SAN FRANCISCO
PLANNING DEPARTMENT

Memo to the Planning Commission

HEARING DATE: MAY 6, 2010

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

Date:	April 28, 2010
Case No.:	2007.0946BEMRTUZ
Project Address:	**Candlestick Point and Hunters Point Shipyard**
Current Zoning:	RH-2 (Residential, House Two Family) RM-1 (Residential, Mixed Low Density) P (Public) M-1 (Light Industrial) 40-X Height and Bulk District OS Height and Bulk District
Block/Lot:	
Project Sponsor:	San Francisco Redevelopment Agency / Office of Economic and Workforce Development / CP Development Co., LP
Staff Contact:	Mat Snyder – (415) 575-6891 mathew.snyder@sfgov.org
Recommendation:	**No Action, informational only**

ACTIONS SCHEDULED FOR THIS HEARING

No actions are scheduled to be taken at this hearing. The Commission will be provided with an informational overview on the Project's Disposition and Development Agreement between the Redevelopment Agency and the Developer, including a presentation on the Project's Transportation Plan and an update on the status of the cleanup of the Hunters Point Shipyard.

BACKGROUND

On March 24, 2010, the Planning Commission initiated General Plan, Zoning, and Map amendments for the Hunters Point Phase 2 – Candlestick Point integrated development project ("Project"). The Commission is scheduled to consider action on these item at their June 3, 2010 Hearing, which will be held jointly with the Redevelopment Commission on actions regarding this project. At the initiation hearing, the Commission requested additional information hearings on a multiple of aspects about the project. On May 6, The Commission is scheduled to hear a third information hearing.

The Office of Economic and Workforce Development, who are managing the project, prepared the attached informational packet in preparation for the May 6 hearing. The packet includes background information on the Transportation Plan, the clean-up of Hunters Point Shipyard, and Proposition G along with an overview memorandum regarding these topics and the Disposition Development Agreement.

Attachments:

1. Memorandum from the Office of Economic and Workforce Development
2. Draft Executive Summary Regarding the Environmental Remediation of the Hunters Point Shipyard
3. Draft Transportation Plan

4. Proposition G, the Bayview Jobs, Parks and Housing Initiative

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ECONOMIC AND WORKFORCE DEVELOPMENT
MICHAEL COHEN, DIRECTOR

CITY AND COUNTY OF SAN FRANCISCO
GAVIN NEWSOM, MAYOR

M E M O R A N D U M

TO: Planning Commissioners

FROM: Michael Cohen

CC: John Rahaim, Mat Snyder, Linda Avery

DATE: April 28, 2010

RE: Hunters Point Shipyard Phase 2-Candlestick Point Integrated Development Project

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On May 6th 2010, the Mayors Office of Economic and Workforce Development and staff from the Department of Public Health and SFMTA will provide the Commission with an informational overview on the Hunters Point Shipyard Phase 2-Candlestick Point integrated development project ("Project") including: the Project's Disposition and Development Agreement with the Redevelopment Agency and the Developer, a presentation on the Project's Transportation Plan and an update on the status of the cleanup of the Hunters Point Shipyard.

BACKGROUND

The Project covers approximately 702-acres along the southeastern waterfront of San Francisco. The Office of Economic and Workforce Development ("OEWD") has been managing the project taking it through its multi-facetted and extensive review process. OEWD reports that the project has been reviewed and discussed in over 215 public meetings including the two community-based advisory organizations that oversee the Project site (the Hunters Point Shipyard Citizens Advisory Committee ("CAC") and the Bayview Hunters Point Redevelopment Project Area Committee ("PAC"), the Agency Commission, the Board of Supervisors, the Planning Commission and other City commissions, along with other local forums.

In May 2007, the Mayor, the Board of Supervisors, the Agency Commission, and PAC and CAC, endorsed a "Conceptual Framework" for the integrated redevelopment of Candlestick Point and Phase 2 of the Shipyard (Phase 1 of the Shipyard was approved and is under construction). The Conceptual Framework envisioned a major mixed-use project, including hundreds of acres of new and restored waterfront parks and open space, thousands of new units of housing including a robust affordable housing program, extensive job-generating retail and research and development uses, permanent space and renovated for the artist colony that exists in the Shipyard and a site for a potential new stadium for the 49ers on the Shipyard.

In April 2007, the Planning Department also entered into a Memorandum of Understanding ("MOU") between the City, the Planning Department, the Recreation and Park Department, the Mayor's Office, and the Redevelopment Agency ("Agency"). The MOU provides for the City and

the Agency to cooperate with one another to facilitate the planning of Candlestick Point and Phase 2 of the Shipyard as one integrated development project consistent with Conceptual Framework.
In June 2008, City voters approved Proposition G, an initiative petition measure named the Bayview Jobs, Parks, and Housing Initiative, regarding plans to revitalize the Project site. Proposition G: (i) adopted overarching policies for the revitalization of the Project site; (ii) authorized the conveyance of the City's Recreation and Park interests within Candlestick Point in furtherance of the Project, provided that there is a binding commitment to replace the transferred property with other property of at least the same acreage that will be improved and dedicated as public parks or open space in the Project; (iii) repealed Proposition D and Proposition F relating to prior plans for the development of a new stadium and retail entertainment project on Candlestick Point; and (iv) urged the City, the Agency and all other governmental agencies with jurisdiction to proceed expeditiously with the Project. A copy of the text of Proposition G is attached.

PROJECT DESCRIPTION

Consistent with Conceptual Framework and Proposition G, the proposed land use and development program on the Shipyard and Candlestick Point include the following elements:

- 10,500 residential housing units, of which 31.86% (3,345) will be below market and public housing replacement units. The housing program includes the complete rebuilding of the Alice Griffith Public Housing Development, also known as Double Rock, to provide one-for-one replacement of existing units targeted to the same income levels as those of the existing residents and phased to ensure that residents have the opportunity to move directly to the new units.

- 2,500,000 sq. ft. of research and development uses including office and light industrial uses targeting emerging industries and technologies such as green technology.
- 150,000 sq. ft. of office and other commercial uses on Candlestick Point.
- 336 acres of new and restored open space and active recreation areas inclusive of the dual use stadium parking lot, which includes neighborhood parks within Candlestick Point and the Shipyard, new waterfront parks around the entire perimeter of the Shipyard connecting to the region's Bay Trail, and a major renovation of the Candlestick Point State Recreation Area with restored habitat areas and public access to the water.
- 635,000 sq. ft. of regional retail on Candlestick Point.
- 125,000 sq. ft. of neighborhood-serving retail on both the Shipyard and Candlestick Point.
- Permanent new and renovated space for the existing Shipyard artists as well as an arts education center.
- A 150,000 sq. ft. (220-room) hotel on Candlestick Point.
- A 10,000-seat performance venue on Candlestick Point.
- A potential new 69,000-seat, world-class football stadium for the 49ers.

- New public and community facilities on both the Shipyard and Candlestick Point, including a new fire station on the Shipyard and space for an expanded police station or school on Candlestick Point.
- A 300-slip marina on the Shipyard.

Should the 49ers choose not to relocate to the Shipyard, the Hunters Point Shipyard Redevelopment Plan allows for housing and additional research and development land uses to replace the stadium and associated parking lots. The Shipyard Redevelopment requires that in order for housing to be developed on the stadium site, any environmental conditions or plan restrictions placed on the property by the United States Navy, United States Environmental Protection Agency, California Department of Toxic Substances Control, and San Francisco Bay Area Regional Water Quality Control Board (the "Regulating Agencies") that would prohibit these uses would need to be removed by the Regulating Agencies. This permitted land use reflects the preferred non-stadium plan for the Project, which would shift 1,625 housing units from Candlestick Point to the stadium site, provides for 500,000 million square feet of additional research and development space on the stadium site, and slightly reduces the total open space on the Shipyard to approximately 222 acres for a total Project open space acreage of approximately 326 acres.

PROJECT DISPOSITION AND DEVELOPMENT AGREEMENT

Similar to other large redevelopment projects, the development of phase 2 of the Hunters Point Shipyard and Candlestick Point will be governed by a Disposition and Development Agreement ("DDA") with one master developer. The DDA is the primary legally binding document between the Agency and CP Development Co., LP , a joint venture between Lennar and Scala Real Estate Partners, Hillwood, and Estein and Associates, USA (the "Developer") that connects the various Project documents such as the Below Market-Rate Housing Plan, Financing Plan, Transportation Plan, Infrastructure Plan, Community Benefits Plan, Design for Development Documents, Open Space Plan and Sustainability Plan as well as the respective entitlement documents for the Project including the Redevelopment Plan Amendments, Interagency Cooperation Agreement and land assembly documents. The DDA ensures that the vision, goals and priorities for the development of the Shipyard and Candlestick Point that were set forth in the Conceptual Framework and Proposition G are implemented in accordance with the priorities that the Bayview Hunters Point community and PAC and CAC has previously articulated. The various plans and many of the documents incorporated into the DDA have already been extensively vetted in numerous public forums over the past three years.

In summary, the DDA governs the Developer's rights to develop the Project in phases in accordance with the related Project documents. The DDA sets forth a phasing road map for development of the Project, including the Major Phases, which provide for planning of large mixed-use areas or neighborhoods within the Project site and Sub-Phases, which provide for more detailed planning of smaller-scale areas within the Major Phase. The DDA also establishes the linkages between the Developer's build out of Major Phases and Sub-Phases of the Project, and the Developer's obligations to complete the parks, transportation and other infrastructure required for that build-out and to deliver affordable housing parcels and other public benefits corresponding to that build out. These linkages are articulated in the Phasing Plan and the Schedule of Performance, and include outside dates by which the Developer must submit applications and

commencement and complete major components of infrastructure to serve Major Phases and Sub-Phases.
The Developer's role under the DDA reflects a "horizontal" land development model. Under this model, land is the asset that is being improved and sold. The DDA is designed to transform the Project site into finished parcels that are improved with streets, sidewalks, parks, and other public infrastructure and certain community facilities. In this structure, the Developer's role is to build the horizontal infrastructure improvements, together with the provision of various community amenities and other public benefits. In return, the Developer receives the right to develop and to sell land for "vertical" development.

The DDA also sets forth conditions for the transfer of land within the Project to the Developer that mirrors the phasing requirements. Generally, the Agency will not convey title to any parcel within the Project to the Developer until a Sub-Phase Application for such Sub-Phase has been approved and the Developer has satisfied the conditions to close of escrow under the DDA and the Design Review and Document Approval Procedure (the "DRDAP") and provides financial guarantees to the Agency for the completion of all infrastructure and related public benefits included in that Sub-Phase.

Land transferred to the Developer within a given Sub-Phase will be subject to a "right of reverter" under which the Agency may re-take ownership of the land if the Developer fails to substantially complete the infrastructure allocated to that Sub-Phase within the time frame set forth in the Project Documents and corresponding Major Phase and Sub-Phase approvals.

Additional information about the respective components of the DDA is detailed in the Project's Executive Summary document that was provided to the Commission in the March 25th Commission Packet. Additionally, previous informational presentations have been made to the Commission on other components of the DDA including the Design for Development Documents and Sustainability Plan. This informational hearing will focus primarily on the Transportation Plan as a component to the DDA as well as how the cleanup of the Shipyard makes it possible to develop the Project in accordance with the goals set forth in Proposition G and the Conceptual Framework. An additional informational hearing will be held on May 13th and staff from OEWD will provide the Commission with an overview of other components of the DDA including the Project's Below Market-Rate Housing Plan, Community Benefits Plan and workforce development and local hiring programs.

PROJECT TRANSPORTATION PLAN

Due to geography, topography and the current extent and condition of City infrastructure, Candlestick Point and the Shipyard are comparatively isolated from the transit and roadway networks serving the City and region and are less accessible for pedestrians and bicyclists and has one of the lowest transit mode splits in the City. Currently, the Shipyard is served by only one Muni line, the 19 Polk, and Candlestick Point is only served by the 29 Sunset, and the T-Third light rail and several other Muni bus lines are within a half-mile of the Project boundaries. These deficiencies have been identified as top community concerns in the extensive local and citywide planning efforts for the Project and across southeastern San Francisco more generally. One of the most important public benefits provided by the Project is the investment hundreds of millions of dollars in transportation improvements to benefit not only the new development, but also the

surrounding neighborhoods. Improving accessibility and reliability of public transportation and promoting walking and cycling as primary modes of transportation will be critical to ensuring that the development occurs in an environmentally and economically sustainable way that will benefit the existing Bayview Hunters Point community. In recognition of both the current need for improved transportation options within the Bayview Hunters Point communities well as the sustainability objectives of the Project, the Transportation Plan has been designed to meet three key objectives:

1) Meet the Project goals of being a transit-oriented, bicycle and pedestrian-friendly, accessible for all modes while managing traffic and parking issues to create a livable and sustainable community and dramatically improving transit quality and access to the existing Bayview Hunters Point neighborhood.

2) Remain consistent with SFMTA-based transportation policies, plans and objectives, including the Transit Effectiveness Project, the Short-Range Transit Plan, the Bicycle Plan, the Better Streets Plan, SFGo, SF Park and related agency policies regarding traffic calming, parking and traffic management.

3) Integrate transportation policies and infrastructure in a cost-effective, sustainable and strategically viable implementation plan that is closely coordinated with the phased build-out of the development.

The City and the Project's Developer have been working collaboratively with SFMTA to ensure that the proposed transportation improvements are consistent with the City-wide Muni network. The transportation network and associated roadway improvements and bike and pedestrian networks, detail the integrated connections from surrounding areas to this site. Extensions and increase in frequency along select Muni lines, creation of a new Rapid Bus service linking the Project to BART and Caltrain, and two new Downtown express lines, building upon the Transit Effectiveness Project,

- A new street grid modeled on standard city blocks and using the format of the Better Streets Plan to ensure safe, attractive and walkable streets,
- connections to the City's Bicycle Plan network, complemented by extensive new trails, paths and routes, and incorporate the Bay Trail and the Blue Greenway,
- Street and arterial capacity and infrastructure upgrades to efficiently manage the current and Project-generated traffic, goods movement and on-street parking, accommodating needs for expansion while maintaining a strong transit, pedestrian and bicycle mode split and minimizing impacts on surrounding areas,
- A new bridge over Yosemite Slough connecting Hunters Point and Candlestick Point exclusively for BRT, bicycles and pedestrians, except on game days only, when automobiles will use a portion of the bridge.
- On-site Transportation Demand Management and a Intermodal Transit Center, and
- A program for phasing and long term management and operation of these networks during

Attached is a copy of the Project's Draft Transportation Plan, which includes additional detail on each of these key components. The Draft Transportation Plan is the result of a three-year community based planning process with key stakeholders including the PAC, CAC, SFMTA, Transportation Authority, Agency, Planning Department and members of the Bayview Hunters Point community. In the past three years alone, their have been more than 20 public meetings and workshops specifically focused on the Transportation components of the Project.

CLEANUP OF THE HUNTERS POINT SHIPYARD

The cleanup of the Hunters Point Shipyard is essential not only to proceeding with the development of the Project, but also to ensuring that a significant environmental blight in the southeast portion of San Francisco is transformed into a productive use that benefits the existing Bayview Hunters Point community and the City as a whole.

The United States Navy ceased operations at the Shipyard in 1974 and officially closed the base in 1988. The Shipyard was then included on the Department of Defense's 1991 Base Realignment and Closure (BRAC) list. In 1993, following designation of the Shipyard by the City's Board of Supervisors as a redevelopment survey area, the City and the Agency began a community process to create a plan for the economic reuse of the Shipyard and the remediation and conveyance of the property by the Navy.

In March 2004, the Agency, in cooperation with the City and the Developer, negotiated a comprehensive agreement with the Navy governing the terms and conditions of the hazardous materials remediation and conveyance of the Shipyard by the Navy to the Agency (the "Conveyance Agreement"). The Conveyance Agreement obligates the Navy to remediate hazardous materials on the Shipyard to levels consistent with the land uses designated in the original redevelopment plans for the Shipyard and to convey parcels to the Agency at no cost on a phased basis as the Navy successfully completes the required remediation.

The Shipyard has been extensively studied and analyzed for over 20 years and, as a result of those studies and the extensive and overlapping oversight of multiple regulatory agencies including: the U.S. Environmental Protection Agency ("U.S. EPA"), the Department of Toxics Substances Control ("DTSC") and the San Francisco Bay Area Regional Water Quality Control Board ("SFRWQCB"), our knowledge about the nature of the contamination at the Shipyard is very good. Those analyses have repeatedly demonstrated that the Shipyard in its current state does not present an immediate threat to tenants, visitors or the surrounding community. However, in order to implement the community's redevelopment plans for the Shipyard, the Navy needs to implement various environmental remedies to allow sub-surface construction, or those costs would be transferred to the Project. Fortunately, the Navy has spent over $700,000,000 to date on the Shipyard and much of the developable land will soon be ready for transfer.

Post-transfer, the condition of the Shipyard and the long-term on-going oversight and use restrictions at the Shipyard, will be very similar to other successful "brownfields" projects in the Bay Area such as Mission Bay and Emeryville. In addition, the incredibly robust, and often redundant, level of local, State and Federal oversight of the environmental condition of the

Shipyard will continue after land is transferred to the Agency. Ultimately, both Federal and State EPA must certify in writing that the Shipyard can be developed and used safely - for people and the environment - before any transfer or construction can occur.

In addition, the City through its implementation of Article 31 of the Health Code and sections of the Building Code and Public Works Code will ensure that the site is safe for both people and the environment by implementing sampling requirements for the areas that were formally industrial areas and will be converted to residential use, and will require that prior to receiving permit approval for excavation or grading on the Shipyard, contractors would be required to submit plans to ensure safe work practices and environmental protection during construction including: a Dust Control Plan, an Unknown Contaminant Contingency Plan, a Disposal Plan (if applicable), a Site Specific Health and Safety Plan and a Soil Importation Plan.

Additional information regarding the cleanup of the Shipyard can be found in the Draft Executive Summary Regarding the Environmental Remediation of the Hunters Point Shipyard, which has been prepared by the Department of Public Health, the City and Agencies' technical consultant Treadwell & Rollo, the Agency and the OEWD.

ENVIRONMETNAL REVIEW

The Draft Environmental Impact Report was published on November 12, 2009. City staff and the environmental consultants are currently working on the Comments and Response portion of the EIR. Certification of the EIR is tentatively scheduled to occur at the same time as other Project actions at a meeting with the Redevelopment Agency Commission on June 3, 2010.

An additional informational hearing on the Project is scheduled for the May 13, 2010.

Attachments:

1. Draft Executive Summary Regarding the Environmental Remediation of the Hunters Point Shipyard
2. Draft Transportation Plan
3. Proposition G, the Bayview Jobs, Parks and Housing Initiative

DRAFT
EXECUTIVE SUMMARY
REGARDING THE ENVIRONMENTAL REMEDIATION OF THE HUNTERS POINT SHIPYARD

April 2010

SAN FRANCISCO
Office of Economic and Workforce Development

Treadwell&Rollo

DRAFT EXECUTIVE SUMMARY REGARDING THE ENVIRONMENTAL REMEDIATION OF THE HUNTERS POINT SHIPYARD

After many, many years of community based planning, redevelopment plans for Phase 2 of the Hunters Point Shipyard, together with Candlestick Point, are close to being presented for final approval. For a detailed summary of the redevelopment plans for the areas and other related documents, please see www.oewd.org.

Because the Hunters Point Shipyard ("Shipyard") is a Superfund Site within a community with long-standing Environmental Justice concerns, extraordinary measures have been taken over the last 20 years to (i) investigate the types of materials on site that need to be remediated, (ii) fund and implement the cleanup and (iii) establish procedures regarding construction on the Shipyard after the cleanup is complete. The purpose of this Executive Summary is to describe those measures and explain how they relate to the redevelopment plans for the property. This Executive Summary also includes a section answering "Frequently Asked Questions" about the Shipyard cleanup.

I. Regulatory Oversight of Navy's Cleanup

For over 20 years, the Navy has been investigating and remediating contamination on the Hunters Point Shipyard. The cleanup work has been implemented in accordance with the Comprehensive Environmental Remediation and Compensation Liability Act ("CERCLA"[1]) which is commonly called Superfund. Superfund provides broad federal authority to clean up releases or threatened releases of hazardous substances that may endanger public health or the environment. The law authorized the US EPA to identify parties responsible for contamination of sites and compel the parties to clean up the sites.

The Shipyard is subject to the oversight of the US Environmental Protection Agency ("USEPA") and two departments within Cal-EPA: the Department of Toxics Substances Control ("DTSC") and the San Francisco Bay Area Regional Water Quality Control Board ("RWQCB"). All three of these agencies work together on the Shipyard under the terms of a Federal Facilities Agreement ("FFA") dated 1992. The City, through the San Francisco Department of Public Health ("SFDPH") and its consultant, Treadwell and Rollo, also closely monitors the Navy cleanup. And, for the last four years, the San Francisco Redevelopment Agency ("Agency") has funded an independent community-based firm to oversee and provide public outreach regarding cleanup issues on the Shipyard and to conduct numerous public meetings and workshops regarding the cleanup, often through the Hunters Point Shipyard Citizens Advisory Committee.

[1] CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act, commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

As shown on Attachment 1, for cleanup purposes the Shipyard is currently divided into 13 parcels: A, B, C, D-1, D-2, E, E-2, F (offshore underwater area), G, IR7/18, UC-1, UC-2 and UC-3.

Under CERCLA and the 2004 Conveyance Agreement between the Agency and the Navy (the "Conveyance Agreement"), the Navy is required to complete the necessary remediation for each of these parcels and to provide a warranty that the property has been cleaned to a level that is protective of human health and the environment given the intended reuse. Prior to any transfer, USEPA, DTSC, and the RWQCB must concur in writing that sufficient remedial action has been taken to protect human health and the environment for the parcel's intended future use. In addition, under applicable federal laws, if further remedial action is found to be necessary even after transfer to the Agency or a developer, the Navy remains responsible for completing any required cleanup and the Navy must indemnify subsequent owners and retain liability for unknown or newly discovered hazardous materials. Also, as was done in connection with the transfer of Parcel A to the Agency, the Agency will procure pollution legal liability insurance covering potential environmental claims related to construction and development on the Shipyard.

