

MAC ARTHUR BART TRANSIT VILLAGE

HEALTH IMPACT ASSESSMENT



Public Review Draft

UC Berkeley Health Impact Group

January, 2007



The process of plan making should be viewed as a continuous cycle. There are interrelationships among the phases of the planning process. Information gained at a later phase can inform the outcome of an earlier phase. It is important to recognize the iterative nature of planning and to allow for continuous cycling to occur.

THE PLANNING PROCESS

Reprinted with permission from *Guidelines for Preparing Urban Plans*, copyright 1995 by the American Planning Association, Suite 1600, 122 South Michigan Avenue, Chicago, IL 60603-6107.

***Dedicated to an informed, accountable and
just democracy***

Contributors

The UC Berkeley Health Impact Group (UCBHIG) consists of faculty and students of the course on Health Impact Assessment at UC Berkeley School of Public Health. The course faculty includes Rajiv Bhatia, MD, MPH Tom Rivard, MS, and Edmund Seto, PhD. The faculty collectively provided direction and oversight for the Mac Arthur BART Transit Village HIA and reviewed and edited the analysis and each chapter of this report. The following students conducted original research and drafted chapters for each of the following specific subject areas: Jme Mclean, housing; Mary Lee, Retail Services; Colleen Reid, Schools and Childcare; Max Richardson, Parks; Suzanne Tsang, Pedestrian Safety; Amod Pokrel, Air Quality; Eunice Lee, Environmental Noise; Suzanne Tsang, Community Violence; Kim Gilhuly, Social Cohesion and Social Exclusion. In addition, Matt Beyers, of the Alameda County Public Health Department provided analysis of census data, retail service maps. Cyndy Comerford provided pedestrian injury data and maps; Tom Rivard provided forecasts of traffic and particulate matter exposure and Rajiv Bhatia estimated the health effects of particulate matter exposure for the Chapter on Air Quality. Tom Rivard and Rajiv Bhatia wrote the chapter on Transportation. The Mac Arthur BART HIA borrows from the research on land use—health pathways, existing conditions in Oakland, regulatory standards, and forecasting methods documented in the Oak to Ninth HIA published in the June 2006.

Acknowledgements

Walter Miles for provide a people's history of the planning effort; Kathy Kleinbaum for providing data on plans and for being responsive to student questions; Jason Patton for helping us understand historic and current efforts for transportation realm improvement; Bart Ostro for providing guidance on particulate matter health effects forecasting;

Correspondence

Please direct comments and questions on the Mac Arthur BART HIA to Rajiv Bhatia at ucbhig@gmail.com.

Suggested Citation: Mac Arthur BART Transit Village Health Impact Assessment. Berkeley, California: University of California Berkeley Health Impact Group; January, 2007.

Table of Contents

Executive Summary	ES-1 to 9
Chapter 1. Introduction and Scope	IS-1 to 16
Chapter 2. Housing	HO-1 to 34
Chapter 3. Transportation	TR-1 to 13
Chapter 4. Retail Services	RS-1 to 21
Chapter 5. Schools and Childcare	SC-1 to 31
Chapter 6. Parks and Natural Space	PN-1 to 20
Chapter 7. Pedestrian Safety	PS-1 to 12
Chapter 8. Air Quality	AQ-1 to 13
Chapter 9. Environmental Noise	EN-1 to 16
Chapter 10. Community Violence	CV-1 to 11
Chapter 11. Social Cohesion & Exclusion	SCE-1 to 32

Mac Arthur BART Transit Village Health Impact Assessment

Mac Arthur BART Transit Village Health Impact Assessment

Executive Summary

Introduction

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.^{1 2} 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. 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.³ In the United States, HIA can be contrasted to the traditional EIA in being voluntary, evaluating environmental, social, and economic effects using the lens of human health, estimating benefits as well as adverse consequences, and considering the distribution or equity of effects.

