avenue / Ford Street / Kennedy Street intersection experienced 33 incidents and the 29th Avenue / Ford Street intersection experienced 21 incidents over the last five years. While these hot-spots are indeed important to consider in terms of targeted traffic improvements, the fact that accidents occur all over the Plan Area illustrate that there are more systemic transportation issues that could be addressed via neighborhood-level transportation and circulation improvements.

Interestingly, given how degraded the pedestrian and bike environments are, the pedestrian and bicycle collision numbers are not high. This may reflect the fact that residents and workers in the Plan Area are not actually walking and biking very much, but rather driving to meet their daily needs and to/from work.

Table 10.5. Number of traffic-related collisions in the Plan Area (2002-2007)

	West	Central-West	Central-East	East	Plan Area	Oakland
Car (Vehicle / Vehicle)	237	105	67	5	414	33,552
Bike (Vehicle / Bike)	0	4	2	0	6	773
Pedestrian (Vehicle / Ped)	0	1	0	0	1	1447

Source: Arup, 2009.

People's transportation behaviors – including how much and how far they drive, as well as whether they own a private vehicle – are shaped by numerous factors. Determining factors include whether there is a mix of land uses providing access to jobs, goods, and services near residential development, the area's public transit service, walking or biking environment, driving conditions, and socio-demographic factors including population age, income, or household size.

Nonetheless, car ownership is directly related to driving behaviors. Vehicle driving, in turn, is directly proportional to air pollution and greenhouse gas emissions. Air pollutants, including ozone and particulate matter are causal factors for cardiovascular mortality and respiratory disease and illness. Areas with high levels of motor vehicle driving also tend to have higher motor vehicle collision and injury rates, as well as reduced opportunities for physical activity and its physical and mental health benefits. Motor vehicle collisions are one of the leading causes of preventable injury in the nation and the world, and the leading cause of death in the United States for people aged 1-24. Changes in the roadway environment can address both real and perceived safety hazards for pedestrians and bicyclists - including complete streets and bicycle lanes, reducing vehicle speeds (traffic calming), and introducing additional traffic engineering measures at intersections (e.g., signs, turning restrictions) to reduce conflicts between pedestrians/bikes and cars.

The number of people who walk in an area is affected by the quality of the pedestrian environment including: street and sidewalk design and connectivity, presence of street furniture, traffic volume (determined by vehicle trips and miles traveled), traffic calming features, pedestrian safety interventions (e.g. crosswalks, countdowns), and the aesthetics and safety of the surrounding environment. Mixed, dense residential and commercial development, as well as close (i.e. <½ mile) proximity of development to public transit, decreases the distance between people's residential, employment, and other (e.g. shopping, errands, social) activities and increases walking as a means of transportation. Walking is further impacted by socio-demographic factors, as many low-income people walk regardless of environmental quality because it is their primary means of transportation. The number of people biking in an area is largely impacted by factors including the presence and quality of bike lanes and bicycle network connectivity, proximity of development to public transit and other destinations, traffic volume and speed, and presence of bike storage, bike locks, and bike racks (including on public transit). Biking is further impacted by population socio-demographic factors, including ability to ride a bike and for what distance.

Walking and biking to work as well as using public transit to get to work helps people meet minimum requirements for physical activity. Twenty-nine percent of people using transit to get to work meet their daily requirements for physical activity from walking to work. Health benefits of physical activity include a reduced risk of premature mortality and reduced risks of coronary heart disease, hypertension, colon cancer, and diabetes mellitus. Research has found that proximity to public transit helps to determine travel choice. For normal trips, only 10% of Americans will walk one-half mile. A recent study in King County, WA demonstrated that for every quarter mile increase in distance to transit, the likelihood of using transit fell 16%. One study found that 33% of residents living near BART stations used rail to get to work as compared to 5% of residents living in areas not served by BART. Transit use promotes environmental health by reducing air pollution and greenhouse gas emissions from automobiles.

A high quality pedestrian environment can support walking both for utilitarian purposes and for pleasure. Recent studies in the United States have demonstrated that people walk on average 70 minutes longer per week in pedestrian-oriented communities. In turn, walking contributes to minimum requirements for physical activity, an established protective factor for cardiovascular diseases, diabetes, and some types of cancer. As non-vehicle form of transport, pedestrian and bicycle trips do not contribute to noise or air pollution emissions. Finally, a vibrant pedestrian environment may contribute to both economic vitality and social interaction in a place, furthering the development of social capital.

Access to Goods and Services

Overall, being within walking distance of neighborhood goods and services promotes physical activity, reduces vehicle trips and miles traveled, and increases neighborhood cohesion and safety. By reducing vehicle trips and miles traveled, dense neighborhoods with diverse and mixed land uses can also reduce air and noise pollution, which subsequently impacts associated respiratory and noise-related health conditions. According to the US Green Building Council, research has shown that "living in a mixed-use environment within walking distance of shops and services results in increased walking and biking, which improve human cardiovascular and respiratory health and reduce the risk of hypertension and obesity." Below we describe Plan Area goods and services access for several indicators, including schools, child care, parks and recreational facilities, libraries, retail food, and banks/credit unions.

Methodological Note: The household and population data provided by Strategic Economics provides more information than is available in the County Assessor's parcel data; however, the household and population data are summarized by Plan Area. Because parcel-level household and population data are unavailable, the percent of households and population covered by various HDMT facilities has been calculated as a percentage of each Plan Area that falls within 1/4, 1/2, and 1-mile distances from the various facilities studied.

Schools

There are currently no public schools within the Plan Area and five public schools within ½ mile buffer of the Plan Area. One private school (Beacon Day School) operates within the Plan Area. Overall, only one-half of Plan Area households live in close proximity to a public school and rates are more varied across Subareas (Table 10.6). All Central-West Subarea households live within ½ mile proximity to a public school, three-quarters of Central-East households and just under half of West Subarea households live within a ½-mile of a public school. However, the East Subarea currently has the worst access to a public school with very little of the Subarea within a ½ mile proximity.

Given that the largest number of households currently resides in the Central-West Subarea, the fact that there are schools close by adds to the residential suitability of the area. For households living in the West and Central-East Subareas, school access is slightly less than desirable for new residential growth. In contrast, while there are only three households currently in the East Subarea who are impacted by the lack of access, if future growth is intended for this area, larger and more concerning numbers of residents would be impacted.

Table 10.6. Proportion of households within 1/2 mile of public elementary, middle and high school

West		Central-West		Central-East		East		Plan Area	
N	%	N	%	N	%	N	%	N	%
37	48%	224	100%	50	79%	0.1	3%	188	51%

Source: Community Design + Architecture, 2009.

Neighborhood schools have been found to serve as social and community hubs that promote interaction between neighbors and community members, and if planned as multi-use facilities, schools can benefit the local community in a number of ways during afterschool hours. A half-mile proximity was selected for this indicator to identify what proportion of households fall within a "walkable" distance

of a public school. Research on travel mode choice also shows that when schools are located closer to home, more children walk and/or bicycle to school and vehicle pollution emissions fall.

It is important to note that all public schools within ½-mile of the Plan Area are on the other side of I-880, which poses a significant barrier to safely accessing these schools. According to the Centers for Disease Control and Prevention, long distances to school are a primary barrier to walking to school. Danger from traffic was the second most important barrier. As described in the Transportation section above, walkability in the area is very poor, and there are numerous risks associated with crossing under and over the freeway. It is unclear to what extent residents of the Plan Area attend these schools, and how they travel there. However, changes in the physical environment, such as sidewalks, traffic calming measures, and well designed crosswalks, can make walking and biking to school more desirable and safer.

Child Care

There are currently five child care providers in the Plan Area who collectively provide a capacity of at least 130 slots for care. These providers reflect both institutional child care centers as well as licensed family child care homes. Facilities are located on Livingston Street, 9th Street, Elmwood Avenue and 22nd Avenue.

Understanding child care availability and capacity in the area is useful when comparing future population growth scenarios. The accessibility of child care for families with children is dependent on capacity of child care providers to meet demand. It is important to note that not all child care centers and homes operate at maximum capacity. Substantial research demonstrates that accessible high quality child care positively affects childhood growth, physical development, and physical health, cognitive, behavioral and school outcomes.

Parks and Recreational Facilities

Overall, proximity to parks in the Plan Area is excellent. Virtually all individuals living in the West, Central-West and East Subareas are within a ¼ mile of a neighborhood or regional park (Table 10.7). Access is a bit lower in the East Subarea (80%), though still quite good. Overall, the Plan Area performs significantly well in relation to this indicator. A ¼-mile proximity was selected for this indicator to identify what proportion of the population falls within a "walkable" distance of a park/recreational facility.

There are, however, no recreational facilities in the Plan Area or within a ¼ mile buffer. Recreational facilities are different than parks in that they provide more organized opportunities for athletic programming and well-maintained spaces for group physical activity.

Table 10.7. Proportion of population within 1/4 mile of neighborhood or regional park

West		Central-West		Central-East		East		Plan Area	
N	%	N	%	N	%	N	%	N	%
108	100%	586	99%	167	80%	6	97%	865	94%

Source: Community Design + Architecture, 2009.

It is important to note that proximity to a park does not guarantee access. Many factors affect access to parks including the presence of major roads, highways, buildings and gates, perceived and actual safety, hours of access, quality of park grounds and facilities, transportation, and cultural preferences. This

indicator is just one element of many in assessing access to parks. For more detailed information, see the Land Use and Urban Form section.

Parks and natural open space areas promote physical activity and social interaction. One review of studies showed that access to places for physical activity combined with outreach and education can produce a 48% increase in the frequency of physical activity. The number of neighborhood parks in proximity to one's residence and the types of amenities at the park has been associated with physical activity in children. Living in proximity to green space is associated with reduced self-reported health symptoms, better self-rated health, and higher scores on general health questionnaires. Trees and green space also improve the physical environment by removing air pollution from the air and mitigating the urban heat island effect produced by concrete and glass. Finally, the presence of views and access to natural vegetation in the urban environment reduces socially unacceptable behavior and crime and increases concentration and fewer behavior problems among children.

Libraries

The Plan Area has very good proximity to public libraries, with 90% of residents living within 1 mile of a public library (Table 10.8). The closest libraries are located on the other side of the I-880 freeway in the Fruitvale neighborhood and in Alameda. As a result both the Central-West and Central-East areas have the best proximity. The West and East Subareas, on the other hand, have somewhat less access. Again, capacity of the library is unknown and physical access to the library is compromised by the traffic hazards associated with crossing the I-880.

Table 10.8. Proportion of population within 1 mile of a public library

West		Central-West		Central-East		East		Plan Area	
N	%	N	%	N	%	N	%	N	%
96	89%	593	100%	209	100%	5	77%	823	90%

Source: Community Design + Architecture, 2009.

While ½ mile proximity is generally considered within walking distance, given the immense number of resources needed to build and maintain a public library, it is currently infeasible to have a library within ½ mile of all residents. For this reason, a one-mile proximity was chosen. Libraries serve as important public educational and cultural facilities that help to disseminate health information to health providers and the general public, promote general and health literacy, consolidate information on vulnerable populations, organize/filter and improve access to reliable internet resources, facilitate educational collaborations between agencies and communities, and promote art and cultural activities both on and off library property.

Retail Food Environment

There are no grocery stores within the Plan Area, but three grocery stores are located within a ½-mile buffer. The Central-West and Central-East Subareas have the best access with 100% and 80% of the populations respectively living within ½-mile (Table 10.9). The East Subarea has the worst access with only 12% of the population living within a ½-mile. These grocery stores reflect a mix of large-scale supermarkets (e.g., Albertsons) as well as smaller grocery and produce stores that sell a wider range of products including fresh produce. Though not shown on the map, there is also one farmers' market that operates year-round at Fruitvale Village (34th Ave. and East 12th St.) every Sunday; this market is within one mile of most of the Plan Area.

While there are no liquor stores in the Plan Area or within a ½-mile, there are, however, seven convenience stores that are known to provide unhealthy food retail as well as alcoholic beverages. There are 1.7 convenience stores per square mile of the Plan Area and its ½ mile buffer in comparison to only 0.99 grocery stores per square mile. This highlights a disparity in the availability of healthy food retail versus unhealthy food retail. In contrast to convenience stores, grocery stores are defined as selling more healthy food retail including fresh fruits and vegetables. There are also six restaurants in the Plan Area.

Table 10.9. Proportion of population within 1/2 mile of a grocery store

West		Central-West		Central-East		East		Plan Area	
N	%	N	%	N	%	N	%	N	%
39	36%	593	100%	168	80%	.7	12%	464	51%

Source: Community Design + Architecture, 2009.

Again, the ½-mile proximity is considered a "walkable" distance for neighborhood access. However, similar to the above indicators, geographic proximity does not equal access. Transportation features of the Plan Area including major highways and busy roadways likely inhibit pedestrian and bicycling access to grocery stores. Additionally, these data do not reveal qualitative differences between food retail, such as price mix, quality of foods, availability of fresh produce, and cultural preferences, that are additionally important factors for consideration of accessibility.

Nonetheless, local food environments influence the food retail options households and individuals have. Access to healthy food choices is directly correlated to obesity and diabetes rates, which occur in higher rates among people living in low-income communities with worse food environments. Supermarkets may provide access to a greater variety of cheaper and healthier foods, including fresh fruits and vegetables. This access helps to facilitate healthier dietary choices. Research has found that the presence of a supermarket in a neighborhood predicts higher fruit and vegetable consumption and a reduced prevalence of overweight and obesity. Though there are no liquor stores in the Plan Area, it is important to note that the density of alcohol outlets is strongly associated with greater rates of physical assaults, violent crimes, and violence in general.

Banks and Credit Unions

There are five credit unions/banks located in the Plan Area and within a ½-mile buffer. Again, Central-West and Central-East residents have the best access, with 100% of residents within ½-mile (Table 10.10).