II. The Shipyard Cleanup has been Thoroughly Studied

One important advantage of the many and often overlapping regulatory jurisdictions overseeing the cleanup of the Shipyard is the knowledge that the scope of potential contamination at the Shipyard and the appropriateness of the proposed remedies have been very thoroughly studied. The scope of environmental sampling and characterization at the Shipyard is immense and thorough. As shown on the map in Attachment 2, over the last 20 years, more than 22,000 soil samples and 10,000 groundwater samples have been analyzed across the vast majority of all areas of the Shipyard.

The cleanup process mandated by CERCLA and the FFA required the Navy to prepare an iterative series of reports documenting various investigation and remedial activities, and for the various regulatory agencies to review and approve those reports. Over the last 20 years, the Navy has completed numerous specific reports and analyses for areas of potential contamination on the Shipyard. Based on those reports, specific cleanups plans have been developed and, as described further below, in many cases completed. After specific cleanup actions are finished, additional confirmatory testing is done to ensure the cleanup was effective and the property can be used safely. Every step of that process involves extensive public review and expert peer review. A more detailed description of the various steps in the CERCLA process is presented in Attachment 3.

In addition to the parcel-by-parcel reports and analyses described above, the Navy has conducted several basewide investigation and remediation programs for specific types of hazardous materials, including potential radiological contamination, asbestos in buildings, and underground storage tanks. For example, in 2003, the USEPA conducted an extensive surface scan of the Shipyard with very sophisticated monitoring equipment to determine whether there were any immediate health or safety risks to tenants or

neighbors of the Shipyard from low-level radiological contamination at the Shipyard. USEPA concluded then that no such risk existed and both USEPA and the California Department of Public Health ("CDPH") have indicated their intention to complete further surface scans prior to the transfer of additional parcels.

III. Status Of The Navy's Cleanup

To date, the Navy has spent or obligated over $700,000,000 on the cleanup of the Shipyard. About 90% of the "removal actions" are done for the properties being transferred in the next 2 years and many of the other expected "removal actions" for the whole Shipyard are done or nearing completion. In addition, much of the regulatory paper work and confirmatory testing necessary to transfer land is nearing completion for much of the developable land on the Shipyard. A more detailed, parcel-by-parcel status of the Shipyard cleanup is presented in Attachment 4.

The ultimate conclusions of the testing and analyses done on the Shipyard are twofold: first, in its current state, the Shipyard does not present an imminent threat or substantial risk to long-term existing tenants, the surrounding environment or the local community. In fact, for many years the various environmental regulatory agencies have approved a number of long-standing leaseholds on the Shipyard, by the San Francisco Police Department, hundreds of artists and many others, all in close proximity to various active remediation sites. Second, while the Shipyard does not present a health risk in its current state, extensive cleanup is required to allow the type of subsurface construction necessary to implement the community's long-standing vision for redevelopment of the site. Otherwise that cost would fall to the Agency or the Project. Fortunately, under applicable federal base closure laws, the Navy is legally obligated to cleanup the Shipyard to levels consistent with the City's reuse plans. Even more fortunately, the City's congressional delegation has been extraordinarily successful in securing funds for the Navy cleanup. In fact, over the last several years the Navy has spent more money on the cleanup of the Shipyard than any other closed base in the country.

IV. Nature of the Navy's Cleanup

As a general matter, the Navy is required to physically remove anything that cannot or should not remain in the ground. Low-level contaminants may remain in the ground so long as they meet USEPA and DTSC "risk ranges" (i.e., will not pose a significant hazard to residents, workers, tenants, visitors neighbors or the environment) and so long as appropriate use restrictions and physical covers are put in place. As described further below, in many cases the physical covers are simply the buildings, streets, sidewalks or new parks created by the development. In many cases, the regulatory agencies did not have to require the cover, but are doing so to provide extra protection to the ultimate users and residents of the Shipyard.

In the case of groundwater plumes in areas like the Shipyard, where the groundwater is not used for drinking water, the groundwater plumes are treated and

monitored. When very low levels of residual groundwater contaminants are too difficult to completely remove from the groundwater, natural treatment processes are used over several years and are monitored to verify that the levels are decreasing. While the building construction itself acts as a barrier to residual contamination, the installation of vapor barriers to completely cut off exposure of building occupants to certain types of residual groundwater contamination is the usual regulatory requirement for these areas to ensure that occupants are completely safe.

A summary of the strategies for dealing with specific types of contamination and other environmental information including groundwater and volatile organic compounds, Parcel E-2 landfill, low-level radiation, naturally occurring asbestos, abrasive blast material, naturally occurring metals, lead based paint, pile driving through contaminated soil, notification requirements, monitoring and enforcement of environmental restrictions, asbestos containing materials, and Superfund and Brownfields sites are presented in Attachments 5 through 17.

The cleanup approach described above is very common in the development of what are known as "Brownfields". Brownfields redevelopment typically involves "recycling" former industrial lands – usually polluted – into more productive uses like residential, commercial or recreational uses. The successful recycling of Brownfields is made possible by environmental remediation strategies that require the removal of serious contaminants, but that allow low-level, ubiquitous, materials to remain in place safely through the use of land use covenants, deed restrictions, and engineering and institutional controls to protect human health and the environment. Superfund sites are a category of Brownfield sites. Former military bases comprise a large group of Brownfield sites and many are Superfund sites as presented in Attachment 16.

Many cities and industrial areas are Brownfields and many have been successfully cleaned up and reused for mixed-use developments. In fact, Brownfield development or land recycling is one of the most environmentally sound ways of addressing regional growth (as opposed to paving over "green fields"), is very common and is proven to provide significant economic, environmental and public health benefits.

In fact, much of downtown San Francisco and the eastern neighborhoods on the Bay from Mission Bay down through Islais creek have been Brownfields since the 1906 earthquake when these neighborhoods were created by filling in the Bay with earthquake rubble. The fact that this rubble contained chemical contamination was recognized long before the word "Brownfields" became fashionable. The SFDPH established the "Maher" ordinance in 1986 (now Article 22A of the Health Code) to deal with these fill areas and the contamination associated with them. Once the Navy has prepared land at the Shipyard for transfer, the condition of the land and the engineering or institutional controls there will be very similar to other Brownfields in the Bay Area like Mission Bay, Emeryville, the America Center in San Jose, Mandela Gateway in Oakland, Oyster Point in South San Francisco and the Uptown Development in Oakland. A synopsis of a number of local Brownfields projects is included as Attachment 17.

Mission Bay and Emeryville are particularly relevant examples. Mission Bay is a typical urban Brownfields site. It was an area of Bay fill that was used for rail yards, warehousing and miscellaneous dumping. After extensive testing, the City decided to redevelop the site, but to prevent exposure to contaminants, gardens must be in raised boxes (example of an institutional control) and there is a requirement for the final end use to require a durable cover or clean topsoil (example of an engineering control). Additionally, due to organic material in the Bay fill and underlying organic-rich native material around Mission Bay, methane is sometimes detected in soil gas and if present above action levels, methane gas mitigation systems must be designed and installed during building construction. The barriers (or "covers") between the widespread but low level contamination across Mission Bay that are provided by the building pads, parks and streets of the development itself are the most important element of the final environmental remedy for Mission Bay.

Much of Emeryville is also a good example of Brownfields development. Emeryville was a former hub of industrial activity. As industrial activities began to contract and relocate to other cities in the 1970s, they left behind properties with contaminants that had to be cleaned up before new redevelopment could happen. Many properties in Emeryville have been redeveloped using the Brownfields model of evaluating risk and implementing engineering controls like "caps" and "covers" and institutional controls like deed restrictions prohibiting gardens at grade. Like the Shipyard, much of the redevelopment in Emeryville has focused on housing, commercial, retail and park uses and Emeryville is rapidly redeveloping into a commercial and residential community with a diverse population that is growing at a rate expected to be more than twice the rate of surrounding Alameda County.

V. Regulatory Oversight during Construction

After the transfer of land from the Navy to the Agency, and the concurrence of the various regulatory agencies that the property can safely be used under the City's redevelopment plans, construction on the Shipyard will be required to comply with a variety of applicable federal, state and local environmental laws. These laws will be enforced both through provisions in those laws and through mitigation measures that will be imposed through the adoption of a Mitigation Monitoring and Reporting Program ("MMRP") as part of findings adopted as required by the California Environmental Quality Act ("CEQA") at the time the Project is approved. The mitigation measures related to the issues discussed in this summary are presented in Attachment 18.

To ensure that all environmental restrictions are complied with, the MMRP requires any builder working on the Shipyard, before obtaining any permits for construction, to provide documentation to the SFDPH that the work will comply with all environmental restrictions imposed on the property through the CERCLA process, or a separate process that the RWQCB is overseeing to address petroleum contamination. Further, under a pre-existing Memorandum of Understanding between the Navy and DTSC, DTSC will have authority in perpetuity to enforce all land use restrictions that the Navy has imposed on the property through deed restrictions.

Other hazardous materials laws will also control construction activities at the Shipyard. For example, if soil or groundwater containing hazardous materials must be disposed of off-site, the handling and disposal will be subject to an array of laws. Also, if buildings contain asbestos or lead-based paint, these materials will be subject to special laws governing their handling administered by the Bay Area Air Quality Control District ("BAAQMD"), the California Occupation Safety and Health Administration ("Cal/OSHA") and the San Francisco Building Department through the City's Building Code Chapter 34.

In addition to federal and state regulatory oversight, the City will oversee a number of activities related to construction on the Shipyard, including the removal of underground storage tanks and the handling of lead-based paint on buildings during demolition. Most importantly, in connection with the first phase of development on the Shipyard, a new section of the Health Code, Article 31, was written to specifically apply the Maher Ordinance to construction on the Shipyard. Article 31 requires that prior to receiving permit approval for excavating or grading, a builder must submit a Site Evaluation Report that includes information about the site history and current site conditions. They are also required to submit the following plans to ensure safe work practices and environmental protection during construction: a Dust Control Plan; an Unknown Contaminant Contingency Plan; a Disposal Plan (if applicable); a Site Specific Health and Safety Plan; and a Soil Importation Plan (if applicable). Article 31 also includes sampling requirements for areas that were formerly industrial areas and are now being converted to residential use. All of these requirements will remain in place for Parcel A, and Article 31 will be amended as part of the overall project approvals to cover construction on the rest of the Shipyard.

VI. Construction Dust

One of the most widely discussed issues regarding construction at the Shipyard has concerned construction dust. As with any large site, construction activities at the Shipyard will generate dust. The entire site will be subject to BAAQMD regulations and the SFDPH controls on dust through SF Health Code Article 22B. To assure compliance with these requirements, the MMRP requires builders to obtain approval of an Asbestos Dust Mitigation Plan from BAAQMD for areas over one acre that contain or might contain naturally occurring asbestos and approval of a Dust Control Plan from SFDPH for all areas of the Shipyard. The purpose of these monitoring and control requirements is to trigger health protective actions such as increased dust control or temporary health protective shut downs of the dust generating activities. The levels of dust or naturally occurring asbestos that trigger action are set at levels well below any level of health concern so that if there are any issues with the monitoring or control there will not be any long term health effects.

BAAQMD is the lead regulatory agency for air quality in the Bay Area. BAAQMD has enacted specific regulations for construction impacts related to the disturbance of serpentine rock. Prior to commencing construction on Parcel A, Lennar was required to obtain BAAQMD's approval of an Asbestos Dust Mitigation Plan. In

granting that approval, BAAQMD went beyond the minimum requirements of the regulations and required Lennar to prepare an air monitoring plan and establish a network of airborne asbestos monitoring stations at different locations on the perimeter of the site. In addition, Cal OSHA reviewed and approved a site-specific plan for the grading to ensure that workers were protected from potential exposure to naturally-occurring asbestos. The regulatory agencies review of the potential impacts of construction dust at the Shipyard also considered hazardous substances other than serpentine rock that may be present in the soil that could have been released into the air during construction. Their conclusion was that Parcel A could be used for unrestricted residential use and that there would not be an unacceptable hazard from the construction dust.

In addition, under Article 31, the SFDPH approved a specific Dust Control Plan for the Shipyard that required both general measures to control the spread of dust from construction activities in any area of the project and the use of particulate dust samplers to monitor compliance. Key elements of these dust control plans include:

- Watering unpaved construction roads as well as adjacent paved roads in use by contractors
- Posting speed limit signs for 10 mph within the construction site
- Implementation of erosion control measures as required in the Storm Water Pollution Prevention Plan (SWPPP – under separate regulatory authority)
- Paving the main access and egress routes to and from the main construction site
- Construction of gravel access pads at secondary access points, onsite loading areas and at temporary stockpile locations
- Sweeping 500 feet of public roadway of all visible track out at exits from the construction site at least once a day
- Wetting active portions of the construction site prior to soil disturbance to prevent visible dust emissions from crossing the property line
- Provide as much water as necessary to control dust (without creating run-off) in any area of land clearing, earth movement, excavation, drillings, and other dust-generating activity
- Watering dry areas frequently
- Sweeping paved portions of construction sites frequently, if needed
- Applying physical or chemical stabilization to unpaved roads, if needed
- Covering soil hauling trucks with tarps
- Wetting soil or materials hauled in trucks
- Washing down wheels and all equipment before moving from the construction site onto paved public roads
- Providing at least one foot of freeboard when loading soil hauling trucks
- Pre-wetting excavation areas to anticipated depth of excavation
- Stabilizing excavated, cleared or graded areas with water or a dust palliative
- Stabilize all finished areas with hydroseed or similar measures within 5 working days of completion
- Halt all earthmoving activities when sustained hourly average wind speed is 25 mph or greater
- Stabilizing inactive stockpiles by wetting, tarping or similar methods

- Minimizing drop heights of excavated materials
- Windbreaks installed on perimeter fencing
- Particulate monitoring equipment (measures dust levels in air) installed at upwind and downwind locations at the site
- Record keeping for particulate monitoring results
- Action levels for stopping work when particulate levels are too high at the perimeter
- Action levels based on wind, dust migration and if dust is contained within the property boundary but not controlled within a specified number of minutes
- Establishment of a hotline for surrounding community members
- Submission of daily inspection reports to SFDPH of their contractors' inspections of earthmoving operations

In furtherance of the Dust Control Plan, the SFDPH and the BAAQMD conduct random daily inspections of Parcel A Redevelopment to verify that the dust control plan is properly implemented, no visible dust is crossing the property boundary, and that any dust generated within the property boundaries is kept to a minimum and immediately suppressed when observed.

A detailed summary of prior issues concerning construction dust at the Shipyard is attached hereto as Attachment 19. As noted therein, despite numerous allegations, no evidence has been provided to suggest that construction activities at the Shipyard created a significant health risk in the community. In fact, the SFDPH, the BAAQMD, the CDPH, the US Agency for Toxic Substances and Disease Registry and the USEPA have all specifically opined that the measures currently in place are protective of human health and the environment and that there is no reason not to proceed with development of the Shipyard.

In fact, the oversight by the SFDPH of the construction on Parcel A was one of the strongest and most regulated in the Bay Area. The developer was required to submit and obtain approval of a Dust Control Plan prior to construction that included particulate monitoring and action levels for shutting down work if dust was generated. SFDPH conducted inspections and, under their strict regulatory authority, required additional action for dust generation problems once in August 2007 and three times in 2006. There have been no dust problems observed by the inspectors or in the daily particulate monitoring logs at property since August 2007. None of the dust generation problems prior to and from August 2007 were a health concern. The SFDPH regulatory action based on the Dust Control Plan was a preventative measure to assure that the dust generation would not become a health issue. These regular inspections, strict oversight and daily particulate monitoring provide an extra layer of assurance that dust levels have been kept extremely low throughout the construction so that any dust generated was of small enough quantities and short enough duration that it would have been less than any estimate for dust exposures envisioned by the regulatory agencies when they allowed the property to be approved for unrestricted residential use.

VII. Frequently Asked Questions

Is the Shipyard Safe for Existing Tenants and Visitors?

Yes. The Shipyard hosts thousands of tenants, workers and visitors every year and has for many years. The regulatory agencies specifically approved these uses because the Shipyard is not unsafe to people in its current state.

How Does Proposition P relate to these Plans?

On November 7, 2000, the voters of San Francisco voted to approve Proposition P which called upon the Navy to remediate the Shipyard to the highest levels practical to assure flexible reuse of the property. More details on Proposition P are included in Attachment 20. On July 30, 2001, the Board of Supervisors approved a resolution confirming as the policy of the City and County of San Francisco that the Hunters Point Naval Shipyard should be cleaned of toxic and hazardous pollution by the Navy to the highest practical level. In furtherance of Proposition P, in 2004, the City approved a Conveyance Agreement with the Navy that contemplated the phased transfer of parcels on the Shipyard; provided that the regulators concur the property can safely be used for its intended use. That agreement and the processes set forth in it, together with applicable federal, state and local laws, will govern future transfers between the Navy and the Agency.

What is the difference between a cap and a cover?

Both "caps" and "covers" are typical of Brownfields development. The term "cover" refers to a remedy requiring that physical barriers be installed (or remain in place) to support the development (e.g., building slabs, pavement for roads, concrete for sidewalks, clean soil in parks), meet certain specifications of thickness and be maintained to prevent breaches. The controls imposed in conjunction with cover remedies include an operation and maintenance plan and generally contemplate that temporary breaches of the cover will be allowed as part of redevelopment activities with the approval of the regulatory agency and will require replacement of the cover to repair any such breaches.

The term "cap" refers to a remedy requiring the installation of a surface specifically engineered to be placed on top of an area of known or suspected residual contamination (typically a landfill); the surface may be asphalt, concrete, or soil, but is generally more robust than a "cover" remedy, includes a "demarcation layer" of some sort, is often accompanied with recovery or monitoring equipment, and requires more intensive operation and maintenance than a "cover" remedy. The controls imposed in conjunction with cap remedies generally make it more difficult to secure approval for a breach of the cap than the controls for a cover remedy.

Where will Residential Use be allowed at the Shipyard?

The remedy requirements chosen for the Shipyard include physical barriers (e.g. covers consisting of a building, street, sidewalk or two feet of clean soil in parks) on top of existing soil and, in some small areas of residual groundwater contamination, special foundations for buildings. These two requirements will be the same and will look the

same in both residential and commercial areas of the site as presented in the table in Attachment 21.

In the dark green areas of the map in Attachment 21, residential use has already been approved by the Regulatory Agencies or will be approved in the next year and a half. Many of the light green areas are currently planned for non-residential uses (e.g. open space, industrial, commercial, research and development) however the remedy requirements are the same or are anticipated to be the same as residential areas – physical barriers for soil and small areas with special building foundations for groundwater. Therefore, it is anticipated that these areas can be used for residential use if additional approvals are obtained from Regulatory Agencies. The additional regulatory approval would consist of a review of existing soil and groundwater data, at the time that the approval is sought, and an assessment of whether any further soil or groundwater treatment is required.

What does a potential "early transfer" mean in the context of the Shipyard?

CERCLA requires that, prior to real property conveyance, the Navy must remediate hazardous substances to a level consistent with the protection of human health and the environment; or, if conveying property before completion of remediation, the Navy must ensure that the property is suitable for conveyance for the use intended and that the intended use is consistent with the protection of human health and the environment. There are two ways in which the Navy can transfer title to the Shipyard: (1) after complete remediation of a parcel (e.g., the approach taken with Parcel A) or (2) or as an early transfer before remediation is completed.

The first option for title transfer assumes that all remediation necessary to protect human health and the environment has been conducted on the property. In conveying property that is remediated, the Navy documents its findings in a Finding of Suitability to Transfer ("FOST"). The FOST documents environmental findings regarding the proposed transfer, summarizes the environmental condition of the property and, where appropriate, identifies any environmental conditions that would pose constraints to activities or uses of the property. At the time of transfer, the Navy is required to covenant that all required remediation has been completed and that if additional remedial action is needed with respect to contaminants on the property at the time of transfer, further cleanup will be the Navy's responsibility. The Conveyance Agreement for the Shipyard also requires federal and state environmental regulator concurrence prior to conveyance of a parcel by FOST.

CERCLA also provides that the Navy may transfer property before all remedial action is complete via an "early transfer", but only if USEPA and the Governor of California first authorize the transfer. To do so, they must determine that the property is suitable for the use intended by the Agency, the intended use is consistent with protection of human health and the environment, restrictions are imposed in the deed for the property that will ensure protection of human health and the environment, and the Agency will be able to complete any remaining remedial activities. The Navy will document that the property may be transferred prior to the completion of all remediation in a Finding of Suitability for Early Transfer ("FOSET"). No property will transfer until

the Navy has completed and the regulators have approved all radiological investigation and cleanup activities.

Consistent with the Preliminary Hazardous Materials Remediation Plan that was endorsed by the Board of Supervisors as part of the Conceptual Framework in May 2007, the Agency is considering approval of an "early transfer" of Parcel B (except for certain portions of IR 7/18) and Parcel G. Subsequent early transfers of other parcels (except Parcel E-2, a portion of Parcel E and IR 7/18) may also be considered. As noted above, the Navy has already completed most of the remediation of Parcels B and G and the Navy and regulatory agencies have already selected the remedy for the remaining cleanup required for these parcels, which, pursuant to either a FOST or a FOSET, will consist of installation and operation of groundwater treatment systems, construction of a surface cover, installation of vapor barriers under buildings in some locations and construction of a shoreline revetment wall.

After an early transfer, the Agency would be responsible for implementing those remedial activities that remain in accordance with the approved remedial design documents. The Navy would provide a financial grant to the Agency of the funds necessary for the Agency to implement those remedial activities, and to procure environmental insurance covering cost over-runs and discovery of unknown contaminants. The Agency would be supervised by the same regulatory agencies supervising the Navy, and would be held to standards as strict as those the Navy is held to, under a legal agreement called an Administrative Order on Consent ("AOC") which would be signed by US Department of Justice, USEPA, DTSC and the RWQCB. If the Agency were found to be unable to perform its obligations under the AOC, the regulatory agencies could require the Navy to reassume its responsibilities for completing the cleanup. If an early transfer is not pursued for Parcels B and G, the Navy would perform the remedial activities itself under the supervision of the regulatory agencies, and transfer ownership of the property after those agencies determined the cleanup was complete. Under either scenario, no property will transfer until the Navy has completed and the regulators have approved radiological investigation and cleanup.

How is potential Sea Level rise being addressed and what does it mean for the cleanup?

