Lake Merritt Station Area Plan

Health Impact Assessment

June 2012

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1. Executive Summary

The City of Oakland, along with Bay Area Rapid Transit (BART) and the Peralta Community College District (Peralta), are in the process of preparing a Station Area Plan (SAP) for the Lake Merritt BART Station (LMB). The LMB SAP offers the opportunity to bring many health benefits to the local community. However, as with all land use projects of this magnitude, it may also introduce or exacerbate health hazards and risks. The goal of this Health Impact Assessment (HIA) is to identify potential health benefits and risks associated with the LMB SAP, and to offer recommendations for optimizing health impacts for all people affected by the plan.

The steering committee brought together to conduct this HIA offered health impact analysis input at various stages of the planning process. HIA input included a limited health impact analysis of Land Use and Transportation Concepts released by the City of Oakland in June and July, 2011; a health impact assessment of the Draft Emerging Plan (DEP) in letter format in November 2011; and a summary of health research evidence pertaining to additional topics, as requested by City of Oakland planning staff.

The Steering Committee selected the following five health determinants for the focus of the HIA, all of which are of high priority to the community:

- Transportation
- Housing
- Economic Development
- Parks
- Public Safety

Key Assessment Findings

Baseline Health Conditions

Baseline health conditions in the Planning Area were assessed. Using zip codes to approximate the Planning Area, it was discovered that Planning Area residents have slightly higher rates of receiving care for diabetes and coronary heart disease compared to the City of Oakland. Twice as many people in Planning Area zip codes received inpatient or emergency room care for mental disorders as the rest of Oakland. Asthma rates are particularly high in Chinatown, and heart disease is the leading cause of death for all Oakland residents.

Health Impacts Related to Transportation

Key health issues related to transportation explored in the HIA include physical activity related to walking, biking, and using public transit; traffic safety for motorists, pedestrians and bicyclists; and air quality impacts of vehicles.

The proportion of Planning Area residents who walk to work (18%) is four times higher than proportions for Oakland and Alameda County. The Planning Area has one of the highest concentrations of pedestrians in the city. Two percent of residents bike to work, which is similar to the proportion for Oakland. Sidewalks are present throughout the Planning Area and their conditions range from poor to good. There is a dearth of bikeways in the Planning Area, although improvements are being made in recent years. Chinatown, which makes up a large portion of the Planning Area, has historically had the highest concentration of pedestrian/vehicle collisions in the city.

Air quality conditions are poor in the Planning Area, and a big reason for this is that Interstate 880 traverses the Planning Area, along with other major vehicle thoroughfares.

The Lake Merritt BART Draft Emerging Plan proposes to generate between 30,987 and 36,461 additional new daily vehicle trips, which will negatively impact air quality and pedestrian and bicycle safety, if not mitigated. The DEP proposals also include features that will be positive to health, such as pedestrian improvements, traffic calming features such as lane reduction and narrowing, and bike lanes.

Health Impacts Related to Housing

Key issues for health related to housing that are explored in the HIA include displacement and affordability.

As of 2000, median gross rent in the Planning Area was about 70% of median gross rent in the City overall. However, as it becomes further developed with BART Station Area Plan and other developments, the Planning Area is very vulnerable to rising housing costs, gentrification, and displacement in coming years. Measures should be taken to create permanently affordable housing.

Health Impacts Related to Economic Development

Key health determinants related to economic development that are explored in the HIA include workforce characteristics, including income, age, educational attainment, employment and work location; business characteristics, including employment potential, industry and occupational categories; wages and benefits; and workforce development. Additionally, existing conditions for businesses that offer necessary resources, and that facilitate growth and potential to attract more revenue to the area are presented.

The industries with the greatest representation by residents in the Planning Area were (in this order):

- Educational services, health care and social assistance
- Arts, entertainment, and recreation, and
- Accommodation and food services;
- Finance and insurance, and real estate and rental and leasing;
- Retail trade; and
- Professional, scientific, and management, and administrative and waste management services.

This somewhat aligns with the breakdown of businesses by industry in the Planning Area. The industries offering the most jobs in the three zip codes intersecting the Planning Area include (in this order):

- Professional, scientific, and technical services;
- Health care and social assistance;
- Administrative and support and waste management and remediation services;
- Finance and insurance;
- Other services;
- Transportation and warehousing; and
- Accommodation and food services.

Based on this information it appears as though some residents are working locally, but it is not possible to say how many and whether local resident qualifications are appropriate for the businesses present in the Planning Area.

The Lake Merritt BART Station Area Plan could add an estimated 4,423 new jobs to the Planning Area, primarily through the addition of new retail and office jobs and at the expense of some auto-related and industrial jobs. The addition of new retail and office jobs has the potential to benefit local residents, as

many local residents are monolingual Chinese and appropriate employment for this population is more common in smaller (rather than larger) retail and office spaces. Therefore, if some portion of the new retail and office jobs are in smaller spaces, local residents have a greater chance of benefiting from SAP development.

Health Impacts Related to Parks

This HIA explored parks by examining the Draft Emerging Plan's impacts on the amount of park land, park acres per resident, geographic access to parks, and programs and features offered by parks.

The Planning Area currently includes three local parks and two regional parks. Although many Planning Area residents live near a park, the number of park acres per 1,000 people is likely lower than city and other guidelines, and that of Oakland overall. Planning Area parks could therefore be considered overcrowded. Proximity to a regional serving park is also not available to many Planning Area residents.

While the Draft Emerging Plan proposes additional parkland, which will increase geographic access to parks for many people, which is a health benefit, new residential development will also accommodate more residents. Thus, even with additional proposed parkland, the parkland per population decreases in an already park-deficient area. We recommend that park programming decisions include community input and be culturally appropriate.

Health Impacts Related to Public Safety

Crime and violence are significant health concerns to residents in the Planning Area. Crime does occur in the Planning Area, and blocks around the Lake Merritt BART Station are perceived by many as unsafe. Crime prevention through environmental design (CPTED) principles, as related to the Planning Area, are discussed in this HIA. According to CPTED, crime can be mitigated by increasing commercial and retail use as well as mixed-use development, attracting pedestrian activity and "eyes on the street," reducing traffic volumes and speeds, and increasing social cohesion. According to CPTED principles, the Lake Merritt BART Station Area Plan will for the most part lead to the prevention of crime.

In conclusion, the Lake Merritt BART Station Area Plan offers an extraordinary opportunity to benefit the health of current and future residents of the Planning Area as well as the entire City of Oakland. Transit access, pedestrian improvements, traffic calming designs, healthy and affordable housing, local jobs, increased access to existing regional parks, and probable improvements to public safety are all likely to lead to health benefits. However, some negative health impacts of the proposals are predicted, such as a higher risk for housing displacement and gentrification, increased pedestrian and bicycle collisions, and hazardous air quality impacts associated with increased vehicle trips and increased resident exposure to Interstate 880. Recommendations included in this HIA will help address these negative impacts and improve future health outcomes.

2. Introduction

The City of Oakland, along with Bay Area Rapid Transit (BART) and the Peralta Community College District (Peralta), are in the process of preparing a Station Area Plan (SAP) for the Lake Merritt BART Station (LMB). In conjunction with meeting future demand for growth (as projected by the Metropolitan Transportation Commission and the Association of Bay Area Governments), the SAP will steer future redevelopment within the project area (including all parcels within a 10 minute walk surrounding the BART station), will establish regulations for redevelopment projects on public and private property, and will guide the redesign of streets and sidewalks to make the area more transit-oriented. Key objectives of the LMB SAP as identified by the City of Oakland[1] include the following:

- Increase use of non-automobile modes of transportation, including walking, bicycling, bus, BART, carpooling, ridesharing and other options; and reduce auto use.
- Increase the housing supply, especially affordable housing for low-income residents. Specifically increase the amount of housing around the BART station.
- Increase jobs and improve access to jobs along the transit corridor.
- Provide services and retail options in the station area.
- Identify additional recreation and open space opportunities.
- Provide an impetus for real development projects and specific public improvements. The plan should generate interest, enthusiasm and consensus about new development in the area and establish priorities for public improvement projects.

In addition to addressing the needs of BART (related to current and future ridership) and the Peralta Community College District (related to education and maximizing the use of Laney College), the City of Oakland has expressed their commitment to address the needs of the community.[2] Many diverse residents, businesses and students make up the community of this area. Oakland's Chinatown makes up the majority of the population in the project's defined Planning Area (see Figure 1), and it functions as a regional center for the Asian community. The Planning Area also includes a portion of Lake Merritt, a regional park attracting users from around the city and beyond.

This project will have major implications for the Chinatown community and businesses, Lake Merritt BART Station users, students at Peralta's Laney College, residents and workers of downtown Oakland, properties and communities along the southern border of Lake Merritt, and green space in the area. In order to identify positive and negative environmental impacts of this project, and plan mitigations for negative impacts, an Environmental Impact Report (EIR) will be conducted near the end of the planning process. However, EIRs have traditionally fallen short of adequately considering the range of *health* impacts associated with planning processes.

The LMB SAP offers the opportunity to bring many health benefits to the local community. However, as with all land use projects of this magnitude, it may also introduce or exacerbate health hazards and risks. **The goal of this Health Impact Assessment (HIA) is to identify potential health benefits and risks associated with the LMB SAP, and to offer recommendations for optimizing health impacts for all people affected by the plan.**

The LMB SAP HIA process (an additional component to the SAP planning process) is being undertaken through funding provided by the Federal Transit Administration (FTA) Public Transportation Participation Pilot Program to increase opportunities for under represented populations to participate in transportation planning processes. The HIA portion of the grant-funded project was conducted between

January 2010 and December 2011, and was led by Human Impact Partners (HIP) with collaboration of the following groups funded through the project:

- Public Health Law & Policy (PHLP);
- Asian Pacific Environmental Network (APEN); and
- TransForm.

The following additional stakeholders with extensive background and experience in the Oakland Chinatown community participated in the entirety of the HIA process. Their participation was not funded through the FTA grant:

- Asian Health Services (AHS) and
- East Bay Asian Local Development Corporation (EBALDC).

Representatives of these six organizations formed the Steering Committee for this HIA.

This report is divided into the following ten sections:

1. *Executive Summary* – summarizes key points of the HIA report
2. *Introduction* – introduces context of the HIA
3. *Background and Screening* – provides background on the HIA and description of the screening process for this HIA
4. *HIA Scope* – describes steering committee scoping process, including identification of populations affected by the decision, geographic area of focus, potential health effects of the LMB SAP, five health determinant categories, prioritized research questions, and assessment methods and data sources used in the HIA.
5. *Assessment Findings and Recommendations* – Presents research connecting each health determinant to health outcomes, existing conditions for each health determinant, forecasted impacts of the LMB SAP on health, and recommendations for the LMB SAP based on findings of the impact assessment and evidence-based best practices.
6. *Reporting* – Summarizes reporting products and activities.
7. *Monitoring* – Presents effects of the HIA on the decision to date and outlines a plan for tracking future effects of the decision on health outcomes.
8. *Conclusions* – Summarizes overall conclusion of the HIA.
9. *References* – Lists references cited throughout this report.
10. *Appendices* – Includes the HIA pathway diagrams and scope.

3. Background and Screening

HIA is a combination of procedures, methods and tools by which a policy or project may be judged for its potential health effects on a population, and the distribution of those effects within the population.[3] HIA can be used to improve the quality of public policy decision making through evidence-based recommendations to enhance predicted positive health impacts and minimize negative ones.

While there is no "typical" health impact assessment, best practice standards outline six steps in conducting an HIA:

- **Screening**: determines the need for and value of an HIA
- **Scoping**: identifies the potential health impacts to evaluate
- **Analysis**: Uses qualitative and quantitative data, expertise and experience to judge the magnitude and direction of potential health impacts
- **Recommendations**: Presents evidence-based (when possible) mitigation strategies for addressing any identified negative health impacts

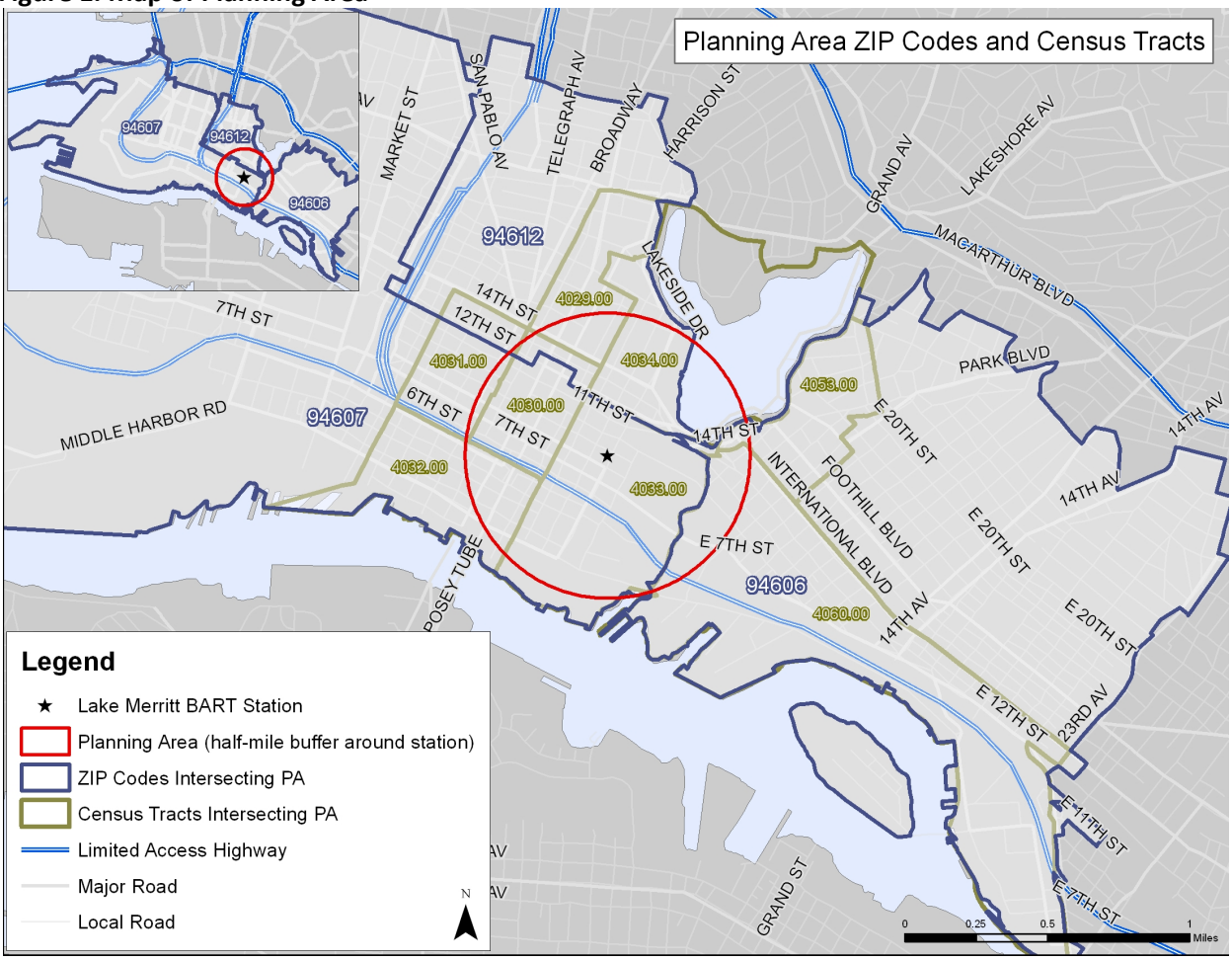
- **Reporting**: delivers results to stakeholders through reports and presentations
- **Monitoring**: tracks the effects of the HIA on the decision and critically reviews the HIA process

The screening process was conducted between January and April 2010, when PHLP brought together groups for the FTA grant application. Screening was conducted informally through a series of phone calls between PHLP and other organizations in the collaborative (later termed the Steering Committee).

Health concerns in the vicinity of LMB were identified during HIA screening. Prior to this HIA opportunity, community stakeholders had expressed their concerns about existing conditions in Chinatown as well as potential risks associated with the LMB SAP. Crime and air pollution have been main concerns of the community, and some other community needs have been identified, such as improved sidewalks (such as benches, streetlights, and trees), neighborhood parks and spaces for tai chi and other athletic activities, and affordable and senior housing. It was determined that the LMB SAP could potentially impact all of these concerns and needs.

Ultimately, the LMB SAP was chosen as a project on which to conduct an HIA because of its potential to impact the health of a great number of people, past and ongoing community engagement in local advocacy and planning processes, and ample time within the decision-making timeline for conducting the analysis and communicating results. In addition, the City of Oakland had already formed an official community engagement process, so it was anticipated that they would be open to results of an HIA driven by organizations formally engaged in their own process. The Steering Committee anticipated that an HIA on the LMB SAP would offer valuable findings and recommendations for improving community health that would not otherwise be included or considered in the planning process.

Figure 1. Map of Planning Area



After the majority of HIA screening was complete, HIP notified City of Oakland planning staff about this HIA in September 2010. HIP invited city planning staff to give input on the HIA scope, and sought a collaborative approach to contributing HIA findings and recommendations to the planning process. Through a subsequent series of conversations with planning staff, the HIA steering committee agreed to offer HIA input within the planning process at times when city decision-makers were open to receiving input. Specifically, the HIA team and city decision-makers agreed on the following HIA deliverables and timelines:

- Limited health impact analysis of Land Use and Transportation Concepts released by the City of Oakland in June and July, 2011;
- Health impact assessment of the Draft Emerging Plan (DEP) in November 2011 in a letter format; and
- Review of health research evidence pertaining to additional topics (as necessary) following the Draft Emerging Plan HIA letter.

Reporting materials are discussed and referenced in Section 6 of this report.

4. HIA Scope

All members of the Steering Committee conducted the HIA scoping process collaboratively. Commitment to a collaborative process, a limited budget, and a large range of differing priorities among Steering Committee members made for a lengthy scoping process (April 2010 through December 2010), but the time spent led to a strong and thorough scope.

Guiding Principles
In 2009 in advance of the LMB SAP planning effort, the City of Oakland, Asian Health Services and the Oakland Chinatown Chamber of Commerce held a series of community outreach meetings and surveys. As a result of that community visioning process, nine *Guiding Principles*[4] were generated to guide development in the Planning Area. The HIA scoping process began with a discussion of the following nine Guiding Principles:

- Public Safety
- Jobs
- Housing
- Community Facilities and Open Space
- Business
- Transportation
- Cultural Preservation
- Community Engagement
- Health

All of these principles are tied to health and wellness, but the HIA Steering Committee did not have time and resources to analyze all of them. Thus, a prioritization process was conducted that included a discussion of potential HIA indicators with which to analyze the LMB SAP's impact on each principle, the capacity of the LMB SAP to impact each principle, and the level of priority placed on each guiding principle by the community.

Populations
The LMB SAP will primarily impact Planning Area residents and employees, BART riders, Laney College students, and regional parks users. Street design aspects of the SAP will also affect pedestrians, bicyclists, and drivers who travel through the Planning Area. Vulnerable populations include the many low-income residents living in subsidized and de-facto market-rate affordable housing in the Planning Area; residents living in close proximity to I-880 and its associated vehicle emissions; a large senior population in Chinatown; those whose income depends on the success of many small businesses in Chinatown; and non-English speakers who especially depend on living and working with others who share their native language.

Area of focus
In order to effectively align with the LMB SAP planning process and to create the highest likelihood of impact, the geographic area of focus for the HIA is the Planning Area identified by the city, which is the area within a half-mile radius of the Lake Merritt BART Station.

Hypotheses and research questions
The Steering Committee selected five health determinants for the focus of the HIA, all of which are of high priority to the community:

- Transportation
- Housing
- Economic Development
- Parks
- Public Safety

Pathway diagrams are diagrams connecting a policy, project or plan proposal to health determinants and then health outcomes. A series of pathway diagrams illustrating the LMB SAP's hypothesized impacts on health outcomes through each health determinant were created during the HIA Scoping step. Pathway diagrams are included in Appendix A. Research questions for exploring hypotheses were created, and for each research question, indicators were developed to measure the effect of the LMB SAP on the health determinant. The HIA scope, including research questions and indicators, is attached as Appendix B.

Assessment methods and data sources
Assessment methods and data sources identified by the Steering Committee, with HIP's leadership, are included in the scope (see Appendix B).

Some of the major data sources that are included and referred to repeatedly throughout this report are the following:

- *Lake Merritt Station Area Plan Existing Conditions and Key Issues Report (SAP Existing Conditions Report)* – includes a wealth of information and data on existing conditions in the Planning Area.
- *Asian Health Services Community Environmental Audit Survey* – "Patient leaders" assembled by Asian Health Services, a member organization of the Steering Committee, conducted an observational survey of three areas within the Planning Area: 10th to 14th Street, the Lake Merritt BART Station vicinity, and the area east of Lake Merritt. Observational results are referenced in this report.
- *Neighborhood Teas and Focus Groups* – as part of their community engagement process, the City of Oakland conducted four "teas" or focus groups:
    - The *Merchants Tea* included 34 local merchants and interested community members;
    - The *Property Owners and Brokers Tea* included ten community members, including realtors or property owners with interests in the Planning Area, councilmember aides, redevelopment agency staff, and Chamber of Commerce representatives;
    - The *Students Tea* included 12 Laney College students and interested community members; and
    - The *Families Tea* included 11 interested community members with children or grandchildren that use the area or that are involved with Lincoln Elementary School.

  Summaries of all tea conversations are included in the Lake Merritt Station Area Plan Summary of Community Feedback.[5]

In order to acquire Planning Area data from certain sources that organize data by zip code, we used zip codes 94606, 94607, and 94612. The Planning Area is mainly made up of these three zip codes so our sense is that data from these zip codes provides an adequate representation of Planning Area characteristics. However, data from certain zip codes that make up small portions of the Planning Area (e.g., 94610) are excluded. In addition, zip code 94607, which is included in this analysis because it includes a large portion of the Planning Area, also contains nearly the entirety of West Oakland, a separate and different community. These are limitations of using data organized by zip code.

Similarly, for census data collection, the smallest available Census units (blocks or tracts) were intersected with the Planning Area (a half-mile buffer around the Lake Merritt BART Station) and blocks or tracts were excluded when a majority of their area fell outside the buffer. For some characteristics (race/ethnicity) we were able to use the 2010 decennial Census and block geographies, but for the majority, we used larger geographies (tracts) and the American Community Survey's (ACS) 2005 to 2009 5-year averages (there are three tracts where the majority of the tract falls within the buffer). In some cases, where data was only available at this scale, the characteristics of Oakland residents were referenced.

Prioritization process
At the end of the scoping process it was determined that the scope was too long given the budget allocated for this HIA. HIP then led a prioritization process whereby each indicator in the original scope (shown in Appendix B) was evaluated based on available data sources, available methods, and difficulty and time associated with analysis. Furthermore, limited resources available for this HIA required prioritizing the scope. While the *existing conditions analysis* (Section 5) covered a broad range of topics prioritized by the HIA Steering Committee during HIA scoping, final reporting products included an even narrower *impact analysis* (Section 5) scope that coincided with issues deemed most closely related to health, were most controversial, or for which additional health impact information was anticipated to be most utilized for decision-making.

Final Scope
The prioritization process resulted in a slightly reduced final scope that addressed the original research questions but included fewer indicators. Discussion and measurements of the final indicators are presented in Section 5 of this report. In this report, indicators are discussed within narrative text. Before finalizing the scope, a final draft including narrowed down indicators was presented to the Steering Committee and the City of Oakland planning committee for review and approval.

5. Assessment Findings and Recommendations

This section describes our HIA Assessment, which was conducted between January and November 2011. A profile of demographics and general health conditions are presented in Sections 5.1 and 5.2, respectively. For each of the health determinants introduced in Section 4 (transportation, housing, economic development, parks and open space, and public safety), Sections 5.3 through 5.7 summarize research connecting the health determinant to health, existing conditions in the Planning Area, impacts of the Station Area Plan on the health determinant, and proposed recommendations. Recommendations are emphasized by the use of *italics* in Sections 5.3.3, 5.4.3, 5.5.3, 5.6.3, and 5.7.3.

5.1 Demographics of Planning Area

The following information describes demographic characteristics of the population living in the Planning Area according to aggregated Census data that approximates a half-mile radius around the station. The smallest available Census units (blocks or tracts) were intersected with a half-mile buffer around the Lake Merritt BART Station and blocks or tracts were excluded when a majority of their area fell outside the buffer. For some characteristics (race/ethnicity) we were able to use the 2010 decennial Census and block geographies, but for the majority, we used larger geographies (tracts) and the American Community Survey's (ACS) 2005 to 2009 5-year averages (there are three tracts where the majority of the tract falls within the buffer). In some cases, where data was only available at this scale, the characteristics of Oakland residents were referenced.

According to the 2010 decennial Census (block-level data), the majority of Planning Area residents are Asian (over 50%); followed by white (23%), black or African American (15%), and Hispanic or Latino (7%) residents (respectively).

The majority of residents in the Planning Area speak English at home (53%) and a large proportion of residents (39%) speak Asian and Pacific Island languages. Many more residents speak Asian and Pacific Island languages in the Planning Area compared to Oakland, where only 13% do.

The three age groups with the greatest representation in the Planning Area are the 25-44, 60+, and 45 to 60 (respectively). Compared to Oakland, the Planning Area has more residents in the 60+ age range and fewer residents in the under 5, 5-14, and 15-24 ranges.

Sixty-two percent of residents have attended some college or have a college degree or higher, while 38% have a high school diploma or less. Compared to the Planning Area, slightly fewer Oakland residents have attended some college or have a college degree or higher (60%) and slightly more Oakland residents have a high school diploma or less (40%).

According to the Census, the average unemployment rate over the five year period between 2005 and 2009 in the Planning Area is 6%, which is lower than in Oakland overall (9%). However, compared to Oakland, the Planning Area has fewer people in the labor force (includes people who are unemployed, or looking for work).

There is evidence that the Census of the population underreports unemployment rates. Additionally, the figures in Table 1 represent the average of five years of the American Community Survey (2005-2009), a time period in which unemployment rates have changed dramatically. Therefore, to get a more accurate picture, the California Employment Development Department's Labor Market Info was accessed.[6] In April 2011, 30,900 of Oakland's workforce of 198,200 people were unemployed. Therefore, Oakland's unemployment rate was 16%. This is higher than the State of California's rate (12%) and higher than that of Alameda County (10%). This suggests that the unemployment rate of the Planning Area is much higher than 6% - the rate cited above – though potentially not higher than Oakland (if proportionality is assumed).

The median household income is lower in the Planning Area, but slightly fewer people are living below the poverty line compared to Oakland.

Information on how workers who live in the Planning Area get to work reveals fewer workers drive a car (alone or carpool), more workers take public transportation, more than twice the number of Planning Area residents take the subway as compared to Oakland residents, and more than four times the number walked to work compared to Oakland residents. In addition, more people in the Planning Area have a short commute (under 15 minutes) compared to Oakland.

Table 1. Planning Area Demographics

	Planning Area		*Oakland*	
	Total	*% of Total*	*Total*	*% of Total*
Total population	**13,423**		**390,724**	
Race/Ethnicity				
White alone	3,125	23%	101,308	26%
Black or African American alone	1,991	15%	106,637	27%
Asian alone	6,823	51%	65,127	17%
Hispanic or Latino origin	959	7%	99,068	25%
Language Spoken at Home				
English only	3,213	53%	223,779	61%
Spanish	188	3%	80,238	22%
Other Indo-European languages	308	5%	9,875	3%
Asian and Pacific Island languages	2,372	39%	48,061	13%
Other languages	26	0%	6,128	2%
Age Composition				
Under 5	333	3%	30,712	8%
5 to14	502	4%	46,451	12%
15 to 24	891	8%	46,634	12%
25 to 44	4,520	40%	137,203	34%
45 to 60	2,052	18%	77,863	20%
60+	3,024	27%	59,930	15%
Median age	**40.3**		**35.4**	
Educational Attainment (for population over 25)	**9596**		**274,996**	
Less than 9th Grade	1,469	15%	33,334	12%
Some High School, no diploma	817	9%	24,857	9%
High School Graduate (or GED)	1,338	14%	52,438	19%
Some College, no degree	1,683	18%	47,220	17%
College Degree (Associate's or Bachelor's degree)	3,010	31%	74,991	27%
Post-graduate degree	1,279	13%	42,156	15%
Unemployment				
Total in the labor force	6,348	61%	210,231	66%
Total NOT in the labor force	4,039	39%	107,147	34%
Total civilian unemployed population	398	6%	19,726	9%
Median household income	**$46,463**		**$49,695**	
Percentage of people whose income in the last 12 months is below the poverty level		**16%**		**18%**
Means of transportation to work (workers 16 and over)	**5,801**		**184,844**	
Car, truck, or van -- drove alone or car pooled	2,746	47%	126,358	68%
Public transportation (excluding taxicab)	1,525	26%	31,445	17%

	Planning Area		*Oakland*	
	Total	***% of Total***	***Total***	***% of Total***
Bus or trolley	540	9%	15,636	9%
Subway	985	17%	15,041	8%
Walked	1,067	18%	8,030	4%
Rode bike	89	2%	3851	2%
Commute times				
10 min. and under commute	360	7%	10,994	6%
10-15 min. commute	1,076	20%	21,795	13%

Source: US Census, American Community Survey (2005-2009)

5.2 General Health Conditions

General health conditions in the Planning Area are reported below. In cases when data specific to the Planning Area is unavailable, data for the City of Oakland (Oakland) or Alameda County are reported instead. Population health counts are three-year totals (2006-2008) and the rates are a three-year average (2006-2008) as defined by Alameda County Public Health Department (ACPHD).[7]

Physical activity

In Alameda County 38.54% of adults engage in moderate or higher levels of physical activity (moderate is defined as at least 5 days a week and for 30 minutes), and White people were 1.5 times more likely to be physically active than African Americans, 1.3 times as likely than Asians, and 1.2 times as likely as Latino populations. The overall rate of moderate physical activity is higher than state and national averages at 36.3% and 31.9%, respectively.[8]

Low Birth Weights

In the City of Oakland 7.6% of births are considered low birth weight babies (weighing less than 2,500 grams). This rate is higher than the average rates for Alameda County as a whole at 7.2% and California at 5.7%, but is lower than the national average of 8.2%. African Americans in Alameda County have the highest rates at 11.9%, followed by Asians at 7.4%.[9]

Obesity

Overweight is defined as an adult with a body mass index (BMI) of 25-29.9. Obese is defined as an adult who has a BMI of 30 or higher. For children, the BMI depends on the height/weight relationship.[10] Alameda County and the State of California both report that 22.7% of the adult population is obese. This is less than the national average of 33.8%. In Alameda County, African Americans have the highest rates of obesity at 42.4%, and Asian Pacific Islanders have such a small rate that it doesn't register.[11] Among school-aged children in Oakland, 36.4% are overweight compared to 29.1% in Alameda County.