Table 10.10. Proportion of population within 1/2 mile of a bank/credit union

West		Central-West		Central-East		East		Plan Area	
N	%	N	%	N	%	N	%	N	%
39	36%	593	100%	209	100%	3	50%	606	66%

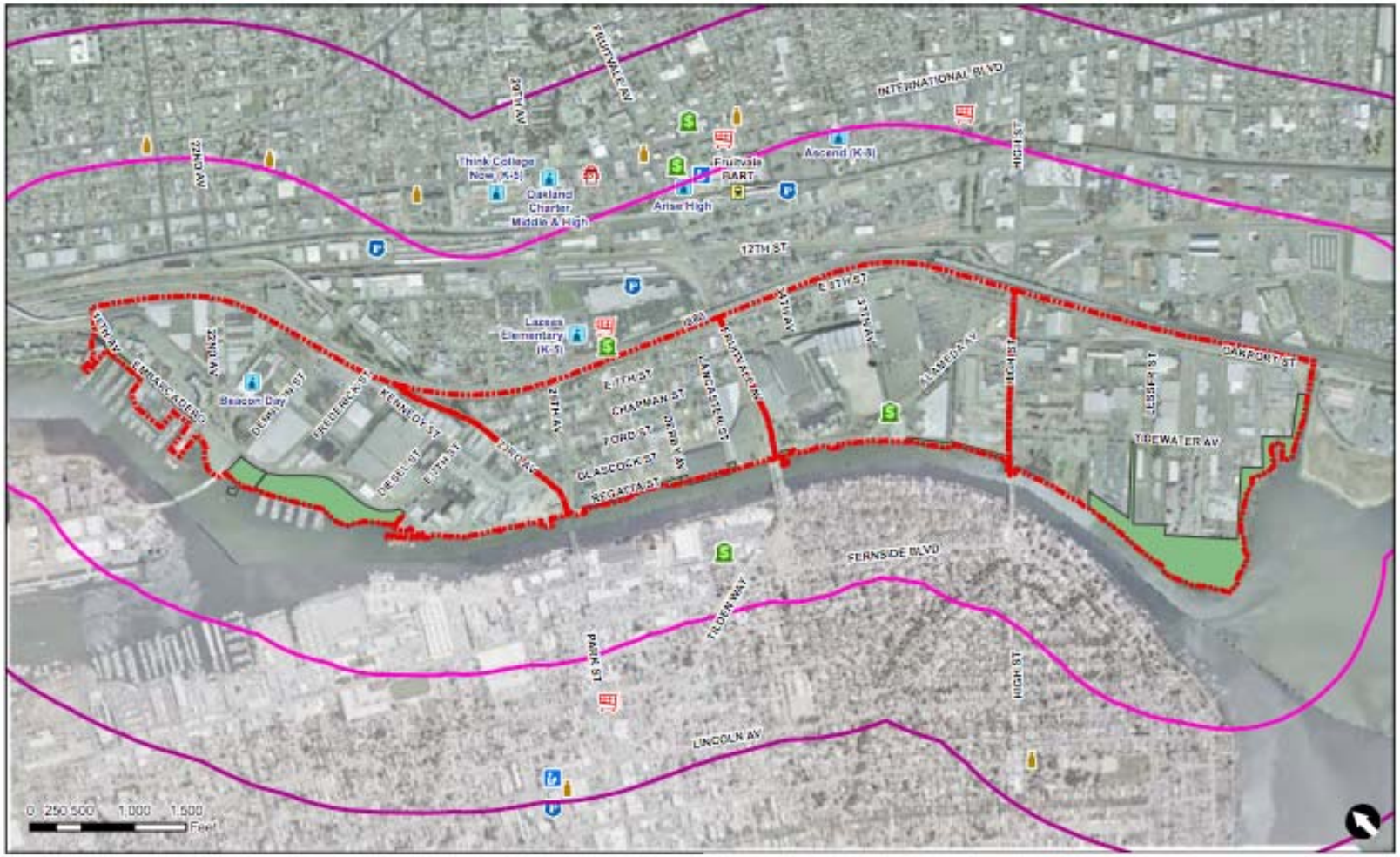
Source: Community Design + Architecture, 2009.

Studies show the lack of physical proximity to financial services is most frequent in low-income and minority populations. In addition, fringe financial services, such as check cashers, payday lenders, and pawn shops, are largely in low-income and minority neighborhoods. These lenders have high fees attached to their services and no savings account options, which puts additional financial burdens on these populations. Ensuring that banks and credit unions are more widely available helps provide opportunities for personal savings.

Police and Fire

There are two fire stations and four police stations within one mile of the Plan Area. As far as proximity for residents, 100% of West, Central-West and Central-East households are within one mile of both of these services. In addition, over 90% of East Subarea households are within 1 mile of a police station, but only 24% of residents are within one mile of a fire station. For more detailed information, see the Infrastructure and Public Facilities section.

The presence of emergency services is essential for the protection of public safety. Adequate capacity at police and fire stations insures speedy response times to emergency events. And the presence of these facilities affects perceptions of public safety, and may serve to deter crime.



Source: City of Oakland, Strategic Economics, ARUP, Community Design + Architecture

Proximity to Community Uses

May 1, 2009

Subarea Boundaries
1/4-Mile Buffer
1/2-Mile Buffer

Community Uses

- Police Facility
- Fire Department
- Bank/Credit Union
- Library
- School
- Grocery Store
- Convenience/Liquor Store
- Parks - Existing and Under Construction

CITY OF OAKLAND

CENTRAL ESTUARY PLAN
A Vision for Oakland's Waterfront
COMMUNITY DESIGN + ARCHITECTURE

Adequate and Healthy Housing

The Resident Profile section of the existing conditions report contains a significant amount of information regarding resident housing conditions in the Plan Area. Because residential density and high quality and affordable housing are significant predictors of health, we highlight related data for these indicators in this section as well.

Housing Density

As indicated in the Resident Profile, the Plan Area has a far lower housing density than Oakland as a whole - 0.9 housing units per acre versus 4.4. There is also significant variation between the Subareas, however; the Central-West Subarea has 3 housing units per acre while the East Subarea has virtually no housing. Since 2000, the vast majority of new housing built in the Planning Area was in the Central-West Subarea. No housing has been built in the Central-East or East Subareas since 2000. Overall the West, Central-East and East Subareas can be characterized as having a very low residential density while the Central-West Subarea has a higher level of density. People living in higher density neighborhoods with a mix of shops/businesses within easy walking distance have a 35% lower risk of obesity. Increasing residential density also advances the concept of "eyes of the street", and can increase perceived safety among residents.

Housing Cost Burden

The federal government defines households that spend more than 30 percent of their income on their homes as cost-burdened. The U.S. Census collects data on percentage of household income spent on their gross rent defined as the contract rent plus the estimated average monthly cost of utilities and fuels. Table 10.11 illustrates housing cost burden on renters living in the Plan Area. Overall, a lower percentage of renter households in the Plan Area are cost-burdened than in Oakland (39 percent and 42 percent respectively). However, the variation is more striking when disaggregated at the Plan Area. For example, renter households in the Central-West Subarea experience the highest degree of housing cost burden, with just over half of renters paying greater than 30 percent of their income on rent. The Central-East Subarea has the lowest proportion of cost burden with only 27 percent of renter households paying greater than 30 percent of income on gross rent. However, this data is nearly a decade old, and a majority of new ownership housing in the Plan Area has been built in the past several years. A more current analysis of cost-burden would help inform the planning process.

Table 10.11. Housing Cost Burden, 1999

	West		Central-West		Central-East		Plan Area		Oakland	
	#	%	#	%	#	%	#	%	#	%
Renters spending greater than 30%of income on gross rent	80	38%	90	51%	44	27%	214	39%	37,268	42%

Source: 2000 U.S. Census; Strategic Economics, 2009.

High housing costs relative to the income of an individual or household result in one or more outcomes with adverse health consequences: spending a high proportion of income on housing, sharing housing with other individuals or families, accepting lower cost substandard housing, moving to where housing costs are lower, or becoming homeless. Spending a high proportion of income on rent or a mortgage means fewer resources for food, heating, transportation, health care, and child care. Sharing housing can mean crowded conditions, with risks for infectious disease, noise, and fires. Lower cost housing is often substandard with exposure to waste and sewage, physical hazards, mold spores, poorly maintained paint, cockroach antigens, old carpeting, inadequate heating and ventilation, exposed heating sources and wiring, and broken windows. Moving away can result in the loss of job, difficult school transitions, and the loss of health protective social networks.

Overcrowding

The Plan Area has a high degree of overcrowding in comparison to Oakland as a whole. Table 10.12 illustrates the proportion of households living in overcrowded conditions. Overcrowding, as defined by the U.S. Department of Housing and Urban Development (HUD), is greater than 1.01 people per habitable room. In 2000, 32% of households in the Plan Area lived in overcrowded conditions while only 16% of Oakland households lived in overcrowded conditions. The distribution of overcrowding was varied across the Plan Area. The Central-East Subarea experienced the highest rate of overcrowding (48%) and the Central West Subarea had the least degree of overcrowding (17%).

Table 10.12. Overcrowding, 2000

	West		Central-West		Central-East		Plan Area		Oakland	
	#	%	#	%	#	%	#	%	#	%
More than 1 Person/Room	94	31%	38	17%	110	48%	242	32%	24,403	16%
Source: 2000 U.S. Census; Strategic Economics, 2009.										

The impacts of overcrowding on health are both direct and indirect. Most immediately, crowding increases risks for respiratory infections such as tuberculosis and ear infection. Overcrowded housing has also been associated with increased mortality rates (particularly for women), meningitis, and *Helicobacter pylori* bacteria, which can cause stomach ailments. Crowded housing conditions also contribute to poor child development and school performance, in part because overcrowding limits the space and quiet necessary for children to do homework. Overcrowding may act cumulatively with other environmental health stressors. For example, one recent study found that crowding combined with noise significantly increases chronic stress hormones in low-income children. Finally, overcrowding affects health indirectly by creating conditions conducive to poor sanitation, high environmental noise, and residential fires.

Tenure

As stated in the Resident Profile, the overall rate of homeownership within the Plan Area is somewhat lower than the rest of Oakland. However, this statistic was highly variable among the Subareas. In 2000, only 16% of housing units were owner occupied in the West Subarea, whereas 64% of housing units were owner occupied in the Central-East Subarea. Since 2000, all new housing construction in the Planning Area has been in the form of condominiums. Thus, although a portion of these may be rented, it is likely that the owner-occupancy rate of the Central-West Subarea has increased substantially.

Although a mortgage can be a financial burden, home ownership does provide multiple benefits to its owners including increased tax benefits, collateral for financial emergencies, and opportunities for wealth creation. Home ownership is also associated with increased residential stability, and benefits homeowners by providing a setting for expression of identity and control. This catalyzes a personal investment in home maintenance, neighborhood improvement, and community cohesion.

Healthy Economy

Because an extensive analysis of business and employment conditions in contained elsewhere in the Existing Conditions Report, only two indicators are reviewed in this section: income diversity and income self-sufficiency.

Income Diversity

Income diversity measures how equally different income groups are represented in the Plan Area Subareas. As indicated in the Resident Profile, the Plan Area has a varying degree of income diversity across Subareas. The West and Central-West Subareas appear to have a wider range of income diversity, while the Central-East Subarea has the least amount of income diversity. When examining income distribution data for the Subareas, it appears that the Central-East Subarea is comprised almost entirely of low-income households.

Residents of high-poverty neighborhoods live about eight fewer years than non-poverty neighborhoods; they also suffer more preventable events like infant mortality, pedestrian injuries, and homicide. Research also demonstrates a relationship between residential segregation and teenage childbearing, tuberculosis, cardiovascular disease, availability of food establishments serving healthy foods, and exposure to toxic air pollutants. One study found that reducing income-related residential segregation improved household safety, reduced exposure to crime, and decreased neighborhood social disorder.

Occupation, Earnings and Income Sufficiency

Income is one of the strongest and most consistent predictors of health and disease in the public health research literature. Nationally, individuals with average family incomes of $15,000-$20,000 are three times more likely to die prematurely as those with family incomes greater than $70,000. It has also been shown that every additional $12,500 in household income buys one year of life expectancy (up to an income of $150,000). Low income is also a risk factor for low birth weight babies, for injuries or violence, for most cancers, and for most chronic conditions. The relationship between income and health is mediated though nutrition, employment conditions, parenting resources, leisure and recreation, housing adequacy, and neighborhood environmental quality, community violence and stress.

Finally, numerous studies have shown that income inequality, a measure of the distribution of income, is strongly and independently associated with decreased life expectancy and higher mortality, as well as reduced self-rated health status and higher rates of violence.

The family economic self-sufficiency standard is an alternative to the federal poverty line for measuring income adequacy. Unlike the federal poverty line, the self-sufficiency standard demonstrates how much income is needed for a family of a certain composition in a given place to adequately meet its minimal basic needs. In contrast, the federal poverty line is based on the cost of a single item: food. It does not vary by the local cost of living, and it relies on the outdated assumption that food represents one-third of a family's budget. For a family of four—whether in a high cost market like Oakland, CA or a more affordable market like Baton Rouge, LA—the poverty line is $20,650 in annual household earnings. In contrast, the self-sufficiency standard measures the actual cost of living on a county-by-county basis, including costs of transportation, taxes, childcare, housing, food, and health care.

According to the Insight Center for Community Economic Development, the 2003 the Self-Sufficiency Standard for Alameda County in 2008 was $24,630 per year for one adult, $43,974 per year for one adult

with one preschooler and $58,008 for one adult with one infant and one school age child. For details on the creation, calculation and use of the self-sufficiency standard, please visit: http://www.insightcced.org.

Table 10.13 displays Central Estuary Plan Area occupations, numbers of Plan Area jobs provided by those occupations, and the average annual income for those occupations. The table includes all industries for which there were at least 10 employees in the Plan Area in 2007 and for which there was wage data available. In total, there were 4,447 jobs provided in the Plan Area at a wide range of annual wages. When comparing average annual wages to the self-sufficiency standard, 121 jobs (3 percent of total jobs provided in the Plan Area) did not provide wages that met self-sufficiency standards for a single adult and 2,086 jobs in the Plan Area did not provide wages that provided wages sufficient to support one adult with one preschooler (47 percent of jobs in the Plan Area). Finally, when looking at wages necessary to support one adult with two children (one infant and one school age child), 3,202 jobs did not provide sufficient wages to support this family type (72 percent of total jobs).