Since, 1993, the City of Oakland, BART and the MacArthur Citizens Planning Committee (CPC) have been working to develop the MacArthur BART station area. They envision a safe, vibrant, pedestrian-scale mixed-use transit village that helps to connect the east and west sides of State Route 24. The most recent development proposal for the MacArthur Transit Village project includes the following key components:

- 518-625 units of high-density multi-family housing in structures 5-6 stories tall, of which approximately 20% will be below market rate rental and 80% will be for-sale condominiums.
- Approximately 30,000 square feet of ground-floor neighborhood serving retail and community space.
- 625-750 residential parking spaces and 15-60 retail and community parking spaces and replacement of 300 of the 600 existing BART spaces along with the implementation of a Residential Parking Permit Program that covers ¼ mile radius around project.
- Public infrastructure upgrades, including a new public street through the site off of Telegraph Avenue, the renovation of the existing BART entry plaza, a new public plaza adjacent to the retail space, and streetscape improvements on 40th Street adjacent to the station."

In the context of our course on HIA at the School of Public Health at the University of California at Berkeley, students and faculty 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. The fall 2006 class chose Mac Arthur BART as a subject for a HIA after considering the socially vulnerable areas surrounding the transit village, the spatial patterns health disparities in Oakland, and the potential for the project to affect, both positively and negatively, multiple environmental and social determinants of health. This report provides the findings of a health impact assessment on the Mac Arthur BART Transit Village.

The process for conducting an HIA on the Mac Arthur BART builds on lessons learned from the Oak to Ninth Avenue HIA undertaken during the spring of 2006. First, the HIA is being conducted concomitant with the environmental analysis and should be complete and ready to share with key stakeholders,

¹Quigley R. [Health Impact Assessment. International Best Practice Principles](#). International Association of Impact Assessment 2006

² 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.

³ [National Association of City and County Health Officials \(USA\)](#)

Oak to Ninth Avenue Health Impact Assessment Executive Summary

agency, and developers in advance of the draft environmental impact report. Second, the HIA will attempt to qualitatively and quantitatively evaluate project benefits, in order to provide a more comprehensive assessment with regards to health. Third, the HIA works to further develop the analytic techniques used in the prior study. Forth, the HIA attempt to bring in more original qualitative and quantitative data.

To scope this assessment, UCBHIG developed a set of assessment questions related to the project and its potential effects on several categories of health determinants. (See Scope in Chapter 1) UCBHIG students then used the following methods and strategies to conduct this analysis:

- Describing of potential pathways between the project and health based on of the empirical and scientific literature on the relationships between the built environment and health
- Reviewing planning and assessment documents related to the transit village and area transportation projects
- Conducting Field visits and observations of the site area
- Interviewing key stakeholders and content experts
- Interviewing area residents and business people
- Interpretation, analysis, and mapping of available secondary data
- Collecting environmental data on air quality, noise, and pedestrian environments
- Applying quantitative health effects forecasting tools, where available

This report that follows includes one chapter for each category of health determinant in the scope. 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 project and human health;
- C. Relevant established standards and health objectives;
- D. A description of the setting, context, or existing conditions
- E. Key health assessment questions and synthesis of the findings from research;
- 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.

We ask readers to keep in mind that health impact assessment is a developing practice in the United States. While substantial evidence supports the pathways between the project and health discussed in this analysis and good evidence helps us judge the general direction of likely effects, it is not always possible to estimate the magnitude of effects quantitatively or with precision. We have attempted to be cautious to not overstate the certainty and precision of any predictions. We also strive to be comprehensive and balanced in pointing out benefits, potential harms and potential opportunities. In some cases, the analysis suggests mixed effects. (e.g. pedestrian improvements and more pedestrian-vehicle conflicts).

Overall, HIA is intended to support the consideration of health issues by the public and policy makers. While we do not claim to provide definitive answers to all of the questions raised, we do aim for this Health Impact Assessment to provide useful and constructive information to those designing and evaluating the Mac Arthur BART transit village. UCBHIG also hopes this effort contributes to the field of health impact assessment in California and the United States.