Diabetes

ACPHD reports that 4% of the population in the Planning Area zip codes received inpatient or emergency department care for diabetes, compared to 3% for Oakland and Alameda County residents as a whole. The overall prevalence rate of diabetes in Alameda County is 7.8%, which is the same for California and lower than the national rate of 10.7%. In Alameda County, African Americans have the highest prevalence rate of diabetes at 11.8%, followed by Asian Pacific Islanders at 7.9%.[12]

Coronary Heart Disease (CHD)

ACPHD reports that 3% of the population in the Planning Area zip codes received inpatient or emergency department care for CHD, compared to 2% for Oakland and 3% Alameda County residents as a whole. Age adjusted[a] CHD hospitalization rates for Alameda County are 924.6 per 100,000 populations. African Americans have the highest rate at 1,098.6 followed by Whites at 958.2 per 100,000 population.[13]

Asthma

Hospitalization rates

ACPHD reports that 3% of the population in the Planning Area zip codes received inpatient or emergency department care for asthma during the three-year period of 2006-2008, compared to 2% for Oakland and Alameda County residents as a whole. Asthma rates in Oakland are consistently higher than other cities within Alameda County (other than Hayward) as well as state rates, and African Americans consistently have higher prevalence, emergency department and hospitalization rates.

Emergency department visits for asthma among Oakland residents are 726.3 per 100,000 people. This rate is higher than any other city in Alameda County and 1.4 times higher than Alameda County as a whole, which has a rate of 505.2 per 100,000. Oakland's rate is 1.98 times higher than the state rate of 366.4 per 100,000. African Americans have the highest rate at 1,452.2, which is ten times higher than Asians, who have the lowest rate of 141.0.[14]

Emergency department visits for children under 5 years in Oakland are 2,198.5 per 100,000 people, which is 1.53 times higher than Alameda County's rate of 1,427.1 and 2.48 times higher than the state rate of 883.4. African American children in Alameda County have the highest rate at 4,566.8, which seven times as high as Asians, who have the lowest rate of 458.4.[15]

Prevalence rates

Alameda County has a 16.6% prevalence rate of asthma, compared to 13.6% at the state level. African Americans have a rate of 22.3%, which is 1.7 times higher than Asian/Pacific Islanders at 13.2%. In terms of age, the highest asthma prevalence rate of 24.5% is found among school age children 5-17 years.

Missed school days due to asthma

Children Now's *California Report Card 2011* reports that 11% of California's children who have been diagnosed with asthma (134,000 children) miss five or more days of school per year due to their asthma condition.[16] In Alameda County, of children 0-17 who currently attend school and have been told they have asthma, 8.5% missed 1 or 2 days of school in the past 12 months, 3.7% missed 3-4 days, and 5.7% missed 5-10 days of school all due to asthma.[b] Comparatively, in the entire state, 8.2% of children have missed 1 or 2 days of school, 5.1% have missed 3-4 days, 6.3% have missed 5 to 10 days, and 3.5% have missed 11 days or more all due to asthma.[17] Note: The California Health Interview Survey states that "School days missed due to asthma in past 12 months has these restrictions: Asked of respondents age 0 to 17 years who currently attend school/day care and who have been told have asthma."

Missed workdays due to asthma

Of all Alameda County adults diagnosed with asthma, 10.5% missed 1 to 10 days of work in the past 12 months, and less than 1% missed more than 11 days of work all due to asthma.[c] Comparatively, within

[a] An age adjusted rate is a statistical analysis equally weighting rates in different ages groups for comparison and overall totals

[b] Note: County data not statistically significant.

[c] Note: County data not statistically significant.

the entire state, 11.3% of workers missed 1 to 10 days of work and very few have missed more than 10 days of work all due to asthma.[18 d]

Respiratory and heart disease

Respiratory and heart disease are two main impacts of exposure to air pollution that can cause death. Chronic lower respiratory disease ranks among the top five leading causes of death in Oakland, causing 3.9% of all deaths in the city. Chronic lower respiratory diseases causes 4.6% of deaths in Alameda County and is also among the top five causes of death countywide.[19]

Heart disease is the leading cause of death for Oakland residents, causing 23.8% of all deaths, as well as for Alameda County residents, causing 24.5% of all deaths in the county.[20] Hospitalization rates for coronary heart disease in Oakland are lower than the county average, where the Oakland rate is 815.3 per 100,000 people and Alameda County rate is 924.6. Countywide African Americans have the highest rate of hospitalization from coronary heart disease at 1,098.6 per 100,000.[21]

Lead poisoning rates

Lead is a mineral used in many manufactured products. Lead is harmful to human health and the California Department of Public Health reports that there is no safe level of lead in the blood and that even small amounts may cause learning and behavioral problems, whereas higher levels can damage the nervous system, major organs, and may lead to seizures and death.[22] Children under the age of 6 are the most vulnerable to lead poisoning because their nervous systems and brains are still under formation. While lead poising in California is not as common as in other parts of the nation, lead poisoning does persist. The percent of child (0-5 years) lead poising in Alameda County is comparable to California as a whole, and it is important to note that over 95% of children have some amount of lead in their blood. See Table 2.

Table 2. 2009 Blood-Lead Level in micrograms per deciliter (ug/dL) for children ages 0-5 years.

Blood-lead level (ug/dL)	Geography	%	Number	Total # screened
9.5 + ug/dL	California	0.4%	2,426	642,526
	Alameda County	0.5%	97	17,892
4.5 to <9.5 ug/dL	California	3.6	22,876	642,526
	Alameda County	2.9%	524	17,892
0 to <4.5 ug/dL	California	96.1%	617,224	642,526
	Alameda County	96.5%	17,271	17,892

Sources:
California Department of Public Health Lead Poising Data Query.[23]
Response and Surveillance System for Childhood Lead Exposures (RASSCLE II) from the State of California, Department of Public Health, Childhood Lead Poisoning Prevention Branch. Data extracted on April 3, 2010.

d Note: The California Health Interview Survey states that: "Work days missed due to asthma in past 12 months has these restrictions: Asked of adults under 70 years of age who have been diagnosed with asthma and who either still have asthma or have had an asthma episode within the past 12 months. Does not include respondents for whom a proxy provided responses."

Mental health outcomes

ACPHD reports that 6% of the population in the Planning Area zip codes received inpatient or emergency room care for mental disorders, compared to 3% for Oakland and Alameda County residents as a whole.

Injury and fatality rates from crime and violence

Injuries and fatalities due to violence were collected from the California Department of Public Health EpiCenter and were captured from hospital discharge and death certificate data. Only county-level data were available, so these numbers are not specific to Oakland or the Planning Area.

Non-Fatal Injuries

There were a total of 9,233 non-fatal injuries (hospitalized) in Alameda County in 2009. Of these, 560 were caused by such harms as abuse and neglect, blunt object, cut/pierce, unarmed fight, and firearms.[24] There were a total of 88,265 non-fatal emergency department visits (treat and release or transferred to another facility) from injury in Alameda County in 2009. Of these, 6,311 were caused by harms including abuse and neglect, blunt object, cut/pierce, unarmed fight, and firearms. [e] [25]

Fatal Injuries

There were a total of 629 fatal injuries (hospitalized) in Alameda County in 2009. Of these, 127 were caused by assault/homicide (including abuse and neglect, blunt object, cut/pierce, unarmed fight, firearm, and other).[26]

5.3 Transportation

Our transportation system is a multi-modal web connecting people and families to housing, goods and services, educational and work opportunities, and social interactions. While transportation is an integral part of daily life for all, many historical transportation policies and patterns have benefited the wealthy while marginalizing or harming many low-income communities and communities of color (e.g., constructing freeways in low-income and minority neighborhoods). Recent transportation choices in the U.S. are beginning to address how to integrate sustainable and equitable transportation into our society for healthier communities. A healthier and more sustainable transportation system makes alternatives to driving more convenient, increases access for everyone, and encourages more active forms of transport.

5.3.1. Research Connecting Transportation to Health

Walking and Biking

Walking for transportation, physical activity, and leisure is a form of physical activity, which can prevent obesity, diabetes, and heart disease, improve mental health and physiological wellbeing, and promote longevity.[27] Transportation and land use patterns can allow, incentivize, or prevent healthy behavior such as walking.[28] A "walkable" or "complete" or "livable" neighborhood, characterized by mixed residential and commercial uses with easy access to a variety of food and retail options, parks and open space, and modes of transport, can lead to more exercise and less obesity by significantly reducing the need to drive.[29] Access to transit is integral in the walkability of a neighborhood and according to an analysis of US travel survey data, 16% of all recorded walking trips are part of transit trips, and these tend to be longer than average walking trips (Weinstein 2001[30]). In pedestrian–oriented neighborhoods people walk an average of 70 minutes longer per week.[31]

[e] Note: it is possible that if an injured person was transferred to another hospital, they might be represented more than once in this data from multiple hospital discharge reports.

Similarly, biking is a practical mode of transportation, physical activity, and leisure and shares many of the same co-benefits to health as walking. At year 20 of a U.S. study, active commuting (walking or biking to work) was positively associated with fitness in men and women and negatively associated with BMI, obesity, and blood pressure in men.[32] Cycling reduces the risk of serious conditions such as heart disease, high blood pressure, obesity and the most common form of diabetes.[33] Even new cyclists covering short distances can reduce their risk of death (mainly due to the reduction of heart disease) by as much as 22%.[34]

Social Cohesion through Walking and Biking

Transportation can also support or hinder social networks and community cohesion by affecting access and interactions among members within a community. For example, investments in pedestrian facilities or traffic calming not only encourage more short walking and bicycling trips within a community but also provide settings for social interaction. Support, perceived or provided, from neighbors, friends, and family can buffer stressful situations, prevent damaging feelings of isolation, and contribute to a sense of self-esteem and value. Socially isolated people die at two or three times the rate of people with a network of social relationships and sources of emotional and instrumental support.[35] In a study conducted in Alameda County, those with fewer social contacts had twice the risk of early death, even accounting for other factors including income, race, smoking, obesity, and exercise.[36]

Driving

There are many negative health impacts of driving. A study in Atlanta, Georgia looked at people living in walkable vs. car-dependent neighborhoods, and found that those living in car-dependent neighborhoods drove an average of 43 miles per day (vs. 26 in walkable neighborhoods), and walked much less (only 3% walked vs. 34% in the walkable areas).[37] This extra time in the car is hazardous to health:

Obesity

- A study in the US showed that each additional hour spent in a car per day was associated with a 6% increase in the likelihood of obesity. Each additional hour walked per day was associated with a 4.8% reduction in the likelihood of obesity.[38]
- In a California study assessing vehicle miles traveled (VMT) and obesity, counties with the highest average amount of VMT were significantly associated with the highest average rank of obesity.[39]
- Urban areas where people use cars less show higher rates of walking and lower rates of obesity and hypertension.[40]

Air Pollution

Personal motor vehicles are well recognized as significant contributors to a number of air pollutants that negatively impact public health. Motor vehicles produce fine particulate matter, nitrogen oxides, carbon monoxide, and volatile organic compounds, contribute to tropospheric ozone, and emit air toxics such as those contained in gasoline and diesel exhaust. Vehicles also affect health through impacts on environmental noise and climate change. Vehicle emissions of greenhouse gases are contributing to global climate change and this in turn threatens catastrophic regional and world-wide effects on health through the environmental changes it creates, including more frequent extreme weather events, flooding, species loss, changes in food production, increases in waterborne and food-borne illnesses, and increases in the vectors of infectious diseases. The following section describes health impacts associated with vehicle air emissions.

Air Pollution

Despite promulgation of National Ambient Air Quality Standards (NAAQS) for criteria pollutants, implementation of air quality control plans, and nationwide monitoring, air pollutants continue to have significant impacts on human health.

As discussed previously, transit-oriented communities are associated with reduced reliance on personal motor vehicle use, the potential to decrease regional air quality-related health burdens, and accessibility to health-promoting goods and services. However, in some cases, sites suitable for transit-oriented development are located adjacent to busy roadways, creating the potential for residents to be exposed to high levels of traffic-related pollution.

Types of Air Pollutants and Associated Health Impacts

There are many types of air pollution. Six criteria air pollutants, including ozone (O3), carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO2), sulfur dioxide (SO2), and lead, are currently regulated by the United States Environmental Protection Agency (EPA). Table 3 shows some of the known health effects associated with these air pollutants. Heath-based standards for ambient air have been developed by the EPA for each of these pollutants as mandated by the Clean Air Act. The Clean Air Act also requires states to develop specific plans to achieve these standards. One way that these pollutants are regulated is through a national network of air quality monitors that provides information on ambient concentrations for each of the criteria air pollutants.

Particulate Matter

Particulate matter is unique among criteria air pollutants as it represents a heterogeneous group of physical entities.[41] Based on toxicological and epidemiological research, smaller particles and those associated with traffic appear more closely related to health effects.[42] Adverse health outcomes associated with particulate matter persist (see Table 3). While some of these effects are due to non-attainment of air quality standards, there is a potential that even low-level exposures – exposures at levels below existing standards – may still result in adverse health impacts.[43] Air quality epidemiology has not established clear "no effects" thresholds for particulate matter. Example health impacts include:

- Diesel exhaust, including PM, is a potent carcinogen;[44]
- Low birth weight: Ambient air pollution (when looking at PM2.5, PM10, coarse PM, CO, NO2 and O3) in California was found to result in lower infant birth weight of full-term infants. Lower birth rates can result in a host of other infant health concerns including infant mortality;[45]
- One study showed that PM was responsible for 9,300 deaths, 16,000 hospital visits, and 600,000 asthma attacks in California alone. [46]
- Recent epidemiologic studies in California have found that fine particulate matter may cause health effects at levels below national standards;[47]
- According to a cost-benefit analysis recently done by the EPA, reducing the NAAQS for fine particulate matter by 1 microgram (µg) per cubic meter from 15 to 14 would result in 1,900 fewer premature deaths, 3,700 fewer non-fatal heart attacks, and 2,000 fewer emergency room visits for asthma each year;[48]
- The 2002 State of California Air Resources Board Air Quality Standards Staff Report for Particulate Matter estimated that significant health benefits would accrue from reducing ambient PM 2.5 from current levels to natural background concentrations for every county in California (CARB 2002[49]).

Carbon Dioxide (CO_2)

The EPA has identified carbon dioxide (CO_2) as being harmful to human health.[50] CO_2 is a greenhouse gas

found naturally in our environment and is essential to the health and well being of the planet. However, in excess CO_2 is harmful and contributes to global climate change. Global climate change is a serious threat to the health and wellbeing of our planet and all its existing life forms, including humans. Greenhouse gases, contributing to climate change, may increase heat-related illness and death, health effects related to extreme weather events, health effects related to air pollution, water-borne and food-borne diseases, and vector-borne and rodent-borne disease.[51, 52, 53]

The burning of fossil fuel is a major contributor to CO_2 and in 2004 CO_2 from fossil fuel comprised 81 percent of total greenhouse gases.[54] Transportation related CO_2 emissions account for 38 percent of net CO_2 in California, and 36 percent is directly from on road vehicles.[55] There is great potential to reduce the total greenhouse gas emissions in California by reducing on road vehicle CO_2 emissions.

Air Toxics

Other pollutants not regulated as "criteria air pollutants" are also sources of health concerns. The California Air Resources Board (CARB) has identified 10 air toxics of concern, five of which are emitted by on-road mobile sources: benzene, 1,3-butadiene, formaldehyde, acetaldehyde, and diesel PM.[56] Mobile source air toxics are known or suspected to cause cancer or other serious health or environmental effects. Benzene is of particular concern because it is a known carcinogen and most of the nation's benzene emissions come from mobile sources. Diesel exhaust particulate matter (DPM) is a toxic air contaminant and known lung carcinogen that is created by combustion of diesel fuel in heavy-duty trucks and heavy equipment.

Table 3. Air Pollutants and Pollutant Mixtures with Important Motor Vehicle Sources

	Air Pollutant	Source	Health Effects
Criteria Pollutants	**Ozone**	Tropospheric ozone is formed in the atmosphere from chemical transformation of certain air pollutants in the presence of sunlight. Ozone precursors include vehicles, other combustion processes and the evaporation of solvents, paints, and fuels	Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.
	Carbon Monoxide (CO)	Produced due to the incomplete combustion of fuels, particularly by motor vehicles	Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood resulting in fatigue, impaired central nervous system function, and induced angina.
	Particulate Matter (PM_{10} and $PM_{2.5}$)	Diverse sources including motor vehicles (tailpipe emissions as well as brake pad and tire wear, woodburning fireplaces and stoves, industrial facilities, and ground-disturbing activities	Impaired lung function, exacerbation of acute and chronic respiratory ailments, including bronchitis and asthma, excess emergency room visits and hospital admissions, pre-mature arteriosclerosis, and premature death.
	Nitrogen Dioxide (NO_2)	Combustion processes in vehicles and industrial operations	Increase the risk of acute and chronic respiratory disease and reduce visibility
	Sulfur Dioxide (SO_2)	Combustion of sulfur-containing fuels such as oil, coal, and diesel	Increased risk of acute and chronic respiratory

	Air Pollutant	Source	Health Effects
Non-criteria Pollutants	**Diesel exhaust**	Diesel engines	Probable human carcinogen (IARC Group 2A) Diesel engines also emit particulate matter criteria pollutants produced through combustion.
	Benzene	Gasoline engines	Known human carcinogen (IARC Group 1A)
	1,3 butadiene	Motor vehicle engines	Probable human carcinogen (IARC Group 2A)
	Benzo(a) pyrene	Motor vehicle engines	Probable human carcinogen (IARC Group 2A)

Exposure to air pollutants in vulnerable populations

Some populations may be more physically vulnerable to the impacts of air pollution exposures. The elderly and the young, as well as populations with higher rates of respiratory disease such as asthma and chronic obstructive pulmonary disease (COPD), and populations with other environmental or occupational health exposures (e.g., indoor air quality) that impact cardiovascular or respiratory diseases are more sensitive to adverse health effects.

Housing Near Freeways

New epidemiologic evidence may have a direct effect on community planning and development near sources of air pollution. For instance, epidemiologic studies have consistently demonstrated that children and adults living in proximity to freeways or busy roadways have poorer health outcomes. For example:

- A study of children in the Netherlands found that lung function declined with increasing truck traffic density especially for children living within 300 meters of motorways.[57]
- Children in Erie County, New York hospitalized for asthma were more likely to live within 200 meters of heavily trafficked roads.[58]
- Among children living within 150 meters (or 492 feet) of a main road in Nottingham, United Kingdom, the risk of wheeze increased with increasing proximity to the road.[59]
- In Oakland California, children with higher exposure to traffic related pollutants had more asthma and bronchitis symptoms.[60]
- In a low income population of children in San Diego, children with asthma living with 550 feet of high traffic flows were more likely than those residing near lower traffic flows to have more medical care visits for asthma.[61]
- In a study of Southern California School Children, living within 75 meters of a major road was associated with an increased risk of lifetime asthma, prevalent asthma, and wheeze.[62]
- Ozone is a respiratory irritant that exacerbates asthma and impairs lung development. Children living next to busy roadways have more respiratory disease symptoms and reduced lung function measures.[63] [64] [65]
- In a study conducted in 12 southern California communities, children who lived with 500 meters (1,640 feet) of a freeway had reduced growth in lung capacity compared to those living greater than 1,500 meters from the freeway (just over one mile).[66]

Based on this evidence, new policies related to land use development are emerging. For example, the California Air Resource Board (CARB) has provided guidance on appropriate development near sensitive populations. In their Air Quality and Land Use Handbook: A Community Health Perspective (2005[67]), CARB recommends not locating sensitive land uses, including residential developments, within specific distances to known sources of air pollution, such as not locating sensitive land uses within 500 feet of a

highway with more than 100,000 vehicles per day (CARB 2005). This presents some challenges for infill development, when many potential sites are near sources of existing air pollution. It also presents challenges to transit-oriented development because many existing transit hubs are located alongside of busy roadways.

CARB's guidance to not locate sensitive land uses within 500 feet of a highway with more than 100,000 vehicles per day is used in this analysis as a standard by which to analyze health impacts related to vehicle air emissions.

Air pollution and equity

The California Environmental Justice Advisory Committee asserts that these highways and freeways act as a stationary source of emissions for residents in nearby communities, exposing residents to disproportionate amounts of air pollutants such as PM 2.5 from vehicle emissions.[68] In California, African Americans, Asians and Latinos, as well as children of color, are more likely to live close to major highways and suffer more pollution and resultant public health problems such as increased cancer risk.[69, 70] Poorer residents may be more likely to live in poorer housing conditions with higher levels of indoor air pollutants, and may also live closer to industry or busy roadways. A study in the Southern Coast of California showed that income and non-white racial status was associated with significantly higher rates of PM 2.5 (specifically PM 2.5 from chromium and diesel) exposure.[71] These factors may result in variation in the estimates of air pollution-related health effects. For example, a recent study of mortality and air pollution in Los Angeles found that concentration response functions based on a within-city estimate were 2-3 times those based on regional studies.[72]

<u>Public Transit</u>

Access to (including proximity, affordability, reliability and quality of service) and use of public transit facilities are important for health and wellbeing. Many people depend upon public transit for travel to jobs, school, childcare, grocery stores, medical care, social and family activities, and for accessing other goods and resources necessary for health, and connecting with family and friends. Public transit is especially crucial for households without vehicles. For low-income residents who do not own automobiles, accessible, affordable, and convenient mass transit is particularly crucial for accessing daily activities. A study of fifteen low-income neighborhoods in the San Francisco Bay Area found that 66% of residents had no transit access to hospitals and 48% no walking access to a supermarket.[73] Residents do not utilize available medical services if they are difficult to reach and thus limited or no access to transit may affect low-income residents' health and quality of life in a critical manner. Even for households that have access to vehicles, public transit provides an alternative to driving. Choosing public transit over driving improves public health by reducing air pollution, greenhouse gases, vehicle collisions, and increasing physical activity.

Transit Use and Physical Activity

Use of public transportation instead of personal vehicles results in higher levels of physical activity. Americans who use public transit spend a median of 19 minutes daily walking to and from transit. Twenty-nine percent achieve more than or equal to 30 minutes of physical activity per day solely by walking to and from transit, enabling them to reach the Centers for Disease Control and Prevention (CDC) recommended amount of physical activity (30 minutes a day, five times a week).[74] Further, 16% of all recorded walking trips are part of transit trips, and these tend to be longer than average walking trips, according to an analysis of US travel survey data.[75] Thus, those taking public transit reap the health benefits of exercise and physical activity, i.e., reduced risk for cardiovascular disease and diabetes, increased strength for bone health, decreased risk of cancer, and decreased risk of depression.

Public Transit and Income Available for Other Health-Promoting Resources
Because money is a general resource for health - securing essential human needs like food, clothing, and shelter- transportation options can impact health through their effects on household budgets. A household with two adults that uses public transit saves an average of $6,251 per year compared to an equivalent household that owns two cars.[76] The savings associated with taking public transit can be used for other necessities including healthcare, food, housing and clothing, and thereby lead to improved health.

Transit Use and Air Quality
Passenger vehicles are the largest single source of greenhouse gas emissions in California, accounting for 30 percent of the total.[77] Air quality from pollutants has a direct impact on respiratory and cardiovascular disease. Motor vehicle air quality impacts results in 50-70 million days of restricted level of activity, 20,000-46,000 cases of respiratory illness, and 40,000 premature deaths.[78] Mode shift from individual autos to public transit can significantly reduce air pollutants because per capita air pollution from vehicle/bus emissions is reduced.

Transit and Social Connectivity
Taking public transportation aids in decreasing isolation and encourages what city planning advocate and critic Jane Jacobs referred to as casual contact from unplanned social interactions (Jacobs 1961[79]). Access to public transportation is an especially important contributor to social connectivity for young, old, and disabled populations. Specifically, adequate access to public transit enables elderly and disabled populations to participate in community and civic life such as attending a recreational or community facility. For the elderly and the disabled, limited access to public transit creates barriers to participation in community and civic life, potentially, leading to feelings of depression and alienation.[80]

<u>Traffic Safety</u>
In 2009 there were over 33,000 fatalities and 2.2 million injuries from crashes on US roadways, for all modes of transportation. Twelve percent of the fatalities and 2% of the injuries (ranging from non-severe to severe) were pedestrians. Three percent of the fatalities and 2% of the injuries were bicyclists. Children aged 10-15 have the highest population-based injury rate (33 per 100,000) and people over 74 years have the highest population-based fatality rate (at 2.19 per 100,000 – almost double the overall population rate of 1.33).[81] These rates do not take exposure risk into consideration.

Pedestrian and bicyclist safety is critical to achieving an increase in active transportation. A neighborhood with significant obstacles to walking such as high traffic volumes and speeds, narrow sidewalks, poorly connected streets, unsafe intersections, and a lack of lighting, is not likely to promote walking.[82] [83] [84] The risk of pedestrian injuries may discourage pedestrian activity and negatively impact physical activity levels. Pedestrians are even likely to limit their exposure if there is a perception of danger. For example, one study found that three factors – traffic volume, traffic speed and the separation between pedestrians and traffic – explained 85% of the variation in perceived safety and comfort for pedestrians.[85] Such impacts to safety are real as well as perceived: environmental variables associated with actual pedestrian collisions include pedestrian volume,[86] vehicle volume,[87] vehicle type,[88] vehicle speed,[89] intersection design, pedestrian facilities, lighting, and weather.[90]

Street design infrastructure proven to enhance cyclist safety includes clearly-marked, bike-specific bike lanes, paths, and routes[91] (separated by barriers from vehicle traffic when possible),[92] street lighting,

paved surfaces, low-angled grades[93] bicycle signage, shared lane markings and bicycle-specific signals.[94] In addition, these features enhance pedestrian safety by separating bicycles from sidewalks.

Vehicle Volume & Safety

Public health and transportation safety research consistently demonstrates that vehicle volumes are an independent environmental predictor of pedestrian injuries.[95] [96] [97] [98] [99] The magnitude of effect of vehicle volume on injuries is significant. For example, in a study of nine intersections in Boston's Chinatown, researchers calculated an increase in 3-5 injuries per year for each increase in 1,000 vehicles.[100]

Other studies illustrate that as pedestrian and bike volumes increase, collisions with automobiles may decrease. For instance, an analysis of pedestrian and bicycle volume found that with increasing numbers of walkers and bicyclists, injury rates decreased.[101] Similarly, an analysis of pedestrian injuries in Oakland illustrated that the risk for pedestrian-vehicle collisions was smaller in areas with greater pedestrian flows and greater in areas with higher vehicle flows.[102]

Vehicle Speed

Vehicle speeds predict both the frequency as well as the severity of pedestrian injuries. Below 20 miles per hour (mph) the probability of serious or fatal injury is generally less than 20%; this proportion rapidly increases with increasing speed and above 35 mph, most injuries are fatal or incapacitating.[103] Another study showed that the average pedestrian has an 85% likelihood of fatality when struck by a vehicle traveling at 40 mph, whereas if the vehicle is traveling at 30 mph the likelihood is reduced to 45%, and when vehicles are traveling at 20 mph the likelihood of fatality is only 5%.[104]

On average, each 1 mph reduction in speed may reduce collision frequency by 5%, with effects greatest for urban main roads and low speed residential roads.[105]

There is even a positive linear relationship between *posted* speed limits and severity of pedestrian injury and fatality. Where the speed limit of 25 mph is posted, 2.2% of pedestrian collisions result in fatality, whereas in locations with 30 mph and 35 mph the percentage of pedestrian fatalities rose to 3.9% and 8.1% respectively.[106]

One-way streets

One-way streets have generally been found to reduce pedestrian crashes as well as pedestrian injury and fatalities;[107] [108] some argue that this is because one-way streets may provide an advantage to pedestrians by having primary traffic coming from only one direction (and hence one may need to only prioritize looking in one direction when crossing).[109] However, at least one study found that one-way streets pose a greater risk for child pedestrian injuries.[110] On the other hand, since one-way streets tend to have higher vehicle speeds,[111] some injuries due to crashes may be more severe or lead to fatality.[112] At least one study indicates that in residential areas, one-way streets face worse air quality, traffic and traffic related concerns.[113] This may also be due to higher auto speeds. Careful considerations and contextual differences should be examined when converting one-way streets to two-way and vice versa.

