

OAK TO NINTH AVENUE

HEALTH IMPACT ASSESSMENT



Public Review Draft

UC Berkeley Health Impact Group

May 31, 2006

***Dedicated to those who work for an informed,
accountable and just democracy***

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About UC Berkeley Health Impact Group

The UC Berkeley Health Impact Group (UCBHIG) is a collective of graduate students and faculty associated with the UC Berkeley School of Public Health. Please direct comments and questions on the Oak to Ninth Avenue HIA to ucbhig@gmail.com.

May 30, 2006

Oakland City Council
One Frank Ogawa Plaza
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Honorable Members of the Oakland City Council:

We are pleased to share with you this complete public review draft the Oak to Ninth Avenue Health Impact Assessment.

Having expertise, knowledge, and experience from many disciplines and perspectives supports good public decisions. We believe that this assessment complements other environmental and economic analysis conducted for the Oak to Ninth Avenue development project, by looking at how the project as proposed affects the conditions required for optimal health.

The report includes analysis of impacts on five issue areas: parks and open space, pedestrian injury, housing, air quality, and noise along with constructive recommendations for improving the project and mitigating adverse health impacts. Findings for some of these component analyses have been already communicated to you and the Oakland Planning Commission.

Meaningful public involvement and buy in of all stakeholders also supports successful outcomes. This assessment therefore provides and analysis of the history and process that led to this development proposal and the quality of the public involvement opportunities along the way.

We understand that successful decisions typically involve trade-offs. Still, we trust you will take the time necessary to review our findings and consider and evaluate the recommendations and their feasibility.

We are currently providing this assessment as a public review draft. We would be happy to respond to any questions would also request city staff point out any errors or omissions. Finally, we would be very interested in your perspectives on the value of health impact assessment for future city planning decisions.

Respectfully,

The U.C. Berkeley Health Impact Group

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Executive Summary

Introduction

Health Impact Assessment (HIA) refers to a set of methods and tools used to answer an important question: how do policies, plans, programs, or projects affect health, health behaviors, and social resources necessary for health? A number of countries and the World Health Organization (WHO) have adopted Health Impact Assessment (HIA) methods to incorporate the consideration of potential health consequences into the review of proposed policies and developments.

The Oak to Ninth area comprises approximately 64 acres of waterfront property owned by the Port of Oakland. According to the City of Oakland, “The proposed project includes up to 3,100 residential units, 200,000 square feet of ground-floor commercial space, 3,500 structured parking spaces, approximately 29.9 acres of public open space, two renovated marinas, and a wetlands restoration area.” The University of California at Berkeley Health Impact Group (UCBHIG) is a non-partisan, independent collective that emerged from a graduate seminar on HIA at the UC Berkeley School of Public Health. UCBHIG conducted a HIA of the Oak to Ninth Avenue development project due to its large scope and influence on many determinants of human health. UCBHIG members did not receive funding for this assessment nor do any members have economic interests in the outcomes of the Oak to Ninth decision.

We conducted the analysis for this HIA between February and May 2006. Prior to and at public hearings of the Oakland Planning Commission and the Oakland City Council in March 2006, we communicated several components of this analysis and associated design recommendations. Many of the issues evaluated in this HIA have been the subject of public comment and continue to be the subject of substantial public debate and negotiation. This analysis does not reflect or take into account any changes to the project subsequent to the Final Environmental Impact Report in February 2006.

Like Environmental Impact Assessment (EIA), this HIA includes an impacts analysis and proposes a set of mitigations to those impacts. However, the Oak to Ninth HIA also differs from the traditional EIA in several significant ways:

- HIA complements analysis required under CEQA;
- HIA evaluates environmental, social, and economic effects using the lens of human health;
- HIA estimates benefits as well as adverse consequences;
- HIA evaluates the distribution of impacts on different populations; and,
- HIA uses quantitative and qualitative methods.

This HIA evaluates the project’s effects relative the following health-related factors. These include:

- Democratic planning processes
- Parks and natural spaces
- Pedestrian injuries
- Healthy housing and social integration

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- Air quality
- Community noise

Given limits on resources and time available for the project, our group has not evaluated all health issues potentially related to this project. Methods used by UCBHIG in conducting this analysis include:

- Review of the empirical and scientific literature related to this project
- Review of public standards, objectives, regulations, and guidance relevant to planning and health
- Planning document review
- Interviews and dialogue with key stakeholders
- Secondary data analysis
- GIS Mapping
- Quantitative forecasting
- Review and analysis of public comment and testimony

This report includes an executive summary, an introduction and one chapter for each of the above topics. Each chapter begins with a short summary of identified impacts and recommendations to improve those impacts. Each chapter is then organized into the following sections: (A) summary (B) evidence on the relationships between the topic and health; (C) relevant established standards and health objectives; (D) the setting, context, or existing conditions; (E) analysis and impact assessment; and (F) recommendations for design and mitigation. Relevant figures and maps follow each chapter. We include each chapter summary below as part of this executive summary.

UCBHIG recognizes that there is significant public controversy associated with approval of the Oak to Ninth Avenue project and related planning and design issues. Overall, we aim for the Oak to Ninth Avenue Health Impact Assessment to provide constructive recommendations both in the interest of social and public health and in the interest of an open and transparent public process. Our groups' long term interest is to use health impact assessment in support of future development in the City of Oakland.

Chapter Summaries

Chapter 2: Planning Process Analysis

Stakeholders participating in the Oak to Ninth Avenue development process have raised several concerns about the planning procedures. Many people allege that the development proposal submitted by Oakland Harbor Partners (herein known as OHP or "the Developer") disregards the legislatively established Estuary Policy Plan, does not fulfill the obligation to develop a specific plan, and does not follow the terms of the Port's Schedule of Performance. Others contend that planning has not accounted for more substantive planning issues such as affordable housing, integration, pedestrian safety, and open space accessibility. This planning process analysis examines the following five process-related questions:

1. *Did the Development Process conform to the requirements in the Port of Oakland's request for qualifications (RFQ)?*
2. *Is the Development Project consistent with the Oakland General Plan?*
3. *What consequences result from not requiring the Developer to produce a specific plan?*
4. *What was the quality of public participation in the Oak to Ninth Avenue Development Process?*
5. *What was the role of interest groups in influencing this development project?*

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Key Findings

1. A review of the Oak to Ninth Avenue development process relative to the Port of Oakland's RFQ schedule of performance revealed the following five issues:
 - a. Oakland Harbor Partners (OHP) did not initiate or develop a specific plan with community input as required in the RFQ Schedule of Performance;
 - b. OHP did not meet subsequent scheduled performance milestones;
 - c. OHP development plans diverged from the Estuary Policy Plan vision without public review;
 - d. The Port of Oakland did not re-appraise the property or alter the land sales price despite plan revisions expected to increase property values;
 - e. Economic feasibility studies that may have justified the OHP revision of the project objectives were not subject to public review or scrutiny.
2. Revisions to a General Plan should generally follow a process similar to the one that led to its adoption. In the case of the Oak to Ninth Avenue development, the public and stakeholders are responding and reacting to a proposal in substantial conflict with established public policy goals as articulated in the Oakland General Plan without first having the opportunity to re-evaluate those policy goals.
3. Evidence suggests that the OHP development plan is neither substantively or procedurally equivalent to a specific plan. By issuing a development proposal in advance of comprehensive planning and then later suggesting that the development proposal is substantively and procedurally equivalent to a specific plan, the City of Oakland may be effectively de-legitimizing both the City's General Plan as well as established planning principles.
4. In the Oak to Ninth case, the lack of ability for participants to influence design and planning appears to be a substantial barrier to meaningful public participation

Recommendations

While time and expense is required for a successful public planning process, the costs of poor decisions, whether measured in public dissatisfaction, loss of trust in public agencies, or human, social, and environmental costs outweighs these short term expenses. Successful public involvement has many direct and indirect social benefits. The following are three recommendations for the Oak to Ninth Development as it stands in May 2006:

1. The City of Oakland should specifically document whether and how the project has been responsive to public concerns and to constructive design change recommendations raised in the numerous public meetings and hearings.
2. Regardless of the history of the process, the City of Oakland should convene an independently facilitated multi-stakeholder consensus process to address unresolved controversies associated with the Oak to Ninth Development and to address and resolve inconsistencies between the project and established General Plan goals and policy.
3. The findings from both the documentation of public concerns and the multi-stakeholder consensus process should be made publicly available, at a minimum via the City of Oakland website.

Chapter 3: Parks and Natural Spaces

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Access to parks and natural spaces confers numerous health benefits. For example, contact with nature and passive and active recreation are positively associated with physical activity, mental health and a sense of well being, social cohesion, and environmental quality. Specific health outcomes improved by access to parks and natural spaces include depression, obesity, heart disease, cognitive function, and problem-solving ability. Significant economic and social costs result from limited and unequal access to parks and natural spaces.

Analysis of the current distribution of city parks in Oakland reveals that large percentages of Oakland residents do not have access to open space resources which can help prevent many of the disease outcomes currently endemic in the city such as diabetes, hypertension, and obesity. Less than half of Oakland residents live within 10 minutes walking distance of a city park. The distribution of access to Regional Parks is also not uniform among Oakland neighborhoods. Most striking is the lack of access to large parks that would be suitable for recreation and getting the recommended amounts of physical activity. In particular, two-thirds of Oakland youth do not live in areas that provide access to adequate park resources. This is an environmental factor contributing to childhood obesity.

The parks and natural spaces that remain in the public domain in the proposed Oak to Ninth development will provide a significant health benefit to the future residents of the development; however, the project, in part due to its design, does not provide a significant new park resource for the City as a whole. Only with modifications to increase the accessibility of these parks to adjacent neighborhoods and other Oakland residents will they help reduce the current park shortage for the City as a whole. With such modifications, these parks could result in a significant benefit to the health of Oakland residents.

Key Findings

1. The Oak to Ninth Project will result in a new residential neighborhood rich in park resources; this will have positive health benefits for the residents of this new neighborhood.
2. The Oak to Ninth Project represents a net loss of 15 acres of open space relative to existing planning designations under the Oakland General Plan Estuary Policy Plan; this represents the loss of a significant health resource for Oakland as a whole.
3. Unmitigated physical and social barriers between the proposed estuary and waterfront resources and upland neighborhoods will limit the potential health benefits of the project to Oakland residents. This represents a missed opportunity to improve the health of Oakland residents.
 - Elements of the Project, particularly the large residential buildings, create potential physical and social barriers to views and public access to public park resources along the Estuary and Waterfront.
 - Physical barriers, including the rail corridor and the I-880 freeway corridor create a significant obstacle to convenient public access from upland and park-poor neighborhoods.
 - The project did not include planning or design for functional access between upland neighborhoods and proposed public park resources along the estuary and waterfront.
 - Existing preliminary work on estuary access (e.g., 5th Avenue Multi-modal transportation design work) was not reflected in the development proposals to the City.
 - Facility and operations planning for the proposed parks do not reflect input and needs of residents of upland neighborhoods.
 - The community benefits district proposed for the park risks functional privatization of park resources.

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Recommendations for Design and Mitigations

1. Create safe, continuous, and functional routes connecting the waterfront to adjacent neighborhoods. At a minimum, an inviting route should exist along the estuary channel and along 5th Avenue.
 2. Provide public transit services directly to the waterfront.
 3. Increase public parking adjacent to waterfront park resources.
 4. Ensure the socio-economic integration of project housing.
 5. Explore design changes to improve visibility of the waterfront.
 6. Explore re-routing the Embarcadero between the residential uses and the public waterfront.
 7. Include residents of upland neighborhoods in park planning.
 8. Create seats for citywide interests on all oversight bodies for project parks.
-

Chapter 4: Pedestrian Injuries

According to Oakland's Pedestrian Master Plan, Oakland suffers approximately 85.5 vehicle injuries to pedestrians per 100,000 every year including 3 pedestrian fatalities per 100,000 per year. The rate of pedestrian injuries is about 4 times the USDHHS standard; the rate of fatal injuries in Oakland is three times the USDHHS standard. A significant number of Oakland pedestrian injuries occur in the neighborhoods and streets surrounding the proposed project (e.g., Downtown, Jack London Square, Chinatown, Lakeshore, East Lake, Lower San Antonio, International Blvd). Health impact forecasting shows that the project will contribute to an increase in pedestrian injury rates due to a significant increase in project-related vehicle trips on roadways surrounding the project. Furthermore, safe walking or biking routes between the project and upland neighborhoods, schools, community facilities, and regional transit stops do not exist. The project's adverse health impacts warrant investments in feasible pedestrian safety mitigations at intersections and in pedestrian routes between the project and typical destinations.

Key Findings

1. Quantitative forecasting of changes to Oakland's pedestrian injury rate based on project-related changes in traffic flows and a baseline injury rate of 100 injuries per year in the area of influence estimates that the project's traffic alone will contribute about 5.4 additional injuries per year or 268 pedestrian injuries in the years 2025-2075. The cumulative impact of increased traffic in the area by 2025 forecasts 20 additional injuries per year with a total of 1000 growth related additional injuries in the years 2025-2075.
2. No safe pedestrian routes currently exist between the project and upland neighborhoods; residents traveling to schools, community facilities, and transit stops via walking are at risk of pedestrian injury.

Recommendations for Design and Mitigations

1. Implement a traffic calming program in adjacent residential neighborhoods to include vehicle lane narrowing, raised crosswalks, raised intersections, and traffic circles.
2. Provide countdown pedestrian signal heads, bulb outs, and center median refuge islands at high-volume multi-lane intersections where cumulative traffic volume increases exceed 5%.
3. Provide pedestrian warning signs or lights at all crossings or cross walks without traffic signal lights.
4. Divert through-traffic around mixed use neighborhoods.

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5. Study one-way to two-way conversions and lane reductions for the Chinatown District.
 6. Institute speed limit reductions to less than 20mph in mixed-use residential areas adjacent to the project.
 7. Plan and implement bicycle and pedestrian trails between the waterfront, adjacent neighborhoods and transit stations east of I-880; one class I bike should be provided (e.g., along the estuary channel pathway and the existing at-grade 5th avenue roadway should undergo redesign as a multi-modal corridor between the Eastlake District and the waterfront.
 8. Widen sidewalks or provide buffers between sidewalks and vehicle lanes on busy roadways with significant pedestrian traffic.
-

Chapter 5: Healthy Housing and Social Integration

Encompassing shelter, home, and neighborhood, housing affects health in diverse ways—positively and negatively. Healthy housing is affordable, physically safe, stable, spacious, and located in a setting that provides access to jobs, goods, services, transportation and nature, supporting meaningful social participation. Land use policies such as zoning and redevelopment can either facilitate or hinder the achievement of adequate housing needs in a city. Research demonstrates that residents of low-income economically segregated communities in Oakland live about six fewer years and experience a much greater burden of chronic disease than those in non-poverty neighborhoods. These reductions in life expectancy are caused by many place-based factors including air pollution, violence, traffic hazards, poor schools, the absence of parks, and limited economic opportunity and mobility. In contrast, mixed-income neighborhoods are assured the health benefits of access to healthier foods, better schools, better public transit, safer neighborhoods, park access and cleaner environments. The Oak to Ninth Development, as proposed, increases the supply of future market-rate housing but does not respond to the need for moderate and low-income housing. The project also creates a largely upper-income class-stratified community. As such, it is potentially a lost opportunity for improving health and wellbeing, growth of community ties, and enhancement of social cohesion in Oakland.

Health Impacts

1. The Oak to Ninth Project increases the future supply of housing in Oakland for those able to afford market-rate housing.
2. The project does not equitably advance Regional Housing Needs Determination (RHND) objectives for all income strata. Oakland has only met 18%, 57%, and 8% of its current RHND obligations for very-low, low and moderate income households, while exceeding RHND requirements for market rate housing. The project would result in an additional 121% of the 1999-2006 production targets for market-rate housing, while producing only 8%, 29%, and 0% of very-low, low and moderate production goals.
3. The project does not provide adequate and attractive housing choices for families with school aged children.
4. The project, in its current design, will foster the development of a socio-economically homogeneous community, exacerbating existing tensions between individual, neighborhood, and commercial interests.
5. The project may contribute to a greater concentration of below-market housing in low-income neighborhoods.

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6. The project may contribute to regional air pollution and traffic congestion, resulting from demographic changes and shifts in the local jobs/housing balance.

Recommendations for Design and Mitigations

1. Ensure distribution of housing costs reflects the current household income distribution of Oakland so that:
 - a. At least 25% of housing is affordable to low-income and very low-income households,
 - b. At least 25% of housing is affordable to households earning the area's median income;
 2. Incorporate mixed-income dwellings as opposed to building market rate and below market rate housing in segregated areas.
 3. Include as part of the development project site and implementation plans for a neighborhood elementary school.
 4. Creating crossing points and common paths of access where residents must come in contact with one another.
 5. Include a common courtyard with benches, plants and fountains in order to create common spaces through which dwellers pass and mingle.
-

Chapter 6: Air Quality

Vehicle emissions associated with the I-880 freeway, including particulate matter and diesel particulate matter have the potential to result in significant and adverse impacts on the health of residents of the Oak to Ninth project. Without mitigations, future residents of the Oak to Ninth Avenue living within 500 feet of the I-880 freeway are likely to experience higher rates of respiratory illnesses and higher morbidity from asthma. The project also indirectly increases exposure to roadway particulate matter emissions in neighborhoods surrounding the project.

Key Findings

1. Future Oak to Ninth residents are at risk of chronic and acute respiratory disease due to freeway related vehicle emissions.
2. Freeway diesel emissions result in a small increase cancer risk for project residents.
3. Project related traffic will increase cumulative air pollution exposure to residents of neighborhoods adjacent to the project, including children and the elderly.

Recommendations for Design and Mitigations

1. Evaluating modifications to the project footprint to reduce the number residential dwellings within 500 feet of interstate I-880.
2. Notifying all potential buyers that the property they are occupying has air quality risks and educate them in the proper use of any installed air filtration.
3. Requiring, as an additional condition of development, prospective monitoring of particulate matter hot spots both on the Oak to Ninth site and in neighborhoods to the east, northeast, and southeast.
4. Developing requirements for air quality mitigation measures and/or traffic demand management measures that would be triggered by local particulate matter levels that exceed California standards.

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5. Include as part of the development project site and implementation plans for a neighborhood elementary school. Alternatively, provide a safe and continuous pedestrian pathway to a nearby school with 0.5 miles of the project site.
 6. For residential units within 500 feet of I-880:
 - a. Providing residential units with individual HVAC systems in order to allow adequate ventilation with windows closed;
 - b. Locating air intake systems for heating, ventilation, and air conditioning (HVAC) systems as far away from existing air pollution sources as possible;
 - c. Using HEPA air filters in the HVAC system and developing a maintenance plan to ensure the filtering system is properly maintained; and,
 - d. Utilizing only fixed windows next to any existing sources of pollution.
 7. Providing 110 and 220 outlets at project loading docks so that trucks can connect with these outlets to power their auxiliary equipment.
 8. Utilizing only electric forklifts and landscaping equipment in the project operations and the operations of tenants.
 9. Requiring the transit shuttle to run at least every 30 minutes in the off-peak and every 15 minutes during peak travel times with hours that match BART's schedule.
 10. Unbundling the cost of parking from residential rents to encourage residents to reduce their car ownership rates.
 11. Implementing a project-wide car share program.
 12. Subsidizing transit passes to employees and residents at the project site (e.g. AC Transit's Eco-Pass program).
 13. Requiring secured bicycle parking for employees and residents.
 14. Requiring commercial tenants to provide a parking cash-out program to their employees to reduce the likelihood of driving alone.
 15. Providing a safe route for children living at the project to safely get to and from school by walking and bicycling.
 16. Providing a safe route for walking and bicycling to area BART stations.
 17. Consider reductions in regional and area wide air pollution emissions via modifications to the number and type of units below market rate.
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Chapter 7: Community Noise

The Development of the Oak to Ninth project will result in exposure to future residents of high levels of community noise. Parcels A, F, G, K, and M, closest to the freeway, have background noise levels currently over Ldn 70 dBA, and residential uses at these levels are considered normally unacceptable to clearly unacceptable based upon the Oakland General Plan. In addition, they are subjected to numerous short term railroad horn noise exposures at the 5th Street railroad crossing. The USEPA estimates that these unmitigated noise levels will result in community reactions ranging from threats of legal action to vigorous protest and may result in elevated blood pressure, circulatory disease, ulcer, colitis, and sleep deprivation. Implementation and evaluation of a comprehensive set of indoor and outdoor noise mitigations should be required as a condition of development.

Key Findings

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1. Regardless of the feasibility and effectiveness of indoor noise mitigations, some project residents are likely to be exposed to environmental noise to an extent that can create annoyance and adversely effect school and work performance.
2. Without mitigations, we estimate 53% of residents in dwellings adjacent to the railway line will experience sleep disturbance; even with a highly effective noise mitigation program capable of reducing noise by 50dB, 7% of residents would experience sleep disturbance.
3. Existing project area outdoor noise levels of greater than 70 dB will prevent normal voice level communication at unprotected exterior locations.
4. Plans under consideration for development of affordable housing include locating below market rate housing on project area parcels with the highest levels of noise create an adverse environmental justice impact.

Recommendations for Design and Mitigation

1. Reduce the speeds of the traffic on the Embarcadero and project's residential streets.
2. Notify all potential buyers that the property they are occupying has noise risks.
3. Installation of noise-insulating windows, exterior doors and walls, and individual HVAC system.
4. Design units exposed to high noise levels with interior courtyards and patios that open into acoustically protected and shielded areas.
5. Require, as a condition of development, all feasible traffic demand management actions.
6. Integrate below market and market rate units in the same buildings to prevent environmental justice impacts.

Oak to Ninth Avenue

Health Impact Assessment

Chapter 1

Introduction and Scope

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Chapter 1. Introduction and Scope

A. The Rationale for Health Assessment in Land Use Planning

The health of people depends on quality of their environments. In broad terms, a healthful environment requires adequate housing; access to public transit, schools, parks and public spaces; safe routes for pedestrians and bicyclists; meaningful and productive employment; unpolluted air, soil, and water; and, cooperation, trust, and civic participation.

Land use and transportation planning decisions can have significant and wide-ranging impacts on the environment as well as on health. Today it is well recognized that urban design that maintains long distances between where people live, work, shop, and play is responsible for air and water pollution, stressful commutes, physical inactivity, and global warming.¹ Effects on land use decisions on health are due to physical as well as social factors and the interactions among them. Unaffordable housing forces people to live in crowded or substandard conditions; to compromise access to quality jobs, services and education; and to work multiple jobs to make ends meet. The concentration of low-income populations in segregated neighborhoods creates multiple forms of disadvantage, including deteriorated schools and public infrastructure, high rates of crime, and limited employment opportunities. Societies achieve optimal health for their populations by providing healthful environments and working conditions for all members.

Key to the design of a healthful environment are mechanisms to consider health in policy making, however, few such mechanisms exist. With regards to land use and transportation planning and policy, no specific mandates exist to consider health comprehensively. While land use plans and development projects must comply with specific environmental and building health and public safety regulations and, in some states, requirements for environmental review, the regulations do not take into account all health issues.

Residents and community organizations frequently request planning agencies to conduct health and social analyses of land use plans and development projects; however, within local and regional Planning Departments, resources, expertise, and experience do not typically exist to assess health impacts. Similarly, most public health professionals have little experience working in the realm of planning. In general, Planning, Transportation, Housing and Economic Development agencies make decisions that affect health-related factors in built environment important to health, typically without consideration of health and without consultation with public health professionals.

In the United States, local public health agencies are increasingly recognizing the need to play a role in improving environmental conditions. For example, in its 2004 Oakland Health Profile, the Alameda County Public Health Department documented the burden of disease and mortality varies considerably from neighborhood to neighborhood, illustrating the importance of place to health. For neighborhoods with high poverty rates and poorer health outcomes in Oakland, the Health Department prioritized: “,,, a focus on supporting and working with community as partners to address social and environmental factors associated with good health. Specific issues include access to healthy foods, parks and playgrounds, housing, transportation, education, employment, universal access to quality health care, and clean air.”

¹ Ewing R, Frank L, Kreutzer R. [Understanding the Relationship Between Public Health and the Built Environment: A Report to the LEED-ND Core Committee](#). 2006.

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Cities in California, such as Oakland and San Francisco, are reviewing an unprecedented amount of residential development. Some of this development represents location-efficient infill and transit oriented development, which has well recognized environmental and health benefits. Indirectly, location efficient development can benefit health by increasing walking and bicycling, reducing emissions of pollutants into air and water, improving traffic safety, and building social capital. Collectively, these factors are associated with heart disease, hypertension, asthma, bronchitis, stroke, diabetes, obesity, osteoporosis, depression, and some cancers. A health analysis that illustrates these benefits might support resource-efficient land use strategies and can also help focus attention on the design and infrastructure needs for healthy and active living.

However, if not appropriately planned, location-efficient development also has the potential to cause or exacerbate avoidable health disparities. For example, many opportunity sites for infill and smart growth development are near freeways and other busy roadways. New residential development in core urban neighborhoods can thus increase noise and air pollution exposure and pedestrian--vehicle conflicts and injuries. New residential development that is not affordable risks involuntary displacement, a significant concern for existing urban communities. A health analysis of projects and plans can help analyze and mitigate such harmful effects. For example, health analyses could illustrate the need for requiring ventilation systems to reduce indoor particulate pollution and by requiring engineering countermeasures to reduce pedestrian injuries. Preventing their adverse health outcomes supports the adoption and success of location-efficient growth strategies.

Overall, some of relationships between design and health that merit analysis might include:

- Attention to safety and indoor air quality in the design and construction of buildings can both reduce environmental asthma triggers and prevent unintentional injuries.
- Neighborhood schools and child care centers reduce vehicle pollution while supporting childhood learning and parental involvement.
- Complete neighborhoods with integrated public and retail services and quality pedestrian environments increase physical activity potentially decreasing several chronic health conditions.
- Neighborhood groceries and farmer's markets support households to make nutritious food choices.
- Accessible and frequent transit services provide improved access to goods, services and health care.
- Ethnically and economically integrated neighborhoods support equality of economic and educational opportunities, resulting in better mental health and less violence.

B. The Practice of Health Impact Assessment

One strategy being used by local public health agencies to evaluate and improve land use and transportation planning is Health Impact Assessment (HIA).² In the United States, public health agencies in diverse cities such as San Francisco, Riverside, Denver, and Minneapolis, and Philadelphia are increasingly investing in strategies to influence the "built environment" to improve population health and reduce health inequities.

² [National Association of City and County Health Officials \(USA\)](#)

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Chapter 1. Introduction and Scope

Health Impact Assessment (HIA) describes the methods and tools used to inform policy-makers about how policies, plans, programs, or projects can affect health, health behaviors, and social resources necessary for health.^{3 4} Internationally, many countries use HIA to help direct public policy in ways that prevent disease and illness, potentially reducing significant economic costs of health care services. The International Association of Impact Assessment summarizes the rationale for HIA below:

Development planning without adequate consideration of human health may pass hidden “costs” on to affected communities, in the form of an increased burden of disease and reduced well-being. From an equity point of view, it is often marginalized and disadvantaged groups who experience most of these adverse health effects. From an institutional point of view, it is the health sector that must cope with development-induced health problems and to which the costs are incurred of dealing with an increased disease burden. HIA provides a systematic process through which health hazards, risks and opportunities can be identified and addressed upstream in the development planning process, to avoid the transfer of these hidden costs and to promote multi-sectoral responsibility for health and well-being.

While there are no specific legal or regulatory requirements for HIA in California, other laws do contain requirements to analyze issues relevant to health. For example, the California Environmental Quality Act (CEQA) requires that all potential environmental changes that can result in significant adverse impact on humans or public health must be addressed in an environmental impact report. (Section 15126.2 (a); Section 15065) Where project areas contain low-or moderate-income housing, California Redevelopment Law also requires a neighborhood impact report which describes in detail the impact of the redevelopment plan “... upon the residents of the project area and the surrounding areas, in terms of relocation, traffic circulation, environmental quality, availability of community facilities and services, effect on school population and quality of education, property assessments and taxes, and other matters affecting the physical and social quality of the neighborhood.” HIA provides Planning and Redevelopment agencies a way to help the requirements of both environment and neighborhood impact reports.

Typical steps in the HIA process are not dissimilar from the more common Environmental Impact Assessment (EIA). Typical steps include screening, scoping, analysis, reporting, and monitoring. Like Environmental Impact Assessment (EIA), this HIA includes an impacts analysis and proposes a set of mitigations to those impacts. However HIA, in the United States, is a new practice, with practitioners exploring alternative approaches to its practice and learning practical knowledge and information needs. HIA is also distinct from EIA as it is a voluntary assessment not bound in scope or approach by the procedural requirements and past practice of EIA. In general, HIA differs from the traditional EIA in several significant ways:

- HIA is voluntary but complements analysis required under law;
- HIA evaluates environmental, social, and economic effects using the lens of human health;
- HIA estimates benefits as well as adverse consequences;

³Quigley R. [Health Impact Assessment. International Best Practice Principles](#). International Association of Impact Assessment 2006

⁴ Cole B, Wilhelm M, Long P, Fielding J, Kominski G. and Morgenstern H. 2004. Prospects for Health Impact Assessment in the United States: New and Improved Environmental Impact Assessment of Something Different? *Journal of Health Politics, Policy and Law* 29 (6): 1153-1186.

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- HIA evaluates the distribution of impacts on different populations; and,
- HIA uses quantitative and qualitative methods.

Health Impact Assessment can also be understood as a policy tool intended to support a democratic, transparent, and fully informed policy-making process that considers the health of all people and fairness in the distribution of health resources. In adhering to these principles, practitioners of HIA should strive to involve affected stakeholders, use the best available knowledge, analyze both costs and benefits to health, evaluate the distribution of effects on vulnerable populations, and consider short term and long term effects.

C. Oak to Ninth Development Project

The Oak to Ninth Avenue Project involves rezoning approximately 64 acres of underutilized public waterfront on land currently owned by the Port of Oakland to enable a private mixed use residential development. The site is currently occupied by a combination of commercial, warehouse and light industrial uses. Under proposed entitlements, the developers can build 3100 market-rate condominiums and 200,000 sq feet of commercial space on 32 acres of the site. Another 32 acres of the site, largely tidelands subject to the public trust, will remain as new public parks. The project is proposed to be constructed in eight phases over approximately eleven years.

D. UCBHIG Health Impact Assessment

The University of California at Berkeley Health Impact Group (UCBHIG) is a non-partisan, independent group of graduate students and faculty participating in a seminar on health impact assessment at the UC Berkeley School of Public Health. In the seminar students learn about the core concepts, approaches, and tools of HIA. Students also engage firsthand with the practice of HIA by conducting an analysis on one project of regional significance and communicating their findings to local or regional officials. UCBHIG members do not receive funding for HIA nor do they have economic interests in the outcomes of the decisions they evaluate.

Specific aspects about the process for conducting this HIA are summarized below:

Screening UCBHIG conducted a HIA of the Oak to Ninth Avenue development project due to its large scale and potential influence on many determinants of human health including, housing, social segregation, open space, air quality, environmental noise, traffic hazards, and its proximity to socially vulnerable populations. In October 2005, one member of the UCBHIG submitted written comments on the Draft EIR. This comment outlined the potential for impacts on traffic injuries, noise related health effects, and respiratory disease on the Oakland Chinatown community, alerted the City to the need for further study of impacts related to noise, and identified analytic methods that could be employed in this analysis. The authors of the Oak to Ninth HIA did not believe the Final EIR provided a substantive analysis of the health impacts questions raised in that critique. Others who provided oral or written comment on the EIR also called for further analysis of health related impacts. Notably, the Chair of the Oakland Planning Commission requested the Director of CEDA to pursue available methods to further study pedestrian injury impacts. Given the public demand for greater analysis of health issues, UCBHIG decided to

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conduct this analysis to demonstrate both the rationale and the means for health effects analysis of these concerns.

Timing The assessment activities for this HIA occurred between February and May 2006. A draft HIA was published on May 31, 2006. In addition, the group communicated interim findings and design recommendations to the Developer, the Oakland Planning Commission and the Oakland City Council prior to the issuance of the draft report. The analysis is based on the project as described in the Final Environmental Impact Report in February 2006. Many of the issues evaluated in this HIA continue to be the subject of substantial public debate and negotiation.

Scope Given limits on resources and time available for the project, our group did not evaluate all health-relevant impact issues related to this project. Ideally, a comprehensive Health Impact Assessment analyzes all potentially adverse and beneficially impacts in a comprehensive way. Arguably, the project has several benefits to the City and people of Oakland. It will develop underutilized land as new housing and improve parts of the waterfront as accessible public destinations connected to the regional bay trail. However, the scope of this HIA focused on issues identified in critiques of the project both in the project's draft EIR as well as public hearings and community meetings. Specific facts about the project and the questions this HIA sought to answer are identified in the scoping table in the appendix to this chapter. The following several health-related questions to be most relevant to the public dialogue on the project:

- Whether the planning process reflected meaningful public participation
- Whether the City would lose open space or access to open space
- Whether project related traffic would result in an increase of pedestrian injuries
- Whether the project provided housing that met local needs
- Whether freeway related emissions would negatively affect the health of future project residents
- Whether the level of noise would negatively affect the health of future project residents

The Oak to Ninth HIA also did not conduct a comprehensive evaluation of alternatives. This is important as for any project, the benefits and costs, need to be judged against alternative scenarios. For example, amendments to the General Plan and Zoning reprogrammed land from a waterfront destination to a residential neighborhood. Housing is a real community need in Oakland but the benefit needs to be considered relative to an alternative where the same housing investments are made around blighted opportunity corridors in redevelopment areas. Similarly, the benefit to waterfront accessibility needs to be considered against the original waterfront design plan.

Assessment Methods An HIA may use both qualitative and quantitative methods. Methods used by UCBHIG in conducting this analysis include:

1. Review of the empirical and scientific literature related to this project
2. Review of public standards, objectives, regulations, and guidance relevant to planning and health
3. Planning document review
4. Interviews and dialogue with key stakeholders
5. Secondary data analysis
6. GIS Mapping
7. Quantitative forecasting
8. Review and analysis of public comment and testimony

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Community Participation Ideally, an HIA will be conducted in close collaboration with stakeholders representing all interests affected by the project or plan; however, HIA can also be effective if conducted in less participatory way (“desktop HIA”) if it provides meaningful and objective analysis of issues raised by stakeholders. The timing of the project decision and the capacity of the UCBHIG precluded convening a stakeholder advisory group to this HIA. UCBHIG members conducted outreach informally in person, and via email and telephone to identified stakeholders both to gain understanding of the project, to understand ideas already proposed for design and mitigation, and to understand the relative priorities of issues.

Report Structure This report includes an executive summary, an introduction and one chapter for each of the above topics. Relevant figures and maps follow each chapter. Each chapter begins with a short summary of identified impacts and recommendations to improve those impacts. Each chapter is then organized into the following six sections:

- A. Summary;
- B. Evidence on the relationships between the topic and human health;
- C. Relevant established standards and health objectives;
- D. A description of the setting, context, or existing conditions
- E. Analysis and impact assessment;
- F. Recommendations for design and mitigation.

Caveats and Limitations The primary purpose of HIA is to support the consideration of health issues by the public and policy makers. The **Oak to Ninth Avenue Health Impact Assessment** provides this analysis and associated constructive recommendations in the interest of public health and an open and transparent public process. We ask readers to keep in mind that HIA is a developing practice in the United States, keeping the following caveats and limitations in mind.

- Available analytic methods do not allow quantitative estimation of health effects for all pathways between social decisions and health. In most cases, available evidence does allow HIA to make reasoned judgments about whether the pathways between the project and health will operate and about the general direction and magnitude of effects;
- Resource limitations did not allow a comprehensive analysis of all potential health effects
- This HIA does not provide a comprehensive balance sheet of costs and benefits or make any judgments among trade-offs. (See discussion above)
- This HIA is limited in not comparing the project to alternatives (e.g., an project to develop housing in an alternative location)

Table IS.1: Health Determinants, Project Effects, and Assessment Questions for the Oak to Ninth HIA.

Health Determinants	Project Facts	HIA Questions
Housing Crowding Affordability Physical hazards Heat and Air	3100 housing units Density ~ 139 du/ acre Building Heights: 86-240 feet Subject to requirements for 15% of units to be affordable below market rate	<i>Will the project provide housing that meets regional needs with regards to size and affordability?</i> <i>Is the location of the housing accessible to resident needs, such as retail, parks, and schools?</i>
Livelihood Security of Employment Wages and income, Benefits and leave Job Hazards Job Autonomy Economic diversity Wealth	Short term Construction Employment Long term employment associated with project commercial space, retail, and area maintenance Project Labor Agreement 1.6 million fund for Job training	
Nutrition Food costs Food quality Food safety Proximity of food resources	Project will provide 200,000 square feet of ground-floor commercial space; Commercial uses not determined	
Air Quality Pollutants in outdoor air Pollutants in indoor air Environmental tobacco smoke	Project within 500ft of Interstate-880 Project residents will generate ~27,000 daily vehicle trips	<i>Will vehicle emissions associated with the I-880 Interchange create hazard for respiratory diseases in project residents?</i> <i>Will the transit village cumulatively improve or compromise air quality in the project areas</i>

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<p>Water Quality Contaminants in drinking water Infectious agents drinking water Recreational water quality.</p>	<p>No known effects</p>	<p>-</p>
<p>Noise Environmental noise Occupational noise</p>	<p>Project within 500 ft of Interstate 880 Measured noise levels on project site >70 db Ldn. Noise from nearby train horns in excess of 103 SEL represent significant potential sleep disturbance.</p>	<p><i>Will area noise sources (e.g. freeway and Bart) create health hazards for new project residents? Are regulatory requirements for acoustic mitigations sufficient to protect health and sleep?</i></p>
<p>Safety Violent Crime Property Crime Fire hazards Traffic hazards</p>	<p>Site plan for pedestrian and bicycle circulation;</p>	<p><i>Will the transit village contribute to or prevent pedestrian injuries in Oakland?</i></p>
<p>Transportation Access to jobs, goods, services, and educational resources Non-motorized travel Vehicle miles</p>	<p>Project trip generation: ~27,000 daily vehicle trips; Parking: 3,950 onsite parking spaces: about 3,500 in enclosed parking structures, about 375 spaces along public streets within the project area, and about 75 spaces in surface lots in proximity to the proposed open space areas; Transportation Demand Management Plan</p>	<p><i>Does the project employ a full spectrum of transportation demand management practices</i></p>
<p>Education School quality School proximity</p>	<p>No plans for new onsite or area school facilities;</p>	<p><i>Will the project create new demand for area k-12 public schools? Will existing schools be sufficient to meet demand?</i></p>

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<p>Parks and Natural Space Park quality, Park services Park access</p>	<p>Development of ~23 acres of new public parks; net loss of park acreage relative to existing General Plan Existing adjacent ~5 acre park Obstacles to pedestrian or bicycle access to parks from upland neighborhoods</p>	<p><i>Will existing plus planned park resources sufficient to enable minimal physical activity requirements of project and area residents?</i> <i>Will safe walking and biking paths help area resident's access new park resources?</i></p>
<p>Private Goods and Services Quality and proximity of financial institutions Quality and proximity of childcare services Quality and proximity of health services</p>	<p>Project will provide 200,000 square feet of ground-floor commercial space; Commercial uses not determined</p>	
<p>Public services Quality and proximity of health services</p>	<p>No Information</p>	
<p>Social Networks Contact with friends and families Support from friend and family</p>	<p>No Information</p>	
<p>Social Equity The proportion of the population living in relative poverty Attitudes towards or stereotypes of minority racial, social, and ethnic groups The segregation of residences by race, ethnicity, religion, or class The degree of inequalities in income or wealth</p>	<p>No information</p>	
<p>Political Systems The degree and quality of participation in public decision-making Government accountability</p>	<p>Project requires amendments to General Plan Project involves sale of public land Project involves removal of California Tidelands Trust designation</p>	<p><i>Did the MBTV planning process for the transit village meaningfully responding to the needs of all area residents?</i> <i>How do plans respond to community concerns (design changes, feasibility studies, etc)</i></p>

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Table IS.2. Communication by UC Berkeley Health Impact Group on Oak to Ninth

Document	Content	Date
Letter to Marge Stanzione on Draft EIR	Identified inadequate analysis of issues of air quality, noise, and traffic injuries in the DEIR	October 24 th , 2005
Letter to Councilwoman Brunner on proposed Health Impact Assessment March 28 th , 2006	Introduced the project of the Health Impact Assessment on the Oak to Ninth Avenue	February 28 th , 2006
Letter to Planning Commission Chair Jang on project-related pedestrian injuries	Provided a Pedestrian Injury Analysis and suggested pedestrian safety	March 3, 2006
Testimony to the Planning Commission	Written summary of testimony from students and faculty raising issues of air quality, noise, pedestrian injuries, inadequate schools, barriers to open space access, and needs for affordable housing	March 15 th , 2006
Letter to Councilwoman Brunner on inadequate analysis Air Quality and Noise	Pointed out inadequate analysis within the EIR of air quality and noise effects related to I-880 and the project; raised associated environmental justice issues	March 22, 2006
Written Comment provided to Council at Public Hearing listing Design Recommendations to Improve Health	Provided design recommendations for health to mitigate effects of noise, air quality, and pedestrian injuries and to increase public access to the waterfront, and to provide an on-site school	March 15 th , 2006
Letter to Councilwoman Brunner raising issue of inconsistency between the planned uses and the General Plan Noise Element	Pointed out that noise levels on the project would place housing where the General Plan had found residential uses to be 'clearly unacceptable.' Suggested additional analysis and mitigations	April 12 th , 2006
Public Review Draft of Health Impact Assessment http://ehs.sph.berkeley.edu/hia/	Final report of UCBHIG group with chapters on public process, housing, open space, pedestrian safety, air quality, and noise.	June 1 st , 2006
UCBHIG response to the June 9 th Critique of the HIA by Environ Consulting	Responded to city critique and reiterated why the EIR was inadequate with regards to pedestrian safety, noise, air quality, and schools	June 20 th , 2006
Final Oak to Ninth HIA		

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Chapter 2 Planning Process Analysis

A. Summary

Stakeholders participating in the Oak to Ninth Avenue development process have raised several concerns about the planning procedures. Many people allege that the development proposal submitted by Oakland Harbor Partners (herein known as OHP or “the Developer”) disregards the legislatively established Estuary Policy Plan, does not fulfill the obligation to develop a specific plan, and does not follow the terms of the Port’s Schedule of Performance. Others contend that planning has not accounted for more substantive planning issues such as affordable housing, integration, pedestrian safety, and open space accessibility. This planning process analysis examines the following five process-related questions:

1. *Did the Development Process conform to the requirements in the Port of Oakland’s request for qualifications (RFQ)?*
2. *Is the Development Project consistent with the Oakland General Plan?*
3. *What consequences result from not requiring the Developer to produce a specific plan?*
4. *What was the quality of public participation in the Oak to Ninth Avenue Development Process?*
5. *What was the role of interest groups in influencing this development project?*

Key Findings

1. A review of the Oak to Ninth Avenue development process relative to the Port of Oakland’s RFQ schedule of performance revealed the following five issues:
 - a. Oakland Harbor Partners (OHP) did not initiate or develop a specific plan with community input as required in the RFQ Schedule of Performance;
 - b. OHP did not meet subsequent scheduled performance milestones;
 - c. OHP development plans diverged from the Estuary Policy Plan vision without public review;
 - d. The Port of Oakland did not re-appraise the property or alter the land sales price despite plan revisions expected to increase property values;
 - e. Economic feasibility studies that may have justified the OHP revision of the project objectives were not subject to public review or scrutiny.
2. Revisions to a General Plan should generally follow a process similar to the one that led to its adoption. In the case of the Oak to Ninth Avenue development, the public and stakeholders are responding and reacting to a proposal in substantial conflict with established public policy goals as articulated in the Oakland General Plan without first having the opportunity to re-evaluate those policy goals.
3. Evidence suggests that the OHP development plan is neither substantively or procedurally equivalent to a specific plan. By issuing a development proposal in advance of comprehensive planning and then later suggesting that the development proposal is substantively and procedurally equivalent to a specific plan, the City of Oakland may be effectively de-legitimizing both the City’s General Plan as well as established planning principles.
4. In the Oak to Ninth case, the lack of ability for participants to influence design and planning appears to be a substantial barrier to meaningful public participation

Recommendations

While time and expense is required for a successful public planning process, the costs of poor decisions, whether measured in public dissatisfaction, loss of trust in public agencies, or human, social, and environmental costs outweighs these short term expenses. Successful public involvement has many

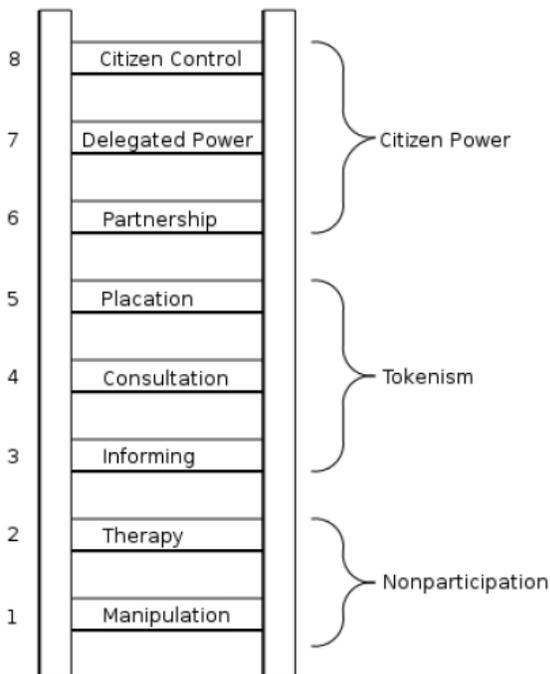
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direct and indirect social benefits. The following are three recommendations for the Oak to Ninth Development as it stands in May 2006:

1. The City of Oakland should specifically document whether and how the project has been responsive to public concerns and to constructive design change recommendations raised in the numerous public meetings and hearings.
2. Regardless of the history of the process, the City of Oakland should convene an independently facilitated multi-stakeholder consensus process to address unresolved controversies associated with the Oak to Ninth Development and to address and resolve inconsistencies between the project and established General Plan goals and policy.
3. The findings from both the documentation of public concerns and the multi-stakeholder consensus process should be made publicly available, at a minimum via the City of Oakland website.