**Oak to Ninth Avenue Health Impact Assessment
Executive Summary**

Chapter Overview	Health Impacts	Recommendations for Design and Mitigation
<p>HOUSING</p> <p>In this chapter, we summarize the relationships between housing and human health and review the evidence that supports them. We then consider these linkages in an assessment of the MacArthur BART Transit Village (MBTV) Project's housing plans. In our assessment, we highlight key health assets of the MBTV Project, suggest strategies and mitigations to improve housing plans where possible, and discuss any health-related housing dilemmas related to the MBTV design.</p>	<ol style="list-style-type: none"> 1. The project will result in a significant net increase the regional housing supply; 2. The project will not provide homeownership opportunities to Oakland households of average economic means; 3. The project will increase the regional supply of rental housing affordable to those making less than the median income; 4. The project will result in an in-migration of wealthier residents, positively contributing to area economic integration and markets for retail services; 5. The project may result indirectly increased property values and rent costs in the greater Mac Arthur BART Area potentially leading to some existing residents and businesses getting priced out; 	<ol style="list-style-type: none"> 1. Promote healthy air quality and noise levels within the housing units through proper ventilation and noise control design measures that reduce exposures from highway traffic 2. Select building materials and ventilation systems for housing units to reduce allergies and toxic exposures; LEED-certified green building options may be appropriate 3. Conduct lead screenings and removal in the Greater Mac Arthur BART Area to reduce possible community exposure to lead 4. Use best practices for air quality monitoring and dust regulation during the destruction of existing buildings to reduce exposure to toxins 5. Ensure that enough money is set aside in the budget for proper maintenance and repair of future housing units over time 6. Incorporate Green Building design to create more energy efficient homes 7. Use higher quality building materials to offset maintenance and repair costs down the road 8. Provide outreach to area residents with regards to public resources available for home maintenance and repair; 9. Un-bundle the sale of parking from the sale of housing units and reduce the number of parking spaces per household or overall parking spaces per development area 10. Provide bicycle parking to residents, possibly in the form of monitored bike parking similar to the Bike Station in Berkeley 11. Increase the availability of affordable housing by requiring the developer to provide or fund BMR housing as a condition of development; or by providing a density bonus to the developer conditional on the provision of BMR housing 12. Increase the number of family-size housing units to accommodate local families 13. Explore ways to provide some BMR units for sale 14. Integrate BMR with Market rate housing minimizing differences between the nature and the quality of units offered to low-income and market-rate units 15. Work together with local residents and property owners to improve housing stock using public housing improvement resources.

**Oak to Ninth Avenue Health Impact Assessment
Executive Summary**

Chapter Overview	Health Impacts	Recommendations for Design and Mitigation
<p>TRANSPORTATION This chapter provides an assessment of the proposed Mac Arthur BART transportation village (MBTV) on transportation and identifies feasible mitigations to reduce project generated vehicle trips.</p>	<ol style="list-style-type: none"> 1. As an example of TOD, the MBTV will reduce the growth of vehicle miles traveled expected at a regional level, limiting deterioration in regional air quality and preventing associated circulatory and respiratory disease. (Beneficial Effect) 2. The project will facilitate routine physical activity for project residents. This will help prevent obesity, improve cardiovascular function, and increase community interaction. (Beneficial Effects) 3. Local vehicle trips will increase resulting in increases in pedestrian accidents and bicycle accidents on streets in the immediate vicinity. (Potential Adverse Effect) 	<ol style="list-style-type: none"> 1. Increase the density of the project by increasing the number of new units. 2. Increase the proportion of below market rate housing and housing units affordable to those with moderate incomes. 3. Unbundle the cost of parking from residential rents to encourage residents to reduce their car ownership rates. 4. Reduce the number of structured parking spaces for residential uses below a ratio of 3 spaces for 4 units. 5. Price structured residential parking and area residential parking permits at the market rate. 6. Increase parking costs for use of the BART station to reduce vehicle use and encourage local shuttle use. 7. Do not provide structured employee parking for BART or project commercial uses. 8. Provide free structured parking for car share. 9. Require transit shuttles to operate at least every 30 minutes in off peak and every 15 minutes during peak travel times with hours to match BART schedules. 10. Ensure the project is connected to the local bike network via class I or II bike lanes. 11. Ensure sidewalk bicycle racks are co-located with retail uses 12. Provide secure bicycle storage protected from the weather at BART. 13. Improve pedestrian and bicycle street crossing, especially at Telegraph & 40th and Telegraph & Mac Arthur intersections. If the pathway to transit is conducive to walking the area of TOD influence can expand beyond the normal ¼ mile to as far as ½ mile thereby resulting in further reduction in VMT. 14. Enhance streetscape of the 40th Street underpass to provide connectivity for Westside residents and enhance the desirability of the transit village. 15. Incorporate retail diversity study in selecting new retail outlets for Mac Arthur BART. Retail should serve the needs of the local community thereby reducing trips originating both within and beyond the local neighborhood.