Table 10.13. Plan Area Occupations and Self-Sufficiency Standard	Number of Plan Area Jobs, 2007	Average Annual Wage, 2007
Limited-Service Eating Places	18	$14,350
Other Schools and Instruction	16	$17,000
Full-Service Restaurants	70	$17,300
Sporting Goods, Hobby, and Musical Instrument Stores	17	$18,300
Alameda County Self-Sufficiency Wage for one Adult	**n = 121**	**$24,630**
Services to Buildings and Dwellings	53	$27,550
Drycleaning and Laundry Services	24	$27,950
Investigation and Security Services	330	$28,400
Furniture Stores	16	$29,850
Automotive Repair and Maintenance	94	$33,300
Vending Machine Operators	21	$34,750
Bakeries and Tortilla Manufacturing	252	$35,050
Lessors of Real Estate	28	$35,200
Individual and Family Services	515	$36,650
Building Material and Supplies Dealers*	158	$37,400
Grain and Oilseed Milling	90	$37,900
Miscellaneous Nondurable Goods Merchant Wholesalers	24	$38,600
Other Motor Vehicle Dealers	39	$38,750
Elementary and Secondary Schools	54	$39,150
Coating, Engraving, Heat Treating, and Allied Activities	21	$39,250
Home Health Care Services	27	$39,800
Automotive Equipment Rental and Leasing	14	$39,850
Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	28	$40,100
Household and Institutional Furniture and Kitchen Cabinet Manufacturing	78	$42,300
Warehousing and Storage	32	$43,250
Other Support Services	36	$43,500
Specialized Freight Trucking	31	$43,850
Alameda County Self-Sufficiency Wage for one Adult and one Preschooler	**n = 2086**	**$43,974**
Electronics and Appliance Stores	28	$44,750
Printing and Related Support Activities	14	$44,850
Independent Artists, Writers, and Performers	11	$44,900
Foundation, Structure, and Building Exterior Contractors	96	$46,000
Building Finishing Contractors	22	$46,150
Lumber and Other Construction Materials Merchant Wholesalers	57	$46,400
Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	16	$49,400

Grocery Stores	10	$49,400
Boiler, Tank, and Shipping Container Manufacturing	14	$49,550
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	52	$50,300
Specialized Design Services	24	$51,300
Beverage Manufacturing	94	$52,100
Business, Professional, Labor, Political, and Similar Organizations	13	$52,500
Outpatient Care Centers	10	$53,500
Grocery and Related Product Wholesalers	65	$54,450
Glass and Glass Product Manufacturing	500	$55,350
Automobile Dealers	14	$55,750
Other Heavy and Civil Engineering Construction	65	$56,750
Architectural and Structural Metals Manufacturing	11	$57,900
Alameda County Self-Sufficiency Wage for Two Adults, one Infant and one School Age Child	**n = 3202**	**$58,008**
Building Equipment Contractors	141	$60,950
Paper and Paper Product Merchant Wholesalers	66	$61,700
Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	30	$63,650
Other Specialty Trade Contractors	69	$65,250
Agencies, Brokerages, and Other Insurance Related Activities	71	$65,650
Highway, Street, and Bridge Construction	47	$67,000
Cement and Concrete Product Manufacturing	30	$67,350
Advertising and Related Services	38	$67,450
Legal Services	52	$67,850
Residential Building Construction	20	$67,900
Waste Treatment and Disposal	12	$67,950
Machinery, Equipment, and Supplies Merchant Wholesalers	93	$68,700
Commercial and Service Industry Machinery Manufacturing	25	$71,500
Nondepository Credit Intermediation	10	$71,650
Professional and Commercial Equipment and Supplies Merchant Wholesalers	26	$76,400
Electrical and Electronic Goods Merchant Wholesalers	33	$79,150
Management, Scientific, and Technical Consulting Services	57	$83,050
Architectural, Engineering, and Related Services	150	$85,450
Semiconductor and Other Electronic Component Manufacturing	13	$88,800
Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	20	$91,050
Drugs and Druggists' Sundries Merchant Wholesalers	84	$95,900
Computer Systems Design and Related Services	26	$111,050

Land Subdivision	27	$111,650
Scientific Research and Development Services	105	$116,050
Total jobs	**4447**	

Social Cohesion

Crime rates in the Plan Area significantly exceed those found in Oakland. Table 10.14 highlights violent crime and property crime rates for census tracts that contain the Plan Area. Between 2005 and 2007, tract 4061 had a violent crime rate more than three times the rate of Oakland (42.2 violent crimes per 1,000 and 13 violent crimes per 1,000, respectively) and tract 4073 had a violent crime rate almost six times the Oakland rate (74.6 violent crimes per 1,000). Violent crimes include homicides, physical assaults and sexual assaults. The trend is the same for property crimes. Rates for property crimes are more than double the Oakland rate in tract 4061, and more than quadruple the Oakland rate in tract 4073. Property crimes are limited to those reported to the police, whether they were attempted or completed, and include burglary, larceny-theft, and motor vehicle theft.

Table 10.14. Rate of property crime and violent crime reports per 1,000, 2005 - 2007

	Property Crime Rate	Violent Crime Rate
4060.00 (northwest tract)	82.1	24.7
4061.00 (middle tract)	106.1	42.2
4073.00 (southeast tract)	186.9	74.6
Oakland	44.4	13.0

Source: Alameda County Public Health Department, with data from Oakland Police Department, 2005-2007

In addition to having direct, adverse health outcomes for victims, community violence can impact the perceived safety of a neighborhood, inhibiting social interactions and adversely impacting social cohesion and economic investment. Witnessing and experiencing community violence has also been found to cause longer-term behavioral and emotional problems in youth. Other research illustrates that residents' worries about safety in their neighborhoods can be a cause of chronic stress. Fear of crime and feelings of vulnerability to crime can also decrease residents' sense of control over their lives and their life satisfaction. One study found that residents of neighborhoods with greater safety (as reported by other residents of the neighborhood) had less hypertension than residents of neighborhoods with less safety. Finally, residents' feelings about safety in their neighborhoods can also be a disincentive to engage in physical activity outdoors, particularly among women and older persons.

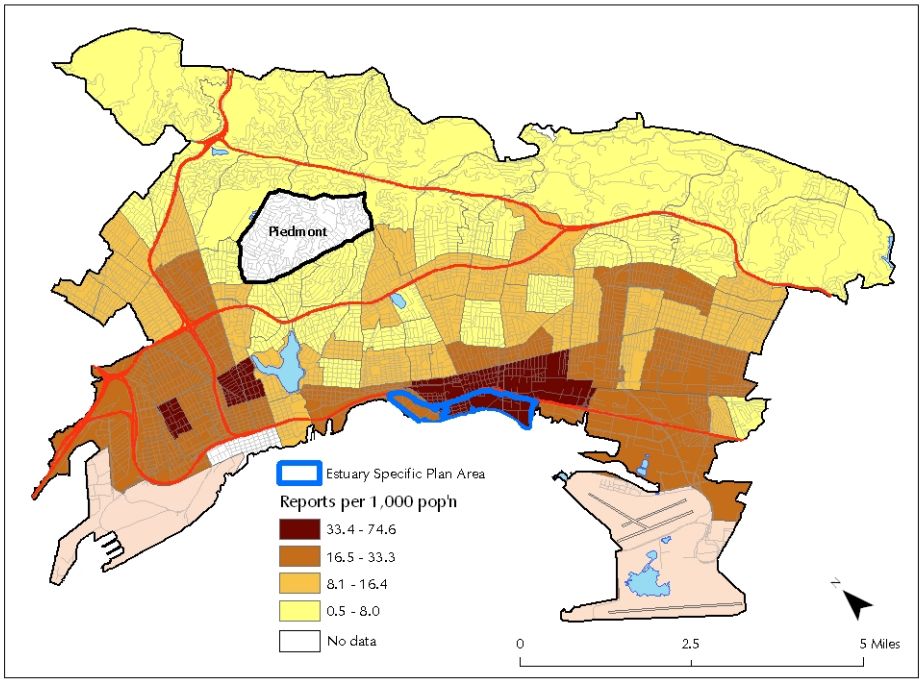
The data above illustrate reported crimes only. Measuring the incidence of crime is extremely difficult. Much crime goes undetected and some crimes are not reported to police. Crimes that go undetected and unreported cannot be counted. Finally, the police themselves may, for various reasons, not record something as a crime, or inaccurately report something as a crime when it is not. Underreporting and statistical undercount influence the degree to which these data are reflective of violent crimes, particularly rape and sexual assault.

The Alameda County Blueprint for Violence Prevention identifies land use and zoning as potential factors that can have a positive impact on violence prevention. For example, "Land-use patterns that encourage neighborhood interaction and a sense of community have been shown not only to reduce crime, but also create a sense of community safety and security. Further, good community design can contribute to a general increase in community networks and trust by creating a "neighborhood feel" through which people are encouraged to interact with each other in a safe environment."

Violence is rarely caused by a single risk factor but rather by the presence of multiple risk factors and absence of protective (or resiliency) factors. Risk factors are traits or characteristics that increase the relative risk of an individual or community being affected by or perpetrating violence. Resiliency factors are traits or characteristics that protect an individual or community from violence.

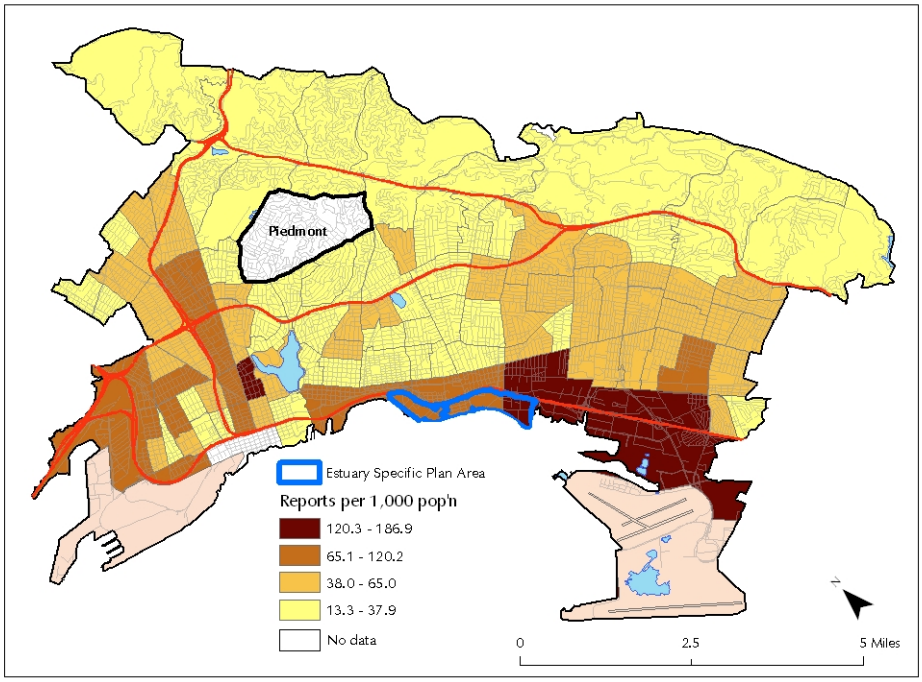
The Plan Area includes a number of resiliency factors that may contribute to violence prevention including accessible parks, a range of goods and services in close proximity such as retail food, public transit, libraries, and schools. The Plan Area is also relatively diverse in terms of housing mix, income and race/ethnicity. Overall, however, the Plan Area includes a number of known risk factors for crime such as poor pedestrian and bicycle environments, freeway on and off-ramps, high volume roadways and noise levels, and a relatively low population density.

Oakland Violent Crime Rate



Source: CAPE.

Oakland Property Crime Rate



Source: CAPE.

References

Regional and City Context

Envision Oakland: City of Oakland General Plan. Adopted in March 1998.

Estuary Policy Plan. City of Oakland. 1999.

Redevelopment Plan For The Central City East Redevelopment Project. The Redevelopment Agency of The City of Oakland. 2003; Amended 2007.

Redevelopment Plan For The Coliseum Area Redevelopment Project. The Redevelopment Agency of The City of Oakland. 1995; Amended 2007.

Oakland Planning Code. City of Oakland Community and Economic Development. 2008.

Report and Recommendations Adopting a Motion Establishing a City-wide Industrial Land Use Policy. City of Oakland Community and Economic Development. 2008.

Blight Analysis to Support Amendment to the Coliseum Area Redevelopment Plan. Hausrath Economics Group. *Draft*, May 2009.

Oakland Waterfront Trail: Bay Trail Feasibility and Design Guidelines. City of Oakland. 1999.

FOCUS: The Bay Area Vision. Joint Policy Committee. http://www.bayareavision.org/. Accessed April 2009.

Goods Movement/Land Use Project for the San Francisco Bay Area. Metropolitan Transportation Commission. 2008.

California State Lands Commission Home Page. http://www.slc.ca.gov/. Accessed July 23, 2009.

The Public Trust Doctrine and The Modern Waterfront, California State Lands Commission, 2007.

SFBCDC – San Francisco Bay Conservation and Development Commission. San Francisco Bay Conservation and Development Commission. http://www.bcdc.ca.gov/. Accessed June 2009.

Historical Context

Archaeological Research Design and Treatment Plan; Volume II: Prehistoric Archaeology. I-880 Cypress Replacement Project; California Department of Transportation. June, 1995.

The Aboriginal Population of Alameda and Contra Costa Counties, California. Anthropological Records; Vol. 16, No. 4. 1957.

Margolin, Malcolm and Michael Harney. The Ohlone Way: Indian Life in the San Francisco-Monterey Bay Area. Heyday Books; Berkeley, California. 2002.

The Peraltas: Spanish Pioneers and the First Family of the East Bay. Peralta Hospital; Oakland, California. 1971.

History of the Port of Oakland: 1850-1934. State Emergency Relief Administration.

A History of the Physical Development of the City of Oakland: The Formative Years, 1850-1930. John Beatty Dykstra/University of California, Berkeley. 1952.

Horace Carpentier. Waterfront Action. http://www.waterfrontaction.org/learn/horace.htm accessed March, 2009.

Horace Carpentier. Wikipedia. http://en.wikipedia.org/wiki/Horace_Carpentier accessed March, 2009.

Online Archive of California. California Digital Library - www.oac.cdlib.org/. Accessed March, 2009.

California Place Names: the Origin and Etymology of Current Geographical Names. 4th ed. University of California Press. 2004.

The Ship Brooklyn Association. http://www.shipbrooklyn.org/ accessed March, 2009.

Jingletown. Wikipedia. http://en.wikipedia.org/wiki/Fruitvale,_Oakland,_California accessed March, 2009.