There has been a concern expressed that sea level rise due to climate change could potentially cause flooding of the redevelopment area, causing migration of contaminants or an increase in liquefaction potential. More details about sea level rise are included in Attachment 22. The Navy is assuming three feet (36 inches) of sea level rise in the design of Navy required shoreline protection structures. The approach to addressing sea level rise has been closely integrated with the physical barriers that will be on the site to ensure that the site is safe for people and the environment. The Redevelopment project is taking several measures to address sea level rise including: setting back development at least 100 feet from the shoreline, raising the occupied floors of the development to 55 inches above the 100 year flood level and exploring potential adaptive management strategies that could be implemented to address additional rises in sea level such as landscaped berms or seawalls at the shoreline that would prevent wave over-topping. Attachment 23 details the relationship between the physical barriers that will be on the Shipyard along with the proposed sea level rise strategies.

Metals and Sea Level Rise

The groundwater levels under the Shipyard have gone up and down over time, as much as eight feet or more in some areas of the site, depending on the amount of rainfall in the winter. These varying groundwater levels have been considered in the Navy's chosen remedies for contamination at the site. When the sea level rises, groundwater levels near the shore will also rise. Residual chemicals in soil largely consist of metals which are associated with the rock and soil that were historically used to fill in the Bay. These metals are not part of a spill of chemicals but rather reflect metals concentrations normally associated with Franciscan Formation bedrock. These metals are predominantly immobile and do not dissolve in groundwater and are not associated with any existing groundwater contamination. Thus, a rise in the groundwater level caused by a rise in sea level will not mobilize these metals. As an added precaution, these metals will be under a physical barrier (e.g., soil cover, pavement, sidewalk, concrete building foundation) that will reduce human exposure to these residual metals in the soil.

Vapors and Sea Level Rise

After remediation is complete there may still be low levels of residual chemicals in groundwater in a few known areas (see map in Attachment 21) that could result in vapors accumulating under buildings constructed over these areas. Subsurface soil vapor sampling will be conducted to refine the boundary of these small areas. If needed, a vapor mitigation system (thick plastic and vent pipes) will be constructed within and underneath building foundations. These vapor mitigation systems are common, well tested, and protective of building occupants, be they residential or commercial occupants. All soil vapor sampling programs, definition of areas requiring vapor controls and the design and installation of vapor mitigation systems will be overseen and approved by the regulators (USEPA, DTSC, and RWQCB). Furthermore, any soil vapor mitigation system will be subject to periodic inspection and maintenance to ensure proper operation. In addition, if the sea level rises so that the near shore groundwater rises close to the surface, then vapors would no longer accumulate in soil under buildings because the soil would be saturated with groundwater and could no longer contain vapors. If the groundwater, in the few small well defined areas, rises to the surface prior to the completion of residual remediation, then current laws will require the reevaluation of the groundwater hazard to human health or the environment. Additionally, the Institutional Controls placed on areas with residual chemicals would force action to maintain protection to the environment and prevent human exposure.

Parcel E-2 and Sea Level Rise

The Navy will also consider sea level rise when developing remedies for the Parcel E-2 landfill. Some groundwater results show that leaching from the landfill has the potential to impact to the Bay. The Parcel E-2 Feasibility Study has identified remedies to mitigate these potential impacts through containment, monitoring and removal. If the Navy remedy selection process results in an engineered cap being selected by the Navy, approved by the regulators, and constructed on top of the E-2 landfill, then the cap will be designed to contain the waste in the landfill even if the groundwater in the landfill rises as a result of sea level rise.

Additionally, emergency response plans will be carried out following major flooding and seismic events, at which time the landfill engineered cap, if chosen as the remedy, will be investigated for potential breaches and repaired.

What happens if contamination is kept in place and there is a large earthquake?

Given the Shipyard's proximity to major area faults and the subsurface conditions present, seismic hazards (earthquakes) and liquefaction (a situation in which the strength and stiffness of a soil is reduced by earthquake shaking) could occur, but would not fatally impact new development or uncover toxics that could expose the public or the environment to unacceptable levels of hazardous materials. More details about seismic hazards and liquefaction issues are included in Attachment 24.

The Seismic Hazard Mapping Act was passed in 1990 following the Loma Prieta earthquake. The Act was designed to reduce threats to public health and safety and to minimize property damage caused by earthquakes. This Act is considered in all new designs for structures at the Shipyard. Based on existing data and Navy studies of the site, there is little or no risk of large ground movements at the site as a result of liquefaction, except deep under the landfill (see below). To further investigate liquefaction and earthquake hazards, site-specific geotechnical and seismic studies will be required for the project prior to issuance of any building permits. Seismic mitigation measures will include structural measures (specific structural design) and possible ground improvement methods (e.g. over-excavation, compaction). These measures will be determined by a site-specific seismic analysis. These studies will provide ground improvement/mitigation recommendations to address potential liquefaction-related ground hazards, should they exist.

Metals and Earthquake hazards

Residual chemicals in soil largely consist of metals which are associated with the rock and soil that were historically used to fill in the Bay. The residual metals are only a concern for health after a lifetime of significant daily exposure. Exposure to a small amount of dust is not a health concern. To prevent long-term exposure, these residual metals will be under a physical barrier (e.g. soil cover, pavement, sidewalk, concrete building foundation) that will reduce human exposure to the metals in the soil. Operation and maintenance plans for these physical barriers will be carried out to periodically monitor and repair any cracks. If cracks do occur after an earthquake, the cracks will be discovered during the required post-earthquake inspections and will be repaired.

Vapors and Earthquake hazards

After remediation is complete there may still be low levels of residual chemicals in groundwater in a few known small areas (see figures in Attachment 24). If the subsurface vapor sampling predicts a problem with vapors from these small groundwater areas accumulating under a building, the building is designed with a vapor mitigation system (thick plastic and vent pipes) to vent the vapors to the atmosphere. This vapor mitigation system and the building are designed to withstand shaking during an earthquake and continue operating as designed after an earthquake.

Parcel E-2 Seismic Hazards and Liquefaction and Release of Contaminants

The Navy's Draft Final Remedial Investigation/Feasibility Study Report included a liquefaction and slope stability evaluation. The evaluation concluded that, for soil layers that could liquefy during the largest potential earthquakes, lateral movement of soil below the waste might be as much as 4 to 5 feet. Further technical review and reports may refine this estimate. Settlement of liquefiable soil below the waste may be up to 10 inches. If the Navy proposes and regulators concurs that an engineered cap should be installed on top of the landfill as part of the Navy's CERCLA program, site-specific geotechnical studies will be used in the design of the engineered cap to minimize potential breaks during earthquakes. The cap would limit exposure and protect humans from long-term health risks even if breaks in the cap temporarily occur. Operation and maintenance plans for the engineered cap will be carried out to monitor and repair potential breaks. Therefore, if ground rupture were to occur, contaminants should not be released at levels presenting a concern to human or ecological health.

A landfill gas collection system was installed at the landfill in 2002. Methane is the primary component of landfill gas. Methane is non-toxic and vented to the atmosphere through the collection system. The landfill gas has been tested for other chemicals of concern and none have been found at a level of concern. After an earthquake, the landfill gas collection system would be checked and repaired if there were any problems found.

Emergency response plans will be carried out following major flooding and seismic events, at which time the landfill engineered cap, if chosen as the remedy, will be investigated for potential breaches and repaired.

What is the difference between a Notice of Violation and an Exceedance with regard to Construction Dust?

As noted above, dust control standards are set at levels well below any level of concern to protect public health. Notice of Violation systems are established to correct problems with compliance with the Dust Control Plan so that public health continues to be protected. Four Notices of Violations (three in 2006 and one in 2007) were issued by the SFDPH for construction on Parcel A because Lennar's contractors had problems with their work practice and difficulty adhering to the strict standards of the Dust Control Plan on these four occasions. The Asbestos Dust Mitigation Plan required by the BAAQMD is also a work practices monitoring system. The BAAQMD issued two Notices of Violation to Lennar for monitoring problems at the beginning of the project and for other incidents of dust control problems. All these problems were corrected as required and improvements were made. There have been no Notices of Violation over the past two and a half years.

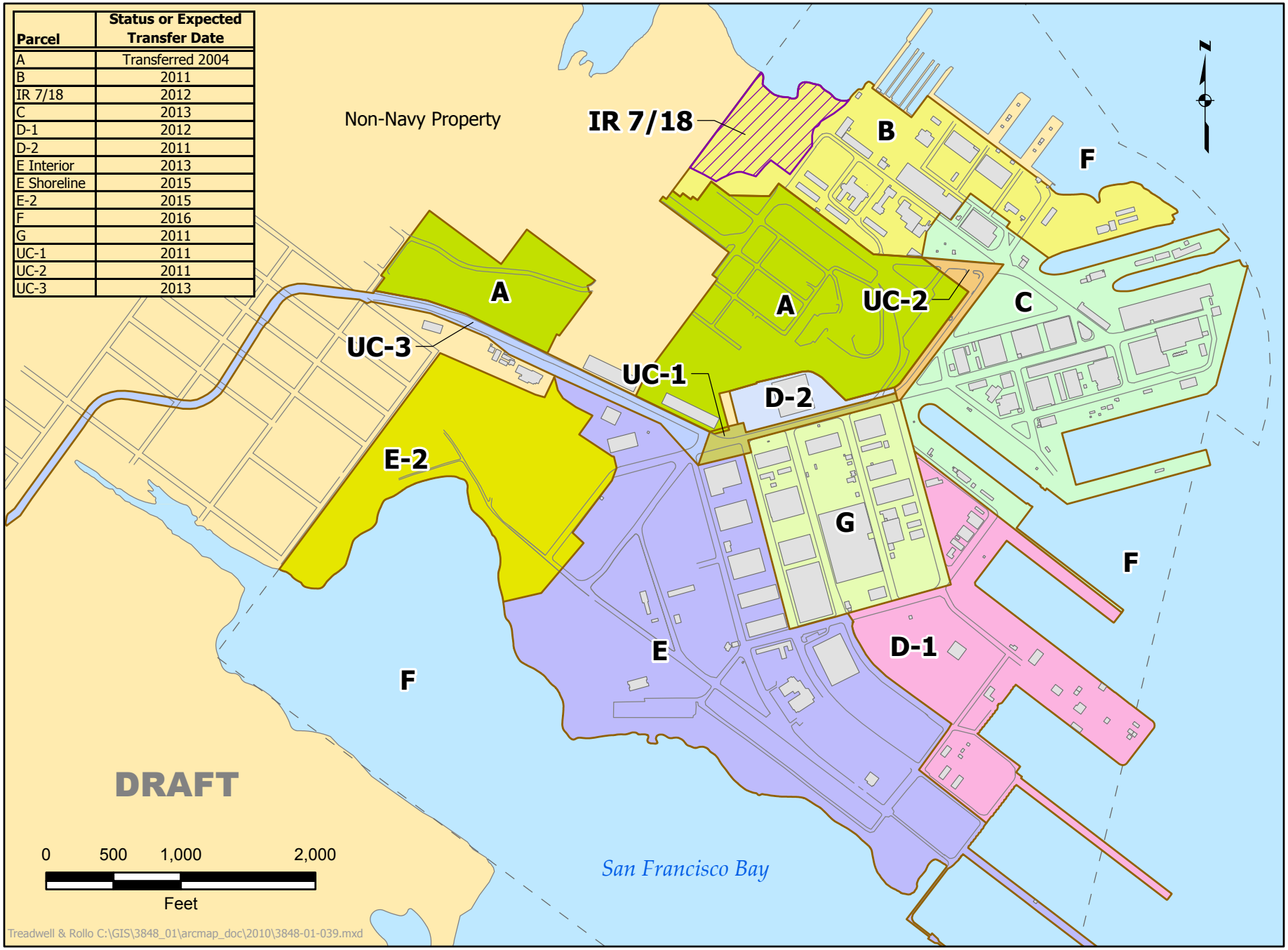
Exceedances are different. The Asbestos Dust Mitigation Plan anticipated that Lennar would reach the shut down (or "exceedance") levels for the asbestos air sampling during the ordinary course of their construction activities because the BAAQMD deliberately set those numbers at a conservative health protective level. Therefore an "exceedance" of the shut down criteria is part of the normal work system. Given the existence of naturally occurring asbestos in native rock, it is not surprising that during

grading and excavating on Parcel A there have been a number of occasions when the air sampling results indicated naturally occurring asbestos levels requiring temporary shutdown of the project under the conservative shutdown levels required in the air-district-approved air monitoring plan. Further details about these dust and asbestos issues are presented in Attachment 19. The very reason that these regulatory mechanisms exist is to establish safeguards so that dust issues can be addressed promptly and the public health can be protected. That is exactly what happened on Parcel A. It now is apparent, after the USEPA's 2009 draft study of some of the airborne asbestos samples from the site, that the system of monitoring airborne asbestos at the Shipyard is even more conservative than what might be necessary from a health perspective. When the USEPA looked at the air monitoring samples from the Shipyard, they concluded in their draft report, that the current system of air monitoring has required more temporary shutdown days than would be indicated if a similar USEPA type sample analysis was used.

LIST OF ATTACHMENTS

Attachment 1

Parcel Map of the Shipyard


Parcel | Status or Expected Transfer Date
A | Transferred 2004
B | 2011
IR 7/18 | 2012
C | 2013
D-1 | 2012
D-2 | 2011
E Interior | 2013
E Shoreline | 2015
E-2 | 2015
F | 2016
G | 2011
UC-1 | 2011
UC-2 | 2011
UC-3 | 2013
Non-Navy Property
IR 7/18
B
F
A
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UC-2
C
UC-3
UC-1
D-2
E-2
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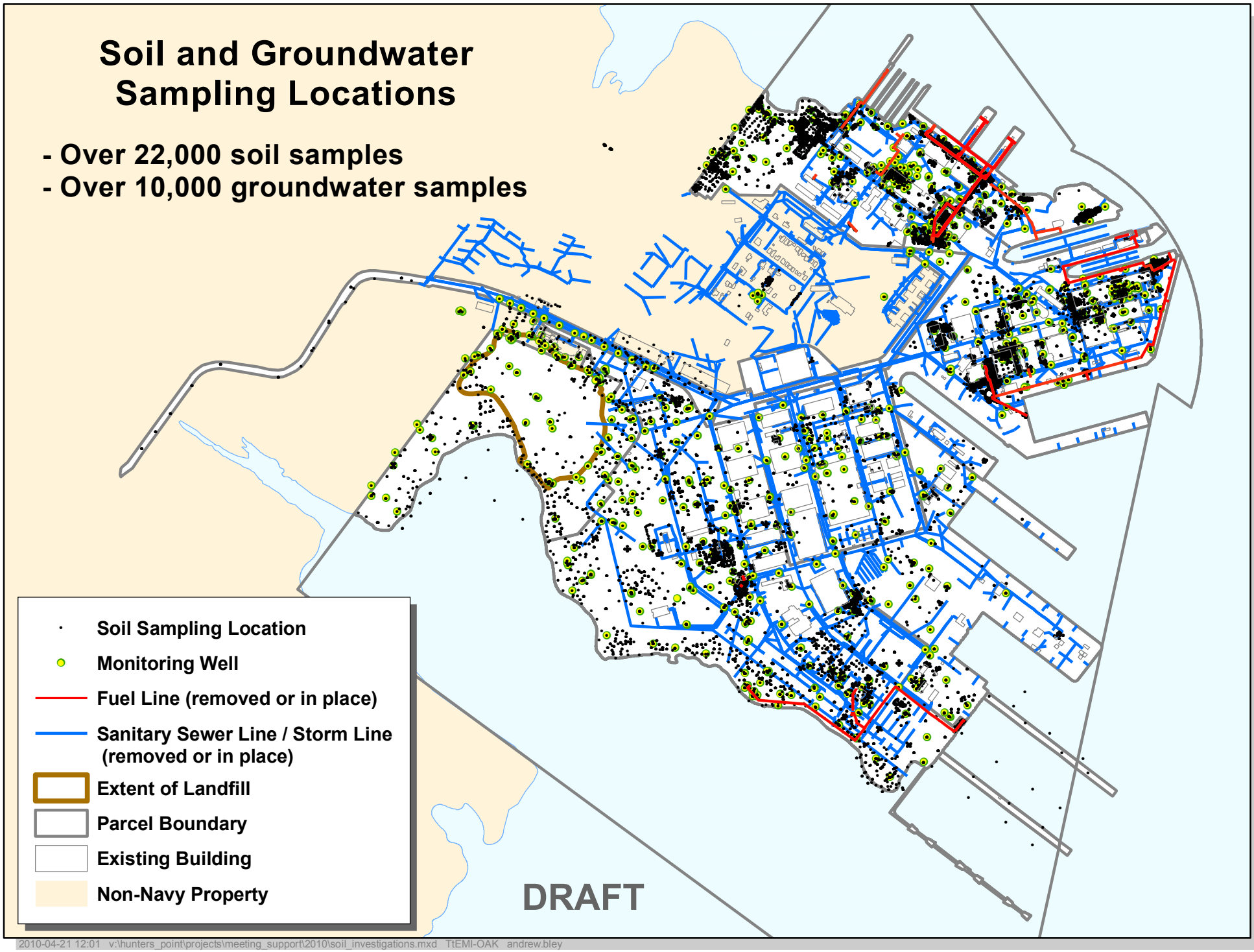
Attachment 2

Sampling Map

Soil and Groundwater Sampling Locations

- Over 22,000 soil samples
- Over 10,000 groundwater samples



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Attachment 3

Steps in the CERCLA Process

Attachment 3
Steps in the CERCLA Process

The CERCLA[1] process is defined in general terms below. A summary of the steps in the CERCLA process is described here and is illustrated on the Status of CERCLA Process figure below. The relevant environmental regulatory agencies would require performance of the remedial activities that the Navy is undertaking regardless of whether any redevelopment projects were proceeding. Potential environmental effects of the remedial activities (i.e., of soil excavation, soil transport, and operation of treatment systems) have been, and will continue to be, evaluated by the Navy and regulatory agencies in conjunction with the approval process for specific remedial actions, and appropriate environmental controls have been, and will continue to be incorporated into the design and implementation of those remedial actions.

Summary of Navy Cleanup Process

The Navy is carrying out each step in the CERCLA process listed below for each parcel at the Shipyard. Each step results in the preparation of a document which is available to the public at the official document repository which the Navy is required to maintain for the project (located at the San Francisco Public Library located at 100 Larkin Street, San Francisco, California). Many of these documents (e.g., the Feasibility Study and Proposed Plan) are made available in draft form for public review and comment before they are finalized. Pursuant to the Community Involvement Plan implemented by the Navy and approved by the regulatory agencies, various types of community outreach activities are conducted in association with each of these steps.

- **Preliminary Assessment/Site Inspection** — An initial review of the site, including review of historic records and visual inspections. Sampling and analysis of soil, surface water, and/or groundwater may occur to evaluate whether the site needs to move to the next phase for further investigations.

- **Remedial Investigation** — A closer look including collecting and analyzing samples to assess risk to human health and the environment. Treatability studies may occur in conjunction with or alongside physical investigation and alternative evaluation. A Removal Action may also be performed at this point.

- **Feasibility Study** — Results of the risk assessment, along with other data collected during the Remedial Investigation, are used to evaluate cleanup alternatives that have been screened for effectiveness, implementability, and cost.

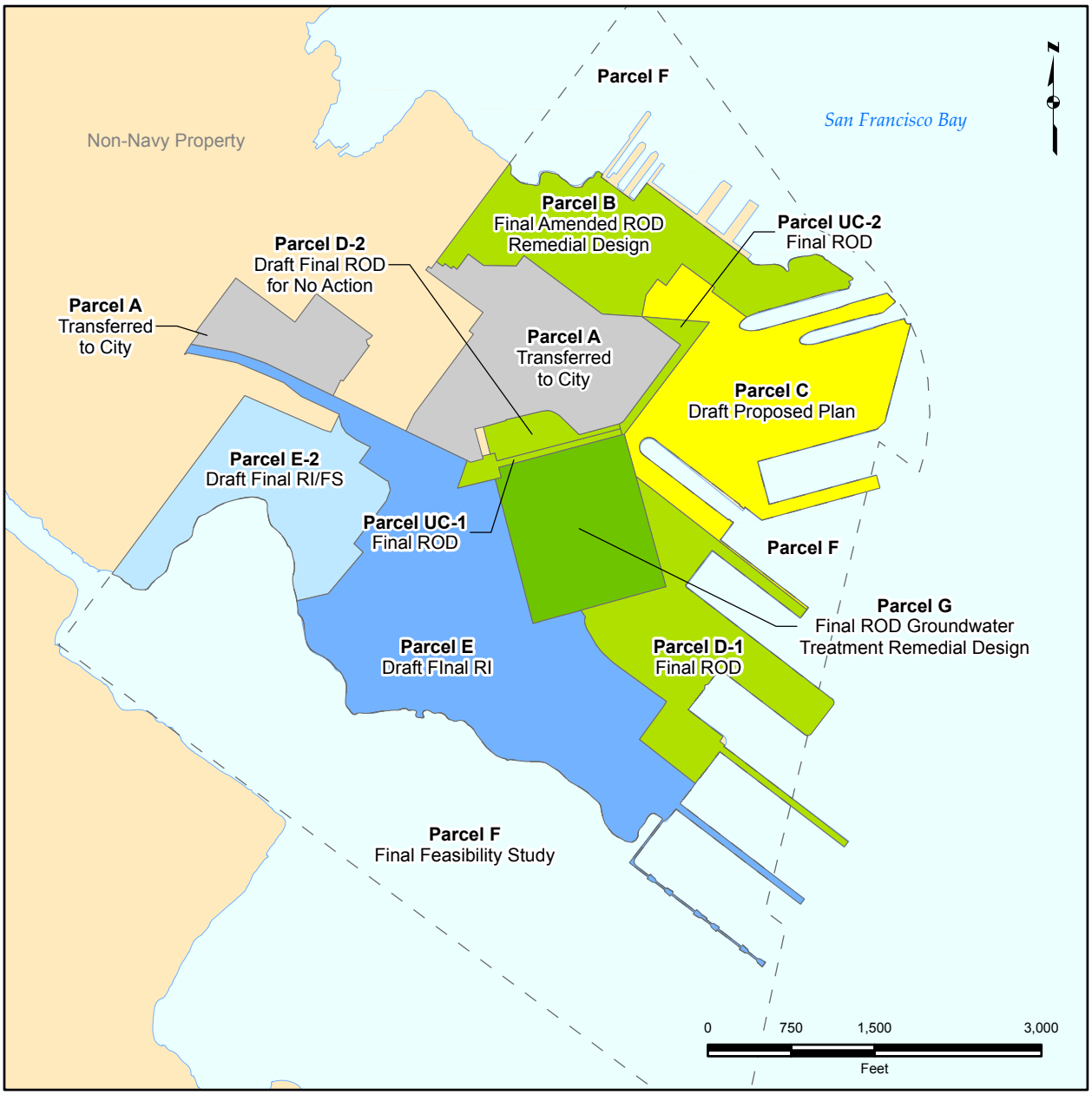
[1] CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act, commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

- **Proposed Plan** — A fact sheet that describes cleanup alternatives evaluated in the Feasibility Study and explains the preferred alternative. This step requires a meeting to be held to provide information to the public and allow the public to comment on the preferred cleanup alternative.