**Oak to Ninth Avenue Health Impact Assessment
Executive Summary**

Chapter Overview	Health Impacts	Recommendations for Design and Mitigation
<p>Retail Services This chapter provides an overview of the relationships between retail and health both with regards to service access and resident livelihood. We then provide a brief community health assessment of the Macarthur BART transit village (MBTV) proposed 30,000 square feet of ground-floor neighborhood-serving retail and community space based on reviews of planning and assessment documents, secondary data sources, and interviews with stakeholders.</p>	<ol style="list-style-type: none"> 1. A retail plan that includes a neighborhood grocery store is likely to improve access to quality food and nutritional health for both residents and BART commuters. This benefit will depend on the size, diversity, and affordability of the establishment and may be greatest for a full service grocery store. (Potential Beneficial Effect) 2. Development of a vibrant mixed-use commercial corridor through residential and retail development has potential to deter crime, reducing injuries and stress for residents. (Potential Beneficial Effect) 3. The transit village may contribute to the diversity of retail goods and services to the neighborhood. Via effects on pedestrian activity the project may increase resident physical activity and reduce some vehicle trips. Ensuring that new retail fills existing gaps and responds to resident needs will maximize this benefit. (Potential Beneficial Impact) 4. New retail associated with the project may provide new employment opportunities some of which may be suitable for unemployed or underemployed area residents. Job training and local recruitment may support this benefit. (Potential Beneficial Impact) 5. The project will increase retail property value and as a result, may eventually displace some of the current retail businesses, disrupting local livelihoods. (Potential Adverse Effect) 	<ol style="list-style-type: none"> 1. Ensure retail development is reflective of community's wants and needs <ol style="list-style-type: none"> a. Conduct a comprehensive retail market analysis to include a retailer and consumer survey b. Establish a neighborhood retail planning council to assist in retail planning phases 2. Create a local fund via a development agreement or assess a development impact fees to: <ol style="list-style-type: none"> a. maintain property affordability for current vulnerable businesses 3. Encourage a wide variety of healthy food establishments <ol style="list-style-type: none"> a. Recruit a full-service grocery store to occupy retail space on the site; b. Alternatively, work to locate a full service grocery store on the western side of SR 24 c. Hold a farmers market near western side of the BART station d. Require retail food stores to accept food stamps and EBT. 4. Ensure that community members have adequate and equitable access to a range of necessary, yet diverse array of goods and services. <ol style="list-style-type: none"> a. Recruit a pharmacy, bank, and hardware store to locate at or near the site b. Require retail food stores to accept food stamps and EBT. 5. Provide tax incentives, or interest-free loans to stimulate local entrepreneurship <ol style="list-style-type: none"> a. Provide incentives for full-service grocery store – (e.g., help pay for parking spaces) 6. Use a development agreement or a community benefits agreement to ensure: <ol style="list-style-type: none"> a. employment of local residents in new retail b. provision of jobs with living wage and health insurance c. fund workforce development programs 7. Analyze the current labor market in terms of employment opportunities, placement, and retention and implement appropriate retail development according to workforce needs. 8. Prohibit or limit retail establishments associated with adverse health outcomes such a liquor stores 9. Work with the community to create strategies promoting