B. Planning, Participation, and Public Health

Defining Public Participation in the Context of Institutional Decision-making In the context of public participation in public agency decisions, participation can mean attendance at a meeting, involvement in identifying problems to be solved, or a partnership to take action. Because there is the potential for “participation” to mean different things to different people, it is important to define and distinguish between the different types of participation.



Sherry Arnstein (1969) used the “Ladder of Participation” to illustrate the different types of engagement individuals may experience in planning.¹ At the bottom of the ladder, the participant is not sought out for his/her experience and instead services or therapy are provided “to” the individual. “Informing and consultation” represent tokenism, where the voices of participants are sought out, but are rarely actually incorporated into any policy changes. “Placation” is when the participants advise decision-makers, but the power-holders retain the right to decide. The top rungs of the ladder illustrate where participants have meaningful ability to identify problems, change strategies and solutions, and influence decisions. The table below provides examples of each type of participation in Arnstein’s typology.

¹ Arnstein, S.R., A Ladder of Citizen Participation. Journal of American Planning Association, 1969. 35(4): p. 216-224.

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Participation and Power In the *Ladder of Participation*, Arnstein distinguishes between the “haves” (those with power) and the “have-nots” (those without power) and insightfully acknowledges the barriers and obstacles to sharing decision-making power:

“Each group encompasses a host of divergent points of view, significant cleavages, competing vested interests, and splintered subgroups. The justification for using such simplistic abstractions is that in most cases the have-nots really do perceive the powerful as a monolithic “system,” and power-holders actually do view the have-nots as a sea of “those people,” with little comprehension of the class and caste differences among them. It should be noted that the typology does not include an analysis of the most significant roadblocks to achieving genuine levels of participation. These roadblocks lie on both sides of the simplistic fence. On the power-holders' side, they include racism, paternalism, and resistance to power redistribution. On the have-nots' side, they include inadequacies of the poor community's political socioeconomic infrastructure and knowledge-base, plus difficulties of organizing a representative and accountable citizens' group in the face of futility, alienation, and distrust. ... Depending on their motives, power-holders can hire poor people to co-opt them, to placate them, or to utilize the have-nots' special skills and insights. Some mayors, in private, actually boast of their strategy in hiring militant black leaders to muzzle them while destroying their credibility in the black community”.

Examples of Participation based on Shelly Arnstein's *Ladder of Participation*

Participation Type	Example
Manipulation	Officials educate, persuade, and advise citizens.
Therapy	Officials convene tenant groups to take a defined action to solve problems (e.g neighborhood cleanup campaign)
Informing	Through meeting, flyers, and other forms of outreach, power-holders inform stakeholders about plans and programs. This approach does not guarantee the material is understood and typically there is no channel for public feedback
Consultation	Through attitude surveys, neighborhood meetings, and public hearings, power-holders seek opinions from the lay public. This approach does not guarantee participant influence on plans.
Placation	Power-holders select community member(s) to participate on planning committee to represent the views of the community. This approach raises questions about who selects participants and whose views they represent as well as questions about participant influence on plans.
Partnership	Power is redistributed through negotiation and establishment of common ground-rules. This approach typically results from organized power-base in the community making demand to officials. Authenticity requires structures to make community leaders accountable to members.
Delegated Power	Participants have decision making power either on the planning/decision-making board or as separate/parallel groups of citizens & power-holders.
Citizen Control	Neighborhood corporation with no intermediaries between it and the source of funds.

Arnstein also notes several arguments against shared power.

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“Among the arguments against community control are: it supports separatism; it creates balkanization of public services; it is more costly and less efficient; it enables minority group “hustlers” to be just as opportunistic and disdainful of the have-nots as their white predecessors; it is incompatible with merit systems and professionalism; and ironically enough, it can turn out to be a new Mickey Mouse game for the have-nots by allowing them to gain control but not allowing them sufficient dollar resources to succeed. These arguments are not to be taken lightly. But neither can we take lightly the arguments of embittered advocates of community control - that every other means of trying to end their victimization has failed!”

Freudenberg’s (2004) analysis of the rights given to individuals provides another way of framing participation and community power.² (See table below)

Dimensions of Power	
Rights	Examples
Right to be informed	Right to know laws, Freedom of Information Act, mandatory reporting of toxic emissions, public environmental impact reviews
Right to sit at decision-making table	Mandate for citizen participation in zoning or siting reviews, negotiation for settlement of lawsuits
Right to say no	Legal challenges for violation of due process in zoning or environmental impact review, other lawsuits
Right to frame issue and identify options	Participatory processes in which citizens have equal voice with other players and ongoing role in planning processes
Right to make decisions	Ballot initiatives

Both frameworks demonstrate that participant power works in a continuum, moving between power concentrated in the hands of experts and officials and power shared among residents of a community.

The Significance of Participation for Democracy Social participation is an essential activity in a democracy, whose principles include equality and popular control of collective decision-making. Reich (1994) defines the process of democratization as “a process of political change that increases the degree of peaceful competitive political participation in the governmental system and that enhances political and civil liberties at the same time.”³

Democracy requires an enabling environment, guaranteed respect for equality, integrity of person, and participation, and effective and accepted processes through which citizens can negotiate conflicting interests. Democratic decisions take into account the perspectives of the entire range of people and organizations with a stake in the outcomes, helping to identify problems hidden to experts and

² Freudenberg, N. 2004. Community Capacity for Environmental Health Promotion: Determinants and Implications for Practice. *Health Education & Behavior*, Vol. 31 (4): 472-490. April 2004

³ Reich, M., Democracy and Health: An Overview of Issues Presented in Four Papers, in Series on Democracy and Health. 1994, Department of Population and International Health, Harvard School of Public Health: Cambridge. p. 1-23.

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contributing ideas for more effective solutions.⁴ Moreover, engagement of diverse stakeholders can make explicit the existence of competing values and interests. Additionally, multi-stakeholder engagement creates opportunities to articulate and advance a common interest as well as generate the buy-in necessary for effective policy implementation.⁵

All too often, public agencies discount the need for meaningful and inclusive participation in their decision-making.⁶ Government initiated public participation practices have often excluded those with the least economic or political resources.^{7 8} For socially marginal populations, this lack of influence combined with the limited value given to local experience augments powerlessness and increases mistrust of experts and institutions.

Participation and the Value to Planning The 2003 *State of California Guidelines for General Plan*, acknowledges the following benefits of community engagement in the land use planning process:⁹

1. Providing valuable information leading to more informed policy development by decision-makers.
2. Insuring the plan's successful implementation by building a base of long-term support with the public.
3. Reducing the likelihood of conflict and drawn-out battles by addressing public concerns during the general plan process rather than on a case-by-case basis in the future. This can also speed the development process and reduce project costs.
4. Educating the public about community issues.
5. Increasing the public's ability and desire to participate in the community.
6. Enhancing trust in government by strengthening the relationship between elected officials, government staff, and the public.
7. Working towards community consensus and creating a vision for the future.
8. Laying the groundwork for community revitalization and increased investment in the community.
9. Obtaining public input regarding plan policies and community issues and objectives.
10. Providing the public with opportunities to evaluate alternative plans and to participate in developing and choosing a plan that works for their community.
11. Informing decision-makers about public opinion.
12. Preventing consuming, expensive, and divisive conflict
13. Avoiding litigation or ballot initiatives.

The Significance of Participation for Public Health The inclusive and participatory principles underlying democracy also support the health of a community. The World Health Organization's Ottawa Charter on Health Promotion (1986) declared that "...people cannot achieve their fullest health potential unless they are able to take control of those things which determine their health."¹⁰ In the same vein, Hancock and Duhl (1986), two founders of the international Health Cities Movement, defined a "healthy

4 Fung, A, Wright, EO. Deepening Democracy: Innovations in Empowered Participatory Governance. *Politics and Society*. 2001; 29(1):5-41.

5 Dietz T. What is a good decision? Criteria for environmental decision making. *Human Ecology Forum* 2003; 10(1):33-39.

6 Arnstein S. A ladder of citizen participation. *Journal of the American Planning Association*. 1969; 35(4):216-224.

7 Smulovitz C, Walton M. Evaluating Empowerment. Paper presented at the workshop on "Measuring Empowerment: Cross-Disciplinary Perspectives" World Bank. Washington D.C. 2003.

8 Narayan, Deepa with Raj Patel, Kai Schafft, Anne Rademacher and Sarah Koch-Schulte. *Voices of the Poor: Can Anyone Hear Us?* New York: Oxford University Press; 2000.

9 Grattidge, B. and A. Lawler, *State of California General Plan Guidelines*, Office of Planning and Research. 2003

10 World Health Organization. (1986) *Ottawa Charter for Health Promotion*. Drafted at the First International Conference on Health Promotion. Ottawa, Canada. Document Number: WHO/HPR/HEP/95.1

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community” as: “...one that is continually creating and improving those physical and social environments and expanding those community resources which enable people to mutually support each other in performing all the functions of life and in developing to their maximum potential.”¹¹

Key elements of a healthy community related to social participation include:

- A strong, mutually supportive and non-exploitative community
- A high degree of public participation in and control over the decisions affecting one’s life, health, and well-being
- Access to a wide variety of experiences and resources, with the possibility of multiple contacts, interaction, and communication
- Encouragement of connection with the past, cultural and biological heritage, and other groups and individuals¹²

Throughout the past decade, there has been increasing recognition of the importance of participation within the field of public health.¹³ Concepts such as social capital^{14 15}, collective efficacy^{16 17}, and social networks^{18 19} have all gained increasing popularity as research reveals that engagement in community can have positive health outcomes. At the same time, research on the built environment and health further elevates participation and community engagement as key health resource.²⁰

Social Engagement, Social Networks, and Social Capital The word “social” implies participation, engagement and belonging. Investigations into “social networks” and health have determined that an individual’s participation and belonging in a social network serves as a protective or risk factor for health outcomes.^{21,22,23,24} “Social ties” refers to the personal connections an individual has with relatives, friends, colleagues, etc and is often measured by social network diversity.²⁵ “Social integration” refers to the existence or number of particular relationships or organizational involvements.²⁶ Maintenance of both

11 Hancock, T. and L. Duhal, *Healthy Cities: Promoting Health in the Urban Context*. 1986, World Health Organization Europe: Copenhagen.

12 Hancock, T. and L. Duhal, *Healthy Cities: Promoting Health in the Urban Context*. 1986, World Health Organization Europe: Copenhagen.

13 Minkler, M. and N. Wallerstein, *Introduction to Community Based Participatory Research*, in *Community-Based Participatory Research for Health*, M. Minkler and N. Wallerstein, Editors. 2003, Jossey-Bass: San Francisco. p. 3-26.

14 Putnam, R.D., *Bowling Alone: America’s Declining Social Capital*. *The Journal of Democracy*, 1995. 6(1): p. 65-78.

15 DeFilippis, J., *The Myth of Social Capital in Community Development*. *Housing Policy Debate*, 2001. 12(4): p. 781-806.

16 Sampson, R.J., S.W. Raudenbush, and F. Earls, *Neighborhoods and violent crime: a multilevel study of collective efficacy*. *Science*, 1997. 277(5328): p. 918-24.

17 Kawachi, I., B.P. Kennedy, and R.G. Wilkinson, *Crime: social disorganization and relative deprivation*. *Soc Sci Med*, 1999. 48(6): p. 719-31.

18 Berkman, L.F., et al., *From social integration to health: Durkheim in the new millennium*. *Soc Sci Med*, 2000. 51(6): p. 843-57.

19 Kawachi, I., et al., *A prospective study of social networks in relation to total mortality and cardiovascular disease in men in the USA*. *J Epidemiol Community Health*, 1996. 50(3): p. 245-51.

20 Dannenberg, A.L., et al., *The Impact of Community Design and Land-Use Choices on Public Health: A Scientific Research Agenda*. *Am J Public Health*, 2003. 93(9): p. 1500-1508.

21 Berkman LF, Syme SL. (1979) “Social Networks, host resistance, and mortality.” *American Journal of Epidemiology*. Volume 109: 186-204.

22 Vogt TM, Mullooly JP, Ernst D, Pope CR, Hollis JF. (1992) “Social Networks as predictors of ischemic heart disease, cancer, stroke and hypertension.” *Journal of Clinical Epidemiology*. Volume 45: 659-666.

23 House JS, Landis KR, Umberson D. (1988) “Social Relationships and Health.” *Science*. Volume 241: 540-545.

24 House J, Robbins C, and Metzner H, (1982) “The Association of social relationships and activities with mortality: prospective evidence from the Tecumseh Community Health Study.” *American Journal of Epidemiology*. Volume 116: 123-140.

25 Cohen S, Doyle WJ, Skoner DP, Rabin BS, Gwaltney, JM. (1997) “Social Ties and Susceptibility to the Common Cold.” *Journal of the American Medical Association*. Volume 277: 1940-1944.

26 Umberson, D., *Gender, marital status and the social control of health behavior*. *Soc Sci Med*, 1992. 34(8): p. 907-17.

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social ties and integration requires some degree of active engagement by the individual and the community.

“Social engagement” refers to the maintenance of many social connections and a high level of participation in social activities. “Social capital” refers to features of social organization such as civic participation, norms of reciprocity, and trust in others, that facilitate cooperation for mutual benefit.^{27,28} Though there are numerous terms which attempt to quantify and address distinct aspects of socialization, all of these terms involve (to some extent) participation, engagement, or belonging, in other words “being social.” Although connected, being social and participating are not the same things as having political power and being able to effect change in one’s personal or community life.

Participation, Autonomy, and Health Autonomy and control are essential human aspirations. The Whitehall studies conducted by Michael Marmot and colleagues provide further insight into the interesting area of disease causality and personal control. The Whitehall Studies I & II are longitudinal cohort studies examining mortality from coronary heart disease (CHD) among British Civil Servants. In general, Marmot, Bosma, Hemingway, Brunner and Stansfeld found that there was an inverse social gradient in mortality from CHD, where men in lower ranking employment positions had higher rates of CHD than men in higher ranking positions.²⁹ Related research has demonstrated that the degree of job control (including decision authority, skill discretion, ownership over work, etc) may impact rates of coronary heart disease and other health outcomes.

Participation, Empowerment, and Health Wallerstein, recently published a comprehensive review of the evidence illustrating that strategies promoting empowerment can improve health and reduce health disparities for the World Health Organization.³⁰ In this review, Dr. Wallerstein differentiated between empowering processes and outcomes of empowerment. Figure PPA.1 (See Figure PPA.1: Pathways to Empowerment) illustrate the ways in which (1) empowering strategies may improve health and reduce health disparities, and (2) how empowerment may be described as psycho-social, organizational and community/political outcomes.

Wallerstein states “While participatory processes make up the base of empowerment, participation alone is insufficient if strategies do not also build capacity of community organizations and individuals in decision-making and advocacy.”³¹ This sentiment is echoed by James DeFillipis in a critique of the use of social capital in community development. DeFillipis critiques Putnam’s description of social capital through voluntary organizations. By not differentiating between PTAs and trade unions for example, it allows Putnam to ignore power relations that significantly influence intergroup relationships. “More simply put, certain social networks are in greater positions of power than others and they can therefore yield

27 Putnam RD. (Spring 1993) “The prosperous community. Social Capital and economic growth.” American Prospect. 35-42.

28 Kawachi I, Kennedy BP, Lochner K, Prothrow-Stith D. (1997). “Social capital, income inequality, and mortality.” American Journal of Public Health. Volume 87: 1491-8.

29 Marmot MG, Bosma H, Hemingway H, Brunner E, Stansfeld S. (1997) “Contribution of job control and other risk factors to social variations in coronary heart disease incidence.” Lancet. Volume 350: 235-239.

30 Wallerstein, N., What is the evidence on effectiveness of empowerment to improve health? Health Evidence Network Report, 2006.

31 Ibid..

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much more substantial returns to their members when those networks are engaged in social or political conflict.”³²

Social participation at the psycho-social, organizational and the community-political levels are interconnected. As a person becomes more engaged in a particular activity (for example advocating for a particular cause), they are more likely to feel a sense of social cohesion and feel strong social ties through their participation in a group with a particular goal guiding the group’s activity (for example defending the Oakland waterfront). Increased social engagement may have the benefits of improved mental and physical health because the person is out of the house more often and intellectually and socially stimulated. At the same time, as the person becomes more involved, this strengthens the capacity of the organization to achieve change, which has the potential to influence community and political outcomes. The table below provides examples of the conceptual direct and indirect health consequences of participation.

Non-Participation Health Risks	Participation Health Benefits	Participation for Health Needs Social Benefits
Alienation Apathy Passivity Stress Allostatic load Depression	Optimism/hope/positive outlook Self-esteem Sense of control Sense of belonging Social support Inclusion Self-efficacy	Collective efficacy Social capital Safety/ security Housing adequacy Secure livelihoods Access to health care Environmental quality

Summary Overall, this brief synthesis of research on participation and health suggests that participation in planning can serve health interests for the following reasons:

- Individuals have a fundamental right to direct and meaningful engagement on issues that affect them. Participation thus serves the needs of individual freedom.
- The problems affecting health and well-being in today’s society are complex and related to state, national and international institutions, laws, and policies; problems therefore cannot be resolved by one person or one agency but necessarily need the input of multiple stakeholders.
- Community engagement in decision-making improves health outcomes directly and indirectly. The field of community-based participatory research has demonstrated that community involvement in the identification of health problems, selection of interventions, engagement in implementation, and evaluation of outcomes increases the success of the intervention.
- Community ownership over decisions and their outcomes sustains involvement and facilitates stewardship, thereby helping to ensure long term success.
- Participation is necessary to understand the distribution of a proposal’s costs and benefits.

C. Established Standards and Health Objectives

Federal Requirements for Participation

32 DeFilippis, J., The Myth of Social Capital in Community Development. Housing Policy Debate, 2001. 12(4): p. 781-806.

National Environmental Policy Act At the federal level, the U.S. constitution and other laws and regulations require citizen participation in decision-making. The National Environmental Quality Act (NEPA), adopted in 1969, is an example of one procedure to bring information about a project's potential environmental impact into the public view for comment and review. A large number of states, including California have modeled laws after NEPA.

Executive Order 12898 The 1994 Executive Order 12898, Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations, focuses Federal attention on the environmental and human health conditions in minority communities and low-income communities. Within the NEPA process, the order requires Federal agencies to "... ensure that the public, including minority communities and low-income communities, has adequate access to public information relating to human health or environmental planning, regulations, and enforcement ..."³³

Requirements and guidance for participation in California

Brown Act The Ralph M. Brown Open Meeting Act (commencing with Government Code Section 54950) requires cities and counties to provide advance public notice of hearings and meetings of their councils, boards, and other bodies. Meetings and hearings with some exceptions must be open to the public.

California Environmental Quality Act In California, any governmental action that may ultimately cause a physical change in the environment is subject to CEQA. Although the law provides for certain exemptions, when a local or state governmental agency determines that a project or action is subject to CEQA, the agency must determine whether or not the project or action might have significant adverse impacts on the environment. This determination can require an initial (abbreviated) study. If after the initial study, the agency finds no evidence exists for adverse impacts, it issues a negative declaration. If the study anticipates possible significant impacts, the agency requires an environmental impact report (EIR). The study and initial determination identify which potential adverse impacts are included in the EIR. Alternatively, if a project has known potential impacts, the agency and project proponent may find a way to modify the project in order to mitigate the impacts. In this case, the agency issues a "mitigated negative declaration," and an EIR is not required.

If an agency requires an EIR, it must include analysis of the project and all potential impacts of concern. It must also include an analysis of alternatives, mitigations, and their feasibility. Typically, a professional consultant, financed by the projects developer or the proponent of a decision, performs the analysis and writes the EIR. The EIR is first published as a draft document, and the lead agency gives both public agencies and the general public at least 30 days to comment on the analysis. Law requires the governmental agency to respond substantively to all comments on the draft document in a final EIR. Citizens have the right to sue the approving public agencies to assure compliance. (See Figure PPA.2: California Environmental Quality Act Flowchart)

General Plan Requirements Although the majority of local land use and development decision making is conducted at the local level, many of the regulations for land use are established at the state level. In California, Government Code (sections 65000 et seq.) has established laws around general plan

³³ EPA Insight Policy Paper: Executive Order #12898 on Environmental Justice. From http://www.epa.gov/fedfac/documents/executive_order_12898.htm

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requirements, specific plans, subdivisions and zoning. Currently, there are 533 incorporated cities and counties in California – all of which are required to adopt a “a comprehensive, long-term general plan for [its] physical development.” This plan is known as the “General Plan”.

In California, according to California Government Code (Title 7, Division 1, Chapter 3, Article 5, Section 65302), each general plan is required to include the following seven elements: circulation, conservation, housing, land use, noise, open-space, and safety. Other elements such as air quality, capital improvements & public facilities, community design, economic development, energy, flood management, geothermal, parks and recreation, and water are optional but often adopted as well. All elements, whether required or optional, may be published in a single document or in multiple documents.³⁴

According to Toner and colleagues at the American Planning Association,³⁵ a general plan is:

- A public guide to community decision making
- An assessment of the community's needs
- A statement of community values, goals, and objectives
- A blueprint for the community's physical development
- A public document adopted by the government
- Continuously updated as conditions change

The legislative body at the city (city council) and county (board of supervisors) level has primary responsibility for enforcing the policies established by the general plan and adopting zoning, subdivision and other ordinances to regulate land uses. Both the city council and board of supervisors are elected by the voting population. Once elected, the city council and board of supervisors usually nominate one or several hearing committee(s) to assist with analysis of land use policies. These committees may include a Planning Commission, a Zoning Adjustment Board and a Design Review Board. Depending upon the community, the hearing committee may have the power to approve proposals, although final approval is subject to the legislative body (city council or board of supervisors). Although they may provide recommendations, these hearing committees “do not have final say on matters of policy such as zone changes and general or specific plan amendments.”³⁶ However, as the primary body reviewing proposed development and land use plans, the recommendations of the hearing committees, particularly the planning commission, do carry substantial influence on legislators’ decision-making.

Figure PPA.3 provides a general overview of some of the governing bodies involved in the planning process and the types of decisions/actions that they take. (See Figure PPA.3: Brief Overview of Planning Governance) According to general guidelines established by the State of California, throughout the planning process there is supposed to be community input as well as checking compliance with the California Environmental Quality Act (CEQA). Figure PPA.4 illustrates the process suggested by the state government of California and the many potential areas for feedback loops. (See Figure PPA.4: Suggested Local Plan Process in California)

³⁴ <http://www.lib.berkeley.edu/ENVI/genplans.html>. Accessed from web: April 15, 2006.

³⁵ Toner, W., et al., *Planning Made Easy: A Manual for Planning Commissioners, Members of Zoning Boards of Appeal, and Trainers*. 1994, Chicago: American Planning Association. 128.

³⁶ Roberts, T. A Citizen's Guide to Planning. 2001 [cited 2006 March 15]; Available from: http://ceres.ca.gov/planning/planning_guide/plan_index.html.

California Planning Guidance The 2003 State of California Guide to Planning provides the following recommendations for good community participation in the general plan process:

1. Public participation processes take time and resources. Dedicate adequate staff time and other resources to the process.
2. Community members should be included in the general plan process as soon as possible. A visioning process, focus groups, or an advisory committee can be used to identify issues and involve the community before the process is designed.
3. Participants need to know up front what they can expect from their participation and what the process sponsors will do with the information that comes out of the process.
4. It is critical to understand the issues that are important to different segments of the community, including residents, business owners, and elected decision-makers. Address their issues and concerns during the process. Make sure that all stakeholder groups feel that they have an opportunity to give input early in the process.
5. The process should be simple and transparent; participants should be updated frequently as the process moves forward.
6. The process should be designed to meet the needs of your community. No two processes should be the same. Questions to consider include: Will community members need childcare in order to attend meetings? Are residents more likely to participate on a weekend or early in the morning due to work obligations? Will providing refreshments influence more people to attend? How do community members get their information? How comfortable are they with technology? Is translation necessary?
7. The entire process should be documented. This includes keeping a record of and reporting on all groups that have been contacted, any information that is used to inform the process, and all decisions that are made. Documentation can be done through media stories, a website, newsletters, or other materials in order to keep the public informed.
8. The process should be as engaging, interactive, and fun as possible.”³⁷

Environmental Justice and Related Guidance Legislation in California has created additional public participation requirements for the California Environmental Protection Agency.³⁸ In a report by the Cal/EPA Advisory Committee on Environmental Justice, the committee members acknowledged that meaningful public participation and promotion of community capacity building are critically important first steps to successful environmental decision-making processes.³⁹ Their criteria for meaningful public participation include:

- Guidelines for meaningful public participation.

³⁷ Grattidge, B. and A. Lawler, State of California General Plan Guidelines, Office of Planning and Research. 2003

³⁸ These bills have been incorporated into California law in Government Code, Section 65040.12 (Title 7, Division 1, Chapter 1.5, Article 4), and Public Resources Code, Sections 71110-71116 (Division 34, Part 3).

³⁹ CalEPA, Recommendations of CalEPA Advisory Committee on Environmental Justice to the CalEPA Interagency Working Group on Environmental Justice - Final Report, D.B. Allen and D. Takvorian, Editors. 2003, California Environmental Protection Agency. p. 1-58.

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- The identification of an office or contact person who has authority and responsibility for coordinating effective public participation opportunities.
- Awareness of and sensitivity to community-specific communication issues (including media, venue, language, and other cultural issues).
- Relationship building prior to environmental decision points.
- Educational, technical, and other assistance (i.e., capacity building) to support meaningful participation in environmental decisions – subject to the specific limitations in state law regarding the use of government funds for lobbying and other activities.
- Early public involvement in environmental decisions.
- Availability and timeliness of materials and information.
- Feedback to participants.

Requirements for Participation in the City of Oakland

At the local level, public participation must conform to the above Federal and State laws and requirements and would benefit from other non-mandatory guidance. Additional requirements for participation result from requests for state and federal funding.

Oakland Citizen Participation Plan To receive federal funds for housing from Community Development Block Grant, HOME Investment Partnership, Emergency Shelter Grant, and Housing Opportunities for Persons with AIDS grants, the City of Oakland must submit a 5-Year Consolidated Plan, as well as annual Action Plans and Performance Reports to the U.S. Department of Housing and Urban Development (HUD). Included in this required planning is a Citizen Participation Plan, which clearly articulates how the City of Oakland plans to engage its citizen in public decision-making processes related to housing.^{40,41}

According to the Plan amended by the Oakland City Council in 2000, “the City of Oakland is expected to take whatever actions are appropriate to encourage participation of minorities, people who do not speak English and people with disabilities.” The plan further states that “Genuine involvement by low income people must take place at all stages of the process including: identifying needs; setting priorities among these needs; deciding how much money should be allocated to each high-priority need and suggesting the types of programs to meet high-priority needs; as well as overseeing the way in which programs are carried out.”⁴² To facilitate public engagement, the Plan explicitly states when and where public notices and announcements of public hearings and information will be made available.

40 City of Oakland Housing Plans, Policies & Laws - <http://www.oaklandnet.com/government/hcd/policy/policy.html>

41 In a recent evaluation of Oakland's administration of Community Development Block Grants, the evaluation consultants found that compared to five other neighboring cities, “the City of Oakland has one of the most extensive and inclusive structures for engaging the community in providing input into CDBG program.” However, it was noted that there were some important limitations and areas for improvement that could be made. To improve the decision making structure, the evaluators suggested: 1) clarifying the timelines for review; 2) generating meaningful community assessment data; 3) making evaluation data available much sooner in the review process; 4) reducing the frequency of elections. From Meucci, S., P. Gibson, and P. Hanley, Evaluation of CDBG Administrative Practices: A Comparative Review of Selected Cities, G. Associates, Editor. 2002, City of Oakland. p. 1-59.

42 City of Oakland Housing Plans, Policies & Laws - <http://www.oaklandnet.com/government/hcd/policy/policy.html>

D. History of Planning for the Oak to Ninth Avenue Area

An example of community-led participation in Oakland planning occurred with the development of the Estuary Policy Plan. In 1992-1993, Oakland began to update the Open Space, Conservation and Recreation (OSCAR) element of the Oakland General Plan. In June 1993, Alameda County League of Women Voters published a report titled *The Waterfront. It Touches the World; How Does it Touch Oakland?* The report led to the creation of the Waterfront Coalition, a grassroots group that promoted the report's suggestions that Oakland identify as a waterfront city. In embracing this identity as a waterfront city, advocates recognized that efforts needed to be made to preserve and revitalize the waterfront area.

In 1995, the Port of Oakland and the City of Oakland jointly sponsored a charrette⁴³ to develop a community vision for the waterfront that engaged all affected stakeholders and at the same time generate additional policy support. At the same time, the General Plan Congress, a community-wide advisory committee, initiated a Waterfront Subcommittee which helped develop a report with goals, objectives and policies for the entire waterfront area. Recognizing the need for a more detailed study and plan of the Estuary portion of the waterfront, the Port and City of Oakland initiated the Estuary Plan Project, which later became the Estuary Plan Policy (EPP).⁴⁴

One of the key features of the Estuary Plan Project was its comprehensive efforts to engage community members. This included obtaining comments and inputs from:

- **Public agencies** – including the Bay Conservation and Development Commission (BCDC), East Bay Regional Parks District (EBRPD), the Trust for Public Lands, the City of Oakland Life Enrichment Agency—Parks, Recreation and Cultural Services, and the Oakland Museum.
- **Planning/Government Bodies** – including the City-Port Liaison Committee, the City Planning Commission, and the Board of Port Commissioners.
- **Technical Consultants** – ROMA Design Group served as the lead firm, directing the efforts of an Oakland-based team of consultants, including Hansen/Murakami/ Eshima, associated architects; Hausrath Economics Group, urban economists; Gabriel-Roche, Inc., public participation and transportation; Korve Engineering, traffic engineering; as well as numerous other experts in specialized technical areas.
- **The Estuary Advisory Committee** – Members of the committee included: George Bolton, Carl Chan, Don Davenport, Carolyn Douthat, Paul Elizondo, Dr. Eleanor Engram, Ed Fernandez, Frank L. Fuller, Marguerite A. Fuller, Jack Gaskins, Robert Hamilton, Virginia Hamrick, Stana D. Hearn, Gary Knecht, Anthony Mar, Keith Miller, Rosemary Muller, Robert Odermatt, Vincent B. Reyes, Martha Robles-Wong, Sylvia Rosales-Fike, Carolyn Sandidge, C. Peter Smith, Sandy Threlfall, Richard E. Winnie, Cheryl Wong.

According to the Estuary Policy Plan:

“The Estuary Policy Plan has been prepared in an attempt to address issues and concerns that have arisen related to continuity and accessibility of the shoreline, the quality and character of

⁴³ A charrette is an intensive design process that involves the collaboration of all project stakeholders at the beginning of a project to develop a comprehensive plan or design.

⁴⁴ Estuary Policy Plan. 1999. City of Oakland, Port of Oakland: Oakland.

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new development, and the relationship of the shoreline with surrounding districts and neighborhoods. More specifically, the plan builds upon the goals for the waterfront prepared by the General Plan Congress. The EPP called for ‘the transformation of maritime and industrial uses into a public oriented waterfront district that encourages significant public access and open space opportunities.’”

The EPP did not envision residential uses, but did allow for light industrial, manufacturing, artist lofts, workshops, a hotel, commercial-recreation, cultural uses, and water-oriented uses that complement the recreational and open space character of the waterfront.

Timeline and Milestones for the Oak to Ninth Avenue Development Process

Year	Milestones
1926	City of Oakland voters pass charter amendment to establish Port of Oakland as a quasi-independent entity. The Port’s jurisdiction was ~ from the water’s edge to 2nd Street
....	...
1993	Public dialogue about Oakland’s waterfront begins with update of <i>Open Space, Conservation and Recreation Element</i> of the Oakland Gen. Plan.
1993	League of Women Voters publishes award-winning report - <i>The Waterfront: It Touches the World; How Does It Touch Oakland?</i>
1994	The League of Women Voters and others form Waterfront Coalition
1995	City and Port facilitate a planning charrette to formulate a vision for the waterfront.
1996 to 1997	City and Port jointly fund study of the Oakland Estuary from Adeline Street to 66th Avenue and the shoreline to the freeway
	Oakland General Plan updated under the oversight of General Plan Congress
	The Oakland Estuary Study culminates in development of Estuary Policy Plan
1999	Estuary Policy Plan adopted as part of City of Oakland’s General Plan
March 2001	Port of Oakland announces Request for Developer Qualifications (RFQ) for a developer to achieve the Estuary Policy Plan (EPP) vision.
April 2001	The Port hold one informational session for RFQ respondents in the development community
May 2001	The Port of Oakland receives two responses to their RFQ
Sept 2001	Port of Oakland selects Oakland Harbor Partners (OHP) as master developer
September 2001 - April 2002	Developer fails to develop specific plan with community as required in the RFQ Schedule of Performance. Other scheduled performance milestones are subsequently not met.
2003	Port of Oakland appraises land valued at \$34 million with \$16 million of remediation costs based on development mixed residential use concept with 1700 units
2003	Port Commission approves an option for the sale of property to OHP for \$18 million
2003	Oakland voters approve Measure DD including \$18 million to develop public open

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Year	Milestones
	space in the Oak to 9th areas.
Nov 2003	Port of Oakland & OHP enter into option Agreement for Potential Purchase & Ground Lease of Property
May 2004	City of Oakland announces an Initial Study of Environmental Impacts for a proposed Oak to Ninth Development Project with 3100 dwelling units. .
June 2004	City of Oakland issues a Notice of Preparation of the DEIR. The issue is heard at a regular meeting of the Planning Commission.
July 2004	City of Oakland hosts a Community Meeting on the scope of the EIR
August 2004	Senator Perata gains passage of SB 1622 to enable State Lands Commission to execute a Tidelands Trust Exchange on the property
February 2005-April 2005	City and Developers host small group meetings and open house for the project to inform the public about the project
August 2005	City of Oakland publishes the DEIR. Comments are taken at a September Special Planning Commission Meeting
Oct 2005	The Oakland Parks and Recreation Commission and the Local Preservation Advisory Board begin a series of public hearings on Oak to Ninth
Dec 2005	The Oakland Planning Commission takes a field trip to the Estuary Site
Feb 2006	The City of Oakland publishes the Final EIR
March 2006	The Planning Commission certifies the adequacy of the EIR. The Commission simultaneously recommends the project and associated general plan and zoning changes for City Council approval.
March 2006	The City Council Hosts an information hearing on the Project. Project approvals are scheduled for June 2006 following a mayoral election.

The overarching EPP goals are summarized as follows:

- Increase the awareness of the waterfront throughout the city and region, and maximize the benefit of Oakland's waterfront for the people of the city.
- Promote the diversity of the waterfront by providing opportunities for new parks, recreation, and open space; cultural, educational and entertainment experiences; and new or revitalized retail, commercial and residential development.
- Enhance and promote the city's waterfront for the economic benefit of the community, with emphasis on Oakland's position as a leading West Coast maritime terminal and a primary Bay Area passenger and cargo airport.
- Connect the waterfront to the rest of the city, with emphasis on linking the adjacent neighborhoods and downtown directly to the waterfront, reducing physical barriers and the perception of isolation from the water's edge, and improving public access to and along the waterfront.
- Preserve and enhance the existing natural areas along the waterfront."⁴⁵

⁴⁵ Estuary Policy Plan. 1999, City of Oakland. Port of Oakland: Oakland. p. 137.

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The City incorporated the Estuary Policy Plan into Oakland's General Plan in June 1999. The Port of Oakland, which owns the majority of the land within the waterfront area, then developed and issued a Request for Developer Qualifications (RFQ) to solicit developers for 60 acres of waterfront. The Port released the RFQ in March 2001, stating the following specific development objectives for the property and proportion of the waterfront:

1. Working with the City of Oakland, the community, and the development team, create a vision for the Oak-to-Ninth District through a Specific Plan that incorporates the objectives of the *Estuary Policy Plan*, with the goal of generating economic benefits and creating new waterfront amenities for the citizens of Oakland.
2. Create a financing strategy for the redevelopment of the Port-owned parcels that incorporates a broad mix of uses, is financially feasible, and generates jobs for the community and revenue for both the Port and the City.
3. Develop a financing strategy to create a significant amount of quality public open space and public access to the waterfront.
4. Create a financing structure for the basic infrastructure needed to support development, including sewer lines, storm drainage, utility lines, roadways, etc.
5. Create a planning process that provides for substantive participation by neighbors, interested community groups and other stakeholders.⁴⁶

Throughout the RFQ, there are multiple explicit statements that the proposal by the developer must develop a specific plan that incorporates the recommendations from the Estuary Policy Plan. The RFQ quotes the following section from the Estuary Policy Plan:

“The Oak-to-Ninth District is large and diverse, with several unique, complicated issues that dominate its real development potential. It should be planned in sufficient detail to identify all potential issues and to understand the options available to address these issues in a timely manner. **A Specific Plan should be prepared prior to development.** Planning should be based on a strategy which analyzes the area comprehensively and which accounts for the constraints imposed by subsoil environmental conditions. Transformation of the district will require that several outstanding issues be resolved simultaneously. Development feasibility should be analyzed, phasing of improvements should be identified, and a funding strategy to finance and implement recommended open space should be addressed. These require that a realistic development program and site plan be developed.”

After release of the RFQ, the Port held one informational meeting, targeted towards potentially interested developers, to discuss the requirements for the proposal process. Statements of Developer Qualifications were due on May 28, 2001 – less than three months after the announcement. Only two developers submitted an RFQ. In September of 2001, the Board of Port Commissioners selected the development team of Oakland Harbor Partners, LLC, joint venture between Signature Properties and Reynolds & Brown, to enter into an Option Agreement. This process occurred in accordance with the

⁴⁶ Request for Developer Qualifications, Oak-to-Ninth District Properties, March 2001. http://www.portofoakland.com/pdf/rfq_01_a.pdf

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Schedule of Performance established by the initial Request for Developer Qualifications (See Figure PPA.8: RFQ Schedule of Performance).

In 2003, the Port of Oakland appraised the property at \$34 million less clean up costs (~\$16 million) based on a developer proposed concept plan that now called for a mixed-use residential neighborhood with 1700 units. The Port of Oakland subsequently granted OHP the option to buy the property for \$18 million in 2003.