- **Record of Decision (ROD)** — The selected cleanup alternative is documented and publicized in this document. A summary and responses to all comments on the Proposed Plan are included in this document.

- **Remedial Design** — A design for implementing the selected cleanup alternative is prepared. A fact sheet is sent to the public before the Navy begins work on the cleanup.

- **Remedial Action** — The cleanup remedy is carried out and the public is kept informed.



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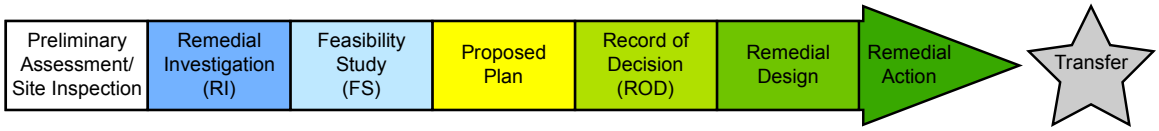

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STATUS OF CERCLA PROCESS

Attachment 4

Parcel-By-Parcel Summary and Expected Transfer Dates

Attachment 4
Parcel-By-Parcel Summary and Expected Transfer Dates

Eighty-eight acres of the Shipyard know as Parcel A was transferred from the Navy to the San Francisco Redevelopment Agency and is under construction. The figure presented in Attachment 3 shows the current stage of the CERCLA process for each parcel.

Parcel B

The Navy has completed the preliminary investigation, site inspection, remedial investigation, feasibility study, proposed plan, and ROD. The Navy issued an initial ROD in 1997, prepared a remedial design, and proceeded with remedial action implementation. After a decade of work and additional study, it developed a revised remedy. The Navy issued an amended ROD in 2009. The Navy has been carrying out remediation of radiologically impacted sewers and storm drains and buildings since 2007. Remediation means that the sewers and storm drains are removed from the ground and adjacent soil is excavated until confirmed clean. All sewers, storm drains and residual radiological contamination have been removed and all areas have been certified clean by Navy laboratories. A few buildings that used to contain residual contamination have also been cleaned up and certified clean by Navy laboratories. All these areas will receive closure certification from the Regulatory Agencies prior to transfer. Three small areas of chemical soil contamination will be excavated in 2010 by the Navy and that will complete all required soil excavation work on Parcel B. The Navy is completing a remedial design for the remaining work on Parcel B. The Navy is also planning to complete the design and standards for soil vapor surveys and then conduct a soil vapor survey over the entire parcel to verify that future construction will require vapor barriers in few, if any, areas. Also the corrective action work plan for the petroleum hydrocarbon program in Parcel B was finalized in 2009, fieldwork has been completed, and the report documenting completion is being finalized. The shoreline areas in Parcel B that are not currently built with sea walls will be reinforced with rip-rap (a revetment wall) to prevent soil from going into the Bay and then the buildings, streets, sidewalks, landscaped and park areas will be built over the next 7 years, as required, to cover the existing soil and to meet the needs of development. The paperwork to document the groundwater treatment and the new construction will be submitted to and approved by the Regulatory Agencies.

Parcels C

The Navy has completed the preliminary investigation, site inspection, remedial investigation, feasibility study and proposed plan and a ROD is currently being prepared. The proposed plan for Parcel C was published in 2009 and the Navy is predicting to finish the Record of Decision in 2010. The ROD will describe the remedial actions that have been approved by the Navy, the USEPA, and the state regulatory agencies for remediating soil and groundwater in Parcel C. Parcel C is undergoing removal of sewers,

storm drains and residual contamination. All these areas will receive closure certification from the Regulatory Agencies for these issues prior to transfer. A study to evaluate methods to clean up solvents and metals in groundwater (known as a "treatability study") is in progress at Buildings 134, 211, 231, and 253 in the eastern area of Parcel C. The Navy is predicting the property will be ready for transfer in 2013. After transfer, the buildings, streets, sidewalks, landscaped and park areas will be built, as required, to cover the existing soil and to meet the needs of development. The paperwork to document the new construction will be submitted to and approved by the Regulatory Agencies.

Parcel D now new Parcels D-1, D-2, G and UC-1

The original Parcel D consisted of 101 acres of the southeast-central portion of HPS. After completing the preliminary investigation/site assessment, remedial investigation, and feasibility study for Parcel D, the Navy prepared a Proposed Plan that presented a proposal for remedial action to be selected in the ROD for the entire Parcel. Although the Proposed Plan covered all of Parcel D for final remedy selection, the Navy divided Parcel D into four new parcels: Parcels D-l, D-2, G, and UC-l ("UC" stands for Utility Corridor). One combined ROD for Parcels D-1 and UC-l was issued and separate draft RODs were prepared for Parcel D-2 and Parcel G.

- **Parcel D-1** — The Final Parcel D-1 ROD was issued in 2009. Parcel D-1 is undergoing removal of sewers, storm drains and residual contamination. The regunning pier (the area with the large crane) is also undergoing an investigation and removal of any remaining contamination. All these areas will receive closure certification from the Regulatory Agencies for these issues prior to transfer. Small areas requiring soil excavation because of chemical contamination will be completed over the next year. A groundwater treatability study was recently completed for Parcels D-1 and G and the final treatability study report will be issued and describes the success of the treatment method to clean up solvents and metals in groundwater. Results will be evaluated to determine whether further treatment is needed or only follow-up monitoring. The Navy is writing all the Remedial Design documents for the work identified in the Parcel D-1 ROD. This parcel is expected to be ready for transfer to SFRA in early 2012. After transfer, the buildings, streets, sidewalks, landscaped and park areas will be built over the next seven years, as required, to cover the existing soil and to meet the needs of development. The paperwork to document the new construction will be submitted to and approved by the Regulatory Agencies.

- **Parcel D-2** — The Parcel D-2 Removal Action Completion Report for removal of sewers and storm drains was issued recently. The final "No Further Action" ROD for Parcel D-2 is expected in summer 2010. The property will then be ready to be transferred after the Navy issues, with the concurrence of regulators, a Finding of Suitability to Transfer.

- **Parcel G** — The Navy issued a final ROD for Parcel G in March 2009. A draft Remedial Design document is currently under review by the Regulatory Agencies. These documents call for excavation and off-site disposal of contaminated soils and installing soil covers (e.g. building foundations, streets, sidewalks, clean soil for parks); treating groundwater at specific locations by injecting chemicals or biological nutrients to break down the chemicals, along with groundwater monitoring; and continuing the removal of radiologically-contaminated building materials and soils. All sewers, storm drains and residual radiological contamination have been removed and all areas have been certified clean by Navy laboratories. A few buildings that used to contain residual contamination have also been cleaned up and certified clean by Navy laboratories. All these areas will receive closure certification from the Regulatory Agencies prior to transfer. The groundwater remediation was completed as part of a groundwater treatability study. The Navy will also complete the excavation of two small areas of chemical soil contamination in 2010 and that will complete all required soil excavation work on Parcel G. Once the property is transferred, groundwater monitoring will be conducted to finalize the closeout of the Navy's groundwater treatment. Then the buildings, streets, sidewalks, landscaped and park areas will be built over the next seven years, as required, to cover the existing soil and to meet the needs of development. The paperwork to document the new construction will be submitted to and approved by the Regulatory Agencies.

Parcel E

The Navy has completed the preliminary assessment/site investigation and the remedial investigation, and has prepared a draft feasibility study (FS) for Parcel E that provides and evaluates a list of various methods, known as remedial alternatives, to address impacts to soil and groundwater. The Navy began a groundwater treatability study in 2009. The removal of sewer, storm drains and residual contamination under the streets in Parcel E is ongoing. All street areas are predicted to receive closure certification from the Regulatory Agencies for these issues prior to transfer. These street and adjacent areas in the inland area of Parcel E might be transferred to the SFRA in fall of 2013 and the buildings, streets, sidewalks, landscaped and park areas will be built, as required, to cover the existing soil and to meet the needs of development. The paperwork to document the new construction will be submitted to and approved by the Regulatory Agencies. The shoreline areas of Parcel E are predicted to require an engineered cap similar to Parcel IR7/18 and to be developed as parkland. The Navy will install the engineered cap and receive regulatory closure for these shoreline areas. The Navy predicts that the proposed plan for the cleanup decision for all areas of Parcel E will be finished in 2011 and that the ROD will be signed by 2012.

Parcel E-2

Parcel E-2 is the landfill parcel. The Navy has completed the preliminary assessment/site investigation and issued the combined remedial investigation and FS (RI/FS) Report for Parcel E-2. This report will provide information on the distribution of impacts to soil and groundwater in Parcel E-2 and evaluates a list of available alternatives to cleanup the impacts. In addition, a draft final addendum to the FS was issued in March 2010 to address radiological impacts in Parcel E-2. The Navy predicts that they will finish the proposed plan for Parcel E-2 in 2010 and publish a ROD in 2011. The Navy will install the remedies that are selected in the ROD and finish the paperwork and prepare this parcel for complete closure so there will be no cleanup work required on the parcel after transfer. This parcel is expected to transfer in 2015 and will be developed into a park after transfer.

Parcel F

Parcel F is the underwater portion of the Shipyard. The Navy has completed the preliminary assessment/site investigation and a combined remedial investigation/feasibility study, as well an updated feasibility study. A Proposed Plan is expected to be issued in 2011. A ROD is predicted to be finished in 2012. It is also predicted that the Navy will install any required remedies and finish the paperwork and prepare this parcel for complete closure so there will be no cleanup work required on the parcel after transfer. This parcel is predicted to transfer in 2016.

Parcel IR 7/18

Parcel Installation Restoration (IR) 7/18, an area that is currently a part of Parcel B, has a completed Remedial Design Document. IR7/18 is being prepared for complete closure with the Navy planning to: 1) finish the installation of a cap on the site including a protective revetment along the shoreline and 2) achieve Regulatory Agency approval and sign-off that all remedial action has been completed. Once the property has received regulatory closure and the Navy has completed the transfer paperwork, the area will be transferred to SFRA for development as a park. This transfer is expected to occur in late 2012.

Parcels UC-1 and UC-2

The RODs for Parcels UC-1 and UC-2 were completed in 2009. All sewer, storm drains and any residual contamination have been removed. These parcels are being prepared for complete closure by the Navy so there will be no cleanup work required on the parcel after transfer. Once these parcels have received regulatory closure and the Navy has completed the transfer paperwork, the area will be transferred to SFRA probably in late 2011.

Parcel UC-3

Parcel UC-3 is currently part of Parcel E. It consists of Crisp Road and a railroad right of way that extends into the adjacent neighborhood. The Navy is planning to dig up the sewer and storm drains in Crisp Road and remove residual radiological contamination in 2010. The Navy will finish the paperwork and prepare this parcel for complete closure so there will be no cleanup work required on the parcel after transfer. They are predicting a ROD by 2012 and transfer in 2013.

Timeline for Transfers

- Expected parcel transfer dates are shown on the parcel map of the Shipyard in Attachment 1 and listed below.

- Parcels B, D-2, G, UC-1 and UC-2 are expected to transfer in 2011. B and G will be transferred under a FOSET and D-2, UC-1 and UC-2 will be transferred by FOST.

- IR7/18 and Parcel D-1 are expected to transfer in 2012, IR7/18 by FOST and D-1 by FOSET.

- Parcel C, the inland area of E and UC-3 are expected to transfer in 2013. C and the inland area of Parcel E are expected to transfer by FOSET. UC-3 is expected to transfer by FOST.

- Parcel E-2 and the shoreline areas of Parcel E are expected to transfer by FOST in 2015.

- Parcel F might transfer in 2016.

These schedules assume “cleaner” parcels will be transferred via an “early transfer light” where only groundwater treatment and monitoring remain.

Attachment 5

Groundwater and Volatile Organic Compounds

Attachment 5
Groundwater and Volatile Organic Compounds

Groundwater contamination in areas like the Shipyard, where the groundwater is not used for drinking water, is typically treated and monitored. Very low levels of residual volatile organic compounds (VOCs) are sometimes too difficult to completely remove from the groundwater. The enhanced natural processes (post-treatment) over several years time can be monitored to verify that the levels are decreasing. The installation of vapor barriers to completely cut off exposure of building occupants to the residual volatile vapors is the usual regulatory requirement for these areas. Typically the building foundation itself would act as a barrier to residual vapors and the requirement for vapor barriers is an extra level of protection that ensures that occupants are completely safe. This section discusses the areas of the Shipyard and residual VOCs in groundwater in each of those areas.

Parcels B and G

Volatile organic compounds (VOCs) have been detected in the subsurface on Parcels B and G.

VOCs are currently present in Parcel B soil vapor and groundwater associated with a plume at Building 123 or IR-10. Soil vapor associated with this groundwater plume has been extracted for treatment and groundwater has been treated in situ through injection of reagents into the subsurface. Additional groundwater remediation is planned and is currently undergoing design by the Navy. The Navy has been treating groundwater plumes impacted by VOCs as part of a Treatability Study conducted on Parcels D-1 and G in 2008 and 2009. The treatment has been successful in reducing VOC concentrations to below groundwater remediation goals. Soil vapor sampling conducted as part of the Treatability Study indicates that VOC concentrations in soil vapor do not exceed health risk standards. Additional soil vapor and groundwater sampling will be conducted to confirm that the VOC levels continue to remain below levels of concern.

Currently, all of Parcel G and the majority of Parcel B are designated as Areas Requiring Institutional Controls (ARICs) for VOCs. Future soil gas sampling will be used to assess potential health risks from vapor intrusion and modify these ARICs. The Navy has adopted an Approach for Developing Soil Gas Action Levels for Vapor Intrusion Exposure[2] which will be used to develop benchmarks for comparing results of the soil gas surveys and to identify areas where initial ARICs for VOCs need to be modified and whether further remediation and/or vapor mitigation is needed to protect human health.

[2] Navy, 2010. Draft Final Memorandum: Approach for Developing Soil Gas Action Levels for Vapor Intrusion Exposure at Hunters Point Shipyard. February 26.

Based on the above, the VOCs are being treated on Parcel B and have been treated and continue to be monitored on Parcel G; thus, VOCs on Parcels B and G will not pose a risk to the health and safety of future owners, residents or visitors to Parcels B and G because for any area where an ARIC for VOCs remains, there will be requirements specified in the Remedial Designs to construct special foundations under buildings. These special foundations are expected to include passive vapor mitigation systems. These vapor mitigation systems might require gravel and vent pipes under the buildings and then a thick tarry plastic barrier or similar on top of the foundation. This type of vapor mitigation system will prohibit any residual VOCs under the building from migrating into the building.

Parcels C, D-1, and E

VOCs have also been detected in groundwater on Parcels C, D-1, and E. There are four groundwater plumes on Parcel C. Soil vapor associated with these groundwater plumes has been extracted for treatment and groundwater has also been extracted or treated at three of these plumes and additional treatment is being conducted by the Navy at the plume located adjacent to Parcel B. VOCs in groundwater on Parcel D-1, located southeast and adjacent to Parcel G, have been treated by the Navy as part of the Parcels D-1 and G groundwater treatability study. Eight VOC groundwater plumes exist on Parcel E, located west and southeast adjacent to Parcel G, and are part of a current groundwater treatability study by the Navy designed to reduce VOC concentrations. The Navy's work on these parcels will determine if future actions will need to be taken or whether vapor mitigation systems will be required for any residual VOCs.

Parcel E-2

Very low levels of volatile organic compounds (VOCs) have also been detected in the subsurface on Parcel E-2 under Crisp Avenue and in other areas of the landfill distant from Parcel G. Although VOCs are commonly found in low concentrations in landfill gases, the VOCs detected under Crisp Avenue are not likely associated with the landfill gas on Parcel E-2, because there has been no detection of methane in the Crisp Avenue GMPs. Crisp Avenue contains many utility lines, including sewers and storm drains. Sewers, in particular, contain low levels of VOCs. In addition, the asphalt on Crisp Avenue and soil under Crisp Avenue could contain trace amounts of petroleum hydrocarbons and other chemicals that could be emitting these low levels of VOCs.

The Navy, the regulators, including the California Integrated Waste Management Board and the Agency's independent consultant, Treadwell & Rollo, have investigated these potential concerns and agree that VOC levels that were detected on Crisp Avenue are well below any level that would cause a risk to future residents or workers on Parcel G or in the areas adjacent to Crisp Avenue.

Attachment 6

Parcel E-2 Landfill Cleanup Strategies

Attachment 6
Parcel E-2 Landfill Cleanup Strategies

The existence of a landfill on a Brownfields site is a common scenario. Some notable Brownfields that contain landfills that were successfully redeveloped including Shoreline Amphitheater in Mountain View, America Center in San Jose, Oyster Point in South San Francisco and Sierra Point in Brisbane. All of these sites were developed into commercial or recreational uses with buildings and facilities on top or immediately adjacent to the old landfill. The Shipyard landfill was used to dispose of all the Shipyard garbage. In addition, construction debris was also dumped in the landfill. There is also evidence that chemicals were dumped in the landfill. Because there were no accurate records kept of the disposal activities, it is not possible to know the exact extent of chemicals dumped in the landfill; however, it is possible to measure the extent of any possible impact to human health and the environment from the landfill.

The CERCLA process (see Attachment 3), which governs the environmental investigation, risk assessment, evaluation of remediation alternatives, and selection of a remediation alternative, is ongoing at Parcel E-2. The City and County of San Francisco regularly reviews and comments on Navy documents related to the CERCLA process. Parcel E-2 is proposed for use as open space. The Navy is in the process of selecting a final remedy for the landfill and all of the Navy decisions on the Parcel E-2 landfill will undergo regulator review and approval and provide opportunities for public input.

On August 16, 2000, a brush fire burned approximately 45 percent of the landfill surface area; small subsurface areas continued to burn for approximately one month after the surface fire was extinguished. An interim cap was constructed over the majority of the landfill in order to extinguish the fire and prevent future fires until the chosen remediation could be implemented. The cap covers approximately 14.5 acres; it reduces water infiltration, thereby reducing the potential for hazardous substances to leach out from the landfill. The interim cap effectively limits air intrusion into the landfill, thus smothering of any smoldering subsurface areas remaining from the fire. In addition, the interim cap significantly reduces storm water infiltration through the landfill, thereby reducing the potential for hazardous substances to leach out from the landfill. The interim cap has been vegetated to stabilize surface soils and limit erosion. Additional information on construction of the interim cap is provided in the *Final Removal Action Landfill Cap Closeout Report*[3].

Measurements have been made of the vapors from the landfill. Typical of all landfills, landfill gas is being generated by breakdown of the materials disposed in the landfill. Methane and carbon dioxide are the two main components of landfill gas. Methane is

[3] TtEMI. 2005a. "Final Removal Action Landfill Cap Closeout Report, Parcel E-2, Hunters Point Shipyard, San Francisco, California." February 7.

non-toxic but it can create a potential explosion hazard if it collects inside of a structure. In 2002, the Navy installed, on the north side of the landfill, and between the landfill and Parcel A, a gas control system which includes a subsurface gas cutoff wall, landfill gas extraction wells and three tiers of gas monitoring probes (GMPs) which are sampled monthly and results reported quarterly[4]. The three tiers of GMPs primarily monitor whether the gas is migrating beyond the boundaries of the landfill and onto the immediately adjacent UCSF property. If gas (volatile organic compounds or methane) is detected above the trigger levels in the GMPs, the Navy promptly activates its extraction system to remove the gas from the subsurface. The Navy has a detailed Landfill Gas Monitoring and Control Plan in place, which includes steps for notifying the relevant regulators. There are 13 GMPs located on Crisp Avenue north of the landfill which are monitored for methane. To date these GMPs have been sampled 50 to 100 times and there has been no detection of methane or landfill gases in the Crisp Avenue probes.

In addition, in 2002, the Navy conducted an ambient air survey across the landfill and within 300-feet of the landfill perimeter. Results indicated that landfill gas was not in the breathing zone across the landfill, within 300-feet of the landfill perimeter, or within assessable buildings surveyed outside the 300-foot perimeter.[5] The groundwater flowing out of the landfill has been tested and monitored for almost 20 years. The groundwater is slowly flowing into the Bay. In a few areas on the east side of the landfill that contain volatile chemicals in groundwater, the concentrations of chemicals are a potential concern for human exposure, because models predict indoor air problems if new buildings were to be constructed. These areas of volatile chemicals will be treated over the next few years (similar to the treatment of volatile chemicals on Parcels B, C, D-1, E and G). The other main chemical found in the effluent from the landfill is PCBs. This PCB contamination is of concern for small aquatic organisms in the Bay. It is also a concern because it is possible that it will contribute to the PCBs in the fish that visit the South Basin area at the Shipyard. Due to these concerns, the Navy is conducting extensive cleanup of PCBs in the downgradient shoreline area of the landfill parcel. The Navy's selected long-term remedy will control the groundwater from the landfill and protect human health and the environment from any further contamination.

As noted in Attachment 4 Parcel by Parcel Summary and Expected Transfer Dates, the Navy has prepared a draft final RI/FS report. The Navy's remedial objective is to prevent exposure to contaminants at levels exceeding remediation goals. The remedial alternatives developed and being evaluated for nonradioactive chemical contamination in Parcel E-2 include excavating all solid waste and contaminated soil from the landfill and adjacent areas, and excavating contaminated sediment from the shoreline; or a combination of capping the landfill and excavating solid waste and contaminated soil in

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[4] ITSI. 2008d. *Final Landfill Gas Monitoring Report For July-September 2008, Post-Removal Action, Parcel E-2, Industrial Landfill, Hunters Point Shipyard, San Francisco, California*. October 27.