**Oak to Ninth Avenue Health Impact Assessment
Executive Summary**

Chapter Overview	Health Impacts	Recommendations for Design and Mitigation
		safety, reducing crime, and elevating perceived safety among retailers and consumers.
<p>Schools and Childcare This chapter provides an assessment of (1) neighborhood public school capacity relative to project generated demand (2) neighborhood childcare capacity relative to project generated demand and (3) the adequacy and safety of current walking and biking routes to neighborhood public schools from MBTV.</p>	<ol style="list-style-type: none"> Using varying methods, estimates of student generation based on the proposed MBTV project's 80/20% mix of 625 market and below-market rate housing range from 132 to 420 new students. Although the local high school may have sufficient capacity for additional students from the transit village, local elementary and middle schools are near capacity and may not be able to support all new students from the transit village. A quantitative forecast of child care demand based on demographic data, suggests between 638 and 722 children will need the services of either family child care or a child care center, while only 172 and 373 spots are currently available in existing family child care and child care centers, respectively. Local schools are within 1.5 miles from MBTV, which allows for children to walk or bike to school. However, pedestrian hazards surrounding Mac Arthur BART (e.g. multi-lane roads, high vehicle volume) and limited safety countermeasures (e.g., advanced crosswalk design, bike paths) create a barrier to active transportation to schools. 	<ol style="list-style-type: none"> Re-assess the adequacy of school capacity in the neighborhood under the assumption that the project may ultimately attract families to the same degree as other transit villages; Work with the Oakland Unified School District to ensure that local schools can meet project generated student demand; Conduct further analysis of child care supply by age of child. Ensure that there is a child care center at the Mac Arthur BART Transit Village with safe indoor or outdoor play space; Investigate financial strategies for enabling or subsidizing child care on the site with Local Investment in Child Care (LINCC); Include at least two housing units in the village designed to function as family child care facilities; Implement the City of Oakland Recommended Bikeway Network from 1999, especially the on-street striped bike lanes on 40th Street and Telegraph Ave; Make pedestrian improvements on Telegraph Avenue to provide a safe crossing for children walking to local schools.
<p>Parks and Open Space This chapter reviews the existing standards for parks and public health in Oakland, assesses the existing park and natural resources in Oakland and the MacArthur BART Neighborhood, and offer mitigations to improve park resources for current and future residents of the MacArthur BART</p>	<ol style="list-style-type: none"> The MacArthur BART neighborhood currently has greater access to high quality park space than many Oakland neighborhoods. Less than half of Oakland residents live within 10 minutes walking distance of a city park. MacArthur BART residents, however, are within walking distance of Mosswood Park. Grove Shafter Parks I, II, and III are also nearby, but currently lack high quality amenities and users are subject to freeway related noise and air pollution. Regardless, the existing amount of park space available to MacArthur BART residents still falls short of goals set out by Oakland's General Plan. An increased population will decrease the per capita park acreage even further. Improving and maintaining pedestrian and bicycle access to park 	<ol style="list-style-type: none"> Create safe, continuous, and functional routes to Mosswood Park for MacArthur BART residents West and East of I-980. This can be done through a "green corridor," signage, bike lanes, improved pedestrian facilities, etc. Actively promote and advertise public transit services to local and regional parks. A joint collaboration between the City of Oakland, AC Transit, BART, and MacArthur BART development agencies should advertisement campaigns, bike tours, increased signage, etc. to promote public transit as a means to reach parks and natural spaces.