Traffic level of service (LOS), which is heavily analyzed by traffic engineers and planning agencies in local jurisdictions, is based on measures of how efficiently cars move through specified roadways and intersections, based on an A – F rating system with "A" indicating free flowing traffic and "F" indicating extremely congested traffic.[114] , [115] LOS often shows that one-way streets earn the highest LOS rating because of higher vehicle speeds; however, LOS does not necessarily take into account the impacts of

high vehicle speeds on other roadway users such as pedestrians, bikes, and transit. Where one-way streets are present, traffic calming measures (described above) can help mitigate resulting higher speeds.

Vulnerable pedestrians
Pedestrian collisions are more common in low-income areas, potentially reflecting greater traffic volumes and lower automobile ownership among residents of these neighborhoods.[116] Additionally, Ragland et. al. (2003) assert that African Americans, Latinos, and Native Americans are all at higher risk for pedestrian injury and fatality that Whites.[117] Older adults also suffer disproportionately from both risk and impact of pedestrian auto collisions. Older adults tend to walk slower and have slower reaction times that may put them at more risk as a pedestrian, and in the unfortunate event of a collision, older adults are more likely to have severe and fatal injuries due to frail physical conditions.

5.3.2. Existing Transportation Conditions in the Planning Area

Walking

Community Perspectives
Walking is a primary mode of transportation in the Planning Area, and pedestrian safety and walkability are of great concern to the community. The Asian Health Services' Lake Merritt BART Station Area Community Engagement Final Report states, "Many of the community's transportation-related issues reflect a pedestrian perspective."

Number of Pedestrians
According to the American Community Survey, 18% of people in the Planning Area walk to work. This is more than four times higher than Oakland's and Alameda County's proportions (both 4%), and more than five times higher than the California and US proportions (both 3%).[118]

BART reports that on an average weekday, 45% of the LMB riders walked to the BART station from their homes in 2008. This is 45% higher than the average number of riders originating at home who walk to any Bay Area BART station (31%), suggesting that improving walking access may increase BART ridership at this station. BART also reports that in the same year, 80% of non-home origin riders (people coming from school or work, etc.) walked to the Lake Merritt BART station. With a total of 6,021 riders entering Lake Merritt BART station on an average weekday (both home and non-home origins) we can expect that 3,771 people or 63% of all riders are walking to this station from the surrounding neighborhood (median walking distance is .5 miles[119]). [120 f]

In addition to the people walking to BART, many people use Alameda Contra Costa Transit District (AC Transit) in the PA. AC Transit reports that 20,787 people get on and off AC Transit buses in the PA (weekday count), and all of these person-trips most likely have a walking component in order to get to the transit station or destination.[121]

There have been no comprehensive pedestrian counts in the PA. Observations reported in the SAP Existing Conditions Report suggest that there are heavy levels of pedestrian activity around the Lake Merritt BART Station (with an emphasis on Oak Street), in the Chinatown district (primarily along and

[f] Note: it is unclear from the report whether people who drive closer to BART but still have a walking component are captured as drivers or walkers, mode of transport categorization would be up to the individuals response on the survey form.

between Franklin and Harrison from 7th to 11th Streets), and around Lake Merritt. As part of a larger study estimating pedestrian volumes for Alameda County, researchers at UCB have counted pedestrians at two intersections in the PA: 1) Broadway and 12th Street and 2) Webster and 7th Streets. Counts took place during weekdays and weekends for two hours each. At Broadway and 12th Street (downtown adjacent to 12th Street BART station), 3,577 weekday pedestrians were counted and 1,374 weekend pedestrians were counted, both during a two-hour time period. During a two-hour time period at Webster and 7th Streets (Chinatown), 937 weekday pedestrians were counted and 1,131 weekend pedestrians were counted.[122]

Walkability Score

When the Lake Merritt BART Station address was entered into walkscore.com, the PA[g] received a walk score of 91 out of 100, classifying it as a "walkers paradise." [123] This score is within the highest possible ranking category and is 22% higher than the average Oakland score of 71 ("very walkable"). Walk Score (walkscore.com) is a web-based program that measures the walkability of any address. They use a variety of data sources for available amenities and facilities such as schools, shops, parks and restaurants to create an algorithm. This score does not reflect issues related to the social environment such as crime and perceived safety, nor does it reflect pedestrian infrastructure (such as the presence or quality of sidewalks) or traffic safety, all of which may enhance or deter people from walking.

Pedestrian Conditions

According to the SAP Existing Conditions Report, [124] sidewalks are present throughout the Planning Area and reportedly range from poor to good condition.[h] The majority that are in good condition are in the Chinatown area and many of the poor to fair condition sidewalks are located near I-880, on and adjacent to Jackson and Oak Streets, and around the BART parking lot. Most sidewalks in Chinatown are wider (12 feet) than sidewalks elsewhere within the Planning Area. The 12-foot wide commercial-area sidewalks in Chinatown offer ample space for high volumes of pedestrians, buffer zones separating pedestrians from oncoming traffic, and areas for merchants. Many Planning Area sidewalks that are in poor to fair condition are also narrower in width (4 feet). Between high pedestrian volumes and merchant overflow onto sidewalk space, they can be prohibitive for many pedestrians, particularly the old and disabled and those with strollers and families.

Merchant obstructions exist along some sidewalks, primarily in the Chinatown district, which potentially render the sidewalks inaccessible to people in wheelchairs, older adults and people with strollers.[125] The surface of the sidewalks is unknown and not reported in the SAP Existing Conditions Report. In a Community Environmental Audit Survey conducted by Asian Health Services of the Lake Merritt BART area (the area closest to BART, East Lake and 10th to 14th Streets were assessed), the majority (94%) of surveyors stated that they observed the presence of sidewalks on both sides of the street, but only 60% were in good condition (wide enough, a stroller or wheelchair can pass, very evenly paved, no cracks), 21% in medium condition (more evenly paved, few cracks), and 10% were observed as being in poor condition (broken, very uneven, lots of cracks). [126]

Pedestrian amenities at intersections in the Planning Area are generally adequate but accessibility is inconsistent, especially for seniors and people with disabilities. When asked about pedestrian amenities at intersections in the Community Environmental Audit Survey conducted by Asian health Services, 72%

[g] Note: this includes a 1.5 mile radius around the given address using a distance decay function, applying a higher weighting to amenities closest to the chosen address)

[h] Note: report does not describe what defines "poor" or "good" conditions.

of surveyors stated that they observed marked pedestrian crossings on both legs of the crossing, and 20% stated that they observed marked pedestrian crossings on one leg of the crossing. Pedestrian signals were observed on both legs of the crossing by 56% of respondents, and 37% observed pedestrian signals on only one leg of the crossing.[127] Marked crosswalks range from the standard two stripes (majority) to ladder style crossings (few), and in addition, there are four pedestrian scrambles in the PA's Chinatown district (Franklin and Webster Streets at 8th and 9th Streets). There are ten noted "difficult crossing" areas in the EC report, although specifics are not identified. The SAP Existing Conditions Report indicates that many intersections have curb cuts and marked crossings, but many are out of date (not in compliance with new American Disability Act (ADA) standards or not aligned properly with the crossing). There are some areas where there are no curb ramps at all, making an inaccessible environment for many people with disabilities (primarily around the 5th and Laney areas).

Biking

Presence of Bikeways

There are three primary classifications of bikeways. In brief, they include[128]:

- Class 1 (bike path): bicycle path that is completely separated from the street
- Class 2 (bike lane): striped lanes on the street for the use of bicyclists
- Class 3 (bike routes): identified and designated preferred routes for bicyclists. The city of Oakland has three sub categories for Class 3 bike lanes to better accommodate issues commonly found in Oakland (such as one way streets):
    - Class 3A: Arterial bicycle routes are routes where bike lanes are not feasible and adjacent streets are not conducive for bicycle travel.
    - Class 3B: Identified bicycle routes on residential streets with low traffic volumes.
    - Neighborhood connectors: mapped routes to identify good connections *within* neighborhoods.

In the PA bikeways are not readily present on the existing road network (although many routes are planned as stated in the Oakland Bicycle Master Plan). Existing routes include a Class 3 signed route on Oak Street between Embarcadero and 4th Streets, a Class 2 bike lane along the Embarcadero, and a Class 1 bike path through Laney College.[129] The dearth of bikeways is verified by "ground truth" from residents with 100% of surveyors participating in the Asian Health Services' Community Environmental Audit Survey stating that they did not see a bike lane while conducting field observations in the three surveyed areas (the area closest to BART, East Lake and 10th to 14th Streets were assessed).[130]

Bike Parking

Bicycle parking is found at the Lake Merritt BART Station and to varying degree throughout the Planning Area. LMB has 32 pay bicycle lockers and bike racks, many of which are used to capacity during the weekday. Several bike racks are found at corners in the core Chinatown commercial area and Laney College has bike racks available for students. Throughout the Planning Area, bikes are observed locked to parking meters and trees, suggesting that there is a dearth of adequately placed bike parking facilities. [131]

Per Oakland's Bicycle Master Plan, the City has made a concerted effort to identify routes conducive to bicycle traffic and implement bike lanes of varying classification, especially around the existing transit network.[132]

Number of Bicyclists

Despite limited designated bike lanes and routes, 2% of resident workers over the age of 16 in the PA bike to work. This is equivalent to the overall percentage observed in Oakland as a whole, but is 33% higher than Alameda County (1.5%) and twice as high as California (at 1%).[133] In addition, 8% of Lake Merritt BART riders (home-based) ride their bike to BART; higher than the 4% average of all BART stations,[134] and 10th Street was observed as having the highest volume of bike riders to the BART Station.[135] Bike count data collected at two intersections in the Planning Area indicate that during a two hour weekday period, 63 bikes were counted at Broadway and 12th Street, and 26 bikes were counted at Webster and 7th Streets,[136] suggesting that bicycling is a utilized mode of transportation in the Planning Area.

Air Pollution

Community Perspectives

Air pollution is of great concern to residents in the Planning Area. Asian Health Services reports that 38% of residents cited air pollution as harmful to their health. [137]

Air Pollutant Concentrations

The San Francisco Department of Public Health (SFDPH) performed an Exposure Assessment in the Planning Area, based on the traffic pattern and proximity of I-880 and arterial streets. They estimated that the concentration of $PM_{2.5}$ in Oakland Chinatown is between 0.6 and 2.2 ug/m^3, with the largest midsection in the 1.0 to 1.5 ug/m^3 range. For comparison, the action level threshold in San Francisco is 0.2 ug/m^3, and concentrations in the Planning Area far exceed this level.

The California Air Resources Board measures pollutants from stationary monitors throughout the state. The closest monitor to the Planning Area is over six miles to the southeast. The data represented in Table 4 illustrates that air pollutants around the stationary monitor generally do not exceed state or national standards. PM 2.5 is the one identified pollutant that exceeded the national standard for a total of three days during 2009. There are limitations to this data and it should be used with caution, as it is not directly from the Planning Area, does not reflect proximity to vehicle pollutants from Highway 880 and the Webster/Posey tubes or vehicle travel within the LMB Station Planning Area, and does not include all air pollutants that may impact health.

Table 4. Air pollutants from the closest stationary monitor to the PA

(9925 International Blvd, which is about 6.5 miles southeast of Lake Merritt BART Station, unless otherwise noted)

Pollutant	Standard	2007	2008	2009
OZONE				
Highest 1-hr Average (ppm)		0.04	0.086	0.092
Days over State Standard	0.09	0	0	0
Highest 8-hr Average (ppm)		0.036	0.064	0.063
Days over State/National Standard	0.07	0	0	0
Days over National Standard	0.075	0	0	0
CARBON MONOXIDE				
Highest 8-hr Average (ppm)		1.4	1.63	1.99
Days over State/National Average	9	0	0	0

Pollutant	Standard	2007	2008	2009
PM 10 (Fremont-Chapel way Monitoring Site; over 20 miles southeast of LM BART Station)				
Highest State 24-hr Average (ug/m3)		60.6	38.7	*
Estimated Days over State Standard	50	6	*	*
Estimated Days over National Standard	150	0	*	*
Annual Average		19.6	*	*
PM. 2.5				
Highest 24-hr Average (ug/m3)		22.8	30.1	36.3
Estimated days over National 24-hr. Standards	35	*	0	3
State Annual Average	12	*	9.5	*
Nitrogen Dioxide				
Highest Daily Maximum Hourly (ppm)		0.059	0.07	0.062
Days above state standard		0	0	0
* = insufficient or no data available to determine the value Data source: CARB ADAM[138]				

Annual Average Daily Traffic

Interstate 880, which runs through the Planning Area, has an Annual Average Daily Traffic (AADT) count of 226,000 vehicles at Oak and Madison Streets, and many of these are heavy duty trucks because I-880 is a primary truck route.[139] The Posey Tube and the Webster Street Tube are two parallel tunnels running beneath the Alameda-Oakland Estuary that connect Oakland with the city of Alameda. The Posey Tube carries Oakland-bound traffic under the Estuary and the Webster Tube carries traffic bound for Alameda. Highway 260, which occupies the Alameda Posey Tube, has an AADT of 47,500 vehicles, and the Webster Tube has an AADT of 22,300 vehicles.[140] AADT from I-880 and California Highway 260 together result in approximately 295,800 vehicles per day traveling through the Planning Area emitting harmful air pollutants and exposing nearby communities. In keeping with CARB's recommendation to not have residential areas within 500 feet of high traffic volume roads, this HIA examines the proximity of residents to the I-880 and the Webster/Posey Tubes. According to our GIS analysis, twelve percent of current residents live within 500 feet of either I-880 or the Webster/Posey Tubes.

Public Transit

The two primary public transit providers in the Planning Area are BART and AC Transit. Twenty-six percent (26%) of Planning Area residents use public transit to get to work. This is higher than the rates for Oakland (17%), Alameda County (11%), California, and the nation (both at 5%).[141] Ninety-one percent of the Planning Area blocks are within ¼ mile of a bus stop or a BART station entry point (assuming population is evenly distributed across blocks. According to the Asian Health Services Community Environmental Audit Survey, 66% of survey participants did not see either a bus stop or light rail station, only 26% of participants reported seeing a bus stop, and only 8% reported seeing a light rail station (i.e., BART) in the three geographic areas assessed by the audit (the area closest to BART, East Lake and 10th to 14th Streets).[142]

Community Perspectives

In a "Family Tea" of eleven community members (children, parents and grandchildren) conducted by the City, participants expressed an explicit desire for more public transit, specifically more bus access, including stops, routes and frequency.[143] Merchant tea participants felt that there should be more transit ridership in Chinatown given the area's amenities and resources. They appreciate transit resources in the area.[144]

BART[145]

The Lake Merritt BART Station is the center of the Planning Area and also serves as a central hub of transit activity with many AC Transit bus lines along the surrounding streets. The LMB station is served by three BART lines:

- Dublin Pleasanton/Daily City
- Fremont/Richmond
- Fremont/Daly City

Operating Hours:

- Weekday: 4:33 am – 12:56 am
- Saturday: 6:07am – 12:56 am
- Sunday: 8:07 am – 12:56 am

Frequency: Peak and non-peak BART trains generally stop at LMB every 15 to 20 minutes (per line).

Ridership: On an average weekday, the LMB station has an average of 6,021 riders enter the station.[146] From 2003 - 2010 (averaged fiscal years) there has been an 18% increase in weekday average exits, the highest being 2009 with 5,848 average exits. [147]

Mode of transportation to BART: 45% of residents who travel to LMB from home walk as their mode of transportation. This is 45% higher than for the average BART station (31%).[148] Five percent (home origin) use other public transit to get to LMB station. This is 67% *lower* than the average BART station (at 15%) suggesting that transit connectivity may be needed.[149] Eight percent biked to LMB, twice as high as the average BART station (at 4%) suggesting that this area has high potential for increased bike travel to transit and other destinations.[150] Twenty-three percent of home-origin LMB station riders drive alone, which is lower than the average BART station with 34% of patrons who drive alone to BART.

Demographics: The majority of BART riders at the LMB station are White (43%), followed by Asian/Asian Pacific Islander (27%) and Black/African American (14%).[151] See Table 5 for a comparison of BART ridership race/ethnicity demographics with neighborhood racial/ethnic composition. BART ridership amongst the White population is nearly twice as high as total ridership amongst the Planning Area population, and conversely the percentage of BART riders that are Asian are nearly half of the total proportion in the Planning Area.

Table 5. Race/Ethnicity of BART Riders at Lake Merritt Station

Race/Ethnicity	Planning Area	BART ridership
White	23%	43%
Black or African American	15%	14%
Asian	51%	27%
Hispanic or Latino	7%	12%

Twenty-two percent (22%) of LMB station users have a household income of $25,000-$49,000, followed by 20% of riders with a household income of $50,000-$74,000. [152]

Accessibility*:* All BART stations are equipped with elevators, verbal and brail signs directing patrons, on-car priority seating, and accessible parking (at stations that offer parking), among other features. The LMB station has a parking lot available for patrons. Data is not available specifically for LMB station elevator performance, but system-wide elevator performance for the first quarter of 2011 was between 95 and 100%. BART notes, "With staffing constraints, station elevators are a priority".[153] Based on observation, there is limited Chinese translation of BART information and / or wayfinding, despite the high amount of Chinese speaking residents in the community surrounding LMB station.

AC Transit[154]

Fifty-four percent of the streets in the Planning Area have one or more AC Transit bus routes. The Planning Area is served by two AC Transit lines (11 and 88) that directly serve the LMB station. Frequency of these bus routes is approximately every 20 – 60 minutes (peak and non-peak hours). In addition to the bus routes that directly serve the LMB station, several other Local AC Transit buses operate within the Planning Area: 1, 1R, 12, 14, 18, 26, 31, 40, 51A, 58L, 62, 72, 72R, and 72M. The East Bay Bus Rapid Transit (BRT) route, scheduled to begin operation in 2016, will also serve the Planning Area. Designated school routes include 618 and 651, and all night routes include 800, 801, 840, and 851. A few Transbay buses (O, OX and W) operate in the Planning Area. Frequency of these bus routes is approximately every 12 – 60 minutes (peak and non-peak hours).

Punctuality: According to AC Transit, for January 2011, there was a 24% "on-time" service performance rating for weekday buses, and 68% of the stops were categorized as "late."[155] Many of the bus stops in the Planning Area lack benches and shelters for comfort while waiting for the bus. The high probability of buses being "late" paired with lack of bus stop amenities may prohibit many users from riding the bus due to lack of accessibility and reliability.

Ridership: A weekday count reported by AC Transit shows that 20,787 people got on or off AC Transit buses in the Planning Area (daily count).[156]

Mode of transportation: While there are no surveys of AC Transit riders' mode of transit to bus stops for the LMB station area or the Planning Area specifically, of system-wide AC Transit users, 80% walk, 12% bus transfer, and 8% BART. Of those who walked, approximately 33% walked less than one block to the bus stop, and nearly ¾ of all riders were within 4 blocks of a bus line. [157]

Demographics: While there are no surveys of AC Transit rider demographics for the LMB station area or the Planning Area specifically, general information on all AC Transit riders in the region is available:[158]

- 71% of riders have a household income of less than $50,000.
- 37% of riders surveyed were Black/African American, 37% Asian, and 18% were Asian Pacific Islander.

Accessibility: All AC Transit buses are equipped with the following accessibility features:

- Passenger lifts or ramps (for wheelchair/mobility aid users, or anyone who has trouble climbing steps)

- "Kneeling", which lowers the first step several inches to make the first step easier (note: special "Flash Cards" are available upon request from AC Transit, which passengers can display prior to boarding, for requesting lift or kneeler)
- Priority Seating near the front of buses, for people with disabilities and seniors
- Two designated wheelchair locations per bus, each equipped with locking devices that hold the wheelchair safely in place, and are required for all wheelchair users. Drivers provide assistance with wheelchair locking as needed. Also provided are lap/shoulder belts that wheelchair users can request, along with assistance from driver.
- A special Wheelchair Marking/Tether Strap program is also available for identifying/providing proper fastening points on wheelchairs
- Stop announcements (in English) at major intersections and transfer points, provided either verbally by drivers, or by automated equipment.

Traffic Safety

Community Perspectives
Community residents have expressed a safety concern of speeding traffic in the "Family Tea" conducted by the city.

Vehicle Speed Limits
Speed limits on local roads are determined by the local city or jurisdiction, which in the case of the PA is the City of Oakland. The State of California also restricts speeds in some cases, such as speed limits of 25 mph within 500-1,000 feet of a school when children are present (note that some schools may have speed limits as low as 15 mph) and in business or residential areas (unless otherwise posted).[159] There are several schools in the PA, and thus speeds are restricted to a maximum of 25 mph near schools when children are present.

The maximum allowable speed limit within 100 feet of a railroad crossing in California is 15 mph.[160] There are railroad tracks present in the PA; therefore, speeds are restricted at crossings.

Posted speed limits in the PA range from 25 mph (10th Street East of Fallon Street, 11th Street, East 12th Street, Webster Street, Harrison Street, and Lakeside Drive) to 30 mph (7th Street) with the majority of observed speed limits at 25 mph.[161]

Street Classification and directionality
The Federal Highway Administration (FHWA) defines local streets based on classifications. The three classifications are:

1. *Arterial*: provide the highest level of service at the greatest speed for the longest uninterrupted distance, with some degree of access control. 2400+ peak hour vehicles per hour.
2. *Collector*: provide a less highly developed level of service at a lower speed for shorter distances by collecting traffic from local roads and connecting them with arterials. 1200 to 1400 peak hour vehicles per hour.
3. *Local*: consist of all roads not defined as arterials or collectors and primarily provide access to land with little or no through movement. Less than 1200 peak hour vehicles per hour.

Within the Planning Area there are 7 arterial streets, 6 collector streets, and 7 local streets.

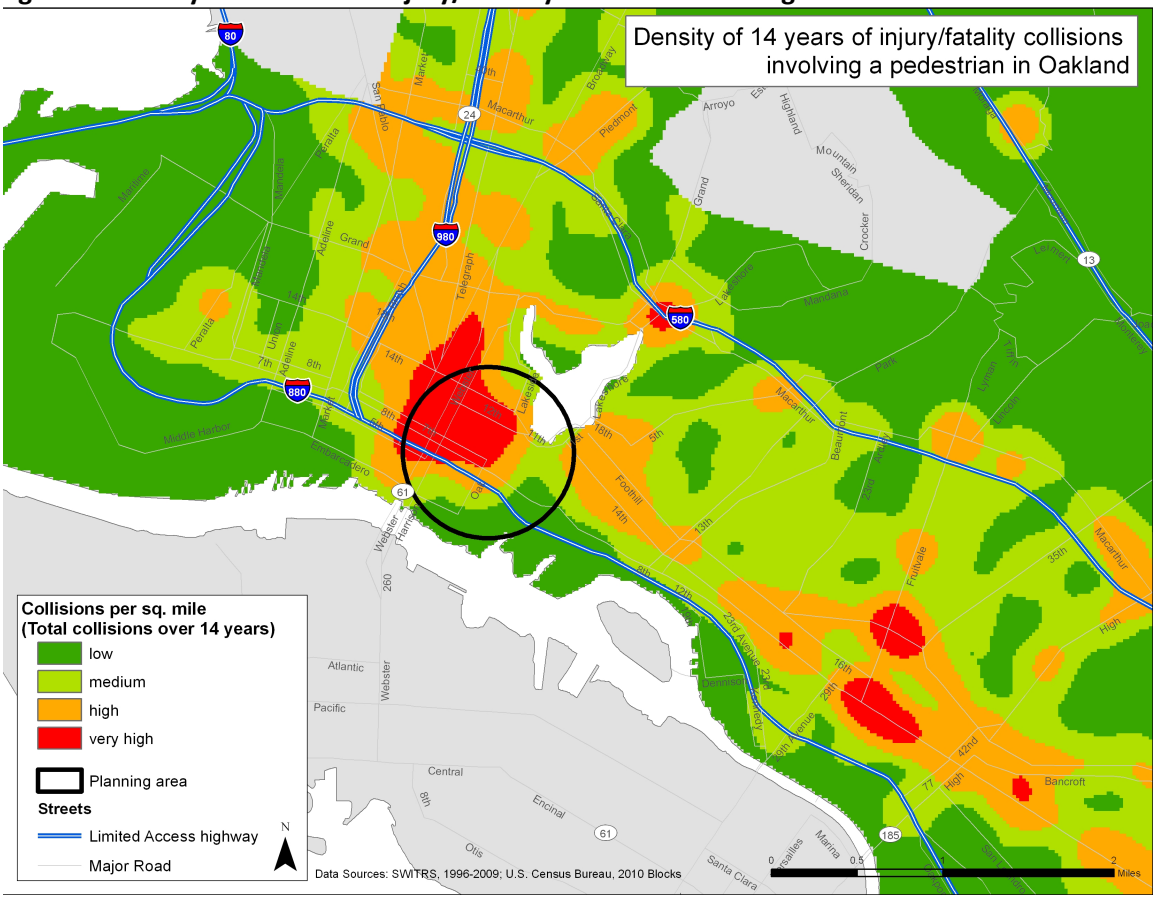
Several segments of the arterial and collector streets are one-way, and the majority of the one-way streets and street segments have 4 lanes (13th, 12th, 11th, 10th, 8th, 7th, Webster, Harrison, and Oak streets).

Pedestrian injuries and fatalities

According to HIP's GIS analysis, from 1996 to 2009 (14 years) there were 299 pedestrian collisions in the PA (total reported injury and fatality) and many were concentrated in the Chinatown area, with the intersection of Franklin and 7th Street having the highest rates of collisions at a total of 16. Additional notable intersections (with 8 or 9 pedestrian collisions) include Broadway and 8th Streets, Webster Street at both 9th and 12th Streets, Harrison Street at both 12th and 14th Streets, as well as the intersections of Madison and 14th Streets and Oak Street and Lakeside Drive.[162]

The density of pedestrian injury/fatality collisions for 1996-2009 in the Planning Area is 380 collisions/square mile, over five times as high as Oakland as a whole at 69 collisions/square mile.[163] Figure 1 below shows the density of collisions involving a pedestrian in the Planning Area and the rest of Oakland.

Figure 2. Density of 14 Years of Injury/Fatality Collisions Involving a Pedestrian in Oakland

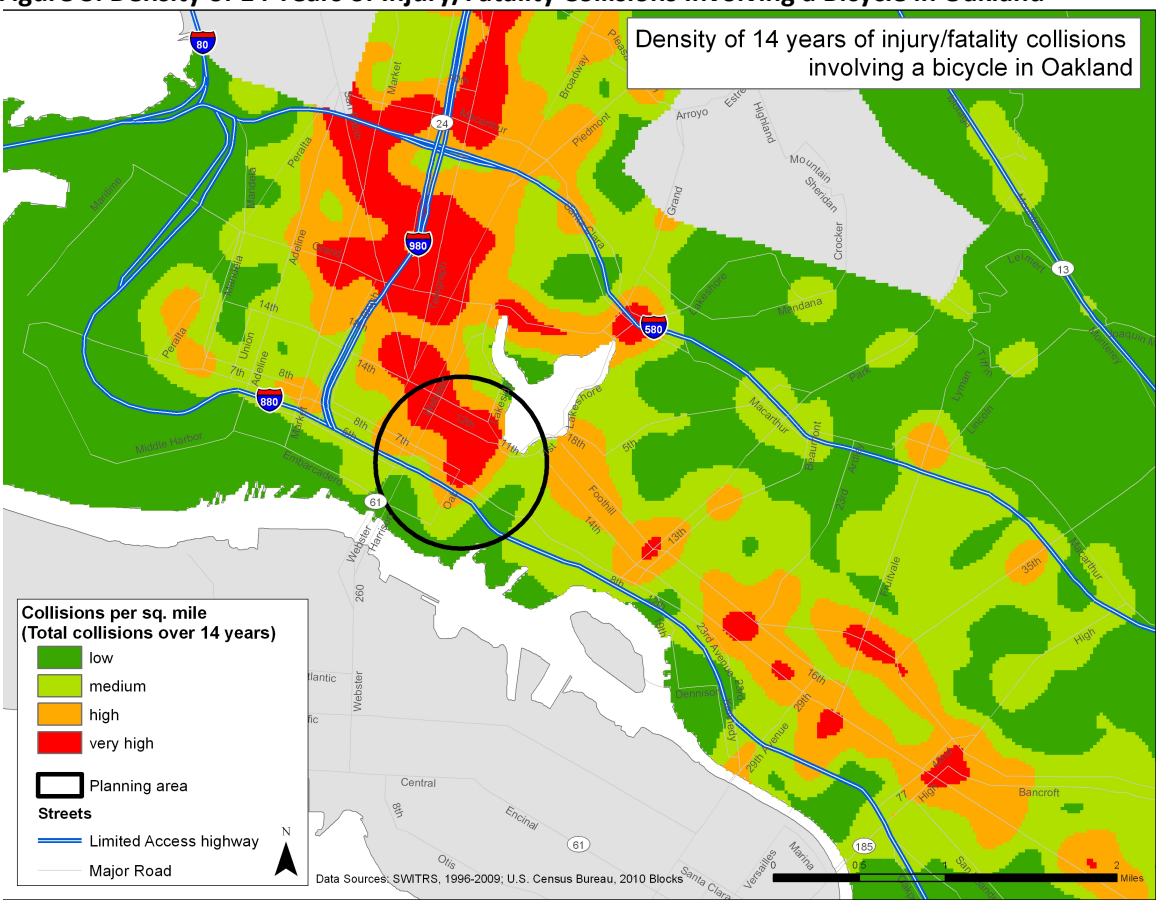


The California Office of Traffic Safety reports annual injury and fatality statistics for cities of similar size, ranked by DVMT.[164] For total pedestrian injuries and fatalities in 2009, Oakland ranked 3rd in the state with a total of 256 injuries and fatalities (43% of total pedestrian injuries and fatalities for Alameda County). At a rate of 5.87 per 100,000 population, 12.5% of the traffic fatalities in Oakland were pedestrians.[165] Children (<15 years of age) and seniors (65 and older) are particularly vulnerable to pedestrian collisions in Oakland, both being ranked 4th in the state for pedestrian injuries and fatalities.