[5] TtEMI, 2003. Final Parcel E-2 Nonstandard Data Gaps Investigation Landfill Gas Characterization, Hunters Point Shipyard, San Francisco, California. December 23.

adjacent areas and excavating contaminated sediment from the shoreline; and possibly placing a slurry wall to limit groundwater flow to the Bay. Specific radiological control procedures to properly screen, segregate, characterize, and dispose of radioactive materials will be part of this work.

Because of the extensive knowledge that we have about the landfill, the redevelopment of the area is designated for open space and recreational uses as the most easily implemented and most protective end use. If the Navy selects an engineered cap remedy for the E-2 landfill, it is anticipated to include many feet of clean soil and other protective layers. Since the Navy has already conducted surveys that show no vapors in ambient air on top of the landfill, the extra layers of soil will provide an added measure of protection to allow for recreational uses on top of the engineered cap. This is a common solution for new development built on top of landfill.

The Navy has not yet issued a formal decision about how it intends to remediate the landfill. The USEPA must concur with the remedy selected, must supervise remedy implementation, and must then concur that the Navy has fully implemented the remedy. USEPA may determine that restrictions must be placed on the property to protect human health and the environment while the remediation is ongoing and after the remediation is complete. The Navy, USEPA, DTSC, RWQCB, and California Department of Public Health (CDPH) will require that before any development activity occurs at the Shipyard, appropriate and legally enforceable environmental restrictions on uses and activities at Parcel E-2 be in place and applicable to that activity, whether in the form of a recorded covenant, deed provision, easement, or lease term. The restrictions will be sufficient under CERCLA and other applicable laws to ensure protection of human health and the environment during and after the development activity process and will identify the specific mechanisms to be used to implement and enforce the restrictions. Most of the land area within Parcel E-2 is considered radiologically impacted. The Navy has performed two removal actions at Parcel E-2 that have involved excavation and offsite disposal of low-level radioactive waste. At the Metal Slag Area, the Navy removed and disposed of off-site approximately 8,200 cubic yards of soil, metal slag, and debris; of this removed material, approximately 74 cubic yards of the soil was identified as radiologically impacted. The Navy also removed and disposed of off-site 32 radiological devices, 15 cubic yards of radiological debris (primarily fire bricks), and approximately 30 cubic yards of metal debris. At the PCB Hot Spot Area, the Navy removed and disposed of off-site, approximately 44,500 cubic yards of soil and debris; 533 cubic yards of the removed soil and fire brick debris was identified as radiologically impacted as well as 40 radiological devices, 78 cubic yards of metal debris, and 19 pieces of other radioactively contaminated debris and two drums of mixed waste.

Sampling and analysis results indicate that concentrations of radioactive chemicals in surface soil pose a potential unacceptable risk to future site users, and remedial alternatives are being evaluated to address the potential risks. The remedy for radiological materials in the E-2 landfill is to:

- Survey structures, former building sites, and radiologically impacted areas
- Decontaminate buildings
- Excavate storm drain and sanitary sewer lines
- Dispose of excavated materials and soils at off-site facilities
- Conduct surveys to ensure that sites are safe for unrestricted use

Due to the potential for radiologically impacted fill material such as sand-blast grit used in decontaminating ships that participated in atomic weapons testing and radioluminescent dials and gauges to be present in the landfill, the area may be restricted with respect to its future use. If following remediation, areas must be designated as "radiologically restricted", administrative and/or legal controls will be put in place to restrict access to the area and prevent land uses that result in unacceptable exposure to human health.

Groundwater does not appear to have been impacted by radionuclides. However, non-radioactive chemicals in groundwater within and in close proximity to the landfill area require analysis of remedial alternatives. Remedial alternatives for groundwater include monitoring, institutional controls, source removal, and containment.

Attachment 7

Low-level Radiological Materials Cleanup

Attachment 7
Low-level Radiological Materials Cleanup

The radiological contamination at the Shipyard has been extensively studied for 10 years. The Final Historical Radiological Assessment (HRA)[6] documented the history of the use of radioisotopes and radiological contamination. The Navy is currently remediating all radiologically-impacted structures and radiological contamination associated with the sewer and storm drain system. The Navy is disposing of radiologically impacted soil and materials found off-site and is in the process of seeking an unrestricted use designation for structures and areas where it has completed radiological remediation associated with the sewer and storm drain system. The Agency will not accept property for transfer until the Navy has completed radiological surveys, investigations, and radiological cleanup as approved by Federal and State regulatory agencies.

This radiological history is not typical at most Brownfields sites however the levels of radiological contamination that have been found in the investigations and testing are low level despite this unique history. Since the publication of the HRA, the Navy has spent over $200 million dollars on radiological surveys, removing the sewers and storm drains, and removing residual radiological contamination. They have also spent over $20 million dollars excavating the shoreline areas of Parcel E-2. The testing protocols have involved spreading out the excavated soil and testing it in six inch lifts – a depth which the radiation detectors can easily scan the soil. In addition, they confirm the scans by taking soil samples and testing them for radiation in the on-site laboratory with quality control samples analyzed at an off-site laboratory. For all the sewer and storm drain areas, the Navy is removing all radiological contamination. So while the history and fact that there might have been residual radiological contamination is unique, the end result is that the contamination will be gone and will have no impact on future users.

In addition to the storm drain and sewer system and structures identified as radiologically-impacted, there are areas containing fill that the Navy has identified as containing or potentially containing radionuclides in soil. These areas are in Parcel B in the IR 7/18 areas, in portions of Parcels E and Parcel E-2.

For IR7/18, the Navy cannot prove that there is no radiological contamination, so they are taking the conservative approach of assuming that there might be some contamination remaining (although none has been found). The Navy has already begun scanning the surface of this area to verify that there is no radiological contamination at or near the surface that could injure humans. If contamination is found, it will be removed. Once these scans are completed, it will be safe from radiological contamination and would be safe for residents and workers to walk on the surface. However, to be absolutely sure that no one will accidentally dig up any unknown contamination (that is not detectable at the

[6] US Department of the Navy, *Hunters Point Shipyard Final Historical Radiological Assessment History of the Use of General Radioactive Materials 1939–2003,* August 2004.

surface and is not currently impacting the surface), the Navy will install a demarcation layer and three feet of clean soil and will require deed restrictions that will not allow for digging in this area. These deed restrictions will be monitored by the San Francisco Health Department and the Regulatory Agencies. The CDPH will also scan the surface of the areas following cover placement to verify that health risks have been mitigated. The cover will be monitored as required by an Operation and Maintenance Plan and groundwater will be monitored to verify that radionuclides are not present. The IR-7/18 area is designated as open space and no pile-supported structures will be built within this area. A revetment wall will also be constructed along the shoreline to prevent any erosion of IR-7/18 fill materials into the Bay; the revetment wall design will take into account projected sea level rise.

For the E-2 landfill and the shoreline areas of Parcel E (see Attachment 21 Map – yellow areas), it is not feasible to remove all the subsurface small amounts of suspected contamination. These areas mostly contain contamination from radium painted dials. These dials were buried in the shoreline area of Parcel E and are also suspected to be scattered in the landfill. The Navy will scan the surface of all these areas to verify that there is no radiological contamination at or near the surface that could injure humans. Once these scans are completed, the surface will be safe from radiological contamination and would be safe for residents and workers to walk on top of. However, to be absolutely sure that no one will accidentally dig up any buried contamination (that is not detectable at the surface and is not currently impacting the surface), the Navy is expected to build a cap of several feet of clean soil and several protective layers (e.g. geotextiles and liners), if USEPA concurs. They will also have deed restrictions for not digging and these deed restrictions will be monitored by the San Francisco Health Department and the Regulatory Agencies. The end result will be an area that will be suitable for open space and recreational uses.

So while the history for these areas is unique, the end result for the areas cleaned of all radiological contamination is similar to other Brownfields sites with only residual chemical contamination (or no contamination for clean areas). For the IR7/18, Parcel E-2 landfill and Parcel E shoreline areas that will require an engineering cap, these areas are similar to Brownfields that are built on top of landfills and the deed restrictions related to the engineered cap. These areas will be suitable for their intended use as parks and recreational area.

Attachment 8

Naturally Occurring Asbestos

Attachment 8
Naturally Occurring Asbestos

The area surrounding Hunters Point Shipyard contains serpentinite, chert, and basalt bedrock typical of the Franciscan Complex. Serpentinite, which is the state rock and located in 44 of the 58 of counties, can contain naturally occurring asbestos, which is identified as a potential health hazard requiring control measures. Serpentinite bedrock is present in Parcel A, Parcel B, a portion of Parcel C, and a small area of Parcel G. Some other areas of Hunters Point Shipyard are known to contain some serpentinite fill because the serpentinite bedrock hill was cut down and used to fill in the Bay to create Hunters Point Shipyard.

Due to the health concerns surrounding naturally occurring asbestos, both the developer and the Agency have been monitoring the vicinity of Parcel A for asbestos that may become airborne due to soil-disturbing activities (e.g., grading) since September 2006. This monitoring program is being carried out in accordance with an Asbestos Dust Mitigation Plan (ADMP), which has been approved by the Bay Area Air Quality Management District (BAAQMD), and a Dust Control Plan (DCP), which has been approved, and compliance is monitored by SFDPH. During redevelopment of areas that contain naturally occurring asbestos, dust control and monitoring programs will be implemented in accordance with the DCP.

Attachment 9

Abrasive Blast Material

Attachment 9
Abrasive Blast Material

ABM, also referred to as sandblast grit, was historically used at the Shipyard to prepare ship hulls for repainting and other repairs. Wet sandblasting is also specifically mentioned as a method used for decontamination of irradiated ships involved in Operation Crossroads in the late 1940s and early 1950s, as documented in the HRA (see Attachment 7).

The ABM used to sandblast a ship is generally a non-cohesive, granular material and typically may have a characteristic green or black color. Granulated ABM made by all manufacturers is chemically inert; therefore, it does not have hazardous waste characteristics of flammability, corrosivity, or reactivity. Historically, silica sands were commonly used as ABM. Other common ABMs used at Naval facilities included Green Diamond®, a ferro-nickel slag produced as a byproduct of nickel production from lateritic ore, and Black Beauty®, a coal slag abrasive.

Historically, after a sandblasting operation, there was a large quantity of used ABM. This used material was sometimes stockpiled and then reused. Anecdotal evidence suggests that ABM was sometimes used at the Shipyard as bedding, aggregate, or backfill material (e.g., for pipelines, former fill areas, roadways, and driveways). Typically, the Navy did not keep records documenting the placement locations, so the exact locations and quantities of ABM are not known. However, ABM has been encountered during site characterization and remediation activities.

As indicated by the activities described above, three types of contamination issues arise from reuse of spent ABM. First, ABM can contain elevated levels of metals from the paint on ships, particularly lead, chromium, copper, nickel, and zinc. Second, the coal slag that is used to manufacture ABM sometimes contains low levels of naturally-occurring radionuclides (radium and its daughter products), which may be concentrated during the ABM manufacturing process. Third, spent ABM may be associated with the decontamination of ships used during atomic weapons testing in the South Pacific. Issues two and three may have resulted in ABM with elevated radiation levels.

Fortunately, ABM is readily distinguishable from natural soils or other backfill used at HPS. ABM materials have specific physical characteristics such as grain size, uniformity of material, and color. These characteristics allow visual observations to be used to determine when the ABM is encountered in the subsurface.

Limited quantities of buried ABM have been removed from Parcels B and G. Remedial actions have removed ABM identified in portions of Parcel B. Between 1991 and 1995, approximately 90 tons of ABM was removed from IR Site 44 in Parcel G (formerly Parcel D) and recycled.

Despite these discoveries, there is no evidence that backfilling with spent ABM was a routine practice at HPS. The regulatory agencies required no further investigation of this issue. Though there is no reason to suspect a significant amount of ABM at HPS, there is a possibility that it, like other unknowns, might be found. Under federal law, the Navy has provided the CERCLA Covenant that any additional remedial action found to be necessary after the date of transfer shall be conducted by the United States.

Because it specifically requires protocols for unknowns, such as ABM, Article 31 will provide an added level of protection. Contractors will be required, under Article 31, to submit an unknown contaminant contingency plan to address ABM and other potential contaminants. Thus, if ABM is disturbed during construction activities, it will be properly identified and handled.

Attachment 10

Naturally Occurring Metals

Attachment 10
Naturally Occurring Metals

Concerns have been raised regarding naturally occurring metals in soils. Much of the land that the City and County of San Francisco occupies, including part of the Shipyard, and in particular the Parcel A hill, contains serpentinite, chert and basalt bedrock typical of the Franciscan Complex. The Franciscan Complex is the predominant bedrock unit in the California Coast Ranges. Elevated levels of arsenic, iron, manganese and nickel are naturally found in these rock formations, and therefore found in soil in any area of the City that overlays these rock formations. Since there are no known man-made sources of these metals on Parcels B and G or these sources have been remediated, the Navy and regulators have concluded that elevated detections of these metals that the Navy found and any similar levels found in the future are most likely due to these natural rock sources being cut for use as fill material. These residual chemicals in soil, largely consisting of certain specific metals which are typically associated with the rock and soil that were historically used to fill in the Bay to expand the Shipyard, may remain. These metals are not part of a "spill" or "release" of contaminants, but rather reflect metals concentrations normally associated with Franciscan Formation bedrock and/or reflect metals concentrations normally associated with the type and quality of soil used during the period the Shipyard was filled. Because of the ubiquitous or ambient nature of these metals and their various concentrations, based on the risk evaluation conducted the Navy the regulators concluded that potential risks associated with slightly-elevated metals should be managed by preventing exposure through placing and maintaining covers. These covers (i.e. physical barriers) will be placed over existing soil through the use of new building foundations, roads, sidewalks, parking lots and/or placement of clean soil in open space areas.

Attachment 11

Lead Based Paint

Attachment 11
Lead Based Paint

As with the majority of pre-1978 buildings, a number of buildings at HPS were painted with lead-based paint (LBP). It is anticipated that the deeds for future transfers of land at HPS will contain a deed notice and restriction concerning LBP, just as they did for the transfer of Parcel A. The LBP notice will provide information about the hazards of lead paint on residential dwellings built before 1978 and notice that lead poisoning is a particular risk for young children and pregnant women. It is anticipated that the LBP restriction will ban the reuse of existing structures with LBP for residential use and occupancy of new residential structures until soil assessment, and if needed, soil abatement is complete and, as a result, these populations will not be exposed. The notice further provides that any subsequent owner of the property will be responsible for managing LBP in compliance with all applicable federal, state, and local laws and regulations.

San Francisco Building Code, Chapter 34, Section 3407, establishes requirements for projects that disturb lead-based paint on the exterior of buildings or steel structures. It is implemented by the Department of Building Inspection (DBI). The ordinance contains performance standards, including a requirement to establish containment barriers during disturbance of LBP that are at least as effective at protecting human health and the environment as those in the most recent *Guidelines for Evaluation and Control of Lead-Based Paint Hazards* promulgated by the US Department of Housing and Urban Development.

For Hunters Point Shipyard, the *San Francisco Health Code* Article 31 requires assessment of LBP hazards in areas that allow residential use. This assessment could include submittal of a LBP in Soil Sampling Report to analyze and, if found above action levels, remediate LBP in soil.

It is anticipated that the deeds for future HPS parcels will prohibit the use of existing structures containing LBP for residential or child-occupied facilities. This will not be an issue because the residential and childcare facilities will be in new structures that will be built in the future.

Attachment 12

Pile Driving Through Contaminated Soil

Attachment 12
Pile Driving Through Contaminated Soil

Deep foundations may be required to support some new buildings and structures at the Shipyard including the Yosemite Slough Bridge and other structures near the Bay where soft sediments are present near the ground surface. The foundations for these structures may extend below the soft sediments into competent soil or bedrock to provide adequate support.

As described in Attachment 4 Parcel-by-Parcel Summary and Expected Transfer Dates, there are ongoing remediation programs related to former Navy operations. The Navy is conducting soil and groundwater cleanup to reduce chemical concentrations to meet cleanup levels approved by federal and state regulatory agencies. Residual chemicals in soil, largely consisting of certain metals which are associated with the rock and soil that were historically used to fill in the Bay to expand the Shipyard, may remain. These chemicals are not part of a "spill" or "release" of contaminants, but rather reflect metals concentrations normally associated with Franciscan Formation bedrock that was used as a source of fill material during the period when portions of the Shipyard was filled.

Therefore, the Shipyard sites should not be contaminated and pile driving should not present any concern of cross-contamination. However, should contamination still be a concern at a Shipyard site, piles could be installed using methods that case the pile through the contaminated zone and allow the pile installation through zones of contamination without adversely impacting the environment or spreading the contamination to other subsurface layers. The potential impacts related to installation of foundation or utility support piles and mitigation measures will be performed prior to issuance of any building permits. Additionally, if contaminants were encountered in a location where piles are to be installed, the Covenant(s) to Restrict Use of Property and Deed will require adherence to a Risk Management Plan, which in addition to Article 31 and FEIR mitigation measures, would specify procedures necessary to prevent pile installation from creating a vertical conduit for chemicals occurring in shallow groundwater to move along the pile to deeper groundwater zones, and avoid degradation of the deeper groundwater. The mitigation measure would require all excess fill or native soil materials generated during pile driving to be properly managed. Implementation of mitigation measures would ensure the safe handling of potentially contaminated materials encountered during improvement or installation of underground utilities and minimize effects on human health and the environment.

Attachment 13

Notification Requirements

Attachment 13
Notification Requirements

Prior to transferring ownership of any property at HPS, the Navy will prepare and circulate for public comment a document called a Finding of Suitability for Transfer or a Finding of Suitability for Early Transfer for parcels subject to early transfer. These documents will include detailed information about the nature and extent of contaminants and the measures taken to address contamination, including any restrictions that will be imposed on the use of, or activities that may be conducted at, the property, and any notices required to be provided such as notices and notice requirements regarding the existence of lead-based paint and asbestos containing materials. Such restrictions will also be set forth in both the deed and a separate land use covenant, both of which will be legally recorded, and will also be provided to tenants and any subsequent property owner. General statutory and common law requirements applicable to transfers and leases of real property provide for disclosures of hazardous conditions, including releases of hazardous substances and hazardous materials to purchasers and tenants.

The Navy is required to prepare and implement a Community Involvement Plan under the Federal Facilities Agreement. This plan provides for a number of activities designed to inform neighbors and other members of the public about the status of Shipyard cleanup activities. If the Agency implements remediation activities as part of an Early Transfer, the Agency would be required to implement similar community relations and public information activities under the Administrative Order on Consent. Community relations and public information requirements may also be incorporated into the requirements of cleanup decision documents, leases and transfer documents imposed on the Agency and other subsequent purchasers and tenants.

Notice of new discoveries of unknown contaminants requires the development of an unknown contaminant contingency plan that must include appropriate notification and site control procedures. “Appropriate notification” shall include appropriate notification to nearby property owners, schools, and residents.

The Dust Control Plan for the Project is anticipated to include establishing a hotline for surrounding community members who may be affected by dust and requiring the contact person to take corrective action within 48 hours. The hotline number will be provided to adjacent residents, schools and businesses.

Attachment 14

Monitoring and Enforcement of Environmental Restrictions

Attachment 14
Monitoring and Enforcement of Environmental Restrictions

Article 31 of the San Francisco Health Code establishes an administrative process related to the Phase I Hunter Point development requiring the San Francisco Department of Public Health (SFDPH) to verify compliance with Final Environmental Impact Report (FEIR) mitigation measures and other environmental restrictions and plans prior to issuance of construction or grading permits by the DBI or DPW. Following permit issuance, the SFDPH continues to monitor and enforce compliance. The City anticipates amending Article 31 to establish a similar process for Phase II that is subject to City permitting authority.

In addition to being enforceable by the SFDPH, the hazardous material-related restrictions, notices and other requirements imposed as institutional controls pursuant to the environmental cleanup and property transfer process will be redundantly incorporated into two separate legally enforceable documents: the recorded deeds conveying ownership of the property and recorded covenants to restrict use of property. Violations of deed restrictions by a subsequent property owner are legally enforceable by the Navy and by any other predecessor owner in the chain of title such as the Agency, the developer, or parties to whom portions of the property are conveyed. Violations of the recorded covenant to restrict use of property are enforceable by USEPA and DTSC.

Attachment 15

Asbestos Containing Materials

Attachment 15
Asbestos Containing Materials

Due to the presence of ACM in structures at HPS Parcels, a deed to include a notification and other requirements pertaining to ACM will be required. The deed notice will state that ACM is present in the buildings and structures on the Parcel, that the location and condition of known ACM is documented in specific reports, and the deed will prohibit the use of these structures. In the covenant regarding ACM, future owners and developers will be responsible for managing ACM and for complying with all applicable federal, state, and local laws relating to ACM, including when demolishing or handling buildings or utilities containing ACM.

Attachment 16

Superfund Sites

Attachment 16
Superfund Sites

Superfund is the common name for CERCLA, the federal law designed to clean up abandoned hazardous waste sites. Superfund provides broad federal authority to clean up releases or threatened releases of hazardous substances that may endanger public health or the environment. The law authorized the USEPA to identify parties responsible for contamination of sites and compel the parties to clean up the sites. By the beginning of the 21st century, cleanups at more than 750 sites had been completed. Superfund sites are a category Brownfields sites. The attached Table 16-1 illustrates that the types of chemicals found at the Shipyard: metals, PCBs, PAHs, VOCs; are typical Superfund contaminants found at many sites. The Shipyard is similar to a number of the Superfund sites listed in the type of contamination, cleanup remedies selected, end use, and risk management measures.
The contamination present at a Superfund site can vary by:

- Media affected (soil, sediment, groundwater)
- Extent of that affected media (shallow to deep soils and shallow to deep aquifers)
- Types and levels of contaminants.

At Hunters Point Shipyard (HPS), the media affected and contamination present are commonly found at many Superfund sites, and in fact HPS contamination levels and distribution are less than many Superfund sites.