Oak to Ninth Avenue Health Impact Assessment
Executive Summary

Chapter Overview	Health Impacts	Recommendations for Design and Mitigation
neighborhood.	<p>resources will result in net positive health benefits for current and new residents of the neighborhood.</p> <ol style="list-style-type: none"> 3. With proper development and landscaping, the project area can function to increase the amount of green and open space in the MacArthur BART neighborhood. 4. Improved transit options associated with transit oriented development (TOD) may encourage the use of other city and regional parks (e.g. Lake Merritt; Bay Trail) accessible by BART and AC Transit. 5. In the project area, access to quality parks is greater for residents west of State Route 24 than for that west of SR 24. As planned the project does not provide improvements in quality or access necessary to diminish these existing health resource disparities. 	<ol style="list-style-type: none"> 3. Ensure the socio-economic integration of local parks. Current and future amenities and programs at Mosswood Park and Grove Shafter Parks I, II, and III should appeal to and be accessible by all residents of the MacArthur BART Neighborhood. 4. Consider existing and proposed designs that improve visibility of green and open space. 5. Engage the local community in any park and recreational redevelopment that may result from project mitigations: <ol style="list-style-type: none"> a. Mobilize local residents to rejuvenate Grove Shafter Parks I, II, and III with possibly a city-funded project to improve the parks with added landscaping, improved playground facilities, and improved recreational amenities and public spaces. b. Engage the local community in addressing local programming needs in the neighborhood's parks. c. Explore the potential social and recreational opportunities on the project's public space, such as farmer's markets, public concerts, dances, or community fairs.
<p>Pedestrian Safety This chapter examines conditions related to pedestrian safety in the MacArthur BART Transit Village (MBTV) project area, estimates project-related pedestrian injury impacts, and provides recommendations for reducing pedestrian hazards.</p>	<ol style="list-style-type: none"> 1. Quantitative forecasting of changes to Oakland's pedestrian injury rate based on project related changes in traffic flows and a baseline rate of 16.2 pedestrian injuries or deaths per year along arterial roads estimates an additional pedestrian injury or death every 3.25 years on Telegraph, West Mac Arthur, and 40th Streets. (Adverse Health Impact) 	<ol style="list-style-type: none"> 1. Provide pedestrian safety engineering improvements including countdown pedestrian signal heads, bulb outs, and center median refuge islands at high-volume multi-lane intersections along Telegraph Avenue, 40th Street, West MacArthur Boulevard where cumulative traffic volume increases exceed 5%; 2. Provide pedestrian warning signs or lights at all crossings or cross walks with high traffic volumes (>5000) and without traffic signal lights; 3. Institute speed limit reductions to less than 20mph in mixed-use residential areas adjacent to the project; 4. Widen sidewalks or provide buffers between sidewalks and vehicle lanes on busy roadways with significant pedestrian traffic such as 40th Street, West MacArthur, Blvd, and Telegraph. Consider vehicle lane reductions on some corridors (e.g., West MacArthur , 40th Street) to