In late 2003, OHP put forward the current development plan requesting environmental review for a mixed use neighborhood with 3100 dwelling units and the following design, planning, and zoning approvals:

- Revisions to the Oakland General Plan Estuary Policy Plan (see discussion below)
- The adoption of a new zoning district, the “Planned Waterfront Zoning District-4” which sets forth allowable uses and development standards for the proposed project;
- The rezoning of the site from M-40 to PWD-4 and Open Space-Region Serving Park (OS-RSP);
- Approval of a Preliminary Development Plan for the entire 64.2 acre site;
- Revisions of the Central District Urban Renewal Plan and the Central City East Redevelopment Plan to change the land use designation to Planned Waterfront Development-4 and Parks.
- Approval of the proposed Oak to Ninth Mixed Use Development Design Guidelines;
- Approval of a vesting tentative subdivision map which subdivides the site into 13 developable parcels (~34 acres) and parks and open space (~30 acres);
- A conditional use permit for the activities proposed in the OS-RSP zone;
- A 20-year Development Agreement.

E. Planning Process Analysis of Oak to Ninth Avenue Development

There exists no standard method or template for an analysis of a development planning process. This planning process analysis is largely qualitative and examines the following five questions:

1. *Did the Development Process conform to the requirements in the Port of Oakland’s request for qualifications (RFQ)*
2. *Is the Development Project Consistent with the Oakland General Plan?*
3. *What consequences result from not requiring the Developer to produce a specific plan?*
4. *What was the quality of Public Participation in the Oak to Ninth Avenue Development Process?*
5. *What was the role of interest groups in influencing this project outside the public process?*

Question 1: Did the Development Process conform to the requirements in the Port of Oakland’s request for qualifications (RFQ)?

Through the request for qualifications (RFQ) process, the Port of Oakland signaled its intent to develop the Oak to Ninth Avenue Property in conformity with the Oakland’s Estuary Policy Plan. Specifically, the RFQ required the developer to submit “an economically viable development strategy for the areas consistent with the EPP.” The EPP envisioned diverse open space, marine, commercial, and recreational uses. In part because the land was subject to requirements of the California Tidelands Trust, the EPP did

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not envision private residential uses. Based on their response to the RFQ, the Port awarded Oakland Harbor Partners (OHP) an exclusive negotiating agreement with an option to buy the property.

The RFQ process award to OHP included a detailed schedule of performance. (See Figure PPA.8: RFQ Schedule of Performance). The schedule required OHP to initiate a specific planning process involving community and stakeholder meetings in October 2001 and submit a draft specific plan along with a refined development plan in April 2002. Based on available records, OHP did not initiate or develop specific plan with community as required in the RFQ Schedule of Performance and later scheduled performance milestones were subsequently not met.

After gaining "property rights," Signature appears to have convinced City of Oakland and Port of Oakland officials to forgo the EPP vision for an alternative mixed use waterfront development with 1700 private dwelling units along and several of the originally intended EPP uses at a reduced scale. Justifying this concept, in 2002, OHP submitted an economic feasibility analysis to Port officials based on a plan for 1500 condominiums, 200 below market rate housing units, and 142 live-work condominiums in the preserved 1920's portion of the Ninth Avenue Terminal. The feasibility analysis was released to the public in March 2006 but not made available to the general public at the time of this apparent decision.

In 2003, the Port of Oakland appraised the property at \$34 million less clean up costs (~\$16 million) based on expected entitlements for 1700 units. Later that year, the Port of Oakland then granted OHP the option to buy the property for \$18 million. Though increasing the residential density would significantly increase the project's expected revenues; the Port of Oakland did not reappraise the property's value nor re-adjust the land sales prices.

After successfully negotiating an option agreement, OHP proposed a development that again increased the residential density of the proposed development from 1700 units to 3100 units. Increasing the residential density required utilization of land proposed for open space under the EPP and demolition of a majority of the Ninth Avenue Terminal.

In 2004, attorneys for the Port of Oakland collaborated with OHP to draft legislation to enable the Port to exchange parts of the Oak to Ninth Avenue Property under Tidelands Trust designation. Senate Bill 1622 authorized the State Lands Commission to relinquish the Public Trust status of some project parcels if there was a suitable land exchange. This legislation was necessary to permit private residential uses on the property. SB 1622 passed in August 2004 through the sponsorship of Oakland State Senator Donald Perata.

Overall, a review of the development process milestones and Port of Oakland's RFQ, master development agreement, and land sale process identify the following issues:

- **Oakland Harbor Partners (OHP) did not initiate or develop a specific plan with community input as required in the RFQ Schedule of Performance;**
- **OHP did not meet subsequent scheduled performance milestones;**
- **OHP development plans diverged from the Estuary Policy Plan vision without public review;**
- **The Port of Oakland did not re-appraise the property or alter the land sales price despite plan revisions expected to increase property values;**
- **Economic feasibility studies that may have justified the OHP revision of the project objectives were not subject to public review or scrutiny.**

Question 2: Is the Oak to Ninth Development Project Consistent with the Oakland General Plan?

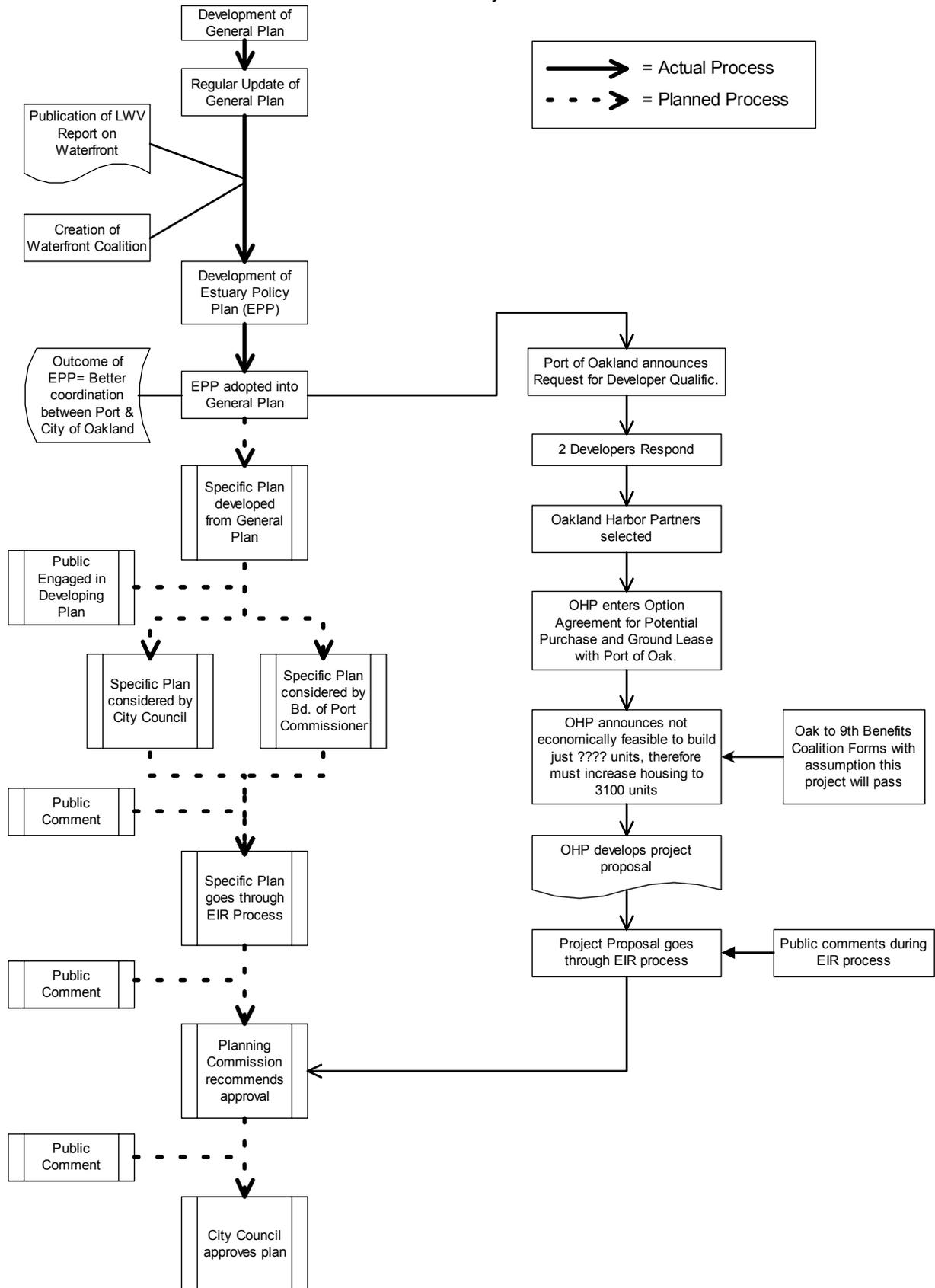
As discussed above, the purpose of having a general plan is to essentially have a blueprint for the city's vision of future growth. By clearly articulating goals, objectives, priorities and values, the general plan provides a measuring stick to which more specifically detailed plans may be analyzed.

According to Oakland Municipal Code, "except as otherwise provided by Section 17.01.040, no activities or facilities shall be established, substituted, expanded, constructed, altered, moved, painted, maintained, or otherwise changed, and no lot lines shall be created or changed, except in conformity with the Oakland General Plan. To the extent that there is an express conflict between the Oakland General Plan and the Zoning Regulations, this requirement shall supersede the requirement for conformity with the Zoning Regulations stipulated in Section 17.07.060 (formerly Section 17.02.060). (Ord. 12054 § 2 (part), 1998)"⁴⁷ (See Figure PPA.5: Project consistency with general plan and zoning to review the decision making matrix and flow chart for decision making related to general plan and zoning compliance.)

⁴⁷ Oakland, C.o., Oakland Municipal Code - GENERAL PROVISIONS OF PLANNING CODE AND GENERAL PLAN CONFORMITY. 2006.

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Planned Process vs. Actual Process
Case Study of Oak to Ninth



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The General Plan's Estuary Policy Plan clearly affirms a vision for the waterfront that prioritized open space, recreational opportunities, and waterfront commercial uses that celebrated the City's waterfront history. As proposed, the development proposal is inconsistent with the General Plan Estuary Policy Plan. For the project to be approved, Oakland Harbor Partners must therefore request modification of these pre-existing plans to regain the required consistency. Based on a review of revisions to the General Plan recommended by the Planning Commission on March 15th, 2006,⁴⁸ the Oak to Ninth project requires the following key amendments to the General Plan to achieve consistency with the General Plan:

1. Revising the site's priority use from 'public use' to "mixed-use."
2. Including residential uses in the mix of uses planned for the Oak to Ninth Avenue Project Area
3. Include non-recreational commercial uses in the mix of uses planned for the Oak to Ninth Avenue Project Area
4. Reduce the portion of the Ninth Avenue Terminal expected to be improved for adaptive reuse to the bulkhead portion of the building
5. Authorizing the demolition of the remainder of the Ninth Avenue Terminal;
6. Reducing the expansion of Estuary Park so that it is no longer required to extend to the Embarcadero;
7. Deleting plans for a pedestrian bridge at the bay ward end of the basin;
8. Deleting provisions for the mooring the ARTSHIP, the proposed headquarters of community outreach and art program;

The above changes represent a significant departure from the policy goals articulated in Oakland's General Plan. While these changes may represent an appropriate response to changes in the needs of Oakland residents since the approval of the EPP in 1999, the City undertook neither technical analysis subject to public review nor a transparent public process to deliberate on these changes. About one-third of individuals providing written or public comment at public hearings explicitly raise the issue of the project's inconsistency with the EPP.

Revisions to a General Plan should generally follow a process similar to the one that led to its development. **Overall, in the case of the Oak to Ninth Avenue development, the public and stakeholders are responding and reacting to a proposal in substantial conflict with established General Plan public policy goals without first having the opportunity to re-evaluate those policy goals.**

Question 3: What consequences result from not requiring the Developer to produce a specific plan?

As discussed above, after the selection process, the Port gave the selected developer, Oakland Harbor Partners, roughly nine months to develop a Specific Plan, including public meetings for this specific planning process. However, as illustrated in the above timeline and the RFQ schedule of performance, a Specific Plan was neither initiated nor developed, and no community meetings were held during the required time period.

48 Oakland Estuary Policy Plan Amendments Oakland Planning Commission 3-15-06 Available at: <http://www.oaklandnet.com/government/ceda/revised/planningzoning/MajorProjectsSection/EXHIBIT%20G%20-%20GPAEPPOaktoNinth31506FINALDRAFT.pdf>

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According to the Developer's and City of Oakland's websites, the first community meetings related to the Oak to Ninth process took place in May and June 2004, after the Oakland Harbor Partners submitted a detailed project development proposal and requested entitlements and general plan amendments from to the City of Oakland. There is no evidence of engagement by the community in any planning that occurred prior to OHP submitting a development proposal. Fundamentally this indicates a departure from the requirement for a specific plan, specified both in the Oakland General Plan and re-iterated in the Port's RFQ schedule of performance.

Specific Plans are governed by Sections 65450 through 65457 of the State Government Code. The State Guidelines state that "(a) specific plan is a tool for the systematic implementation of the general plan. It effectively establishes a link between implementing policies of the general plan and the individual development proposals in a defined area. A specific plan may be as general as setting forth broad policy concepts, or as detailed as providing direction to every facet of development from the type, location and intensity of uses to the design and capacity of infrastructure; from the resources used to finance public improvements to the design guidelines of a subdivision."

According to OHP, the departure from the Estuary Policy Plan (EPP) is legally allowable because they have "submitted a plan to the City of Oakland with far more detail than would be required by a Specific Plan."⁴⁹ Furthermore, OHP asserts that "a Specific Plan process only requires one publicly noticed meeting, while OHP has exceed expectations for engaging the public in the proposal process."⁵⁰

The City also responds directly to the failure to develop a specific plan in the Final Environmental Impact Report.

"The policy itself only calls for more specific planning, not necessarily a specific plan, and the proposed project would achieve each of the articulated reasons for the further detailed planning determined to be necessary for the site. The language that a specific plan "should be" prepared is directory not mandatory. Given that the detailed project proposal and comprehensive analysis in the DEIR meet the intent of the policy, proceeding without a specific plan does not violate the general plan. Moreover, the City could decide to amend this policy to clarify its intent prior to approval of the project in which case the potential for any conflict will be avoided."⁵¹

Substantive Equivalency A specific plan serves both substantive and procedural objectives. Several findings stand in contrast to the substantive equivalency of the Oak to Ninth Development plans and a specific plan.

- **First**, as discussed above, the development proposal diverges substantively from established and articulated public policy goals. In contrast, the aims of a specific plan are to further implement a general plan's policy goals.

49 Oakland Harbor Partners – Frequently Asked Questions about Oak to Ninth: <http://www.oakto9th.com/news.asp>

50 Oakland Harbor Partners – Frequently Asked Questions about Oak to Ninth: <http://www.oakto9th.com/news.asp>

51 Oak to Ninth Avenue Project. February 2006. Final Environmental Impact Report. Master Response 1.

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- **Second**, the proposal does not appear to reflect a consensus of public interests for this site, something a specific plan should engender. Instead, the proposal appears to have generated substantial public controversy by diverging from established City policy. For example, OHP contends that their project would save the public the expense of open space development. On the other side, interest organizations argue that the project shortchanges waterfront history, reduces open space, and creates barriers to waterfront and open space access.
- **Third**, OHP and City of Oakland staff asserts that the Oak to Ninth Development plan contains a similar degree of detail to a specific plan. Several findings subsequently discussed in this health impact assessment suggest that the development proposal has not addressed the breadth of issues appropriate for the plan for a new neighborhood. For example, the development proposal does not include planning for safe upland circulation for bicycles and pedestrians to regional transit, to Lake Merritt trails, and to upland neighborhoods. The lack of planning for non-motorized waterfront access stands in contrast to goals and objectives of the EPP as well as to the Regional Bay Trail Plan.
- **Fourth**, despite revising the area's priority use from public use to mixed use, the planning did not include planning for schools. The 3100 units proposed will be residences to families with children. According to school board members and one City Councilmember, the schools in adjacent neighborhoods are already experiencing crowding.

Procedural Equivalency Regarding procedural equivalency between the development proposal and a specific planning process, OHP claims that they have, with the City of Oakland and the Port of Oakland, hosted at least 12 public hearings regarding the project and conducted outreach to over 4,000 people and over 100 business, civic and community groups.⁵² This position has been frequently repeated by City officials as well as appointed and elected officials.

While OHP asserts that this outreach is unprecedented in the history of Oakland, the position carries some significant assumptions.

The Oak to Ninth Avenue project is the largest development in Oakland since World War II, and will be built on a rare waterfront property in Oakland, and will have anticipated earning of over \$2 billion. The degree of outreach should be proportional to the significance of the project.

More importantly, the developers and city staff equate “being informed” with “being involved.” It is unclear from documents exactly what the “outreach to over 4000 people” entailed. Who conducted the outreach? Were 4000 people actually contacted, or was this number obtained through inclusion of represented individuals – for example, was contacting religious leaders assumed to then represent outreach to the entire congregation? Was the venue and language appropriate for all stakeholders? Were participants informed enough about the issues and alternatives to provide meaningful and relevant input? Were participants aware of the purpose of their involvement and their ability to influence the development?

According to Public Affairs Management of City of Oakland, a primary goal of the public outreach process is to inform the public about these trade-offs and potentially difficult choices

⁵² Oakland Harbor Partners – Frequently Asked Questions about Oak to Ninth: <http://www.oakto9th.com/news.asp>

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for the City's decision-makers.⁵³ This publicly stated purpose does not suggest that the City of Oakland aimed to solicit ideas, recommendations, or alternatives for the Oak to Ninth development project.

According to publicly available information, the public hearings referenced by the developer were in fact ongoing regular meetings of the Planning Commission, the Landmarks and Preservation Board and the Parks and Recreation Board, which typically offer only limited amounts of public input (each person is usually limited to 1-2 minutes, depending upon the number of participants). According to available documentation of past meetings, (See Figure PPA.6: Summary of Public Participation Opportunities) it appears there were really only about 6 opportunities for public engagement at an event dedicated specifically to Oak to Ninth, only three of which were held explicitly for community input (one in the scoping phase and two in the screening phase).

According to comments made by the Planning Commission, the project's departure from the General Plan appears to be acceptable to the Commission given the urgent needs for economic development and urban revitalization in the area.

"Oakland Harbor Partners is proposing a Plan that expands the allowable land uses, such as residential, and extends the vitality of Oakland's neighborhoods and downtown along the waterfront. Their Plan includes open space, trails, public gathering places and commercial uses, as described in the EPP, along with more extensive residential development than is currently allowed due to State Lands Commission restrictions. It is the City's challenge to work with all parties in further refining the Plan so that it meets the objectives of the EPP while still being economically viable, and balances the needs for environmental clean up, provides recreational facilities adjacent to the Estuary, and addresses the strong housing demand in the Bay Area."⁵⁴

The Oak to Ninth project may well advance some social and economic objectives; however, the development project also diverges from legislatively approved policy goals without a public process. Furthermore, the development project as proposed did not address the spectrum of planning issues raised for this site including those associated with circulation, open space access, and public education.

By issuing a development proposal in advance of comprehensive planning and then later suggesting that the development proposal is substantively and procedurally equivalent to a specific plan, both City of Oakland Planning Department Staff and its Planning Commission may be effectively de-legitimizing both the City's General Plan and well-established urban planning principles.

Question 4. What was the quality of Public Participation in the Oak to Ninth Avenue Development Process?

Typology of Public Participation Opportunities Figure PPA.6 provides an overview of the community opportunities for engagement related to the Oak to Ninth proposal. In the table below, we categorize

⁵³ From Public Affairs Management. Oakland Waterfront Community Participation Project - Frequently Asked Questions, January 11, 2005 - <http://www.oaklandnet.com/government/ceda/revised/planningzoning/MajorProjectsSection/FAQ011105.pdf>

⁵⁴ From Public Affairs Management. Oakland Waterfront Community Participation Project - Frequently Asked Questions, January 11, 2005 - <http://www.oaklandnet.com/government/ceda/revised/planningzoning/MajorProjectsSection/FAQ011105.pdf>

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these participation opportunities with the typology of the Ladder of Participation. In the Oak to Ninth Project, the highest level of public involvement occurred via consultation; however, there is no evidence that these consultation opportunities meaningfully have influence on the development project.

Types of Participation	Related Oak to Ninth Examples
Manipulation	<ol style="list-style-type: none"> 1. Developers make public claims that the project creates new parks for the City, borrowing from EPP goals but sidestepping the reduction in park acreage and the EPP inconsistencies. 2. Developers make public claims that the project advances Smart Growth objectives, ignoring a number of Smart Growth criteria not met by the development project.
Therapy	-
Informing	<ol style="list-style-type: none"> 1. The project undergoes Environmental Review under CEQA 2. OHP and City officials conduct outreach to over 4000 people and over 100 business, civic and community groups via small group dialogue and 'open house' events to inform the public and stakeholders about the project. 3. Staff reports and developer presentations inform the public and decision-makers about the project
Consultation	<ol style="list-style-type: none"> 1. OHP and City officials conduct outreach to over 4000 people and over 100 business, civic and community groups via small group dialogue and 'open house' events, provide opportunities for comment, and synthesize the comments into a written report 2. The City of Oakland responds to oral and written comment on the draft EIR. 3. Public comment occurs at formal public hearings
Placation	-
Partnership	-
Delegated Power	-
Citizen Control	-

Influence of public participation on design Our analysis of public comment made to the Planning Commission, the Landmarks and Preservation Board, and the Parks and Recreation Board reveals that there are a relatively small number of people who provide public input via multiple venues. For example, there were 95 individual independent speakers or public comments on the DEIR. (See Figure PPA.7: Public Comment on the Environmental Impact Report) One-third of those individuals brought up the Estuary Policy Plan in their public or written comment. Some of the other common statements allege insufficient consideration of the impact upon traffic congestion and access to public transportation, the need for affordable housing for lower-income individuals and families, preservation of open space and the 9th avenue terminal, and lack of opportunities for public engagement.

The repetition of statements and positions in public comments suggests that the community input did not have significant influence on the design and development decisions within this planning process.

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Barriers to participation The chart below listing factors affecting individuals' ability and interests to participate in a public decision-making process. The responsiveness to some of these factors can be inferred from the data in Figure PPA.6. (See Figure PPA.6: Summary of Public Participation Opportunities) For example, start times varied slightly but publicity information does not provide information on whether translation or childcare was provided. Speaking times varied. The meeting summaries published by the facilitator provided fairly complete narratives of comments, but did not indicate whether or how the comments would translate into design or other project changes.

Common indicators of insufficient or failed public participation include public complaints, about the lack of opportunity to comment, inadequate notice of events, inconvenient meeting times/locations, unavailable materials, and lack of responsiveness from agency; poor attendance at public meetings and low response requests for comment; limited participation of a segment of community or segment of a community. We did not find any data to analyze on these participation indicators collected by the City of Oakland.

Factors Affecting Individuals' Ability and Interest in Public Meetings Participation
<ul style="list-style-type: none">▪ Effectiveness of outreach and announcements including issues related to media, language, explanation of purpose▪ Accessibility of the meeting including issues related to time and location, availability of transportation, disability access, and childcare▪ Languages spoken▪ Translations of expert content to lay audiences▪ Understanding of the planning process▪ Awareness of ability and capacity to affect change▪ Past experiences with public participation including the experience of voice or disenfranchisement▪ Trust in the power-holders▪ Relationship between issue at hand and more immediate issues▪ Fear of retaliation

Question 5: What was the role of interest groups in influencing this project outside the public process?

Several non-profit interest organizations working independently and in broad coalitions engaged in development process for Oak to Ninth Avenue. Below, we summarize the positions of these organizations and coalitions based on public positions and written documents.

- **Waterfront Action** is an Oakland non-profit whose mission is to promote public access to the Oakland-Alameda Estuary and Lake Merritt through using public awareness, education, and direct action. Waterfront Action seeks improvements in the project to improve public access to the waterfront, provide sweeping views of the natural spaces, preserve a greater share of the 9th avenue terminal and advance the phasing of the public open space elements of the project. Waterfront Action also advocates for supporting the Estuary Policy Plan or returning to a transparent public process for its revision.
- The **Oak to Ninth Community Benefits Coalition** includes a number of resident membership organizations and has been negotiating a Community Benefits Agreement (CBA) with the

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developer of the 60 acre site on the Oakland Waterfront known as Oak to Ninth. Community Benefits Agreements are legally binding agreements between a developer and community groups in which the developer agrees to provide certain benefits and mitigations determined by the community representatives. The coalition made demands for affordable housing, the inclusion of opportunities for local businesses, and local hiring job standards. If a CBA is successfully negotiated, the Oak to Ninth Coalition is prepared to support (or at least to not oppose) the developer's requests for entitlements and subsidies from public bodies overseeing the development process.

- The **Alameda County League of Women Voters (LWV)**, authors of the *Waterfront: It touches the World. How does it touch Oakland*, support development if done in accordance with the Estuary Policy Plan and if parks and bay trail elements are developed in early phases. The LWV also advocate for adequate pedestrian and vehicle access, vistas of the waterfront, historic preservation, affordable housing, a neighborhood school, and mitigation of air quality, pedestrian safety, and noise concerns.
- The **East Bay Bicycle Coalition** is focused is on public access to the Oakland Estuary and Bay Trail. EBBC has raised three areas of concern: access and safety to the Oakland Estuary from the upland side of the rail and freeway; access and safety along Embarcadero, an on-street portion of the Bay Trail; and the need to complete the Bay Trail shoreline path through the project area.
- The **Oakland Heritage Alliance** opposed AB 1622. OHA advocates for preservation and reuse of historic structures unless there exists a compelling reason for their demolition. OHA believe the Ninth Avenue Terminal would be eligible for the National Registry of Historic Places and that a transparent and complete alternatives analysis of creative reuse of the historic has not yet occurred. OHA also advocates for a public discussion of changes to the Estuary Policy Plan, either through a specific plan or an equivalent public process to identify public priorities for the area.
- The **Measure DD Community Coalition** is a body of 150 concerned citizens, organizations, and dedicated staff sanctioned by the City Council to monitor parks, open space, and waterways developments authorized under the Measure DD bond referendum. The DD Coalition is interested in the project's potential impact on open space, Estuary access, visibility, and questions of level of development appropriate to the largest undeveloped waterfront area remaining in the city. The Measure DD Coalition strongly urges close adherence to primary EPP objectives by any development plan being considered for adoption, including assuring maximum physical and visual access for the public to the Estuary and the surrounding parks from the Embarcadero and from interior streets.

There exists no straightforward way to judge the influence of these diverse advocacy position held by the above stakeholders and coalitions of stakeholders. All of these stakeholders participated in City sponsored outreach, all provided written or verbal comment and all appeared to have lobbied power-holders. Some stakeholders attempted to negotiate with OHP directly and anecdotal reports suggest that some may have achieved their demands, in part, through private negotiation. Other groups either

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supporting or silent on the project also may have successfully achieved their interests through private negotiations with OHP.

On one hand, in the public record, the OHP proposal did not change substantially between the time it was first proposed to the City and when the planning commission gave its approval on March 15th, 2006. This suggests that stakeholders have collectively had a lack of substantive influence. On the other hand, questions raised by City Council members to the Planning Director at the Council Workshop of March 28th, 2005 echoed many of the frequently mentioned positions of the organizations with the largest constituencies, most notably, the issues of park adequacy and access and of affordable housing and its finance. The significant questioning of the project and request for evaluation of design and planning changes by City Council members two weeks after a near unanimous and unquestioning approval by the Oakland Planning is notable. However, the results of this questioning on the project are yet to be verified.

As discussed above, concerns about violations of the Estuary Policy Plan were frequent in public testimony, but resulted in little rhetoric or questioning of the legitimacy of the planning process on the part of power-holders. Perhaps, an explanation lies in the implications of questioning the planning process. If the process of diverging from the EPP was fundamentally wrong or flawed, then the results, the current development proposal may also be flawed, requiring a return to a community planning process to revise the EPP, as suggested by some stakeholders. This may have been seen as an unacceptable result by some power-holders.

A final observation relates to the relationship between the development proposal, the Oak to Ninth Community Benefits Coalition, and interests advocating faithfulness to the EPP. The OHP proposed replacing the EPP's open space priority with a vision of a new residential neighborhood bordered by a public waterfront. While they were open to negotiate, the open space, waterfront, environmental, and historic preservation interests generally lined up behind the goals of the original plan. However, the Oak to Ninth Community Benefits Coalition's goal of a Community Benefits Agreement is contingent on the substantive achievement of the developer's residential vision. This conflict between the Community Benefits Agreement and the Estuary Policy Plan appears to have prevented a strategic alliance among the Community Benefits Coalition and Estuary Policy Plan advocates. An alliance and consensus of interests among affordable housing, labor, social justice, environmental, open space, and historic preservation may have had a more potent and earlier influence on the development process.

F. Recommendations for Oak to Ninth Planning

Meaningful public involvement and successful consensus building requires developers, city staff, and all stakeholders to sit at the same table. It requires making information publicly available and creating the opportunities for all affected people to understand what is at stake and to speak to their needs and concerns. Most importantly, successful planning must include the promise that the public's contribution will influence the decision.

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A number of new deliberative approaches to environmental decision-making demonstrate effective ways to involve non-experts in policy analysis.^{55 56 57} For example, in the Danish Board of Technology's Consensus Conference, a lay panel deliberates on a public issue and provides a consensus report of their findings to the legislature.⁵⁸ Experts contribute testimony and analysis but only in response to questions posed by the lay panel. Success at the difficult task of gaining consensus among traditional opponents has been illustrated in many areas, including habitat conservation planning, where landowners, environmentalists, and regulators are brought together to develop compromise solutions regarding endangered species protections.⁵⁹

While acknowledging the time and expense involved with a successful public process, we believe the costs of poor decisions, whether measured in public dissatisfaction, loss of trust in public agencies, or human and environmental costs outweighs these short term expenses. As discussed above, successful public involvement has many direct and indirect social benefits. The following are three recommendations for the Oak to Ninth Development as it stands in May 2006:

- 1. The City of Oakland should specifically document whether and how the project has been responsive to public concerns and to constructive design change recommendations raised in the numerous public meetings and hearings.**
- 2. Regardless of the history of the process, the City of Oakland should convene an independently facilitated multi-stakeholder consensus process to address unresolved controversies associated with the Oak to Ninth Development and to address and resolve inconsistencies between the project and established General Plan goals and policy.**
- 3. The findings from both the documentation of public concerns and the multi-stakeholder consensus process should be made publicly available, at a minimum via the City of Oakland website.**

55 Pimbert, M.P. & Wakeford, T. Prajateerpu: A Citizen's Jury/ Scenario Workshop On Food And Farming Futures For Andhra Pradesh, India. London and Sussex: IIED and Institute for Development Studies; 2002.

56 Cornwall A, Gaventa J. From Users and Choosers to Makers and Shapers: Repositioning Participation in Social Policy. Working Paper 127 Sussex: Institute of Development Studies; 2001.

57 Goetz AM, Gaventa J. Bringing Citizen Voice & Client Focus into Service Delivery. Sussex: Institute of Development Studies; 2001.

58 Anderson IA, Jaeger B. Scenario workshops and consensus conferences: Towards more democratic decision making. Science and Public Policy. 1999; 26(5): 331-340.

59 Sabel C, Fung A, Karkkainen B. Beyond Backyard Environmentalism. Boston: Beacon Press; 2000.

Oak to Ninth Avenue Health Impact Assessment

Chapter 3 Parks and Natural Spaces

A. Summary

Access to parks and natural spaces confer numerous health benefits. Contact with nature and passive and active recreation are positively associated with physical activity, mental health and a sense of well being, social cohesion, and environmental quality. Specific health outcomes improved by access include depression, obesity, heart disease, cognitive function, and problem solving ability. Significant economic and social costs result from limited and unequal access to parks and natural spaces.

Analysis of the current distribution of city parks in Oakland reveals that large percentages of Oakland residents do not have access to open space resources which can help prevent many of the disease outcomes currently endemic in the city such as diabetes, hypertension, and obesity. Less than half of Oakland residents live within 10 minutes walking distance of a city park. The distribution of access to Regional Parks is also not uniform among Oakland neighborhoods. Most striking is the lack of access to large parks that would be suitable for recreation and getting the recommended amounts of physical activity. In particular, two-thirds of Oakland youth do not live in areas that provide access to adequate park resources. This is an environmental factor contributing to childhood obesity.

The parks and natural spaces that remain in the public domain in the proposed Oak to Ninth development will provide a significant health benefit to the future residents of the development; however, the project, in part due to its design, does not provide a significant new park resource for the City as a whole. Only with modifications to increase the accessibility of these parks to adjacent neighborhoods and other Oakland residents will they help reduce the current park shortage for the city as a whole. With such modifications these parks could result in a significant benefit to the health of Oakland residents.

Project Health Impacts

1. The Oak to Ninth Project will result in a new residential neighborhood rich in park resources; this will have positive health benefits for the residents of this new neighborhood.
2. The Oak to Ninth Project represents a net loss of 15 acres of open space relative to existing planning designations under the Oakland General Plan Estuary Policy Plan; this represent the loss of a significant health resource for Oakland as a whole.
3. Both unmitigated physical and social barriers between the proposed estuary and waterfront resources and upland neighborhoods will limit the potential health benefits of the project to Oakland residents. This represents a missed opportunity to improve the health of Oakland residents.
 - Elements of the Project, particularly the large residential buildings, create potential physical and social barriers to views and public access to public park resources along the Estuary and Waterfront.
 - Physical barriers, including the rail corridor and the I-880 freeway corridor create a significant obstacle to convenient public access from upland and park-poor neighborhoods.
 - The project did not include planning or design for and functional access between upland neighborhoods and proposed public park resources along the estuary and waterfront.
 - Existing preliminary work on estuary access (e.g., 5th Avenue Multi-modal transportation design work) was not reflected in the development proposals to the City.
 - Facility and operations planning for the proposed parks do not reflect input and needs of residents of upland neighborhoods

- The community benefits district proposed for the park risks functional privatization of park resources.

Recommendations for Design & Mitigations

1. Create safe, continuous, and functional routes connecting the waterfront to adjacent neighborhoods. At a minimum, an inviting route should exist along the estuary channel and along 5th Avenue.
2. Provide public transit services directly to the waterfront
3. Increase public parking adjacent to waterfront park resources.
4. Ensure the socio-economic integration of project housing
5. Explore design changes to improve visibility of the waterfront
6. Explore re-routing the Embarcadero between the residential uses and the public waterfront.
7. Include residents of upland neighborhoods in park planning
8. Create seats for citywide interests on all oversight bodies for project parks

B. Health Effects of Parks and Natural Spaces

Open Spaces (natural spaces) constitute lands set aside for the purpose of either preserving or creating a natural environment.¹ Parks, which may or may not include natural spaces, are public places dedicated for outdoor recreational and leisure activities. Early proponents of urban parks, such as Fredrick Law Olmstead, promoted the inclusion and design of public open space as a critical component of making cities healthier. Much of the recent attention and research on the health benefits of open space have focused on cities where the high densities of people, buildings, roads, and other infrastructure can provide limited access to natural environments.

Parks and natural spaces fill some of human beings' most basic needs – the need for interaction with other people and nature. They also can be among a City's most egalitarian places, bringing together ethnically and socio-economically diverse people seeking an escape from everyday stressors. They provide environmental services that benefit the entire community. These functions result in a variety of health benefits, but require safe and inviting environments for their full realization.

Today, considerable evidence exists confirming the significant role of parks and natural spaces in determining the health status of individuals and communities. The diverse evidence-based relationships between open space and health are illustrated in framework in Table NS.1 below. This framework identifies typical types of public and natural spaces in the urban environment. Associated with these types are their functions with regards to: 1) the direct uses of public and natural spaces by people and 2) the functions of spaces on the physical environment. Health outcomes are associated both with human uses and environmental effects. Features of open space that have been positively linked to health outcomes include providing opportunities to engage in physical activity, have contact with natural environments, community interaction, and improving environmental quality.

The following section outlines some key evidence linking these aspects of open space with health benefits experienced by individuals and communities. The evidence below focuses on the health effects

¹ Fulton W. 2005. Guide to California Planning, Third Edition. Solano Press Books: Point Arena CA.

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of individuals and communities uses of natural spaces and urban parks. Indirect health benefits resulting from improvements in environment quality is beyond the scope of this analysis. A more comprehensive review of the research on parks, natural spaces and health may be found in *Healthy Parks Healthy People: the Health Benefits of Contact with Nature in a Park Context* published in 2002 by Deakin University in Australia.

Table NS.1: Framework for understanding the relationship among parks, public spaces, and natural areas and human health.

Public Space Urban Design Elements	Health Related Functions of Parks and Natural Spaces	Health Outcomes Related to Parks and Natural Spaces
<ul style="list-style-type: none"> ▪ Plazas ▪ Squares ▪ Courtyards ▪ Parks ▪ Community Gardens ▪ Greenways ▪ Bike and Walking Trails ▪ Waterfront Access 	<p><i>Via human activity:</i></p> <ul style="list-style-type: none"> • Physical activity • Recreation • Leisure • Respite / Relaxation • Social interaction <p><i>Via environmental quality:</i></p> <ul style="list-style-type: none"> • Air quality • Water quality • Reduce heat island effect • Habitat preservation • Views 	<p><i>Reductions in Disease Outcomes:</i></p> <ul style="list-style-type: none"> • Premature Mortality • Obesity • Mortality • Cardiovascular disease • Hypertension • Diabetes • Depression • ADHD • Respiratory diseases <p><i>Health Promotion:</i></p> <ul style="list-style-type: none"> • Happiness and well-being • Focus and attention • Problem solving “effectiveness” • Recovery from illness • Productivity • Stress reduction • Restorative • Reduction in social isolation • Community/social cohesion <p><i>Reductions in Exposure to Contaminants in:</i></p> <ul style="list-style-type: none"> • Drinking water • Swimming locations • Fish • Air

Physical activity

Physical inactivity leads to obesity and chronic diseases. Parks facilitate physically active lifestyles by providing relatively low cost choices for recreation. In a 2004 report the Institute of Medicine (IOM) found compelling evidence that the availability of parks and natural spaces “facilitate or constrain physical

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activity”.² Multiple studies, including many of those summarized in the IOM report, confirm that parks are desired destinations used for physical activity and that residential proximity to parks was a significant predictor of physical activity levels.^{3 4 5}

A review of studies showed that access to places for physical activity combined with outreach and education can produce a 48% increase in the frequency of physical activity.⁶ Physical activity has been linked to numerous health benefits including, reductions in premature mortality, preventing chronic diseases such as diabetes and hypertension, improves psychological well-being and preventing obesity.³

Stress, Depression, and Mental Functioning

In the environments of modern cities, parks and open spaces provide needed reprieve from the everyday stressors that lead to mental fatigue. These experiences have been shown to improve the health of adults and children by reducing stress and depression and improving the ability to focus, pay attention, be productive, and recover from illness.⁷ Evidence shows that spending time in parks can reduce irritability and impulsivity and promote intellectual and physical development in children and teenagers by providing a safe and engaging environment to interact and develop social skills, language and reasoning abilities, as well as muscle strength and coordination. In other words, visiting a park can leave one with increased abilities to cope. Researchers in Chicago have found associations between contact with natural environment and improvements in the functioning children with Attention Deficit and Hyperactivity Disorder (ADHD).⁸ Contact with natural environments, such as trees, has also been found to be associated with increases in the psychological resources of individuals living in public housing to make changes that will improve their lives and decreases in “mental fatigue” and finding problems insurmountable.⁹

Recovery from Illness

Parks and Natural Spaces also have direct healing effects. A classic study demonstrated that views of trees enhances the recovery of surgical patients and shortens the duration of hospitalizations.¹⁰ More recently, research from the Netherlands demonstrates that people who live in greener environments reduces the number of health complaints.¹¹

Social Support and Social Cohesion

2 Transportation Research Board Institute of Medicine of the National Academies. 2005. Does the Built Environment Influence Physical Activity? Examining The Evidence. National Academies of Science.

3 Powell KE, Martin LM, Chowdhury PP. 2003. Places to Walk: Convenience and Regular Physical Activity. American Journal of Public Health. 93 (9): 1519-1521

4 Humpel N., Owen N., Leslie E. 2002. Environmental Factors Associated with Adults' Participation in Physical Activity A Review. American Journal of Preventive Medicine. 22(3): 188-199.

5 Takano T, Nakamura K, Watanabe M. 2002. Urban residential environments and senior citizens longevity in megacity areas: the importance of walkable green spaces. J Epidemiol Community Health 56:913-918.

6 Kahn EB. The effectiveness of interventions to increase physical activity. American Journal of Preventative Medicine. 2002; 22: 87-88.

7 Maller C., Townsend M., Pryor A., Brown P., St Leger L. 2005. Healthy nature healthy people: 'contact with nature' as an upstream health promotion intervention for populations. Health Promotion International 21 (1) 45-53.

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

9 Kuo FE. 2001. Coping With Poverty Impacts of Environment and Attention in the Inner City. Environment And Behavior 33 (1) 5-34

10 Ulrich RS. View through a Window may influence recovery from surgery. Science 1984; 224: 421-421.

11 Vries, S. de, Verheij, R.A., Groenewegen, P.P. & Spreeuwenberg, P. (2003). Natural environments - healthy environments? An exploratory analysis of the relationship between green space and health. Environment and Planning A, vol. 35, pp. 1717-1731.

Greener parks satisfy needs for interaction by enticing residents into public spaces with trees, lush lawns and playgrounds. Conversely, barren, dirty communal spaces instill a sense of fear and indifference among residents, discouraging interaction among neighbors, which is crucial for building a sense of community. Sociability may alleviate some forms of mental illness and contribute to a sense of belonging and community. Neighborhood workdays for park and/or garden maintenance and improvement efforts foster common purpose and sense of ownership among residents. Perhaps most importantly, parks become a source of community pride and inspiration for further community improvements and revitalization.