HPS differs from some of these sites in that a source of drinking water has not been impacted and there are no large-scale significant or fast moving groundwater plumes at the Shipyard. Shallow groundwater at the Shipyard is not and will not be considered a drinking water source. In addition, the extent of groundwater contamination is limited to certain areas, and in these limited areas there are no large-scale significant or fast moving groundwater plumes. While this situation is not unique to HPS, there are cases of Superfund sites where the groundwater contamination covers/covered a large area and contamination affected or had a high possibility of affecting potential drinking water sources. The Parcel E-2 landfill and adjacent areas that previously impacted the Bay (Attachment 2) have been extensively excavated and contamination removed. Additional contaminant removal actions will be conducted by the Navy in 2010. Groundwater results show that leaching from landfill has the potential to continue to impact the Bay and the Parcel E-2 Feasibility Study has identified containment remedies to mitigate these potential impacts.

Following are two example sites with more significant residual chemicals than Hunters Point Shipyard:

The Montrose Chemical Corporation and Del Amo Superfund Sites

The Montrose Chemical Corporation (Montrose) and Del Amo Superfund sites are located in Los Angeles County, California. Portions of the sites are within the boundaries of the City of Los Angeles and adjacent to the City of Torrance. The sites were addressed in a joint Record of Decision (ROD, 1999) because they are adjacent and contamination had co-mingled. More than 30 hazardous substances or Contaminants of Potential Concern (COPC's) have been detected at the joint site. Through sampling and analysis, it was determined that contamination in groundwater from Montrose had migrated vertically through five successive aquifers and laterally the migration had formed a plume approximately 1.3 miles long by 0.75 miles wide. The USEPA was concerned that groundwater contamination would continue to spread and eventually reach locations where it could be drawn into wells used for drinking and potable water. Cleanup is currently ongoing.

Otis Air National Guard Base/Camp Edwards Site

The Otis Air National Guard Base/Camp Edwards more commonly known as the Massachusetts Military Reservation (MMR) covers approximately 22,000 acres in Barnstaple County, Massachusetts. Contaminated areas are the result of historic chemical/fuel spills, fire training activities, landfills, and drainage structures. Additionally, effluent from the former sewage treatment plant was historically discharged into sand beds where it seeped into the groundwater. In 1984, the U.S. Geological Survey detected contaminants in monitoring wells downgradient of this former plant. In 1983 and 1984, the Air Force detected volatile organic compounds (VOCs) in on-site monitoring wells near the Base Landfill and a Fire Training Area. Monitoring had also detected VOCs in several hundred private wells (all of which are now on municipal water) and in one town well (which is shut down). The groundwater was contaminated with VOCs, including trichloroethene, tetrachloroethylene, ethylene dibromide (EDB), carbon tetrachloride, and dichloroethylene. Ethylene dibromide has been found to be upwelling in two separate locations, outside the property boundaries, within cranberry bogs in Mashpee and Falmouth. People could be at risk if they accidentally drink or come into direct contact with contaminated groundwater. A number of plume areas have been identified at the Site. Cleanups have included numerous remediation projects addressing both the soil and groundwater contamination at MMR have been implemented since the mid- to late 1990's. Currently there are numerous treatment plants in place which treat approximately 18 million gallons a day of contaminated groundwater. All treated groundwater is returned to the aquifer or discharged to surface water.

Site specific Land Use Covenants (LUCs), deed restrictions, institutional Controls (ICs) and Engineering Controls (EC) are part of the process in reusing a Superfund site are a standard in many cases, and have been used many times at sites with similar contaminants and issues as HPS as illustrated by following example:

Aircraft Components, Inc. (D&L Sales) Superfund Site

The 17-acre Aircraft Components, Inc. ("ACI") site is located in Benton Township, Berrien Country, Michigan. Constructed in the 1910s, the main buildings were used by various manufacturing concerns, including a plating facility, until the mid-1950s. Aircraft Components, Inc., a mail-order airplane parts resale business, then occupied the property until the site was sold to D&L Sales, Inc., in the early 1990s. Aircraft Components bought and sold World War II-era military aircraft gauges and other components and used the ACI site as a warehousing, storage, and shipping center. Some of the aircraft gauges are marked with luminescent paint containing radium-226. The non-radioactive contaminants of concern in soil included the heavy metals, mercury and selenium, and to a lesser extent, lead. Other COPCs in site soil included VOCs, SVOCs and OCPs. Contaminants of concern in groundwater included VOCs. ECs at the Site included; removal and off-site disposal of radioactive airplane gauges and associated debris, initial radiological decontamination of buildings followed by building demolition, excavation and off-site disposal of Radium-226 affected soil, excavation and off-site disposal of metal and/or pesticide soil and sediment, substrate injection into groundwater to promote degradation of VOCs. ICs include; implementing restrictions on land use, and incorporating protective measures into the construction and design of the buildings. USEPA is working closely with the developer to ensure that all applicable state and federal regulations are followed and that reuse of the site is compatible with cleanup levels. The Site is part a community-wide, 530-acre redevelopment project that will include a marina, a golf course, residential homes, and condominium complexes. Site reuse includes part of the golf course. There is also interest in constructing a residential condominium complex on part of the Site.

Table 16-1
Superfund Sites Environmental Management Summary

Site[1]	State	City	Former Use(s)	Contaminants[2]	Land Use Covenants[3] Institutional Controls[4] Engineering Controls[5]	Cleanup and Risk Management	Current/Planned use(s)
Williams Air Force Base	AZ	Chandler	Military - Air Force flight training school	VOCs, OCPs, PCBs, TPH and radiological wastes	ICs and ECs	ICs include: restriction of excavation activities. ECs include; soil excavation, removal of drums, Underground Storage Tanks (USTs) and radiological materials, installation of soil and cement and permeable river rock caps, and long term groundwater monitoring.	Commercial (portion transferred for reuse by Phoenix-Mesa Gateway Airport and Arizona State University). Cleanup is ongoing.
Concord Naval Weapons Station	CA	Concord	Military - Army ammunition transshipment port	SVOCs, OCPs and metals	ECs	ECs include: soil excavation, multi-layer cap.	Inland area closed, transferred and redeveloped. Tidal area retained by military - Army. Cleanup is ongoing.
March Air Force Base	CA	Riverside	Military - Air Force maintenance and repair facility	VOCs and metals	ICs and ECs	ICs are in affect for site L (the former swimming pool). ECs include; removal of USTs, soil excavation and removal of free-product from groundwater.	Approximately two-thirds of the Site has been turned over to BRAC (Air Force office). The remaining third has been retained and renamed March Air Reserve Base (ARB).
Denver Radium Site	CO	Denver	Areas where radioactive soil and debris from ore processing for radium (1920's) was left in place or used for fill or paving materials	Radium, thorium, uranium, metals and radon gas	ICs and ECs	ICs include: limit on excavation in areas where contaminants were left in place with the exception of removal of contamination under city streets as part of routine street maintenance. ECs include: historical soil excavation and disposal and installation of ventilation systems for radon gas.	Mixed use - Commercial, residential and open space

Table 16-1
Superfund Sites Environmental Management Summary

Site[1]	State	City	Former Use(s)	Contaminants[2]	Land Use Covenants[3] Institutional Controls[4] Engineering Controls[5]	Cleanup and Risk Management	Current/Planned use(s)
Durham Meadows	CT	Durham	Industrial	VOCs, lead and dioxins	ICs and ECs	The final remedy for the Site is under review. Proposed ICs include; environmental land use restrictions (ELURs) as defined by Connecticut Remediation Standard Regulations (CT RSRs), which restrict use of certain areas of the Site or contaminated groundwater. Proposed ECs include; soil excavation, groundwater plume monitoring and potential installation of a groundwater extraction system.	The Site continues to be delineated.
Landia Chemical	FL	Lakeland	Industrial Pesticide blending and formulating	VOCs, SVOCs, OCPs and metals	Site specific LUCs, ICs and ECs	Site specific LUCs/deed restrictions to ensure Site remains industrial use. ICs include; restriction of groundwater use and maintenance of engineering barriers. ECs include; soil and sediment excavation, chemical oxidation and in-situ bioremediation.	Storage of construction forms
Fairfield Coal Gasification Plant	IA	Fairfield	Industrial (utility) Coal gasification plant	VOCs, PAHs and metals	ICs and ECs	ICs include: preventing exposure to or ingestion of contaminated groundwater ECs include; initial emergency cleanup actions including the installation of a ground water extraction system. Subsequent cleanup has included the excavation and thermal destruction of contaminated soil, the excavation of contaminated and coal tar and continued treatment of groundwater.	No current redevelopment listed.

Table 16-1
Superfund Sites Environmental Management Summary

Site[1]	State	City	Former Use(s)	Contaminants[2]	Land Use Covenants[3] Institutional Controls[4] Engineering Controls[5]	Cleanup and Risk Management	Current/Planned use(s)
Agricultural Street Landfill	LA	New Orleans Orleans Parish	Municipal Landfill	PAHs and metals	ICs and ECs	ICs include: groundwater at the Site is not available as a drinking water source. ECs include; soil excavation and disposal, capping with clean soil.	Previously 47-acres of the 95-acre Site have been developed. Since cleanup and risk management procedures were implemented, the remaining 48-acres have been cleared for unrestricted reuse.
Aircraft Components (D&L Sales)	MI	Benton Harbor	Industrial/Commercial Plating, airplane parts resale	Radium-226, VOCs, SVOCs, OCPs and metals	ICs and ECs	ICs include: implementing restrictions on land use, and incorporating protective measures into the construction and design of the buildings. ECs include: removal and off-site disposal of radioactive airplane gauges and associated debris, initial radiological decontamination of buildings followed by building demolition, excavation and off-site disposal of Radium-226 affected soil, excavation and off-site disposal of metal and/or pesticide soil and sediment, substrate injection into groundwater to promote degradation of VOCs.	The property is being redeveloped as part of a golf course. Additional planned development includes a marina, residential properties and condominiums.
Griffiss Air Force Base	NY	Rome	Military - Air Force 416th Combat Support Group	VOCs, SVOCs, PCBs and metals	Site specific LUCs, ICs and ECs	Site specific LUCs/deed restrictions are part of the proposed package for site transfer ICs include; restriction on future Site activities. ECs include; soil and sediment excavation, removal of sumps, USTs and a small landfill used to dispose of radioactive tubes, landfill caps, and groundwater treatment systems currently under implementation.	Griffiss was designated for base realignment under BRAC 93. Five early transfer areas have been approved by EPA and the State, with appropriate restrictions.

Table 16-1
Superfund Sites Environmental Management Summary

Site[1]	State	City	Former Use(s)	Contaminants[2]	Land Use Covenants[3] Institutional Controls[4] Engineering Controls[5]	Cleanup and Risk Management	Current/Planned use(s)
Naval Support Activity (NSA)	PA	Mechanicsburg	Military - Navy Global management of repair parts for Navy ships, management of conventional ammunition, metal ore repository.	VOCs, PCBs, PAHs and metals	Site specific LUCs, ICs and ECs	Site specific LUCs/deed restrictions have been imposed at two sites, restricting them to industrial use. ICs are expected to be implemented. ECs include; soil and sediment excavation. A bioremediation program was initiated at one location but was subsequently terminated after reevaluation.	NSA, Mechanicsburg is an active Naval installation participating in cleanup activities. Proposed future use is industrial/commercial. However, the possibility of eventually cleaning the Site up to residential levels and encouraging residential growth in the future has not been ruled out.
Naval Air Station (NAS)	WA	Whidbey Island	Military - Navy Ault Field and the Seaplane Base	VOCs, SVOCs, OCPs, PCBs, PAHs, TPH, dioxins and metals	Site specific LUCs, ICs and ECs	ICs include: continued groundwater monitoring. ECs include; soil and sediment excavation, landfill and ditch capping, groundwater pump and treat system implementation and oil skimming and bioventing.	Monitoring and restoration activities are currently ongoing at Ault Field. However, cleanup activities have been completed at the Seaplane Base which has been released for unrestricted use.

Notes
1. Site - The sites listed are representative of the United States Environmental Protection Agencies (USEPA) ten regions.
2. Contaminants listed are the predominant ones found at a site, but are not an exhaustive list of all contaminants present.
3. LUC - Land Use Covenant incorporates the land use restrictions into environmental restrictive covenants that run with the land and that are enforceable by DTSC against future transferees.
4. ICs - Institutional Controls are legal and administrative mechanisms used to implement land use and access restrictions that are used to limit the exposure of future landowner(s) and/or user(s) of the property to hazardous substances and to maintain the integrity of the remedial action until remediation is complete and remediation goals have been achieved. This is not necessarily and exhaustive list of ICs planned or implemented but rather the main ones.
5. ECs - Engineering Controls are physical controls. Examples of these controls include: the use of building foundations, walkways, parking garages/lots, and import soil to "Cap" the site and limit the exposure of future landowner's) and/or user(s) of the property to hazardous substances. Maintenance protocols for EC's can be found in site management plans, deed restrictions and LUCs. This is not necessarily and exhaustive list of ECs planned or implemented but rather the main ones.
BRAC - Base Realignment and Closure
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
OCPs - Organochlorinated Pesticides
PCBs - Polychlorinated Biphenyls
PAHs - Polycyclic Aromatic Hydrocarbons
TPH - Total Petroleum Hydrocarbons (can be quantified as gasolie, diesel, motor oil, and jet fuel)

Attachment 17

Bay Area Brownfields Sites

Attachment 17
Bay Area Brownfields Sites

The term "Brownfields" has been defined by both the United States Environmental Protection Agency (USEPA) and the California EPA Department of Toxics Substances Control (DTSC) as:

"real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant."

Many cities and industrial areas are Brownfields and many have been successfully cleaned up and reused for multi-use developments. The cleanup and reuse of these lands is now common and provides economic, environmental and public health benefits for the area.

Much of downtown San Francisco and the eastern neighborhoods on the Bay from Mission Bay down through Islais creek have been Brownfields since the 1906 earthquake when these neighborhoods were created by filling in the Bay with earthquake rubble. The fact that this rubble contained chemical contamination was recognized long before the word Brownfields became fashionable. The San Francisco Health Department established the "Maher" ordinance in 1986 (now Article 22A of the Health Code) to deal with these fill areas and the contamination associated with them. In addition to the concerns about chemical contamination associated with earthquake rubble, additional industrial activities, such as the railroad yards in Mission Bay, contributed contamination to these areas.

Hunters Point Shipyard was established as part of the war effort in the 1940's when the Bay was filled to increase the size of the Shipyard. Industrial activities for shipbuilding contributed to the soil and groundwater contamination at the site. With the exception of the radiological contamination, discussed below, the chemicals used at the Shipyard and the contamination that resulted are similar to other large industrial sites throughout the Bay Area and other Brownfields that have been or are being redeveloped. In particular, once the Navy has prepared the land for transfer, the engineering or institutional controls and the remaining environmental cleanup work, in the case of the early transfer parcels, will be similar to other Brownfields in the Bay Area.

The attached Table 17-1 illustrates that the types of chemicals found at the Shipyard: metals, PCBs, PAHs, VOCs are typical Brownfields contaminants found at many sites. HPS is similar to a number of the Brownfields listed in the type of contamination, cleanup remedies selected, end use, and risk management measures.

Brownfields development typically includes cleanup of contamination for the intended property reuse (residential, commercial/industrial or recreational) and the use of Land Use Covenants, deed restrictions, engineering and institutional controls to protect human health and the environment.

In the case of groundwater plumes in areas like the Shipyard, where the groundwater is not used for drinking water, the groundwater plumes are treated and monitored. Very low levels of residual volatile contaminants are typically too difficult to completely remove from the groundwater and the enhanced natural processes (post-treatment) over several years time can just be monitored to verify that the levels are decreasing. The installation of vapor barriers to completely cut off exposure of building occupants to the residual volatile vapors is the usual regulatory requirement for these areas. Typically the building construction itself would act as a barrier to residual vapors and the requirement for vapor barriers is an extra level of protection that ensures that occupants are completely safe.

Comparison to other Brownfields

After completion of a FOST or FOSET, the Shipyard parcels will be substantially like the examples below Mission Bay or Emeryville properties that have been cleaned up through removing contaminants and remaining health risks managed through engineering and institutional controls.

Mission Bay

Mission Bay is a typical urban Brownfields. It was an area of Bay Fill that was used for rail yards and miscellaneous dumping. After extensive testing, it was decided to redevelop, but to prevent exposure to contaminants, single family homes with private yards are prohibited (example of an institutional control) and there is a requirement for the final end use to require an impervious cover or clean topsoil (example of an engineering control). Additionally, due organic material in the Bay Fill and underlying native material, methane is sometimes detected in soil gas and if present above action levels, methane gas mitigation must be designed and installed during building construction. Most of the ground floor uses include research, commercial office space, retail and parking with occasional subsurfaces uses, typically as parking garages and electrical/mechanical rooms. This reduces, once the buildings are constructed, the need to excavate in the existing soils except for occasional utility repairs.

Emeryville

Located in the heart of the San Francisco Bay Area, Emeryville is a geographically small city bisected by four freeways, two state highways, and the Union Pacific Railroad line. Emeryville was a former hub of industrial activities due to its proximity to San Francisco

and Oakland. As large industries began to contract and relocate to other cities in the 1970s, they left behind properties with toxins that had to be cleaned up before other businesses could use them. In 1996, the USEPA selected Emeryville for a pilot program of Brownfields cleanup and has granted $5.8 million to the City for this purpose. The City encourages the remediation and reuse of smaller industrial and commercial sites by providing grants and low-interest loans for site assessments and low- or no-interest loans for the cleanup of smaller properties that are often significantly more difficult to redevelop than larger Brownfields sites. The program has helped to stimulate economic growth, create jobs, increase local revenues, encourage cleanup of contaminated properties, and revitalize urban areas. Many properties in Emeryville have been redeveloped using the Brownfields model of evaluating risk and implementing engineering and institutional controls. Emeryville is rapidly redeveloping into a commercial and residential community with a diverse population that is growing at a rate expected to be more than twice the rate of surrounding Alameda County. The city is focusing on development of additional housing and creation of park and recreational facilities including the Emeryville Greenway. Retail development successes include Ikea's, the South Bay Front Area near Interstate 80/Powell Street exit; and the Bay Street regional center with 400,000 square feet of retail, 340 units of residential and parking structures. Sites are served by regional bus system and local city shuttle bus system linking site to BART and Capitol Corridors train systems.

Table 17-1
Bay Area Brownfields Environmental Management Summary

Site	City	Former Use(s)	Contaminants[1]	Land Use Covenants[2] Institutional Controls[3] Engineering Controls[4]	Cleanup and Risk Management	Current use(s)
America Center	San Jose	Class III Landfill	Methane	Deed restriction[5], LUCs, ICs and EC's	Landfill Cap and Methane Mitigation System per CCR Title 27[6]	Commercial
Bay West Cove	South San Francisco	US Steel Facility & Ship Building	Petroleum hydrocarbons, lead, PCBs	LUCs, ICs, ECs	Excavation of petroleum impacted soil. Soil fixation to stabilize lead. PCB sediment dredging and cover. Lead sediment cover. Onshore area covered by 3-feet of clean fill	Hotels, biotech research, commercial
5600 Third Street	San Francisco	Industrial and Office	Metals	Deed restriction, ICs, and ECs	ECs including capping with concrete, building foundations, pavement and soil	Residential
Emeryville Redevelopment Projects	Emeryville	Various Commercial industrial activities	VOCs, petroleum hydrocarbons, metals, PCBs, SVOCs	Deed restrictions, site specific LUCs, ICs, and ECs	Numerous sites use risk assessments and remedial action Workplans to determine level of effort to remediate (if necessary) and ECs and/or ICs prior to redevelopment	Mixed - residential, industrial/light industrial and commercial
Mandela Gateway	Oakland	Military housing, low-income housing and equipment and building material storage	Metals, Pesticides, Petroleum Hydrocarbons	Deed restriction, ICs, and ECs	Issuance of a deed restriction which includes ECs including capping with concrete and soil, guidance on cap maintenance, conditions and restrictions on capped area disturbance. ICs include the prohibition of installation of domestic water supply wells at the site	Mixed - residential, commercial
Mare Island	Vallejo	Military (Naval Shipyard) - repair and maintenance of military vessels, warehouses, training areas, barracks, post services. Civilian Shipyard - repair and maintenance of vessels, warehouses.	Metals, PCBs, SVOCs, Petroleum Hydrocarbons	Deed restriction, Site specific LUCs, ICs, and ECs	Issuance of a deed restriction (2002) and subsequent LUCs. The deed restriction restricts the re-use of certain areas of Mare Island to uses including research and development, office, Industrial, light industrial, commercial and educational	Mixed - residential, industrial/light industrial and commercial
Mission Bay	San Francisco	Industrial/commercial	Metals, VOCs, Petroleum Hydrocarbons, Asbestos	RMP[7], ICs, and ECs	RMP lists ECs include capping with buildings, parking lots, roads sidewalks and soil, guidance on cap maintenance, conditions and restrictions on capped area disturbance. ICs include prohibition of installation of domestic, industrial or irrigation wells	Mixed - residential, industrial/light industrial, commercial, educational, open space

Table 17-1
Bay Area Brownfields Environmental Management Summary

Site	City	Former Use(s)	Contaminants[1]	Land Use Covenants[2] Institutional Controls[3] Engineering Controls[4]	Cleanup and Risk Management	Current use(s)
Myers Drum	Emeryville	Industrial/commercial and recreational (shooting range)	Metals, Pesticides, VOCs, SVOCs, Petroleum Hydrocarbons, Hydrogen Sulfides,	Deed restriction, ICs, and ECs	Issuance of a deed restriction. The deed restriction restricts residential reuse to floors at least one floor above the ground floor restricts the re-use of certain areas to uses including industrial, light industrial, and commercial/commercial; lists EC	Mixed - residential, industrial, light industrial and commercial
North Beach Hope VI	San Francisco	Industrial, commercial, office, residential	Metals, Petroleum Hydrocarbons, PAHs, cyanide	ICs and ECs	ECs including capping with concrete, building foundations, walkways or the parking garage. Capping planter bases with geotextile fabric. ICs include domestic water supply to continue under San Francisco Public Utilities Commission, no use of site groundwater	Mixed - residential, commercial, and parking garages
Oakland Army Base	Oakland	Military (Army Base) - industrial processes, fuel storage, waste management, cleaning operations, trucking, wharf, and warehousing operations.	Metals, VOCs, SVOCs, PAHs, PCBs, and Petroleum Hydrocarbons	Deed restriction and ICs	Issuance of a deed restriction. The deed restriction restricts any reuse of the site for residences, hospitals, schools, daycare facilities, hospitals or hospices; lists ICs including prohibiting construction of groundwater wells or using groundwater at the site	Currently awaiting redevelopment decision. Under review for many possible reuses including industrial, commercial, and open space.
Oakland Uptown Development	Oakland	Commercial, residential, parking, vacant parcels	Metals, VOCs, and Petroleum Hydrocarbons	Proposed deed restriction, ICs and ECs	ECs including capping with concrete, building foundations, parking garages, pavement and soil. ICs include domestic water supply to continue under East Bay Municipal Utilities District, no use of site groundwater for residential supply	Commercial, residential, parking, and open space
Ohlone College	Fremont	Agricultural	Pesticides	Deed restriction and ICs	Issuance of a deed restriction. The deed restriction restricts any reuse of the site for residences, hospitals, public or private schools for persons under 21 years of age, or daycare facilities. The deed restriction lists ICs including prohibiting activities that disturb soil beneath the site	Mixed- Educational (college) and agricultural land

Table 17-1
Bay Area Brownfields Environmental Management Summary

Site	City	Former Use(s)	Contaminants[1]	Land Use Covenants[2] Institutional Controls[3] Engineering Controls[4]	Cleanup and Risk Management	Current use(s)
Oyster Point	South San Francisco	Class III Municipal Waste Landfill	Methane, TPH, Metals and VOCs	Pending	May include - Landfill cap and methane mitigation system per CCR Title 27 and potential additional ICs	Commercial
The Plant	San Jose	Engine manufacturing plant	VOCs	LUCs and ECs	ECs include soil and groundwater cleanup systems and vapor intrusion mitigations systems	Retail (Mega Mall)
Sierra Point	Brisbane and South San Francisco	Class III Landfill	Methane	Deed restriction, LUCs and ECs	Landfill cap and methane mitigation system per CCR Title 27	Commercial
Stockton Event Center	Stockton	Shipbuilding, steel manufacturing, auto repair, and railroads	Metals and Petroleum Hydrocarbons	Deed restriction, LUCs and ICs	ICs in place covered by the SMP[8]	Recreation and retail
Hunters Point Shipyard Parcel A	San Francisco	Naval Shipyard Housing and Administration	Lead-based paint in soil and Naturally Occurring Asbestos	Deed restriction, LUCs and ICs	San Francisco Health Code Article 31A requires certain activities be completed before issuance of building and grading permits and is monitored by the San Francisco Department of Public Health	Residential
Hunters Point Shipyard Parcels B and G	San Francisco	Naval and Commercial Shipyard	Metals, VOCs, SVOCs, PAHs, PCBs, and Petroleum Hydrocarbons	RMP, ICs, and ECs	In addition to the RMP, will also be covered by an addition to Article 31 or a similar process	Mixed-use, Commercial, Residential, Stadium and Parking, Open Space

Notes:

1. Contaminants listed are the predominant ones found at a site, but are not an exhaustive list of all contaminants present.