Santos, Robert L. Azoreans to California: A History of Migration and Settlement. Alley-Cass Publications; Denair California. 1995.

Walking Tours 2005. Oakland Heritage Alliance. 2005.

Land Use and Urban Form

Waterfront Action Measure DD Projects Map. Waterfront Action. www.waterfrontaction.org. Accessed March 2009.

Oakland Bicycle Master Plan. City of Oakland. 2007.

Pedestrian Master Plan. City of Oakland. 2002.

Park Street Triangle Traffic Study – Draft Final Report. Dowling Associates. 2005.

Institute of Mosaic Art. Institute of Mosaic Art. http://www.instituteofmosaicart.com/. Accessed March 2009.

There is Rail. And Yes, There will be Trains – Inside Bay Area. The Oakland Tribune. http://www.insidebayarea.com/oaklandtribune/localnews/ci_12021395?source=rss. Accessed April 2009.

Streetscapes

Transportation

References are included in standalone document.

Infrastructure and Public Facilities

References are included in standalone document.

Economics and Demographics

Sustainability

Alameda Countywide Clean Water Program: < www.cleanwaterprogram.org >. Accessed in March 17th, 2009.

Alameda Waste Management Authority. <www.stopwaste.org >Accessed in March 23rd, 2009.

California Renewables Portfolio Standard: California Public Utilities Commission. http://www.cpuc.ca.gov/PUC/energy/Renewables/ accessed in March 18th, 2009.

Energy Watch Partnership. Pacific Gas and Electric. < www.pge.com > Accessed in March 20th, 2009.

Green-Collar Jobs in Americas Cities: Apollo Alliance and Green for All. 2008.

Sustainable Community Development Initiative. City of Oakland. 1998.

Urban Environmental Accords. United Nations Environmental Programme. 2005.

Zero Waste Strategic Plan: City of Oakland Department of Public Works. <www.zerowasteoakland.org> . Accessed in March 18th, 2009.

Public Health

Brauer M, Hoek G, Van Vliet P, et al. Air pollution from traffic and the development of respiratory infections and asthmatic and allergic symptoms in children. American Journal of Respiratory and Critical Care Medicine. 2002;166:1092-1098.

California Air Resources Board. Air Quality and Land Use Handbook: A Community Health Perspective. 2005. Accessed at: http://www.arb.ca.gov/ch/landuse.htm

B, Janssen NA, de Hartog J, Harssema H, Knape M, van Vliet P. Air pollution from truck traffic and lung function in children living near motorways. Epidemiology. 1997;8:298-303.

Lin S, Munsie JP, Hwang SA, Fitzgerald E, Cayo MR. Childhood asthma hospitalization and residential exposure to state route traffic. Environ Res. 2002;88:73-81.

Dora C, Phillips M, eds. Transport, environment and health. WHO Regional Publications, European Series, No. 89. 1999. http://www.euro.who.int/document/e72015.pdf

Noise and Health: Making the Link. London Health Commission, 2003. http://www.londonshealth.gov.uk/pdf/noise_links.pdf

Evans G, Marcynyszyn LA. Environmental Justice, Cumulative Environmental Risk, and Health among Low- and Middle-Income Children in Upstate New York. Am J Pub Health. 2004;94:1942-1944.

Vries S, de Verheij RA, Groenewegen PP, Spreeuwenberg P. Natural environments - healthy environments? An exploratory analysis of the relationship between green space and health. Environment and Planning A. 2003;35(10):1717-1731.

Parks for People: Why America Needs more City Parks and Open Space. San Francisco: The Trust for Public Land, 2003.

Kuo FE, Sullivan WC. Environment and crime in the inner city: does vegetation reduce crime? Environment and Behavior. 2001;33(3):343-367.

Taylor AF, Kuo FE, Sullivan WC. Coping With ADD: The Surprising Connection to Green Play Settings. Environment and Behavior. 2001;33(1):54-77.

Ewing R, Frank L, Kreutzer R. Understanding the Relationship between Public Health and the Built Environment: A Report to the LEED-ND Core Committee, 2006.

CDC. Motor vehicle safety: A 20th century public health achievement. MMWR 1999;48:369-374.

Federal Highway Administration. Pedestrian and Bicycle Intersection Safety Indices. Publication No. FHWA-HRT-06-125. McLean, VA, 2006.

Besser LM, Dannenberg AL. Walking to public transit: steps to help meet physical activity recommendations. Am J Prev Med. 2005;29(4):273-80.

Task Force on Community Preventive Services. Increasing Physical Activity: A Report on Recommendations of the Task Force on Community Preventive Services. Morbidity and Mortality Weekly Report. October 26, 2001.

Frank LD, Schmid TL, Sallis JF, Chapman J, Saelens BE. Linking objectively measured physical activity with objectively measured urban form: findings from SMARTRAQ. Am J Prev Med. 2005;28(2 Suppl 2):117-25

Saelens BE, Sallis JF, Black JB, Chen D. Neighborhood-based differences in physical activity: an environment scale evaluation. Am J Public Health. 2003;93(9):1552-8.

Moore Iacofano Gostsman, Inc. Richmond general plan update, issues & opportunities, paper #8: community health and wellness (draft). 2007.

http://www.cityofrichmondgeneralplan.org/docManager/1000000640/Existing%20Condictions%20Report%20August%202007.pdf

US Green Building Council. LEED rating systems, neighborhood development. http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148

Ewing R, Forinash CV, Schroeer W. Neighborhood Schools and Sidewalk Connections. What are the impacts on travel mode choice and vehicle emissions. Transportation Research News. March-April 2005 pp 4-10.

Dellinger A, Staybtib C. Barriers to Children Walking and Bicycling to School. Morbidity and Mortality Weekly Report. 2002;51:701-704.

Ewing R, Schroeer W, Greene W. 2004. School location and student travel: Analysis of factors affecting mode choice. Transportation Research Record: Journal of the Transportation Research Board 1895:55-63.

Karoly LA. Early Childhood Interventions: Proven Results, Future Promise. RAND Corporation, 2005; Schweinhart LJ. The High / Scope Perry Preschool Study Through Age 40. The High Scope Press, 2004.

Kahn EB. The effectiveness of interventions to increase physical activity. Am J Prev Med. 2002;22(4):73-107.

Cohen DA, Ashwood JS, Scott MM, Overton A, Evenson KR, Staten LK, Porter D, McKenzie TL, Catellier D. Public parks and physical activity among adolescent girls. Pediatrics. 2006;118(5):e1381-1389.

Vries S, de Verheij RA, Groenewegen PP, Spreeuwenberg P. Natural environments - healthy environments? An exploratory analysis of the relationship between green space and health. Environment and Planning A. 2003;35(10):1717-1731.

Parks for People: Why America Needs more City Parks and Open Space. San Francisco: The Trust for Public Land, 2003.

Regents of the University of California, PolicyLink, and the California Center for Public Health Advocacy. Designed for Disease: The Link Between Local Food Environments and Obesity and Diabetes. April 2008. http://www.policylink.org/documents/DesignedforDisease.pdf.

Morland K, Diez Roux AV, Wing S. Supermarkets, other food stores, and obesity: the atherosclerosis risk in communities study. Am J Prev Med. 2006;30(4):333-9.

Inagami S, Cohen DA, Finch BK, Asch SM. You are where you shop: grocery store locations, weight, and neighborhoods. Am J Prev Med. 2006;31(1):10-7.

Lipton R, Gruenewald P. The spatial dynamics of violence and alcohol outlets. Journal of Studies on Alcohol. 2002 Mar; 63(2):187-95.

Larry Frank, et al. Linking objectively measured physical activity with objectively measured urban form: Findings from SMARTRAQ. Am J Prev Med. 2005;28(2):117-125.

San Francisco Department of Public Health, Program on Health, Equity, and Sustainability. The Case for Housing Impacts Assessment: The human health and social impacts of inadequate housing and their consideration in CEQA policy and practice. May, 2004. Available at: http://dphwww.sfdph.org/phes/publications/PHES_publications.htm

Cohen R. The Positive Impacts of Affordable Housing on Health: A Research Summary. Enterprise Community Partners, Center for Housing Policy, 2007.

Graham NM. The epidemiology of acute respiratory infections in children and adults: a global perspective. Epidemiol Rev. 1990;12:149-178.

Krieger J, Higgens DL. Housing and Health: Time again for Public Health Action. Am J Pub Health. 2002;92:758-768.

Office of Deputy Prime Minister. 2004. The impacts of overcrowding on health and education: A review of the evidence and literature. London. Last accessed online August 30, 2007 from: http://www.communities.gov.uk/documents/housing/pdf/138631

Ross DP, Roberts P. Income and child well being: A new perspective on the policy debate. Canadian Council for Social Development. Ottawa, 1999.

Cooper, Merrill. Housing Affordability: A Children's Issue. Canadian Policy Research Networks Discussion Paper. Ottawa, 2001.

Acevedo-Garcia D, Lochner KA, Osypuk TL, Subramanian SV. Future Directions in Residential Segregation and Health Research: A Multilevel Approach. Am J of Pub Health. 2003;93:215-221.

Anderson LM, St Charles J, Fullilove MT. Scrimshaw SC, Fielding JE, Normand J. 2003. Providing affordable family housing and reducing residential segregation by income: A systematic review. Am J Prev Med. 24(3S):47-67.

Sorlie PD, Backlund E, Keller JB. US mortality by economic, demographic, and social characteristics: the National Longitudinal Mortality Study. Am J Pub Health. 1995;85(7):949-56.

Duncan GJ, Yeung WJ, Brooks-Gunn J, Smith JR. How much does childhood poverty affect the life chances of children? American Sociological Review. 1998; 63: 406-423.

Morris JN, Donkin AJ, Wonderling D, Wilkinson P, Dowler EA. A minimum income for healthy living. J Epidemiol Community Health. 2000;54(12):885-9.

Alaimo K, Olson CM, Frongillo EA, Briefel RR. Food insufficiency, family income, and health in US preschool and school-aged children. Am J Pub Health. 2001;91(5): 781-786.

Haan M, Kaplan GA, Camacho T. Poverty and health. Prospective evidence from the Alameda County Study. Am J Epidemiol. 1987;125(6):989-98.

Chandola T, Brunner E, Marmot M. Related Chronic stress at work and the metabolic syndrome: prospective study. BMJ. 2006;332(7540):521-5. Epub 2006 Jan 20.

Lynch J, Smith GD, Harper S, Hillemeier M, Ross N, Kaplan GA, Wolfson M. Is income inequality a determinant of population health? Part 1. A systematic review. Milbank Q. 2004;82(1):5-99.

Lynch JW, Kaplan GA, Pamuk ER, Cohen RD, Heck KE, Balfour JL, Yen IH. Income inequality and mortality in metropolitan areas of the United States. Am J Public Health. 1998;88(7):1074-1080.

Fullilove MT, Heon V, Jimenez W, Parsons C, Green LL, Fullilove RE. Injury and anomie: effects of violence on an inner-city community. Am J Public Health. 1998;88(6):924-7.

Perez-Smith AM, Albus KE, Weist MD. Exposure to violence and neighborhood affiliation among inner-city youth. J Clin Child Psychol. 2001;30(4):464-72.

Ozer EJ, McDonald KL. Exposure to violence and mental health among Chinese American urban adolescents. J Adolesc Health. 2006;39(1):73-9.

Altschuler A, Somkin CP, Adler NE. Local services and amenities, neighborhood social capital, and health. Social Science & Medicine. 2004;59:1219-1229.

Rountree PW, Land KC. Perceived risk versus fear of crime: empirical evidence of conceptually distinct reactions in survey data. Social Forces. 1996;74:1353-1376.

Mujahid MS, Diex Roux AV, Morenoff JD, Raghunathan TE, Cooper RS, Ni H, Shea S. Neighborhood characteristics and hypertension. Epidemiology. 2008;19: 590-598.

Foster S, Giles-Corti B. The built environment, neighborhood crime, and constrained physical activity: An exploration of inconsistent findings. Prev Med. 2008;47(3):241-51.

Prevention Institute. 2005. A Lifetime Commitment to Violence Prevention: The Alameda County Blueprint. Available at: http://www.preventioninstitute.org/alameda.html.

Calhoun J. National Crime Prevention Council. New Partners for Smart Growth: Building Safe, healthy, and Livable Communities. 2nd annual conference flyer. 2002.

Appendix A: Susceptibility to Displacement

Background And Methodology

For its Early Warning Tool Kit, the Center for Community Innovation (CCI) defines gentrification as a process of neighborhood change that encompasses economic change in the form of both real estate investment and increases in household income, as well as demographic change in the form of increases in educational attainment. Although some change could be coming from within, as existing residents improve their economic circumstances, most is driven by exogenous forces, as evidenced by home price appreciation. Thus, CCI differentiates gentrification from revitalization more generally, which consists simply of improvements in neighborhood income (due either to newcomers or changes for existing residents). Specifically, the Tool Kit uses the definition of gentrification put forth by Freeman (2005), modified slightly for the Bay Area: a central city neighborhood with housing price appreciation above the regional average, increase in educational attainment above the regional average, and household income at the 40th percentile of regional household income (roughly 80% of median income) in the starting year (as the process begins). What types of neighborhoods are most susceptible to gentrification? To answer this question, CCI looked at the 102 tracts that gentrified from 1990 to 2000 and examined what they were like in 1990. Using multivariate regression, CCI identified different types of factors that make a neighborhood more likely to gentrify. These included demographic factors, such as types of families in the neighborhood; income factors, such as the extent to which local households are experiencing high rent burdens; transportation factors, such as reliance on transit for the commute; housing factors, such as a large share of rental housing; locational factors, such as where the neighborhood lies in the region; and amenities, including parks and community facilities.