There is significant evidence that open spaces, particularly those that consist of a significant amount of vegetation, serve a vital role in communities as a location for social interaction. For example, in a study conducted at a large public housing

development in Chicago, Illinois, vegetated areas were found to be used by significantly more people and those individuals were more likely to be engaged in social activities than similar areas without vegetation.¹² The authors of this study suggest that the vegetation in this study (mostly trees and grass) helped create “vital neighborhood spaces”. Social interaction and neighborhood spaces have been identified as key facets of healthy communities supporting social networks, social support, and social integration that have been linked to improvements in both physical and mental health.¹³

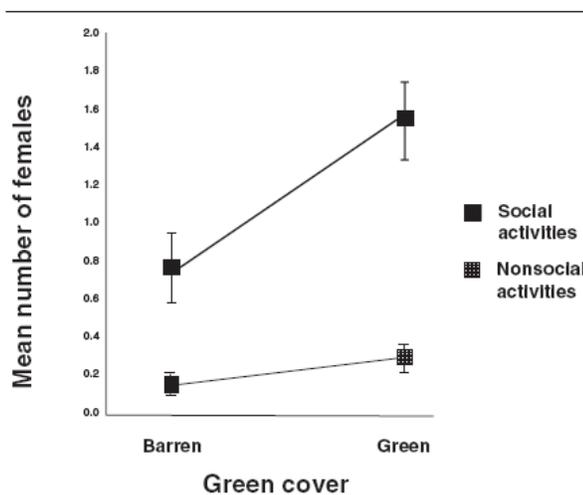


Figure 3: Interaction Between Number of Females Engaging in Social or Nonsocial Activities and the Condition of Nearby Nature in Outdoor Spaces at Ida B. Wells in Chicago

Effects on Vulnerable populations

Significant attention in the literature of the relationships between open space and health is focused on the particular needs of youth and seniors as populations that could benefit greatly from access to open space. Unfortunately, the distribution of parks and open spaces within cities is often inequitable, with the majority situated in affluent areas. Low-income residents are left with few affordable and accessible recreational options. Concern about rapidly increasing rates of childhood obesity has resulted in increased attention on the access of youth to opportunities for recreation and physical activity.¹⁴

Effects on Environmental Quality

Parks and open spaces provide savings on city infrastructure costs by filtering dirty air and water. Vegetation alleviates pressures on storm water management and flood control efforts by slowing and filtering water flow and also decreasing the area of impervious surfaces. Trees and greens space also improve the physical environment by removing air pollution from the air, mitigating the heat island effects

¹² Sullivan WC., Kuo FE, DePooter SF. 2004. The Fruit Of Urban Nature:Vital Neighborhood Spaces. *Environment And Behavior*. 36(5):678-700

¹³ Berkman LF, Glassb T., Brissette IC, Seeman TE. From social integration to health: Durkheim in the new millennium. 2000. *Social Science and Medicine*. 51:843±857

¹⁴ U.S. Department of Health and Human Services. 2000. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office.

produced by concrete and glass, and lowering energy demands and associated emissions during warm periods.¹⁵ As green spaces become more numerous and well-connected, human powered transit options increase, potentially reducing traffic and vehicle emissions.

C. Existing Standards and Public Health Objectives

Standards and health objectives exist for some of the features included in the framework connecting open space with health benefits. In general, standards include quantitative targets for reducing disease outcomes, recommendations for activities supported by parks and natural spaces, and standards for the amount and distribution of parks and natural spaces in urban environments.

Promoting physical activity, reducing obesity, promoting mental health and well-being, promoting healthy environments (including clean air) are all leading health objectives included in the US Department of Health and Human Services (HHS) report Healthy People 2010.^{12 2 16} Recommended levels of physical activity include 30 minutes of moderate-intensity activity five or more days per week or vigorous-intensity activity 20 minutes three or more days per week.¹⁷

Recommendations included in both the Surgeon General's report on Preventing Obesity and the IOM report on the connection between the built environment and physical activity emphasize the need to increase access to locations where individuals can engage in physical activity.^{2 3} In general access measures take two common forms: aggregate acreage per capita and distances between residences and parks.

- The Oakland General Plan, Open Space Conservation and Recreation Element (OSCAR) provides the most general standard for open space, and sets forth a goal of 4 acres of parkland for every 1,000 Oakland residents.
- The International City & County Management Association., in the document "*Creating a regulatory Blueprint for Healthy Community Design*", suggests that parks be located within a quarter of a mile from every residence, roughly equal to a 10 minute walk from residences.³ This distance is supported by research conducted in Georgia that found those individuals who reported they lived within a 10 minute walking distance of a public park were more likely to achieve recommended levels of physical activity.⁴

D. Existing City Park Resources in Oakland

To assess the current status of open space resources in the city of Oakland, we conducted an investigation of access to city parks using Geographic Information Services (GIS) mapping software. Data on the location of parks was gathered from the City of Oakland Parks and Recreation website and Oakland demographic information was taken from the US Census Bureau. The UC Berkeley Geographic Information Science Center (GISCI) provided the neighborhood boundary information. Spatial analyses

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

16 U.S. Department of Health and Human Services. [2001]. The Surgeon General's call to action to prevent and decrease overweight and obesity. [Rockville, MD]: U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General; Available from: U.S. GPO, Washington.

17 Centers for Disease Control and Prevention. 2006. Physical Activity for Everyone: Recommendations <http://www.cdc.gov/nccdphp/dnpa/physical/recommendations/index.htm> Accessed May 7, 2006.

were performed and maps created using ESRI software, ArcMap 9. This investigation attempted to answer the following questions:

1. What is the current access to city of Oakland parks and describe the distribution of these parks spatially and according to resident demographics?
2. What is the current access to city of Oakland parks that are suitable as sites for physical activity and recreation and describe the distribution of these parks spatially and according to resident demographics?

Total acreage of Oakland City Parks

When summed over the entire city of Oakland, there is roughly **one acre of city park land for every 1,000 Oakland residents**. A closer look reveals that this park land is not equally distributed throughout the city. (**Figure NS.1**) The neighborhood level analysis reveals that there are large sections of the city that have limited access to open space with between 0 and 1/3 of an acre per 1,000 residents, significantly below the city of Oakland General Plan goal of 4 acres per 1000 residents. Because this analysis was limited to city parks, it does not include the regional parks. The neighborhoods in the eastern parts of the city have access to regional open space that is not included in this analysis

City Parks within Walking Distance

Examining the fraction of Oakland residents that lives within easy walking distance of park is another measure of the degree to which Oakland is providing a healthy environment in relation to open space. (**Figure NS.2**) Less than half of Oakland residents live within a quarter of a mile of a park. Only 33 percent of Oakland youth living within easy walking distance of a park.

Parks Suitable for Diverse Recreational Activities

While physical activity has been identified as a key health promoting activity supported by open space and urban parks, the attributes of parks that contribute to their suitability for health-relevant activities have not been well established. For example, if a person walks at 2 miles an hour then he or she would then have to walk around the circumference of 1 acre park track 10 times to get the recommended level of physical activity. Alternatively, a 5 acre square park would only require walking around a circular track 3 times. Larger acreage might also be conducive to diverse forms of recreation such as team sports. Therefore it follows that larger parks may support physical activity in qualitatively different ways than smaller parks.

Overall, the City of Oakland has remarkable few large parks suitable for recreation and physical activity. Only 14% of all Oakland residents live within a quarter mile of a park that is greater than 5 acres. (**Figure NS.3**) There is also a pronounced ethnic difference in accessibility to large parks. Hispanics/Latinos (11%) and Native Hawaiian and Pacific Islanders (10%) are much less likely to live within walking distance of a big park. Similarly over 90% of Oakland youth do not live in areas within walking distance of a large park. Examination of the areas within a quarter mile from a large park reveals that in many Oakland neighborhoods there is nobody who lives within easy walking distance to a large park.

E. Impacts of the Oak to Ninth Development on Open Space and Health

Generally speaking, research conducted on the relationships between access to green space and health has consisted of analyses that have demonstrated significant differences in health outcomes between those groups with access to open space and those without. Although measurable increases in health

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benefiting behaviors and activities have been associated with access to open space, few forecasting models allow quantitative estimates of the amount of health benefit gained by increasing an individual's access to parks. A few preliminary efforts are promising:

- Research conducted in Georgia found that 15% more individuals were achieving the recommended levels of physical activity when the place they identified to walk was a park within 10 minute walking distance than when the park was located farther than 10 minutes by walking or some other transportation method.⁴ Although the trend represented by this finding is significant, the study did not control for other potential covariates and therefore the absolute amount of the increase is likely not that useful for application to other groups.
- A study conducted in Tokyo with 3144 seniors in large urban areas found a significant increase in the longevity of those individuals that lived closer to walkable public green spaces.⁶ This research involved a logistic regression model to control for a number of other factors. Therefore, their findings of a 13% increase in the odds of surviving five years when living close to walkable green spaces could be used to predict health effects on other groups of seniors in Japan.⁶

Overall, further research is required to make analytic models of park access and health outcomes context specific and to control for other intervening and confounding. This research will be necessary before planners can make generalized prospective, quantitative predictions for all populations. Nevertheless, the current evidence is strong enough to firmly state that increasing access to open space, particularly in the form of green spaces and parks will qualitatively result in an increase in activities known to have health benefits.

The Oak to Ninth Development proposes construction of approximately 3,100 new units of housing and 21 acres of new parks and open space in Oakland. The impacts of this development on individual and community health can be understood by examining the pathways by which open space has been shown to result in positive health outcomes and evaluating who will have access to these resources. **Figure NS.4** outlines the three principle pathways by which the Oak to Ninth development could result in health impacts by altering the amount and access to open space.

Health Assets for Future Project Residents

By incorporating open space and parks into the design of the development, the Oak to Ninth project will provide residents of this development close access to a resource for social interaction with their neighbors, recreation, physical activity, and contact with natural environments. The Project EIR predicts that the 28.4 acres of open space to be included in this development will provide approximately 11 acres per 1,000 residents, greatly exceeding the OSCAR goal of 4 acres per 1,000 residents. The majority of the residents will live within easy walk from a park.

Loss of Citywide Health Resources

Nevertheless, the Oak to Ninth project represents a loss of open space and parkland for the rest of the city. The proposed design represents a loss of 15 acres of parkland that would have been constructed under the design approved as part of the Oakland General Plan Estuary Policy Plan. The loss of these acres of open space effectively reduces net opportunities for residents of Oakland to have contact with natural landscapes, and for social interaction, physical activity, and recreation. In particular, the failure to implement the Estuary Policy Plan represents the effective loss of potential large parks that could support physical activity and recreation needed to combat chronic diseases such as obesity, hypertension and diabetes that are endemic in Oakland.

Social and Physical Barriers to Waterfront Access for Upland Residents

In addition to the loss of absolute acres of open space, the current planning for the Oak to Ninth Development has not addressed several barriers likely to limit the accessibility of the new parks to residents of the surrounding areas.

- Significant existing physical barriers include automobile oriented streets, industrially zoned land, a multi-lane interstate highway, highway off ramps, a busy rail corridor. Officially sanctioned planning to address these barriers has not occurred. **(Figure NS.5)**
- The placement of the buildings is likely to block views of the waterfront and new parks from adjacent areas, reducing the attraction of these areas as a destination by residents of adjacent neighborhoods.
- The provision of the design that establishes the maintenance of these parks by residents rather than the city of Oakland blurs the line between public and private space. The ability of local residents to control the types of activities to be permitted in the parks included in the Oak to Ninth development represents a potential barrier that could prevent the utilization of these areas by residents of other Oakland neighborhoods.

Impacts on Park Equity of the Oak to Ninth Project

Evaluation of the distribution of city parks in Oakland found that nearly two-thirds of Oakland youth (under the age of 18) did not live within the recommended distance of any parks and 90% did not live within recommended distance of a large park. Sedentary patterns of behavior in youth have been linked with lack of physical activity in adults and the development of obesity and related diseases such as diabetes, hypertension, and premature mortality.² None of the residents of the adjacent neighborhoods, Chinatown and Rancho San Antonio were found to currently live within the recommended quarter mile of a large park (one that is greater than 5 acres). While future residents of the proposed neighborhood will have access to levels of open space that greatly exceed that of adjacent neighborhoods and the city as a whole by up to 10 times, the proposed development does not address reasonably expected access barriers for upland residents. The project thus represents an action that is likely to increase health disparities for future residents of Oakland.

F. Recommendations for Design and Mitigations

The Oak to Ninth Project decreases the overall amount of open space in Oakland and provides a disproportionate share of new open space resources to future residents of this project. These negative and distributional impacts of the Oak to Ninth project might be mitigated by making changes to the design of the project that increase the accessibility and functionality of proposed new parks and open space resources from the perspective of all Oakland residents.

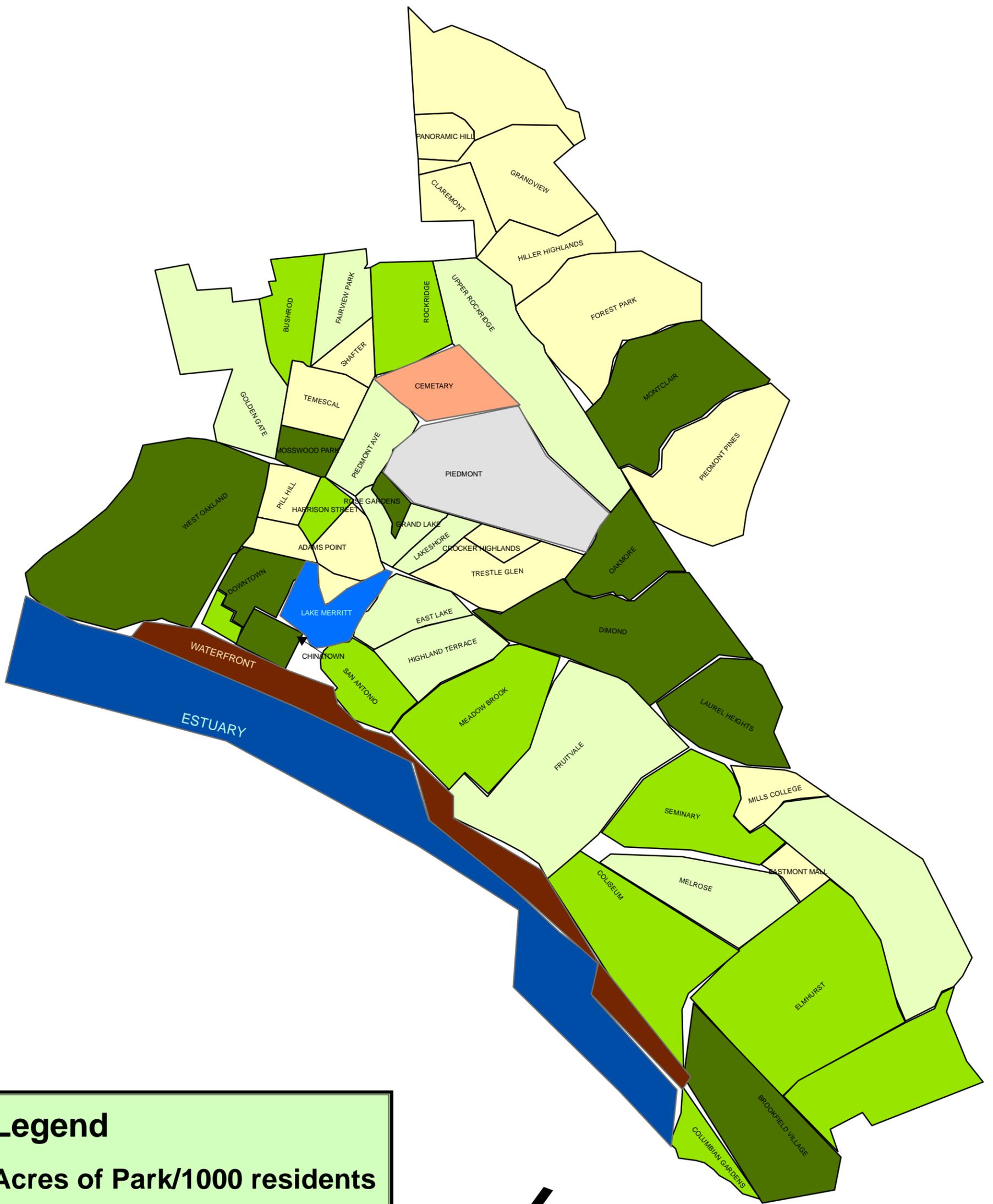
Modifications to the phasing of the development to accelerate the construction of the park and open space within the project as well as some limitations on the heights of buildings located along the waterfront have been incorporated into more latter versions of the Oak to Ninth project design. The proposal by the city of Oakland to construct a bike and pedestrian trail along the Lake Merritt channel has been considered as a means to improve the accessibility and connectivity of the site to surrounding communities and transportation options; however, no commitments have been made by the developer nor mandates by the planning commission. Similarly, concern over pedestrian safety and safe routes to and from the development has largely been unaddressed.

Specific requirements for the development that address the potential physical and social barriers to utilization of the parks by residents of adjacent neighborhoods and other Oakland residents might mitigate some of the above adverse health impacts of the development. Providing safe and convenient access to the new parks for residents of adjacent neighborhoods alone would give roughly 18,070 Oakland residents access to the health benefits of large parks. More specifically 3,730 Oakland youth and 2,660 seniors would have access to an important resource for protecting their health and preventing disease. **(Figure NS.6)** Increasing the accessibility of the Oak to Ninth open space components can be achieved in numerous ways.

- Making improvements for the safety of current intersections, railroad crossings for pedestrian travel could increase the ability and likelihood of residents of neighboring communities to access the open space resources of the development.
- The construction of a greenway along the Estuary Channel, with walking and bike trails connecting neighboring communities to the waterfront on a continuous trail might greatly increase the accessibility of the site. A channel trail should be linked to the Lake Merritt BART station with appropriate signage.
- Fifth Avenue provides an existing at-grade vehicle-oriented access between the Eastlake area and the waterfront. Redesign of this route with attention to bicycle and pedestrian modes of transport and public transportation routes would help connect several park-poor neighborhoods with the new park resources.
- Lastly, provisions for adequate parking and public transportation must be included to provide a means for those Oakland residents living in distant and park poor neighborhoods to experience the health benefits of the Oak to Ninth open space.
- Increasing the visibility of the waterfront and the open space might make more individuals aware and conscious of this public resource, and make use of the resource; altering the footprint or spatial orientation of the buildings could provide more sightlines to the open space and waterfront
- Re-aligning the Embarcadero to pass between proposed park and waterfront the open space and proposed residential uses would increase both visibility as well as access via vehicle transport. Measures which increase the socioeconomic integration of the new community through the inclusion of affordable housing on site and close to the proposed locations for new parks would help reduce economic disparities in the project's benefits.
- Conduct more comprehensive open space audit, to identify and describe the need for new parks in the city. Assess this and other development on the degree to which they meet the open space needs identified in the audit

Although the potential social barriers to accessibility of the Oak to Ninth project are more difficult to predict, in the planning phases consideration of these impacts is necessary to avoid the creation of exclusionary spaces. Efforts to include residents of surrounding communities in the design and oversight of the parks and open space could greatly reduce the potential for the creation of open spaces that are not accessible to residents outside of the Oak to Ninth Development. In addition, follow-up by a public entity should be considered as a means to verify that the Oak to Ninth open space is continuing to function as public space and not a private or restricted use resource for local residents.

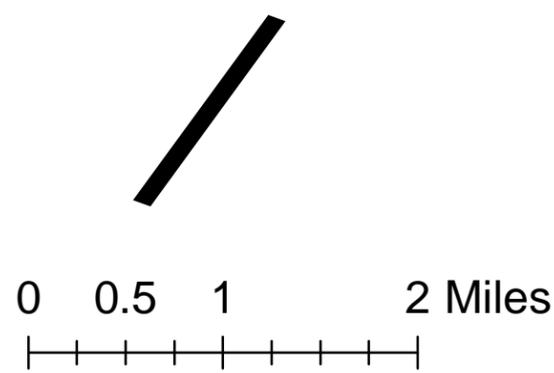
DISTRIBUTION OF THE ACREAGE OF CITY PARKS ACCORDING TO NEIGHBORHOOD IN OAKLAND, CA



Legend

Acres of Park/1000 residents

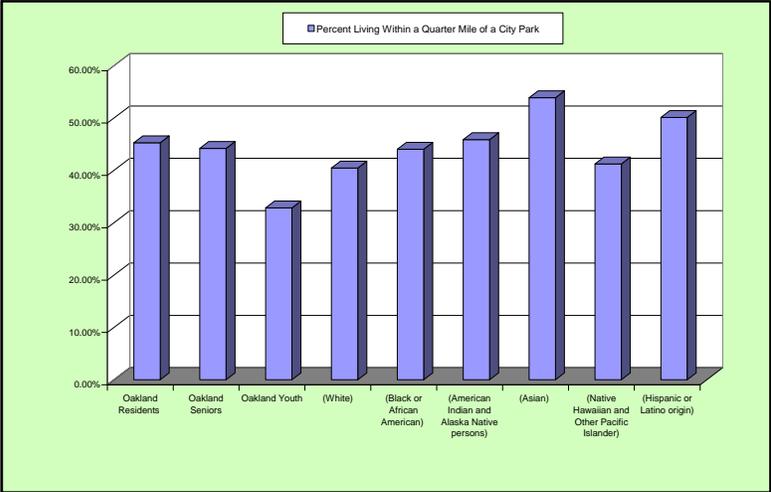
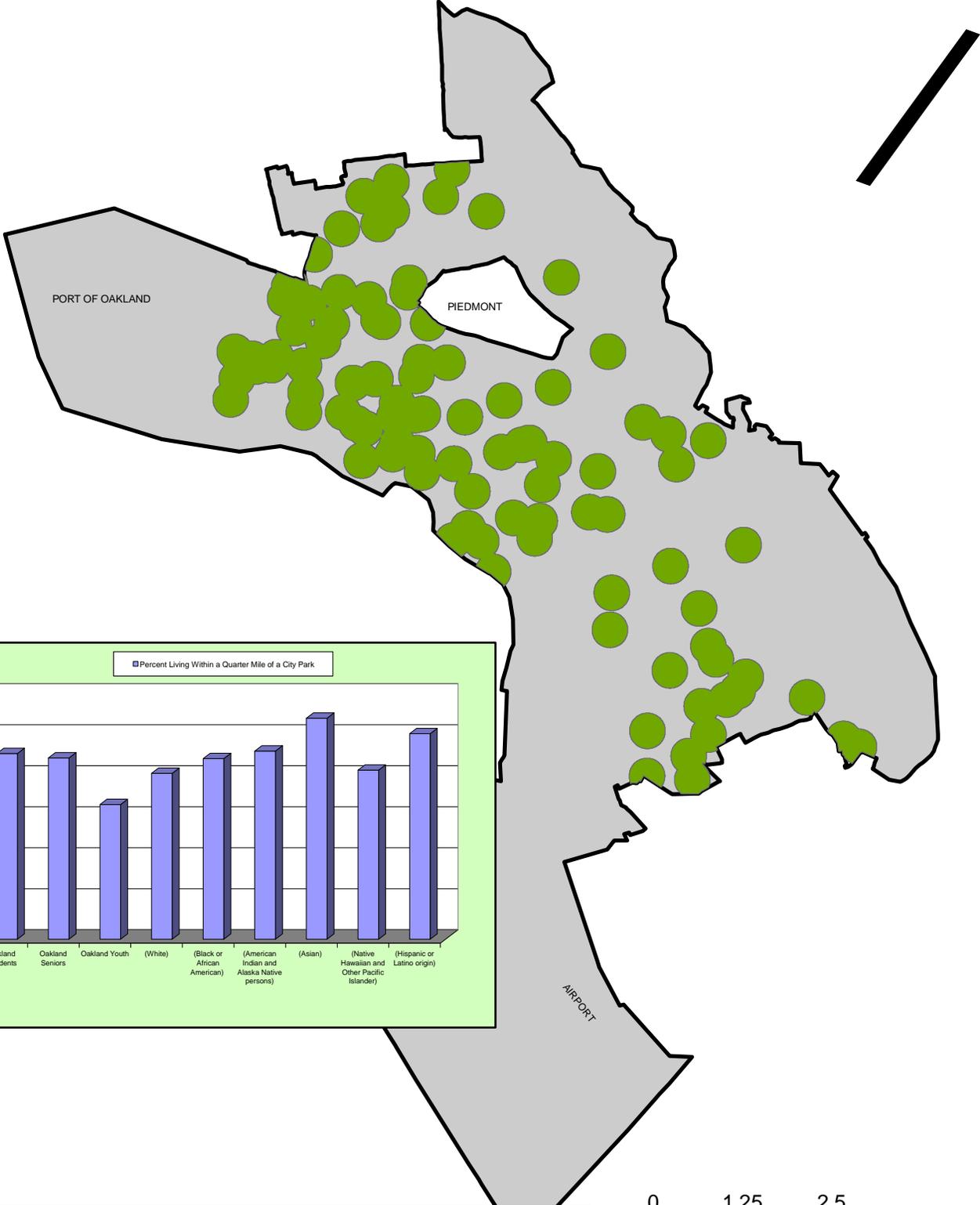
- NONE
- LOW [$<.35$]
- MEDIUM [$.35- .72$]
- HIGH [$.72-1.8$]



DATA SOURCES:
 * City of Oakland Parks and Recreation
 * US Census Bureau
 * UC Berkeley GIS (neighborhood boundaries)

Figure PNS.1

Access to City Parks in Oakland, CA



Legend

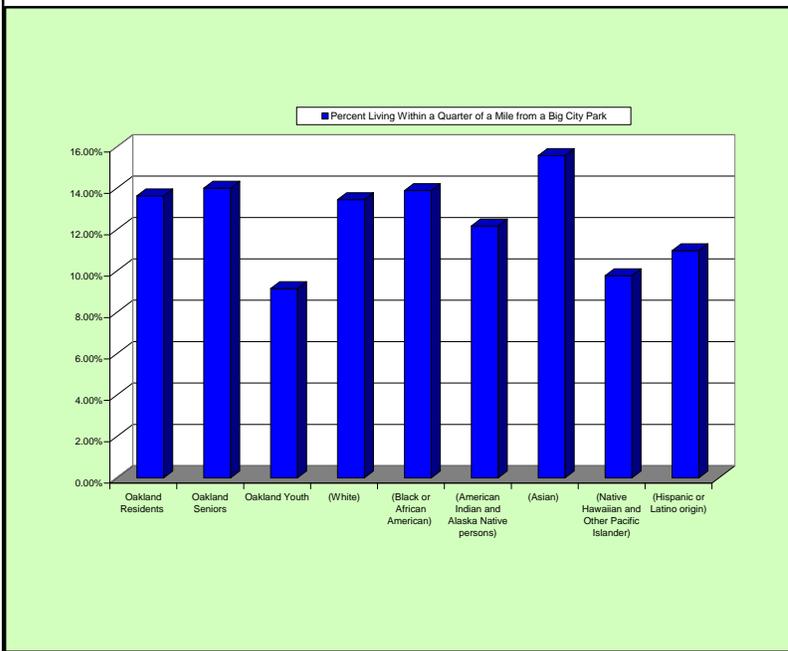
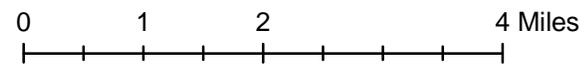
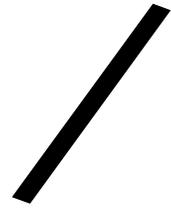
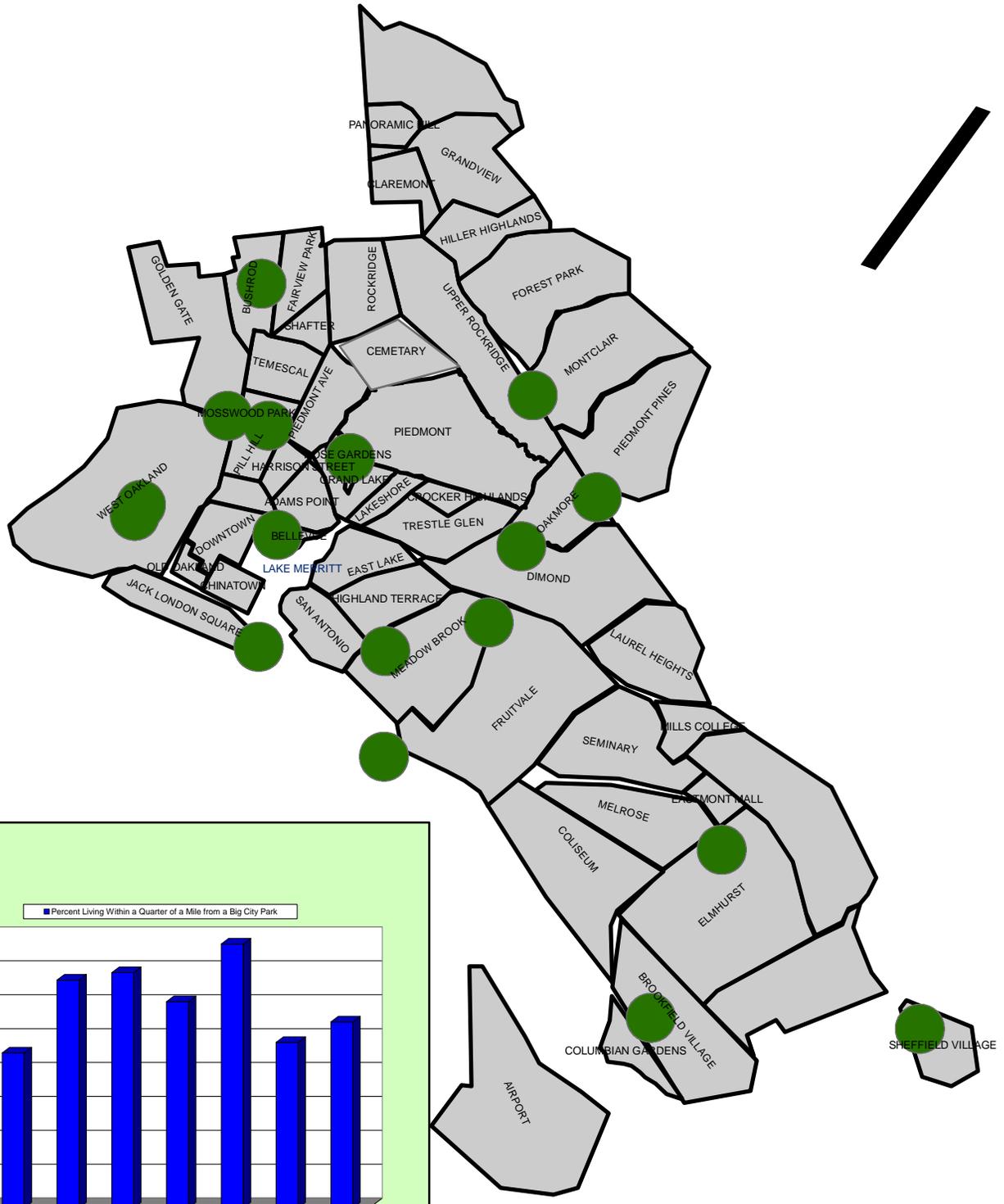
- Area that is a quarter of a mile from an Oakland City Park
- Oakland City Limits

DATA SOURCES:

- * City of Oakland Parks and Recreation
- * US Census Bureau
- * UC Berkeley GIS (neighborhood boundaries)

Figure PNS.2

Location and Access to City Parks Greater than Five Acres in Oakland, CA



Legend

 Area that is a quarter of a mile from city park

DATA SOURCES:
 * City of Oakland Parks and Recreation
 * US Census Bureau
 * UC Berkeley GIS (neighborhood boundaries)

Figure PNS.3

Figure 4: Pathways by which Oak to Ninth Development project could impact open space and health

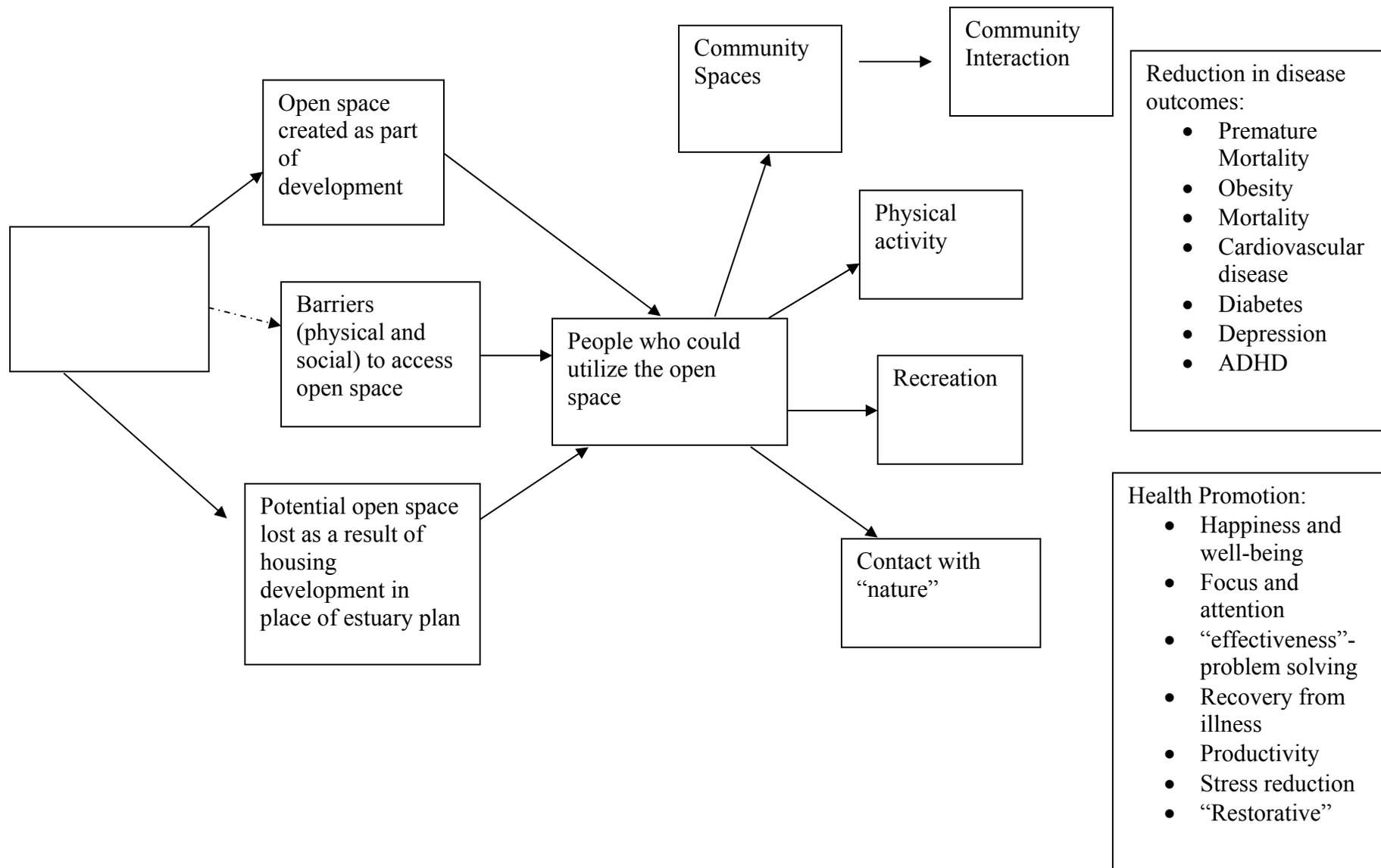
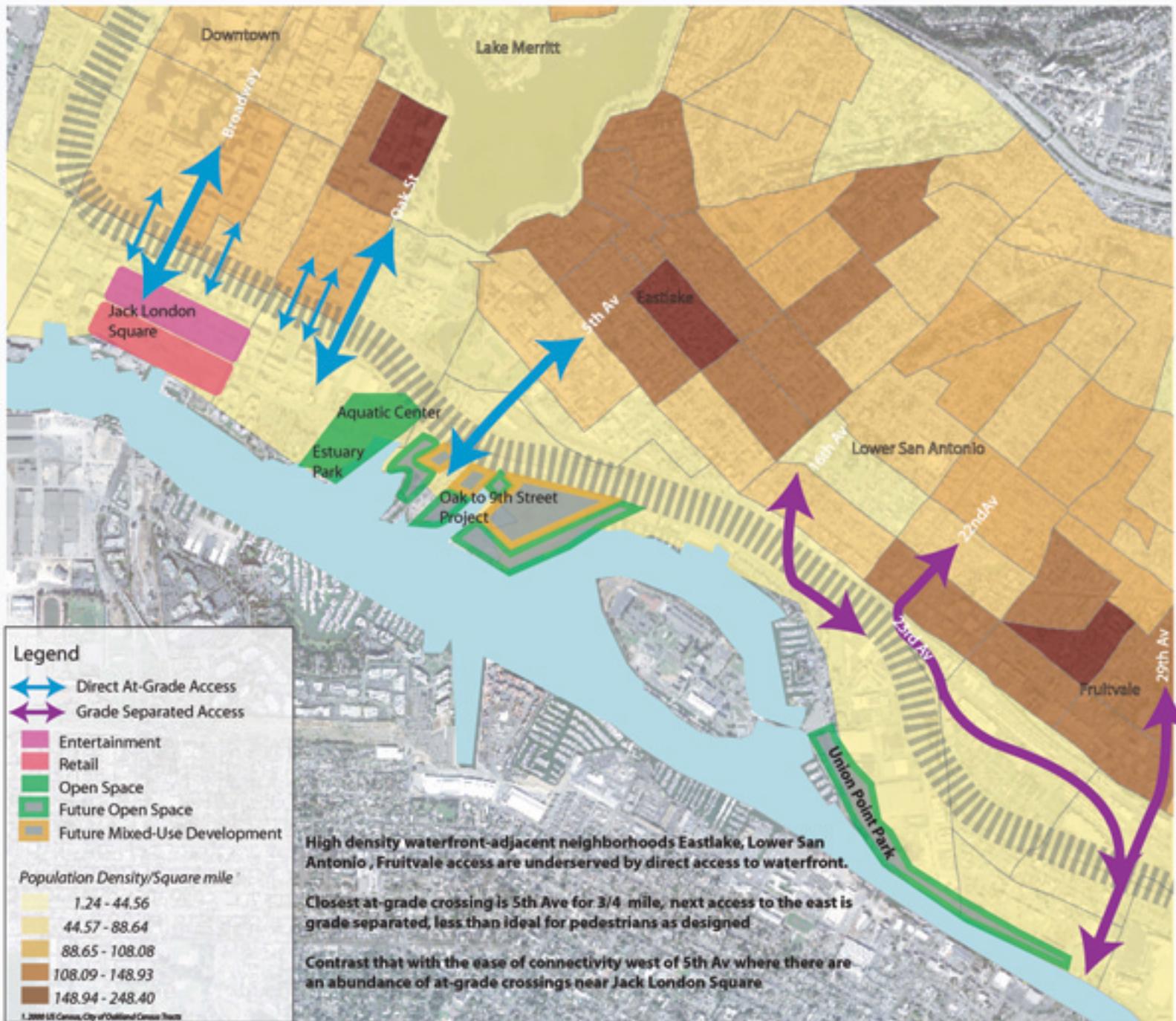
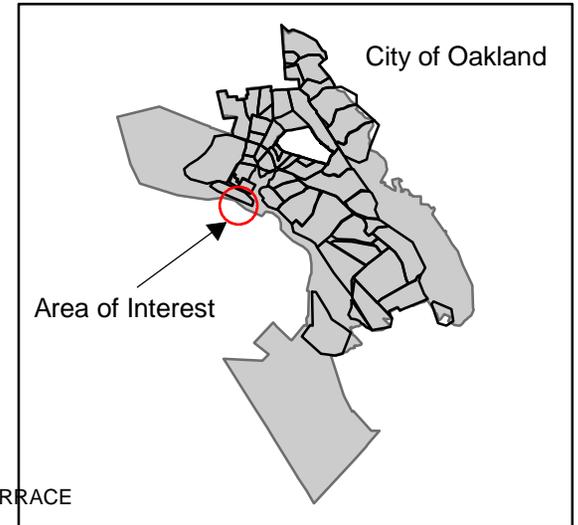
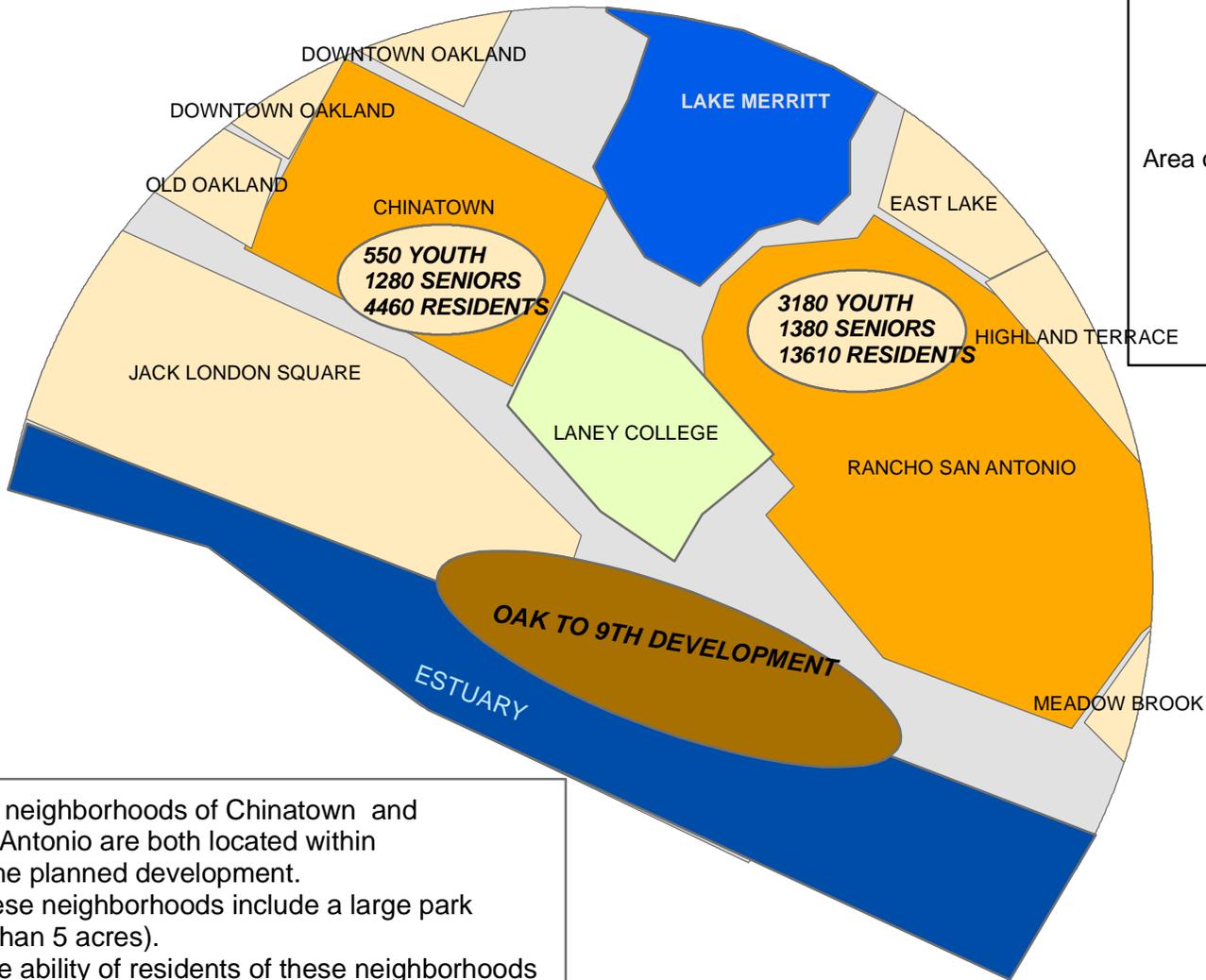


Figure PNS.5



Increasing Access to Parks in Neighborhoods Adjacent to Planned Oak to Ninth Development

0 0.25 0.5 1 Miles



**The Oakland neighborhoods of Chinatown and Rancho San Antonio are both located within one mile of the planned development.
 **Neither of these neighborhoods include a large park (one greater than 5 acres).
 **Increasing the ability of residents of these neighborhoods of the parks to be developed as part of the the Oak to Ninth Development would give approximately 3,730 Youth and 2,660 Seniors access to an important resource for maintaining their health.