Bicyclist injuries and fatalities

Between 1996 and 2009 (14 years) there were 75 reported bicyclist-vehicle collisions in the Planning Area (total reported injury and fatality) according to HIP's GIS analysis.[166] The density of bicycle injury/fatality collisions in 1996-2009 in the Planning Area is 96 collisions/square mile, three times as high as Oakland at 31 collisions/square mile. Bicyclist collisions are particularly high in Oakland in general. In 2009, Oakland ranked 2nd in the state for bicyclist injuries and fatalities with a total of 179[167] (27% of total for Alameda County). Figure 2 shows the density of collisions involving a bicyclist in the Planning Area and the rest of Oakland.

Figure 3. Density of 14 Years of Injury/Fatality Collisions Involving a Bicycle in Oakland



In 2009, Oakland ranked 2nd in the state for bicyclist injuries and fatalities with a total of 179[168] (27% of total for Alameda County). Children under 15 years of age are particularly vulnerable to bicycle-vehicle collisions in the city: Oakland ranks 5th in the state for injuries and fatalities involving children on bikes.

Statewide in 2009, 43% of all traffic fatalities occurred on minor roads (arterials, collectors and local). Over 18% of all California traffic fatalities were pedestrians and 3.2% were bicyclists.[169]

5.3.3. Impacts of the Draft Emerging Plan on Transportation, Related Health Outcomes, and Recommendations Proposed by this HIA

Draft Emerging Plan (DEP) Sections 6 (Streetscape Character) and 7 (Circulation, Access, and Parking) address transportation issues for the Lake Merritt BART Station Area Plan. The DEP makes several streetscape, circulation and land use proposals that have been found in research literature to be associated with health and health-related outcomes. The DEP estimates that existing redeveloped uses currently generate 6,509 daily vehicle trips. The two redevelopment alternatives (high and low residential) would generate 36,461 and 30,987 net new daily vehicle trips (respectively) minus allocation assumptions for transit use. It is impossible to quantify health outcomes related to these proposals, but trends can be concluded based on a review of the literature. Key transportation proposals in the DEP, along with anticipated health and health-related outcomes, are included in Appendix C.

More in-depth health impact analyses of DEP proposals for intersections with known pedestrian safety problems, bike lanes on 8th and 9th streets, and "festival street treatments" are below. Recommendations are presented in *italics*.

Pedestrian Safety Impacts

Streetscape Improvements at Intersections with Known Problems

As described in Section 5.3.2, HIP's GIS analysis found that certain Planning Area intersections have particularly high rates of collisions. Vast increases in daily trip generation (approximately five times the current number) will exacerbate this issue. DEP proposals for streets that contain these intersections are discussed below.

Franklin Street and 7th Street

The DEP concept for 7th Street west of Fallon proposes pedestrian improvements such as corner bulb-outs, enhanced pedestrian crosswalks such as intersection restriping or decorative paving, pedestrian-oriented lighting and street trees. *These improvements are likely to improve visibility of pedestrians and overall quality of the pedestrian environment. However, 7th Street is four one-way lanes and traffic speeds tend to be fast. Lane reduction, two-way conversion, and narrowing would decrease vehicle speeds and thus improve pedestrian safety.*

7th Street at Harrison and Alice

Seventh Street improvements are also critical at the intersections of 7th Street and Harrison and 7th and Alice, as these are two of the intersections at Chinese Garden Park where pedestrian safety is of particular concern. According to a survey conducted by AHS, over 100 trucks and cars passed through these intersections during a 5-minute period.

Broadway and 8th Street

The DEP concept for 8th Street in Chinatown proposes a lane reduction from four lanes one-way to three lanes one-way, sidewalk widening, corner bulb-outs, enhanced pedestrian crosswalks, pedestrian-oriented lighting and street trees. *Lane reduction will likely lead to slower vehicle speeds on 8th Street, which will be safer for pedestrians and bicyclists. However, one-way traffic speeds still tend to be higher than two-way speeds. Sidewalk widening, corner bulb-outs and crosswalks will also likely improve pedestrian safety by shortening crossing distances and increasing pedestrian visibility. If these pedestrian improvements are planned for the intersection of 8th and Broadway, they may address the elevated risk of collisions here.*

Webster Street at 9th and 12th Streets

DEP proposals for Webster Street include a lane reduction from four lanes one-way to three lanes one-way, sidewalk widening, and pedestrian improvements such as intersection restriping or decorative paving, pedestrian-oriented lighting and street trees. *Lane reduction has been found to reduce pedestrian collisions. Sidewalk widening, pedestrian improvements, and other proposed changes to sidewalks and intersections would increase pedestrian visibility, which is likely to increase safety.*

Harrison Street at 12th and 14th Streets

DEP proposals for Harrison Street at these two intersections include corner bulb-outs, restriping or decorative paving, pedestrian-oriented lighting and street trees. *These proposed would increase pedestrian visibility and overall quality, which is likely to increase safety. However, lane reduction and sidewalk widening would improve pedestrian safety to a greater degree.*

Madison Street and 14th Street

DEP proposals for Madison Street include a lane reduction from three lanes one-way to two lanes one-way; Class 2 bike lane, corner bulb-outs, enhanced pedestrian crosswalks through restriping or decorative paving, pedestrian-oriented lighting and street trees. *Lane reduction has been found to reduce pedestrian collisions. However, one-way traffic speeds still tend to be higher than two-way speeds. Pedestrian improvements are anticipated to increase pedestrian visibility, which is likely to increase safety. Addition of a Class 2 bike lane will improve bicyclist safety.*

Oak Street and Lakeside Drive

DEP proposals for Oak Street include lane reduction from four lanes one-way to three lanes one-way, Class 2 bike lane, sidewalk widening north side, corner bulb-outs, enhanced pedestrian crosswalks, pedestrian-oriented lighting and street trees. *Lane reduction has been found to reduce pedestrian collisions. However, one-way traffic speeds still tend to be higher than two-way speeds. Pedestrian improvements are anticipated to increase pedestrian visibility, which is likely to increase safety. It's unclear what sidewalk widening "north side" means, because Oak Street runs north/south. Addition of a Class 2 bike lane will improve bicyclist safety*

"Festival Street" Treatment on Fallon between 8th and 10th Streets

The DEP proposes a "festival street" treatment between Laney College main entrance and BART parking redevelopment site. It is our understanding that this street treatment allows bicycles, pedestrians and cars to have equal "right of way" by eliminating curbs and adding more landscape features. According to transportation expert organization Transform, this street treatment would result in slower vehicle and bicycle speeds, creating a safer environment for pedestrians. As such, we support this street treatment on Fallon and encourage the City to explore similar treatments on other streets.

Bicycle Ridership Impacts

Bike lanes/ routes on 8th, 9th and 10th Streets

The DEP, in accordance with the Oakland Bicycle Master Plan, proposes Class 2 bike lanes (striped lanes on streets) on 8th and 9th Streets east of Harrison. On 8th and 9th Streets west of Harrison, within the Chinatown Core, Class 3 bike routes (preferred streets for bicycle travel using lanes shared with motor vehicles, or sharrows, and lower posted speed limits) are proposed rather than bike lanes.

Adding bike lanes has been found to increase the number of cyclists on roadways. Recent bike lane installments in Oakland have resulted in an increase in observed bike ridership along such routes, especially in areas near/adjacent to the PA. For example, a 113% increase in bike ridership was observed along 3rd St (from Mandela Parkway to Brush Street) in West Oakland and a 54% increase in bike ridership was observed along Embarcadero (from Oak Street to Kennedy Street).[170] This is in line with national patterns: Carr and Dill (2003) found that for cities with populations over 250,000, each additional mile of class 2 bike lanes (defined in the city of Oakland as striped lanes on the street for the use of bicyclists[171]) in a square mile will result in an approximate 1% increase in bicycle commutes to work.[172]

Thus, additional bike lanes proposed in the DEP are anticipated to lead to additional bicyclists, who will gain health benefits associated with physical activity (see Section 5.3.1).

Bicyclist Safety Impacts

HIP's GIS analysis reveals that between 1996 and 2009 (14 years) there were a total of 13 bicycle injury or fatality collisions on 8th and 9th Streets within the Planning Area, with five of these occurring within the Chinatown Core. Class 2 bike lanes (lanes intended for bicycles and designated with striped lanes on streets, stencils, and signage) are anticipated to create safer conditions for cyclists than Class 3 bike routes (sharrows) in most cases. However, site-specific conditions in the Chinatown Core, such as the presence of stopped commercial vehicles that would block a potential bike lane and require bicycle traffic to bypass by entering vehicle traffic lanes, should also be considered in the overall safety of bicyclists. *Based on the identified need for safer bicycle features in the Planning Area, we recommend further study of bicycle safety on 8th and 9th Streets in the Chinatown Core. We support a bicycle lane/route proposal that would provide the highest level of safety for bicyclists. Mitigations such as additional city-designated parking for commercial vehicles (in order to separate vehicle loading/unloading from bicyclist right-of-way) should be considered in this analysis.*

As noted above, the Existing Conditions Report states that 10th Street has the highest volume of bike riders to the Lake Merritt BART Station.[173] HIP's GIS analysis concluded that between 1996 and 2009 (14 years), eight bicycle injury or fatality collisions occurred on 10th Street within the Planning Area, and six of these were east of 10th Street. DEP and Oakland Bicycle Master Plan proposals for 10th Street east of Madison include a Class 2 bike lane; *given the high demand and safety risk, we support this proposal.*

Other Pedestrian and Bicycle Recommendations

Besides those included above in italics, the following recommendations are supported by this analysis.

Although specific relationships between the different factors vary, the built environment characteristics that increase livable, walkable, and bikeable neighborhoods and reduce driving include:

- Compact, mixed land use patterns and high levels of street connectivity;[174] [175]

- Well-designed, mixed-use development around transit nodes, which can increase patronage as much as 5-6 times compared to development away from transit;[176]
- A quality pedestrian environment which reflects factors including: street and sidewalk design and connectivity, presence of street furniture, pedestrian safety interventions such as crosswalks and countdowns, slope and the aesthetics and safety of the surrounding environment;[177]
- Roadway characteristics such as reduced vehicle volume, narrower roadway widths and slower traffic speeds;[178] [179]
- Presence of open or recreational spaces;[180] [181] [182]
- Mixed-use, dense residential and commercial development, as well as close (i.e., <.5 mile) proximity of development to public transit, which decreases the distance between people's residential, employment, and other (e.g., shopping, errands, social) activities and increases walking as a means of transportation;[183]
- Presence and quality of bike lanes, bicycle network connectivity, proximity of development to public transit and other destinations, traffic volume and speed, slope and presence of bike storage, bike locks, and bike racks (including on public transit);
- Providing designated areas on roadways for bicyclists, which makes streets more "bike-friendly" while also increasing safety. Bicycle/auto collisions happen less frequently on streets with bike lanes.[184]
- Traffic calming, which can reduce injuries in residential areas by 15%. Traffic calming features include connected, dedicated sidewalks, lanes, and paths, and interventions;[185]
- Parking supply, pricing and management, which may influence car ownership and therefore the number of vehicle trips and miles traveled;
- Quality of public transportation including proximity to residences, frequency, pricing, reliability, perceived and actual safety, and coverage;
- Cost and convenience of motor vehicle transport (e.g., gas prices, car ownership, and parking supply.[186]
- Congestion Pricing, which involves charging motorists directly for driving on a particular road or in a particular area during congested periods. One comprehensive traffic modeling study for several large California cities predicted that charging 8 to 19 cents per vehicle-mile as a congestion fee would reduce congestion by 5 to 10%, and emissions by 3 to 6%.[187]

The Asian Health Services Community Engagement report[188] lists the following pedestrian-related recommendations proposed by many residents:

- Better sidewalks (supported by 67% of respondents)
- Reduction of trucks and auto traffic (supported by 59% of respondents)
- Better pedestrian street crossings (supported by 50% of respondents)
- Traffic speed reduction and improved transit stops (supported by 33% of respondents)

Participants in the City of Oakland's "Merchant Tea"[189] and "Family Tea" [190] focus groups expressed the following pedestrian-related recommendations for the Planning Area:

- Cleaner sidewalks
- Better street lighting
- More trees
- Better crosswalks and signals, including around Laney College
- Slower vehicle speeds
- Pedestrian scrambles
- Improved pedestrian connections to the Eastlake area
- Traffic calming measures such as speed bumps when approaching intersections

Streetscape Improvements to Preserve and Celebrate Chinatown
We support the inclusion of area-wide streetscape improvements in the Planning Area that preserve and celebrate the cultural, linguistic and historical significance of Chinatown, its residents and visitors. Such improvements can maintain and encourage the growth of the area as a regional destination for Bay Area Asian residents and can contribute to social cohesion, which has health benefits.[191] [192]

Air Quality Impacts

The DEP proposes new residential uses in some of the developments in close proximity to I-880, which would introduce health risks to future residents associated with air pollution from vehicle emissions. In addition, there are existing exposure risks due to current pollution levels and housing near I-880 and potential increased air pollution due to additional vehicle trips (approximately five times the current number of trips) expected from development alternatives. Potential increases in air pollution as a result of this project may impact resident health. *The DEP lists several mitigations for air pollution exposure. We highly support these tactics. We also recommend a thorough study of anticipated traffic and air quality impacts of this proposal be conducted.*[i]

Public Transit Ridership Impacts

Proximity to public transportation, neighborhood walkability/bikability, parking, and traffic congestion all predict the use of public transportation. Availability and proximity of public transportation can decrease the amount a family drives. In a survey with people who moved to a Richmond, CA transit oriented development, 56% said they used public transit more and 93% used transit the same or more.[193] Similarly, the San Francisco Metropolitan Transportation Commission found that individuals living and working within a mile of public transportation use transit for 42% of their work commute trips. Conversely, only 4% of those who *do not* live within a mile of public transportation use it.[194]

The LMB SAP proposes a transit-oriented development that would enable current and future residents to live in close proximity to, and provide enhanced access to, a valuable transit resource. As such, we support the LMB SAP for its overall health-promoting proposals related to public transit access.

5.4 Housing

Housing can impact health in a wide variety of ways. Affordable housing can leave a family with enough money for other necessities such as health care, nutritious food and education. Lower housing costs can prevent stress, homelessness, overcrowding, substandard housing conditions, and social isolation of some populations. Affordable and secure housing can prevent displacement and help build social networks that keep communities stable. Appropriately located housing prevents exposure to air pollution, noise, and traffic, and allows for access to goods and services, parks, public transportation, and schools.

[i] Our preliminary research on air pollution exposure mitigations has also revealed the following specifics relative to HVAC systems solutions: The central HVAC system (not a HEPA system) should include: a prefilter, a second filter and a carbon filter to remove chemical matter; a gas furnace to heat air and a fan to draw air in and ducts to get from the fan to each apartment. The system should keep units at positive pressure, so air is not circulated between rooms. There should be ducts to the corridors of buildings as well as ducts into each room off of the corridors through a ceiling grill. Other requirements of the system include constant operation year round and frequent filter changes. (Source: Guttmann & Blaevoet (Mehran Kharza), personal communication, October 18, 2006.)

5.4.1. Research Connecting Housing to Health

Displacement and Gentrification

Displacement of people from their homes and communities refers to involuntary relocation, either forcibly via Eminent Domain on account of increased economic development towards "the greater good" as deemed essential by the City, or based on housing becoming unaffordable on account of rising costs of living or wage stagnation.

Gentrification is defined as the housing/residential displacement of low-income residents and it is often the case that these communities are minority communities or communities of color. Many community factors (or variables) indicate susceptibility to gentrification. Broad categories identified by Chapple (2009) include transportation, amenities, demographics, housing, income, and location.[195] In the Station Area Plan there is the potential for gentrification resulting in higher housing costs.

In recent years transit-rich areas are becoming increasingly gentrified in urban areas as middle class residents are increasingly interested in walkable/bikeable communities (rather than suburbs lacking nearby destinations). As wealthier residents move into lower-income communities they drive up the cost of housing and goods.

Housing Affordability

Housing affordability impacts health through several pathways: for example, by affecting people's ability to buy food or get medical care, by displacing residents, and by increasing the number of overcrowded households. An increasing share of the population is subject to housing cost burdens in excess of their capacity. Spending a larger share of income on housing decreases the amount of money available for other basic living needs such as food, medication, clothing, and transportation to access jobs.[196] Low paying jobs and high housing costs are the most often cited reason for hunger.[197] In fact, higher levels of food insecurity are associated with an increasing percentage of income spent on housing in US and Canadian studies.[198] [199] The Canadian study specifies that in the lowest income quintile, 68% were unable to meet a food spending adequacy guideline. The USDA determined that median housing costs can predict food insecurity on a state-level; i.e., the higher the median cost of housing, the more likely a family is to not be able to consistently feed itself.[200]

Increased rents or mortgage costs can also precipitate eviction and displacement. Displacement is a stressful life event[201] and relocation can have significant impacts on health and childhood development. Residential stability at childhood (moved 0-2 times) increases the odds that an individual will rate their health positively in midlife by 42%.[202] More specifically, increased mobility in childhood (moving 3 or more times by the age of 7) resulted in a 36% increased risk of developing depression and also correlated with academic delay in children, school suspensions, and emotional and behavioral problems.[203] [204] Displacement can result in loss of job, difficult school transitions, and loss of health protective social networks.[205] Social networks – friends, family, co-workers, neighbors that one interacts with regularly – can provide important emotional and material support in times of sickness or stress.

Location of Affordable Housing

Frequently, affordable housing is concentrated in ethnically or economically segregated neighborhoods. This can impact environmental assets and exposures. Segregated neighborhoods have fewer institutional assets (e.g., schools, libraries, public transit, parks),[206] but have more environmentally burdensome infrastructure (e.g., highways, power plants, factories, waste sites) – compromising air, noise, water, and soil quality.[207] Additionally, more

violent crime, more infectious disease and chronic disease all occur in segregated neighborhoods.[208] Finally, residential segregation often affects minorities as well as low-income residents disproportionately, thus leading to inequities in health outcomes. However, ethnic neighborhoods can also provide social cohesion and support; thus, it's important that all types of neighborhoods have institutional assets, are not burdened by an unfair share of environmental hazards, and have mitigations preventing crime and disease.

A number of additional effects on health and public safety are associated with the location of residential housing. These include:

- Children and adults living in proximity to freeways or busy roadways have poorer health outcomes including more symptoms of asthma and bronchitis symptoms[209] and reduced growth in lung capacity[210] (see air quality discussion in Section 5.3);
- There is an increase in the frequency of respiratory illness in residents living in close proximity to industry;[211] [212] [213]
- Pedestrian hazards are increased in housing proximate to busy roadways;[214]
- For segregated, low income communities, access to frequent, reliable transit can be limited (see the Alameda County Community Based Transportation Plans);
- Proximity to full service supermarkets promotes quality nutritional choices; and
- Proximity to parks and recreational facilities increases physical activity.[215]

Overcrowding

Overcrowding is another common response to unaffordable housing. Overcrowding is defined as households with greater than 1.01 people per habitable room, and severe overcrowding is defined as greater than 1.51 people per habitable room.[216] Overcrowding increases the risk of passing infectious diseases, can lead to stress, and it has been shown to have a direct relationship with poor mental health.[217]

Housing and Air Quality

See the discussion of *Housing Near Freeways* in Section 5.3 above.

5.4.2. Existing Housing Conditions in Planning Area

History of Residential Displacement

Community Perspectives

Current and former Chinatown residents have expressed a deep bitterness about past displacement in the community that occurred due to many historic redevelopment efforts.[218]

Historic redevelopment projects

Redevelopment projects in the Chinatown area throughout the 1950s and 1960s have included highway construction, county and transportation buildings, the Laney College campus, and the Lake Merritt BART Station. Nearly all of these projects involved acquisitions of predominantly residential properties, and people were displaced. Chinatown boundaries have drastically changed since 1960, and changes have resulted in a vast reduction in geographic area. Since the 1980s the community has become more aware of rising housing costs and the impact of development on land use and housing affordability.[219] In 2003 it was revealed that tenants over the age of 40 (mostly elderly), and of lower-income at a large residential building in Chinatown received eviction notices and the developer said he was no longer required to maintain their units as "affordable" and was going to sell. In addition, tenants had been

overcharged $2 million on their rents. This ensued in a long struggle and the City of Oakland eventually sued the developer over rent overcharges.[220]

Proportion of renter and owner occupied housing
The higher the share of renter-occupied housing, the more rapidly the turnover of rental units, and the more likely the area is to gentrify.[221] Over 80% of Planning Area households are renter occupied and fewer than 20% are owner occupied. This estimate combines three slightly different values from three different sources:

Table 6. Proportions of Renter- and Owner-Occupied Housing Based on Three Sources

Source	Renter Occupied	Owner Occupied
American Community Survey 2005-2009, census tracts 4030, 4033 and 4034	81%	19%
Market Opportunity Analysis	84%	16%
SAP Existing Conditions Report	79% (reports 6% vacant)	15% (reports 6% vacant)

In the city of Oakland, approximately 59% of housing units are renter-occupied.[222] [223]

Housing Affordability

Community Perspectives
In a needs assessment conducted with community engagement in 2008, community members indicated on a survey that the most needed type of housing or housing service in the community was affordable housing. Out of 13 options including various types of housing being offered, financial assistance for housing, and housing policy change, over half of survey respondents (54%) selected affordable housing (rented or owned) as the community's biggest need.[224]

In the focus group with Planning Area merchants and students, participants expressed their desire for new housing for a mix of incomes rather than just low-income housing. They felt that too much low-income housing would not sustain the community, and that a proper mix would provide a stronger consumer base in the area.[225] [226]

Students also expressed the need for additional student housing in the area, and identified the intersection at Oak and 6th Streets as one good location.

Median gross rent
Gross rent refers to total rent including all utilities the renter is responsible for. The SAP Existing Conditions Report indicates that based on data from the 2000 census, median gross rent in the Planning Area is about 70% of median gross rent in the City overall. Thus, Planning Area is in relatively affordable compared to the whole city. However, it is acknowledged that based on the available data it is difficult to determine if the lower median gross rent is a result of city-assisted affordable units and public housing in the area.

Proportion of income spent on housing
The generally accepted definition of affordable housing, as stated by the US Department of Housing and Urban Development,[227] is for a household to pay no more than 30% of its annual income on housing.

Families who pay more than 30 percent of their income for housing are considered cost burdened and may have difficulty affording necessities such as food, clothing, transportation and medical care.

For renter households in Planning Area census tracts, 45% pay equal to or more than 30% of their household income on rent. A slightly higher percentage of Oakland renters (52%) have unaffordable rent costs.

Households that spend more than 50% of their income on their homes are classified by the National Low Income Housing Coalition as severely cost-burdened.[228] Of owner households in Planning Area census tracts, 29% spend 50% or more of their household income on housing costs. Of owner households in Oakland, this value is slightly lower at 23%.

Table 7. Housing Costs as Proportion of Income

	Planning Area Census Tracts	Oakland
Renters paying equal to or more than 30% of household income on rent	45%	52%
Home owners paying equal to or greater than 50% of their income on housing	29%	23%

Source: US Census 2005-2009 American Community Survey

Housing and Transportation Affordability Index

The Center for Neighborhood Technology (CNT) has developed a tool called the Housing and Transportation (H&T) Affordability Index, for assessing the true affordability of housing choice by factoring in both housing and transportation costs in a neighborhood. The H&T Affordability Index is based on the notion that transportation costs are an integral part of housing location and should be considered as part of a household's total economic picture. While the traditional definition of affordable housing is that housing should be less than 30% of income, the H+T Index suggests that 45% of income is a conservative estimate for combined housing and transportation expenditures, and a reasonable goal that helps insure adequate funds remain for other household necessities. CNT's methodology for the index is detailed on their website.[229]

For Planning Area block groups where data is available, average costs of housing alone range from 8.1% to 18% of household income. Exceptions include a few lake-front properties having housing costs at 33% and a block group that overlaps with a portion of the Planning Area south of I-880 and north of Jack London Square, which contains housing costs of 41% of income.[230] These percentages are based on the average of owner costs and gross rent costs factoring the respective percentages of owner-occupied housing units with a mortgage and renter-occupied units with cash rent. Based on the traditional definition of affordable housing as housing with costs below 30%, the vast majority of households in the Planning Area would live in affordable housing.

Combined housing and transportation costs in the Planning Area, where data is available, range from 22% to 33% with the exception of the same lake-front properties as above having combined costs of 48% and the same block group south of I-880 having combined costs of 57% of income.

Based on CNT's definition of an affordable range for housing and transportation as the combined costs consuming no more than 45% of income, the vast majority of households in the Planning Area are well

within an affordable range. However, locally specific costs of transit fares and passes may impact this classification.

Proportions of housing for various income levels
The Planning Area includes several city-assisted affordable housing sites. In addition, it includes public housing sites funded by federal aid. Table 8 below presents numbers of both types of affordable housing units in the Planning Area.

Table 8. Affordable Housing Units in the Planning Area

	Extremely Low Income units	Very low income units	Low income units	Moderate income units	Total units
City Assisted Affordable Units in the Planning Area	18	1268	294	13	1593
Public Housing*					101
Total Affordable Housing Units in Planning Area					1694

Source: Lake Merritt Station Area Plan Existing Conditions Report
* Public housing is housing that is publicly funded and administered for low-income families.

Planning Area Housing Need Allocation
According to figures given by the City of Oakland, the Planning Area needs an additional 1,327 homes by 2015 in the following income categories. The full allocation needed is reported below in Table 9.

Table 9. Planning Area Housing Need Allocation (2010-15)

Affordability Level	Housing Need (units)
Very low-income	172
Low income	190
Moderate income	286
Above moderate income	679
Total need	1,327

Source: City of Oakland, Lake Merritt Station Area Plan Existing Conditions Report.

<u>Overcrowded Housing</u>

Community Perspectives
Community members have expressed that overcrowding is a concern in Chinatown.[231]

Average number of people per household in Planning Area
In just over 6,000 households in the Planning Area, the average number of residents per household is two. The SAP Existing Conditions Report states this value as 1.94 or 1.96 (both values are reported).[232] The average value for the three census tracts analyzed, which incorporates weights for each tract's contribution to the total population, is 1.87 people per household.[233] The number of people per household is relatively low compared to Oakland's average household size of 2.65.[234] This may be due to a higher amount of senior and single-resident occupancy (SRO) facilities in the Planning Area.

As stated previously, the US Department of Housing and Urban Development definition of an

overcrowded household is greater than 1.01 people per habitable room. Severe overcrowding is defined as greater than 1.51 people per room. Given these definitions, there are 235 overcrowded households and 242 severely overcrowded households in the Planning Area census tracts. Nearly 8% of households in these three census tracts are either overcrowded or severely overcrowded.

In the City of Oakland, approximately 4% of housing units are overcrowded and approximately 0.8% are severely overcrowded.[235]

5.4.3. Impacts of the Draft Emerging Plan on Housing, Related Health Outcomes, and Recommendations Proposed by this HIA

Recommendations are presented in *italics*.

Displacement Impacts

The Planning Area has been identified as being very vulnerable to gentrification in the coming years. This is a voiced concern with many community leaders involved in this Health Impact Assessment, and has been verified in a 2009 gentrification toolkit report conducted by Chappel at the Center for Community Innovation.[236] This report specifically identifies community indicators that make a community more susceptible to gentrification in the Bay Area as reinvestment occurs. While this report does not aim to predict gentrification and displacement, it suggests that there is a potential for these to occur if not mitigated during a redevelopment process. Indicators and variables that were specifically looked at included transportation, amenities (recreational and youth facilities, public spaces and parks), demographics, housing conditions and characteristics, income, and geographic location. Of the 18 census tracts found to be the most susceptible to gentrification in the Bay Area (Association of Bay Area Governments nine-county region), three fall within the Planning Area (4030, 4034, 4060). The Lake Merritt/Oakland Chinatown area was specifically focused on as a case study in this report. The case study concludes that the Lake Merritt BART/Chinatown area (the area adjacent to the Lake Merritt Bart station, consisting mostly of redeveloped superblocks with institutional and government users, and the intact grid in Chinatown to the west) is highly susceptible to gentrification with a score of 16 (out of 19 indicators). Thus, without specific mitigations in place, development related to the LMB SAP may lead to displacement and gentrification.

According to the gentrification toolkit report referenced above,[237] the most important intervention for preventing displacement and gentrification is to create permanently affordable housing. Since rent burden does not (yet) seem to be a critical issue in the Planning Area, the focus should be on offering more opportunities for low-income homeownership, to slow the pace of residential turnover. If rent burdens increase as newcomers arrive, rental assistance programs are recommended.

Affordable Housing Impacts

The DEP doesn't make specific proposals around housing that make it possible to predict its cost. However, the DEP acknowledges the need for affordable housing in the Planning Area. Moreover, the expected growth in retail and service jobs in the Planning Area as a result of the DEP, the lower wage status of many of these jobs, and the recommendations above around local hiring indicates further need for affordable housing development. The DEP offers several strategies that are currently under review for addressing this need, and also says that affordable family housing will be sized to support the area's small households as well as families requiring 2- and 3-bedroom units.

The DEP indicates that lower density development is more feasible in the short term, while higher density development will become feasible as the housing market recovers from the recent downturn and rents and sale prices are higher (i.e., page 3-22). Because developers are likely to receive density bonuses in exchange for building affordable units and higher density allows developers to earn income from a greater number of units, higher density development is typically more supportive of affordable housing. Thus, we recommend ensuring that high-density development occurs in a timely manner.