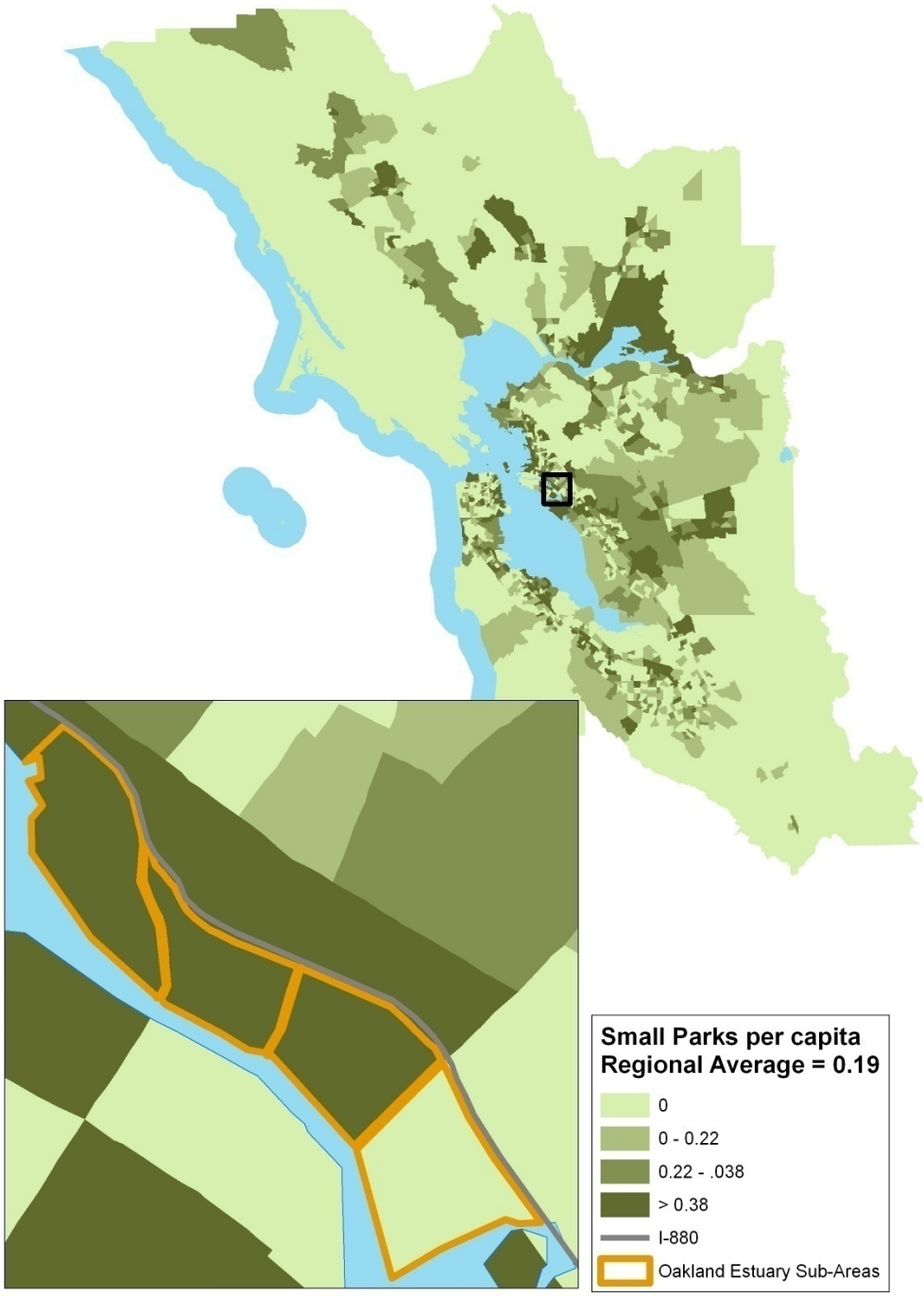
Table A.1 lists the nineteen factors that lay behind gentrification in the 1990s, showing whether they had a positive influence, causing more gentrification, or negative influence, causing less. The table ranks the variables' significance and shows the most important ones in bold; since these factors are many times more important than the others, it is worth examining them in more detail.

Table A.1. Factors behind gentrification in the 1990s.

Variable Type	Variable	Direction	Rank
Transportation	**% of workers taking transit**	**Positive**	4
Amenities	**Youth facilities per 1,000**	**Positive**	3
	Public space per 1,000	**Positive**	5
	Small parks per 1,000	Positive	17
Demographic	**% non-family households**	**Positive**	8
Housing	**% of dwelling units in buildings with 5+ units**	**Positive**	7
	% of dwelling units in buildings with 3-4 units	**Positive**	10
	% renter-occupied	**Positive**	13
	Public housing units	Positive	19
Income	**Income diversity**	**Positive**	6
	% of renters paying > 35% of income	**Positive**	11
Location	Distance to San Jose	Positive	14
Transportation	**% of dwelling units with 3+ cars available**	**Negative**	2
Amenities	**Recreational facilities per 1,000**	**Negative**	1
Demographic	**% married couples w/ children**	**Negative**	9
	% non-Hispanic white	**Negative**	12
Housing	Median gross rent	Negative	18
Income	% of owners paying > 35% of income	Negative	15
Location	Distance to San Francisco	Negative	16

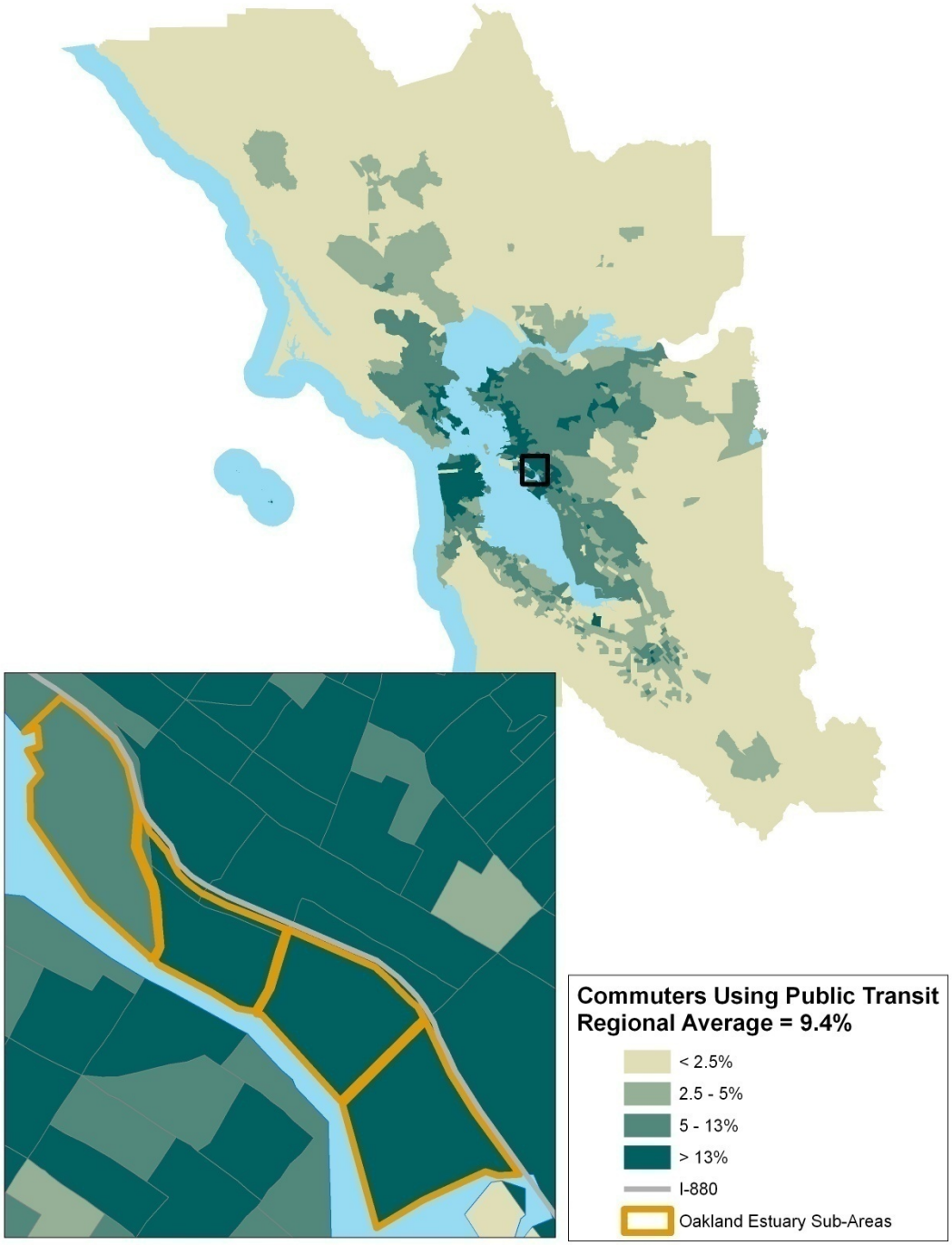
Availability of amenities and **public transportation** top the list of factors (see Figures A.1 through A.3). More than who lived in the neighborhood in 1990, or where it was located within the region, or even the characteristics of the neighborhood, what was most important in attracting change to the area was the proximity of amenities such as youth facilities and public space (and to a lesser extent, small parks), as well as the convenient location of transit (as evidenced by a high share of transit commuters). Interestingly, two of these variables were more likely to cause neighborhoods not to gentrify (i.e., were negative in influence): the presence of public/nonprofit recreational facilities and a concentration of homes with more than three cars. The latter variable simply reflects auto-oriented outer suburban areas that are not likely to gentrify anyway because they are not central locations. Though more research is needed to understand why recreational facilities deter gentrification, it may be because they draw heavy traffic from more disadvantaged groups.

Figure A.1: Small Parks per Capita in the Bay Area and Central Estuary, 2000



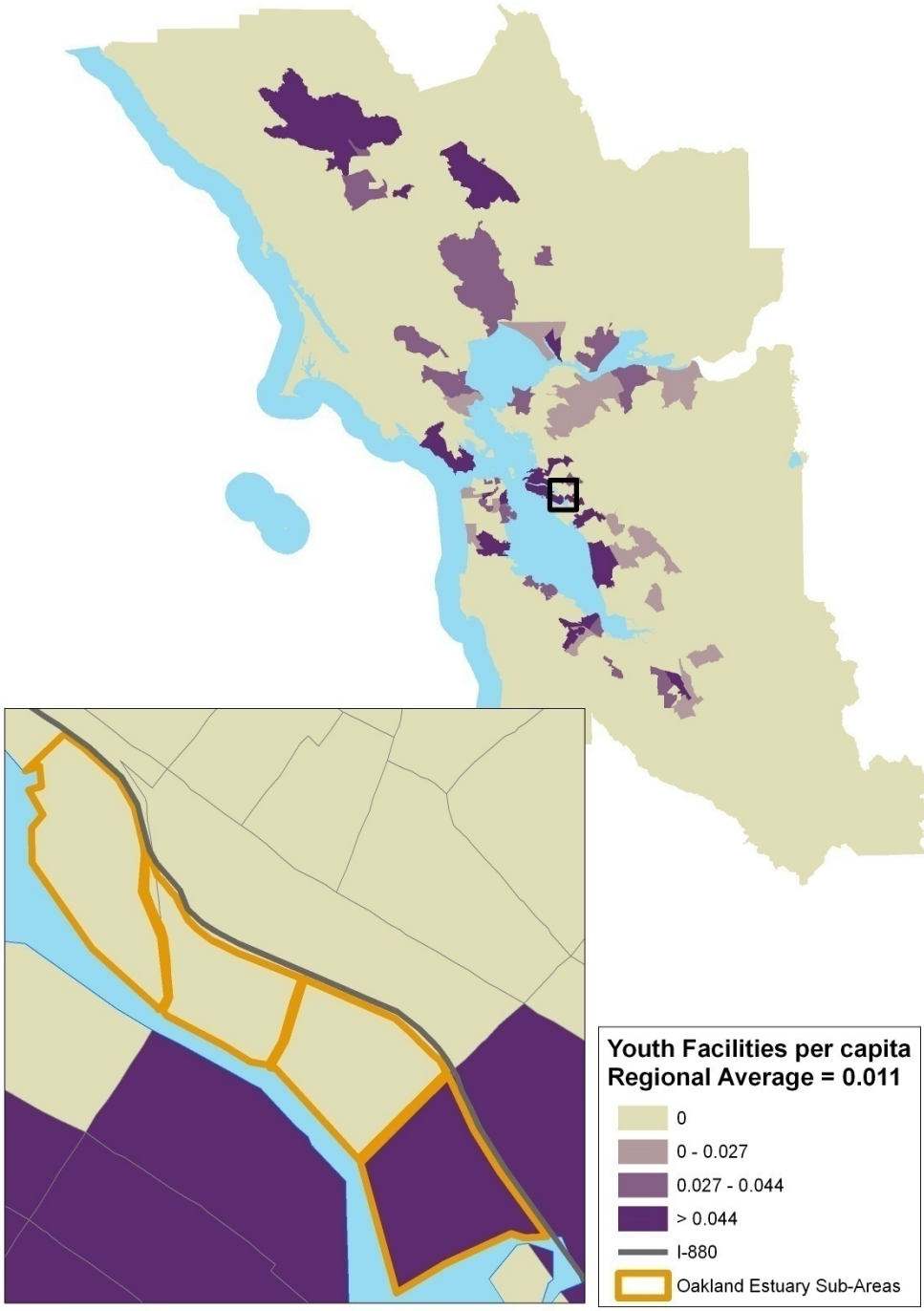
Source:ESRI; Center for Community Innovation, 2009