Figure PNS.6

DATA SOURCES:
 * City of Oakland Parks and Recreation
 * US Census Bureau
 * UC Berkeley GIS (neighborhood boundaries)

Oak to Ninth Avenue Health Impact Assessment

Chapter 4 Pedestrian Safety

Oak to Ninth Avenue Health Impact Assessment

Chapter 4. Pedestrian Safety

A. Summary

Data available from the Statewide Integrated Traffic Records System (SWITRS) demonstrates that in Oakland between 2000 and 2005, there have been 2045 pedestrian collisions with motor vehicles between the years of 2000-2005. 1951 of the collisions have resulted in pedestrian injuries with 198 of the injuries being severe and 63 fatal. The annual rate of pedestrian injuries is about 4 times Federal public health goals. A significant number of Oakland pedestrian injuries occur in the neighborhoods and streets (e.g., Downtown, Jack London Square, Chinatown, Lakeshore, East Lake, Lower San Antonio, International Blvd) surrounding the proposed project. Health impact forecasting shows that the project will contribute to an increase in pedestrian injury rates due to a significant increase in project related vehicle trips on roadways surrounding the project. Furthermore, safe walking or biking routes between the project and upland neighborhoods, schools, community facilities, and regional transit stops do not exist. The project's adverse health impacts warrant investments in feasible pedestrian safety mitigations at intersections and in pedestrian routes between the project and typical destinations.

Project Health Impacts

1. Project related changes in traffic flows will contribute about 5.4 additional injuries per year or 268 pedestrian injuries in the years 2025-2075. The cumulative impact of increased traffic in the area by 2025 forecasts 20 additional injuries per year with a total of 1000 growth related additional injuries in the years 2025-2075.
2. No safe pedestrian routes currently exist between the project and upland neighborhoods; residents traveling to schools, community facilities, and transit stops via walking are at risk of pedestrian injury.

Recommendations for Design and Mitigations

1. Implement a traffic calming program in adjacent residential neighborhoods to include vehicle lane narrowing, raised crosswalks, raised intersections and traffic circles;
2. Provide countdown pedestrian signal heads, bulb outs, and center median refuge islands at high-volume multi-lane intersections where cumulative traffic volume increases exceed 5%;
3. Provide pedestrian warning signs or lights at all crossings or cross walks without traffic signal lights
4. Divert through-traffic around mixed use neighborhoods;
5. Study one-way to two way conversions and lane reductions for the Chinatown District;
6. Institute speed limit reductions to less than 20mph in mixed-use residential areas adjacent to the project;
7. Plan and implement bicycle and pedestrian trails between the waterfront, adjacent neighborhoods and transit stations east of I-880; one class I bike should be provided (e.g., along the estuary channel pathway and the existing at-grade 5th avenue roadway should undergo redesign as a multi-modal corridor between the Eastlake District and the waterfront.
8. Widen sidewalks or provide buffers between sidewalks and vehicle lanes on busy roadways with significant pedestrian traffic.

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Chapter 4. Pedestrian Safety

B. Background

Prior to the 1970s, the United States was a world leader in traffic safety. However, over the past three decades, measured by the number of traffic deaths per million vehicles, the United States has slipped to 13th place, and is still sinking.¹ Nationally, for people aged one to 40, traffic injuries are the single greatest cause of disability and death. Over 42 000 people have died on US roads since 2002. Pedestrians account for 11% of all motor vehicle deaths, and in cities with populations exceeding 1 million, they account for about 35%. Each year, 80 000 to 120 000 pedestrians are injured and 4600 to 4900 die in motor vehicle crashes. Children aged 5 to 9 years have the highest population-based injury rate, and people older than 80 years have the highest population-based fatality rate. Pedestrians older than 65 years are more likely than younger pedestrians to be struck at intersections.

Preventable Causes of Pedestrian Injuries

The rate of pedestrian injuries in an area is dependent on several environmental factors such as vehicle volume, vehicle type (truck vs. car), vehicle speed, pedestrian volume, roadway width, vehicle speed, pedestrian facilities (sidewalk width, driveway conflicts, buffers), intersection design (crossing distance, signal phasing and timing, corner radii, cross walk treatments, median islands, curb extensions), lighting, and weather.^{2 3 4 5 6}

Public health and transportation safety research consistently demonstrates that vehicle volumes are an important and independent environmental cause of pedestrian injuries.^{7 8 9 10} 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 1000 vehicles.¹¹ The City of Oakland Pedestrian Master Plan also highlights the negative effect of high volumes on safety.¹² A national study of pedestrian injuries and crosswalks that included data from Oakland also found that higher average daily traffic and multi-lane roads were

1 Evans, L. A New Traffic Safety Vision for the United States. *AJPH* Sept 2003, Vol 93, No. 9 (1384-1386)

2 La Scala EA, Johnson FW, Gruenewald PJ. Neighborhood Characteristics of Alcohol-related Pedestrian Injuries. *Prevention Science*. 2001; 2:123-134.

3 Taylor M, Lynam D, Barua A The effects of drivers speed on the frequency of road accidents. Transport Research Laboratory. TRL Report 421 Crowthorne, UK, 2000.

4 Morrison DS, Petticrew M, Thomson H. What are the most effective ways of improving population health through transport interventions? Evidence from systematic reviews. *Journal of Epidemiology and Community Health* 2003;57:327-333.

5 Evidence shows that pedestrian and bicycle injuries vary with the 0.4 power of the proportion of trips made by walking or bicycle. Jacobsen PL. Safety in numbers: more walkers and bicyclists, safer walking and bicycling. *Injury Prevention*. 2003; 9: 205-209.

6 Leden L. Pedestrian risk decrease with pedestrian flow. A case study based on data from signalized intersections in Hamilton, Ontario. *Accident Analysis and Prevention*. 2002; 34:457-464.

7 LaScala EA, Gerber D, Gruenewald PJ. Demographic and environmental correlates of pedestrian injury collisions: a spatial analysis. *Accident analysis and Prevention*. 2000; 32:651-658.

8 Roberts I, Marshall R, Lee-Joe T. The urban traffic environment and the risk of child pedestrian injury: a case-cross over approach. *Epidemiology* 1995; 6: 169-71.

9 Stevenson MR, Jamrozik KD, Spittle J. A case-control study of traffic risk factors and child pedestrian injury. *International Journal of Epidemiology* 1995; 24: 957-64.

10 Agran PF, Winn DG, Anderson CL, Tran C, Del Valle CP. The role of the physical and traffic environment in child pedestrian injuries. *Pediatrics*. 1996; 98: 1096-1103.

11 Brugge D, Lai Z Hill C, Rand W. Traffic injury data, policy, and public health: lessons from Boston Chinatown. *Journal of Urban Health* 2002; 79: 87-103.

12 City of Oakland. Pedestrian Master Plan. Page 18.

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Chapter 4. Pedestrian Safety

significant and independent environmental risk factors for vehicle-pedestrian crashes in multi-variate analysis.¹³

Vehicle speeds are the most important predictor of the severity of pedestrian injuries. Below 20mph the probability of serious injury or fatal injury is generally less than 20%; this proportion rapidly increases with increasing speed and above 35mph, most injuries are fatal or incapacitating.¹⁴ With regards to sensitive populations, the elderly and the very young populations are more vulnerable to vehicle injuries while walking because of slower walking speeds or slower reaction times.

Economic Costs of Pedestrian Injuries

Vehicle injuries to pedestrians have significant economic costs beyond their physical toll on victims. A recent analysis of California data concludes that in 1999 economic costs resulting from 5634 fatal and non-fatal vehicle injuries to pedestrians resulted in over \$3.9 billion in direct and indirect costs (\$692,000 per injury). California Highway Patrol estimates of economic costs of vehicle injuries to pedestrians disaggregated by injury severity are provided in the table below.

Pedestrian Injury Severity	Economic Cost per Injury
Fatal Injury	\$ 2,709,000
Severe Injury	\$ 180,000
Visible Injury	\$ 38,000
Complaint of Pain	\$ 20,000

C. Established Standards and Health Objectives

The US Department of Health and Human Services (USDHHS) establishes National objectives for the **rate of pedestrian injuries**.¹⁵ The Federal Department of Health and Human Services defines the **pedestrian injury rate** as *the number of injuries per unit time in a population of a standard size* (e.g. injuries per year per 100,000 people).

- A rate of non-fatal vehicle injuries to pedestrians no greater than 19 injuries per year per 100,000 people.
- A rate of fatal vehicle injuries to pedestrians no greater than 1 injury per year per 100,000 people.

Significance criteria for pedestrian safety currently in the Project's environmental review include only: (1) the introduction of an incompatible use or (2) the introduction of a design feature that does not comply with Caltrans design standards and that results in increased traffic hazard to pedestrians. (DEIR page IV.B-12). The City of Oakland does not have a policy or other guidance to form the basis of significance criteria for impacts on pedestrian injuries. However, the absence of an established significance threshold for pedestrian injuries does not obviate the need to perform analysis of potentially significant environmental effects.

¹³ Zegeer CV, Steward RJ, Huang HH, Lagerwey PA. Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations: Executive Summary and Recommended Guidelines. Federal Highway Administration, 2002.

¹⁴ National Highway Traffic Safety Administration. Literature Review on Vehicle Travel Speeds and Pedestrian Injuries. Washington DC: USDOT, 1999.

¹⁵ U.S. Department of Health and Human Services. Healthy People 2010 Objectives.

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According to CEQA guidance, lead agencies can derive “objectives, criteria, and procedures for the evaluation of projects” from many sources.^{16 17} Standards may be qualitative or quantitative, based on health based standards, service capacity standards, ecological tolerance standards, policies and goals within the city’s general plan, or any other standard based on environmental quality. Ideally, a local jurisdiction adopts significance thresholds via ordinance or regulation after a public process; however, Oakland has not formally adopted comprehensive significance thresholds for any impact under CEQA.

Given that Oakland has a pedestrian injury rate several fold greater than USDHHS national objectives, quantifiable increases in pedestrian injuries in excess of injuries related to population growth should be potentially significant environmental effects under CEQA.

D. Pedestrian Injuries in Oakland and the Project Area

According to Oakland’s Pedestrian Master Plan, Oakland residents suffer approximately 85.5 vehicle injuries to pedestrians per 100,000 every year including 3 pedestrian fatalities per 100,000 per year.¹⁸ This rate of injuries is about 4 times the USDHHS standards. The published rate of fatal injuries in Oakland is 3 times the USDHHS standard.

Data available from the Statewide Integrated Traffic Records System (SWITRS) demonstrates that in Oakland between 2000 and 2005, there have been 2045 pedestrian collisions with motor vehicles between the years of 2000-2005.¹⁹ 1951 of the collisions have resulted in pedestrian injuries with 198 of the injuries being severe and 63 fatal.

A significant number of Oakland pedestrian injuries occur in the neighborhoods and streets (e.g., Downtown, Jack London Square, Chinatown, Lakeshore, East Lake, Lower San Antonio, International Blvd) surrounding the proposed project. According to the Oakland Pedestrian Master Plan (page 25): “Most pedestrian-vehicle collisions occur in downtown, Chinatown, and along vehicle streets.” Furthermore, the neighborhoods surrounding this project contain sensitive populations more vulnerable to impacts on pedestrian safety, including children, the elderly, walking-dependent, and the low-income transit-dependent.

¹⁶ California Government Code §21082

¹⁷ Thresholds of Significance: Criteria for Defining Environmental Significance. CEQA Technical Advice Series. Sacramento: Office of Planning and Research; 1994

¹⁸ Oakland Pedestrian Master Plan. Page 30.

¹⁹ Pedestrian collision data for Oakland was obtained from the Statewide Integrated Traffic Records System (SWITRS). This system is maintained by the California Highway Patrol (CHP), Caltrans, and the California Department of Motor Vehicles (DMV), and contains data on all reported vehicle collisions in California that occur on a public roadway. The dataset for a five year period was cleaned and imported into GIS. The vehicle collision data was then geocoded (assigning an x and y coordinate to an address so it can be placed on a map) by using the intersection of the primary and secondary street. All vehicle collisions with pedestrians were selected and 2045 (90%) of these cases were geocoded successfully to an intersection. The vehicle collisions with pedestrians were then categorized by pedestrian impact and displayed on a map. Each circle represents a location where a vehicle collided and injured one or more pedestrian. To further analyze pedestrian collisions in the surrounding areas of the Oak to Ninth development project, we obtained a list of the 51 intersections used for analysis of peak-hour traffic conditions in the Oak to Ninth Draft EIR. The intersections were geocoded (90%) and plotted on a map. A polygon was then drawn around the core intersections, which excluded outliers. Within this polygon, there were 575 vehicle collision with pedestrians, which resulted in 545 pedestrian injuries, in which 12 were fatal and 51 were severe. This number is underestimated because only 90% of pedestrian collisions were geocoded. The actual number of pedestrian collisions can be anywhere from 0 – 10% higher. It is difficult to estimate because there could be significant pattern differences resulting from spatially non-random differences in geocoding.

E. Impact Analysis

The EIR acknowledges that the increase of pedestrian activity and vehicle volume will result in greater pedestrian—vehicular conflicts but provides no analysis of these effects. Existing software tools to evaluate area-level pedestrian injuries potentially applicable to EIA include the Pedestrian and Bicycle Crash Analysis Tool and Crossroads. These tools help identify crash patterns and their causes linking causes to potential strategies. Zonal analysis is another method that helps planners identify and target areas with high densities of pedestrian injuries one analysis.²⁰ However, none of these methods are routinely used in planning and environmental review for pedestrian safety impact analysis and none have been used in the evaluation of the Oak to Ninth Avenue development.

Few precedents exist for forecasting pedestrian injuries in the context of planning and environmental review; nevertheless, existing research suggests that such forecasting models could be readily developed and applied with existing data. As discussed above, studies in both the transportation and public health literature consistently show that a number of environmental factors affected by development, including vehicle volume and vehicle speed have direct, statistically independent significant and independent effects on injuries. Roadway vehicle volume is also an environment variables routinely assessed in land use planning. In EIA, transportation analysis already involves assigning project related vehicle trips to existing roadway to determine subsequent effects on Level of Service and delay at intersections.

In the public health discipline, risk assessment principles are used commonly in combination with exposure data and effect estimates from empirical research to apply novel applied methods to specific contexts. Human health risk assessment methods are sufficiently robust and flexible to predict human health hazards based on generalizable empirical environmental health evidence. Appropriate use of risk assessment methods requires empirically derived effect estimates along with data on exposure, the population at risk, and baseline incidence of the condition of interest. Typically, a practitioner using risk assessment must also make and document certain simplifying assumptions. Overall, in order to be useful in the context of EIA, a pedestrian injury forecasting tool should to be simple to use, based on available or routinely produced inputs, provide meaningful, interpretable, and robust estimates, and be applicable for use in diverse areas.

²⁰ Zone Guide for Pedestrian Safety. NHTSA, 1998.

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Our analysis forecasts pedestrian injury based on a single predictor (dependent) variable—vehicle volume— and a common form of the road safety function—a description given by transportation engineers to the relationship between vehicle volume and injury rates or counts. Intuitively and empirically, increases in vehicle volume on a given road facilities will also increase the probability of pedestrian-vehicle conflicts. This logical inference should hold unless vehicle volume increases or related changes results in a change in pedestrian volume or behavior or new design elements are introduced to reduce pedestrian-vehicle conflicts or hazards (e.g. traffic calming).

As referenced above, studies supporting a volume-pedestrian injury nexus are typically cross-sectional in design but have used multi-variate analysis techniques. Multivariate modeling techniques have allowed traffic safety researchers to estimate the influence of predictor variables on response variables taking into account variation in other environmental characteristics. Multiple studies, cited above, used multi-variate modeling techniques to estimate the effect of vehicle volume on injuries independent of the other factors listed above. These studies consistently show that vehicle volume has a direct, statistically significant and independent effect on injuries;

A power function is common empirically supported parametric form of the road safety function:

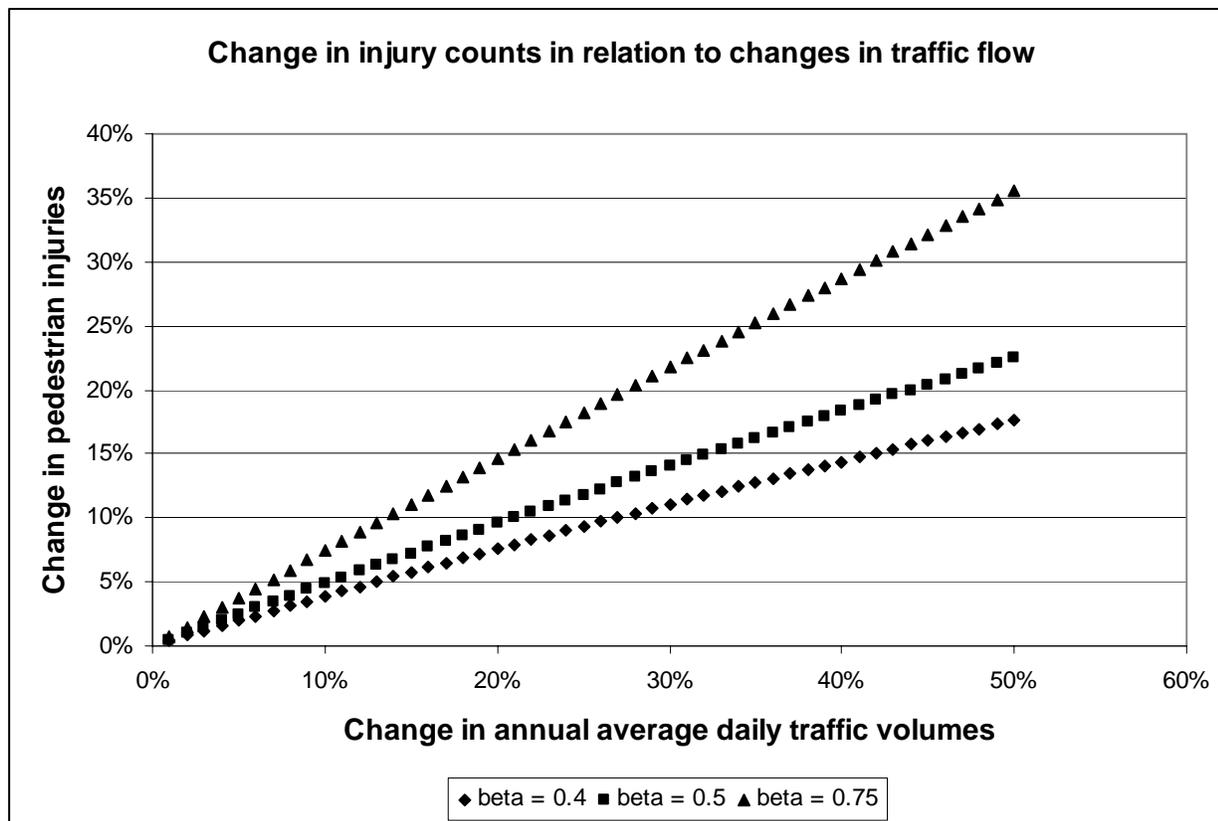
$$\text{Injuries} = \alpha X (\text{Average Annual Daily Trips})^\beta ; \text{ typically where } \beta < 1 \quad 21$$

Empirical evidence suggests that 0.5 is a reasonable parameter for β in the equation above.²² Based on this relationship, the rate of pedestrian injuries will increase proportional to the square root of vehicle volume and the increase in the rate will be attenuated at higher vehicle volumes. The figure below graphically illustrates the relationship between change in vehicle volume and the change in the number of injuries varying the parameter Beta. Based on this function and Beta =0.5, a 50% increase in traffic volume would translate into an approximately 22% increase in the number of pedestrian injuries.

While pedestrian injuries is a function of environmental factors other than vehicle volume, it is reasonable to estimate future injury rates based on volume—injury relationships in the case of Oak to Ninth as the project does not change other environmental factors in area of study that affect pedestrian-vehicle conflict and there is nothing unique about the characteristics of project related vehicle traffic to distinguish this traffic from other sources of traffic.

21 Lord D, Manar A, Vizioli A. Modeling crash-flow density and crash-flow-V/C ratio relationships for rural and urban freeway segments. *Accident Analysis and Prevention* 2005; 37: 185-199.

22 Lee C, Abdel-Aty M. Comprehensive analysis of vehicle-pedestrian crashed at intersections in Florida. *Accident Analysis and Prevention* 2005; 37: 775-786.



To forecast pedestrian injuries prospectively using this model requires two data inputs: the baseline rate of pedestrian injuries in the area and the expected change in vehicle volume on roadways in the area.

According to traffic analysis in the DEIR for this project, the development, which includes 3100 residential units and 3500 parking spaces, will result in an additional 27,110 daily vehicle trips external to the project. (FEIR Table IV.B-4) A detailed intersection level traffic analysis in the DEIR demonstrates that these trips will increase traffic volume on local streets in the downtown, Chinatown, and Jack London Square, and other neighborhoods. Five percent or greater cumulative increases in traffic volume would occur at several intersections. Overall, the increase in vehicle volumes at intersections in the neighborhoods around the project will vary considerably, ranging from about 2% to 127%. The average project-related increase in vehicle volume in the surrounding neighborhoods at the studied intersections is about 11% after project completion. The average cumulative increase in vehicle volume by 2025 at these intersections is 45% including other development projects proposed for the area.

The Statewide Integrated Traffic Records System (SWITRS) provided data on all reported pedestrian injuries occurring in Oakland. In Oakland, 2045 pedestrian collisions with motor vehicles occurred between the years of 2000-2005. Pedestrian injuries were mapped to intersections using ArcGIS, with over 90% of 2000-2005 injuries successfully geocoded. A traffic analysis conducted for the Oak to Ninth Project and documented in the Draft EIR provided baseline and peak-hour traffic conditions for 51 intersections. A polygon drawn around the 51 EIR intersections bounded 545 pedestrian-vehicle collisions resulting in pedestrian injuries during this time period. Since ~10% of collisions could not be geo-coded, we assumed the current annual average number of pedestrian injuries in affected by project-

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traffic was approximately 100 per year. Because some pedestrian injuries may not be reported, this may underestimate the actual pedestrian injury rates.

Assuming the current annual average rate of pedestrian injuries in affected neighborhoods is 100 per year, the model described above estimates an increase in 5.4 injuries per year or 268 injuries between 2025 and 2075.²³ Based on the cumulative increase in average daily trips of 45% in 2025, the impact is 20 injuries per year or 1000 injuries between 2025 and 2075.

The following are the main assumptions required for this forecast of project-induced pedestrian injuries:

1. The relationship between volume and injuries for road facility in areas affected by project-related traffic can be robustly represented by a power function with a Beta of 0.5.
2. Pedestrian flow does not change in the affected area. (The development is likely to increase pedestrian traffic; however, increased roadway traffic may inhibit pedestrian activity.
3. No new pedestrian safety countermeasures are implemented
4. Vehicle volume changes at intersections evaluated for the LOS analysis are reasonable surrogates for volume changes at adjacent and area roadways bounded by those intersections.

While simple to understand and use, the approach used in this analysis of pedestrian injuries could be improved by developing and validating an analytic model in the local context. A more specific analysis using the above approach might estimate changes in pedestrian injuries based on vehicle flow on all segments on all roadways; in our case, the lack of data on volume changes for all intersections and roadway precluded this approach. As discussed, above Zonal analysis or software tools such as Pedestrian and Bicycle Crash Analysis Tool and Crossroads would also provide a complimentary method for pedestrian impact analysis for this project.

F. Recommendations for Design and Mitigations

The project's adverse impacts on the pedestrian injury rate require a comprehensive countermeasure plan in the adjacent neighborhoods and planning and implementation of safe routes between the project and upland neighborhoods. A countermeasure plan should be based on further analysis of pedestrian safety hazards and mitigations on specific streets and intersections with significant increases in traffic volume.

The risk of pedestrian injuries must be considered alongside the many health benefits associated with walking. Increased walking provides exercise and has the potential to reduce rates of childhood obesity and overweight, as well as increase mobility and access among older adults. Walking also provides a transportation alternative to the automobile, reducing traffic congestion and related environmental hazards such as noise and air pollution. Hence, mitigations to reduce pedestrian injuries should not come at the expense of limiting, or discouraging pedestrian access and activity.

²³ Estimates of pedestrian injuries in the project's area of influence are based on review of available injury data. This estimate will be updated based on the most recent pedestrian injury data when available.

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Existing planning efforts have already developed comprehensive countermeasure plans at for some neighborhoods. For example, the Revive Chinatown Plan lays out an approach to pedestrian safety for the Chinatown District. The UC Berkeley Traffic Safety Center has conducted other site specific pedestrian safety analysis in Emeryville and Oakland. The Oak to Ninth Project could provide funding for the implementation of that plan proportional to it's the project related share of traffic volume in this District.

Empirical research provides some evidence for the effect of pedestrian safety countermeasures on pedestrian injury. The National Cooperative Highway Research Program's 2005 State of the Knowledge Report on crash reduction factors for traffic engineering includes accident reduction factors for pedestrian injuries based on meta-analysis of empirical research. In conducting an HIA of pedestrian safety improvements of the Buford Highway, Centers for Disease Control used accident reduction factors to estimate the injury reduction benefits of a program of countermeasures.

In 2005, the non-profit organization, Urban Ecology conducted a preliminary planning study to assess issues of upland access to the waterfront at the estuary. As part of that effort, the planning study identified land uses and described circulation. (See Figure Ped.2) The study suggested pedestrian specific safety improvements for the 5th Avenue and 7th Street intersection. (See Figure Ped.3) The study also provided a preliminary concept plan illustrating a multi-modal corridor along 5th Avenue from Eastlake District to the Oakland Waterfront(See Figure Ped.4).

Appropriate and effective pedestrian safety mitigations would include the following:

1. Implement a traffic calming program in adjacent residential neighborhoods to include vehicle lane narrowing, raised crosswalks, raised intersections and traffic circles;
2. Provide countdown pedestrian signal heads, bulb outs, and center median refuge islands at high-volume multi-lane intersections where cumulative traffic volume increases exceed 5%;
3. Provide pedestrian warning signs or lights at all crossings or cross walks without traffic signal lights
4. Divert through-traffic around mixed use neighborhoods;
5. Study one-way to two way conversions and lane reductions for the Chinatown District;
6. Institute speed limit reductions to less than 20mph in mixed-use residential areas adjacent to the project;
7. Plan and implement bicycle and pedestrian trails between the waterfront, adjacent neighborhoods and transit stations east of I-880; one class I bike should be provided (e.g., along the estuary channel pathway and the existing at-grade 5th avenue roadway should undergo redesign as a multi-modal corridor between the Eastlake District and the waterfront.
8. Widen sidewalks or provide buffers between sidewalks and vehicle lanes on busy roadways with significant pedestrian traffic.
9. In the future, Oakland should consider developing a pedestrian injury threshold for CEQA analysis as a matter of policy.

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Chapter 5

Healthy Housing

A. Summary

Encompassing shelter, home, and neighborhood, housing affects health in diverse ways—positively and negatively. Healthy housing is affordable, physically safe, stable, spacious, and located in a setting that provides access to jobs, goods, services, transportation and nature, supporting meaningful social participation. Land use policies such as zoning and redevelopment can either facilitate or hinder the achievement of adequate housing needs in a city. Research demonstrates that residents of low-income economically segregated communities in Oakland live about six fewer years and experience a much greater burden of chronic disease than those in non-poverty neighborhoods. These reductions in life expectancy are caused by many place-based factors including air pollution, violence, traffic hazards, poor schools, the absence of parks, and limited economic opportunity and mobility. In contrast, mixed-income neighborhoods are assured the health benefits of access to healthier foods, better schools, better public transit, safer neighborhoods, park access and cleaner environments. The Oak to Ninth Development, as proposed, increases the supply of future market-rate housing but does not respond to the need for moderate and low-income housing. The project also creates a largely upper-income class-stratified community. As such, it is potentially a lost opportunity for improving health and wellbeing, growth of community ties, and enhancement of social cohesion in Oakland.

Health Impacts

1. The project would result in an additional 121% of the 1999-2006 production targets for market-rate housing, while producing only 8%, 29%, and 0% of very-low, low and moderate production goals. Oakland has only met 18%, 57%, and 8% of its current RHND obligations for very-low, low and moderate income households, while exceeding RHND requirements for market rate housing. The Oak to Ninth Project thus increases the future supply of housing in Oakland primarily for those able to afford market-rate housing and does not equitably advance Regional Housing Needs Determination (RHND) objectives for all income strata.
2. Because of the lack of an onsite or nearby public school, the project does not provide adequate and attractive housing choices for families with school aged children.
3. Based on MTC research, a project that achieves minimum Redevelopment Area affordability requirements would generate 1113 fewer weekday vehicle trips relative to a project without any BMR housing. A design which balances affordability relative to regional household incomes would produce 3426 fewer vehicle trips relative to a project without BMR housing.
4. This analysis of the Oak to Ninth project based on URBEMIS found that the emission estimates were mitigated by increasing the proportion of below market rate (BMR) housing. Changes in the project design to ensure greater affordability would generate fewer vehicle trips and consequently fewer environmental impacts

Recommendations for Design and Mitigations

1. Ensure distribution of housing costs reflects the current household income distribution of Oakland so that:
 - a. At least 25% of housing is affordable to low-income and very low-income households,
 - b. At least 25% of housing is affordable to households earning the area's median income;
2. Incorporate mixed-income dwellings as opposed to building market rate and below market rate housing in segregated areas.

3. Include as part of the development project site and implementation plans for a neighborhood elementary school.
4. Creating crossing points and common paths of access where residents must come in contact with one another.
5. Include a common courtyard with benches, plants and fountains in order to create common spaces through which dwellers pass and mingle.

B. Housing and Human Health

Adequate shelter, as described in the 1996 Istanbul Declaration on Shelter, “means more than a roof over one’s head. It also means adequate privacy; adequate space; physical accessibility; adequate security; security of tenure; structural stability and durability; adequate lighting, heating and ventilation; adequate basic infrastructure, such as water-supply, sanitation and waste-management facilities; suitable environmental quality and health-related factors; and adequate and accessible location with regard to work and basic facilities: all of which should be available at an affordable cost. Adequacy should be determined together with the people concerned, bearing in mind the prospect for gradual development. Adequacy often varies from country to country, since it depends on specific cultural, social, environmental and economic factors. Gender-specific and age-specific factors, such as the exposure of children and women to toxic substances, should be considered in this context...”¹

“‘Healthy housing’ covers the provision of functional and adequate physical, social and mental conditions for health, safety, hygiene, comfort and privacy. A healthy home therefore is not a specially designed house; it is more a residential setting for a household that is including all standards and ‘best practice knowledge that has been gained over centuries of dwelling construction and immediate environment design.’
--World Health Organization

Housing is much more than the individual dwelling unit providing shelter. WHO’s Fourth Ministerial Conference on Environmental Health Review of Evidence on Housing and Health defines housing as “the conjunction of the dwelling, the home, the immediate environment and the community.”² Shelter, home and neighborhood interaction of the home unit affect the individual’s quality of life and his or her health. Healthy housing is affordable, physically safe, stable, spacious, and located in a setting with access to jobs, goods, services, transportation and nature and supports meaningful social participation. The table below illustrates the multiple factors that link housing to health and well-being.

When thinking of housing and health it is particularly important to consider the population that is at highest risk. Children are particularly susceptible to environmental exposure and other social and environmental hazards. Children’s sensitivity arises from an underdeveloped immune system combined with many neuro-developmental processes that are occurring throughout the various stages of growth, and exacerbated by their instinctual desire to explore the world.

¹ Habitat declaration, Istanbul (1996). 2nd HABITAT Conference in Istanbul. Quoted in: Bonnefoy RX, et. al. World Health Organization Fourth Ministerial Conference on Environmental Health Review of Evidence on Housing and Health. Budapest, Hungary. 23-25 June 2004. Published April 28, 2004.

² Bonnefoy RX, et. al. WHO Fourth Ministerial Conference on Environmental Health Review of Evidence on Housing and Health. Budapest, Hungary. 23-25 June 2004. Published April 28, 2004.

Dimensions of Housing Relevant to Human Health

	Material and Physical	Immaterial and Social
Individual and Household	Secure shelter Light, Air, Heating and Cooling Facilities for cooking and bathing Occupancy and Crowding Physical Hazards (e.g., lead paint, pests, allergens, trip and fall hazards)	Affordability Tenure Degree of autonomy and control
Neighborhood and Community	Access to employment Access to schools, transportation, public services, and retail goods Air, Soil, Water quality Community Noise Parks and Natural Spaces	Wealth Crime and Violence Social cohesion and support Community efficacy and political power

Lack of Secure Shelter (Homelessness) Lack of housing and the overcrowding found in temporary housing for the homeless has been found to contribute to morbidity. For example, crowded conditions can increase the transmission of respiratory infections. Substandard housing, such as that used by the homeless population, often lacks safe drinking water and hot water for washing, and often have ineffective waste disposal, intrusion by disease vectors (e.g., insects and rats).³ Additionally, substandard housing negatively affects health: a 1994 study of children living in homeless shelters in the Los Angeles found that the vast majority (78%) of homeless children interviewed suffered from depression, a behavioral problem, or severe academic delay.⁴ Among sheltered homeless men and women, age adjusted death rates are several fold higher than in the general population.⁵

Light, Air, Sound, Heating, and Cooling The design of a home can have an important impact on the health of individuals. Poor natural lighting degrades mental health and promotes accidents.⁴ Ventilation is important for healthy airflow, moisture reduction and adequate temperature control. In addition to negative respiratory health effects mentioned below, poor ventilation is also associated with negative

3 US Conference of Mayors

4 Zima BT, Wells KB, Freeman HE. Emotional and behavioral problems and severe academic delays among sheltered homeless children in Los Angeles County. American Journal of Public Health. February 1994 Vol 84: 260-264

5 Barrow, SM, Herman, DB, Cordova P, Stuenkel, EL. Mortality among Homeless Shelter Residents in New York City. American Journal of Public Health. 1999; 89: 529-534.

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effects on the psychological wellbeing of inhabitants, increasing stress levels and anxiety.^{4,6} The associations between temperature variability and health are numerous and include direct increases in cardiovascular disease, arthritis and poor sleep. Indirect effects include changes in air moisture and mold growth, which affect pulmonary wellness.^{4,7-8} Adverse health effects from noise pollution are mostly related to annoyance. In most residential places, levels do not threaten hearing impairment, but are loud enough for marked annoyance, decreased quality of sleep, decreased ability to concentrate and learn, increased anxiety, increased stress levels and increased risk of hypertension and ischemic heart disease.^{9,10,11}

Overcrowding Some individuals and households double up in response to reductions in supply or increases in the cost or demand for housing. While this prevents homelessness, overcrowding can increase the risk for respiratory infections such as tuberculosis in adults and ear infection in children.¹² Overcrowding also increases the risk for poor sanitation, exposure to environmental noise, and residential fires. Crowded or substandard housing contribute to poor child development and school performance.¹³ For example, overcrowding can limit the space and quiet necessary for children to do homework.¹⁴ A recent study found that crowding combined with noise significantly increases chronic stress hormones in low-income children.¹⁵

Physical Hazards in Homes A number of environmental conditions in older and poorly maintained housing affect health. Older housing stock often lacks adequate ventilation. Inadequate heating or ventilation leads to dampness and mold growth. Warm humid conditions also contribute to dust mites, a respiratory allergen implicated in the development and recurrence of asthma.¹⁶

Hazardous physical conditions in the home also produce a significant burden of injury. In the US, there are approximately 13.5 million annual non-fatal injuries in or around the home.¹⁷ Most of this results from substandard housing conditions that vary in severity: from corroded windows that are difficult to open and close, unprotected heaters, unprotected windows, slippery surfaces, and sharp deteriorated edges, to damaged or flimsy stair rails and exposed electrical socket wires.

Corridor and door width is of particular importance to elders and handicapped individuals. Hallways that are too narrow or doors that are not wide enough to allow for wheelchair access, use of a walker, and ease of maneuvering can impair movement and accessibility throughout the home. This can lead to risky

6 Hyndman SJ. Housing dampness and health amongst British Bengalis in east London. *Soc Sci Med* 1990;30:131-141.

7 Collins KJ, Cold and Heat-Related Illnesses in the Indoor Environment. In: Burrige R, Ormandy D, eds. *Unhealthy Housing: Research, Remedies and Reform*. New York, NY: Spon Press; 1993:117-140.

8 Heat-related deaths-Los Angeles County, California, 1999-2000, and United States, 1979-1998. *MMWR Morbidity and Mortal Weekly Report*. 2001;50:623-625

9 Evans G, Marcynyszyn :LA. Environmental Justice, Cumulative Environmental Risk, and Health among Low- and Middle-Income Children in Upstate New York. *American Journal of Public Health*. 2004;94: 1942-1944.

10 Van Kempen EEMM, et. al. The Association Between Noise Exposure and Blood Pressure and Ischemic Heart Disease: A Meta-analysis. *Environmental Health Perspectives* 2002;110:3:307-317.

11 Evans GW. Child development and the physical environment. *Annual Review of Psychology*.2006; 57:423-451.

12 Krieger, J & Higgins, DL. Housing and Health: Time again for Public Health Action. *American Journal of Public Health*. 2002; 92: 758-768.

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

14Cooper, M. op cit.

15 Evans G, Marcynyszyn :LA. Environmental Justice, Cumulative Environmental Risk, and Health among Low- and Middle-Income Children in Upstate New York. *American Journal of Public Health* 2004;94: 1942-1944.

16 Institute of Medicine. *Clearing the Air: Asthma and Indoor Air Exposures*. National Academy Press. Washington D.C. 2000.

17 Krieger J, Higgins DL. *American Journal of Public Health*. 2002 May;92(5):758-68. Housing and health: time again for public health action.

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maneuvers that could easily lead to injury of both the individual in need and the person that may be facilitating his or her activity. For example, bathrooms that are difficult to access can put individuals at an increased risk for falling and injuries, and restricted movement around the house can decrease a person's independence, moreover decreasing their quality of life.

Homes also contain hazards attributable to toxic building materials. This is especially dangerous to infants and toddlers who are at a sensory exploratory age with tendencies to bite window sills when they are at mouth level.¹⁸ This practice increases the risk of lead exposure in buildings with lead-based paint.

Physical hazards are also affected by housing market affordability. For example, code enforcement agents often find that tenants are reluctant to initiate enforcement actions because of fears of landlord reprisal or eviction in an unaffordable housing market.

Social Cohesion and Support Social cohesion is a broad concept that operates at many levels such as family, neighborhood, identity group, locality, society, etc. Dimensions of social cohesion relevant for human health include *supportive social networks* (which provide access to material and emotional support in times of need), *social participation* (meaning participation in relationships providing friendship and company and participation in the workforce), *community engagement* (including participation in organizations that work for the benefit of members and others), and *political engagement* (involvement in the democratic process to advance needs or interests.)

Strong social relationships and community cohesion are protective of health in multiple ways. Neighbors, friends, and family provide material as well as emotional support. Support, perceived or provided, can buffer stressful situations, prevents damaging feelings of isolation, and contributes to a sense of self-esteem and value.¹⁹ Strong relationships exist among supportive social networks and illness rates, recovery from illness, and mortality (see above discussion of residential displacement). Social isolation can both cause and aggravate mental illness. Health benefits of community participation result from actions of community organizations to meet survival needs (food pantries) and improve neighborhood conditions (neighborhood clean-up days). Political engagement influences public spending on programs that provide health, education, job training, and public transit.

The magnitude of the effect of social support on health is substantial and has been illustrated by several prospective long term studies in the United States. For example, even after accounting for income, race, smoking, obesity, and exercise, the Alameda County Study found that individuals with fewer social contacts (e.g. marriage, family, friends, and group membership) had twice the risk of early death.²⁰ In a more recent study, living in high-density Mexican-American Neighborhoods reduced the risk of stroke, cancer, and hip fracture by two-thirds for older Mexican immigrants.²¹

One of the most significant effects of eviction and displacement may be the loss of community cohesion

18 Jackson, R.J. Seminar on The Built Environment. Berkeley, CA. 2006.

19 Cohen, S, Underwood, LG, Gottlieb, BH. Social Support Measurement and Intervention. Oxford University Press. New York. 2000.

20 Berkman LF, Syme SL Social networks, host resistance, and mortality: a nine-year follow-up study of Alameda County residents. American Journal of Epidemiology. 1979; 109(2):186-204.

21 Eschbach K, Ostir GV, Patel KV, Markides S, Goodwin JS. Neighborhood context and mortality among older Mexican Americans: Is there a Barrio Advantage. American Journal of Public Health. 2004; 94: 1807-1812.

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created by long-term residents.²² Measures of social cohesion such as the degree of trust among neighbors are strongly associated with health, education, and neighborhood safety.²³ Displacement can result in the reduction of long-term residents who are most likely to invest in their communities. In areas where residents feel less invested because of the continual threat of displacement, one can find dilapidated environmental conditions, such as broken windows on buildings, loitering and illegal disposing of hazardous substances. Furthermore, neighborhoods where residents have little incentive to invest are shown to have higher high school drop out rates and crime rates.

Neighborhood Schools Community schools are key elements of healthy and sustainable neighborhoods, and housing choice for families depends on neighborhood school access and quality.²⁴ Community schools provide a sense of safety, build connections between the school and neighborhood, instill a sense of community among students, engage students in learning, encourage parental involvement, facilitate physical activity, and promote environmental quality.²⁵ Research on educational practices has demonstrated that well designed and operated community based schools support the goal of high quality education.²⁶ Parental involvement is crucial to the child's academic success, yet the farther a child lives from school, the less likely parents will be involved in the institution and attending PTA meetings, sports matches, concerts and plays.