We support the policies offered in the DEP for promoting affordable housing, and we recommend commitment to these policies in order to ensure their adoption once the market has recovered. After the market has recovered and resources provided by the Lake Merritt BART Station redevelopment are actualized, gentrification in the Planning Area may be a large threat. Therefore, it is even more important to ensure that these policies are permanently in place.

In addition, based on the importance of affordable housing for health, our housing recommendations are in line with the Oakland Chinatown Coalition as follows:

1. Requirements for new mixed-income housing development with at least 30% of units in the Planning Area affordable to families below 60% AMI ($55,000 for a family of four), including extremely low and very low-income community members. This requirement will support housing for a healthy, diverse mix of incomes, ranging from the lowest income to Oakland's actual median income to higher income residents.
2. The development of family housing larger than 2 bedroom units.
3. Protections against direct displacement from demolition of existing housing and businesses.
4. A strengthening of tenant rights protections for community members against indirect displacement through gentrification and rising housing costs.
5. The Chinatown neighborhood should benefit from publicly-owned parcels, including the development of affordable housing, active park space, and community centers.

5.5 Economic Development

The Economic Development analysis considered the health impacts of the SAP through its effects on the business environment and therefore job creation, wages and benefits, local hiring, and education or workforce development. We also considered the health impacts of the SAP through its effect on businesses and therefore the resources they provide for residents, the social environment they encourage, and the revenues they bring, which facilitate further local job creation and spending.

5.5.1. Research Connecting Economic Development to Health

Wealth, employment and economic mobility are important determinants of health. The SAP will facilitate job creation in the Planning Area. Access to good jobs with benefits, decent pay, upward mobility, and job training help families avoid falling into financial disaster and reduces their risk for premature death and chronic disease.[238]

Income

For individuals, income is one of the strongest and most consistent predictors of health and disease in the public health research literature.[239] Nationally, individuals with the lowest average family incomes ($15,000- $20,000) are three times more likely to die prematurely as those with higher family incomes (greater than $70,000).[240] In addition to premature mortality risk, people with lower incomes are more

susceptible to other risks such as giving birth to low birth weight babies, for suffering injuries or violence, for getting most cancers, and for getting chronic conditions.[241]

The adoption of a living wage, which can be set at a local or state level, is associated with a decrease in premature death from all causes for working adults. Among the offspring of low-wage workers, a living wage was associated with improved educational outcomes and a reduced risk of early childbirth.[242] Attainment of self- sufficiency income predicts better health, improved nutrition, and lower mortality.[243]

Unemployment

People who experience unemployment or unstable employment live shorter lives and have a greater burden of disease. Unemployment leads to a shortened life expectancy and higher rates of cardiovascular disease, hypertension, depression and suicide.[244] [245] [246] [247] Those experiencing precarious or unstable employment have worse self-rated health and higher rates of hypertension, longstanding illness, mild psychiatric morbidity and general illness symptoms.[248] In 1976, an estimated 6,000 excess deaths were reported as a result of a 1% increase in unemployment in the United States.[249] Those who self-reported job insecurity versus those with secured employment faced minor mental illness.[250]

Local hiring

Being able to work close to home decreases poor health outcomes associated with driving time, such as stress, heart problems, musculoskeletal disorders, and lack of time for physical activity, social cohesion and family. The more time in the car, the less time a person has to engage in leisure time physical activity, and physical activity is associated with many health outcomes.[251] In one US study, each additional hour spent in a car per day was associated with a 6% increase in the likelihood of obesity. Each additional hour walked per day was associated with a 4.8% reduction in the likelihood of obesity.[252] Time spent in a car driving is also associated with 1.6 to 2.8 times higher odds of having shoulder pain when compared to those who spend less time in a car.[253] Traveling to and from work is the single biggest cause of stress for many people. According to a UK survey, 44% of people believed rush hour traffic was the single most stressful part of their life.[254] Time spent commuting decreases the time an individual has with family and affects engagement in civic or volunteer activities.[255] Long commutes can distance an individual from his or her community and decrease social connectivity. Social connection has a variety of health impacts, ranging from reducing stress, having a longer lifespan, and supplying access to emotional and physical resources.[256] [257] Reduced driving also decreases air and noise pollution and emission of greenhouse gases, all of which have negative health impacts ranging from respiratory disease to stress to death from extreme weather (air quality impacts of driving are discussed in the Transportation section).

Health Insurance Coverage

Employment offers opportunities for health insurance coverage and other benefits. Nationwide, 18,000 premature deaths a year are attributable to lack of health coverage. People without health insurance often forego timely health care and suffer more severe illnesses.[258] Families with at least one full-time, full-year worker are more than twice as likely to have health insurance coverage compared to families with part-time, seasonal, temporary, self- employed, or contracted workers.[259]

Paid Sick Leave

Overall, 39% of Californians lack paid sick days. Workers who are full time and in the top 1/4th of earnings are over three times more likely to have paid sick days than part-time and in the bottom 1/4th of earnings.[260] Parents with paid sick days are over five times more likely to care for children when they are sick, more likely to take time off when they are sick, and less likely to transmit infectious diseases

like flu and gastrointestinal illness.[261]

Workforce Development

Successful transitional jobs programs in over 30 US states have been found to promote higher job retention rates and wage gains, reduce employer turn-over, reduce recidivism, reduce reliance on public benefits, and lower child poverty.[262] In an evaluation of the U.S. Workforce Investment Act, individuals participating in job training had significant increases in earnings after receiving the training compared to those who did not receive the training.[263]

Retail Goods and Services

The types of retail that a city encourages to locate in an area, as well as the public services that are made available, can impact the choices that residents make. The location of goods and services and their proximity to where people live helps determine whether people use them, how often, and how they access them (e.g., by walking or driving). Research suggests that closer proximity to retail can increase access and, in turn, health.

Improved nutritional health is one example of a consequence of retail proximity, as a neighborhood supermarket can increase access to and consumption of affordable, quality food.[264] Diet-related disease is one of the top sources of preventable deaths among Americans.[265] A lack of supermarkets can lead to smaller stores as the main source of local groceries, or the need to drive to get groceries. One study conducted in Los Angeles County concluded that longer distances traveled to grocery stores were associated with an increased body mass index (BMI).[266] For a 5'5" tall person, traveling 1.75 miles or more to get to a grocery store meant a weight difference of about 5 pounds. Several studies have shown that a majority of people get their groceries in distances that take 5-10 minutes to reach, and are 0.4 – 0.9 miles away.[267] A lack of proximity results in low-income households having little choice about where to purchase food. Such households buy less expensive but more accessible food at fast food restaurants or highly processed food at corner stores. These types of foods are often higher in calories but usually lower in nutritional value.[268] The result of consuming these types of foods is higher obesity in low-income populations.[269]

Physical activity can also increase if residential uses and their retail service needs are closely integrated. A study in Atlanta assessed resident obesity in relation to development density, mixed-uses, and street connectivity and found a 12.2% reduction in the odds of being obese with each inter-quartile increase in these factors.[270] This provides evidence that living in a mixed-use area with a variety of shops and services is a good predictor of obesity levels in urban areas. A San Francisco Bay Area study looking at non-work related trips in four neighborhoods, controlled for socio-economic status, found that proximity and mix of retail as well as having many quality destinations and modes of transport choices are some of the most influential factors in people's decisions to walk.[271] Physical activity has been associated with various health benefits including reductions in premature mortality, the prevention of chronic diseases such as diabetes, obesity, and hypertension, and even improvements in psychological well-being.[272] [273]

Chinatown, compared to other retail nodes in Oakland, has one of the highest sales volumes in the City with over $10 Million in sales in 2006.[274] Indirectly, retail can contribute to a vibrant economy, potentially increasing income and job security, both of which are well-established determinants of health.[275] [276]

Social Cohesion

A feeling of social connectedness has health benefits. Higher rates of social connectedness or support are associated with lower resting blood pressure, better immune system function, and lower amounts of stress hormones.[277] One study showed that for patients recovering from heart surgery, ratings of the statement "I feel lonely" were associated with mortality at 30 days and five years after surgery, even after controlling for preoperative conditions known to increase mortality.[278] A study in Australia showed that higher levels of social integration as measured by almost all indicators were associated with lower mortality rates.[279] Those who consider themselves socially connected are more likely to actively cope (e.g., problem solve) with stressful tasks and situations. Active coping has been associated with a biomarker signifying a healthier cardiac response.[280] Studies consistently find an inverse relationship between levels of social connection (defined as "social capital") and mental health issues: the higher the level of trust and connectivity in an area, the lower the levels of mental illness.[281]

5.5.2. Existing Economic Development Conditions in Planning Area

The following section reports on the following existing conditions related to the above listed health impacts of the business environment: workforce characteristics, including income, age, educational attainment, employment and work location; business characteristics, including employment potential, industry and occupational categories; wages and benefits; and workforce development. Additionally, existing conditions for businesses that offer necessary resources, and that facilitate growth and potential to attract more revenue to the area are presented.

Community Perspectives

Priorities raised by merchants in the "merchants tea" were wishing to "expand Chinatown and attract more people to the area to better compete with other Asian markets and centers." They expressed that a key asset of Oakland's Chinatown is its unique and vibrant environment. They noted their concern about zoning regulations being too restrictive for certain businesses; for example, medical services such as acupuncture are not permitted on the ground floor of buildings, within 30 feet of the front property line, or in a certain zoning category.[282]

Reports from youth who frequent the Planning Area, which were gathered by the City of Oakland through the "students tea," indicate that mixed-use development, more shopping and dining, and revitalized night life are desired. Students felt that businesses such as restaurants or a major market should be open much later, noting that the nearest eateries to campus close at 2:30pm. Some students felt that there should be a range of businesses, with ideas such as coffee houses, a Trader Joe's, and a Farmer's Market on campus.[283]

HIA steering committee members and participants in focus groups ("teas") conducted by the City of Oakland felt strongly that the social and cultural benefits of the Asian resident community, culturally focused retail, and cultural resources contribute to a sense of social cohesion and are a great health asset of the Planning Area. The presence of Asian-targeted goods and services destinations and recreation and cultural centers contribute to social cohesion because they draw Asian residents from nearby and more distant locations within the bay area, provide a gathering place for Asian residents and allow people to meet and interact with others in these spaces. This creates and encourages a sense of community, or more specifically, a sense of mutual aid, neighborhood security, of belonging, and shared values.

Workforce characteristics

Table 10 shows the average resident representation in various occupations and industries over the 5-year period from 2005 to 2009, according to the census. For residents of the Planning Area, the occupation with the greatest representation was management, professional, and related, followed by service, and sales and office occupations. This is similar for residents of Oakland. The industry with the greatest representation by residents in the Planning Area was educational services, health care and social assistance. This was the same for the residents of Oakland. The next highest industries represented by Planning Area residents are arts, entertainment, and recreation, and accommodation and food services; finance and insurance, and real estate and rental and leasing; retail trade; and professional, scientific, and management, and administrative and waste management services (in this order).

Table 10: Occupation and Industry representation for residents in the Planning Area

	Planning Area		Oakland	
	Total	% of Total	Total	% of Total
Occupation				
Civilian employed population 16 years and over	**5,872**		**189,999**	
Management, professional, and related occupations	2,380	41%	78,772	42%
Service occupations	1,309	22%	34,298	18%
Sales and office occupations	1,431	24%	40,677	21%
Farming, fishing, and forestry occupations	0	0%	432	0.2%
Construction, extraction, maintenance, and repair occupations	414	7%	16,473	9%
Production, transportation, and material moving occupations	338	6%	19,347	10%
Industry				
Civilian employed population 16 years and over	**5,872**		**189,999**	
Educational services, and health care and social assistance	1,412	24%	44,880	24%
Arts, entertainment, and recreation, and accommodation and food services	681	12%	17,720	9%
Finance and insurance, and real estate and rental and leasing	624	11%	12,401	7%
Retail trade	574	10%	18,328	10%
Professional, scientific, and management, and administrative and waste management services	561	10%	30,208	16%
Public administration	496	8%	7,712	4%
Manufacturing	479	8%	12,430	7%
Construction	378	6%	14,309	8%
Other services, except public administration	318	5%	11,311	6%
Information	179	3%	5,850	3%

Wholesale trade	85	1%	4,732	2%
Transportation and warehousing, and utilities	85	1%	9,636	5%
Agriculture, forestry, fishing and hunting, and mining	0	0	482	0.3%

Source: 2010 Decennial Census (Race/Ethnicity only); American Community Survey, 2005-2009 5-year averages for three Census tracts that intersect the Planning Area and all of Oakland city.

The Census does not provide health insurance coverage information for smaller areas than Oakland, but looking at Oakland indicates that the majority of residents had health insurance coverage as of the 2009 American Community Survey.

Table 11. Total Oakland population with and without health insurance coverage

Total male/female all ages **with** health insurance	338,519	83%
Total male/female all ages **without** health insurance	68,693	17%

Source: 2009 American Community Survey

Business Characteristics

Site Visits

In order to get a better sense of the business environment than was available through public data, we conducted site visits to four key sections of the Planning Area. These provided a more specific description of land use, the feel of the business environment, the presence of chain and independent establishments, cultural influences, and pedestrian activity. We also wanted to confirm the presence of some of the business types that we were interested in specifically counting.

The areas we visited included Chinatown, the area near the Lake Merritt BART station, the area near some of the government buildings around Madison and 13th Street, and the east side of Lake Merritt near International Blvd. and 2nd Avenue. For four specific blocks we recorded the land use, types of businesses present, the number of businesses present, the presence of Asian characters on signage, chain establishments, and the level of pedestrian activity (a few, medium, or a lot of people walking). We also made note of chain establishments and Asian signage as we walked to and from the blocks we observed to get a sense of these for a broader area. Appendix D includes the observational survey guide.

These four areas were very different in terms of the business environment. The area with the most business and pedestrian activity was by far Chinatown. On the block we observed, we estimated a total of 35 ground-floor businesses and an average of 9 businesses on each face of the block (4 faces total). There was a mix of retail offerings, including grocery stores, restaurants, jewelry stores, and banks and there were offices on the second floors of many of the buildings. Almost all of the businesses had Asian characters on signs and we noticed one national chain—an insurance agency—and two local chains on the whole block—a cell phone communications company and a bank. There was a lot of pedestrian activity on each block face, which we defined as roughly 10 or more people on the street. In fact, one block face with a predominance of produce markets had over 100 people walking.

The other areas had fewer businesses (two blocks had some block faces with no businesses) and even some defunct businesses and vacant lots. The other blocks contained more residential or institutional

uses and parking lots. In the other parts of the Planning Area, outside Chinatown, we encountered one other chain (McDonalds) and an ATM sign for a national chain bank. Pedestrian activity was either absent, or consisted of a few people walking. Outside of Chinatown the Asian cultural influence (using Asian language signage as the indicator) is mostly absent. One exception to this is in the area east of Lake Merritt and the Oakland Estuary near International Ave and 2nd Ave; there's another Asian cultural hub just outside of the eastern border of the Planning Area.

These findings indicate, anecdotally, that there is a relationship between an active business environment and increased pedestrian activity. Additionally, Chinatown represents a cultural draw to this commercial area that may be contributing to successful business operations and economic vitality. There is a lot of potential for increasing business activity in parts of the Planning Area outside of Chinatown and a realization of this opportunity may bring about a more active street life in those areas.

Zoning and mixed land uses
According to the SAP Existing Conditions Report, the Planning Area is 7% mixed use. The mixed use areas are made up of the following three mixes of uses: Office and Retail (2%), Residential and Office (1%), and Residential and Retail (3%). For perspective, the uses that take up the largest proportion of the Planning Area are Public/Institutional (31%), Residential (17%), Residential Multi-Family (16%) and Park (15%; includes local parks and regional parks such as parkland bordering Lake Merritt and the Estuary). Only 4% is occupied by Office uses and 2% by Commercial.

Based on walking through mixed-use areas during the site visits, it appears that these have more pedestrian activity than areas that are not mixed use.

Employment potential and industry and occupational categories
Table 12 shows the number of establishments by industry and the number of employees associated with those establishments according to the Census for two different geographic areas – Oakland and the three zip codes (combined) that intersect the Planning Area (94606, 94607, and 94612).[284] [285] The zip code data represents an area smaller than Oakland, but still larger than the Planning Area because some portions of these zip codes fall outside of the Planning Area (even large portions) (see Figure 1).

The Census reports slightly different information for Oakland compared to that reported for zip codes. The zip code Census data reports the number of establishments with employees in various size classes (e.g., 1-4, 5-9, 10-19, 20-49 employees, etc.); therefore, the figure reported in Table 12 for zip codes for the number of employees is the median number of employees represented across all of the employee size classes. The exact number of employees per establishment can therefore not be known given these data. Looking at the size classes shows that the majority (60% and above) of the establishments have either 1-4 or 5-9 employees and almost all establishments in these three zip codes have fewer than 100 employees. The only businesses that on average have more employees in the larger size classes (10-19 or 20-49) are those in the following industries: management of companies and enterprises; administrative and support and waste management and remediation services; and educational services.

The industries with the most establishments in Oakland and the three zip codes is for the most part consistent for these two geographic areas, with the top five industries in terms of number of establishments including the following (in this order): professional, scientific, and technical services; health care and social assistance; retail trade; other services; and accommodation and food services.

Looking at these data in terms of the number of jobs offered provides a picture of the employment potential of the various industries. The industries offering the most jobs in the three zip codes intersecting the Planning Area include (in this order):

- Professional, scientific, and technical services;
- Health care and social assistance;
- Administrative and support and waste management and remediation services;
- Finance and insurance;
- Other services;
- Transportation and warehousing; and
- Accommodation and food services.

However, these rank differently compared to the Oakland data.

The industry categories with the highest employee to establishment ratios in the Oakland data, or that offer relatively more jobs per business, are as follows (in this order):

- Information (28 employees per establishment)
- Arts, entertainment, and recreation (27 employees per establishment)
- Administrative and support and waste management and remediation services (27 employees per establishment)
- Health care and social assistance (22 employees per establishment)
- Manufacturing (22 employees per establishment)

This order (employees per establishment in Oakland) was taken from the Oakland data because the exact number of employees is estimated, unlike the zip code data where the median number of employees per establishment is estimated. These industries are not necessarily those that offer the most jobs because some of these industries are represented by fewer establishments.

Table 12. Total Establishments by Industry and Employees in Oakland (2007) and Three Zip Codes Intersecting the Planning Area (2008)

		Oakland (2007)			Three zip codes Intersecting the Planning Area (2008)		
NAICS Code	Industry description	Number of establishments	Number of paid emplys	Emplys per est.	Number of establishments	Median number of Emplys across emplymnt size classes	Emplys per est.
54	Professional, scientific, and technical services	1,491	15,315	10	773	11,846	15
62	Health care and social assistance	1,231	27,120	22	319	6,764	21
44	Retail trade	1,099	11,176	10	321	3,456	11
81	Other services (except public administration)	844	6,692	8	451	5,627	12
72	Accommodation and food services	826	11,240	14	336	4,763	14
53	Real estate and rental and leasing	475	2,942	6	158	1,411	9
31	Manufacturing	407	8,970	22	146	2,721	19
56	Administrative and Support and Waste Management and Remediation Services	403	10,727	27	140	6,655	48
51	Information	179	5,088	28	81	3,348	41
61	Educational services	130	1,118	9	80	2,362	30
71	Arts, entertainment, and recreation	118	3,225	27	41	1,423	35
52	Finance and insurance*	--	--	--	231	5,671	25
42	Wholesale trade*	--	--	--	213	3,416	16
23	Construction*	--	--	--	156	2,338	15
48	Transportation and warehousing*	--	--	--	115	5,039	44
55	Management of companies and enterprises*	--	--	--	38	4,075	107
	Total	7,203	103,613		3,608	70,935	

* Industry categories not included in Oakland data

The SAP Existing Conditions Report includes an estimate of the number of jobs available by job category in the Planning Area (see Table 13). It is not possible to directly compare these numbers to those accessed through the Census (above) because the geographic area, sources, time period and categories of jobs provided are different. However, given that three out of the five industry categories from the zip code data are included in the top ranked "Service Employment" category of the Existing Conditions data, it is reasonable to assume that the jobs pattern displayed in the Planning Area (as defined by the SAP

Existing Conditions Report) is similar to the other sources. Retail jobs are about the third highest in terms of number of jobs available in Oakland and in the Planning Area (as defined by the SAP Existing Conditions Report), but this ranking differs from the number of employees at retail jobs in the three zip codes intersecting the Planning Area.

Table 13. Jobs by category in the Planning area and City of Oakland (2005)

Job Category	Total jobs in the Planning Area	Percent of total jobs in Planning Area	Total jobs in Oakland	Planning Area jobs as percent of Citywide jobs (within the category)	Planning Area jobs as a percent of total Citywide jobs	Percent of total in Oakland
Service Employment (includes health, educational, recreational, financial and professional jobs)	11,922	39%	84,994	14%	6%	42%
Other	11,822	39%	69,042	17%	6%	34%
Retail	4,168	14%	24,163	17%	2%	12%
Manufacturing	1,595	5%	17,002	9%	1%	8%
Wholesale/ Trade	958	3%	6,927	14%	0%	3%
Agriculture, Fishery, & Mining	23	0%	289	8%	0%	0%
Total	30,488		202,417			

Businesses and occupations with opportunity

California's Employment Development Division publishes a list of the fastest growing occupations in the Oakland-Fremont-Hayward Metropolitan Division for the years 2008-2018.[286] The list includes about 50 occupational titles where employment is expected to increase between 2008 and 2018. The percentage increase in employment, the median hourly wage for the title, and the education and training level needed are given. Because these are occupational titles, they do not directly correspond to the industry categories listed above. Further, many of these occupations are those that could be held by self-employed individuals. Nevertheless, if our goal is to understand the potential for jobs in occupations that are expected to be in demand, we can make some assumptions about which occupational titles listed below correspond to which industry categories. These assumptions are listed in the last column of Table 14 below. The industry categories with the most occupational titles expected to increase between 2008 and 2018 are health care and social assistance, and professional, scientific, and technical services (in that order). These industries are already in the top 5 in terms of the number of establishments and employees in Oakland and in the three zip codes that intersect the Planning Area.

Table 14 was sorted to highlight the occupations that require the least amount of education and training, the highest median hourly wage, and the greatest percent change in employment. Given the average education levels of Planning Area residents (see Section 5.1 – 44% of residents have a college degree or higher), a good portion of the occupations on this list may be appropriate for Planning Area residents.

Of the **37** fastest growing occupations with job growth at or above 20% in Oakland between 2008 – 2018:

- 8 require a first professional, doctoral or master's degree (22%)
- 5 require a Bachelor's Degree (14%)
- **10 require an Associate Degree or Post-Secondary Vocational Education (27%)**
- 8 require work experience in a related occupation, long-term on-the-job training or moderate-term on-the-job training (22%)
- 6 require short-term on-the-job training (16%)

More of the fastest growing occupations in Oakland require advanced education beyond high school. Also, 24% of the high growth jobs listed for Oakland do not provide a living wage ($19.58/hr for one adult and one child – see below) and 44% do not provide the self-sufficiency wage ($27.99/hr for one adult with one preschool-age child). Finally, 60% of the fast growing occupations that only require on the job training do not pay a living wage.

Table 14. Occupational Titles That Are Predicted to Grow the Fastest Between 2008 and 2018

Occupational Title	Percent Change in Emplymnt	Median Hourly Wage	Education and Training Levels*	Industry category (see Table 12 above)
Refuse and Recyclable Material Collectors	17.8	$22.27	11	56
Interviewers, Except Eligibility and Loan	18.4	$20.70	11	81^
Nursing Aides, Orderlies, and Attendants	26.4	$14.64	11	62
Taxi Drivers and Chauffeurs	20.5	$11.98	11	48
Ushers, Lobby Attendants, and Ticket Takers	21.9	$10.64	11	71
Hotel, Motel, and Resort Desk Clerks	23.1	$10.53	11	72
Home Health Aides	50.6	$9.78	11	62
Amusement and Recreation Attendants	20.7	$9.50	11	71
Dental Assistants	31.2	$21.68	10	62
Pharmacy Technicians	27.8	$19.51	10	62
Medical Assistants	32.7	$16.41	10	62
Dietetic Technicians	21.7	$14.96	10	62
Coaches and Scouts	24.3	[2]	9	54
Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	30.9	$28.07	9	54
Interpreters and Translators	18.2	$25.09	9	81^
Audio and Video Equipment Technicians	19.6	$19.92	9	54
Self-Enrichment Education Teachers	27.5	$23.25	8	61
Licensed Practical and Licensed Vocational Nurses	22.9	$28.24	7	62
Surgical Technologists	29.6	$24.86	7	62
Fitness Trainers and Aerobics Instructors	40	$19.98	7	54 or 81
Medical Secretaries	27.2	$18.51	7	62
Dental Hygienists	31.1	$49.06	6	62
Registered Nurses	25.1	$48.06	6	62
Radiologic Technologists and Technicians	20.2	$36.01	6	62

Insurance Sales Agents	17.8	$35.99	6	52
Respiratory Therapists	27.8	$33.80	6	62
Paralegals and Legal Assistants	18.4	$29.10	6	54
Medical Records and Health Information Technicians	23.3	$19.01	6	62
Veterinary Technologists and Technicians	20.2	$17.93	6	54
Physician Assistants	41.9	$49.17	5	62
Network Systems and Data Communications Analysts	36.7	$39.02	5	51 or 54
Probation Officers and Correctional Treatment Specialists	17.7	$38.23	5	81^
Credit Analysts	18.9	$36.34	5	52
Training and Development Specialists	17.4	$34.97	5	61
Personal Financial Advisors	27.2	$33.49	5	52
Compensation, Benefits, and Job Analysis Specialists	20.2	$30.91	5	54
Public Relations Specialists	18.8	$30.21	5	54
Medical and Public Health Social Workers	18.7	$29.43	5	62
Employment, Recruitment, and Placement Specialists	19.2	$28.07	5	54
Medical and Health Services Managers	21.8	$50.22	4	62
Occupational Therapists	33.3	$42.07	3	54
Physical Therapists	33	$41.84	3	62
Instructional Coordinators	21.5	$35.29	3	^
Mental Health and Substance Abuse Social Workers	17.3	$25.29	3	62
Mental Health Counselors	19.5	$20.99	3	54 or 62^
Biochemists and Biophysicists	35.7	$42.71	2	54
Medical Scientists, Except Epidemiologists	36	$40.95	2	54 or 62
Internists, General	29.2	N/A	1	62
Pediatricians, General	30.2	$77.52	1	62
Family and General Practitioners	18.5	$67.27	1	62

^ = Uncertain which Industry Category is most appropriate.

*Education and training levels

1 - First Professional Degree - LLD/MD
2 - Doctoral Degree
3 - Master's Degree
4 - Bachelor's Degree or Higher and Some Work Experience
5 - Bachelor's Degree
6 - Associate Degree
7 - Post-Secondary Vocational Education
8 - Work Experience in a Related Occupation
9 - Long-Term On-the-Job Training
10 - Moderate-Term On-the-Job Training
11 - Short-Term On-the-Job Training

Small Businesses

Given that development in the Planning Area is likely to focus on opportunity sites and other infill strategies, small businesses may be particularly relevant for the economic development policies included in the SAP. Small businesses are valuable because they are a primary source of economic growth, create a large portion of the country's new jobs, are a source of innovation in the marketplace, are flexible in terms of facilities (more small businesses can fit into an area space-wise compared to large firms), they often fill underserved niches in the labor market, and they employ higher shares of minority workers (65.9 percent of Hispanics work for firms with fewer than 500 employees) and individuals with low educational attainment.[287] [288]

Despite these benefits, small businesses also have some disadvantages. Of all the new business startups in this country, only 1/3 eventually turn a profit, 1/3 break even, and 1/3 never leave a negative earnings scenario.[289] Small firms' average pay tends to be lower than that of larger firms; however, this may be due to the demographic profile of the small firm work force. When comparing wages between large and small firms the difference in pay disappears when the comparison is limited to full-time workers with a college degree.[290] Small firms may also face challenges around financing and providing health care and retirement benefits to their employees.[291]

It is difficult to conclude, however, that small businesses are either all good or all bad because while they are more volatile, they do still produce a net increase in jobs per year and the successful and growing small businesses represent the stable and large businesses of tomorrow. About half of new firms survive five years or more and almost all fast-growing firms started small, as did most large firms.[292] Therefore, the importance of small firms should not be underestimated because of their challenges.

The US Small Business Association (SBA) defines a small business in rather large terms (under 500 employees). Considering the average employee size of establishments in the Planning Area (almost all are less than 500 employees and several are under 20), it is therefore important to consider whether there are any differences between the "large" and the "small" small businesses. Are smaller firms any less viable? A report by the SBA examined the under-20 employee subset of small business in the current economic downturn and found that these firms' employment losses were seen mostly in the early part of the recession, while firms with 20 to 499 employees have realized losses more recently. The report indicates that firms with fewer than 20 employees accounted for 24 percent of the net job loss from 2008 to the second quarter of 2009; firms with 20 to 499 accounted for 36 percent; and firms with more than 500 employees accounted for 40 percent.[293] So they are not necessarily more fragile than larger small businesses.