2. LUC - Land Use Covenant incorporates the land use restrictions into environmental restrictive covenants that run with the land and that are enforceable by DTSC against future transferees.

3. ICs - Institutional Controls are legal and administrative mechanisms used to implement land use and access restrictions that are used to limit the exposure of future landowner(s) and/or user(s) of the property to hazardous substances and to maintain the integrity of the remedial action until remediation is complete and remediation goals have been achieved.

4. ECs - Engineering Controls are physical controls. Examples of these controls include: the use of building foundations, walkways, parking garages/lots, and import soil to "Cap" the site and limit the exposure of future landowner(s) and/or user(s) of the property to hazardous substances. Maintenance protocols for EC's can be found in site management plans, deed restrictions and LUCs.

5. Deed restriction - A form of LUC that usually includes site specific ECs and instructions for future practices associated with the site. The deed restrictions include the identical land use restrictions in the LUCs that run with the land and are enforceable against future transferees.

6. Barclays Official California Code of Regulations (CCR Title 27) - Environmental Protection
7. RMP - Risk Management Plan
8. SMP - Site Mitigation Plan

VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
PCBs - Polychlorinated Biphenyls
PAHs - Polycyclic Aromatic Hydrocarbons

Attachment 18

Summary of Draft Environmental Mitigation Measures

Table 18-1
Draft Environmental Mitigation Measures

MM HZ-1b Compliance with Requirements Imposed by Cleanup Decision Documents and Property Transfer Documents. Prior to obtaining a grading, excavation, site, building or other permit from the City for development activity at the Shipyard involving subsurface disturbance, the Project Applicant shall submit documentation acceptable to the San Francisco Department of Public Health that the work will be undertaken in compliance with all restrictions imposed pursuant to a CERCLA ROD, Petroleum Corrective Action Plan, FOST, FOSET or FOSL, including restrictions imposed in deeds, covenants, leases, easements, and LIFOCs, and requirements set forth in Land Use Control Remedial Design Documents, Risk Management Plans and health and safety plans. Such restrictions, imposed by federal and state regulatory agencies as a condition on the Navy transfer of the property to the Agency, will ensure that the property after transfer will be used in a manner that is protective of the environment and human health. The City will implement this measure by requiring these actions as part of amendments to San Francisco Health Code Article 31.

MM HZ-2a.1 Unknown Contaminant Contingency Plan. Prior to obtaining the first site, building or other permit for development activities involving subsurface disturbance, the Project Applicant shall prepare and the San Francisco Department of Public Health shall approve a contingency plan to address unknown contaminants encountered during development activities. This plan, the conditions of which shall be incorporated into the first permit and any applicable permit thereafter, shall establish and describe procedures for implementing a contingency plan, including appropriate notification to nearby property owners, schools and residents and appropriate site control procedures, in the event unanticipated subsurface hazards or hazardous material releases are discovered during construction. Control procedures would include, but would not be limited to, further investigation and, if necessary remediation of such hazards or releases, including off-site removal and disposal, containment or treatment. In the event unanticipated subsurface hazards or hazardous material releases are discovered during construction, the requirements of this unknown contaminant contingency plan shall be followed. The contingency plan shall be amended, as necessary, in the event new information becomes available that could affect the implementation of the plan. This measure shall be implemented through additions to Article 31.

MM HZ-2a.2 Site-Specific Health and Safety Plans. Prior to obtaining the first site, building or other permit for the Project from the City for development activities involving subsurface disturbance, the Project Applicant shall prepare and submit to SFDPH a site-specific health and safety plan (HASP) in compliance with applicable federal and state OSHA requirements and other applicable laws to minimize impacts to public health and the environment. development of the plan shall be required as a condition of any applicable permit. The plan shall include identification of chemicals of concern, potential hazards, personal protective equipment and devices, and emergency response procedures. The HASP shall be amended, as necessary, in the event new information becomes available that could affect the implementation of the plan.

Table 18-1
Draft Environmental Mitigation Measures

MM HZ-5a Foundation Support Piles Installation Plan. Prior to obtaining a permit from the City that authorizes installation of deep foundation piles, the Project Applicant shall prepare and submit a plan acceptable to the City stating that pilot boreholes for each pile would be drilled through the artificial fill materials so the piles can be installed without damage or misalignment and to prevent potentially contaminated fill materials from being pushed into the underlying sediments or groundwater. This measure shall be implemented for Candlestick Point through implementation of mitigation measure MM HZ-1a. This measure shall be implemented for the Shipyard through additions to Article 31.

MM HZ-9 Navy-approved workplans for construction and remediation activities on Navy-owned property. Construction activities and remediation activities conducted on behalf of the Agency or the Project Applicant, on Navy-owned property shall be conducted in compliance with all required notices, restrictions, or other requirements set forth in the applicable lease, easement, or license or other form of right of entry and in accordance with a Navy-approved work plan. This mitigation measure also requires that such activities be conducted in accordance with applicable health and safety plans, dust control plans, stormwater pollution prevention plans, community involvement plans, or any other documents or plans required under applicable law. The City/Agency will access Navy property through a lease, license, or easement. The City/Agency shall not undertake any activity or approve any Project Applicant activity on Navy-owned property until the Navy and other agencies with approval authority have approved a work plan for the activity. The requirement to comply with the approved work plans shall be incorporated into and made a condition of any City/Agency approvals related to activities on Navy property. This measure shall be implemented for the Shipyard through additions to Article 31.

MM HZ-10b Regulatory Agency–Approved Work Plans and Permits for Shoreline Improvements. Prior to undertaking any shoreline improvement activities that would affect sediment at the Shipyard, the Agency or its contractor or Project Applicant shall prepare appropriate design documents and submit to US EPA, DTSC, RWQCB, and, if necessary, the Navy and CDPH for approval. A Dredged Material Management Office (DMMO) permit shall be obtained. The design documents shall incorporate the necessary shoreline improvements required for each specific area (e.g., including, but not limited to, rock buttressing, pile replacement, backfilling, riprap, or installation of natural-looking shoreline protection using fill and ACB mats) such that remediation (removal of sediment and any necessary dredging) and structural improvements are performed under the same regulatory approvals and permits.

Prior to undertaking any shoreline improvement activities that could affect contaminated sediments left in place and covered or capped with a Navy-installed remedial measure, or that would involve pile replacement in such areas, the Agency or its contractor or Project Applicant shall prepare appropriate design documents that: (1) describes how the cover or cap would be inspected to determine whether proposed shoreline improvements would adversely affect the cover or cap; and (2) describes how construction activities would be performed to mitigate environmental risk and to restore the cover or cap. The design documents shall be submitted to

Table 18-1
Draft Environmental Mitigation Measures

USEPA, DTSC, RWQCB, and, if necessary, the Navy and CDPH for approval. A DMMO permit shall be obtained, as applicable.

Prior to undertaking any shoreline improvements that could encounter contaminated sediments, the Agency or its contractor or Project Applicant shall comply with all requirements incorporated into the design documents, work plans, health and safety plans, dust control plans, and any other document or plan required under the Administrative Order of Consent. This includes all restrictions imposed pursuant to a CERCLA ROD, Petroleum Corrective Action Plan, FOSET, including restrictions imposed in deeds, covenants, and requirements set forth in Land Use Control Remedial Design Documents, Risk Management Plans and health and safety plans. Prior to obtaining a grading, excavation, site, building, or other permit from the City that authorizes remedial activities, SFDPH shall confirm that the work proposed complies with the applicable plans required by the Administrative Order of Consent. This measure shall be implemented through additions to Article 31 or through an equivalent process established by the City or Agency as explained in MM HZ-1b.

MM HZ-12 Compliance with Administrative Order on Consent at Early Transferred Parcels. Prior to undertaking any remediation activities at the Shipyard on property that the Navy has transferred to the Agency as part of an early-transfer, the Agency or its contractor or Project Applicant shall comply with all requirements incorporated into remedial design documents, work plans, health and safety plans, dust control plans, community involvement plans, and any other document or plan required under the Administrative Order on Consent. This includes all notices, restrictions, and requirements imposed pursuant to a CERCLA ROD, Petroleum Corrective Action Plan, FOSET, including restrictions imposed in deeds, covenants, and requirements set forth in Land Use Control Remedial Design Documents, Risk Management Plans, community involvement plans, and health and safety plans. Prior to obtaining a grading, excavation, site, building, or other permit from the City that authorizes remedial activities, SFDPH shall confirm that the work proposed complies with the applicable plans required by the Administrative Order on Consent. This measure shall be implemented through a requirement in additions to Article 31.

MM HZ-15 Asbestos Dust Mitigation Plans and Dust Control Plans. Prior to obtaining a grading, excavation, site, building or other permit from the City that includes soil disturbance activities, the Project Applicant shall obtain approval of an Asbestos Dust Mitigation Plan (ADMP) from BAAQMD for areas over 1 acre that potentially contain naturally occurring asbestos and approval of a Dust Control Plan (DCP) from SFDPH for all areas at the Shipyard. Compliance with the ADMP and DCP shall be required as a condition of the permit.

The ADMP shall be submitted to and approved by the BAAQMD prior to the beginning of construction, and the Project Applicant must ensure the implementation of all specified dust control measures throughout the construction Project. The ADMP shall require compliance with the following specific control measures to the extent deemed necessary by the BAAQMD to meet its standard:

Table 18-1
Draft Environmental Mitigation Measures

- For construction activities disturbing less than one acre of rock containing naturally occurring asbestos, the following specific dust control measures must be implemented in accordance with the asbestos ATCM before construction begins and each measure must be maintained throughout the duration of the construction Project:
  - Limit construction vehicle speed at the work site to 15 miles per hour
  - Sufficiently wet all ground surfaces prior to disturbance to prevent visible dust emissions from crossing the property line
  - Keep all graded and excavated areas around soil improvement operations, visibly dry unpaved roads, parking and staging areas wetted at least three times per shift daily with reclaimed water during construction to prevent visible dust emissions from crossing the property line. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour
  - Adequately wet all storage piles, treat with chemical dust suppressants, or cover piles when material is not being added to or removed from the pile
  - Wash down all equipment before moving from the property onto a paved public road
  - Clean all visible track out from the paved public road by street sweeping or a HEPA filter equipped vacuum device within 24 hours
- For construction activities disturbing greater than one acre of rock containing naturally occurring asbestos, construction contractors are required to prepare an ADMP specifying measures that will be taken to ensure that no visible dust crosses the property boundary during construction. The plan must specify the following measures, to the extent deemed necessary by the BAAQMD to meet its standard:
  - Prevent and control visible track out from the property onto adjacent paved roads. Sweep with reclaimed water at the end of each day if visible soil material is carried out from property
  - Ensure adequate wetting or covering of active storage piles
  - Hydroseed or apply non-toxic soil stabilizers to disturbed surface areas and storage piles greater than ten cubic yards or 500 square feet of excavated materials, backfill material, import material, gravel, sand, road base, and soil that will remain inactive for seven days or more.
  - Control traffic on on-site unpaved roads, parking lots, and staging areas—including a maximum vehicle speed of 15 miles per hour or less
  - Control earth moving activities
  - Provide as much water as necessary to control dust (without creating run-off) in any area of land clearing, earth movement, excavation, drillings, and other dust-generating activity
  - Control dust emissions from off-site transport of naturally occurring asbestos containing materials
  - Stabilize disturbed areas following construction

Table 18-1
Draft Environmental Mitigation Measures

If required by the BAAQMD, air monitoring shall be implemented to monitor for off-site migration of asbestos dust during construction activities, and appropriate protocols shall be established and implemented for notification of nearby schools, property owners and residents when monitoring results indicate asbestos levels that have exceeded the standards set forth in the plan.

The DCP shall be submitted to and approved by the SFDPH prior to the beginning of construction, and the site operator must ensure the implementation of all specified dust control measures throughout the construction Project. The DCP shall require compliance with the following specific mitigation measures to the extent deemed necessary by the SFDPH to achieve no visible dust at the property boundary:

- Submission of a map to the Director of Health showing all sensitive receptors within 1,000 feet of the site.
- Keep all graded and excavated areas, areas around soil improvement operations, visibly dry unpaved roads, parking and staging areas wetted at least three times per shift daily with reclaimed water during construction to prevent visible dust emissions from crossing the property line. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour
- Analysis of wind direction and placement of upwind and downwind particulate dust monitors.
- Record keeping for particulate monitoring results.
- Requirements for shutdown conditions based on wind, dust migration, or if dust is contained within the property boundary but not controlled after a specified number of minutes.
- Establishing a hotline for surrounding community members who may be potentially affected by Project-related dust. Contact person shall respond and take corrective action within 48 hours. Post publicly visible signs around the site with the hotline number as well as the phone number of the BAAQMD and make sure the numbers are given to adjacent residents, schools, and businesses.
- Limiting the area subject to construction activities at any one time.
- Installing dust curtains and windbreaks on windward and downwind sides of the property lines, as necessary. Windbreaks on windward side should have no more than 50% air porosity.
- Limiting the amount of soil in trucks hauling soil around the job site to the size of the truck bed and securing with a tarpaulin or ensuring the soil contains adequate moisture to minimize or prevent dust generation during transportation.
- Enforcing a 15 mph speed limit for vehicles entering and exiting construction areas.
- Sweeping affected streets with water sweepers at the end of the day.
- Hiring an independent third party to conduct inspections for visible dust and keeping records of those inspections.
- Minimizing the amount of excavated material or waste materials stored at the site.

Table 18-1
Draft Environmental Mitigation Measures

- Prevent visible track out from the property onto adjacent paved roads. Sweep with reclaimed water at the end of each day if visible soil material is carried out from property

For all areas, this measure shall be implemented through Article 22B (areas over one half acre) or for the Shipyard through additions to Article 31.

MM GE-4a.1 Site-Specific Geotechnical Investigation with Seismic Analyses. Prior to the issuance of any building permits for the Project site:

- The Applicant shall submit to the San Francisco Department of Building Inspection (DBI) for review and approval a site-specific, design-level geotechnical investigation prepared by a California Certified Engineering Geologist (CEG) or California Registered Geotechnical Engineer (GE), as well as project plans prepared in compliance with the requirements of the San Francisco Building Code (SFBC), the Seismic Hazards Mapping Act, and requirements contained in CGS Special Publication 117A "Guidelines for Evaluating and Mitigating Seismic Hazards in California." In addition, all engineering practices and analyses of peak ground accelerations and structural design shall be consistent with SFBC standards to ensure that structures can withstand expected ground accelerations. The CEG or GE shall determine and DBI shall approve design requirements for foundations and all other improvements associated with the permit application.
- DBI shall employ a third-party CEG and California Registered Professional Engineer (Civil) (PE) to form a Geotechnical Peer Review Committee (GPRC), consisting of DBI and these third-party reviewers. The GPRC shall review the site-specific geotechnical investigations and the site-specific structural, foundation, infrastructure, and other relevant plans to ensure that these plans incorporate all necessary geotechnical mitigation measures. No permits shall be issued by DBI until the GPRC has approved the geotechnical investigation and the Project plans, including the factual determinations and the proposed engineering designs and construction methods.
- All Project structural designs shall incorporate and conform to the requirements in the site-specific geotechnical investigations.
- The Project CEG or GE shall be responsible for ensuring compliance with these requirements.

MM GE-4a.3 Site-specific Seismic Analyses to Ensure Safety of Bridge Design. Prior to the issuance of any building permits for the Project site, the California Certified Engineering Geologist (CEG) or California Registered Geotechnical Engineer (GE) for the Project shall confirm that the design-level geotechnical investigation for the Yosemite Slough bridge is based on Caltrans specifications (*Bridge Design Specifications*, Section 20 of *Bridge Memos to Designers, Seismic Design Criteria* as previously described) and meets the San Francisco Department of Public Works Bureau of Engineering (BOE) requirements. The Project CEG or GE and California Registered Structural Engineer ((SE) shall approve bridge design. No building permits shall be issued until the CEG or GE and SE verify that the Project's bridge design complies with all Caltrans specifications and BOE requirements.

Table 18-1
Draft Environmental Mitigation Measures

MM GE-5a Site-Specific Geotechnical Investigation with Analyses of Liquefaction, Lateral Spreading and/or Settlement. Prior to issuance of building permits for the Project site:

- The Applicant shall submit to the San Francisco Department of Building Inspection (DBI) for review and approval a site-specific, design-level geotechnical investigation prepared by a California Certified Engineering Geologist (CEG) or California Registered Geotechnical Engineer (GE), as well as project plans prepared in compliance with the requirements of the San Francisco Building Code (SFBC), the Seismic Hazards Mapping Act, and requirements contained in CGS Special Publication 117A "Guidelines for Evaluating and Mitigating Seismic Hazards in California." In addition, all engineering practices, and analyses of structural design shall be consistent with SFBC standards to ensure seismic stability, including reduction of potential liquefaction hazards.
- DBI shall employ a third-party CEG and California Registered Professional Engineer (Civil) (PE) to form a Geotechnical Peer Review Committee (GPRC), consisting of DBI and these third-party reviewers. The GPRC shall review the site-specific geotechnical investigations and the site-specific structural, foundation, infrastructure, and other relevant plans to ensure that these plans incorporate all necessary geotechnical mitigation measures. No permits shall be issued by DBI until the GPRC has approved the geotechnical investigation and the Project plans, including the factual determinations and the proposed engineering designs and construction methods.
- All Project structural designs shall incorporate and conform to the requirements in the site-specific geotechnical investigations.
- The site-specific Project plans shall incorporate the mitigation measures contained in the approved site-specific geotechnical reports to reduce liquefaction hazards. The engineering design techniques to reduce liquefaction hazards shall include proven methods generally accepted by California Certified Engineering Geologists, subject to DBI and GPRC review and approval, including, but not necessarily limited to:
  - > Structural Measures
    - – Construction of deep foundations, which transfer loads to competent strata beneath the zone susceptible to liquefaction, for critical utilities and shallow foundations
    - – Structural mat foundations to distribute concentrated load to prevent damage to structures
  - > Ground Improvement Measures
    - – Additional over-excavation and replacement of unstable soil with engineering-compacted fill
    - – Dynamic compaction, such as Deep Dynamic Compaction (DDC) or Rapid Impact Compaction (RIC), to densify loose soils below the groundwater table
    - – Vibro-compaction, sometimes referred to as vibro-floatation, to densify loose soils below the groundwater table
    - – Stone columns to provide pore pressure dissipation pathways for soil, compact loose soil between columns, and provide additional bearing support beneath foundations

Table 18-1
Draft Environmental Mitigation Measures

- Soil-cement columns to densify loose soils and provide additional bearing support beneath foundations

- The Project CEG or GE shall be responsible for ensuring compliance with these requirements.