According to the 2001 National Household Travel Survey, less than 15% of children aged 5 to 15 walk to school. In contrast, in 1969, almost half of students walked or biked to school. According to the CDC, long distances to school are a primary barrier to walking and danger from traffic was the second most important barrier.²⁷ Research on travel mode choice also shows that when schools are located closer to home, more children walk and/or bicycle to school and vehicle pollution emissions fall. A simulation done for Gainesville, Florida demonstrated that neighborhood schools and sidewalk completeness resulted in a doubling of the number of children walking and a 15% reduction in vehicle emissions.²⁸

Housing Affordability Housing in the United States is typically obtained through the private market for goods; this means that cost and affordability is directly related to access and quality. When the demand for affordable housing is greater than its supply, households have a limited number of choices. Individuals must either pay more than they can afford for housing, resort to lower quality housing, accept overcrowding, or move away to where costs are lower in order to stay within their economic means.

Inadequate availability of affordable housing "is amongst the most prevalent community health

22 Jacobs J. *The Death and Life of American Cities*. New York: Random House; 1961.

23 Putnam, Robert. *Social Capital: Measurement and Consequences*. ISUMA. 2001(Spring): 41-51.

24 Blash, Lisel; Shafer, Holley; Nakagawa, Monique; Jarret, September; *Getting Behind Families Leaving San Francisco*; San Francisco State University; Public Research Institute; September 2005

25 *Schools for Successful Communities: An Element of Smart Growth*; The School Building Association including Council of Educational Facility Planners International and United States Environmental Protection Agency; September 2004

26 Binger, Steven; Quinn, Linda, and Sullivan, Kevin; "Schools as Centers of Community: A Citizen's Guide For Planning and Design"; National Clearinghouse for Educational Facilities, Coalition for Community Schools, Building Educational Success Together; Knowledge Works Foundation, Council of Educational Facility Planners; Washington D.C., 2003

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

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

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concerns.”²⁹ This shortcoming in housing creates a number of concerns. The most obvious is homelessness (discussed above). However, it also results in displacement of residents further away from their employment, community, friends and basic services such as supermarkets.

Most directly, unaffordable housing leads to financial distress that is responsible for a large reduction in monetary allocation for other basic living needs such as food, medication and clothing. Today, many households with incomes several times the full-time minimum wage pay more than half of their incomes for housing.³⁰ Nationally, those with incomes in the bottom fifth of the income distribution and paying 50% of their incomes for housing have an average of \$417 to cover all non-housing monthly expenses. This means that in order to pay for housing, many households may need to sacrifice other essential needs including food, clothing, and health care services. A recent survey of American cities found that low paying jobs and high housing costs are the most frequently cited reasons for hunger.³¹ One study showed that children from low-income families on a waiting list for housing subsidies were 8 times more likely to have retarded growth compared with children whose families had obtained the subsidy.³²

Unaffordable housing cost burdens constitute a potential economic strain for many households. Strain or extra work to meet cost burdens may compromise personal or family relationships. Time-pressured parents may choose either more punitive or low-effort strategies to resolve conflict with children.³³ Studies have shown that economic strains such as being unable to pay the bills cause depression in mothers and harsh parenting styles.

The experience of stress can also result in physiological changes associated with human disease.³⁴ For example, a randomized study of healthy human volunteers demonstrated that chronic stress doubled the rate at which inoculation with a common cold virus led to a clinical infection.³⁵ Among pregnant women, stress has also been associated with a greater likelihood for pre-term delivery and low birth weight— both factors that potentially lead to developmental delays and increased infant morbidity and mortality.

Involuntary Displacement Involuntary displacement or relocation is a stressful and even traumatic event. If displaced residents are forced to relocate outside of their neighborhood, valuable supportive family and community relationships can be lost both for those leaving and well as for those remaining behind.

Some inferences about the health effects of displacement come from public health studies of residential mobility. Public health research has studied the effects of residential stability on several health outcomes. Residential stability in childhood has positive effects on self-rated health at midlife.³⁶ On the other hand, in a longitudinal analysis, increased mobility was associated with childhood events such as abuse,

29 Anderson LM, et al. Providing Affordable Family Housing and Reducing Residential Segregation by Income. A systematic Review. American Journal of Preventive Medicine. 2003;24(3S):47-67.

30 The State of the Nation's Housing. Joint Center for Housing Studies of Harvard University. 2003.

31 Sandel, M, Sharfstein, J, Shaw, R. There's no place like home: How America's Housing Crisis Threatens our Children. Housing America. San Francisco. 1999.

32 Meyers A, Frank D, Roos N, Peterson KE. Housing subsidies and pediatric nutrition. Archives of Pediatrics and Adolescence. 1995; 148:1079-1084.

33 Dunn, James R. A population health approach to housing: A framework for research. Report prepared for the National Housing research Committee and the Canada Mortgage and Housing Committee. University of Calgary. 2002.

34 McEwen, Bruce E. Protective and damaging effects of stress mediators. New England Journal of Medicine. 1998; 338(3): 171-179.

35 Cohen, Sheldon et al. Types of Stressor that increase susceptibility to the common cold in Healthy Adults. Health Psychology. 1998; 17(3):214-223.

36 Bures RM. Childhood residential stability and health at midlife. American Journal of Public Health 2003; 93: 1144-8.

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neglect, and household dysfunction and increased the likelihood of smoking and suicide.³⁷ Another longitudinal study demonstrated that residential instability in childhood predicted the lifetime risk of depression and the timing or onset of depression.³⁸ Other research from education and social science fields demonstrates frequent family relocation leads to children's grade repetitions, school suspensions, and emotional and behavioral problems.³⁹

Displacement may also contribute to residential segregation and 'ghettoization' if available replacement housing for displaced residents is not available in integrated neighborhoods. (See below) A study that examined expiring HUD Section 8 agreements with private owners in California, found that, on average, families relocated to relatively more racially-segregated communities.⁴⁰

The San Francisco Department of Public Health conducted focus groups with tenants facing eviction from the Trinity Plaza Apartments due to redevelopment in 2003. Discussing how she felt about an eviction notice, one resident stated: "We are fearful, feelings are hurt, and [we're having] difficulty speaking about displacement, stressed, sleeplessness, anxiety, and the issue has been constantly going on."

Displacement can also result in indirect environmental effects. For example, low-income households are more likely not to own a car and depend on public transit trips. Displacement of lower-income workers away from job and transit centers has the potential to increase household vehicle ownership, vehicle trip frequency, and vehicle trip distances. Vehicle travel results in significant environmental and health burdens due to poor air quality, noise pollution, injuries, and physical inactivity.^{41 42 43}

Segregation Racially segregated neighborhoods concentrate conditions of disadvantage in a number of ways. As places these neighborhoods typically have fewer assets and resources such as schools, libraries and public transportation.⁴⁴ Segregated low-income neighborhoods host unwanted land uses such as power generation, solid and hazardous waste sites, and bus yards.⁴⁵ Freeways and other busy roadways often run through low-income neighborhoods resulting in disproportionately higher exposure to noise and air pollution. Residents are often isolated from economic opportunities and marginalized in political decision-making, limiting their ability to effect change in their circumstances.^{46 47} Segregation has profound and diverse impacts on health.^{48 49 50} Residents of high-poverty neighborhoods live about

37 Dong M. Childhood residential mobility and multiple health risks during adolescence and adulthood. *Archives of Pediatrics and Adolescent Medicine*. 2005; 159: 11-4-1110.

38 Gilman SE, Kawachi I, Fitzmaurice GM, Buka L. Socio-economic status, family disruption and residential stability in childhood: relation to onset, recurrence and remission of major depression. *Psychol Medicine* 2003; 33: 1341-55.

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

40 Forbes E. *Eroding Neighborhood Integration: The Impact of California's Expiring Section 8 Rent Subsidy Contracts on Low-Income Family Housing*. 2000 The Ralph and Goldy Lewis Center for Regional Policy Studies. UCLA, School of Public Policy and Social Research. Los Angeles, California

41 EPA 2001

42 Frumkin, Howard. *Urban Sprawl and Public Health*. *Public Health Reports*. 2002; 117: 201-217.

43 Litman T. Op Cit.

44 Kawachi I, Berkman LF. *Neighborhoods and Health*. New York: Oxford University Press; 2003.

45 Maantay J. Zoning, equity, and public health. *American Journal of Public Health*. 2001; 91:1033-1041.

46 Wilson WJ. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago: University of Chicago Press; 1987.

47 Bullard R D. *Dumping in Dixie: Race, class, and environmental quality*. Boulder: Westview; 1990

48 Sampson RJ, Raudenbush SW, Earls F. Neighborhoods and violent crime: a multilevel study of collective efficacy. *Science* 1997; 277:918-924.

49 Schulz AJ, Williams DR, Israel BA, Lempert LB. Racial and spatial relations as fundamental determinants of health in Detroit. *The Milbank Quarterly*. 2002; 80:677-707.

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eight fewer years than non-poverty neighborhoods. A good deal of this burden of mortality is due to preventable events like infant mortality, pedestrian injuries, and homicide. Research also demonstrated a relationship between residential segregation and negative health outcomes such as teenage childbearing, tuberculosis, cardiovascular disease, availability of food establishments serving healthy fare and exposure to toxic air pollutants.⁵¹

Evidence for the environmental effects of segregated neighborhoods comes from the HUD Moving to Opportunity demonstration program. This program, implemented in five US cities, evaluated the health and social effects of relocating households from public or subsidized housing in high poverty neighborhoods to private rental housing in non-poverty neighborhoods. The program design involved a random assignment of families to an experimental group (vouchers for housing in low poverty neighborhoods and relocation assistance) a section 8 group (geographically unrestricted vouchers), and a control group with a longitudinal follow-up of families over 10 years. The following excerpt from the executive summary of the interim evaluation testifies to the social value of non-poverty area residence:⁵²

From the families' perspectives, the principal benefit of the move was a substantial improvement in housing and neighborhood conditions. Families who moved with program vouchers largely achieved the single objective that loomed largest for them at baseline: living in a home and neighborhood where they and their children could feel and be safe from crime and violence. On a list of observable characteristics, their homes and neighborhoods were substantially more desirable than those where control group members lived. These benefits accrued to families in both the experimental group and the Section 8 group, although the improvements tended to be roughly twice as large for experimental group families, who were required to move to low-poverty areas, at least initially.

Perhaps not surprisingly, these improvements in living environment led to significant gains in mental health among adults in the experimental group. The levels of psychological distress and depression were substantially reduced in this group. In addition, adults in both the experimental and Section 8 groups experienced substantial reductions in obesity for reasons we do not yet understand. Among the children in these families, girls appear to have benefited from the move in several ways. They experienced improved psychological well-being, reporting lower rates of psychological distress, depression, and generalized anxiety disorder, and improved perceptions of their likelihood of going to college and getting a well paid, stable job as an adult. These girls' behaviors changed as well, with a smaller proportion working instead of attending school. They were less likely to engage in risky behavior or to use marijuana. Finally, both these girls and society as a whole benefited from a reduced number of arrests for violent crimes.

C. Established Standards and Health Objectives

50 Williams DR and Collins C. Racial residential segregation: a fundamental cause of racial disparities in health. Public Health Reports. 2001; 116:404-416.

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

52 U.S. Department of Housing and Urban Development Moving to Opportunity for Fair Housing Demonstration Program: Interim Impacts Evaluation. 2003 (accessed at www.huduser.org)

Regional Housing Needs Determination The Regional Housing Needs Determination process is a State mandate devised to address the need for and planning of housing across a range of affordability in all communities throughout the State. Each jurisdiction within the Bay Area (101 cities, 9 counties) is given a share of the anticipated **regional housing need**. The timeframe for the last RHND process is January 1, 1999, through June 30, 2006, (a seven and a half year planning period). According to the State Department of Housing and Community Development, there is a regional need for 230,743 new housing units in the nine Bay Area counties from 1999—2006. Of that amount, at least 58 percent, or 133,164 units, are needed for moderate, low and very low-income households. For Oakland, the table below compares housing units produced (based on permits issued) to the RHND for the 1999 to 2006 time period.

The State of California (Government Code Section 65584) further mandates that each council of governments (COG) distribute the State-identified housing needs allocations to each jurisdiction within the COG's region. HCD provides regional housing numbers or "goal numbers" that specify the regions' share of the state's housing need. It is the responsibility of the Association of Bay Area Governments (ABAG) to determine the fair share of regional housing need for each city and county within the San Francisco Bay Area region. The law further states that "[T]he share of a city or county of the regional housing needs includes the share of the housing need of persons at all income levels within the area significantly affected by a general plan of the city or county."

The state asks local jurisdictions to develop their fair share obligations under regional housing needs determinations. Cities are obligated by the state to develop a Housing Element (a mandatory element of the General Plan) to identify policies and implementation actions to achieve RHND targets. To date, Oakland has more successfully achieved moderate and above-moderate income housing production goals (as established in the Regional Housing Needs Determination) than low and very low income housing. (See table below based on Oakland's Housing Element)

Jobs Housing Balance Local, regional, and, state policies, including California Assembly Bill 857,⁵³ the Bay Area Regional Air Quality Plan⁵⁴, and the California General Plan Guidelines,⁵⁵ and the 2003 Governor's Environmental Goals and Policy Report⁵⁶ aim for improving the jobs—housing balance in order to mitigate adverse environmental effects.

National Health Objectives The Federal Government prepares an agenda for health known as Healthy People 2010 which includes a list of health objectives and goal for reducing the burden of illness and injury. The following is a list of goals relevant to housing:

- Goal 8-11: Eliminate elevated blood lead levels in children
- Goal 8-16: Reduce indoor allergen levels
- Goal 8-19: Increase the number of new homes constructed to be radon resistant
- Goal 8-23: Reduce the proportion of occupied housing units that are substandard

D. Housing Needs in Oakland and the Region

53 California Assembly Bill 857. 2002.

54 BAAQMD CEQA Guidelines. 1999.

55 California General Plan Guidelines. Sacramento: Office of Planning and Research; 2003.

56 Governor's Environmental Goals and Policy Report. Sacramento: Office of Planning and Research, 2003.

Housing Cost Needs

The project EIR contains a description of demographic and housing market conditions in the project area. A range of other data sources suggest City of Oakland currently has significant unmet housing affordability needs. This report provides additional information regarding housing demand for the low and moderate income sectors of the housing market.

According to the Department of Housing and Urban Development, housing costs are considered high relative to income when they exceed 30% of household income. Spending over 50% of income on housing reflects a severe cost burden. According to the National Low Income Housing Coalition, a household making the median income in the Oakland-Fremont Metropolitan Area needs to spend 60% of its income to afford a fair market rent of \$1250 for a 2 bedroom apartment.⁵⁷ This fair market rent reflects 142 hours of work per week at the minimum wage or 58 hours of work per week at the typical renter's wage.

The situation in the City of Oakland is consistent with the Oakland-Fremont metropolitan area. Using 2000 Census data the City of Oakland recently concluded that in Oakland 40,000 renters earn less than \$30,000/year and 20,000 pay more than 50% of income for rent.⁵⁸ The City's analysis also showed that 21% of households were overcrowded and 14% severely overcrowded. Furthermore, a large numbers of renter families are in substandard housing.

Area housing affordability needs are dependent on the proportion of area households with low income. A low-income household is defined by U.S. Department of Housing and Urban Development (HUD), based on median income for Oakland-Fremont metropolitan area. The table below illustrates 2006 thresholds for different categories of low income. On average, household income in Oakland is lower than that for the metro area as a whole. According to the US Census, the 2000 median household income for Oakland was \$40,055 relative to the current area median income of about \$83,000. Over half of all Oakland households qualified as very low or low income and 37% qualified as very low income. The map below illustrates the spatial distribution of low-income household in Oakland, illustrating a significant economic gradient moving from flatlands to hills.

Income Level	Household Size (number of persons)					
	1	2	3	4	5	6
Extremely Low	\$17,600	\$20,100	\$22,650	\$25,150	\$27,150	\$29,150
Very Low	\$29,350	\$33,500	\$37,700	\$41,900	\$45,250	\$48,600
Low	\$46,350	\$53,000	\$59,600	\$66,250	\$71,550	\$76,850
Median	\$58,700	\$67,000	\$75,400	\$83,800	\$90,500	\$97,200

The lower household incomes of Oakland residents mean that available housing creates is unaffordable or results in housing cost burdens for many. For example, according to the City of Oakland, the Fair Market Rent for a two-bedroom apartment is \$1,238, which requires an income of at least \$49,000. Similarly, purchasing a \$400,000 house requires an income of over \$90,000 in addition to a down payment.

⁵⁷ Out of Reach 2006. National Low Income Housing Coalition.
⁵⁸ Jeff Levin. City of Oakland Community Economic Development Agency. 2006

Renters have particular vulnerability to market trends in housing costs. Based on an analysis done by the Oakland Tenant's Union in 2004,⁵⁹ City of Oakland currently has significant unmet needs for renters.

- 63% of Oakland renters are currently unable to afford a 2-bedroom apartment in Oakland at the fair market rate of \$1,420/month.⁶⁰
- 42% of renters and 33% of owners pay more than 30% of their income for housing. And among renters with incomes of less than \$35,000, about 70% of them pay more than 30% of their income towards rent. (2003 DHE)
- Waiting lists for assisted housing for seniors, disabled, and families range from 6 months to 2 years
- Waiting lists for Section 8 vouchers currently range between 3 and 5 years, with an anticipated increase based upon new federal policies.⁶¹

Housing Production

Housing production in Oakland in the most recent RHND period (1999-2006) is enumerated in the table below. The table illustrates that the City of Oakland has exceeded production targets for market rate housing for this period. However, production of housing for those with very low, low and moderate incomes is a small fraction of the needed demand.

Oakland's Housing Production Compared to Regional Housing Needs Determination for 1999-2006

State Identified Affordability Categories	1999-2006 RHNA	City of Oakland Housing Permits Issued			
		Jan 1, 1999 – Jun 30, 2004	Jul 1, 2004 – Jun 30, 2005		Total
			Unrestricted	Deed Restricted	
Very Low (up to 50% AMI)	2,238	289	0	104	393
Low (51- 80% AMI)	969	419	0	136	555
Moderate (81-120% AMI)	1,959	152	0	3	155
Above Moderate (> 120% AMI)	2,567	3,650	903	0	4,553
Total	7,733	3,727	746	37	5,656

E. Impact Analysis

The Project's environmental review evaluated the project's impacts with regards to the following housing-related criteria:

- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere, in excess of that contained in the Oakland Housing Element

⁵⁹ Margareta Lin and Carol Chacon. The Coalition To Protect Rental Housing Report And Analysis Of Proposed Changes To Oakland's Condominium Conversion Ordinance: Impacts On Affordable Housing And Low-Income Tenants. East Bay Community Law Center 2004. Available at: http://www.oaklandtenantsunion.org/condos/EBCLC_Report_20040525.doc

⁶⁰ National Low Income Housing Coalition, "Out of Reach 2003: America's Housing Wage Climbs".

⁶¹ New HUD policies will severely reduce the amount of Section 8 vouchers funded. National Low Income Housing Coalition, April 30, 2004 Advisory.

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- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere, in excess of that contained in the Oakland Housing Element
- Induce substantial population growth in a manner not contemplated in the General Plan, either directly or indirectly, such that additional infrastructure is required that was not previously analyzed
- Have social and economic effects that result in indirect changes in the physical environment, such as in ripple effects that would lead to physical deterioration and urban decay

The Project EIR described the current supply of employment and housing on the proposed project site, in surrounding areas and did not find any significant impact for the criteria listed above. The lead agency does analyze the direct effect on the supply of affordable housing in Oakland, the indirect effect on housing rents and prices in surrounding neighborhoods, and finally the indirect physical impacts, which require mitigation.

Effects on Housing Adequacy Clearly the project significantly increases the supply of housing in Oakland. However, as planned, none of the 3100 units produced by Oakland Harbor Partners will meet the needs of very low-income and low-income Oakland households. As of June 2005, Oakland had already exceeded market-rate housing obligations for 1999-2006 by seventy-seven percent based on building permits issued.⁶² In contrast, Oakland has only met 18%, 57%, and 8% of its current RHND obligation for very-low, low and moderate income households, respectively.

The project site sits within an Oakland Redevelopment Zone, which requires that 15 percent of housing units developed in the associated redevelopment area be affordable, with 40 percent affordable to “very low income” households. Because the project is in a redevelopment area, it creates a new legal obligation on the City to build ~465 units of below market rate housing.

According to the Oak to Ninth Development Agreement, the developer is obligated to offer for sale to the City of Oakland air rights on about 4.45 acres of land (Parcels F and G) for the production of affordable housing by a non-profit housing developer. The City of Oakland is obligated also to pay the full subsidy required to produce the affordable housing. The developer will retain the right to construct 3100 market rate dwelling units on the other parcels zoned for residential uses.

Overall, eighty-seven percent of the units produced through the Oak to Ninth Avenue project would be market-rate units. This project would result in an additional 121% of the 1999-2006 production targets for market-rate housing, while producing only 8%, 29%, and 0% of very-low, low and moderate production goals, respectively.

The table below disaggregates the project's housing production by affordability. The table illustrates that Oakland has only met 18%, 57%, and 8% of its current RHND obligation for very-low, low and moderate income households, while exceeding RHND requirements for market rate housing. The Oak to Ninth Avenue project would result in an additional 121% of the 1999-2006 production targets for market-rate housing, while producing only 8%, 29%, and 0% of very-low, low and moderate production goals.

⁶² Levin, J. Workforce Housing Annual Progress Report on Implementation of the Housing Element. City of Oakland. CEDA December 2005.

Oak to Ninth Project Housing contribution to the Regional Housing Needs Determination

	Very-low	Low	Moderate	Market	Total
Oakland Share of RHND 1999-2006	2238	969	1969	2567	7743
Oakland Housing Permits Issued (June-05)	393	555	155	4,553	5656
Oakland Unmet Needs (2005)	1845	414	1814	-1986	2087
Percent Achievement of RHND	18%	57%	8%	177%	
Proposed Units Within the Development				3100	3100
Redevelopment Obligation Onsite	186	279			465
Project Total	186	279	0	3100	3565
Contribution to RHND	8%	29%	0%	121%	

This analysis only evaluates the relation of the project to housing demand with regards to housing costs. A more detailed quantitative analysis of the relationship should also evaluate adequacy with regards to size, number of bedrooms, and neighborhood infrastructure.

Feasibility of Additional Affordable Housing Under the development agreement provided in the June 20th City Staff Report, the City Council has committed to paying a discounted cost for the land and the full costs of subsidizing affordable housing construction on the development site. As proposed the project will require Type I construction techniques which can add \$75-100 per square foot to building costs. The development agreement obligates the City to use an estimated \$85 million of public housing funds for the up-front subsidy required to build the affordable housing at Oak to Ninth.

Many California cities require developer affordable housing contributions. These cities argue that development of market-rate housing is profitable even allowing for high investor rates of return.⁶³ In addition, most cities require developers to fund transportation impact fees and other public infrastructure costs. For example, in approving new zoning rules for the 6000 unit Rincon Hill Area in San Francisco, developers agreed not only to surpass the City's existing **12% inclusionary housing requirement by 50%** but also to pay an **additional \$25 per square foot fee** for affordable housing, community economic development, street improvements, parks, and community centers.

Evidence suggests that the development plan for Oak to Ninth Avenue should include sufficient revenue to ensure adequate developer profit. The additional residential uses and the high density entitled by the City Council substantially increase the value of the property relative to the purchase price. Overall, based on current area prices for condominiums, the project has expected revenue of at least \$2,000,000,000. The entitlements thus should generate enough new wealth for the developer to make a significant contribution to the development's affordable housing obligation. However, Oakland Harbor Partners have claimed that any contribution would make the project financially infeasible.

⁶³ Keyser Marston Associates, Inc. San Francisco Inclusionary Housing Program Sensitivity Analysis, 2006

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A simple way to evaluate the ability of the developer to contribute to Oak to Ninth's redevelopment affordable housing obligation is to evaluate whether the land is priced fairly relative to the proposed entitlements and developer obligations. This calculation involves estimating the value of the land under the new entitlements and then subtracting the purchase price of the land, costs of meeting obligations of the development agreement, and any other extra-ordinary costs such as those for environmental clean up.

Considering the developer's profit under this short-term scenario is appropriate from a public finance perspective for the following reasons:

- The City of Oakland does not actually require the developer to build the housing. Instead, the developer has the option of selling entitled parcels to other developers and builders. The developer can exercise his option with the Port to purchase the property, incur all short term costs including demolition and site remediation, meet future obligations under the development agreement including offsite improvements and park construction, and sell the entitled but undeveloped parcels to third parties at a fair market value.
- A rational developer will choose to undertake longer term risks of development only if he judges that the rate of return from the long term investment is greater than that from the short term investment.

Comparable land has a market value of \$45,000 per unit based on a Port of Oakland Appraisal conducted in 2003. Based on this land value and the proposed 3100 units, the undeveloped land should have a value of **at least \$139 million**. Based on the more recent proposed offer of \$60 million for 8.25 acres of Oakland School District property (conditional on zoning for 1388 units), the Oak to Ninth land has a value of **at least \$134 million**. Because the School District Property would have a higher density than the Oak to Ninth project (168 d.u./acre vs. 139 d.u./ acre) and because inclusionary zoning laws may soon be in place in Oakland, this \$134 million estimate based on the school property offer is likely to underestimate the Oak to Ninth land's actual value.

Based on information in the City of Oakland staff report and other public records, the developer has an option to purchase the property from the Port for **\$18 million**. The developer's estimates of costs associated with the entitlements, including costs of required environmental remediation, park development, offsite improvements, and other agreed upon community benefits in the development agreement, is **\$76 million**. These costs do not include costs not documented in the public record, such as costs associated with pre-development design and environmental review. The developer will also be gaining a contribution of about \$29 million from the repurchase of parcels F and G. This simple analysis based on entitled land value tells us that the developer is getting an immediate short term profit on the land sale and entitlement process of not less than **\$74 million**. The gross profit on the acquisition of the land, securing development rights, and meeting obligations of the development agreement thus appears to suggest that the developer could feasibly contribute a significantly greater share of the revenues associated with the development for City affordable housing obligations and / or other community planning needs for this project.

Developer Profit on Land Entitlements based on Comparable Per Unit Values and One-Time Extra-ordinary costs and Exactions

Land Costs		
Port Land Sale	\$ 18,000,000	Port of Oakland
Extra-ordinary Costs		
Demolition	\$ 7,845,000	Developer Estimate in C-B Appraisal
Offsite Costs	\$ 11,893,524	Developer Estimate in C-B Appraisal
Site Remediation	\$ 24,500,000	Developer Estimate in Staff Report
	\$ 44,238,524	
Community Benefits		
Affordable Housing Contribution	\$ -	Council Hearing
Job Training Fund	\$ 1,650,000	Staff Report
Chinatown Pedestrian Safety Study	\$ 400,000	Staff Report
Construction of Public Parks	\$ 26,000,000	Developer Estimate in Staff Report
Historic Resource Mitigation	\$ 500,000	Developer Estimate in Staff Report
9th Avenue Terminal Restoration	\$ 3,000,000	Developer Estimate in Staff Report
Acceleration of Required traffic improvements	\$ 500,000	Developer Estimate in Staff Report
	\$ 32,050,000	
Total Land and Extra-ordinary costs	\$ 76,288,524	
Land Sale to City for Affordable Housing (4.4 acres)	\$ 29,000,000	Staff Report
Total Cost to Developer	\$ 65,288,524	
Per Unit Developer Cost (128 du/acre)	\$ 21,061	Unit Value Based on 3100 units
Benchmark Land Value (Based on C-B Appraisal)	\$ 139,500,000	Based on \$45,000 per unit land value in 2003 C-B Appraisal
Per Unit Land Value	\$ 45,000	
Benchmark Land Value (Based on Proposed Sale of OUSD Land)	\$ 134,005,764	
Per Unit Land Value (168 du / acre)	\$ 43,228	Sale of OUSD Property
Gross Profit on Acquisition, Remediation, and Development Agreement Obligations	\$ 74,211,476	

Project Effects on Social Cohesion The Oak to Ninth project will result in a new residential neighborhood which, because of the high cost of housing, is likely to be relatively homogeneous with regards to social class. According to the US Census, the 2000 median household income for Oakland was \$40,055 relative to the current area median income of about \$83,000. Over half of all Oakland households qualified as very low or low income and 37% qualified as very low income. According to the City of Oakland, the Fair Market Rent for a two-bedroom apartment is \$1,238, which requires an income of at least \$49,000. Similarly, purchasing a \$400,000 house requires an income of over \$90,000 in addition to a down payment.

While social homogeneity with regards to income, education, and age may have some positive effects on social cohesion among project residents, future Oak to Ninth residents may not reflect the economic or ethnic diversity of the community or the city. This may reinforce an inward-focused culture and create polarization between neighborhood interests and broader social concerns.

Research on “gated communities” in the United States suggests that these structures may diminish social contact across ethnic and class lines, and members can form powerful voting blocks against public sector interests.⁶⁴ For example, if fewer families with children live in the project, it may make it less likely that residents support school funding. Conversely, greater interaction with children from the neighborhood may increase support for children’s needs. Other research on urban dynamics suggests the migration of populations with relatively higher socio-economic class into low-income or distressed urban neighborhoods might result in the demolition of low-income housing and reductions in support for public health and social services.⁶⁵

Project Effects on Public School Demand and Capacity The Oak to Ninth Avenue project anticipates 3100 residential units and 5000-6000 residents. A new residential neighborhood of this magnitude should expect a significant population of children. Based on California State Department of Education student generation rates, the project’s 3100 dwelling units would generate 2170 K through 12th grade students. The project sponsor estimates a student generation of 253-304 students based on the expected market for condominium units; however, given the 20 year time horizon for the project it may be speculative to predict the ultimate demographic composition of the project.

The development proposal does not include any planning for a neighborhood school. Both public schools closest to the project site, La Esquelita and Lincoln Elementary Schools are already serving children at their capacity. The combined current enrollment of La Esquelita and Lincoln Elementary Schools is about 865 students. According to OUSD School Board Members, School site staff and OUSD enrollment data, the nearest schools; Lincoln, La Esquelita, and Franklin do not have additional capacity. Both schools are at capacity and they are not losing enrollment. OUSD has recently proposed to sell school facilities in the area. The proposal also has not included planning for safe pedestrian access to nearby area public schools.

64 Lang RE & Danielsen KA. Gated Communities in America: Walling Out the World. Housing Policy Debate. 1997; 4: 867-899.

65 Newman K, Ashton A. Neoliberal urban policy and new paths of neighborhood change in the American inner city. Environment and Planning A. 2004; 36: 1151-1172. Curran W. Gentrification and the nature of work: exploring the links in Williamsburg, Brooklyn. Environment and Planning A. 2004; 36: 1243-1258.

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A family's housing choice decisions depend on access to and the quality of area schools for all of the reasons discussed above. The absence of adequate neighborhood public school with safe access at the Oak to Ninth Avenue site will likely discourage many families with school aged children and those anticipating children from considering living within the proposed neighborhood. The project may thus not provide housing opportunities of adequate quality for the large sector of the population with children. Furthermore, by discouraging residence of families with children, the project will limit the future demographic diversity of the community living at the site and will increase avoidable project generated vehicle trips.

Project Effects on Segregation The Oak to Ninth project triggers State Redevelopment Law requirements for the City of Oakland to produce low income housing. Redevelopment Law requires the agency to produce new affordable housing units equivalent to 15% percent of new dwelling units developed by private entities. Forty percent of the affordable units need to be affordable to very-low income households. From the perspective of integration, affordable housing should be included within the context of a mixed-income project. If this low-income housing is not integrated into the project, it may more likely be produced where housing costs are already low, potentially increasing residential segregation by household income. Under the terms of the development agreement, dated June 19th, 2006, the project sponsor will offer for sale Lots F and G to the Redevelopment Agency for the production of affordable housing; thus the project will provide the potential health benefits associated with a mixed income development.

Impacts on Housing Diversity on Traffic and Air Quality

The number and type of units below market rate affect regional and area wide air pollution emissions. The relationship between housing affordability and vehicle trips is mediated through relationships among household income, vehicle ownership, and vehicle driving. Abundant evidence in the transportation and planning research literature has documented this relationship. Specific to the Bay Area, the MTC quantified the relationship between household income, travel behavior, and vehicle trips based on results from their Bay Area Travel Survey. In the Bay Area, there is a very strong relationship between household income and vehicle trip generation. Households in the highest income quartile generate almost 4 more vehicle trips per day (160 percent increase) than those in the lowest quartile.

Quartile of Household Income	Q1	Q2	Q3	Q4
Range of Household Income	<\$30,000	\$30,000-59,999	\$60,000-99,999	\$100,000 +
Weekday Vehicle Driver Trips	2.402	4.102	5.302	6.327

The relationship between household income and vehicle trips suggests that variants of project design with greater affordability would be a mechanism by which the project could generate fewer vehicle trips and consequently fewer environmental impacts indirectly related to vehicle trips. The table below provides an illustration of this relationship based on three scenarios:

- Project with housing affordable only to those making greater than the median income⁶⁶;
- Project meeting minimum redevelopment area requirements for housing affordability with 15% of units affordable to those making less than the median income;

⁶⁶ Median Household income is defined as \$60,000 in order to be consistent with the quartiles of income used in the MTC Bay Area Travel Survey.

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- Project with housing affordability in balance with the regional distribution of household income.

Scenario	Housing Affordable to Each Household Income Quartile				Weekday Trips
	Q1	Q2	Q3	Q4	
Market Rate (Current Project)	0.0%	0.0%	50.0%	50.0%	18025
Min Affordability Requirements	6.0%	9.0%	42.5%	42.5%	16912
Regionally Balanced	16.0%	30.6%	29.5%	23.8%	14599

Based on MTC data, relative to the project as proposed, a modified design with minimum Redevelopment Area affordability requirements would generate 1113 fewer weekday vehicle trips relative to a project without BMR housing. A design which balances affordability relative to regional household incomes would produce 3426 fewer vehicle trips relative to a project without affordable housing.

The California Air Resources Board (CARB) developed the "Urban Emissions Model" (URBEMIS) to assist local public agencies with estimating air quality impacts from land use projects when preparing a CEQA environmental analysis. The model is situated in a user-friendly computer program that estimates construction, area source, and operational air pollution emissions from a wide variety of land use development projects in California. The model further estimates emission reductions associated with specific mitigation measures including transportation demand reduction measures and affordable housing.

This analysis applied the URBEMIS model to the Oak to Ninth project and found that the emission estimates were mitigated by increasing the proportion of below market rate (BMR) housing (See table below). We used the following land use inputs: (1)3100 condo/townhouse high rise, (2) 170,000 sq. feet regional retail, (3) 30,000 sq. feet supermarket; (4) 28.4 acres city park. Operational emission sources were set at default with temperature site specific and target year 2025. We varied the proportion of BMR units between 0 and 50%.

OPERATIONAL (VEHICLE) EMISSION ESTIMATES (lbs/day)

	ROG	NOx	CO	SO2	PM10
unmitigated	64.80	46.97	539.25	1.29	194.36
BMR 15%	64.42	46.57	534.53	1.27	192.62
BMR 25%	64.16	46.30	531.37	1.27	191.47
BMR 50%	63.51	45.63	523.49	1.25	188.58

It is important to note that the URBEMIS model provides very conservative estimates of the effect of greater affordability on reduced air emissions, and we believe the above estimates likely underestimate the beneficial effect of affordability. The URBEMIS model assumes a 4% reduction in vehicle trips for each deed-restricted below market rate housing unit.⁶⁷ The 4% reduction parameter is significantly less than the three fold difference in vehicle trip generation between households in the lowest and highest income quartiles in the Bay Area Region based on regional travel survey data. The URBEMIS parameter may reflect differences in the income—vehicle trips relationship between the Bay Area and the rest of the

⁶⁷ Software User's Guide: URBEMIS2002 for Windows with Enhanced Construction Module, Version 8.7, South Coast Air Quality Management District, April 2005.

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State of California. While this analysis provides sufficient evidence for an effect of affordability on air emissions, modifying this parameter using location specific analysis would provide a more precise estimate of effect.

Environmental Effects Related to Jobs-Housing Balance Along with job location and housing availability, housing price, housing quality, and school quality are important variables on housing choice. Qualitatively, the jobs-housing balance depends on available housing being adequate in size and affordable in cost to an area's employees.⁶⁸ In the Bay Area, housing supply has not kept pace with the growth of jobs. Because of this, Oakland faces a severe shortage in the supply of housing particularly for low and middle income households.

Expected employment growth is likely to exacerbate housing supply-demand imbalance for low and moderate income households. Most of the new jobs projected in the regional economy will be in the service and retail sectors, with incomes insufficient to afford market-value property. Furthermore, the gap between the minimum wage and the minimum hourly wage required to afford adequate housing has increased over the past decade. Today, thousands of low income renters pay more than 50% of their income in rent. Even individuals earning modest wages, such as public service employees and those in the construction trades cannot afford to live where they work.⁶⁹

As a result of this imbalance in supply and demand, many households, especially family households with children, are relocating far from regional job centers primarily in order to purchase affordable homes. Findings from one analysis of Bay Area jobs-housing balance trends found that job-rich cities have relatively high housing prices and workers were less likely to live locally when housing was expensive.⁷⁰ At the same time, higher paid workers from other Bay Area cities and non-workers are taking up residence in cities in the urban core like Oakland.

Inadequate housing for households of different economic means in Oakland combined with the loss of low and middle income households will have significant social, economic, and environmental costs. The growth in external commuting means greater air pollution, transportation infrastructure expenditures, and loss of natural habitats fragmentation. Total vehicle miles of travel (VMT) have doubled in the U.S. since 1970.⁷¹ The MTC expects VMT to continue to grow in the Bay Area Region despite significant transportation investments.⁷²

Based on this context and trends, this project may contribute to the following effects on demographics in the City of Oakland.

1. This project will provide higher- income households greater opportunities for home ownership in Oakland; some higher income worker households residing elsewhere in the region may relocate to Oakland; and a greater proportion of new higher-income employees moving into the region will reside in Oakland.
2. High income "empty nesters" and second-home owners constitute a significant share of the market for market rate condominium development in the area. This project is likely to result in a greater proportion of higher income non-worker households residing in Oakland.

68 California Planning Roundtable 1998

69 Governor' Environmental Goals and Policy Report. Office of Planning and Research 2003

70 Cervero R. Jobs Housing Balance Revisited: Trends and Impacts in the San Francisco Bay Area. American Planning Association Journal. 1996; 62:492-511.

71 EPA 2001

72 San Francisco Bay Crossings Study. Metropolitan Transportation Commission 2002.

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3. Moderate-income and low-income worker households currently renting will not have sufficient opportunities for home ownership in the project. The project is thus likely to result in a smaller proportion of moderate-income and low-income households employed and residing in Oakland.
4. Few households employed in new jobs will have opportunities to live in this project. This means that a smaller share of those employed in lower wage jobs in Oakland are likely to be residing near their jobs.

The effect of these demographic changes associated caused by a jobs-housing imbalance will have effects on regional transportation demand and commute patterns. Some of these effects are likely to include:

1. Higher income households have high rates of vehicle ownership and automobile use. Retaining higher income households in Oakland may result in fewer miles driven relative to a situation where they reside outside the city, at least for commute trips.
2. Low-income and moderate-income households will have more and longer vehicle trips. People in lower income households take fewer vehicle trips and more transit trips than people in higher income households. Relocation of lower-income workers further from job and transit centers would be likely to increase household vehicle ownership, vehicle trip frequency, and vehicle trip distances relative to a scenario where lower-income people can reside closer to job centers.
3. Increased proportion of total Oakland employees residing outside of the City will increase vehicle trips and distances. New housing would not meet the needs, with regards to costs, for most new employees expected to be working in Oakland.

F. Recommendations for Design and Mitigations

To the extent feasible, the Oak to Ninth project should model healthy housing and ethnic and economic integration. At present, the project represents an unrealized opportunity for the project to meet housing needs for all sectors of Oakland's population. The project proposed varieties of design and size but not a variety of affordability. Given the pathways between housing and health described above, the project should provide an amount of affordable housing that not only meets demand, but also addresses the human health consequence of economic and social segregation and integrates the social community within the project with the surrounding neighborhoods. The following actions would have positive contributions to the long-term health and well-being of the Oakland population, particularly low-income, immigrant, and minority families:

1. Ensure distribution of housing costs reflects the current household income distribution of Oakland so that:
 - a. At least 25% of housing is affordable to low-income and very low-income households,
 - b. At least 25% of housing is affordable to households earning the area's median income;
2. Incorporate mixed-income dwellings as opposed to building market rate and below market rate housing in segregated areas.
3. Include as part of the development project site and implementation plans for a neighborhood elementary school.
4. Creating crossing points and common paths of access where residents must come in contact with one another.

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5. Include a common courtyard with benches, plants and fountains in order to create common spaces through which dwellers pass and mingle.

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Chapter 6 Air Quality

A. Summary

Vehicle emissions associated with the I-880 freeway, including particulate matter and diesel particulate matter have the potential to result in significant and adverse impacts on the health of residents of the Oak to Ninth Project. Without mitigations, future residents of the Oak to Ninth Avenue living within 500 feet of the I-880 freeway are likely to experience higher rates of respiratory illnesses and higher morbidity from asthma. The project also indirectly increases exposure to roadway particulate matter emissions in neighborhoods surrounding the project.

Health Impacts

1. Results of an application of a line source dispersion model indicates that the parcels within the development site near the freeway (G, F, and A) have approximately a 4 times increase in PM 10 exposure as compared to those furthest away (J and C). Future residents living on the parcels adjacent to I-800 should be thus expected to experience adverse health effects.
2. Freeway diesel emissions result in a small increase cancer risk for project residents.
3. Project related traffic may significantly increase cumulative air pollution exposure to residents of neighborhoods adjacent to the project, including children and the elderly.