Although the SBA uses a larger definition of a small business, for the purposes of this analysis, we are considering establishments with 20 or fewer employees to be small. Table 12 above indicates that for the three zip codes intersecting the Planning Area, eight out of the 16 industries represented on average fall beneath this limit (see "Employees per establishment" column). However taking into account the prevalence of some of these industries in the Planning Area, for example professional, scientific, and technical services; retail trade; other services; and accommodation and food services, or by the SAP Existing Conditions report's categorization, service employment, other, and retail, there is likely a predominance of small businesses in the Planning Area. This conclusion is supported by the Oakland 2010 Business Retention and Expansion Survey, which found that most businesses in Oakland are relatively small—68% have less than 20 employees and 60% have revenues of less than $2.5 million.[294]

Independent and franchised establishments

There is currently a predominance of independent businesses in the Planning Area as revealed by the site visits. Because there are so many, an understanding of the benefits and drawbacks of franchises is warranted, as current Planning Area merchants favor expanding independent businesses rather than attracting franchised firms.[295]

The primary concerns related to franchises are whether or not these businesses are more viable in the long term and whether they have the potential to bring more jobs to the area compared to independent establishments. Research indicates that startup franchises are actually not more likely to survive than independent startups. This is because young franchise firms are concentrated in retailing and retailing firms have higher risk and lower return profiles. Franchise startup owners are also more likely to be less educated, which is linked to higher failure rates. However, franchises are more likely than independent firms to utilize paid employees and they are more likely to employ more employees (9.3 vs. 2.1).[296]

Green Businesses

Green businesses are another example of business types that are likely to see greater employment in the future, given the country's need to promote sustainable development and natural resource utilization. The CA EDD defines "Green Jobs" as jobs involved in economic activities that help protect or restore the environment or conserve natural resources. They report these economic activities as generally falling into the following categories:

- Renewable energy
- Energy efficiency
- Greenhouse gas reduction
- Pollution reduction and cleanup
- Recycling and waste reduction
- Agricultural and natural resources conservation
- Education, compliance, public awareness, and training

Unfortunately, we were not able to identify an accurate source of information to describe the presence of green businesses in the Planning Area. The U.S. Green Building Council publishes a list of companies and organizations that are LEED Professional Credential holders who are qualified to build cost-efficient and energy-saving green buildings. However, this list is searchable by state only. The list is not publicly available for smaller areas such as Oakland. It is possible to go through the many listings in California to quantify those doing business in Oakland or the Planning Area, but that task was beyond our resource capacity.

The U.S. Bureau of Labor has also put together a list of the industry classification codes that could contain green businesses,[297] but the industries named contain both green and non-green businesses; therefore, it is not an accurate measure of the number of green businesses in the Planning Area. However, based on this list, we did identify the following industries that contain green businesses and are likely to be present in the Planning Area:

- Construction
- Manufacturing
- Wholesale trade
- Retail trade
- Transportation and warehousing
- Information
- Professional, scientific, and technical services

- Administrative and Support and Waste Management and Remediation Services
- Other services (except public administration)

Wages and Benefits

The following are existing conditions for wages offered and income needs, given the cost of living, in Oakland and Alameda County.

Researchers at Pennsylvania State University (Penn State) have gathered data on wages in the United States. Their data on Oakland is publicly available and described below. The 'living wage' they calculate is intended to provide a minimum estimate of the cost of living for low wage families and includes information about costs of food, child care and education, healthcare, housing, transportation, other necessities, and taxes.

Table 15 shows calculations of the living wage for different family types. In order to support the described family, an individual must earn the hourly amount listed as the living wage, assuming they are working full-time (2080 hours per year). The state minimum wage is the same for all individuals, regardless of their family type. The poverty rate is the hourly earnings of a sole provider working full time that would classify that family as being below the poverty level.

Table 15. Comparison of Living Wage For the City of Oakland For Different Family Scenarios

Hourly Wages	One Adult	One Adult, One Child	Two Adults	Two Adults, One Child	Two Adults, Two Children
Living Wage	$11.23	$19.58	$15.72	$24.11	$30.43
Poverty Wage	$5.04	$6.68	$6.49	$7.81	$9.83
Minimum Wage	$8.00	$8.00	$8.00	$8.00	$8.00

http://www.livingwage.geog.psu.edu/places/0600153000

Another measure—the self-sufficiency standard—provides a different perspective on making ends meet in the region. The self-sufficiency standard measures how much income is needed for a family of a certain composition (number of adults and children), living in a particular county to adequately meet minimal basic needs without public or private assistance. Costs taken into account in the self-sufficiency wage calculation include those that families face on a daily basis in a particular area, such as housing, food, child care, health care, transportation, and other necessary spending.[298]

In Alameda County, the self-sufficiency wage for one adult with one preschool-age child is $27.99 per hour. The combined self-sufficiency wage for two adults, one preschool-age child and an infant is $30.72 per hour.[299] Even though California's minimum wage ($8.00) is higher than the federal minimum wage in the US ($7.25), it is still not high enough to meet the self-sufficiency standard.

Table 16 below illustrates the distribution of median wages for various occupations in comparison to the wages necessary for self-sufficiency in Alameda County. As the data shows many occupations do not pay enough to cover a family's basic expenses.

Table 16. Comparison of Oakland Self-sufficiency Wage to Hourly Median Wages for Selected Occupations, Alameda County, 1st Quarter Earnings, 2010[300]

Occupations	Median Hourly Wage
Food Preparation and Serving-Related Occupations	$9.47
Farming, Fishing, and Forestry Occupations	$9.80
Personal Care and Service Occupations	$11.97
Building and Grounds Cleaning and Maintenance Occupations	$13.32
Sales and Related Occupations	$14.16
Healthcare Support Occupations	$14.69
Transportation and Material Moving Occupations	$15.59
Production Occupations	$15.66
Office and Administrative Support Occupations	$18.70
Protective Service Occupations	$20.36
Community and Social Services Occupations	$24.11
Arts, Design, Entertainment, Sports, and Media Occupations	$24.84
Education, Training, and Library Occupations	$25.00
Installation, Maintenance, and Repair Occupations	$25.29
Construction and Extraction Occupations	$27.13
Self-sufficiency wage for one adult with a preschooler	**$27.99**
Combined self-sufficiency wage for 2 adults, 1 preschooler, and 1 infant	**$30.72**
Business and Financial Operations Occupations	$34.43
Life, Physical, and Social Science Occupations	$35.73
Computer and Mathematical Occupations	$39.83
Healthcare Practitioners and Technical Occupations	$40.19
Architecture and Engineering Occupations	$40.85
Legal Occupations	$43.96
Management Occupations	$51.67

The following offers an understanding of the extent to which industries that are present in the Planning Area may offer health insurance. According to the Employee Benefit Research Institute, 70% of all employees in the US are insured. The public sector has the highest rate of health insurance coverage (87%), while 70% of employers in the private sector offer health insurance. In the private sector, the agriculture industry has the lowest rate of insurance coverage and mining; finance, insurance, real estate, and rental leasing; information; and manufacturing have the highest rates, as 84%, 83%, 82% and 81% (respectively) of employees in these industries are covered.

The following are the industries with the most employees in the Planning Area (from zip code data above) and the percent of employees covered by health insurance:

- Professional, scientific, and technical services – 71%
- Health care and social assistance – 78%
- Administrative and support and waste management and remediation services – 71%
- Finance and insurance – 83%
- Other services – 56%
- Transportation and warehousing – 76%
- Accommodation and food services – 46%

The highest of these is finance and insurance and the lowest is accommodation and food services.

Table 17. Employer sponsored Health Insurance for Workers Ages 18-64 by Industry, United States, 2008

	All	Number insured	Percent
All Industries	147,617,960	103,774,893	70%
Self-employed	13,604,794	6,587,978	48%
Wage and Salary Workers	134,013,166	97,186,914	73%
Public Sector	21,206,044	18,528,833	87%
Private Sector	112,807,122	78,658,081	70%
Agriculture	1,392,923	564,830	41%
Mining	781,513	656,011	84%
Construction	8,582,467	4,859,912	57%
Manufacturing	15,409,039	12,510,842	81%
Wholesale and Retail Trade	19,386,026	13,086,790	68%
Transportation and Utilities	5,757,536	4,347,985	76%
Information	3,019,759	2,475,308	82%
Finance, Insurance, Real Estate, and Rental Leasing	8,623,277	7,164,331	83%
Professional, Scientific, Management, Administrative, and Waste Management	12,714,399	9,035,984	71%
Education, Health, and Social Services	19,462,980	15,254,569	78%
Arts, Entertainment, Recreation, Accommodation, and Food Services	12,006,071	5,542,223	46%
Other Services	5,671,132	3,159,296	56%

Source: Employee Benefit Research Institute tabulations of data from the Current Population Survey, March 2009 Supplement.

The following offers an understanding of the extent to which industries that are present in the Planning Area may offer paid sick leave. In California, proportions of workers with paid sick leave were highest among those in information (89%), management (84%), and finance and insurance (83%). Only a minority of workers in construction (22%), administrative and waste services (28%), and accommodation and food service (30%) industries had paid sick leave.

Table 18. Estimated California workers with and without paid sick days

Industry	Percent of workers with paid sick leave, Pacific region [1]	Percent of workers WITHOUT paid sick leave, Pacific region	Employment in California 2007[2]	Number of California workers without paid sick days
Mining	48%	52%	24,518	12,674
Utilities	58%	42%	57,062	24,167
Construction	22%	78%	896,245	702,720
Manufacturing	65%	35%	1,463,970	513,430
Wholesale trade	66%	34%	696,006	237,662
Retail trade	49%	51%	1,639,988	831,857
Transportation and warehousing	73%	27%	423,423	114,863
Information	89%	11%	450,680	50,986
Finance and insurance	83%	17%	588,365	100,545
Real estate and rental	67%	33%	274,969	90,505
Professional and technical services	68%	32%	968,907	307,971
Management	84%	16%	194,557	30,506
Administrative and waste services	28%	72%	963,327	695,758
Educational services	68%	32%	237,468	74,940
Health care and social assistance	78%	22%	1,306,069	284,396
Art, entertainment, and recreation	35%	65%	235,907	154,174
Accommodation and food service	30%	70%	1,222,963	856,233
Other service	60%	40%	674,990	270,472
Total				5,353,859

[1] Source: Data provided by Dr. Vickie Lovell based on Institute for Women's Policy Research analysis of the March 2006 National Compensation Survey, adjusted for job tenure eligibility using the annual average of the 2007 JOLTS. Figure for local government is from Lovell (2004), No Time To Be Sick.

2 Source: Data provided by Dr. Vickie Lovell from Quarterly Census of Employment and Wages. 3rd and 4th Quarter of 2006 and 1st and 2nd Quarter of 2007. Downloaded from www.labormarketinfo.edd.ca. Excludes federal, state, and San Francisco workers, who already have paid sick days.

Workforce Development

The following table was created to provide a sense of the education, training, and workforce development opportunities in the Planning Area and nearby. A variety of class types are represented including those that are part of the East Bay Regional Occupational Program (ROP). These classes receive federal funding through the State Department of Education, and are strategically linked to local industries where jobs are available. Many ROP classes include an internship component, and all offer a certificate upon completion. Some ROP classes are open to adults as well, as are many of the other programs.

Table 19. Education and Workforce Development Resources in and near Oakland

Provider Name	Provider Type	Provider Location
Academy of Chinese Culture	Masters of traditional medicine	Oakland, CA www.acchs.edu
Academy of Truck Driving	Private technical school	Oakland, CA www.acdltruckdriver.com
Advanced Technology Skills	Private technical school	San Ramon, CA www.technologyskills.com
Alameda Computer Center	Employment agencies and opportunities	Oakland, CA
Alameda High School	East Bay Regional Occupational Program (ROP)	Alameda, CA http://www.eastbayrop.org/
Alameda Transportation and Logistic Academic Support	Training and job placement for logistics industry	Oakland, CA http://atlas-training.org/
Bay Cities Bible College	Four-year Colleges and Universities	Oakland, CA http://www.bcbionline.org
Body Electric School	Private Business and Technical Schools	Oakland, CA http://www.bodyelectric.org
Bunche High School	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org/
Business Education Technology	Private Business and Technical Schools	Oakland, CA
Cal State University East Bay	Continuing education	Hayward, CA www.ce.csueastbay.edu
California Building Performance Contractors Association	Energy efficiency training for contractors	Oakland, CA http://cbpcatraining.org
California School of Real Estate	Private Business and Technical Schools	Oakland, CA http://www.easy2pass.com
Castlemont High School	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org
CBIT	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org
Center for Hypnotherapy	Private Business and Technical Schools	Oakland, CA
Central Valley Automotive & Machinist Joint Apprenticeship	Private Business and Technical Schools - Apprenticeships	Oakland, CA www.autoapprenticeship.com
Civicorps Schools	Public Adult Schools with occupational programs	Oakland, CA http://www.cvcorps.org/

College of Alameda	Vocational programs English as a second language	Alameda, CA www.alameda.peralta.edu
Contractors State License Services	Private Business and Technical Schools - Contractors licenses	Oakland, CA www.cslscorp.com
Dewey High School	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org
East Oakland Youth Development Center	Public Institution	Oakland, CA http://www.eoydc.org
EF International Language School of English	Private for profit institution	Oakland, CA http://www.ef.com
Embry-Riddle Aeronautical University	Private non-profit institution - four year college/university	Oakland, CA www.embry-riddle.edu
Encinal High School	East Bay Regional Occupational Program (ROP)	Alameda, CA http://www.eastbayrop.org/
English Center	Teaches English for the work place	Oakland, CA www.englishcenter.edu
ESL On-Site Inc.	Private non-profit institution	Oakland, CA http://www.ESLonsite.com
Expression Center for Digital Arts	Private Business and Technical Schools	Oakland, CA http://www.expression.edu
Family Bridges Inc	Private non-profit institution	Oakland, CA http://www.fambridges.org
Far West	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org
Fremont CPA	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org
Fresno Area Brick and Tile Apprenticeship	Private Business and Technical Schools - Apprenticeships	Oakland, CA http://www.bac3train.com
Golden Gate School of Lock Technology	Private Business and Technical Schools	Oakland, CA
Goodwill Industries of the Greater East Bay	Public Adult Schools with occupational programs	Oakland, CA http://www.goodwill.org
Green Career Institute, LLC	Education and training for the green industry	Oakland, CA www.greencareerinstitute.com
H & R Block Income Tax School	Private Business and Technical Schools	Oakland, CA http://www.hrblock.com
Holy Names University	Private non-profit institution - four year college/university	Oakland, CA http://www.hnu.edu
International College of Cosmetology	Private Business and Technical Schools	Oakland, CA www.international-cosmetology.com
Island High School	East Bay Regional Occupational Program (ROP)	Alameda, CA http://www.eastbayrop.org
Laney College	Two-year, Public, Technical and Community Colleges	Oakland, CA www.laney.peralta.edu
Lao Family Community Development, Inc.	Employment services for immigrants, refugees, asylees, and low-income U.S. nationals	Oakland, CA http://www.lfcd.org/

Life Academy	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org/
Lincoln University	Private non-profit institution - four year college/university	Oakland, CA www.lincolnuca.edu
McClymonds High School	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org/
McKinnon Institute	Private Business and Technical Schools	Oakland, CA www.mckinnonmassage.com
Merritt College	Two-year, Public, Technical and Community Colleges	Oakland, CA http://merritt.peralta.edu/
Merritt College One-Stop Shop	Career and Job Placement Center	Oakland, CA http://www.merritt.edu
Met West	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org
Mills College	Private non-profit institution - four year college/university	Oakland, CA http://www.mills.edu
Moler Barber College	Private Business and Technical Schools	Oakland, CA
Moving On Center for Participatory Arts and Somatic Research	Private Business and Technical Schools	Oakland, CA www.movingoncenter.org
National Holistic Institute and Teaching	Private Business and Technical Schools	Emeryville, CA http://www.nhi.edu
Next Step Learning Center	Public Institution	Oakland, CA http://www.nextsteplc.org
Oakland Career Center – East Bay Works	Job resources, databases, counselors	Oakland, CA www.eastbayworks.com/
Oakland High School	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org
Oakland Institute of Automotive Technology	Private Business and Technical Schools	Oakland, CA www.oaklandiInstituteofautomotivetechnology.com
Oakland Tech High School	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org
Oakland Unified School District Adult Education	Public Adult Schools with occupational programs	Oakland, CA http://www.ousd.k12.ca.us
Patten College	Two-year, Private, non-profit, Technical and Community Colleges	Oakland, CA http://www.patten.edu
Piedmont Yoga Studio	Private Business and Technical Schools	Oakland, CA http://www.piedmontyoga.com
Precision Truck School Inc.	Private Business and Technical Schools	Oakland, CA www.precisiontruckschool.com
Regional Technical Training Center	Technical training and placement	Oakland, CA http://rttc.us/
Samuel Merritt University	Two-year, Private, for-profit, Technical and Community Colleges	Oakland, CA http://www.samuelmerritt.edu

Shiloh Bible College	Private for profit institution	Oakland, CA
Shirley Ware Education Center Local 250	Two-year, Private, for-profit, Technical and Community Colleges	Oakland, CA
Skyline High School	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org
Solar Staffing, Inc.	Training and placement in solar panel placement	Oakland, CA www.solarstaffing.com
Stride Center	Training and placement in information technology	Oakland, CA www.stridecenter.org
The Bread Project	Training/ placement for commercial baking and cooking	Emeryville, CA http://breadproject.org
The Breema Center	Public Adult Schools with occupational programs	Oakland, CA http://www.breema.com
The English Center ECIW	Language and professional development	Oakland, CA http://www.englishcenter.edu/
The Loss Prevention Group	Security guard training	Oakland, CA www.oaklandsecuritytraining.com
Unity Council Multi-Cultural One Stop Career Center	Workforce development for low-income limited English proficient clients	Oakland, CA http://www.unitycouncil.org/services4.htm
Urban Voice	Private Business and Technical Schools	Emeryville, CA http://www.urbanvoice.org
World Vision College of Cosmetology, Inc	Private Business and Technical Schools	Oakland, CA www.worldvisioncollege.com
YES Academy	East Bay Regional Occupational Program (ROP)	Oakland, CA http://www.eastbayrop.org

<u>Businesses that offer necessary resources to community</u>

Retail and services

The numbers above give us a relative idea of the presence of retail establishments in the Planning Area. According to the Oakland Chinatown Chamber of Commerce and their Wa Sung Community Service Club Community Directory (2010), a rough count of the businesses listed shows there are about 670 goods and services establishments in Chinatown. This number seems consistent with the other data sources we were able to reference, especially considering that not all of the 670 establishments counted in the directory represent the retail trade industry and there were 321 retail trade establishments in the three zip codes intersecting the Planning Area in 2008.

The site visits support the assumption that there is a dense retail and services environment in Chinatown especially. Retail and services outlets are less concentrated in other parts of the Planning Area, especially in the specific sub-areas that were the focus of site visits.

Grocery stores

The California Department of Health's Nutrition Network publishes a mapping application that makes public the locations and characteristics of nutrition and other health related data, including grocery

stores. According to the database, there are 24 grocery stores in the Planning Area.[301] Of the 24, three call themselves "supermarkets", but this is a classification that the owners have indicated and may not represent standard definitions of larger grocery stores. In fact, site visits revealed that two of these locations actually represent the same store and another larger grocery store that could be considered a supermarket was not present in the database. None of the locations that call themselves "supermarkets" were chains. We were not able to gather information on the hours of operation for grocery stores.

Whether they are classified as grocery stores, supermarkets, or other classifications, in site visits to Chinatown we saw an abundance of markets where fresh and healthy food could be purchased and that seemed to serve as magnets for pedestrian activity.

The USDA recently measured what are called "food deserts" for Census tracts throughout the country. A food desert is defined as a *low-income Census tract* where a substantial number or share of residents has *low access* to a supermarket or large grocery store.[302] To qualify as a "low-access community," at least 500 people and/or at least 33 percent of the census tract's population must reside more than one mile from a supermarket or large grocery store.[303] By this definition, none of the Census tracts in the Planning Area qualify as food deserts.

Even though the Planning Area would not be considered a food desert by either the USDA's definition, or our identification of plentiful sources of healthy food in Chinatown, we have identified a few opportunities to improve access to a variety of healthy foods. First, the site visits revealed that although there may be many retail food outlets in Chinatown, outside of this sub area where the residential density is greater, there are far fewer opportunities to purchase fresh and healthy food. Residents of these areas may not live in a food desert because the nearest supermarket or large grocery store is within a mile, but many do likely need to travel greater than a quarter- or a half-mile (a reasonable distance to walk to the grocery store). Second, community representatives of the Planning Area have said that many of the markets in the area that sell fresh and healthy food close too early for residents to get their shopping done after work hours.

Produce Markets

According to the California Department of Health's Nutrition Network mapping application there is one fruit and vegetable market in the Planning Area.[304] This means that a store that sells produce classified itself as a produce market. Site visits throw these results into question, as we saw many stores selling produce in Chinatown. It is likely that many of the grocery stores identified in the previous section would also be considered produce markets by conventional standards.

Farmers' Markets

There are 2 farmers markets either in or near the Planning Area.[305] The first is located on 9th and Broadway and is open on Fridays from 8-2. The second is located on Broadway and Embarcadero and is open on Sundays from 10-2. EBT is accepted there. Electronic Benefits Transfer (EBT) is accepted at both, which means that food stamp recipients can make purchases.

Given this level of access, an additional farmers market may not represent the best opportunity to increase access to fresh fruits and vegetables for Planning Area residents.

Health care providers
According to HealthyCity.org there are 10 health care establishments in the Planning Area.[306] HealthyCity.org is an information resource that makes data and maps available to communities for the purposes of planning and advocacy. The following list represents health care services in the categories of: emergency medical care, general medical care, health screening and diagnostic services, health supportive services, human reproduction, inpatient health facilities, specialized treatment facilities, specialty medicine, hospitals, and federally funded health centers.

1. Adult Medical Services Hotel
2. AIDS Project of the East Bay
3. Alameda County Public Health Department – Community Health Services
4. Asian Community Mental Health Services
5. Asian Health Services
7. Asian Network Pacific Home Care and Hospice
8. Family Bridges, Inc.
9. Hong Fook Adult Day Health Care Center
10. Ramsell Public Health Prescription Drug Discount Card Program

Businesses that facilitate growth and spending/revenue in Oakland

Asian Targeted or Owned Businesses
The site visits revealed a predominance of businesses targeting the Asian population of the Planning Area and beyond. This was ascertained through the observation of signage with Asian characters. We assume that many of these establishments are Asian-owned, though we did not conduct a formal survey to confirm this. In an approximately 10-block area in Chinatown, we judged every block with businesses present to have a majority of signage with Asian characteristics (around 80% of businesses or more).

These findings are important because research shows that minority businesses hire much greater percentages of minority employees than majority-owned firms do.[307] Therefore, there may be local hiring advantages to facilitating the growth of Asian targeted and owned establishments in parts of the Planning Area where there are Asian residents but not an existing predominance of these businesses.

5.5.3. Impacts of the Draft Emerging Plan on Economic Development, Related Health Outcomes, and Recommendations Proposed by this HIA

Recommendations are presented in *italics*.

Employment Opportunities and Local Hiring Impacts

In Chapter 3, the DEP estimates that the SAP could add an estimated 4,423 new jobs to the Planning Area, primarily through the addition of new retail and office jobs and at the expense of some auto-related and industrial jobs. The addition of new retail and office jobs has the potential to benefit local residents, as many local residents are monolingual Chinese and appropriate employment for this population is more common in smaller (rather than larger) retail and office spaces. Therefore, if some portion of the new retail and office jobs are in smaller spaces, local residents have a greater chance of benefiting from SAP development. The DEP does not break down retail or office development into these terms. Further there is no established definition of what constitutes smaller retail and office spaces and is therefore more likely to facilitate local hiring. It is therefore not possible to quantify the local hiring

potential of the development scenarios outlined in the DEP. However, combined with the economic development strategies outlined in Chapter 9, smaller, local, multicultural businesses that are more likely to hire locally may be encouraged to establish themselves in the newly available retail and office space (see below).

The DEP includes the following economic development strategies that have the potential to impact local hiring:

- *Actively highlight and enhance the economic asset of Oakland Chinatown*
- *Actively engage with multicultural communities in business and employment development*
- *Leverage Laney College as an important asset in the Station Area that can serve as a physical and economic anchor*
- *Create an Enterprise Development Program to provide technical and, possibly, financial support for local start-up businesses*
- *Support business retention by maintaining a revolving City loan program for local businesses needing temporary financial support*
- *Promote more public/private partnerships to achieve catalyst development, business development, community engagement and other objectives*

With all of these strategies the DEP is encouraging local, multicultural, and cross-sector business and workforce development, which has the potential to leverage connections between public and private businesses and training programs and potential employees that reside in or near the Planning Area. This has the potential to increase local hiring and thus improve its health and health-related effects, such as increased walking, social cohesion and street life and decreased stress, air pollution and traffic.

In addition, the DEP will develop a system of incentives for economic and community benefits such as the Downtown Oakland Community Benefit District. This has the potential to impact local hiring if a local hiring incentive is included in the program. For example, developers could be granted some sort of bonus in exchange for hiring local residents. *We recommend that such an incentive be included in the Oakland Community Benefit District.*

In addition to the recommendation mentioned above, we also suggest the DEP implement the following related to local hiring:

- In collaboration with community stakeholders, establish reasonable local hiring goals, such as by defining what constitutes a local hire, identifying appropriate industries and sectors in which local hiring will be encouraged, and developing target numbers of local hires for those businesses or institutions
- Monitor and track local hiring in the Planning Area and progress towards the above goals
- Include a local hiring-related service as part of the Community Benefit District, whereby business owners can be connected with workforce development programs

<u>Impacts to Active Business Environment and Pedestrians</u>

Our site visit observations indicate, anecdotally, that there is a relationship between mixed-use areas including an active business environment, and increased pedestrian activity. Thus, it is anticipated that the LMB SAP developments will increase physical activity and associated health benefits.

<u>Other recommendations</u>
Besides those included above in italics, the following recommendation is supported by this analysis.

We were not able to identify an accurate source of information to describe the presence of green businesses in the Planning Area. We recommend that the city begin collecting and compiling this information, in order to inform the community about businesses supportive of environmental and health sustainability and to encourage green business practices.

5.6 Parks & Opens Space

5.6.1. Research Connecting Parks and Open Space to Health

Parks and open space can have significant positive impacts on our health and wellbeing, especially in urban areas. Research has shown that a natural environment and green space have a positive effect on health and wellbeing by reducing stress and fatigue and improving mental health and longevity.[308] Parks and trails provide needed reprieve from everyday stressors, acting as "escape facilities." Being able to escape fast-paced urban environments improves health by reducing stress and depression and improving the ability to focus, pay attention, and be productive.[309] Children with neurobehavioral disorders function better following activities in green settings.[310] In contrast, people dissatisfied with their available green spaces have 2.4 times higher risk for mental health issues.[311]Additionally, for girls who live in high-rise residences, the presence of trees and lawn adjacent to their dwelling leads to a greater sense of safety and feeling of belonging; lower levels of fears, fewer incivilities and less aggressive and violent behavior; less chronic mental fatigue, corresponding to a lower likelihood of being impulsive and irritable; and greater self-discipline and ability to concentrate.[312]

Physical Activity

Physical activity has been linked to numerous health benefits, such as reductions in premature mortality; prevention of chronic diseases such as diabetes, obesity, and hypertension; and improvements in psychological wellbeing.[313] Without outdoor places to play, children are less likely to exercise regularly and may face elevated risks for diabetes, obesity, and asthma.[314]Access to local parks facilitates opportunities for physical activity. The CDC states that improved access to spaces for physical activity resulted in 25% more people exercising three or more days a week.[315] It has been shown that a 1% increase in park space can increase physical activity in youth by 1.4%.[316] In a study about Los Angeles, active people who live within two miles of a park are more likely to exercise in a park (34%) than at home (21%), at private clubs (6%), or at other locations (4%), although many people (35%) reported exercising in more than one location. The study also revealed that most (81%) park users live within one mile of a park, and that people living within one mile of a park are four times as likely to visit the park once per week or more.[317] Another study concluded that each additional park within a half mile increased physical activity in teenage girls by 2.8%.[318] Parks play a critical role in facilitating physical activity in minority communities by providing recreational facilities, scheduled and supervised activities, and destinations to which people can walk—even though they may be sedentary after arriving there.[319]

Parks and Social Cohesion

Parks and open spaces create opportunities for community members to gather and socialize, thereby increasing social cohesion. Research has consistently demonstrated that social support, perceived or provided, can buffer stressful situations, prevent feelings of isolation, and contribute to self-esteem.[320]

Green space is an attractive place for socializing, and socializing is important for health and wellbeing. Observations by researchers of vegetated areas with trees and grass showed that green areas contain 90% more people than do barren areas. In this study, 83% more people were observed being involved in

social activities in green spaces vs. barren spaces.[321] Research shows that residents of neighborhoods with greenery in common spaces are more likely to have stronger social ties than those who live surrounded by concrete,[322] and that after new parks open, neighbors are more likely to interact, take pride in their communities, and form neighborhood watch and other local improvement groups. [323] Residences with trees and lawn adjacent to high-rise dwelling cause more social interaction among youth and adults.[324] Cultivating a supportive network in one's community may be particularly critical for seniors who may be more prone to feelings of isolation and illnesses than those who are younger.

Recreational & Cultural facilities
Community centers where one can enjoy various artistic, cultural and fitness programs at no- or low-cost can help enrich one's life. Community centers can also be places where residents can make social connections with other community members to build a foundation for social support. As is the case for retail outlets, community centers and other public services located in close proximity may help residents to increase physical activity.