Figure A.2: Public Transit Use in the Bay Area and Central Estuary, 2000



Source: 2000 U.S. Census; ESRI; Center for Community Innovation, 2009

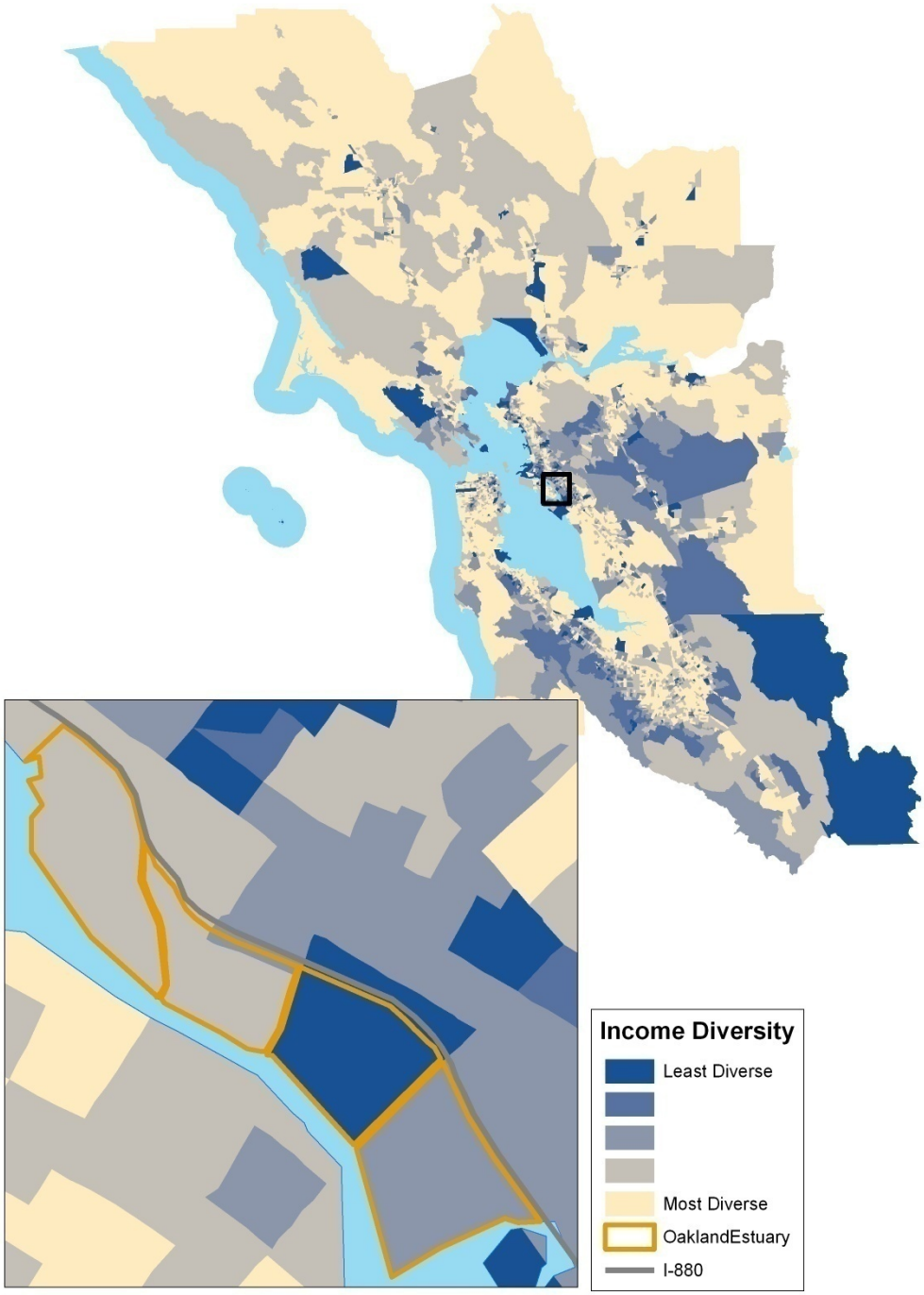
Figure A.3: Youth Facilities per Capita in the Bay Area and Central Estuary, 2000



Source: National Center for Charitable Statistics; ESRI; Center for Community Innovation, 2009

Three **income** variables, (including income diversity, see Figure A.4) make a significant difference in whether a neighborhood will gentrify. Income diversity is a very important indicator: if an area is more diverse, i.e., has relatively equal representation across the six income groups, then it is more likely to attract this form of neighborhood change.

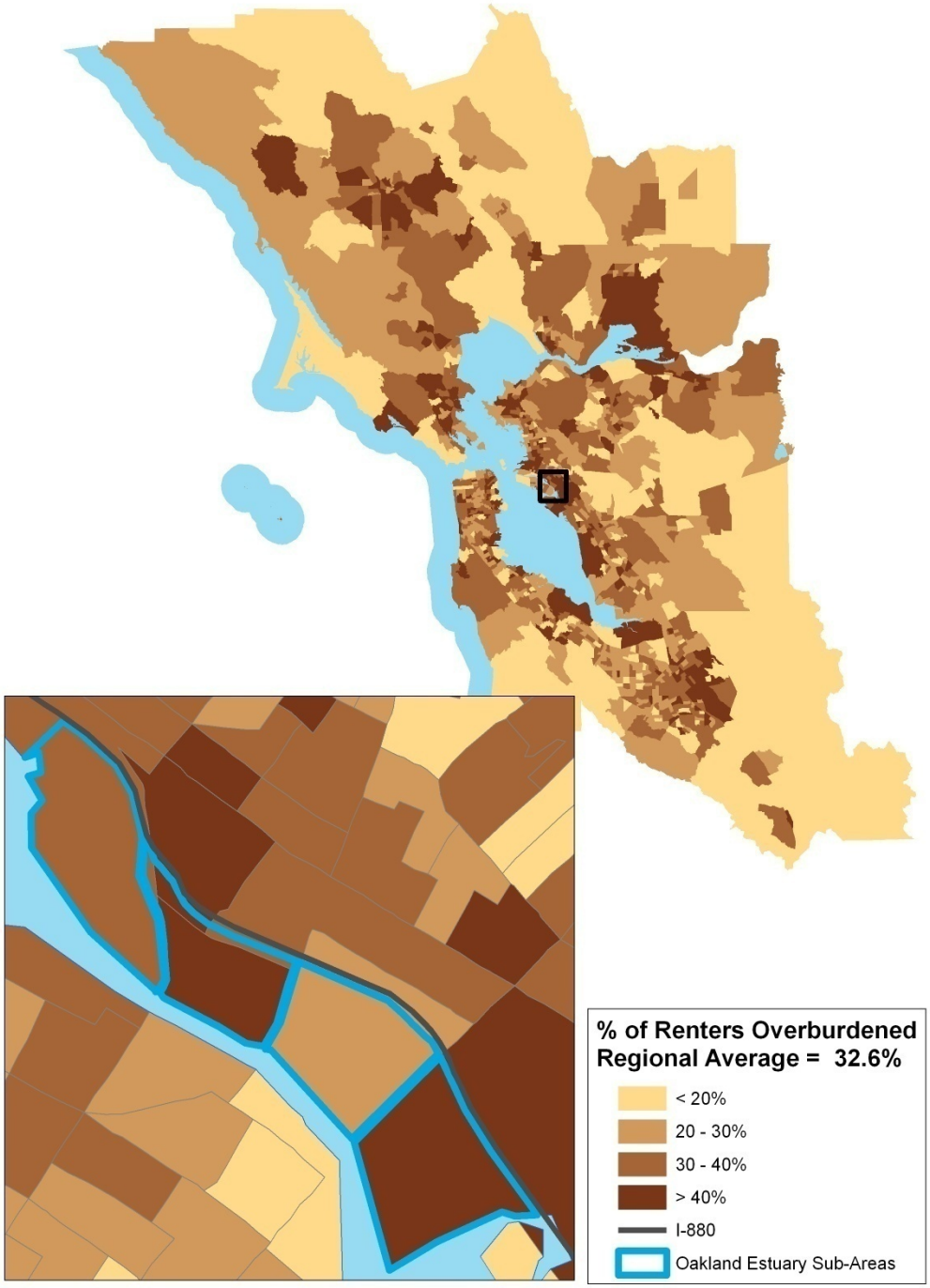
Figure A.4: Income Diversity in the Bay Area and Central Estuary, 2000



Source: 2000 U.S. Census; ESRI; Center for Community Innovation, 2009

Likewise, if there is a high share of renters who pay over 35% of their income for rent, then the neighborhood is more susceptible (see Figure A.5). It is easy to envision what occurs in this case: as an influx of newcomers increases area rents, these overburdened renters find themselves unable to pay an even higher share of their income for rent, so they depart, leaving more vacancies for new gentrifiers. In contrast, neighborhoods with concentrations of overburdened owners are less likely to gentrify, perhaps because the neighborhoods with high concentrations of home ownership tend to be more affluent.

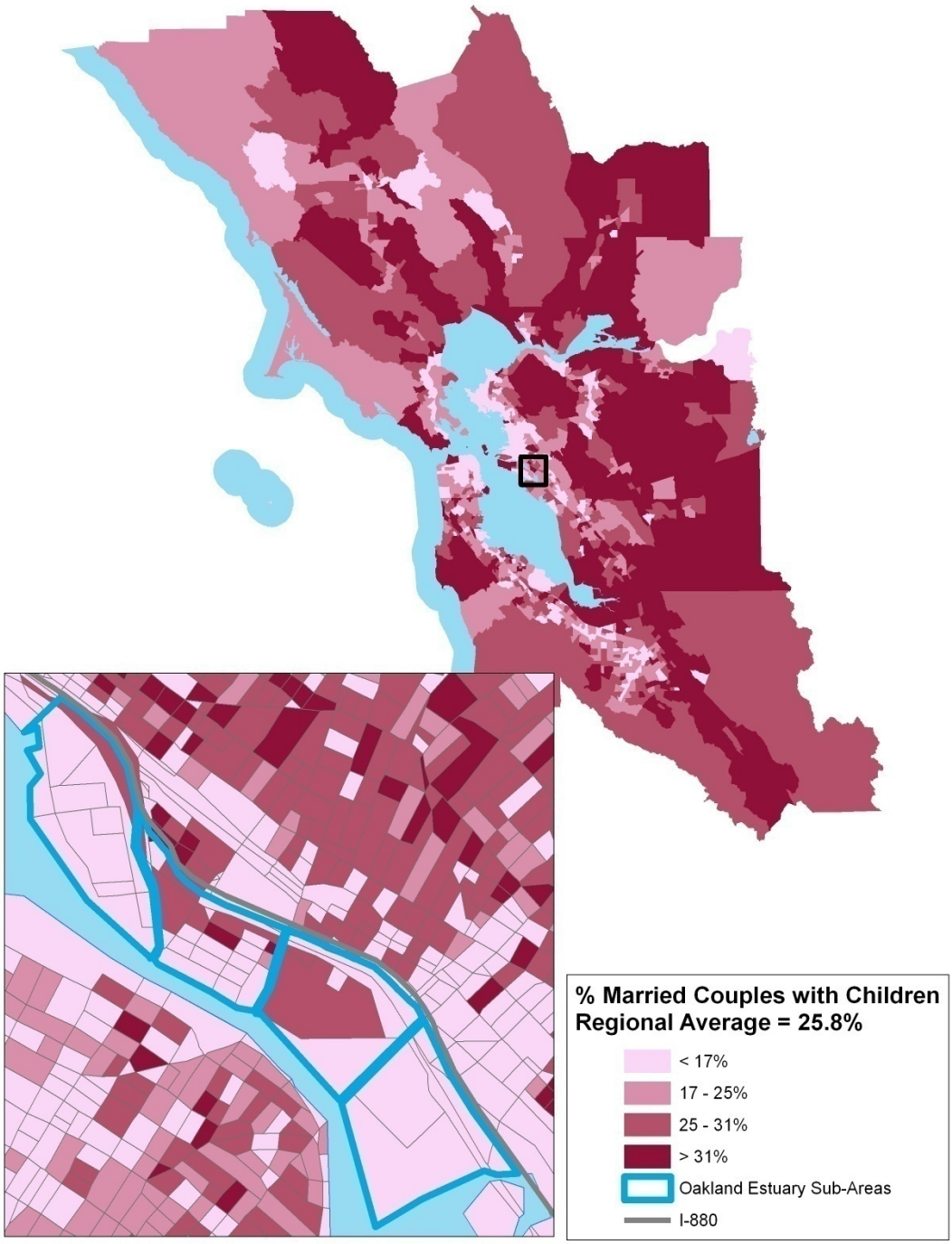
Figure A.5: Rent Burden in the Bay Area and Central Estuary, 2000



Source: 2000 U.S. Census; ESRI; Center for Community Innovation, 2009

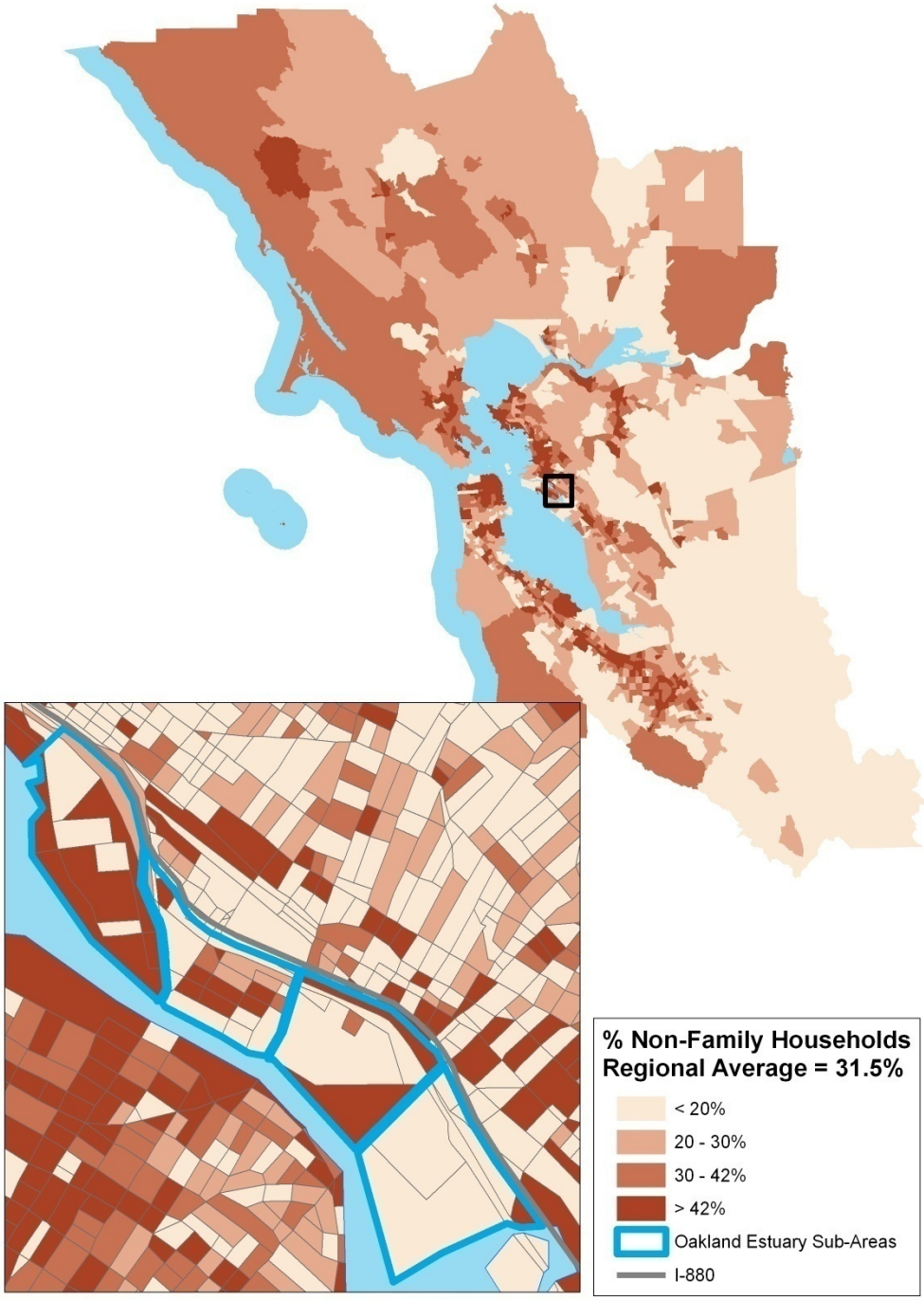
One predictable, but important, **demographic** variable that leads to gentrification is a larger share of nonfamily households. In contrast, the more non-Hispanic whites are in the area, the less likely it is to gentrify: the most susceptible areas are majority minority. Likewise, the more married couples with children, the less likely the area is to gentrify (though there are some exceptions in areas with concentrations of Latino families, e.g. San Jose) (Figures A.6 and A.7)