Recommendations for Design Mitigations

1. Evaluating modifications to the project footprint to reduce the number residential dwellings within 500 of interstate I-880
2. Notifying all potential buyers that the property they are occupying has air quality risks and educate them in the proper use of any installed air filtration.
3. Requiring, as an additional condition of development, prospective monitoring of particulate matter hot spots both on the Oak to Ninth site and in neighborhoods to the east, northeast, and southeast.
4. Developing requirements for air quality mitigation measures and / or traffic demand management measures that would be triggered by local particulate matter levels that exceed California standards.
5. For residential units within 500ft of I-880:
 - a. Providing residential units with individual HVAC systems in order to allow adequate ventilation with windows closed
 - b. Locating air intake systems for heating, ventilation, and air conditioning (HVAC) systems as far away from existing air pollution sources as possible;
 - c. Use mechanical ventilation with the following parameters: ASHRAE 85% supply air filters; ≥ 1 air exchanges per hour of fresh outside filtered air, ≥ 4 air exchanges / hour recirculation; ≤ 0.25 air exchanges per hour in unfiltered infiltration. Such a system would remove 80% of fine particulate matter.¹ Develop a maintenance plan to ensure the filtering system is properly maintained;

¹ William J. Fisk and David Faulkner, Performance and Costs of Particle Air Filtration Technologies, Indoor Air 12(4):223-234

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- d. Utilizing only fixed windows next to any existing sources of pollution.
6. Providing 110 and 220 outlets at project loading docks so that trucks can connect with these outlets to power their auxiliary equipment;
7. Utilizing only electric forklifts and landscaping equipment in the project operations and the operations of tenants
8. Requiring the transit shuttle to run at least every 30 minutes in the off-peak and every 15 minutes during peak travel times with hours that match BART's schedule;
9. Unbundling the cost of parking from residential rents to encourage residents to reduce their car ownership rates;
10. Implementing a project-wide car share program;
11. Subsidizing transit passes to employees and residents at the project site (e.g. AC Transit's Eco-Pass program).
12. Requiring secured bicycle parking for *both* employees and residents;
13. Requiring commercial tenants to provide a parking cash-out program to their employees to reduce the likelihood of driving alone;
14. Providing a safe route for children living at the project to safely get to and from school by walking and bicycling.
15. Providing a safe route for walking and bicycling to area BART stations.
16. Consider reductions in regional and area wide air pollution emissions via modifications to the number and type of units below market rate.

B. Health Effects Associated with Air Quality

Criteria Air Pollutants The USEPA identifies 6 criteria air pollutants that have important human health impacts; these include Ozone (O₃), carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead. The Clean Air Act requires the EPA to develop specific public health and welfare-based exposure standards for the six criteria air pollutants and directing States to develop plans to achieve these standards. Nationally, a network of air quality monitors provides information on ambient concentrations of criteria air pollutants.

Despite promulgation of National Ambient Air Quality Standards for criteria pollutants and implementation of air quality control plans, air pollutants continue to have significant impacts on human health. In part, these ongoing effects are due to non-attainment of air quality standards; however, exposure to air pollutants also results in health impacts even when levels are below existing standards.²

Particulate matter is unique among criteria air pollutants as it represents a heterogeneous group of physical entities.³ Based on toxicological and epidemiological research, smaller particles and those associated with traffic appear more closely related to health effects.⁴ Other particulate matter characteristics that may be important to human health effects include: mass concentration; number concentration; acidity; particle surface chemistry; metals; carbon composition; and origin.

Health Effects Below Ambient Air Quality Thresholds Air quality epidemiology has not established clear “no effects” thresholds for particulate matter, and recent epidemiologic studies in California have also found that significant fine particulate matter is causing health effects at levels below national standards.⁵ According to a cost-benefit analysis recently done by the USEPA, reducing the NAAQS for fine particulate matter by 1 ug per cubic meter from 15 to 14 would result in 1900 fewer premature deaths, 3700 fewer non-fatal heart attacks, and 2000 fewer emergency room visits for asthma each year.⁶ The 2002 State of California Air Resources Board Air Quality Standards Staff Report for Particulate Matter estimated that significant health effects benefits would accrue from reducing ambient PM 2.5 from current levels to natural background concentrations for every county in California.⁷

Toxic Air Contaminants and Diesel Particulate Matter Toxic air contaminants (TACs) are another category of air pollutants not regulated under Federal Criteria air pollution rules but known to have adverse human health effects. There are hundreds of different types of TACs and health effects range from birth defects to cancer. Diesel exhaust particulate matter (DPM) is a toxic air contaminant and known lung carcinogen resulting from combustion of diesel fuel in heavy duty trucks and heavy equipment.

2 Johnson PRS and Graham JJ. Fine Particulate Matter National Ambient Air Quality Standards: Public Health Impact on Populations in the Northeastern United States. *Environmental Health Perspectives* 2005; 113: 1140-1147.

3 Health Aspects of Air Pollution with Particulate Matter, Ozone and Nitrogen Dioxide Report on a WHO Working Group Bonn, Germany 13–15 January 2003. Copenhagen: World Health Organization, 2003

4 Schlessinger RB, Kunzli N, Hidy GM, Gotschi T, Jerrett M. The Health Relevance of Ambient Particulate Matter Characteristics: Coherence of Toxicological and Epidemiological Inferences. *Inhalational Toxicology*. 2006; 18:95-125.

5 Ostro B, Broadwin R, Green S, Fang WY, Lipsett M. Fine Particulate Air Pollution in Nine California Counties: Results from CALFINE. *Environmental Health Perspectives*. 2006: 114: 29-33.

6 Regulatory Impact Assessment. 2006 National Ambient Air Quality Standards for Particle Pollution. US EPA. 2006

7 California Air Resources Board. Particulate Matter Staff Report. 2002

Selected hazardous criteria and non-criteria air pollutants, sources, and effects on human health.

Air Pollutant	Source	Health Effects
Ozone	Troposphere 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 (PM₁₀ and PM_{2.5})	Diverse sources including motor vehicles (tailpipe emissions as well as brake pad and tire wear, 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 (NO₂)	Combustion processes in vehicles and industrial operations	Increase the risk of acute and chronic respiratory disease and reduce visibility
Sulfur Dioxide (SO₂)	Combustion of sulfur-containing fuels such as oil, coal, and diesel	Increased risk of acute and chronic respiratory
Lead	Leaded gasoline (historically), lead paint (on older houses, cars), smelters (metal refineries), and lead storage batteries	Neurotoxic health effects in children
Diesel Particulate Matter	Emissions from diesel engines	Cause of lung cancer

Sensitive Populations Air quality does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects. Population subgroups sensitive to the health effects of air pollutants include the elderly and the young, population subgroups with higher rates of

respiratory disease such as asthma and COPD, populations with other environmental or occupational health exposures (e.g. indoor air quality) that impact cardiovascular or respiratory diseases.

Health Effects Due to Within Area Variations in Exposure Sources The assessment of air pollution using community wide monitoring data does not provide estimates of actual population exposure within a city. Within an area or place, exposure typically varies spatially with higher levels of exposure in proximity to sources of pollution. Two particular sources of within-area variation in air pollution hazards are industrial sources and roadways.

Factors responsible for variation in exposure may also be associated with populations more sensitive to air pollution. For example, poorer residents may be more likely to live in crowded substandard housing and be more likely to live near industrial or roadway sources of air pollution. This misclassification, inherent in much of air pollution research, may be resulting in a significant underestimation of health effects. A recent study of mortality and air pollution in Los Angeles found that concentration response functions based on within city estimate was 2-3 times that based on studies comparing communities.⁸

Health Effects Due to Proximity to Industrial Sources of Air Pollution A number of industrial processes create potential exposure sources of TACs. The California Air Resource Board, Air Quality and Land Use Handbook: A Community Health Perspective (2005) recommends not locating sensitive land uses, including residential developments, within specific distances of certain known sources of toxic air contaminants.⁹ Specific CARB recommendations for the location of residential uses relative to air pollution sources are listed in the section on regulatory thresholds and guidance below.

Roadway Related Health Effects Motor vehicles are responsible for a large share of air pollution especially in California. Consistent with the theory that proximity to air pollution sources is likely to increase both relative exposure and hazards. Epidemiologic studies have consistently demonstrated that children and adults living in proximity to freeways or busy roadways have poorer health outcomes.

- 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.¹⁰
- Children in Erie County, New York hospitalized for asthma were more likely to live within 200 meters of heavily trafficked roads.¹¹
- Among children living within 150 m of a main road in Nottingham, United Kingdom, the risk of wheeze increased with increasing proximity to the road.¹²
- In Oakland California, in children with higher exposure to traffic related pollutants had more asthma and bronchitis symptoms.¹³

8 Jerrett M et al. Spatial Analysis of Air Pollution and Mortality in Los Angeles. *Epidemiology*. 2005; 16: 727-736

9 California Environmental Protection Agency Air Resources Board Air Quality and Land Use Handbook: A Community Health Perspective (Draft approved for publication) February 17th, 2005. Available at: <http://www.arb.ca.gov/ch/landuse.htm>

10 Brunekreef, B. et al. "Air pollution from truck traffic and lung function in children living near motorways." *Epidemiology*. 1997; 8:298-303.

11 Lin, S. et al. "Childhood asthma hospitalization and residential exposure to state route traffic." *Environ Res*. 2002;88:73-81.

12 Venn. et al. "Living near a main road and the risk of wheezing illness in children." *American Journal of Respiratory and Critical Care Medicine*. 2001; Vol.164, pp. 2177-2180.

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- 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.¹⁴
- In a study of Southern California School Children, living within 75 m of a major road was associated with an increased risk of lifetime asthma, prevalent asthma, and wheeze¹⁵
- In a study conducted in 12 southern California communities, children who lived with 500 meters of a freeway had reduced growth in lung capacity relate to those living greater than 1500 feet from the freeway¹⁶

Air pollution monitoring done in conjunction with epidemiological studies has confirmed that roadway related health effects vary with modeled exposure to particulate matter and nitrogen dioxide. However, at this time, it is not possible to attribute roadway related health effects to a single type of roadway, vehicle, or type of fuel. Vehicle tailpipe emissions contain diverse particulate matter as well as well as ozone precursor compounds such as nitrogen oxides (NO_x) and volatile organic compounds (VOC). Vehicles also contribute to particulates by generating road dust and through tire and brake wear.

Because of the robust evidence relating proximity to roadways and a range of non-cancer health effects, the California Air Resource Board includes guidance on locating sensitive land use in proximity their *Air Quality and Land Use Handbook: A Community Health Perspective* (2005). CARB recommends not locating sensitive land uses, including residential developments, within 500 feet of a highway with more than 100,000 vehicles per day.¹⁷ Given that many infill opportunity sites in urban areas are in proximity to busy roadways and other industrial sources, implementing location-efficient development (Smart Growth) will need to address air quality related health effects in the course of site selection, design, and development.

Exposure Assessment Techniques While a national network of air quality monitors provides information on ambient concentrations of criteria air pollutants at the level of cities and regions, significant variation in air quality occur within cities, and established NAAQS monitoring stations do not permit assessment of exposure at specific development sites. In the absence of site specific assessment, via modeling or measurement, it not possible to evaluate the significance of the health hazard posed by roadways for specific proposed uses.

13 Kim, J. et al. "Traffic-related air pollution and respiratory health: East Bay Children's Respiratory Health Study." *American Journal of Respiratory and Critical Care Medicine* 2004; Vol. 170. pp. 520-526.

14 English P., Neutra R., Scalf R. Sullivan M. Waller L. Zhu L. "Examining Associations Between Childhood Asthma and Traffic Flow Using a Geographic Information System." (1999) *Environmental Health Perspectives* 107(9): 761-767.

15 McConnell, R. B., K. Yao, L. Jerrett, M. Lurmann, F. Gilliland, F. Kunzli, N. Gauderman, J. Avol, E. Thomas, D. Peter, J. (2006). "Traffic, susceptibility, and Childhood Asthma." *Environmental Health Perspectives* 114(5): 766-772.

16 Gauderman WJ, Avol E, Gilliland F, Vora H, Thomas D, Berhane K, McConnell R, Kuenzli N, Lurmann F, Rappaport E, Margolis H, Bates D, Peters J. The effect of air pollution on lung development from 10 to 18 years of age. *N Engl J Med*. 2004 Sep 9;351(11):1057-67. Erratum in: *N Engl J Med*. 2005 Mar 24;352(12):1276.

17 California Environmental Protection Agency Air Resources Board *Air Quality and Land Use Handbook: A Community Health Perspective* (Draft approved for publication) February 17th, 2005. Available at: <http://www.arb.ca.gov/ch/landuse.htm>

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Several techniques may be employed to help estimate exposure at a particular point with a cities or regions. The application of these techniques with regards to roadway related health effects has been recently reviewed by Michael Jerrett and colleagues.¹⁸

Most simply, distance or proximity to a pollution source can be used as a proxy for exposure. As discussed above CARB provides distance based buffers for selected stationary and mobile sources that can serve as a proxy for harmful exposure. Furthermore, with regards to roadway related health effects, California Department of Health Services maintains a GIS based web tool that provides total daily vehicle volume within any specified distance at any point in California. This web tool utilizes the California Environmental Health Tracking Program's (CEHTP) spatial linkage web service, computing traffic-related metrics on CalTrans Highway Performance Monitoring System (HPMS) 2004 data in California. (The URL for this tool is: http://www.ehib.org/traffic_tool.jsp.) The use of proximity as a surrogate for exposure does not address the cumulative impacts or the moderating effects of geography, topography, or weather on exposure.

Second, exposure can be interpolated from measurements collected at existing monitoring stations. However, the limited distribution of monitoring stations in most regions does not permit fine grained interpolation.

Third, regression techniques can be used to create a model of exposure based on land use and transportation characteristics. Researchers have created land use regression models for Alameda, San Diego, and Los Angeles based on simultaneous measurements of nitrogen dioxide. The application of this technique to a particular area requires the development and validation of a land use regression model.

Fourth, exposure can be estimated using Gaussian dispersion models based on physical characteristics of emissions, meteorology, and topography. A particular advantage of this technique is that line source regression models have been frequently used in health effects research relating roadways to adverse health outcomes. The CAL3QHC Line Source Dispersion Model Version 2.0, an enhanced version of CALINE3, is an example of a dispersion model that can be used to calculate exposure to an air pollutant at a development site due to roadway vehicle traffic.¹⁹

Health Effects Assessment In general, exposure assessment is sufficient to make informed and health protective development and design decisions. In some cases a health effects assessment is not necessary to evaluate trade-offs. It is possible to quantify the human health effects due to either roadway or industrial sources using well established health risk assessment methodologies. In general, the approach to effects estimation requires (1) a concentration-response function, (2) estimates of exposure to air pollutants, (3) estimates of the number of people exposed and their age distribution, and (4) baseline incidences of health effects. Concentration-response functions are equations that relate a change in the incidence of an adverse health outcome to the change in an ambient concentration of a pollutant. Typically, air quality health impact analysis uses C-R functions based on regression analyses from epidemiological studies.²⁰ Using this method, Ostro has estimated the benefits of federal standards

18 Jerrett M, et al. A review and evaluation of intraurban air pollution exposure models *Journal of Exposure Analysis and Environmental Epidemiology*. 2005; 15:185-204.

19 Op. cit., SCMAQMD, p11.

20 Quantification of the Health Effects of Exposure to Air Pollution Report of a WHO Working Group

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for Particulate Matter and Kunzli has estimated the total health burden of particulate matter in three European Countries.²¹ Quantitative assessments using similar methods have been conducted in other countries and contexts.²² Using this methodology, in 2002, the State of California Air Resources Board Air Quality Standards Staff Report for Particulate Matter estimated that a reduction in ambient PM 2.5 from current levels to 12 ug/ cubic meter in California would result in approximately 6500 fewer deaths and 3100 fewer hospitalizations.²³

A similar approach can be used to estimate excess Cancer Risk Estimation Due to Diesel Particulate Matter. This approach applies an estimates of diesel PM 10 exposure to an inhalation cancer risk unit risk factor (URF) in order to estimate additional lifetime cancer probability. The EPA risk factor (URF) for diesel exhaust in cancer deaths per person exposed in a lifetime to 1ug/m³ is 1.7 X 10⁻⁵.²⁴

Mitigation of Roadway Related Health Effects In general, the design of mitigations to protect sensitive uses from higher levels of pollution should follow exposure assessment. Pre-development assessment in areas potentially near hazardous air pollutions sources, such as busy roadways, should include at a minimum air quality modeling or direct measurement and, where necessary, a health effects assessment.²⁵ ²⁶ Development at a site where exposure levels are substantially higher than background should either be avoided, or, where alternative locations are not feasible, design and development should include sufficient verifiable mitigations to protect future residents from higher rates of morbidity and mortality. Such a program would be similar to site assessment and mitigation programs currently in place for other hazardous physical exposures (e.g. environmental noise and contaminated soil) that occur through development.

The table below outlines the key elements of a program programmatic approach of site assessment to prevent roadway related effects. First, hazard identification involves assessing the cumulative traffic volumes and vehicle mix on roadways within a specified distance of the planned use. Available air pollution exposure modeling tools would provide a mechanism for site specific evaluation. Reductions in exposure associated with future emissions controls will be reflected through modeling methodologies. Engineering solutions including providing mechanical ventilation, keeping building interiors under positive pressure, installing particulate filtration and carbon filtration as needed, and locating air intakes away from pollution sources all could provide a potential pathway for mitigation of this impact to a less-than significant level. Critical in this approach will be to match the design of ventilation solutions to the findings of exposure assessment. Ventilation design needs to be informed by a standard exposure assessment method and either represent best available technology or certified by an air quality professional. In some cases, site assessment data may reveal that that design and engineering solutions are not adequate to

Bilthoven, Netherlands 20-22 November 2000 EUROPEAN CENTRE FOR ENVIRONMENT AND HEALTH, 2001

21 Kunzli et al. Public health impact of outdoor and traffic related air pollution: a European Assessment, The Lancet 356 (2000) p 795.

22 Levy J, Spengler JD "Estimated Public Health Impacts of Criteria Pollutant Air Emissions from the Salem Harbor and Brayton Point Power Plants," Harvard School of Public Health. 2000.

23 California Air Resources Board. Particulate Matter Staff Report. 2002

24 Biwer, B. B., JP. (1999). "Vehicle emission unit risk factors for transportation risk assessments." Risk Analysis 19(6): 1157-1171

25 BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans, December, 1999

26 SMAQMD, Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways, Draft, October, 2006.

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address the exposure hazard. This approach is consistent with California Air Resources Board call for context-specific evaluation of land use-air quality conflicts.

Programmatic Element	Description
Hazard Identification	Use the California Environmental Health Tracking Program's (CEHTP) spatial linkage web service to assess the cumulative vehicle volume on roadways within a 500 feet buffer of the sensitive use site. http://www.ehib.org/traffic_tool.jsp)
Exposure Assessment	Estimate exposure can be estimated using physics based models using data on vehicle volumes, vehicle types, emissions characteristics, meteorology, and topography. The CAL3QHC and CALINE4 Line Source Dispersion Models are examples of available tools.
Mitigation	Design ventilation systems to mitigate excess exposure. An air quality professional to certify ventilation system effectiveness.
Health Effects Assessment	Quantify health effects of exposures not mitigated through ventilation or other design and engineering strategies.

C. Existing Air Quality

The Oak to Ninth Project EIR provides data on levels of criteria air pollutants based on regional stations. As discussed above, this NAAQS monitoring data is limited because it does not provide information on variation of air pollution within an area or the effects of stationary and mobile sources in proximity to the project.

Air pollution modeling research conducted by the State Department of Health Services within Alameda County suggests that land uses and roadways are significant influences on air pollution levels. Researchers at the state department of health environmental health investigations branch used regression techniques and simultaneous measurements of nitrogen dioxide to create a model of vehicle emissions exposure based on land use and transportation characteristics using. A regression model of NO₂ that included total traffic with 40 and 500 meter buffers, proximity of Port land uses, and distance to the nearest road explained 73% of the variation in air pollution levels.²⁷ Measures of NO₂ showed exposure declining with distance both west and east from freeways, suggesting that prevailing winds do not entirely mitigate roadway related exposure hazards west of freeways.

²⁷ Ross Z. EHIB land use regression to predict nitrogen dioxide concentrations in Alameda County, California. ZevRoss Spatial Analysis. June 2005.

D. Established Standards and Health Objectives

National, State, and Regional Air quality regulations and standards are described adequately in the Project EIR. As discussed above, the California Air Resource Board, *Air Quality and Land Use Handbook: A Community Health Perspective* (2005), provides guidance for identifying and avoiding potential health-related land use—air quality conflicts.²⁸ Specific, recommendations for avoiding conflicts are identified in the table below. The handbook can be downloaded from ARB's website: <http://www.arb.ca.gov/ch/landuse.htm>.

²⁸ California Environmental Protection Agency Air Resources Board Air Quality and Land Use Handbook: A Community Health Perspective May 2005.

California Air Resource Board Guidance on Land Use-Air Quality Conflicts

Land Use Source of Air Pollution	Air Resource's Board Recommendations
Freeways and High Volume Roadways	Avoid siting sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	<p>Avoid siting sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating TRUs per day, or where TRU unit operations exceed 300 hours per week).</p> <p>Take into account the configuration of existing distribution centers and avoid locating residences and other sensitive land uses near entry and exit points.</p>
Rail Yards	<p>Avoid siting sensitive land uses within 1,000 feet of a major service and maintenance rail yard.</p> <p>Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.</p>
Ports	<p>Consider limitations on the siting of sensitive land uses immediately downwind of ports in the most heavily impacted zones.</p> <p>Consult with local air districts for the latest available data on health risks associated with port emissions.</p>
Refineries	<p>Avoid siting sensitive land uses immediately downwind of petroleum refineries.</p> <p>Work with local air districts to determine an appropriate separation.</p>
Chrome Platers	Avoid siting sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloro-ethylene	<p>Avoid siting sensitive land uses within 300 feet of any dry cleaning operation. For large operations with two or more machines, provide 500 feet.</p> <p>Do not site sensitive land uses in the same building with perc dry cleaning operations.</p>
Gasoline Dispensing Facilities	Avoid siting sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50 foot separation is recommended for typical gas stations.

E. Health Impact Analysis

Urban land use development can affect population health effects of air quality in two related ways. First, growth and development may result in new local area sources of air pollution through new industrial uses, new transportation facilities, greater personal vehicle use, or increased demand for energy. Second, growth and development can bring a population in proximity to a pre-existing source of air pollution, like busy roadways, increasing exposure and hazard. Based on this general framework, the focus of the air quality analysis in this HIA is identified below:

- The Oak to Ninth DEIR / FEIR already includes an air quality analyses that addresses impact on criteria air pollution at the regional level based on standards set by the regional air quality board. Impacts on regional criteria pollutant emissions are not re-analyzed in this HIA.
- The DEIR/FEIR for the project did not analyze non-cancer chronic and acute health effects due to cars and trucks on I-880. The DEIR/FEIR, the project sponsor asserts that the project's orientation to the freeway and prevalent winds will be adequate to mitigate exposure hazards; however, the assessment did not include measurements of particulate matter or another surrogate of general motor vehicle emissions on the parcels with planned residential development. In order to assess the magnitude of the exposure to roadway related vehicle emissions and associated health effects, the project requires additional site specific air quality analysis not contained in the City of Oakland's EIR, ideally that considers how proposed buildings may affect future wind patterns and the higher levels of traffic related air pollutants during the winter when winds are more still.²⁹ An analysis of freeway related air pollutant exposures on health effects of project residents based on proximity, an available land use regression model and site specific dispersion modeling is described below. A health effects analysis is provided based on modeled air pollution exposure.
- The project did not analyze health effects from vehicle emissions on residents of Jack London Square, Chinatown, Downtown, Lower San Antonio, and around Lake Merritt. This analysis provides a qualitative assessment of air quality effects on surrounding neighborhoods.
- The DEIR/FEIR does include exposure and risk analysis for diesel particulate exposure and cancer. While this analysis finds that that the project will have less than a significant impact on cancer risk, this finding is not consistent with significance thresholds provided by the Bay Area Air Quality Management District.

Roadway Related Emissions and Respiratory Disease

Analysis based on proximity and wind The average daily traffic on I-880 is in excess of a quarter of a million vehicles with over 18,000 vehicles during the peak hour. As discussed above, the California Air Resources Board recommends not to place sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day, based on *both* the long term lung cancer risks as well as short term effects on children's' lungs, including reduced lung function³⁰,

29 Fairley, David, "Sources of Bay Area Fine Particles: A Chemical Mass Balance Analysis" BAAQMD, April, 2005, draft.
<http://www.baaqmd.gov/CARE/documents/050609-fine-particles-7-fairley.pdf>.

30 Venn. et al. "Living near a main road and the risk of wheezing illness in children." American Journal of Respiratory and Critical Care Medicine. 2001: Vol.164, pp. 2177-2180

bronchitis, asthma, and cardiovascular mortality.³¹ Non-cancer health effects on children's' lungs are associated with particulate matter and other exhaust emissions from the operation of fossil fueled vehicles and not associated exclusively to diesel exhaust particulates. Proximity to Interstate 880 in combination with wind rose data suggests the potential for significant exposure hazard during some times of the year. (Figure AQ-1)

Analysis based on Alameda Land Use Regression Model An air quality land use regression model created by the State Department of Health, references above, based on nitrogen dioxide measures in Alameda County also demonstrates a strong significant relationship between vehicle emissions and roadway proximity. Notably, based on the land use regression model results vehicle emissions in Alameda County decline with distance from the freeway on both the east and west sides of 880 freeway.

Analysis based on Line Source Dispersion Model UCBHIG modeled Project Area PM 10 exposure attributable to freeway vehicle traffic on Interstate 880 using the CAL3QHCR Line Source Dispersion Model Version 2.0. CAL3QHCR is an enhanced version of CALINE3 (California Line Source Dispersion Model). The model allows for the use of annual meteorological data collected on an hourly basis. For the purpose of our analysis we used truck percentages and peak hourly traffic count data from California Department of Transportation (CalTrans). EMFAC 2007 for Alameda County was used to calculate emissions. Annual exposure was modeled using annual emissions at 55mph, 50% relative humidity, and 50 degrees F. Worst Day was modeled using annual emissions at 10 mph, 50% relative humidity, and 50 degrees F. Surface meteorology in the SAMSOM format was obtained from San Francisco International Airport³² and Upper Air Data in the SCRAM format was obtained for the Oakland Metropolitan Airport³³. Annual meteorological data from 1990 was used for all inputs to the CAL3QHCR model. Analysis was completed with the CALRoads View Interface Program produced by Lake Environmental.³⁴

The line source dispersion model indicates that the parcels within the development site near the freeway (G, F, and A) have approximately an additional ~2 ug / m³ PM 10 exposure due to the freeway. The levels of PM 10 exposure at parcels adjacent to the freeway are about 4 times those furthest away (J and C). The exposure values modeled above are from Highway 880 traffic only and do not include background ambient PM 10 levels or emissions related to other area stationary or mobile sources.

Health Effects Assessment There is no established health based no effect level for particulate matter exposure. UCBHIG applied the results from the annual dispersion model (figure AQ-3) to the health effects assessment methodology used and documented by CARB in their 2002 Particulate Matter Standards to evaluate the health impacts of particulate matter exposure on the project site attributable to freeway vehicle traffic. Concentration Response Functions for particulate matter exposure and health effects were replicated from those used and documented in the 2002 CARB Standards Report. The Standards Report also provided incidence rates for diseases and the Alameda County Public Health Dept provided crude mortality rates for Oakland using California Vital Statistics Data. The age distribution of residents was assumed to be similar to that for Oakland based on American Community Survey 2005 data for Oakland California.

Based on the above parameters and CARB health effects methodology, the health effects of the 2 ug /m³ annual average contribution from the I-880 freeway on a hypothetical population of 10,000

³¹ Peters, A , et al, "Increased particulate air pollution and the triggering of myocardial infarction." Circulation, 103:2820-2815 (2001)

³² Webmet.com, The Meteorological Resource Center, http://www.webmet.com/State_pages/met_ca.htm

³³ *ibid.*

³⁴ CALRoads View, Air Dispersion Models for Roadways, Lake Environmental, 2006

over 10 years include: 8 events of premature mortality, 4 cases of chronic bronchitis, 106 emergency room visits for asthma, 555 days of upper respiratory symptoms, and 154 asthma attacks.

Thus, based both on proximity and modeled levels exposure, residential development adjacent to the I-880 freeway at the Oak to Ninth project site will exposure future residents to hazardous levels of vehicle related air pollutants. If exposures are not mitigated, residents living on the parcels adjacent to I-800 should be expected to experience significant adverse health effects.

Figure AQ-1. California Air Resources Board 500 ft Buffer from I-880 freeway

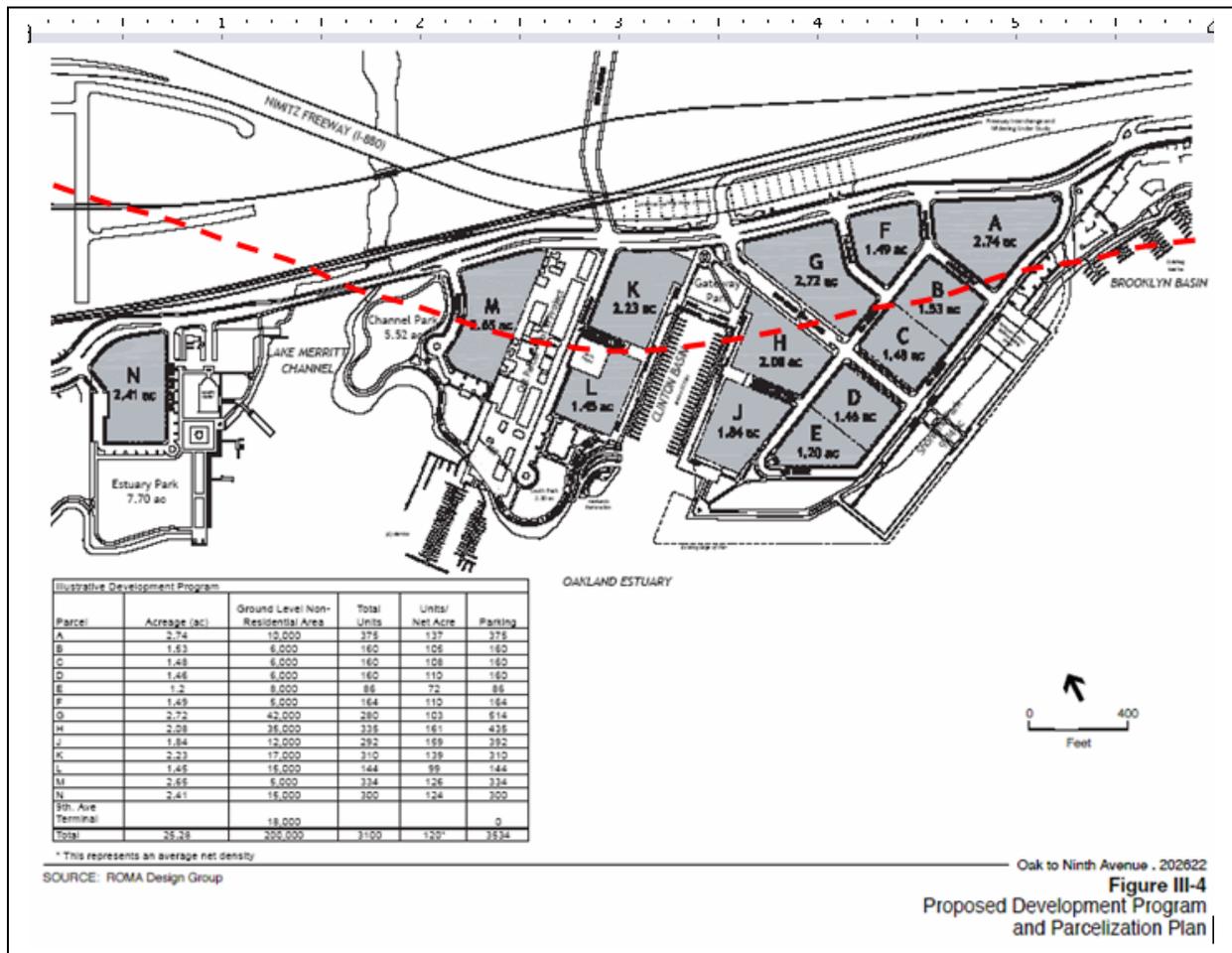


Figure AQ-2. Worst Case PM 10 ($\mu\text{g}/\text{m}^3$) levels: Results CAL3QHCR model for Oak to Ninth

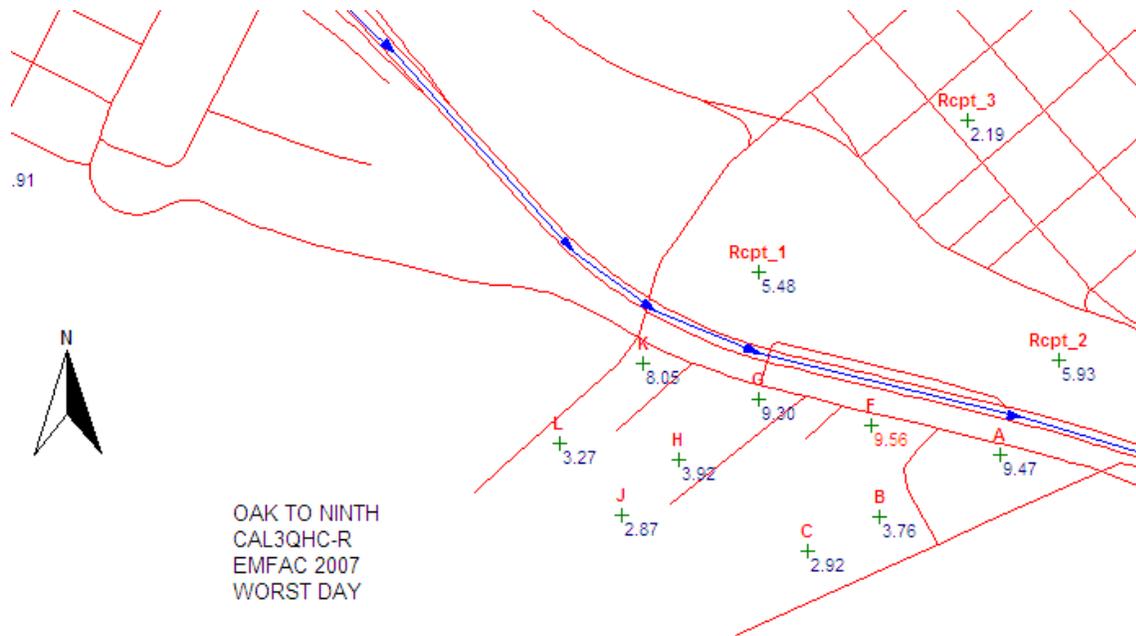
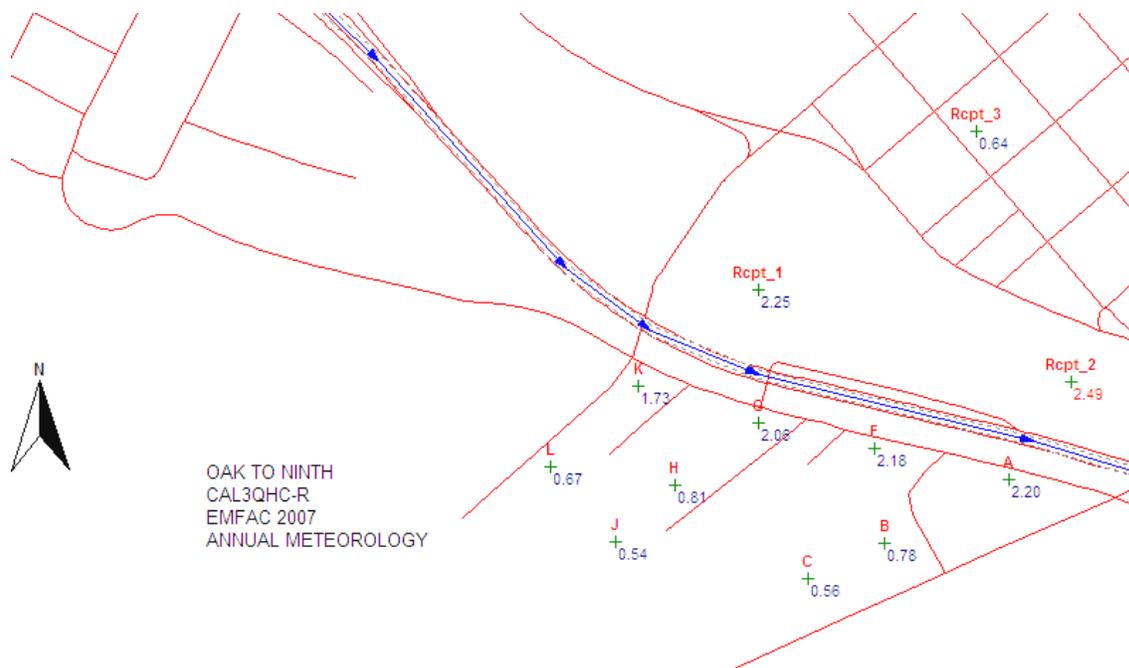


Figure AQ-3. Annual Average PM 10 ($\mu\text{g}/\text{m}^3$) levels: Results CAL3QHCR model for Oak to Ninth



Roadway emissions and health effects in adjacent neighborhoods

The project may have cumulative air quality impacts from project operations on air quality impacts on adjacent neighborhoods. According to the project EIR, the development of the Oak-to-Ninth Avenue Project will result in an additional 27,110 daily vehicle trips external to the project. The DEIR/FEIR did not evaluate vehicle-related particulate matter effects on residents of Jack London Square, Chinatown, Downtown, Lower San Antonio, and around Lake Merritt. Sensitive receptors (for air quality impacts) reside in these areas including, the elderly, young children, and people with pre-existing illnesses, and people performing strenuous work outdoors. Traffic volume increases of 11% in surrounding neighborhoods suggest that the project increase exposure to vehicle related pollutants for residents and workers in these areas. This HIA did not measure or model expected air pollutant levels in neighborhoods adjacent to the project.

Freeway Air Toxics Emissions and Cancer Risks

The Oak to Ninth DEIR states on page IV.C-24 that the incremental cancer risk from exposure to freeway emissions would range from 15 to 30 in a million people. It goes on to state on page IV.C-25 that the total cumulative risk from diesel particulate matter could range from 315 to 330 in a million when background emissions and freeway emissions are combined. The DEIR states on page IV.C-25 that “there are no specific recommendations on acceptable cancer risks from operations not related to on a land use.” The District does have thresholds of significance for toxic air contaminants, of which diesel PM is one, in the *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans (1999)*. These guidelines state that a project would result in a significant impact if the “probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in one million.” It appears that this project could result in potential risk that exceeds the District’s significance thresholds and could result in a significant impact.

F. Recommendations for Design and Mitigations

Developing residential uses on infill sites is challenging; still it is necessary to choose sites in the Bay Area that do not pose an elevated risk to human health for future residents. Based on a full analysis of air quality health effects on current and future area residents the project should plan, engineer, design, and build the new development in such a manner that mitigates air quality and noise exposures. Essential air quality mitigation measures appropriate for this project include

1. Evaluating modifications to the project footprint to reduce the number residential dwellings within 500 feet of interstate I-880
2. Notifying all potential buyers that the property they are occupying has air quality risks and educate them in the proper use of any installed air filtration.

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3. Requiring, as an additional condition of development, prospective monitoring of particulate matter hot spots both on the Oak to Ninth site and in neighborhoods to the east, northeast, and southeast.
4. Developing requirements for air quality mitigation measures and / or traffic demand management measures that would be triggered by local particulate matter levels that exceed California standards.

If development proceeds within 500 feet, Residential uses should incorporate all feasible mitigation measures to reduce the health impacts to new project residents. These measures to reduce pollutant emissions for residents in proximity to I-880 should include:

1. Providing residential units with individual HVAC systems in order to allow adequate ventilation with windows closed
2. Locating air intake systems for heating, ventilation, and air conditioning (HVAC) systems as far away from existing air pollution sources as possible;
3. Use mechanical ventilation with the following parameters: ASHRAE 85% supply air filters; ≥ 1 air exchanges per hour of fresh outside filtered air, ≥ 4 air exchanges / hour recirculation; ≤ 0.25 air exchanges per hour in unfiltered infiltration. Such a system would remove 80% of fine particulate matter.³⁵ Develop a maintenance plan to ensure the filtering system is properly maintained;
4. Utilizing only fixed windows next to any existing sources of pollution.

The project could employ a number of potentially feasible additional design changes to reduce air pollution emissions to residents of surrounding neighborhoods and the region. Additional measures to further reduce the project's significant air quality impacts include:

1. Providing 110 and 220 outlets at project loading docks so that trucks can connect with these outlets to power their auxiliary equipment;
2. Utilizing only electric forklifts and landscaping equipment in the project operations and the operations of tenants
3. Requiring the transit shuttle to run at least every 30 minutes in the off-peak and every 15 minutes during peak travel times with hours that match BART's schedule;
4. Unbundling the cost of parking from residential rents to encourage residents to reduce their car ownership rates;
5. Implementing a car share program;

³⁵ William J. Fisk and David Faulkner, Performance and Costs of Particle Air Filtration Technologies, Indoor Air 12(4):223-234

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6. Subsidizing transit passes to employees and residents at the project site (e.g. AC Transit's EcoPass program).
7. Requiring secured bicycle parking for *both* employees and residents;
8. Requiring commercial tenants to provide a parking cash-out program to their employees to reduce the likelihood of driving alone;
9. Providing a safe route for children living at the project can safely get to and from school by walking and bicycling.
10. Providing a safe route for walking and bicycling to area BART stations.

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Chapter 7 Community Noise

A. Summary

The Development of the Oak to Ninth Project will result in exposure to future residents of high levels of community noise. Parcels A, F, G, K, and M, closest to the freeway, have background noise levels currently over Ldn 70 dBA, and residential uses at these levels are considered normally unacceptable to clearly unacceptable based upon the Oakland General Plan. In addition they are subjected to numerous short term railroad horn noise exposures at the 5th. Street railroad crossing. The USEPA estimates that these unmitigated noise levels will result in community reactions ranging from threats of legal action to vigorous protest and may result in elevated blood pressure, circulatory disease, ulcer, colitis, and sleep deprivation. Implementation and evaluation of a comprehensive set of indoor and outdoor noise mitigations should be required as a condition of development.

Health Impacts

1. Regardless of the feasibility and effectiveness of indoor noise mitigations, some project residents are likely to be exposed to environmental noise to an extent that can create annoyance and adversely effect school and work performance.
2. Without mitigations, we estimate 53% of residents in dwellings adjacent to the railway line will experience sleep disturbance; even with a highly effective noise mitigation program capable of reducing noise by 50dB, 7% of residents would experience sleep disturbance.
3. Existing project area outdoor noise levels of greater than 70 dB will prevent normal voice level communication at unprotected exterior locations.
4. Plans under consideration for development of affordable housing include locating below market rate housing on project area parcels with the highest levels of noise create an adverse environmental justice impact.