Environmental Benefits
Trees and plants are natural air purifiers and they also cool surrounding areas by providing shade. In an area with 100% tree cover (such as forest groves within parks), tress can remove as much as 15% of the ozone, 14% of the sulfur dioxide, 13% of particulate matter, 8% of the nitrogen oxide, and .05% of the carbon monoxide.[325] In one urban park, tree cover was found to remove 48 pounds (lbs) of particulates, 9 lbs nitrogen dioxide, 6 lbs sulfur dioxide, 2 lbs carbon monoxide, and 100 lbs of carbon on a daily basis.[326] By reducing smog, decreasing the heat island effect in cities, and removing harmful air pollution, tree cover and vegetation can also have positive environmental health benefits.[327, 328]

Environmental Justice and Park Access
Community park investments are commonly disproportionate in wealthier neighborhoods, leaving low-income and communities of color with a dearth of neighborhood park access. In Los Angeles, white neighborhoods include 31.8 acres of park space for every 1,000 people, compared with 1.7 acres in African-American neighborhoods and 0.6 acres in Latino neighborhoods.[329]

Climate Change
Shade from trees can reduce air temperature. Reduced air temperature due to trees can improve air quality because the emissions of many pollutants and/or ozone-forming chemicals are temperature-dependent.[330]

5.6.2. Existing Parks and Open Space Conditions in Planning Area

Parks in the Planning Area
Within the Planning Area there are three local parks and two regional parks. The three local parks are Lincoln Park, Madison Park, and Chinese Garden Park. The two regional parks are Lake Merritt Park and Estuary Channel Park. In addition, Laney College has open space parkland within the campus. Parkland in the Planning Area totals 43 acres (15% of the total Planning Area), however 13.6 acres of the total 43 acres are Resource Conservation Areas (within Peralta and Channel Park), resulting in only 29.4 acres of parks that are considered "accessible" for community use.[331] It should be noted that even though parkland may be deemed "accessible," various factors might still prevent community residents from using it. For example, nearby land uses, traffic hazards, and perceived safety can affect park usability. Chinese Garden Park is an example of compromised accessibility due to the high traffic volumes surrounding it and associated pedestrian safety and noise issues. Also, the layout and design of parks

should be suitable for the preferred park activities and cultural habits of residents. The morning practice of Tai Chi is one park activity that requires a particular park design; namely, a good amount of open space with even paving, quality light, and safety. Madison Square Park is currently where many residents practice Tai Chi, (residents were moved here after the demolition of the BART plaza, which used to be the preferred site for Tai Chi). Although improvements have been made to make Madison Square Park more accommodating to the practice, residents still feel more space is needed in the Planning Area that is especially suited to this activity.

Park acres per resident

A common measure of resident access to parks is park acres per resident. The 2010 Lake Merritt Station Area Plan Existing Conditions Report states that the Oakland park policy specifies 10 acres of parkland per 1,000 residents and 4 acres of local parkland per 1,000 residents.[j] Oakland currently has an average of 8.2 acres of total parkland per 1,000 residents and 3.3 acres of local serving parkland per 1,000 residents. Rates of total parkland and local parkland in the Planning Area, at 3.6 acres and 2.4 acres respectively, are lower than the city's average (see Table 20).[332] Even given the available parkland acreage, several parkland areas within the Planning Area have limited or no accessibility for general community use.

Table 20. Parkland (in acres per 1,000 people)

	City General Plan Guidelines	Current parkland acreage in the Planning Area	Current parkland acreage in Oakland (average)
Total parkland	10	3.6	8.2
Local parkland	4	2.4	3.3

Proportion of residents within ¼ mile of local and regional parks

Another indicator of access to parks is residents' proximity to parks. A quarter-mile proximity to a neighborhood or regional park is the benchmark used by the San Francisco Department of Public Health in their Healthy Development Measurement Tool.[333] According to HIP's GIS analysis, 89% percent of residents in the Planning Area currently live within ¼ mile of a local park, and 57% live within ¼ mile of a regional serving park.[k] Together these figures tell us that although many Planning Area residents live near a park, the number of park acres per 1,000 people is likely lower than the guidelines and that of Oakland overall. Planning Area parks could therefore be considered overcrowded. Proximity to a regional serving park is also not available to many Planning Area residents.

Resources and activities at Planning Area parks

Lincoln Park (Neighborhood Park): designated as a "neighborhood park" by the city, Lincoln Park is the only neighborhood-serving park in the Planning Area serving all residents and is 1.4 acres in size (smaller than the average size range for neighborhood parks at 2-4 acres). This being the only neighborhood park, and given it's size, it is not meeting the Oakland service goal of 3 acres for every 5,000 residents within a ¼ mile radius. This park abuts Lincoln Elementary School and

[j] We understand there is potentially a discrepancy between parkland standards presented in the Existing Conditions report and the standard in Oakland's General Plan. We are including standards presented in the Existing Conditions report as a reference point for understanding disparities in access (a total citywide standard, which is apparently what is specified in the General Plan, would not take into account disparities in access for Planning Area residents with respect to the rest of the city).

[k] Local and regional parks were designated as such in the parks GIS database obtained from the City of Oakland.

includes a recreation center, a children's play area and basketball courts. This park is heavily used, children being the primary users of the outdoors portion. There is very little green space at this park.

In a survey conducted by Asian Health Services, 60% of respondents accessed Lincoln Park 1-3 times a week with primary activities while at the park including "meeting friends" (55%), "fitness activities" (55%), "programs at recreation center" (27%), and "tai chi, martial arts, Chinese dance" (27%).[334]

Lincoln Park has been characterized as having strong vitality. Through observations, weekday use was found to be the overall highest, with mid-day and afternoon hours on weekdays having an activity rating of "most active" for children/teens. Adults were "most active" in the recreation center during the weekend.[335]

Madison Square Park (Special Use Park): Madison Square Park has a mix of green space and flat concrete surfaces and is 1.4 acres. The park is primarily known for a space where community residents can often be found practicing tai chi, qigong and fan dancing. This park does not have a community center, and is not heavily used outside of tai-chi, qigong and fan dancing.

In a survey conducted by Asian Health Services, 45% of survey respondents stated that they access Madison Square Park daily with the primary noted activities including "tai chi, martial arts, Chinese dance" 44%), "people watching" (39%), "meeting friends" (39%), and "fitness activities" (33%).[336]

Activities in Madison Square Park have been characterized as "periodic" with some programmed activities such as tai chi, shuttlecock, dancing, and basketball. Older adults and seniors were primarily using the park, and primarily for purposes of recreational sports and activities. Weekday morning tai-chi is observed as being the most active and busiest time of the park. Youth and homeless people were noted as hanging out and loitering during the day. There is no indoor activity center at this park. [337]

Chinese Garden Park (Special Use Park): The 1.3-acre Chinese Garden Park serves as a historical cultural center featuring a Hall of Pioneers, Sun Yat Sen Memorial Hall, and a pagoda. The Park is most widely used and known as the Hong Lok Senior Center, a day center for seniors. The Hall is also rented out for other cultural and social activities. People are frequently observed doing tai chi and gardening in the Chinese Zodiac Garden in the garden area of the park. The park is adjacent to the I-880 and freeway entrance/off ramps with traffic going at high speeds, most notably along 7th and Harrison Streets. Street design, proximity to heavy traffic limits community and pedestrian access to this park and outdoor use.

In a survey conducted by Asian Health Services, 54% of survey respondents never accessed the park and 23% visit the park 1-3 times/week, with primary noted activities including "people watching" (50%), "observing nature" (50%), "meeting friends" (50%), "tai chi, martial arts, Chinese dance" (33%), and "fitness activities" (25%).[338]

Chinese Garden Park has been characterized as being "isolated and sparse" in regards to activity, with almost all activity taking place inside the Hong Lok Senior Center (rather than outside in the fenced park and garden area). The park's primary clientele are seniors accessing the senior center. The busiest time observed was the weekday noon hour (when senior lunch is served), and the

quietest was weekday afternoon. No families or children were observed accessing the park. In sum, this "park lacks vitality."[339]

Lake Merritt Park (Region Serving Park): Lake Merritt Park is a regional park with one segment located within the Planning Area. Lake Merritt is considered a "jewel of Oakland" and is the largest urban fresh and salt-water lake in the nation.[340] The park has a 3.4-mile circumference path where people are often observed walking, jogging and socializing (the entire park is 155 acres with 8.6 of these acres being within the Planning Area). Amenities within the park include tennis courts, kayaking, Children's Fairyland, lawn bowling, bonsai gardens and more. Thousands of people of all ages and with a variety of interests access the park on a daily basis. Pedestrian crossings within the Planning Area that provide access to the lake have been identified as difficult crossing areas.[341]

Peralta Park (Linear Park): The park is located south of Lake Merritt. The park currently has a grass field and a children's play area, but is not easily accessible via the local streets or through Lake Merritt Park. Measure DD funds have begun and will continue to enhance the park, including access to the park, to increase utilization.

Channel Park (Linear Park): is located south of the Peralta Park (from 10th to I-880) and is primarily located within the Laney College Campus. The park includes greenspace and art sculptures. The Channel Park has very limited access from the community as it is located within the Laney Campus and Peralta District Administrative Complex. Measure DD funds have begun and will continue to enhance the park and access to the park to increase utilization.

Estuary Channel Park (Region Serving Park): the primary use of the Estuary Channel Park is a community facility at Jack London Aquatic Center, proving rowing programs for both youth and adults. There is some grass green space available including a picnic area and a public boat-launching ramp.

Additional Recreational & Cultural Centers

There are several recreation centers in the Planning Area. Some are located on or adjacent to the existing parks, and some are primarily cultural and recreation centers. Both the Existing Conditions' report and Chen et al (2010) identify primary cultural facilities and community gathering spaces for recreational purposes. Recreational facilities at Planning Area parks are described below:

Lincoln Sq. Park: Observed recreation areas include basketball courts and children's play area. Seniors frequent the senior center (only open on the weekends) as the center provides indoor tai chi (attracting adults and seniors), dance classes (adults), Chinese Opera and Asian instrument classes (held in the recreation center and at the school), badminton and ping pong.

Madison Sq. Park: Supported recreation includes outdoor tai chi and dance classes (adults and seniors).

Chinese Garden Park: outdoor tai-chi (attracting seniors), Chinese chess (older Asian men), board games, ping pong, ballroom dancing, parties and fieldtrips (all primarily for seniors through the senior center).

Oakland Asian Cultural Center*:* Provides indoor tai-chi and dance classes (adults), Chinese Opera and Asian instrument classes, programs and classes for all age groups.

Laney College: Laney College has many cultural activities, groups and classes. Laney College primarily serves college-age adults for a variety of cultural backgrounds. Some cultural activities at Laney College include tai chi, adult dance classes, Chinese Opera and Asian instrument classes.

Hong Fook Senior Center: Senior center supports senior activities including Mahjong.

Malonga Casquelourd Center for the Arts[342]: This is a city-sponsored arts facility and performing arts center, which includes a 350-seat theater, several performance spaces, meeting rooms, and rehearsal space. The Center serves patrons of all ages interested in cultural performing arts. There are several resident organizations, many of which are youth-oriented.

Along the street/cafes: Chinese Chess and other board games are popular with older Asian men and frequently observed along the street and at cafes.

Near BART Station Entrances / Plaza: Seniors playing Jin (Chinese Hacky Sack), Mahjong and card games can be found during the daytime (especially during the weekends) inside and around the BART station entrances and in the underground station areas, but outside of the BART fare gates.

Other (Family and Regional Association centers): Mahjong is frequently played by seniors.

5.6.3. Impacts of the Draft Emerging Plan on Parks and Open Space, Related Health Outcomes, and Recommendations Proposed by this HIA

Recommendations are presented in *italics*.

New Parks Impacts

The DEP proposes an additional 15.8 acres of parks, with 3.2 acres of local-serving parks. Added to existing parks in the Planning Area, at build-out there would be 58.7 acres of parks in total, with 32.6 acres of local-serving parks. Table 21 shows how the acreage of parks per population would change if DEP proposals were put into place. Even with additional proposed total and local parkland in the Planning Area, the parkland per population *decreases.* This finding in itself signifies a decrease in the health-promoting benefits that parks offer.

Table 21. Projected Compared to Current Parkland in Planning Area (in acres per 1,000 people)

	City General Plan Guidelines	Current parkland acreage in the Planning Area	Projected additional parkland acreage in Planning Area with DEP	Current parkland acreage in Oakland (average)
Total parkland	10	3.6	2.6 - 3.0	8.2
Local parkland	4	2.4	1.4 – 1.7	3.3

Source: City of Oakland. 2010. Lake Merritt Station Area Plan: Existing Conditions and Key Issues Report. Chapter 8: Community Services, Cultural Resources and Public Facilities.

The proportion of residents within ¼ mile of *local* parks will increase with DEP park proposals. The current proportion of Planning Area residents living within ¼ mile of parks is already very high at 89%, and the DEP proposes to increase park acreage while also increasing residential housing; in all likelihood, these proposals will result in an even larger percent of people living close to local parks. Because existing and proposed *regional* parks are all along the eastern edge of the Planning Area rather than interspersed throughout the area, and specific locations for proposed housing are unknown, it is uncertain how the proportion of residents in close proximity to regional parks will change.

In conclusion, with DEP proposals, existing and future residents of the Planning Area will have several parks in close proximity to their homes, which is a beneficial condition for health. However, the capacity of Planning Area parks will not accommodate the needs of the projected Planning Area population. The overall acreage of local and regional existing and proposed parks is less than half of what the city's General Plan calls for.

"Linear" or small parks adjacent to commercial buildings

The DEP's Figure 5.1 indicates that many of the proposed parks are "linear parks," or small patches of green space adjacent to mid- to high-rise office and retail buildings. One extreme example of this is the park proposed within the BART Parking Lot Site, which appears to be fully enclosed by proposed buildings at that site and not accessible to the public (i.e., DEP Figure 3.3). It is unclear whether this park is included in acreage totals of public open space, but we recommend that this proposed park be considered an asset for users of adjacent buildings only and not as a public resource. While it is recognized that space for new parks is limited in urban areas and even adding small amounts of green space is anticipated to support positive health outcomes for residents and workers who use them, these disconnected linear parks are not anticipated to provide the same range of opportunities for recreational activities that existing, larger parks provide. *To address park deficiencies, we recommend adding a full block public park in the Chinatown core, rather than pieces of private developments that are publicly accessible. We also recommend a community input process for planning park features and programming for these proposed parks. In addition, the limited nature of these parks further supports the importance of maintaining and improving accessibility and safety of existing parks in the community, such as Lincoln Park, Madison Square Park, and Chinese Garden Park, as well as connectivity and accessibility to regional parks (Lake Merritt and Estuary Channel Park).*

<u>Existing Parks Impacts</u>

The DEP's intention to enhance existing parks in order to make them more accessible and safe are anticipated to *improve conditions for community health* in the Planning Area. Lincoln Square Park, which is very well used and has been characterized as having strong vitality,[343] has been described as in need of improvements and renovations.

In addition, Chinese Garden Park, which has been characterized as being "isolated and sparse" and lacking in vitality, [344] may become more valuable and accessible to the community with improvements included in the Station Area Plan. The DEP acknowledges constrained access and safety concerns given high volumes of traffic and vehicle speeds on surrounding streets; however, it does not go the extra step to describe design and programmatic changes to the Park to make it more accessible and safe. *We recommend that community-identified proposals for improving Chinese Garden Park and other existing Planning Area parks (i.e., those described on page 5-7) be included in the Station Area Plan*.

Other recommendations
Besides those included above in italics, the following recommendations are supported by this analysis.

- Given the proximity of Chinese Garden Park to I-880, we recommend the consideration of exposures to air pollution when planning development or park programming at this park.
- Pedestrian and bicycle access to Lake Merritt, which is a large open space resource near the Planning Area community, should be enhanced.

5.7 Public Safety

5.7.1. Research Connecting Public Safety to Health

Exposure to crime impacts our health
Public safety is a primary determining factor contributing to a community's health, wellbeing and vitality. Violent crime can cause injury and death and can influence stress levels. Even if crime does not result in injury, it may indirectly impact health by causing fear, feeling unsafe, stress, and poor mental health.[345]

Living in an area with high actual and perceived crime can decrease use of public space, including sidewalks, retail, parks, and community centers. This has an impact on rates of physical exercise and social networks, which subsequently can impact many physical and mental health outcomes. Fullilove (1998) found that fear of crime limits mobility and/or physical activity in a neighborhood, inhibiting social interactions.[346] In a study in Greenwich, London, the participants who reported feeling unsafe to go out in the day were 64% more likely to be in the lowest quartile of mental health.[347]

Many factors contribute to both real and perceived public safety. For example, household income, housing conditions, land use, and community and cultural vitality have all been linked to rates of crime, which in turn impacts real and perceived public safety. While real and perceived rates of crime and safety may not be the same measurement, the outcome is the same: community members limit their activities, which reduces social interactions and subsequent community vitality.

Impact of crime on youth
Being exposed to crime and violence has a ripple effect in communities, especially among youth. Witnessing and experiencing community violence causes longer-term behavioral and emotional problems in youth. For example, in a study in the San Francisco Bay area, Chinese-American urban youth who were exposed to violence showed higher rates of self-reported post-traumatic stress disorder (PTSD), depressive symptoms, and perpetration of violence.[348, 349] Another study highlighted that exposure to violence is associated with more perpetration of violence among Chinese American adolescents living in urban areas.[350]

Land use and the relationship to crime
Land use patterns and types of land use can encourage or inhibit crime and criminal activity. 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.[351] Areas with tunnels, alleyways, or confusing street/path networks are conducive to crime.[352] Access to public parks and recreational facilities has been strongly linked to reductions in crime, and in particular, to reduced juvenile delinquency.[353] Recreational facilities keep at-risk youth off the streets, give them a safe

environment to interact with their peers, and fill up time within which they could otherwise get into trouble.[354] Other land use features and their relationships to crime are described below:

Commercial and mixed use: Environmental context is very important when assessing commercial use and the relationship to crime. Commercial land-use has been positively associated with rates of crime, but street connectivity in retail areas has had a negative effect on crime rates.[355] Browning (2010) has discovered that small increases in commercial and residential growth can lead to increased homicide and aggravated assault, but there is a threshold where the outcome is reversed. However, there *is* a positive and linear relationship between commercial and residential density and robbery rates. An influx in redevelopment with commercial and resident density, specifically in communities that have suffered loss of vitality, may at first lead to higher rates of crime as social controls (specifically from increased eyes on the street from pedestrians) are not yet in place. In contrast, communities that are already vital may see a decrease in rates of crime as the streets become increasingly utilized public spaces, if they are able to maintain vitality during redevelopment and land use efforts.[356]

Public transit: Transit availability and use means that more people are present and walking in an area, and one theory suggests that this may increase opportunities for crime. However, current evidence does not suggest that availability/proximity to public transit has a positive or negative relationship to crime. In fact, in a study conducted in Los Angeles on light rails they found that in general, transit stations were no more unsafe than city streets or other public places. In this study, when considering only serious crime, rail stations were safer than many city streets, because of the high rates of police deployment.[357] So while more people on the streets (accessing transit) may result in higher incidences of crime, there will likely be a lower overall risk of becoming a victim of crime (per person). However, research does not discount that the perception of crime and personal safety may inhibit the use of public transit. Specifically, in Alameda County, many older adults have expressed that fear of real and/or perceived crime is a determining factor when considering the use of public transit.[358] This may in fact be true, especially for ground level transit (i.e. bus stops). Environmental attributes such as alleyways, liquor stores and vacant lots (among a few others) *have* been found to be correlated with crime.[359]

Traffic and speed: High traffic volumes and wide streets may contribute to a feeling of anonymity and less community ownership in an urban area and this may lead to increased crime. One study showed that homes in areas with higher speed limits were more likely to be burglarized.[360] Traffic engineering and urban design can influence speed and calm traffic to make communities safer from traffic related collisions as well as possible criminal activity associated with high speeds and wide roads. The Federal Highway Administration states, "Traffic calming utilizes design strategies to slow down cars and increase the visibility of pedestrians and bicyclists."[361] Basic traffic calming measures include: curb extensions/bulb outs, trees, narrowing of streets, parking, medians, speed humps, roundabouts, bike lanes, and painting strategies to provide real or perceived narrowing of the street design in order to reduce driving speeds. Traffic calming measures to slow down traffic provide more visibility to pedestrians, creating more “eyes on the street” (see pedestrian section below), which can prevent opportunities for crimes to occur.

Pedestrian activity: Pedestrians are attracted to destinations (place to walk to), which in turn create more “eyes on the street”. Jane Jacobs is well recognized for her work contributing to re-claiming open and public spaces for people. She asserts that more people on the streets increases “eyes on the street” as a type of neighborhood or community surveillance improving safety. [362]

Many studies have linked the amount an individual walks with actual or perceived safety, where safety includes freedom from crime and freedom from pedestrian injury.[363] One study looking at Hispanic older adults found that architectural features that facilitate visual and social contacts ("eyes on the street") may be protective factors of physical functioning among older adults by providing safe physical environments to engage in physical activity (i.e. walking).[364] The current evidence suggests that more people on the street paired with social cohesion will decrease rates of crime (where incidences of crime might increase with more people on the street but per population there is a rate decrease).

Preventing Crime through Environmental Design: Crime Prevention through Environmental Design (CPTED) is a successful framework for preventing crime through environmental design and the built environment. For example, one study showed that CPTED was successful in reducing robberies by 30-84%, depending on how many components of CPTED were implemented.[365] The four widely accepted elements of CPTED are:[366]

- *Natural Surveillance*: Open spaces and visibility, such as lighting (especially pedestrian-level lighting) and landscaping, help with natural surveillance.
- *Natural Access Control*: A way of guiding the flow of people by using strategies such as walkways, fences, lighting, etc. to properly guide people through the physical space while decreasing opportunities for crime.
- *Territorial Reinforcement*: creating differentiation between public and privates spaces. Signage and pavement treatments are examples of territorial reinforcement.
- *Maintenance*: Operating under the assumption of the "broken window theory" where one unmaintained incident may lead to others. Maintaining clean and safe community spaces are a preventative measure for more crime.

In addition to these four elements, there are specific CPTED strategies to reduce crime. These include increasing foot traffic, improving lighting, ensuring sidewalks are available and maintained, reducing traffic, and ensuring cleanliness of streets and intersections.[367]

Lighting is especially important for crime prevention in urban areas. The Oakland Police Department states that "lighting by itself does not prevent crime [but it] provides the opportunity for "choice"; the choice to walk forward because you can see clearly that the path is clear and free of danger. If the user can see a potential danger (a person hiding, a group of misbehaving kids at the corner), they may choose to walk a different way. However, lighting can illuminate a target for a criminal as easily as it allows a legitimate user to see a potential threat or criminal. For this reason, lighting must be applied properly. Unless you have natural surveillance of an area, lighting may not always prevent crime. In fact, good lighting without surveillance may actually encourage criminal activity. Lighting is a powerful tool that management and residents can use to control and reduce the "fear" and opportunity of crime."[368]

Gentrification and crime

As described in greater detail in the Housing Section, gentrification is defined as the housing/residential displacement of low-income residents and it is often the case that these communities are minority communities or communities of color. In recent years transit-rich areas are becoming increasingly gentrified in urban areas as middle class residents are more attracted to walkable/bikeable communities (rather than suburbs lacking nearby destinations). As wealthier residents move into lower-income communities they drive up the cost of housing and goods. After gentrification begins in a community,

income differentiation gradually becomes apparent, and this tension may lead to social disorganization and subsequent increases in crime.

One study from the Netherlands identified that neighborhood gentrification was related to higher victimization risk for theft, violence, and vandalism, when controlling for individual, neighborhood and city characteristics.[369] Another early study in Baltimore found that aggravated assault and murder rose in gentrified communities whereas property crime declined.[370]

In contrast, some research suggests that gentrification may lead to lower crime. One study from fourteen neighborhoods in several US cities concluded that gentrification eventually leads to lower personal crime rates but does not impact rates of property crime.[371] Additionally, a qualitative study in the Humboldt Park area of Chicago, IL assessed initial findings that demonstrated a decrease in overall crime as a result of gentrification.[372]

In sum, gentrification can challenge a community and its social connectivity, but current studies and research vary and do not come to a unanimous conclusion as to whether gentrification leads to an increase or decrease in crime. Important factors such as resident displacement and cultural preservation should be assessed with great care to prevent community tension as a neighborhood undergoes changes and/or gentrification.

Income and crime

Poverty and income levels do not directly lead to crime or criminal behaviors. However, income-related risk factors for crime include poverty; lack of economic opportunity; access to criminogenic substances such as drugs, guns, alcohol; poor response to community calls about blighted properties and nuisances by police and other city agencies; and lack of programming for youth and parolees.[373, 374, 375] Poorer neighborhoods are correlated with higher crime rates,[376] and crimes tend to concentrate in areas with higher levels of poverty, lower median households income and lower housing values.[377] In a study of the relationship between state-level homicide rates and income inequality (economic disparity), the greater inequity in income levels of residents accounted for 52% of the variance in homicide.[378]

Social cohesion, cultural preservation and crime

Social cohesion is a complex theory that has been researched in relation to many fields with as many definitions. For the purpose of this report we will use Kearns and Forrest's definition: " a socially cohesive society is one in which the members share common values which enable them to identify common aims and objectives, and share a common set of moral principles and codes of behavior through which to conduct their relations with one another".[379] Social networks can help promote health by spreading healthy norms and exerting social control over unhealthy behaviors.[380] A program in Oakland, CA where teen peer educators present violence prevention workshops in schools has shown that 94% of program members feel they can talk a friend out of carrying a gun, 75% are more likely to look for alternatives to violent situations, and there is an 80% lower truancy rate.[381] Social cohesion and cultural preservation can be protective factors for neighborhood crime. Crime is a deterrent to community cohesion and support, and police, fire, and other security facilities can mitigate crime. Crime is associated with low social capital (often measured as connection and trust to others in the community and/or civic involvement).[382]

Mobile communities (communities where there is high residential turnover) are believed to have lower rates of social integration, decreasing informal community control mechanisms (such as looking out for one another, including within situations involving crime).[383] Merry (1981) found that upon observing a

crime or criminal activity residents of such communities do not intervene to defend the spaces because of pervasive fear of crime and retaliation, whereas people are more likely to intervene the longer they have lived in an area and in areas they perceive to be in their space or home.[384] Cultural preservation and social connectivity can be enhanced by cultural spaces and activities that promote cultural activities and social interaction while simultaneously preventing criminal activity.

5.7.2. Existing Public Safety Conditions in Planning Area

Community Perspectives
Crime and violence are significant health concerns to residents in the Planning Area. Crime and violence were cited as having a significant impact on community health by 64% of respondents in the Lake Merritt BART Station Area Community Engagement report.[385] A small youth focus group conducted by the City of Oakland revealed the following sentiments:

- More than half of the youth felt somewhat safe or very safe in the area;
- All of them answered that they feel less safe in the area from 6pm on; and
- All of them have experienced crime in the area including fights, muggings, thefts, robbery, drug transactions and sexual harassment.

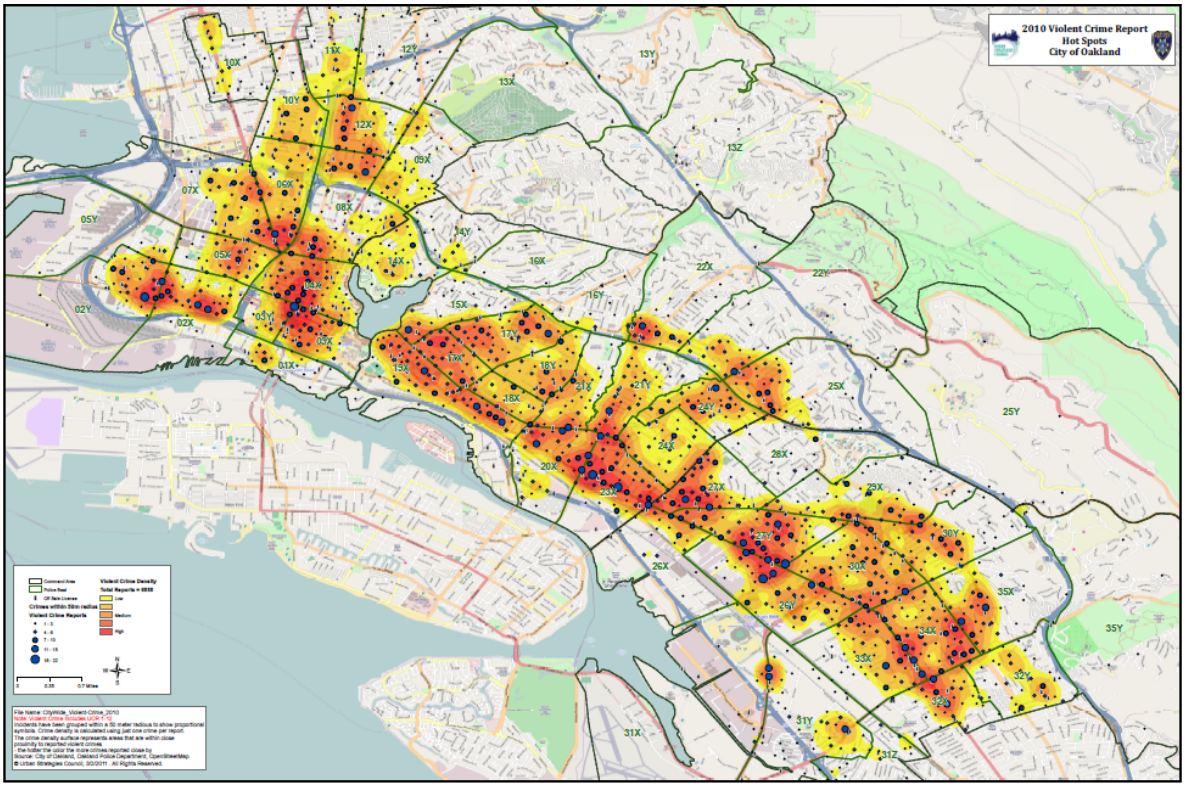
Several specific areas perceived as unsafe, including three blocks around the Lake Merritt BART Station. When coming to the Planning Area, most of the youth are concerned about muggings and they take precautions such as walking in a buddy system at night.