**Oak to Ninth Avenue Health Impact Assessment
Executive Summary**

Chapter Overview	Health Impacts	Recommendations for Design and Mitigation
		<p>simultaneously reduce and slow traffic</p> <ol style="list-style-type: none"> 5. Create a pedestrian-friendly environment in the retail area by <ol style="list-style-type: none"> a. Maximizing pedestrian and transit access to the site from adjacent land uses. b. Providing comfortable transit stops and shelters with pedestrian connections to the main buildings; transit stops and pedestrian drop-offs should be located within reasonable proximity to building entrances - preferably no more than 225 meters (750 feet), and ideally much closer than that. c. Providing attractive pedestrian walkways between the stores and the adjacent sites. d. Ensuring that fencing and landscaping does not create barriers to pedestrian mobility.
<p>Air Quality This chapter of the Mac Arthur BART HIA evaluates the air quality for future residents of the Mac Arthur BART Transit Village and estimates the potential pollution related health effects.</p>	<ol style="list-style-type: none"> 1. Modeled annual levels of PM2.5 at the project site decline with distance on the east side of Highway 24; modeled annual average PM2.5 declines from 0.30 microgram per cubic meter at the western edge of the project site to 0.1 micrograms per cubic meter at the eastern edge. 2. Freeway diesel emissions from trucks result in an excess cancer risk for project residents ranging from 23 to 194 per million. 3. Project related traffic will result in a modest increase in pollution related health effects exposure to residents of neighborhoods adjacent to the project. 	<ol style="list-style-type: none"> 1. 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. 2. Install a central HVAC (heating, ventilation and air conditioning) system with high efficiency filters for particulates. According to a recent study by Bill Fisk at Lawrence Berkeley Laboratory, the following design standards would remove 80% of fine particulate matter mitigating all expected additional roadway effects of particulates and having added health benefits in terms of reducing allergen loads: <ul style="list-style-type: none"> 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. 3. In addition, air intake systems for HVAC should be located as far away from I-580 and SR-24. The project developer should be required to implement an ongoing maintenance plan for filtration system associated with HVAC. 4. Providing 110 and 220 outlets at project loading docks so that trucks can connect with these outlets to power their auxiliary equipment. Utilizing only electric forklifts and landscaping equipment in the

**Oak to Ninth Avenue Health Impact Assessment
Executive Summary**

Chapter Overview	Health Impacts	Recommendations for Design and Mitigation
		<p>project operations and the operations of tenants.</p> <ol style="list-style-type: none"> 5. Unbundling the cost of parking from the purchase or rent of residential units to potentially reduce car ownership and usage by residents. 6. Increasing the frequency of AC Transit services to the project site. 7. Requiring secured bicycle parking for both employees and residents; 8. Restricting employee parking for commercial tenants; 9. Provide on-site child-care (assuming installation of proper HVAC and/or filtration), and/or other services that might reduce typical vehicle trips associated with commuter behavior, which would otherwise rely purely on public transportation. 10. Increasing parking fees for BART parking with no fee for carpool vehicles.
<p>Noise This chapter evaluates environmental noise exposure and associated health effects for residents of the proposed Mac Arthur BART Transit Village project.</p>	<ol style="list-style-type: none"> 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. We estimate the annoyance levels to range from 43% of the exposed population living near BART and the freeway to 5% of the exposed population who live in the relatively quieter inner courtyards. 2. Without mitigations, we estimate 17% of residents in dwellings adjacent to the railway line and highway will experience sleep disturbance; in the quieter inner courtyards we estimate sleep disturbances will affect 6-13% of residents. 3. Existing project area outdoor noise levels proximate to BART and the freeway of greater than 70 dB will prevent normal voice level communication at unprotected exterior locations. 	<ol style="list-style-type: none"> 1. 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. 2. Design units as far away from BART and the freeway as possible, and implement a design that has interior courtyards and patios that open into acoustically protected and shielded areas. 3. Reduce the speeds of the traffic on the highway-24 and project's residential streets through traffic calming measures. 4. Notify all potential buyers that the property they are occupying has significant noise risks. 5. Integrate below market and market rate units in the same buildings to prevent environmental justice impacts. 6. While BART accounts for only small increases in noise exposures, undertaking necessary maintenance of BART tracks would further minimize train-associated noise. 7. Explore possible BART scheduling changes to minimize train passes during typical nighttime sleep hours.