Figure A.6: Household Types in the Bay Area and Central Estuary, 2000



Source: 2000 U.S. Census; ESRI; Center for Community Innovation, 2009

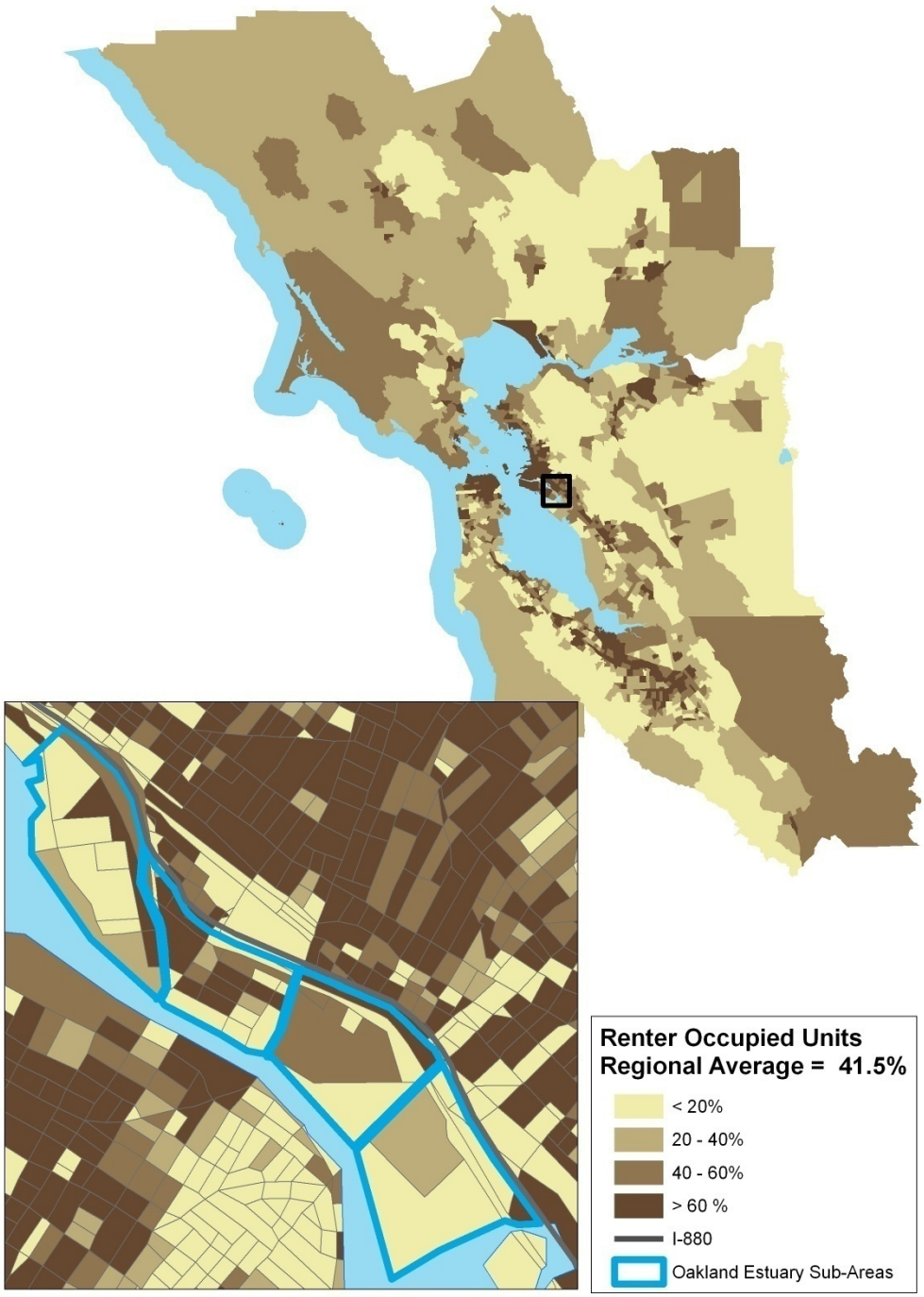
Figure A.7: Non-Family Households in the Bay Area and Central Estuary, 2000



Source: 2000 U.S. Census; ESRI; Center for Community Innovation, 2009

Finally, four types of **housing** variables, closely related to each other, matter significantly. In particular, the higher the share of multi-unit buildings (with three or more units) and the higher the share of renter-occupied housing (Figure A.8), the more likely the area is to gentrify, perhaps because change can occur more rapidly through turnover of rental units.[21] Not surprisingly, the higher the median gross rent, the less likely the area is to gentrify (since it may be affluent already). Finally, the higher the number of public housing units, the more likely the area is to gentrify, perhaps because there is often a lot of mobility in neighborhoods adjacent to public housing.

Figure A.8: Renter Occupancy in the Bay Area and Central Estuary, 2000



Source: 2000 U.S. Census; ESRI; Center for Community Innovation, 2009

If these factors caused gentrification in the past, then they are likely to make neighborhoods more susceptible to gentrification in the future. We can look at how each tract scores on each of these factors to determine whether it is likely to gentrify by 2010 or shortly thereafter.

For each tract, CCI looked at whether it is above or below average on each of the nineteen factors in 2000. For instance, the East Northside neighborhood of San Jose has a below average share of non-Hispanic whites (13% compared to 50% in the region) but an above average share of overburdened renters (35% compared to 30% in the region). Since tracts with a below average share of non-Hispanic whites are more likely to gentrify, this neighborhood scores 1 on this factor; likewise, since tracts with above average rent-burdened households are more likely to gentrify, this neighborhood also scores 1 on the rent burden factor. CCI added the scores across all nineteen factors to come up with the susceptibility index. To qualify as highly susceptible, a tract has to score 1 on 16 or more factors, have a median income below the regional median, and be within one-half mile of a rail or ferry transit station. The most susceptible tracts are concentrated in or near downtown Oakland and San Francisco. Tracts that are moderately susceptible to gentrification have a score of 13, 14, or 15 on the index. There are 90 of these tracts within one-half mile of transit, 61 of which have not gentrified already. Though most are near the major downtowns, they also appear in older suburbs and in urban low-income neighborhoods such as in East Oakland, Bayview, and the Iron Triangle.

Implications

Each of these factors has a direct implication for planning. This research has shown that accessibility to transit (and inconvenience for multiple-car households) makes a neighborhood much more likely to gentrify. This suggests that whenever planners make transit improvements, they should also examine how to preserve and create more permanently affordable housing, whether through joint development, coordination with the housing element, partnerships with nonprofits, or other means. Most amenities, from small parks to public space to youth facilities, seem to be strongly associated with gentrification. Again, this makes an argument for linking planning for open space and other design improvements to various processes for planning and building affordable housing. Some amenities may actually deter gentrification – for instance, this research found that the presence of recreational facilities was negatively associated with gentrification. This finding warrants further research, but does suggest the importance of developing amenities that explicitly support the existing population, rather than some potential future residents.

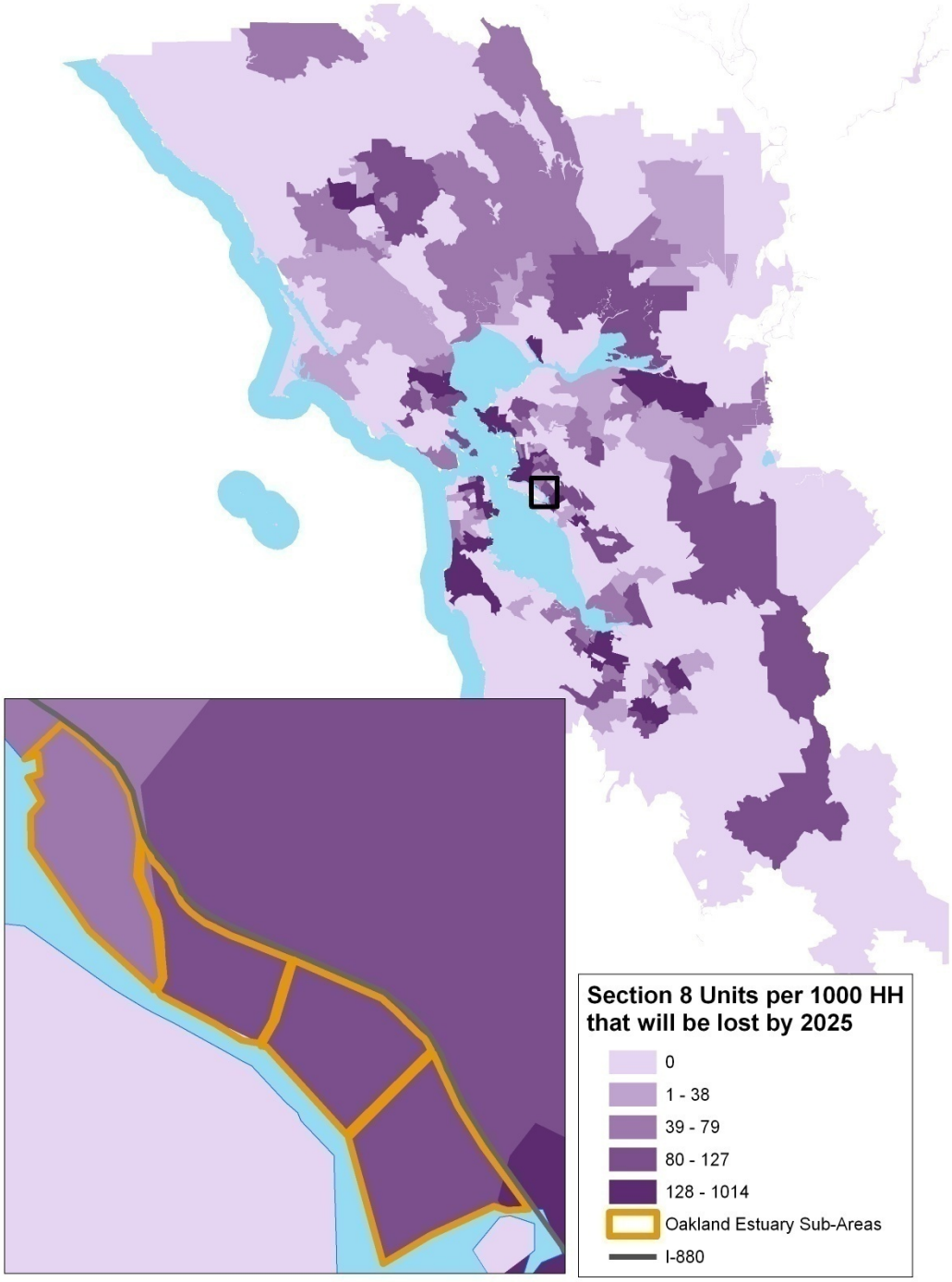
A number of factors lead to direct implications for affordable housing planning. The association of non-family households with gentrifying areas suggests that planners might slow this type of neighborhood change by requiring buildings with larger units (e.g. three or more bedrooms) and amenities that cater to children or the elderly. Most susceptible to gentrification are neighborhoods with multi-unit, renter-occupied buildings. Cities with rent and eviction controls should make sure that these buildings remain protected; if they are project-based Section 8 or some other type of subsidized housing with expiring affordability provisions, cities should intervene pro-actively to ensure that they remain affordable. Finally, in areas where renters pay a disproportionately high share of income for rent, planners should identify households with high rent burdens and connect them to rental assistance programs. Pro-active action may be able to preserve housing affordability for tenants as neighborhood rents rise.

Though we are not able to measure how much displacement is taking place in neighborhoods due to gentrification, there are a variety of factors that make it more likely that displacement will occur in a certain neighborhood. Of the factors presented above, renter occupancy and high rent burdens are likely the most strongly associated with displacement, since renters may not have the choice to stay in their unit

as rents increase. In addition, housing policy can prevent or accelerate displacement processes directly: two factors that drive the extent of displacement are rent control and availability of subsidized housing.

The Bay Area has almost 90,000 units of public housing built under the 1937 and 1949 Housing Acts that will for the most part remain permanently affordable (especially if cities do one-for-one replacement as they renovate the projects into mixed-income developments). But nearly half of its subsidized housing stock now consists of units built since the 1970s, in the form of project-based Section 8 (approximately 20,000 units), Low Income Housing Tax Credit projects (almost 60,000 units), or other programs. Many of these programs have expiring affordability clauses; in other words, the government helped to fund the projects based on a commitment to keep the units affordable to low-income families for a period of years (from 15 to 30). Projects that are in gentrifying areas and are not managed by nonprofits often convert the units to market-rate once the affordability clause expires. Figure A.9 illustrates the potential loss of subsidized housing because of expirations in the project-based Section 8 program; if a project is not managed by a nonprofit, it is deemed more likely to be lost to the market when the project expires. Figure 23 shows that by 2025, just under 4,000 remain in the Bay Area. It is possible that more units will be retained, as intermediaries such as LISC work actively to transfer this stock to nonprofit management. But much depends on the amount of market pressure in years to come.