Direct health impacts from crime in Alameda County
In 2006 there were a total of 9,488 non-fatal injuries (hospitalized) in Alameda County. Of these, 768 were caused by assault/homicide (including abuse and neglect, blunt object, cut/pierce, unarmed fight, firearm, and other).[386] In 2007, there were a total of 757 fatal injuries (hospitalized) in Alameda County. Of these, 154 were caused by assault/homicide (including abuse and neglect, blunt object, cut/pierce, unarmed fight, firearm, and other).[387]

Health impacts as a direct result from crime such as non-accidental injuries and fatalities, hospital admissions due to violent crimes and mental health outcomes (rates of depression, anxiety, hospitalization etc.) are not readily available at the zip code or census tract level for the Planning Area.

Reported incidences and types of crime in the Planning Area
Oakland carries a large share of crimes in Alameda County, and is the only city in the County where violent crimes are disproportionate to population.[388] Certain areas in Oakland have higher violent crime rates than others, and Urban Strategies in partnership with the Oakland Police Department have developed a 2010 “hot spot” map (shown below in Figure 4). Police beats 01x, 03x, 04x, and 19x all fall within the Planning Area, with 03x having the most representation. The map illustrates that there are low to high “hot spots” within the Planning Area, and higher violent crime areas are centered around Broadway Ave and 14th (Police Beat 03x), with some on the eastern side of the lake as well (Police Beat 19x).

Figure 4. 2010 Hot Spots in Oakland for violent crimes



Existing reported incidences and types of crime in the Planning Area were collected from Oakland Crimespotting.[389] Oakland Crimespotting is a web-based interactive map of crimes in Oakland and is intended for use as a tool to understand crimes in Oakland. Data used by Oakland Crimespotting (2007-present) is obtained from the City of Oakland's *CrimeWatch* and is limited by the type of *CrimeWatch* data available. Limitations of Oakland's *CrimeWatch* as identified on the *CrimeWatch* website are:

- The crime icons are intended to indicate the block in which the crime allegedly occurred.
- The crime icons (coordinates) do not reflect the exact location of any particular crime.
- The data is available by crime type, time period, and specific geographic boundary.
- Geographic boundaries include council districts and police beats.
- The crime types available are arson, assault, alcohol, burglary, disturbing the peace, gambling, homicide, narcotics, prostitution, robbery, theft, and vandalism, occurring in the city over the past 90 days.
- The City of Oakland intends that the information provided by this web site is accurate; however, errors sometimes occur.
- There are no implied or express warranties on the materials in this site; the materials that are provided will be subject to revision.
- Use this service at your own risk.
- This service does not reflect official crime index totals as reported to the FBI's Uniform Crime Reporting program.
- The listed crimes are subject to change for a variety of reasons, including late reporting, reclassification of some offenses and discovery that some offenses were unfounded.

Additionally, the data presented through *CrimeWatch* and thus Crimespotting are only reported crimes. Incidences and types of crime presented here do not reflect arrests or crimes that were not reported. However, given the information available, a general sense of crimes rates and types in the area is presented in the figures below (Figure 5 and 6). Categories of crimes collected and presented here include aggravated assault, alcohol, arson, burglary, disturbing the peace, murder, narcotics, prostitution, robbery, simple assault, theft, vandalism, and vehicle theft. Crimes have been categorized into violent crimes (aggravated assault, arson, murder, robbery, and simple assault,) and non-violent crimes (alcohol, burglary, disturbing the peace, narcotics, prostitution, theft, and vehicle theft).

Figure 5. Average density of non-violent crimes between 2008 and 2010

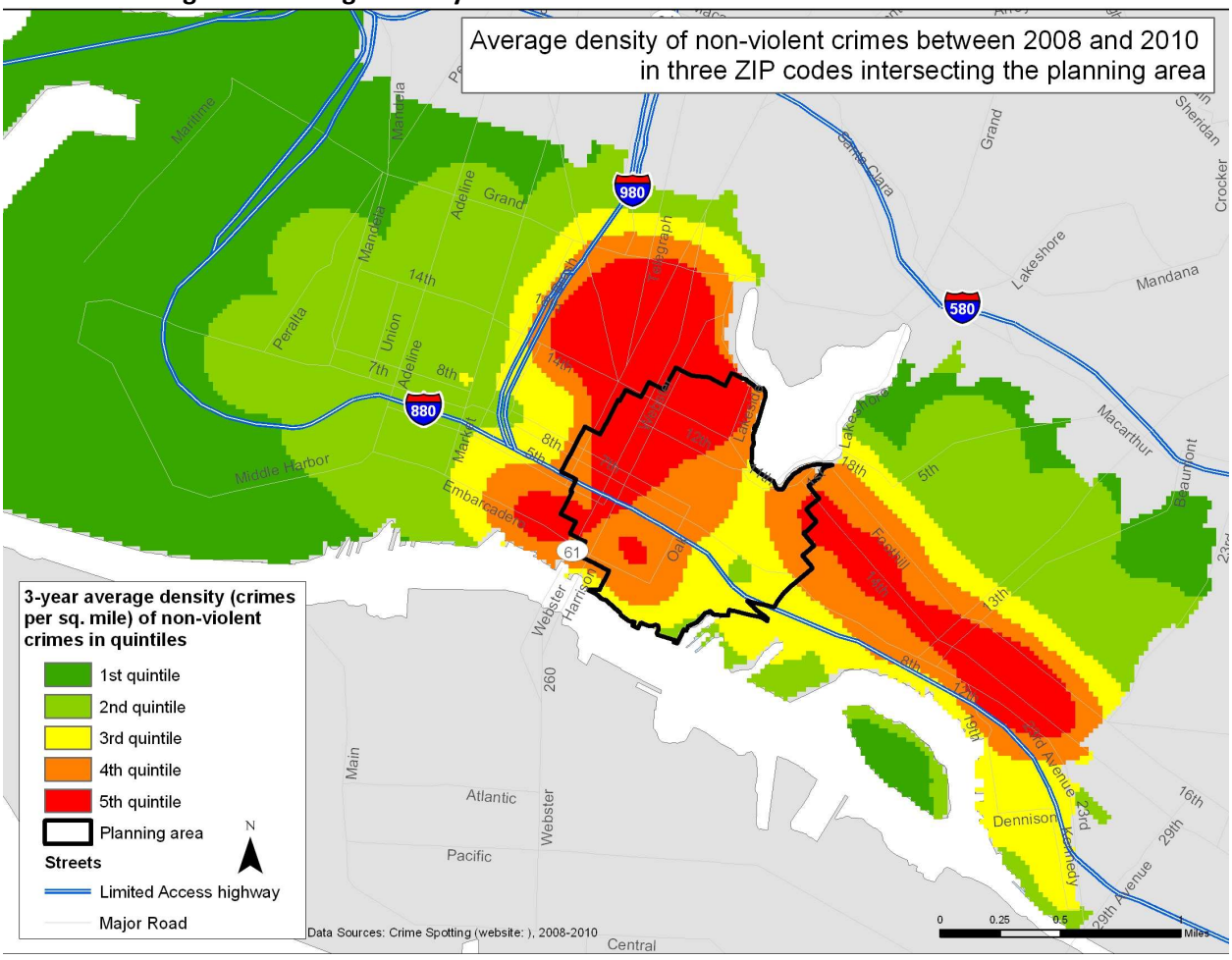
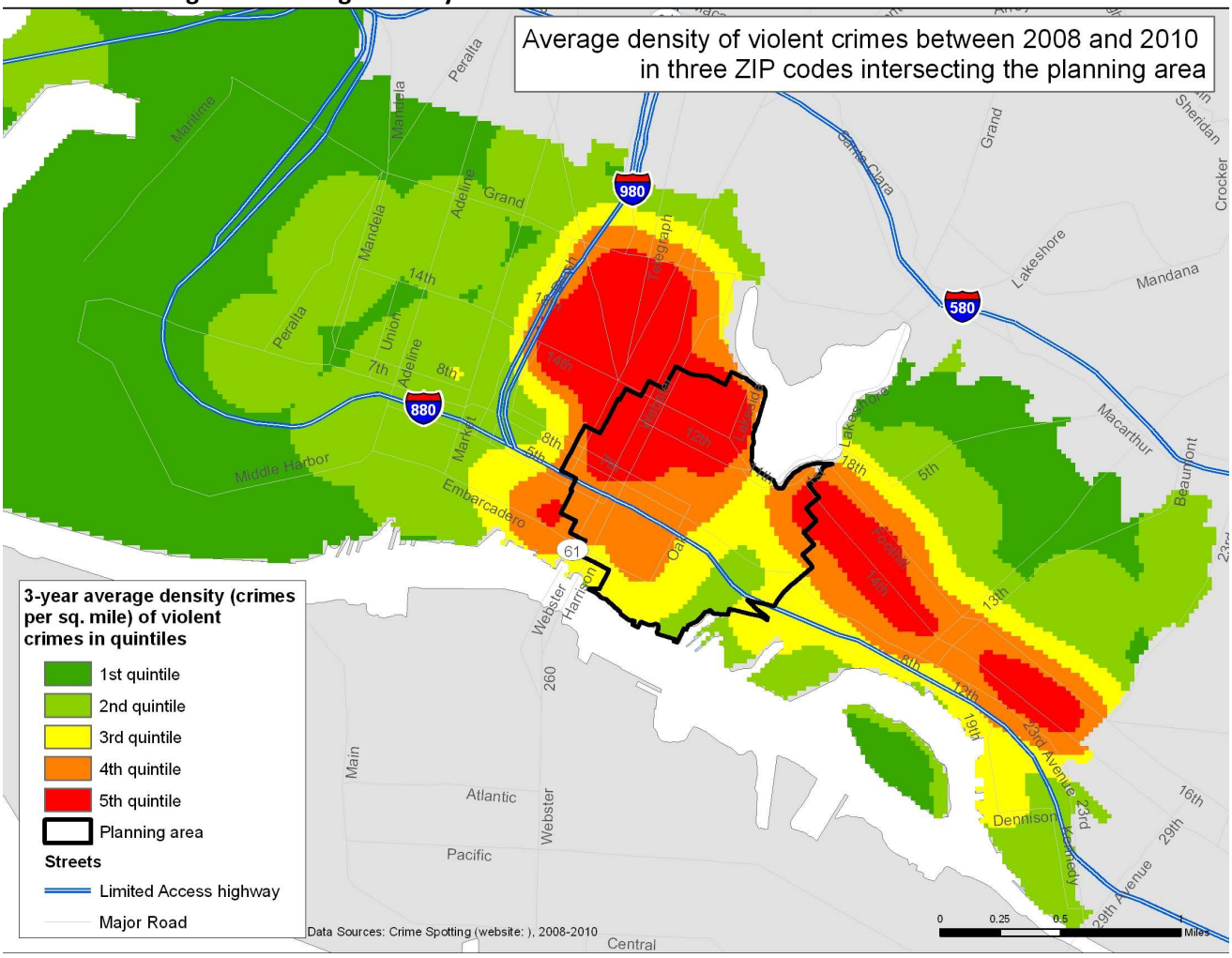


Figure 6. Average density of violent crimes between 2008 and 2010



Land use in the Planning Area and Crime Prevention Through Environmental Design (CPTED)
Crime prevention through environmental design (CPTED) is a priority for the City of Oakland and the Oakland Police Department (OPD). Many new developments and projects undergo a CPTED review that has recently been moved from OPD to the Planning Department. OPD has previously developed a CPTED Security Handbook that is available to residents and businesses to do a self-assessment of how to improve CPTED around their home or business.[390]

Existing commercial and retail usage and crime*:* The SAP Existing Conditions Report states that 4% (or 13 acres) of the entire Planning Area is for commercial (2% of total) and retail (2% of total) use (minus right of way areas and bodies of water).[391] Much of the retail and commercial areas are concentrated in the Chinatown neighborhood of the Planning Area, suggesting that an increase in commercial and retail use in other parts of the Planning Area may have a greater impact on any reduction or increase in crime as theorized in CPTED.

Existing mixed-use and crime: The SAP Existing Conditions Report identifies the percent of land that is currently classified as mixed-use (mixed use is defined as a mix of residential, commercial, or retail uses within the same development). The three groupings are:

- Mixed use office/retail = 2% (7 acres)
- Mixed use residential/office = 1% (2 acres)
- Mixed use residential/retail = 3% (10 acres)

A total of 6% (or 19 acres) of the land in the Planning Area (minus right of way areas and bodies of water) is mixed-use with the majority (90%) having retail at the ground level. Again, much of the mixed-use areas are currently in Chinatown, and increases in mixed-use developments in other areas may have greater impacts on any reduction or increase in crime as theorized in CPTED.

Pedestrian activity and eyes on the street and crime: Pedestrian activity, as illustrated in the literature summarized above, provides greater perceptions of safety through "eyes on the street." Overall, the Planning Area has many destinations and transit availability attracting pedestrians. See the Transportation section of this report for more details on pedestrian volumes in the area. CPTED identifies pedestrian spaces and lighting as important factors in real and perceived pedestrian safety. The Planning Area has a dearth of pedestrian level lighting.

Traffic volume/speeds and crime: Traffic volume is high on many of the roads in the Planning Area. Several of the roads are classified as being *arterials* and *corridors,* with associated vehicle volumes of 2,400+ and 1,200-1,400, respectively (peak hour vehicles per hour). Many of the high volume streets in the Planning Area are one-way multi-lane roads (3 or more lanes). While the posted speed limits have been observed at between 25 and 30mph, one-way multilane roads tend to encourage higher vehicular speeds. (See the transportation section for more details on traffic volumes and speeds in the Planning Area). As described above, greater traffic volumes and traffic speeds increase the perception and possible reality of crime incidence in a neighborhood.

Public transit and crime: Transit access and use is very prevalent in the Planning Area. The Lake Merritt BART Station is a central hub for transit riders (both BART and AC Transit). The station has over 11,000 people entering (over 6,000) and exiting (over 5,000) on an average weekday. [392, 393] Public transit use data is presented here because of the theory that it impacts crime, however, as stated above, current evidence does not suggest that it has any relationship to crime. See Figures 7 and 8 for crime in relation to bus stops in and around the Planning Area.

Figure 7. Average density of non-violent crimes between 2008-2010 with bus stop locations

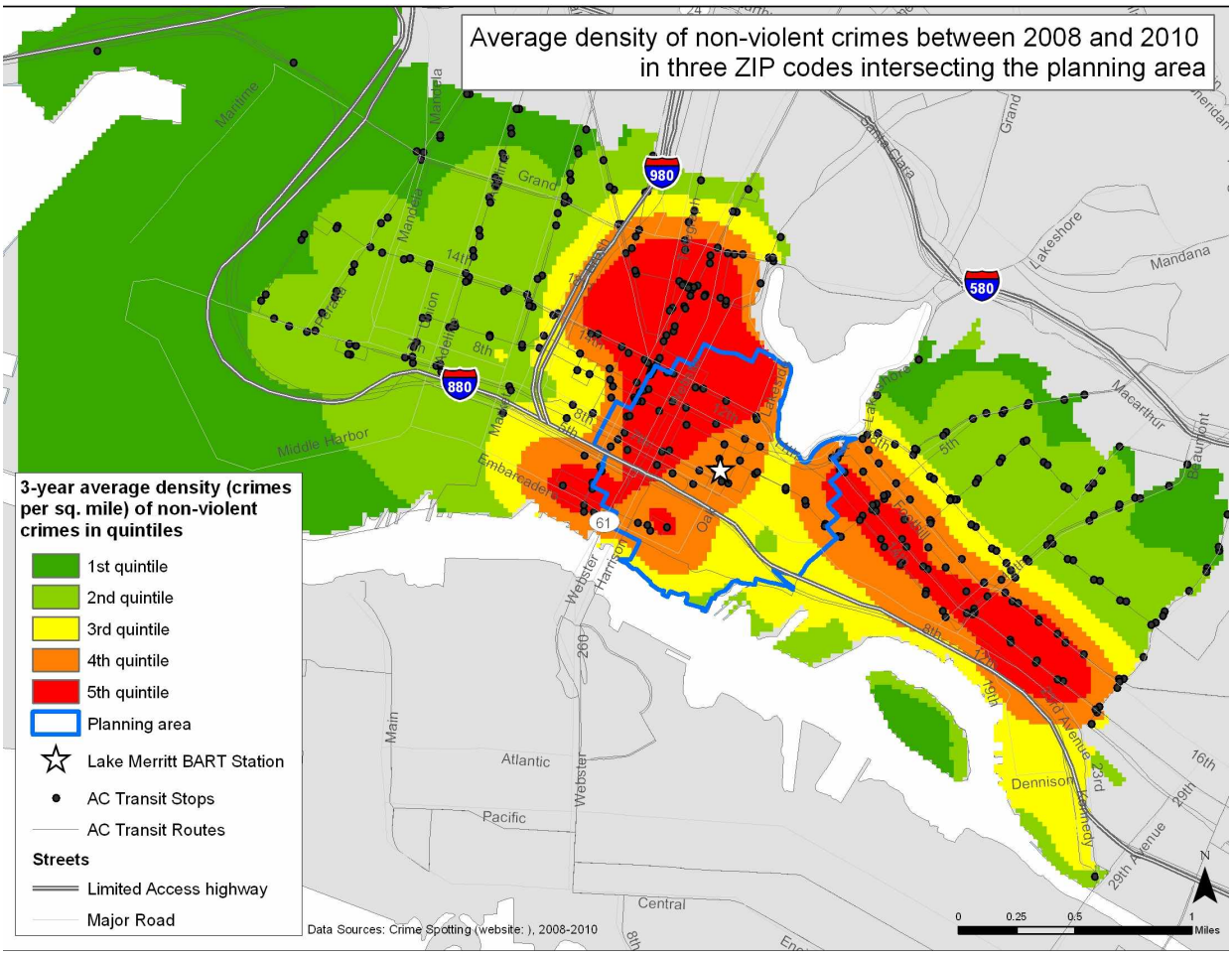
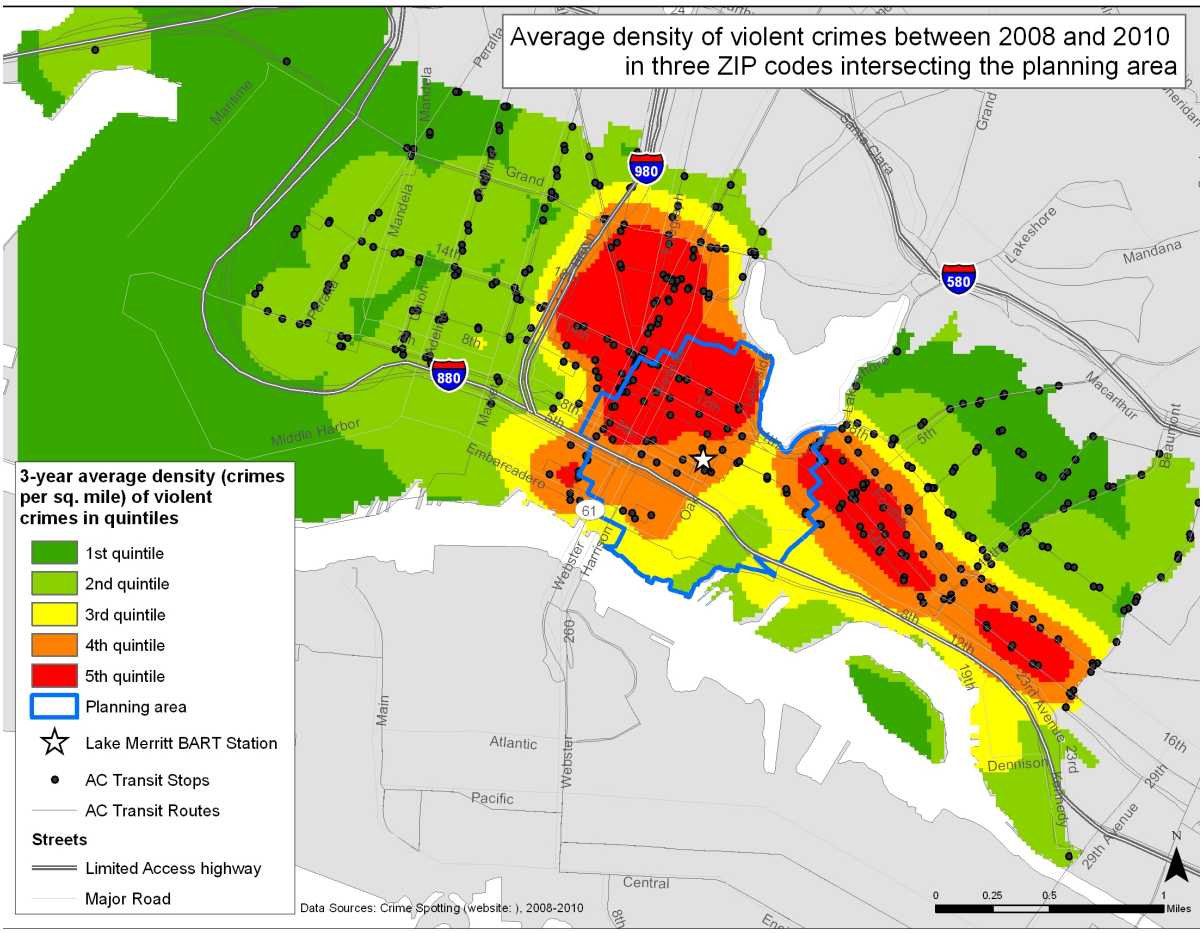


Figure 8. Average density of violent crimes between 2008 and 2010 with bus stop locations



Household income levels, resident ages, and crime: The median household income in the Planning Area is $46, 463 and 16% of the people have had income below the poverty level in the last 12 months. According the Bureau of Labor Statistics, in January 2011, the San Francisco Oakland Fremont area had an unemployment rate (as a percentage of the labor force and not seasonally adjusted) of 10.2%, higher than the average 9.8% national rate.[394] As described above, crimes tend to concentrate in areas with higher levels of poverty, and lower median household income.

Gentrification susceptibility in the Planning Area: The Planning Area has been identified as being very vulnerable to gentrification in the coming years. [395] Research on whether gentrification is a risk factor for crime is mixed.

Social cohesion and cultural preservation

The Planning Area is rich with social cohesion and cultural opportunities contributing to cultural and social preservation, which are potentially conditions which prevent crime. Many of these opportunities and activities are linked to the Chinatown community, Laney College, and/or City-sponsored resources and events. Many are represented in Table 22. Each of the community facilities provides opportunities for residents and communities to gather and build social cohesion and a sense of community. For example, the Oakland Asian Cultural Center alone serves

thousands of community members on an annual basis by providing classes, events, projects, tours and more:[396]

- *Classes*: 350 students/week, 150 students (special workshops), 175 parents, 30 classes weekly
- *Community Collaborations*: 5,320 participants
- *Lunar New Year and APA Heritage Festivals*: 1,500
- *Oakland Chinatown Oral History Project*: 1,000 visitors/participants
- *School Tours*: 1,000 students/teachers
- *Exhibits*: 5,000 people

Table 22. Existing cultural opportunities, resources and activities[397]

Community facilities and cultural gathering spaces	• Lincoln Square Recreation Center • Laney College • Madison Sq. Park • Chinese Garden Park • Oakland Asian Cultural Center • Milton Shoong "Mun Fu Yuen" Chinese Cultural Center • Malonga Casquelourd Center for the Arts • Oakland Museum of California (OMCA) • Numerous Family and Regional Associations (19 total)
Churches in the Chinatown district	• Buddhist Church of Oakland • The Light of the Buddha Temple • Chinese Community United Methodist Church • Chinese Presbyterian Church • Chinese Independent Baptist Church • The Episcopal Church of Our Savior
Libraries	• Main Library • Asian Branch Library • Laney College Student Library • Law Library
Services providers	• Family Bridges • Asian Health Services • Open Door Mission • Salvation Army • Asian Community Mental Health Services • Asian Pacific Environmental Network • Pilipino Advocates for Justice • Asian Youth Promoting Advocacy and Leadership • East Bay Asian Local Development Corporation • Chinatown Chamber of Commerce • Oakland Asian Students Educational Services • Chinese American Citizens Alliance • Hong Food Adult Day Care Health Center • Hong Lok Senior Center • National Council on Crime and Delinquency (NCCD) • Vietnamese Community Center of the East Bay • Community Health for Asian Americans
Organizations	• Asian Branch Lib

	• Lincoln Square Recreation Center • Hall of Pioneers and Sun Yat Sen Memorial Hall • Oakland Asian Cultural Center • Milton Shoong Chinese Cultural Center • Malonga Casquelord Center for the Arts • Buddhist Churn of Oakland • The Light of the Buddha Temple • Oakland Museum of California • Chinese Community United Methodist Church • Chinese Presbyterian Church • Chinese Independent Baptist Church • The Episocpal Church of our Savior • Salvation Army • Wa Sung Community Service Club
Cultural and social events in the area	Annual Events (5 events/series): • StreetFest, since 1988 on the fourth weekend in August draws 100,000 people with 280 vendors and many cultural performances • Lunar New Year Celebrations & Lion Dances: Late Jan - Feb there are at least three separate events (Chinatown Chamber of Commerce, Oakland Asian Cultural Center, & Laney College) • Night Market: started in 2009 by Chinatown Chamber of Commerce runs on weekends during June & July. • Asian Pacific American Heritage Festival: Every May with cultural events, food, dance, performances, etc. • Obon Festival: hosted by the Buddhist Church held in the Church parking lot (Madison Sq. is too small). Laney College Events (5 events): • Black History Month: Each Feb. with the African American Department • World Music Series: Bi-weekly hosted by the Music Department • Dia de los Muertos: festival hosted by the Latin American Studies Dept. • Laney Summer Music Camp: hosted by the Music Department • Laney Flea Market: Every Sunday. Other (1 recurring event): • First Fridays After Five: First Friday of each month with the Oakland Museum
Other social/cultural activities frequently observed in open space in the Planning Area	• Tai Chi and Martial Arts (several hundred daily participants) • Mahjong • Chinese Chess and other board games

5.7.3. Impacts of the Draft Emerging Plan on Public Safety, Related Health Outcomes, and Recommendations Proposed by this HIA

As discussed in Section 4, an impact assessment of the DEP on Public Safety and health outcomes was not conducted due to prioritization of other topics and project timeline constraints.

While we did not conduct our own public safety analysis as part of this HIA, the following recommendations were generated by Asian Health Services' community engagement process, [398] *and we find them to be health-supportive:*

Create safe public spaces

- Increase foot traffic and create job opportunities by attracting small businesses.
- Create a friendly, safe, and transit-oriented environment with better lighting and pedestrian improvements to enhance Chinatown and Laney College.
- Strengthen linkages to key destinations within the area, including Oakland Chinatown and Laney College.

Promote safer streets

- Reduce traffic throughout the neighborhood.
- Improve and maintain sidewalks.
- Ensure cleanliness and safety of streets and intersection crossings.

Improve community police services

- Establish a police sub-station by the Lake Merritt BART Station.

Include violence prevention programs and policies

6. Reporting

This HIA is the final reporting product of this HIA process. As described in Section 3, other reporting products included the following:

- A summary table of health impact feedback on Land Use and Transportation Concepts (Appendix C) released by the City of Oakland in June and July, 2011;
- A health impact assessment of the Draft Emerging Plan in November 2011 (Appendix E); and
- A memo providing requested research evidence to City of Oakland Planning Staff in December 2011 (Appendix F) addressing the following topics:
    - Air quality mitigations for housing near freeways
    - Pros and cons of higher density housing
    - Bicycle and pedestrian infrastructure's impact on business

Other HIA reporting activities included meetings with City of Oakland Planning Staff (June-November 2011) and attending and speaking about elements of the HIA at Oakland City Council hearings (March 2012).

7. Monitoring

Goals for the monitoring process include continuation of advocacy for health-promoting recommendations made by the HIA and holding decision-makers accountable to what they agreed to. Specifically, we would like to see:

- At least four HIA recommendations included in the Final Station Area Plan;
- Additional strategies for increasing parks and open space in the Planning Area;
- Mitigations included in the final SAP for reducing exposure to air pollutants within residential housing; and
- Concrete and specific policies for increasing affordable housing in the SAP.

The HIA monitoring plan, to track the impact of this HIA on LMB SAP planning activities, as well as measure the impact of the LMB SAP on health outcomes, is included in Appendix G. This monitoring plan is intended to be a "living" document, in that it can be further developed and revised as necessary during the monitoring period.

8. Conclusions

The Lake Merritt BART Station Area Plan has the potential to create lasting impacts to health and wellness among residents, workers, and visitors to Downtown Oakland, Chinatown, Laney College, and the southern rim of Lake Merritt. Oakland Chinatown, a regional center for Chinese populations throughout the Bay Area with over 20,000 shoppers and tourists each weekend, makes up a particularly large area of the Lake Merritt BART Station Planning Area. This planning process presents a tremendous opportunity to ensure development that optimizes conditions for a healthy and vibrant community.

Transit access, pedestrian improvements, traffic calming designs, healthy and affordable housing, local jobs, increased access to existing regional parks, and probable improvements to public safety are all likely to lead to health benefits. However, some negative health impacts of the proposals are predicted, such as a higher risk for housing displacement and gentrification, increased pedestrian and bicycle collisions, and hazardous air quality impacts associated with increased vehicle trips and increased resident exposure to Interstate 880. Recommendations included in this HIA will help address these negative impacts and improve future health outcomes.

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