**Oak to Ninth Avenue Health Impact Assessment
Executive Summary**

Chapter Overview	Health Impacts	Recommendations for Design and Mitigation
<p>Community Violence This chapter examines the potential for the Mac Arthur BART to affect and prevent community violence and provides recommendations to incorporate violence prevention into development planning.</p>	<ol style="list-style-type: none"> 1. With the inclusion of physical design strategies that discourage crime, as well as strategies to support a sense of place and community, the project is likely reduce in crime rates and the fear of crime in the area. (Potential Beneficial Effect) 	<ol style="list-style-type: none"> 1. Providing adequate and pedestrian scaled lighting for all public areas, residential streets, and adjacent public streets. 2. Creating clear sight lines to maximize visibility, especially for high risk areas such as parking garages, stairwells and underpasses. 3. Creating public or common spaces that generate/reinforce a lot of pedestrian level activity and/or encourage a sense of community. For example, community urban gardens provide a setting for social activity and users of the gardens contribute to surveillance. 4. Using durable, vandal resistant materials so maintenance is minimal.
<p>SOCIAL COHESION AND SOCIAL EXCLUSION This chapter of the Mac Arthur BART Transit Village Health Impact Assessment provides background information on the relationships among development, social cohesion, and social exclusion and considers mechanisms through which the Mac Arthur Bart Transit Village (MBTV) might positively and negatively affect and social cohesion and social exclusion.</p>	<ol style="list-style-type: none"> 1. Given the expected cost of the project's market rate housing and the current project area demographics, the project is likely to result in greater residential integration with regard to income at the level of the census tract. (Beneficial Effect) 2. Indirectly, expected demographic changes can improve health of area residents via effects on retail environment and public infrastructure. Current area residents should share in many of those benefits. (Beneficial Effect) 3. Market rate and below market rate housing will be segregated on the project site; project could further advance social integration by integrating BMR units. (Potential Beneficial Effect) 4. The incorporation of streets and sidewalks, retail and public areas within the project may facilitate interaction among project and neighborhood residents. (Beneficial Effect) 5. The social integration of the East and West sides of the project area, historically socially segregated by the construction of the MacArthur BART and State Road (SR) 24 is a key goal both to community residents and BART, which, if achieved, would benefit health. Streetscape improvements to 40th Street between MLK and Telegraph will support reconnection but may not be adequate to achieve this outcome. A Westside entrance to BART would help achieve this goal if a feasible and safe method for such an entrance is available is found. Alternatively, developing Mac Arthur Blvd as a retail and pedestrian corridor might serve to help achieve this goal. (Potential Beneficial Effect) 6. The project itself will not directly displace area residents but, via desired economic and environmental effects, may ultimately result in higher property values and rents in the area. Potentially, project-stimulated economic effects may result indirectly in displacement of residents 	<ol style="list-style-type: none"> 1. Implement additional strategies to include more west side residents in the design and planning for MBTV. 2. Integrate Below Market Rate and Market Rate housing on the project site. 3. Create common walking routes and meeting points that encourage interaction. 4. Facilitate economic development of MLK between 40th and MacArthur Blvd. 5. Encourage locally-owned business development at the MBTV and on MLK. 6. Solicit funding to hire a community program coordinator. 7. Study MacArthur Boulevard as another Connector Project. 8. Continue to study the feasibility of a Westside BART station entrance/tunnel with regard to safety, structural feasibility, and cost. . 9. Develop programs to retain low-income residential tenants vulnerable to displacement. 10. Step up routine City maintenance of current infrastructure.

**Oak to Ninth Avenue Health Impact Assessment
Executive Summary**

Chapter Overview	Health Impacts	Recommendations for Design and Mitigation
	<p>neighboring the MBTV, affecting social cohesion of the neighborhood. (Potential Adverse Effect)</p> <p>7. The project includes both new retail and new markets for retail. Local retail that addresses the needs of residents will encourage walking and social interaction from casual contact. Increasing local retail opportunities could also potential increase employment opportunities, thus economic integration. (Beneficial Effect)</p> <p>8. Public infrastructure and retail environment benefits will be disproportionately realized by east-side residents. Integrating plans for neighborhood serving retail on the West side could serve West-side economic revitalization and area-wide social cohesion. (Potential Beneficial Effect)</p> <p>9. If the community’s safety concerns regarding the MBTV (and ongoing concerns in the neighborhood) are properly addressed, increased perceived safety within the area could encourage people to interact outside of their homes. (Potential Beneficial Effect)</p> <p>10. The 5,000 feet of community space currently included in the project can foster social interaction if programming providing it is designed in response to community needs. (Potential Beneficial Effect)</p>	