Recommendations for Design and Mitigation

1. Reduce the speeds of the traffic on the Embarcadero and project's residential streets.
2. Notify all potential buyers that the property they are occupying has noise risks.
3. Installation of noise-insulating windows, exterior doors and walls, and individual HVAC system
4. Design units exposed to high noise levels with interior courtyards and patios that open into acoustically protected and shielded areas.
5. Require, as a condition of development, all feasible traffic demand management actions.
6. Integrate below market and market rate units in the same buildings to prevent environmental justice impacts.

B. Background: Noise and Health Impacts

Long term exposure to moderate levels of environmental noise can adversely affect sleep, school and work performance, and cardiovascular disease.¹ The health impacts of environmental noise depend on the intensity of noise, on the duration of exposure, and the context of exposure. For example, the World Health Organization noise exposure thresholds are much lower threshold for levels inside (30 dB) and outside (45 dB) homes than for commercial (70 dB) and other public areas.

Noise affects sleep both by waking people up and reducing the quality of sleep. A 10 dB change is generally perceived by the human ear as a doubling of noise. According to the WHO, reductions of noise by 6-14 dBA result in subjective and objective improvements in sleep. Environmental noise is a risk factor for cardiovascular disease. Chronic road noise can affect cognitive performance of children including difficulty keeping attention, concentrating and remembering, poorer reading ability, and poorer discrimination between sounds.² The combination of noise and poor quality housing can have additive effects. In one study, a combination of these factors was associated with higher stress and stress hormone levels.³ A comprehensive synthesis of the noise health effects and control is contained in the World Health Organization’s Guidelines for Community Noise.⁴

Determinants of Urban Noise	Health Effects	Modifying Factors	Mitigations
Vehicle volume, Vehicle type Vehicle speed Roadway Conditions Mechanical Equipment	Sleep Stress Cognitive Function Hypertension Annoyance Speech Intelligibility	Noise Intensity Noise Duration Perceived risk associated with noise	Building Orientation Insulated windows, doors, and walls Ventilation System Placement Buffers Traffic Calming

C. Established Standards and Health Objectives

The Oakland General Plan Noise Element, adopted in 2005, provides guidelines for assessing compatibility between various land uses and ambient levels of noise. With regards to residential uses, Oakland General Plan Noise Element’s Land Use Compatibility Chart considers residential uses “normally acceptable” if the Ldn is less than 60 dB. Residential uses are conditionally acceptable if the Ldn is between 60 and 70 dB but development requires noise analysis and mitigation. Residential uses are normally unacceptable at levels over 70dB and the General Plan proscribes residential uses as “clearly unacceptable” where noise levels are greater than 75 dB Ldn, stating that such “development should not be undertaken”.

¹ Dora C and Phillips M. Transport, Environment, and Health reviews of evidence for relationships between transport and health World Health Organization 1999.

² Noise and Health: Making the Link London Health Commission 2003
<http://www.phel.gov.uk/hiadocs/noiseandhealth.pdf>

³ Evans G, Marcynyszyn LA. Environmental Justice, Cumulative Environmental Risk, and Health among Low- and Middle-Income Children in Upstate New York. American Journal of Public Health 2004;94: 1942-1944.

⁴ Available at: <http://www.who.int/docstore/peh/noise/guidelines2.html>.

Oakland General Plan Compatibility Chart for Residential Uses and Community Noise		
Exposure (Ldn, dB)	Guidance	Interpretation
< 60	Normally acceptable.	Development may occur without an analysis of potential noise impacts to the proposed development.
60 - 70	Conditionally acceptable	Development should be undertaken only after an analysis of noise-reduction requirements is conducted, and if necessary noise-mitigating features are included in the design
70-75	Normally Unacceptable	Development should be discouraged; it may be undertaken only if a detailed analysis of the noise reduction requirements is conducted, and if highly effective noise insulation, mitigation, or abatement features are included in the design.
> 75	Clearly Unacceptable	Development should not be undertaken.

Title 24 of the California Code of Regulations provides for noise insulation standards for residential buildings. The code requires an acoustical study whenever a residential building is proposed near an existing or planned freeway, major roadway, rail line, or industrial noise source and where those noise sources cumulatively produce an outdoor Ldn of 60 dB or higher. Residences must be designed to limit interior noise to no more than a Ldn of 45 dB.

D. Noise Conditions at the Project

Standard methods exist to measure environmental noise and to predict changes in noise based on changes in vehicle traffic. The Oak to Ninth Project’s DEIR contained both field measurements of noise and a forecasting analysis predicting the changes in noise due to the project. Table IV.G-3 describes both long and short term measures at 23 locations on the project taken in 2002 by Charles M. Salter Associates measured long term environmental noise levels on parcels A, G, F, K, and M which are situated adjacent to the Embarcadero are very loud, with long term measures generally above 70 dB and above 75 Ldn at many measurement points (DEIR IV.G-11) These high noise levels can be attributed primarily to the parcels’ location in close proximity to I-880 and the adjacent railway corridor. Correspondingly, measured noise levels attenuate with distance from the freeway.

E. Project Health Impacts

Land use development may increase the exposure to environmental noise in several ways: (1) creating new uses that produce noise (e.g., factories); (2) construction; (3) increasing vehicle trips; and (4) bringing people in proximity to sources of noise. The project EIR concluded that the project would cause significant environmental impacts by developing a new residential uses in an area with high ambient noise levels.

Effects on overall health and well-being

The USEPA estimates that these unmitigated noise levels will result in community reactions ranging from threats of legal action to vigorous protest.⁵ This level of annoyance is directly related to several health effects associated with noise induced stress response, including: elevated blood pressure, circulatory disease, ulcer, and colitis. Regardless of the ultimate feasibility and effectiveness of indoor noise mitigations, some project residents are likely to be exposed to environmental noise to an extent that can adversely affect subjective well-being and school and work performance.

Effects on sleep disturbance

The DEIR failed to directly evaluate train horn noise and its potential affect upon sleep disturbance. The Federal Railroad Administration has determined the average train horn creates a single event level of 107 SEL at 100 feet.⁶ The Oak to Ninth DEIR states that in excess of 40 trains per day will cross the 5th Avenue railroad crossing resulting in exposures in excess of 103 SEL at parcels K and M. With windows open the exterior to interior building attenuation will be about 10 dBA resulting in an interior noise level of approximately 93 SEL. The U.S. Federal Interagency Committee on Noise has found that the relationship between sleep disturbance and noise is as follows⁷.

$$\%Awakening = (7.079 \times 10^{-6}) \times SEL^{3.496}$$

Without noise mitigations, we estimated that approximately 53% of the exposed population would be awakened. However, if acoustical insulation and HVAC were included in the design sufficient to reduce noise 50 dBA, we estimate a SEL of 53 dBA and a percent awakening of 7 percent.

Effects on speech

Existing project area outdoor noise levels of greater than 70 dB will prevent normal voice level communication at unprotected exterior locations.⁸

Environmental justice impacts

Project plans under consideration for development of affordable housing include locating below market rate housing on project area parcels with the highest levels of noise. Members of low income households may be more sensitive to the health and developmental impacts of high environmental noise levels. The construction of BMR units on high noise parcels creates adverse environmental justice impacts.

F. Recommendations for Design and Mitigation

California law requires the construction of dwellings include noise mitigation; however, these standards only affect indoor noise exposure. Other measures that might affect ambient noise include (1) Re-engineering, reducing or altering timing of automobile and truck traffic on routes; (2) Requiring noise controls on indoor and outdoor commercial equipment; (3) Re-orienting buildings in ways that create sound buffers for outdoor spaces; (4) Reductions in vehicle speeds. The Project EIR concludes that full

⁵ EPA, Noise Effects Handbook, 1979, p. 8-1, <http://www.nonoise.org/library/handbook/handbook.htm>

⁶ <http://www.fra.dot.gov/us/content/1174>

⁷ <http://www.fican.org/pdf/nai-8-92.pdf>

⁸ *ibid.*, p. 4-4, <http://www.nonoise.org/library/handbook/handbook.htm>

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Chapter 7: Noise

mitigation, for instance via the construction of sound barrier walls is not possible due to the height of the proposed residential towers. The following are recommended actions to reduce project resident exposure to noise.

- Reduce the speeds of the traffic on the Embarcadero and project's residential streets through traffic calming measures.
- Require, as a condition of development, all feasible traffic demand management actions, including shuttle service to BART at frequency of no less than every 15 minutes, a pedestrian and bike pathway connecting development to the BART and surrounding neighborhoods, and greater affordable housing.
- Notify all potential buyers that the property they are occupying has significant noise risks .
- Construction standards required to meet Title 24 noise insulation requirements requiring the use of noise-insulating windows, acoustical exterior doors and walls would also be appropriate mitigations.
- Design units exposed to high noise levels with interior courtyards and patios that open into acoustically protected and shielded areas.
- Integrate below market and market rate units in the same buildings to prevent environmental justice impacts.
- Consider modifying the layout of the project in a way that places a multilevel parking structure to serve as an acoustical barrier between the residences and the freeway.

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Chapter 8

Draft HIA Comments & Responses

Oak to Ninth Health Impact Assessment Chapter 8. Response to Comments

Chapter Overview

The following represent the authors' response to public comments on the UCBHIG Oak to Ninth Draft Health Impact Assessment. The responses are organized by chapter and prefaced by the name of the commenter. Written comments were provided by two private consulting firms, Environ Consulting and Fehr and Peers, on behalf of the property developer, Signature Properties. These comments were published by the City of Oakland. Comments are either direct quotes from the written comment or abstracted phrases.

Chapter 1. Introduction and Scope

The following comments were submitted by Environ Consulting on behalf of Signature Properties. June 19, 2006.

- 1. Statements relating development to health are not substantiated with evidence** We acknowledge that most general statement about health and development are not referenced in the introduction; however, extensive references to empirical research supporting particular relationships are provided in Section B of each chapter.
- 2. The HIA fails to State project all project facts relevant to health impacts** The City of Oakland, as the lead agency, has the formal responsibility to describe the project and conduct an adequate analysis of potentially significant human health effects resulting from environmental changes associated with this project. The Oak to Ninth HIA is intended to be complimentary to the City required analysis. The HIA takes as is the City's Description of the project and available public information, such as the development agreement, is not reproduced in the analysis. The revised final HIA provide a link to all city documents related to the project. UCBHIG acknowledges that the Oak to Ninth HIA focused on limited set of issues: pedestrian safety, respiratory disease hazards, noise-related hazards, open space accessibility, and school facilities capacity. The selection of these particular issues was guided by public comments on the EIR and public testimony in general. For example, the Chair of the Planning Commission, requested the planning department to consider and conduct an analysis of impacts on pedestrian safety. Resources and capacity did not allow a comprehensive assessment of all project effects, both positive and negative, using all possible analytic techniques.
- 3. UCBHIG did not inform proponents of the Oak to Ninth Development and the City about the HIA process until shortly before the planning commission hearing.** UCBHIG conducted the HIA between February and May 2006; however, on of the authors of the HIA, had alerted the City for the need for the analysis in October 2005 in a comment letter on the draft EIR For example, the comment letter points out that conclusion in the DEIR related to pedestrian safety and air quality were not supported by adequate evidence or analysis. The HIA attempted to provide additional evidence and original analysis related to potentially significant adverse impacts where that the EIR was essentially silent. UCBHIG invited multiple stakeholders including the developer to class discussions on the project. Communications between the HIA authors and the City are provided in a new table 2 of Chapter 1 in the revised final HIA.
- 4. Proven methods for predicting health impacts do not exist** UCBHIG acknowledges that HIA is a developing practice especially in the USA and there not standardized protocols for analyzing all pathways between development and health. However, the practice of HIA is not entirely novel. The technique of health risk assessment routinely associates exposure to an environmental agent with a single health outcomes and is used to establish regulatory safety thresholds. Under requirements for cost-benefit analysis, the Federal EPA has conducts health risk assessments for multiple health outcomes related to changes in regulatory thresholds. UCBHIG supports its findings either by using established environmental planning and assessment methods (including those referenced by the USEPA), by employing established principles of risk assessment, by available secondary data, or by making qualitative logical inferences based available peer-

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reviewed research. For each issue, we enumerate feasible mitigations to reduce hazards to health.

5. **The report does not provide a description of the screening process** A brief description of the screening process is provided in the revised final HIA.
6. **The HIA is not justified based on Austrian Health Impact Guidance** Likely impacts to health, research questions, and research methods are typically identified in the scoping phase of a HIA. In the context of group dialogue, UCBHIG participants determined that the Oak to Ninth Avenue development project had potentially significant influence on many determinants of human health including, housing, social segregation, open space, air quality, environmental noise, traffic hazards, and its proximity to socially vulnerable populations. For example, the project's proximity to the 880 freeway creates a potential for increased hazards of respiratory disease and noise related health effects for project residents. The absence of a project area school combined with area school crowding results in safety hazards for students choosing to walk or bike to school or increased traffic. Limited analysis of these issues in the DEIR contributed to the decision to conduct this HIA. Questions addressed in the HIA are provided in a new scoping table in the revised final HIA.
7. **The authors were the only members of the public to express project concerns as public health issues.** Comments on the Draft EIR provided by several community organizations, including the Sierra Club, the East Bay Local Community Development Corporation, as well as by the Chair of the Oakland Planning Commission echoed the need for study of potential for impacts on health, particularly impacts associated with traffic injuries, noise, and freeway vehicle emissions.
8. **The HIA did not involve adequate stakeholder involvement** Processes for HIA range from expert analysis to facilitated dialogues and the degree of participation depends on timing, resources, and the willingness of all parties to agree on scope and purpose. Ideally, all stakeholders mutually agree to conduct and oversee an HIA. In our case, our group reviewed public documents, spoke to stakeholders, invited the developer to a class discussion, and reviewed all public documents available on the project. We learned that almost all of the issues analyzed in the HIA were issues documented in the developer's community outreach of 2005 and in the scoping for the EIR. Concerns about open space access, air quality and noise health effects, and pedestrian injury were well-documented in comments on the DEIR in October 1995. Based on the DEIR and responses to the public comments on the DEIR, it appeared that many of these issues did not have a place in the EIR or traditional EIR practice was not adequate to analyze these issues. Members of our group thus believe we have served the City and the public interest by bringing into the process additional evidence and analysis on issues of public concern.

Chapter 2. Public Participation

The following comments were submitted by Environ Consulting on behalf of Signature Properties. June 19, 2006.

9. The section on planning, participation, and public health relates to large-scale societal issues not related to this Project The section referenced by the comment contains empirical evidence justifying why the quality of public participation is a determinant of health.
10. The City has met all legal requirements with regards to public participation. The section referenced by the comment contains non-binding principles and guidelines on public participation. The section does not make any judgments about the project
11. Neither the Port RFQ nor the EPP recommended but did not require the preparation of a specific plan; the development plan and associated EIR, and other associated documents achieve the objectives of a Specific Plan. The comment is misleading. The production of a specific plan has a

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procedural as well as substantive dimension. There is a substantive difference between developing a specific plan via responsive community process and producing a plan with the required content of a specific plan.

12. **Residential uses were originally envisioned as part of the mix of uses envisioned by the EPP** The comment is misleading. It is accurate to say the EPP envisioned some residential uses there is a substantive difference between the inclusion of residential uses in the plans for a regional recreational—commercial waterfront destination and a mixed-use residential neighborhood as the developer proposed
13. **Milestones in the RFQ were preliminary** Regardless of timelines, developer did not undertake specific tasks, particularly a community planning process to guide the design and objectives of the development
14. **Proposing a viable development was a responsibility of the developer** UCBHIG contends that significant departures from the EPP vision should have been made with public input; there is a difference between using public input to develop a plan and presenting a plan for responsive and reactive public input.
15. **Public agencies did not withhold economic feasibility reports** UCBHIG refers to a 2002 report not a March 2006 economic feasibility report. This released to the public only after a Brown Act request to the Port by Arthur Levy.
16. **Evidence does not support the contention that the property is undervalued.** Both the original per unit land value assessment and the recent offer for the 2nd Avenue school District property in Oakland support the contention that the price of land is significantly below the market value accounting for the developer provided public benefits. A new analysis of land value is provided in the revised final HIA section on housing
17. **None of the changes requested by the City in conjunction with project approval represent a significant departure from the EPP.** The request for amendments and the nature of the amendments both suggest a significant change.
18. **The project is consistent with the goals and objectives of the city undermining claims about the value of a specific planning process.** UCBHIG believes that there is a fundamental difference between using public input to develop a plan and presenting a plan for responsive and reactive public input. That the project as proposed has garnered substantial public support does not imply that the process used to design the project involved meaningful public input.
19. **Page II-6, Para 5 The development has been responsive to public concerns reflected by removal from development of Parcel N, preservation of portions of the Terminal Building; offering for resale land for affordable housing; and funding pedestrian safety studies in Chinatown.** The above listed responsive changes to the project were all made well after the project's approval by the Planning Commission in March 2006, and the public first learned about these responsive changes at the June 20th City Council Hearing. Again, these negotiated changes negotiated for securing project approval in response to significant and vocal public opposition, does not provide evidence that the public had a meaningful role in planning and designing the project.

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Chapter 3. Parks and Natural Spaces

The following comments were submitted by Environ Consulting on behalf of Signature Properties. June 19, 2006.

20. **The City of Oakland sets forth a goal, not a standard, of four acres of parkland for every 1,000 residents. As discussed below, the Oak to Ninth Project exceeds this goal.** The HIA clearly acknowledges that residents living at the project site will benefit from the inclusion of open space at the site. The issue of concern is access to this open space resource for other residents of Oakland. As noted in the HIA and in the response to the HIA, it is important that this space be linked to trails for pedestrians and bikes, having parking. While the response to the HIA notes that it is expected that the space would attract visitors from throughout the region, suggestions provided in the HIA for providing public transit services, visibility, and pedestrian safety improvements would improve access to the project.
21. **References for accessibility** In regard to the correct citation for the distance-based metric to evaluate park accessibility, the National Personal Transportation Survey (1995) indicates that a majority of pedestrian trips are one-quarter mile or less, with one mile generally being the limit that most people are willing to travel on foot. This is roughly equivalent to a 5-10 minute walk to reach a specific destination. The ICMP acknowledges the importance of the quarter mile distance for walking in its Smart Growth documents (see Getting to Smart Growth: 100 policies for implementation, page 10: <http://www.smartgrowth.org/pdf/gettosg.pdf>).
22. **It is not possible for the Oak to Ninth Project to address the distribution of parkland within the rest of the City of Oakland.** Because the open space at the site is intended to serve all residents in Oakland, and as stated in the response, it is expected that the space would attract visitors from throughout the region, efforts should be made to make the open space as accessible as possible. Improving accessibility would benefit the project by providing more people access to the playgrounds, picnic areas, and gardens mentioned that would be included in the project.
23. **The EPP does not contain any acreage requirements for open space.** To be clear, as stated in the Draft EIR, the EPP established land use zoning of "Planned Waterfront Development-1" on nearly the entire project site, except Estuary Park and the Jack London Aquatic Center which were designated as Park, Open Space, and Promenades. The PWD-1 designation intends for:
- "future development in the area should be primarily public recreational uses...; with primary uses including light industrial, manufacturing, assembly, artists workshops, cultural, work/live studios, offices, neighborhood commercial, and restaurants; and including hotel, conference, restaurants, commercial-recreation, and cultural. Water uses also included."
- "The project would not be consistent with the existing land use classification or the existing zoning and would require a General Plan Amendment and Rezoning to accommodate the proposed densities and residential uses."

Given the land use zoning changes, the HIA intends to call into question the proportion of land use that would be devoted to open space.

24. **Access to the project site is discussed in the Draft EIR. Pedestrian improvements are discussed in EIR Chapter IV. The project will not block any existing vistas. Open space will be owned and controlled by the City.** The Draft EIR was unclear about funding for Bicycle/Pedestrian improvements: "*Bicycle/Pedestrian Improvements*."

The City of Oakland Bicycle Master Plan, as adopted in 1999, recommended several improvements to the bicycle and pedestrian facilities within the project study area, including: Converting the Class II facilities on Lakeshore Avenue to Class I configuration,

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Adding Class II bicycle lanes on 5th Avenue, 14th Avenue, 14th Street, and Foothill Boulevard, Designating several downtown streets as Class III bicycle routes. These improvements have not been designed, and are not fully funded at this time, and therefore, cannot be assumed to be in place for this EIR.”

Likewise it is clarification on the commitments to the TMDP included in the Final EIR would be appreciated.

25. **The response to the HIA has stated that Class I bicycle /pedestrian trails will connect to Lake Merritt and BART, and that AC Transit lines, a shuttle service to BART, a ride share service, and bike and pedestrian measures will be implemented for the project.** We applaud the recognition in the response to the HIA of the importance of pedestrian and bike connectivity. However, it is unclear from the response, which actual routes will provide the connections. The HIA suggested improvements and connectivity via the channel trail, a class I route, which would be safe because of its separation from motor vehicle traffic, and along 5th Ave, which the Draft EIR states is the “roadway that would likely serve as a primary project access route”

While the response states that class I bicycle/pedestrian trails will connect to the existing trails to Lake Merritt/BART/AC Transit, it is unclear whether such connections will be new or just rely on existing connections, such as the circuitous class III trail along Embarcadero, over the railroad crossings on Oak St, and under the 880 freeway to connect to the southern end of the Channel trail (figure 1). A new dedicated connection over Embarcadero would be more appropriate. Clarification on the exact routes of the proposed connections would be useful.

Chapter 4. Pedestrian Safety

The following comments were submitted by Environ Consulting on behalf of Signature Properties. June 19, 2006.

26. **The Background section of this analysis is not relevant to the project** The background section of the HIA is intended to project a general overview of the causes and consequences of pedestrian injuries
27. **Multiple factors are responsible for pedestrian injuries** UCBHIG believe that the evidence from empirical studies, including multivariate, multi-level studies, supports the fact that vehicles are an independent and significant causal factor for pedestrian injuries independent of transportation facilities and the characteristics and behaviors of individuals. UCBHIG also believes that with regards to environmental factors, distinctions should be made among modifiable environmental causes such as the volume of people or vehicle volume, non modifiable environmental factors such as weather and night, and protective safety countermeasures treatments.
28. **Traffic is not an established causal factor for pedestrian injuries in Oakland** One purpose of scientific inquiry is to establish generalized relationships that can then be applied to multiple contexts. It is important to understand how local contexts affect generalized causal relationships, but these causal relationships need not be re-established *de novo* for each context.
29. **Standards do not exist for significant pedestrian injury impacts associated with development** We agree that, to date, California jurisdictions have not provided pedestrian injury significance thresholds for CEQA. However, the absence of an existing environmental standard does not preclude a lead agency from making a finding of significant adverse impact under CEQA.

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30. The HIA does not provide the basis for its determination of a baseline injury rate A detailed explanation of how the HIA estimates the baseline injury rate is provided in the revised final HIA. The Statewide Integrated Traffic Records System (SWITRS) provided data on all reported pedestrian injuries occurring in Oakland. In Oakland, 2045 pedestrian collisions with motor vehicles occurred between the years of 2000-2005. Pedestrian injuries were mapped to intersections using ArcGIS, with over 90% of 2000-2005 injuries successfully geocoded. A traffic analysis conducted for the Oak to Ninth Project and documented in the Draft EIR provided baseline and peak-hour traffic conditions for 51 intersections. A polygon drawn around the 51 EIR intersections bounded 545 pedestrian-vehicle collisions resulting in pedestrian injuries during this time period. Since~10% of collisions could not be geo-coded, we assumed the current annual average number of pedestrian injuries in affected by project-traffic was approximately 100 per year. Because some pedestrian injuries may not be reported, this may underestimate the actual pedestrian injury rates.

The following comments were provided by Chris Grey and Mathew Ridgeway of Fehr and Peers on behalf of Signature Properties. June 6 2006

31. Comment 1.a-1.b The conclusion that increasing traffic volumes increases pedestrian collision risk lacks site specificity We agree that local empirical research establishing a relationship between vehicle volume and injuries would be more context-specific. However, studies supporting a volume-pedestrian injury nexus can be generalized because it is supported by peer-reviewed studies in diverse urban settings. Creating generalizable evidence is one purpose of scientific inquiry. We are not aware of any unique about the characteristics of project related vehicle traffic that would make it less or more hazardous than traffic elsewhere.

32. Comment 1.c Dr Bhatia's analysis is based on hypothetical number of pedestrian collisions Baseline data on pedestrian injuries was not available at the time of the March 3rd 2006 analysis. In the draft HIA dated June 1, 2006, we describe our method of assessing the baseline number of injuries. Briefly, the Statewide Integrated Traffic Records System (SWITRS) provided data on all reported pedestrian injuries occurring in Oakland. In Oakland, 2045 pedestrian collisions with motor vehicles occurred between the years of 2000-2005. Pedestrian injuries were mapped to intersections using ArcGIS, with over 90% of 2000-2005 injuries successfully geocoded. A traffic analysis conducted for the Oak to Ninth Project and documented in the Draft EIR provided baseline and peak-hour traffic conditions for 51 intersections. A polygon drawn around the 51 EIR intersections bounded 545 pedestrian-vehicle collisions resulting in pedestrian injuries during this time period. Since~10% of collisions could not be geo-coded, we assumed the current annual average number of pedestrian injuries in affected by project-traffic was approximately 100 per year. Because some pedestrian injuries may not be reported, this may underestimate the actual pedestrian injury rates.

33. Comment 2.a There is no federally approved traffic safety assessment method to assess whether an intersection is safe and whether project-level changes to an intersection increase the likelihood of pedestrian collisions The method used in this study attempts to assess the change in pedestrian injury at the area level and not at the level of the intersection. It is not a method to assess safety at an intersection. The focus on the area level analysis reflects that approximately, 75% of pedestrian-vehicle collisions do not occur at intersection. The conclusion that increasing project traffic increases will increase pedestrian collisions at the area level is based on the logical and empirical nexus between vehicle volume and the probability of pedestrian-vehicle collisions. This logical inference should hold unless (1) the traffic increases only on roadways not accessible to pedestrians; (2) the project or a related trend or action results in a reduction of pedestrian volume on affected roadways; or (3) the project includes new design to reduce pedestrian-vehicle conflicts. The absence of an approved or standard methodology challenges analysis but does not obviate the requirement to use other available methods to

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analyze a potentially significant adverse environmental impact. Human health risk assessment methods are sufficiently robust and flexible to predict human health hazards based on empirical environmental-health relationships. Appropriate use of risk assessment methods requires a practitioner to make and document certain simplifying assumptions. In many cases, these assumptions can be evaluated through sensitivity analysis. We acknowledge that the March 3rd letter and the June 1, 2006 Public Review Draft could more fully document all methodological assumptions. In the revised final HIA we include the following list of all of the main assumptions used in our pedestrian injury analysis: **(a)** The relationship between volume and injuries for road facility in areas affected by project-related traffic can be robustly represented by a power function with a Beta of 0.5; **(b)** Pedestrian flow does not change in the affected area. (The development is likely to increase pedestrian traffic; however, increased roadway traffic may inhibit pedestrian activity; **(c)** No new pedestrian safety countermeasures are implemented; **(d)** Vehicle volume changes at intersections evaluated for the LOS analysis are reasonable surrogates for volume changes at adjacent and area roadways bounded by those intersections.

- 34. Comment 2.b. The City of Oakland does not have a policy or other guidance to form the basis of significance criteria for pedestrian injuries** We appreciate the need for a local significance threshold; however, the absence of an established significance threshold for pedestrian injuries does not obviate the need to perform analysis of potentially significant environmental effects. According to CEQA guidance, lead agencies can derive “objectives, criteria, and procedures for the evaluation of projects” from many sources.^{1 2} Standards may be qualitative or quantitative, based on health based standards, service capacity standards, ecological tolerance standards, policies and goals within the city’s general plan, or any other standard based on environmental quality. Ideally, a local jurisdiction adopts significance thresholds via ordinance or regulation after a public process; however, Oakland has not formally adopted comprehensive significance thresholds for any impact under CEQA. Given that Oakland has a pedestrian injury rate several fold greater than USDHHS national objectives, quantifiable increases in pedestrian injuries in excess of injuries related to population growth would, on their face, appear to be significant.
- 35. Comment 3.a-d There exists no precedent for such an analysis** The absence of a precedent does not obviate the need to perform analysis of potentially significant environmental effects nor is the lack of precedence a substantive challenge to the validity of the analysis. Environmental Impact Reports conducted under CEQA should and often do apply additional methods when needed. For example, the Oak to Ninth Draft EIR contains a qualitative analysis of displacement. In the public health discipline, risk assessment principles are used commonly in combination with exposure data and effect estimates from empirical research to apply novel applied methods to specific contexts.
- 36. Comment 3.e. There is not a way to determine the adequacy of mitigation for such impacts** Empirical research provides evidence for the effect of pedestrian safety countermeasures on pedestrian injury. For example, the study by Markowitz, et al. and reviewed by Fehr and Peers is one example of such evidence. The National Cooperative Highway Research Program’s 2005 State of the Knowledge Report on crash reduction factors for traffic engineering also includes accident reduction factors for pedestrian injuries based on meta-analysis of empirical research. In conducting an HIA of pedestrian safety improvements of the Buford Highway, Centers for Disease Control used accident reduction factors to estimate the injury reduction benefits of a program of countermeasures.

1 California Government Code §21082

2 Thresholds of Significance: Criteria for Defining Environmental Significance. CEQA Technical Advice Series. Sacramento: Office of Planning and Research; 1994

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- 37. Comment 4 The number of pedestrian injuries is a function of environmental factors other than vehicle volume.** We agree with the comment; however it does not acknowledge the capacity (and purpose) of multivariate models to analyze the independent effect of one causal factor from multiple causal factors. While diverse factors affect injury rates, multivariate modeling techniques have allowed researchers to estimate the influence of predictor variables on response variables taking into account variation in other variables; Multiple studies, cited in our analysis, used multi-variate modeling techniques to estimate the effect of vehicle volume on injuries independent of the other factors listed above. These studies consistently show that vehicle volume has a direct, statistically significant and independent effect on injuries.
- 38. Comment 5. The City's Pedestrian Master Plan lists 10 intersections where a majority of the pedestrian collisions occur. None of these intersections carry a significant amount of traffic.** The statement is actually not correct. Based on data in the Oakland Pedestrian Master Plan, no ten individual intersections represented the locations of a majority of collisions. The Master Plan only ranks the top 10 intersections for pedestrian collisions but collectively these intersections represent the sites of only a minority of the city's injuries.
- 39.** According to the Oakland Pedestrian Master Plan (page 25): "Most pedestrian-vehicle collisions occur in downtown, Chinatown, and along vehicle streets." Based on the traffic study conducted in the EIR, the project traffic should be thus expected to affect vehicle volume on intersections and road segments in areas with high prevalence of pedestrian injuries.
- 40. Limited pedestrian collisions at the 50 intersections studied in Oak to Ninth Traffic Study.** The absence of injuries at particular intersections does not preclude the potential for future injuries. Most injuries do not occur at intersections. Furthermore, the EIR analysis did not evaluate all intersections in the area influenced by traffic from the project. Project related traffic can be expected to increase at intersections and road segments surrounding studied intersections. We consider pedestrian injuries at the area level to address the limitation of intersection level pedestrian safety analysis.

Chapter 5. Housing

The following comments were submitted by Environ Consulting on behalf of Signature Properties. June 19, 2006.

- 41. Section of HIA that discusses relationships between housing and health are not project specific.** This section is not intended be site specific but rather provides the reader context on the rational for analytic questions on health and housing.
- 42. Section of HIA discussing standards and health objectives is not site specific** This section is not intended be site specific but rather provides the reader context on applicable objectives and standards.
- 43. There is a surplus production of affordable housing in the Central City East Redevelopment Area.** The findings referenced from the City of Oakland redevelopment agency refer only to redevelopment law requirements. The surplus production in particular areas has not yet been achieved and is only anticipated. Nevertheless, the facts provided by Environ do not contradict the data provided in the HIA revealing that in the current assessment period, Production of low and moderate income housing in Oakland has been substantially lower that State established targets.
- 44. The project will include 420-465 affordable housing units.** First, to note, prior to the June 19, 2006 City Council hearing, the development agreement between the city and Oakland Harbor Partners was silent as to the issue of affordable housing; therefore, this fact was not reflected in the draft HIA of June 1, 2006. This fact is reflected in the revised final HIA. Second, this

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comment statement is not entirely factual. According to the development agreement, the developer is obligated to offer for sale to the City of Oakland air rights on about 4.45 acres of land (Parcels F and G) for the production of affordable housing by a non-profit housing developer. The City of Oakland is obligated also to pay the full subsidy required to produce the affordable housing. Therefore the feasibility of affordable housing is contingent on the City of Oakland’s ability to fund the land purchase and the housing subsidy.

45. No literature is cited to reach the conclusion that the Project may not reflect the diversity of the community. On average, household income in Oakland is lower than that for the metro area as a whole. According to the US Census, the 2000 median household income for Oakland was \$40,055 relative to the current area median income of about \$83,000. Over half of all Oakland households qualified as very low or low income and 37% qualified as very low income. A significant economic gradient exists moving from flatlands to hills. The lower household incomes of Oakland residents mean that market rate housing creates is unaffordable for many. For example, according to the City of Oakland, the Fair Market Rent for a two-bedroom apartment is \$1,238, which requires an income of at least \$49,000. Similarly, purchasing a \$400,000 house requires an income of over \$90,000 in addition to a down payment.

46. Existing area schools will be able to accommodate new students generated as a result of the project The City of Oakland’s June 20th staff report includes the statement that two existing nearby schools, La Escuelita and Franklin Elementary, have the capacity to accommodate additional project-generated students. However, contradicting these statements, the DEIR describes the elementary and middle schools serving the project as already experiencing “high demand” because of their location near downtown central business district. The combined current enrollment of La Esquelita and Lincoln Elementary Schools is about 865 students. According to OUSD School Board Members, school site staff, and OUSD enrollment data, the nearest schools; Lincoln, La Escuelita, and Franklin do not have additional capacity. Both schools are at capacity and they are not losing enrollment. Based on California State Department of Education student generation rates, the project’s 3100 dwelling units would generate 2170 K through 12th grade students, and 1550 Kindergarten through 8th grade students. The estimated number of generated K through 5th grade students would be 1033. The estimate of student generation prepared by the project sponsor (253-304 students) also does not reflect an accepted long-range methodology for determining student capacity need; furthermore, given the 20 year time horizon, the prediction of project demographics and school-age children must reflect area-wide demographic projections and not a current snapshot of the expected market for condominium units.

School	Current Enrollment	Capacity
La Escuelita Elementary	245	250
Lincoln Elementary	614	615

47. The project sponsor will offer for sale Lots F and G to the Redevelopment Agency for the production of affordable housing; thus the project will provide the potential health benefits associated with a mixed income development. This finding is based on the development agreement dated June 19th, 2006. The findings of the Final HIA will be revised to reflect this change.

48. Effects on the jobs-housing balance are not supported by facts The facts provided in the section on social cohesion, documenting housing cost needs for current Oakland households suggest that the housing produced by the project will not be accessible to the majority of those working in Oakland.

49. Recommendations regarding crossing points and common paths of access are not supported by evidence. No comment

Chapter 6. Air Quality

The following comments were submitted by Environ Consulting on behalf of Signature Properties. June 19, 2006.

50. The CARB guidelines for project location are advisory are not intended to imply a buffer.

We do not disagree with this comment. Consistent health research and evidence has demonstrated the nexus between residence in proximity to a roadway or freeway and acute and chronic respiratory disease risks in humans, particularly in children. Based on this research, CARB has published advisory guidance recommending that residential uses not be located within 500 ft of a freeway like I-880. Oak to Ninth residents are likely to experience some adverse health effects due to freeway related traffic noise. The project creates potentially significant environmental impacts on air quality by locating a residential use in proximity to Interstate 880. The City has a responsibility to study freeway related air quality health impacts and their feasible mitigations under CEQA, however, the EIR for the Oak to Ninth Project fails to study non-cancer acute and chronic health effects resulting from residence in proximity to the freeway. Such analysis is feasible via exposure modeling.

51. Site specific analysis to assess air quality is required. We strongly agree with the reviewers call for site specific air quality analysis. However, both the City of Oakland's EIR and addendum to the EIR only speculate on the effect of the freeway on project related particulate matter levels without evidence and analysis. It is the responsibility of the City's EIR to analyze environmental effects that may cause either direct or indirect adverse effects on humans; however, the city does not provide substantive site specific analysis.

Air pollution modeling research in Alameda County further supports the need to do site specific analysis exists for Alameda County. Researchers at the state department of health environmental health investigations branch used regression techniques and simultaneous measurements of nitrogen dioxide to create a model of vehicle emissions exposure based on land use and transportation characteristics using. A model that included total traffic with 40 and 500 meter buffers, proximity of Port land uses, and distance to the nearest road explained 73% of the variation in air pollution levels.³ Measures of NO₂ showed exposure declining with distance both west and east from freeways, suggesting that prevailing winds alone cannot adequately predict exposure.

In the revised final HIA, UCBHIG quantitatively analyzes air quality on the site using a line source dispersion model. Results show that the I-880 freeway contribution to PM₁₀ exposure at Oak to Ninth parcels adjacent to the project is 2ug/m³ as an annual average. Based on the above parameters and CARB health effects methodology, the health effects of the 2 ug /m³ annual average contribution from the I-880 freeway on a hypothetical population of 10,000 over 10 years include: 8 events of premature mortality, 4 cases of chronic bronchitis, 106 emergency room visits for asthma, 555 days of upper respiratory symptoms, and 154 asthma attacks.

52. Exposure to air pollution depends on wind direction and other meteorological factors. We agree with this comment. Meteorological factors are key parameters in line source dispersion models. However, traffic related air pollution declines with distance in Alameda County both east and west of freeways. The comment and the available research underscores the need to base conclusions about pollution exposure on air quality modeling of freeway emissions.

53. The Oak to Ninth HIA uses out of date meteorological data Wind rose provided with the critique shows that the most frequent wind direction is from West to east. Maps of the project show that the freeway runs generally in a direction from West-Northwest to East-Southeast. The

³ Ross Z. EHIB land use regression to predict nitrogen dioxide concentrations in Alameda County, California. ZevRoss Spatial Analysis. June 2005.

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geography along with the updated wind rose data, suggests that freeway vehicle emissions may be entrained and fall at higher levels adjacent to the freeway. The Addendum to the EIR also states that winds blow from the freeway directly towards the proposed development up to 31% of the time. This suggests the potential for significant exposure hazard, re-affirming the need for site specific evaluation through site specific exposure monitoring or modeling. (See above) The development, particularly tall buildings may affect future wind patterns; this possibility should be also considered in exposure modeling.

54. The project is upwind from the major diesel PM source. See comment above.

Chapter 7 Noise

The following comments were submitted by Environ Consulting on behalf of Signature Properties. June 19, 2006.

55. EIR acknowledges and adequately analyzes the noise impacts to the project due to the proximity of the I-880 freeway Noise impacts were one of the few potential health impacts addressed with in the Draft EIR for the Oak to Ninth Ave Project. The inclusion of Noise in scope of the HIA reflects the importance of this issue in the health of future residents, workers, and visitors to the site. We appreciate the responses to our noise chapter that acknowledge the potential noise impacts at this site. With regard to outdoor noise our original concern related to statements in the Draft EIR that stated “the project would locate noise-sensitive multifamily residential uses and public parks in a noise environment where outdoor noise levels are above what is considered “normally acceptable” according to the City of Oakland General Plan Noise Element”, and that outdoor noise exposure would be significant and unavoidable.

56. The EIR requires the project to adhere to the maximum interior noise levels prescribed by Title 24. Compliance will reduce the level of impact to less than significant. We agree that in many cases noise issues can be mitigated. Meeting Title 24 noise regulations would acceptably address indoor noise issues. As stated in the response to the HIA, compliance to Title 24 should occur regardless of location within the development, including residences that are closer to road and rail traffic noise sources, and/or those parcels that are offered as affordable housing.

57. The equation used by the authors to evaluate train noise effects on sleep overestimates impacts on sleep was updated in 1997 base on more recent field studies. Finally we applaud the response to the HIA with respect to better characterizing the effects of noise-induced sleep disturbance. Here, we think it is important to note that quantitative relationships (models) do exist that can be used to estimate health impacts. We believe the response to the HIA is referring to the revised 1997 relationship, which is cited here:
http://www.fican.org/pdf/Effects_AviationNoise_Sleep.pdf

$$\text{Awakenings} = 0.0087 \times (\text{SEL}-30)^{1.79}$$

This estimates a 14% awakening rate for a 93 SEL. Again, we agree that mitigations that attenuate nighttime train horn noise, such as those suggested in the HIA response, can improve the project.

58. The effectiveness of the proposed mitigations is not supported by evidence. Moreover, the Draft EIA states that construction of berms and sound walls along the northern perimeter of the project would not be feasible. It is unclear why the response to the HIA states that “potential health impacts related to noise are presented in the EIR and mitigated to the extent feasible”,

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when the response itself suggests several very good additional mitigations. For example the response suggests several mitigation measures for outdoor noise, including setbacks, locating the majority of open space primarily along the waterfront away from the sources of noise, and using physical obstructions such as buildings and landscaping. Indeed some of these mitigations mirror mitigations suggested by the HIA. Based on the response to the HIA, it is clear that noise remains an issue at this site, and efforts are being made to alleviate these concerns both in the zoning and design guidelines. Given the numerous options for reducing noise suggested in the response, we suggest that each be carefully considered in the design review process.

Other mitigations suggested in the HIA, which were not included in the response, are traffic mitigations. The response to the HIA has requested documentation of how traffic reductions may reduce noise. The relationships between traffic and noise is well established, as suggested in the Draft EIR. Further documentation exists in the documentation for TNM model (the model most likely used in the used in the traffic noise analysis in the Draft EIR) (<http://www.fhwa.dot.gov/environment/noise/tnm/index.htm>). It is common practice, as was done in the Draft EIR to model traffic-induced noise impacts (see Table IV G-6 of the Draft EIR). The modeling work in the Draft EIR estimates that gains in noise of 1.3 to 4.3 dBA are attributable to project-related increases in traffic (Modeled Incremental Increase (Interim Plus Project vs. Modeled Existing) 2010). Hence, the Draft EIR supports the notion of traffic mitigations as a means to reduce noise at the project.