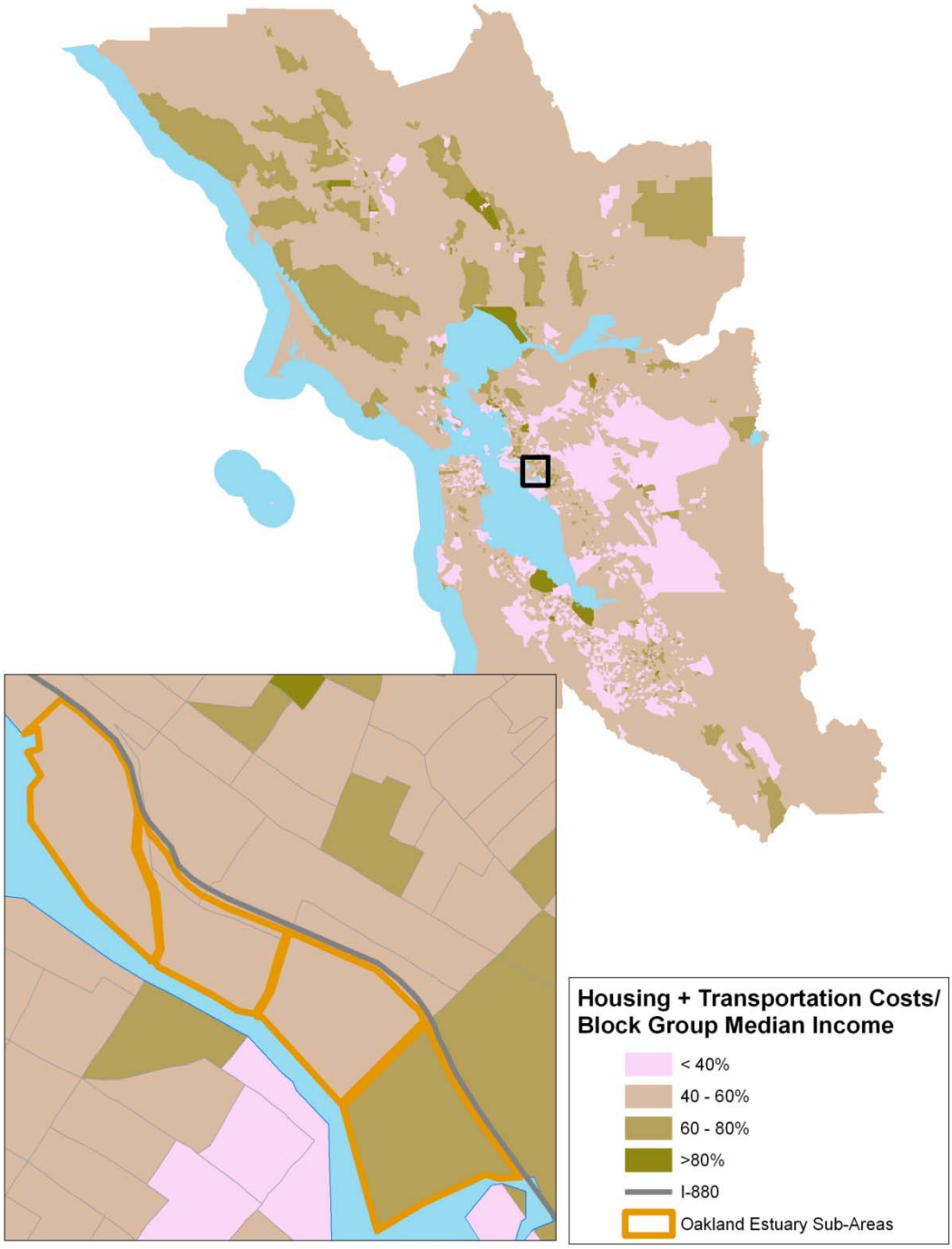
Figure A.9: Potential Loss of Section 8 Units in the Bay Area and Central Estuary, 2000



Source: U.S. Department of Housing and Urban Development; ESRI; Center for Community Innovation, 2009

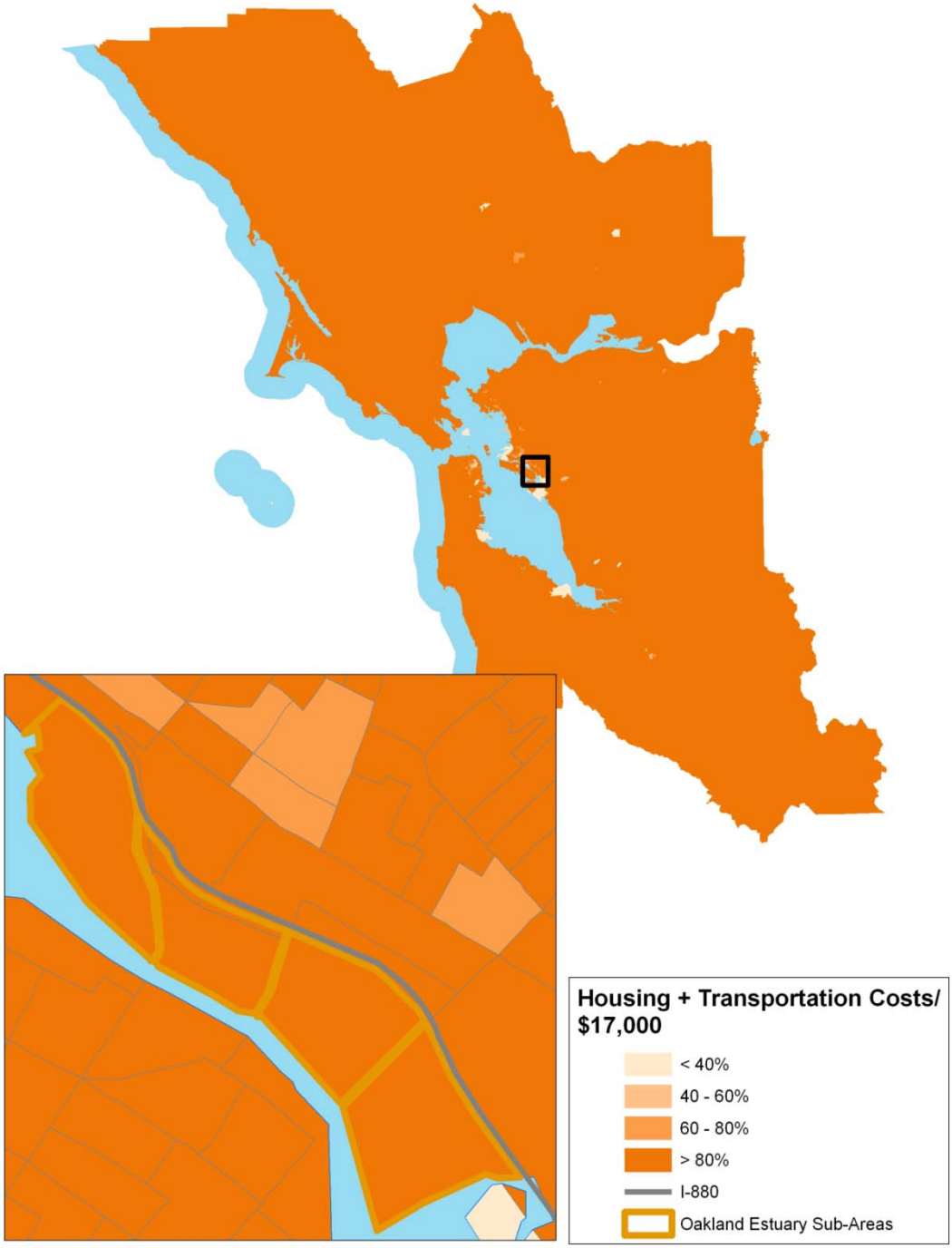
Housing policies drive the supply of affordable housing, but household incomes indicate the demand. Two income indicators suggest potential for displacement because of pressures on the family budget: the compound burden of housing and transportation costs, and the burden of unaffordable mortgages resulting in foreclosure. The Center for Neighborhood Technology (in collaboration with the Center for Transit-Oriented Development) has devised a methodology to estimate how much households of different income levels pay for both housing and transportation (H+T). Overall, in the Bay Area, households pay 48% of their income for housing and transportation costs combined. However, low-income households pay a much greater share of their income for H+T: in fact, were it not for public subsidies that help pay for H+T, some low-income households would find that the two combined exceed their entire income (see Figures A.10 through A.12). Figure A.12 maps H+T for families at the 25th percentile of household income or below ($35,000) for block groups in the Bay Area. Low-income households living in the core areas and/or near transit tend to have a much lower H+T (less than 65%) than households living in outer areas. In neighborhoods highly susceptible to gentrification, an H+T that is disproportionately high indicates that residents are unlikely to be able to stay in the absence of supportive housing policies.

Figure A.10: H+T Burden, Median Income in the Bay Area and Central Estuary, 2000



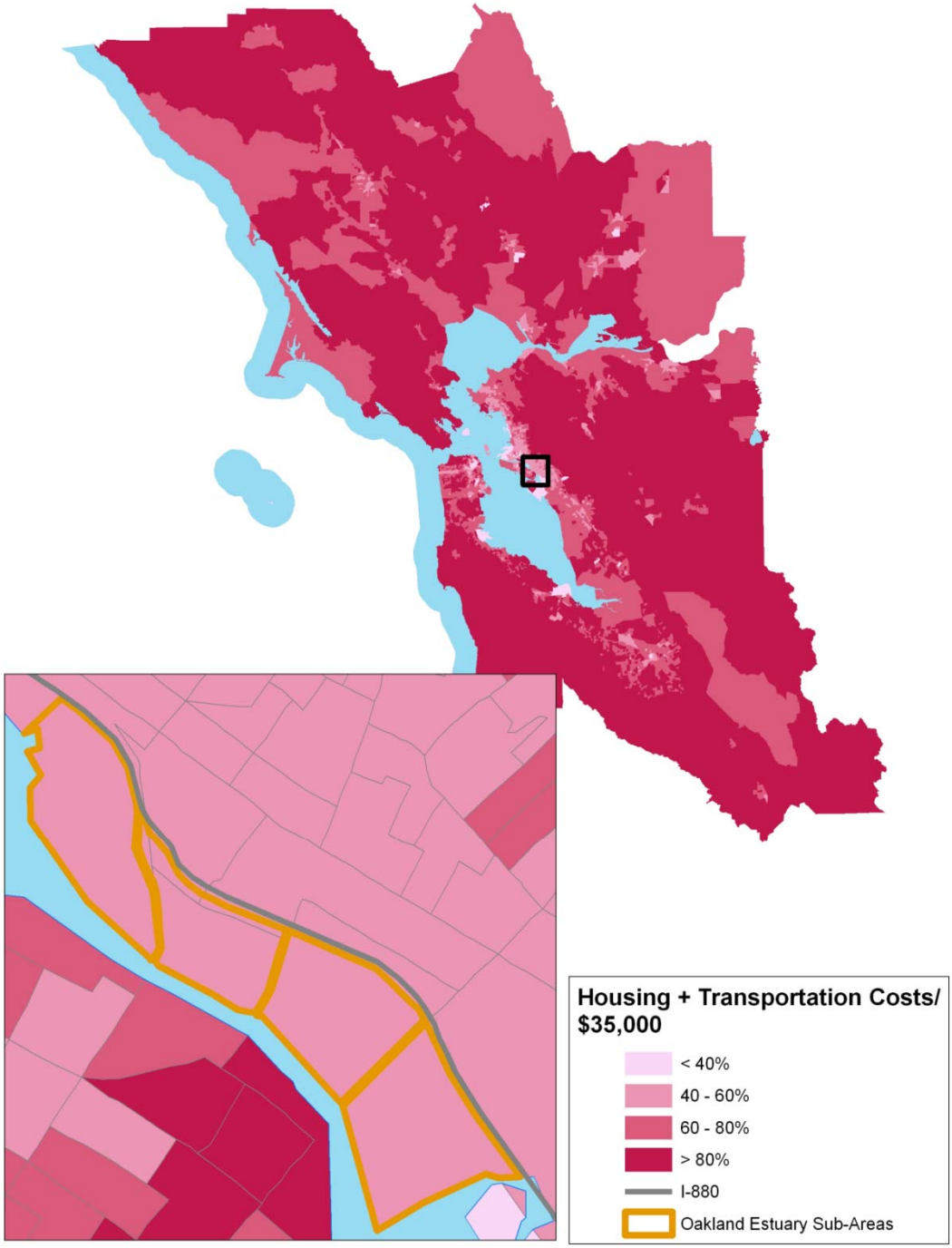
Source: Center for Neighborhood Technology; Center for Community Innovation, 2009

Figure A.11: H+T Burden, Very Low Income Households in the Bay Area and Central Estuary, 2000



Source: Center for Neighborhood Technology; Center for Community Innovation, 2009

Figure A.12: H+T Burden, Low Income Households in the Bay Area and Central Estuary, 2000



Source: Center for Neighborhood Technology; Center for Community Innovation, 2009

Appendix B: Interview Findings

Table B-1: Summary of Employment Characteristics and Building Intensities for Existing Plan Area Businesses

Business Type	# of Employees	Occupied Building Area (SF)	Total Building Area (SF)	Lot Area (SF)	Density (SF per Employee)	FAR	Land Area per Employee (SF)
Manufacturing (Non-Durable Goods)	42	100,000	100,000	535,788	2,381	0.19	12,757
Manufacturing (Non-Durable Goods)	158	120,000	120,000	186,000	759	0.65	1,177
Manufacturing (Non-Durable Goods)	40	30,000	120,419	165,964	750	0.73	1,034
Manufacturing (Non-Durable Goods)	4	3,500	10,500	31,000	875	0.34	2,583
Manufacturing (Durable Goods)	10	10,000	10,000	21,000	1,000	0.48	2,100
Manufacturing (Durable Goods)	30	35,000	35,000	19,349	1,167	1.81	645
Wholesale Trade (Durable Goods)	56	25,000	25,000	87,120	446	0.29	1,556
Social Assistance	550	84,186	195,432	315,048	153	0.62	247
Professional, Scientific, and Technical Services	45	18,000	18,000	32,980	400	0.55	733
Professional, Scientific, and Technical Services	50	14,700	195,432	315,048	294	0.62	474
Professional, Scientific, and Technical Services	50	13,000	120,419	165,964	260	0.73	358

Source: Strategic Economics 2009