MM HY-1a.1 Storm Water Pollution Prevention Plan: Combined Storm Sewer System. In compliance with the Article 4.1 of the Public Works Code and the City's Construction Site Water Pollution Prevention Program, the Project Applicant shall submit a site-specific Storm Water Pollution Prevention Plan (SWPPP) to the SFPUC for approval, prior to initiating construction activities in areas draining to the combined sewer system. The SFPUC requires implementation of appropriate Best Management Practices (BMPs) from the California Stormwater Quality Association Stormwater BMP Handbook- Construction or the Caltrans Construction Site BMPs Manual. In accordance with SFPUC's requirements, the SWPPP shall include:

- An Erosion and Sediment Control Plan that includes a site map illustrating the BMPs that will be used to minimize on-site erosion and the sediment discharge into the combined sewer system, and a narrative description of those BMPs. Appropriate BMPs for Erosion and Sediment Control Plan may include:
  - Scheduling—Develop a schedule that includes sequencing of construction activities with the implementation of appropriate BMPs. Perform construction activities and control practices in accordance with the planned schedule. Schedule work to minimize soil-disturbing activities during the rainy season. Schedule major grading operations for the dry season when practical. Monitor the weather forecast for rainfall and adjust the schedule as appropriate.
  - Erosion Control BMPs—Preserve existing vegetation where feasible, apply mulch or hydroseed areas with native, non-invasive species, until permanent stabilization is established, and use soil binders, geotextiles and mats, earth dikes and drainage swales, velocity dissipation devices, slope drains, or polyacrylamide to protect soil from erosion.
  - Wind Erosion BMPs—Apply water or other dust palliatives to prevent dust nuisance; prevent overwatering which can cause erosion. Alternatively, cover small stockpiles or areas that remain inactive for seven or more days.
  - Sediment Control BMPs—Install silt fences, sediment basins, sediment traps, check dams, fiber rolls, sand or gravel bag barriers, straw bale barriers, approved chemical treatment, and storm drain inlet protection to minimize the discharge of sediment. Employ street sweeping to remove sediment from streets.
  - Tracking Controls—Stabilize the construction site entrance to prevent tracking of sediment onto public roads by construction vehicles. Stabilize on-site vehicle transportation routes immediately after grading to prevent erosion and control dust. Install a tire wash area to remove sediment from tires and under carriages.
- Non-Stormwater Management BMPs that may include water conservation practices; dewatering practices that minimize sediment discharges; and BMPs for: paving and grinding activities; identifying illicit connections and illegal dumping; irrigation and other planned or unplanned discharges of potable water; vehicle and equipment cleaning, fueling, and

maintenance; concrete curing and finishing; temporary batch plants; implementing shoreline improvements and working over water. Discharges from dewatering activities shall comply with the SFPUC's Batch Wastewater Discharge Requirements that regulate influent concentrations for various constituents.

- Waste Management BMPs shall be implemented for material delivery, use, and storage; stockpile management; spill prevention and control; solid and liquid waste management; hazardous waste management; contaminated soil management; concrete waste management; and septic/sanitary waste management.
- SWPPP Training Requirements—Construction personnel will receive training on the SWPPP and BMP implementation.
- Site Inspections and BMP Maintenance—An inspector identified in the SWPPP will inspect the site on a regular basis, before and after a storm event, and once each 24-hour period during extended storms to identify BMP effectiveness and implement corrective actions if required. The SWPPP shall include checklists that document when the inspections occurred, the results of the inspection, required corrective measures, and when corrective measures were implemented. Required BMP maintenance related to a storm event shall be completed within 48 hours of the storm event.

MM HY-1a.2 Stormwater Pollution Prevention Plan: Separate Storm Sewer System. Consistent with the requirements of the SWRCB General Permit for Storm Water Discharges Associated with Construction and Land Disturbing Activities (Construction General Permit), the Project Applicant shall undertake the proposed Project in accordance with a project-specific Storm Water Pollution Prevention Plan (SWPPP) prepared by Qualified SWPPP Developer, who shall consult with California State Parks on those elements of the SWPPP that cover the Candlestick Park State Recreation Area, including selection of best management practices and other SWPPP improvements. The SFRWQCB, the primary agency responsible for protecting water quality within the project area, is responsible for reviewing and ensuring compliance with the SWPPP. This review is based on the Construction General Permit issued by the SWRCB.

The SWPPP shall include, as applicable, all Best Management Practices (BMPs) required in Attachment C of the Construction General Permit for Risk Level 1 dischargers, Attachment D for Risk Level 2 dischargers, or Attachment E for Risk Level 3 dischargers. In addition, recommended BMPs, subject to review and approval by the SFRWQCB, include the measures listed below. However, the measures themselves may be altered, supplemented, or deleted during the SFRWQCB's review process, since the SFRWQCB has final authority over the terms of the SWPPP.

- Scheduling:

  To reduce the potential for erosion and sediment discharge, schedule construction to minimize ground disturbance during the rainy season. Schedule major grading operations during the dry season when practical, and allow enough time before rainfall begins to stabilize the soil with vegetation or to install sediment-trapping devices.

Table 18-1
Draft Environmental Mitigation Measures

Sequence construction activities to minimize the amount of time that soils remain disturbed.

Stabilize all disturbed soils as soon as possible following the completion of ground disturbing work.

Install erosion and sediment control BMPs prior to the start of any ground-disturbing activities.

- Erosion and Sedimentation:
  - Preserve existing vegetation in areas where no construction activity is planned or where construction activity will occur at a later date.
  - Stabilize and re-vegetate disturbed areas as soon as possible after construction with planting, seeding, and/or mulch (e.g., straw or hay, erosion control blankets, hydromulch, or other similar material) except in actively cultivated areas. Planting and seeding shall use native, non-invasive species.
  - Install silt fences, coir rolls, and other suitable measures around the perimeter of the areas affected by construction and staging areas and around riparian buffers, storm drains, temporary stockpiles, spoil areas, stream channels, swales, down-slope of all exposed soil areas, and in other locations determined necessary to prevent off-site sedimentation.
  - Install temporary slope breakers during the rainy season on slopes greater than 5 percent where the base of the slope is less than 50 feet from a water body, wetland, or road crossing at spacing intervals required by the SFRWQCB.
  - Use filter fabric or other appropriate measures to prevent sediment from entering storm drain inlets.
  - Detain and treat stormwater using sedimentation basins, sediment traps, baker tanks, or other measures to ensure that discharges to receiving waters meet applicable water quality objectives.
  - Install check dams, where applicable, to reduce flow velocities. Check dams reduce erosion and allow sediment to settle out of runoff.
  - Install outlet protection/energy dissipation, where applicable, to prevent scour of the soil caused by concentrated high velocity flows.
  - Implement control measures such as spraying water or other dust palliatives to alleviate nuisance caused by dust.
- Groundwater/Dewatering:
  - Prepare a dewatering plan prior to excavation specifying methods of water collection, transport, treatment, and discharge of all water produced by construction site dewatering.
  - Impound water produced by dewatering in sediment retention basins or other holding facilities to settle the solids and provide other treatment as necessary prior to discharge to receiving waters. Locate sedimentation basins and other retention and treatment facilities away from waterways to prevent sediment-laden water from reaching streams.
  - Control discharges of water produced by dewatering to prevent erosion.
  - If contaminated groundwater is encountered, contact the SFRWQCB for appropriate disposal options. Depending on the constituents of concern, such discharges may be disallowed altogether, or require regulation under a separate general or individual permit

Table 18-1
Draft Environmental Mitigation Measures

that would impose appropriate treatment requirements prior to discharge to the stormwater drainage system.

- Tracking Controls:
  - Grade and stabilize construction site entrances and exits to prevent runoff from the site and to prevent erosion.
  - Install a tire washing facility at the site access to allow for tire washing when vehicles exit the site.
  - Remove any soil or sediment tracked off paved roads during construction by street sweeping.
- Non-stormwater Controls:
  - Place drip pans under construction vehicles and all parked equipment.
  - Check construction equipment for leaks regularly.
  - Wash construction equipment in a designated enclosed area regularly.
  - Contain vehicle and equipment wash water for percolation or evaporative drying away from storm drain inlets.
  - Refuel vehicles and equipment away from receiving waters and storm drain inlets, contain the area to prevent run-on and run-off, and promptly cleanup spills.
  - Cover all storm drain inlets when paving or applying seals or similar materials to prevent the discharge of these materials.
- Waste Management and Hazardous Materials Pollution Control:
  - Remove trash and construction debris from the project area daily.
  - Locate sanitary facilities a minimum of 300 feet from receiving waters. Maintain sanitary facilities regularly.
  - Store all hazardous materials in an area protected from rainfall and stormwater run-on and prevent the off-site discharge of hazardous materials.
  - Minimize the potential for contamination of receiving waters by maintaining spill containment and cleanup equipment on site, and by properly labeling and disposing of hazardous wastes.
  - Locate waste collection areas close to construction entrances and away from roadways, storm drains, and receiving waters.
  - Inspect dumpsters and other waste and debris containers regularly for leaks and remove and properly dispose of any hazardous materials and liquid wastes placed in these containers.
  - Train construction personnel in proper material delivery, handling, storage, cleanup, and disposal procedures.

Implement construction materials management BMPs for:

Road paving, surfacing and asphalt removal activities.

Handling and disposal of concrete and cement.

Table 18-1
Draft Environmental Mitigation Measures

- BMP Inspection, Maintenance, and Repair:
  - Inspect all BMPs on a regular basis to confirm proper installation and function. Inspect BMPs daily during storms.
  - Immediately repair or replace BMPs that have failed. Provide sufficient devices and materials (e.g., silt fence, coir rolls, erosion blankets, etc.) throughout project construction to enable immediate corrective action for failed BMPs.
- Monitoring and Reporting:
  - Provide the required documentation for SWPPP inspections, maintenance, and repair requirements. Personnel that will perform monitoring and inspection activities shall be identified in the SWPPP.
  - Maintain written records of inspections, spills, BMP-related maintenance activities, corrective actions, and visual observations of off-site discharges of sediment or other pollutants, as required by the SFRWQCB.
  - Monitor the water quality of discharges from the site to assess the effectiveness of control measures.
- Implement Shoreline Improvements and work over water BMPs to minimize the potential transport of sediment, debris, and construction materials to the Lower Bay during construction of shoreline improvements.
- Post-construction BMPs:
  - Re-vegetate all temporarily disturbed areas as required after construction activities are completed. Re-vegetation shall use native, non-invasive species.
  - Remove any remaining construction debris and trash from the project site and area upon project completion.
  - Phase the removal of temporary BMPs as necessary to ensure stabilization of the site.
  - Maintain post-construction site conditions to avoid formation of unintended drainage channels, erosion, or areas of sedimentation.
  - Correct post-construction site conditions as necessary to comply with the SWPPP and any other pertinent SFRWQCB requirements.
- Train construction site personnel on components of the SWPPP and BMP implementation. Train personnel that will perform inspection and monitoring activities.

MM HY-1a.3 Groundwater Dewatering Plan. Prior to commencement of construction activities and to minimize potential impacts to receiving water quality during the construction period, the Project Applicant shall through the proper implementation of this dewatering plan, show compliance with SFRWQCB/NPDES requirements, whichever are applicable.

The Dewatering Plan shall specify how the water would be collected, contained, treated, monitored, and/or discharged to the vicinity drainage system or Lower Bay. Subject to the review

Table 18-1
Draft Environmental Mitigation Measures

and approval of the SFRWQCB, the Dewatering Plan shall include, at a minimum:

- Identification of methods for collecting and handling water on site for treatment prior to discharge, including locations and capacity of settling basins, infiltration basins (where not restricted by site conditions), treatment ponds, and/or holding tanks
- Identification of methods for treating water on site prior to discharge, such as filtration, coagulation, sedimentation settlement areas, oil skimmers, pH adjustment, and other BMPs
- Procedures and methods for maintaining and monitoring dewatering operations to ensure that no breach in the process occurs that could result in an exceedance of applicable water quality objectives
- Identification of discharge locations and inclusion of details on how the discharge would be conducted to minimize erosion and scour
- Identification of maximum discharge rates to prevent exceedance of storm drain system capacities
- Additional requirements of the applicable General Permit or NPDES Permit/WDR (including effluent and discharge limitations and reporting and monitoring requirements, as applicable) shall be incorporated into the Dewatering Plan

Any exceedance of established narrative or numeric water quality objectives shall be reported to the SFRWQCB and corrective action taken as required by the SFRWQCB and the Dewatering Plan. Corrective action may include increased residence time in treatment features (e.g., longer holding time in settling basins) and/or incorporation of additional treatment measures (e.g., addition of sand filtration prior to discharge).

MM HY-12a.1 Finished Grade Elevations Above Base Flood Elevation. The Project site shall be graded such that finished floor elevations are 3.5 feet above the Base Flood Elevation (BFE), and streets and pads are 3 feet above BFE to allow for future sea level rise, thereby elevating all housing and structures above the existing and potential future flood hazard area. If the FIRM for San Francisco is not finalized prior to implementation of the Project, the Project Applicant shall work with the City Surveyor to revise the City's Interim Floodplain Map. If the FIRM for San Francisco is finalized prior to implementation of the Project, the Project Applicant shall request that the Office of the City Administrator (Floodplain Manager) request a Letter of Map Revision based on Fill (LOMR-F) from FEMA that places the Project outside SFHA and requires that the FIRM is updated by FEMA to reflect revised regulatory floodplain designations.

MM HY-12a.2 Shoreline Improvements for Future Sea-Level Rise. Before the first Small Lot Final Map is approved, the Project Applicant must petition the appropriate legislative body to form (or annex into if appropriate) and administer a special assessment district or other funding mechanism to finance and construct future improvements necessary to ensure that the shoreline, public facilities, and public access improvements will be protected should sea level rise exceed 16 inches at the perimeter of the Project. Prior to the sale of the first residential unit within the Project, the legislative body shall have acted upon the petition to include the property within the

Table 18-1
Draft Environmental Mitigation Measures

district boundary. The newly formed district will also administer a Monitoring and Adaptive Management Plan to monitor sea level and implement and maintain the protective improvements. Shoreline and public access improvements shall be designed to allow future increases in elevation along the shoreline edge to keep up with higher sea level rise values, should they occur. Design elements shall include providing adequate setbacks to allow for future elevation increases along the shoreline.

MM HY-14 Shoreline Improvements to Reduce Flood Risk. To reduce the flood impacts of failure of existing shoreline-structures, the Project Applicant shall implement shoreline improvements for flood control protection, as identified in the Candlestick Point/Hunters Point Development Project Proposed Shoreline Improvements report. Where feasible, elements of living shorelines shall be incorporated into the shoreline protection improvement measures.

Reference:

Draft Environmental Impact Report (DEIR), Candlestick Point-Hunters Point Shipyard Phase II, Volume I: Draft EIR Executive Summary. 12 November 2009. San Francisco Redevelopment Agency. File No. ER06.06.07. City and County of San Francisco Planning Department. File No. 2007.0946E. State Clearinghouse No. 2007082168.

Attachment 19

Summary of Prior Dust Issues

Attachment 19
Summary of Prior Dust Issues

In the past four years, concerns have been raised about dust and asbestos fibers generated during construction at Parcel A. The SFDPH and its outside consultants have carefully studied the potential health impacts of the dust particulates and naturally occurring asbestos disturbed during grading activities on Parcel A. As explained in a memorandum dated February 1, 2007, from Dr. Rajiv Bahtia, the medical director of SFDPH's Environmental Health Section (see below), SFDPH consulted the Chief of the Epidemiological Investigations Unit at the California Department of Health Services (DHS) to determine appropriate investigations to assess the impacts on area residents of exposure to the construction dust generated on Parcel A. SFDPH also retained an independent environmental expert (Treadwell & Rollo) and an industrial hygiene expert (Acumen Industrial Hygiene) to address the same issues (see below). All of these expert sources confirmed SFDPH's conclusion that, given the limited exposure periods and low levels that could have occurred at the Shipyard, it is highly unlikely that exposure to naturally occurring asbestos from the grading operations on Parcel A pose an endangerment to human health; even if "worst case" assumptions are made about the period when Lennar's air monitors were not functioning during the Summer of 2006.

SFDPH also sought guidance from DHS as to whether there were any medially accepted tests that could address community concerns. DHS confirmed SFDPH's assessment that non-invasive testing (e.g. x-rays, blood tests) for asbestos in humans does not exist and invasive testing (e.g. lung biopsy) is not routinely available or recommended. In addition, SFDPH consulted with the Agency for Toxic Substances and Disease Registry and they too confirmed that there are no tests for asbestos in humans and that adequate air monitoring is the recommended method to assess exposure (attached below).

On October 29th, 2007, the Bay Area Air Quality Management District (BAAQMD) held a hearing on the Shipyard dust issue. Although the BAAQMD Board instructed staff to consider fining Lennar for violations related to the failure of Lennar's monitors in the Summer of 2006 (BAAQMD later did fine Lennar for this monitoring failure), the BAAQMD reiterated that the "action" levels set for the Shipyard are "conservative and health protective and provide a significant margin of safety" and that the risk from estimated exposures at the Shipyard are less than 3 in 1,000,000, well within BAAQMD's health standards. A copy of BAAQMD's presentation is attached below for your reference.

The analyses of several independent experts have recently provided further support of the judgments of the SFDPH, CAL-OSHA and BAAQMD that the construction work on Parcel A does not represent a significant long-term health risk to the community or workers.

In September 2007, one of the country's leading public health experts on issues related to asbestos exposures and other environmental health matters, Dr. John Balmes of the University of California at San Francisco, concluded that he "agreed[d] with SFDPH that it is unlikely that exposure to naturally occurring asbestos from grading operations on Parcel A will create a significant risk to human health in the community". Dr. Balmes based his conclusion, in part, on the fact that the shut-down (or "exceedance") levels set by BAAQMD were set so low as to be "designed to be health protective and ensure a low risk even assuming a person would be exposed to certain levels of asbestos on a continual and ongoing basis for 70 years (emphasis added). Here by contrast, the grading period was less than eighteen months and the air monitoring data shows that the average level of asbestos was significantly lower than the amount that is thought to pose a risk of long-term injury." Dr. Balmes presented his findings at workshop hosted by the CAC on September 11th and a copy of his report is attached below for your reference.

The Federal Agency for Toxic Substances and Disease Registry (ATSDR), working with the California Department of Public Health (CDPH), also completed its analysis of the dust issue at the Shipyard in September 2007. The CDPH did the substantive analysis in the report and concluded that "even a 7-year exposure to the levels of asbestos measured around the excavation was estimated to have risks that, on personal level, would be considered low. When one considers that the exposures [at the Shipyard] have occurred over the course of a year or two, the estimated risk would be even lower." The report also concluded that individual medical testing, including blood and radiological testing, is not warranted or recommended. A copy of the CPDH's substantive report is attached below for your reference.

The CDPH report did, however, stress that as a matter of good public health policy, less dust is better, and, thus, the CDPH made a series of recommendations to further improve dust control at the site. Those recommendations include more misting at the fence line, tarping the fence, additional independent oversight, and public outreach. The City agreed with CDPH's focus on further minimizing dust and implemented many of CDPH's recommendations. A copy of SFDPH's response letter to the ATSDR and CDPH outlining the City's plans to implement those recommendations is attached below.

In 2009, USEPA conducted a data review of the construction and the airborne asbestos monitoring. They also conducted a reanalysis of 34 of the airborne asbestos samples that were collected at the site. Their reanalysis included several of the highest airborne asbestos readings that have ever been detected at the site. The re-analysis took into consideration the types and lengths of asbestos fibers found in the samples. USEPA issued a draft technical summary of their work which is attached below for your reference. Their analysis was biased to the highest detections of airborne asbestos at the site since the majority of the samples analyzed from the site have detected no airborne asbestos or much, much lower levels than the 34 samples that were reanalyzed. Their draft conclusion is that the Dust Monitoring Program and the BAAQMD monitoring procedures are operating in an effective manner in minimizing dust generation and

limiting asbestos exposure, and that USEPA sees no reason to suspend or stop the Phase I construction project. USEPA expects to finalize this draft summary in the near future.

In summary, the following agencies have reviewed the dust and airborne asbestos monitoring and control systems in place at the Hunters Point Shipyard Parcel A Redevelopment over the past four years:

- San Francisco Department of Public Health
- Bay Area Air Quality Management District
- California Department of Public Health
- Agency for Toxic Substances and Disease Registry
- United States Environmental Protection Agency

These Agency reviews have suggested improvements to the dust monitoring and control and the majority of these suggestions have been implemented. But not one of these agencies has recommended shutting down the construction or suggested that the prior grading or excavation work created a substantial or long-term health risk. As the attached letter from the CAC states, the conclusions of these regulators and health experts at this point in time should be considered “definitive”.

San Francisco City and County
Department of Public Health
Environmental Health Section

Gavin Newsom, *Mayor*
Mitchell H. Katz, *,Director of Health*

Rajiv Bhatia, *M.D.,M.P.H.*
Director of Environmental Health

INFORMATIONAL MEMORANDUM

DATE: February 1, 2007

TO: Marcia Rosen, Executive Director, San Francisco Redevelopment Agency

FROM: Rajiv Bhatia, Medical Director, Environmental Health Section

PURPOSE OF INFORMATION

The San Francisco Redevelopment Agency Commission has expressed an interest in closely monitoring the enforcement of dust control measures and the evaluation of health concerns related to the Hunters Point Shipyard Phase I construction. This memo provides an update on the San Francisco Department of Public Health (SFDPH) activities related to these issues.

Overall SFPDH has two priority objectives

- Ensuring effective compliance with required dust control plans in order to prevent resident exposure to both particulate matter and specific constituents in dust.
- Responding to community concerns regarding the safety of development activities via public communication, assessment of environmental hazards, and individual health assessments.

SFDPH is currently involved is several related activities to achieve the above objectives. Updates on each of these activities are provided below.

Enhancing Dust Control Plan Compliance Activities

Over the course of the Parcel A Phase I redevelopment project, SFDPH has responded to public complaints about the dust control issues at the site. These complaint inspections have involved inspecting the site, working with Lennar to correct the source of the complaint and citing Lennar when the problem was a violation of the DCP. In addition, because of the problems that have occurred with dust control, SFDPH has conducted regular random compliance inspections to verify Lennar's compliance with their DCP.

As a result of continued community concerns, SFDPH has initiated a new program of daily unannounced compliance inspections to monitor Lennar's

compliance with their DCP. These inspections are scheduled at two independent random times per day. These formal inspections are in addition to the regular random compliance inspections that were occurring and will continue to occur when the on-site SFDPH inspector drives to and from his Shipyard office during the course of his other daily activities.

Enhancing the Dust Control Plan

SFDPH has informed Lennar verbally and in writing on a number of occasions that their dust control efforts needed improvement. SFDPH has proposed revisions to the DCP to enhance clarity and specificity of roles and required actions. We intend to finalize the revisions to the DCP no later than the week of February 12. As a public document, copies of the revised plan will be sent to interested parties.

Facilitating BAAQMD Oversight for Community Monitoring Locations

On Tuesday, January 23, 2006, SFDPH received an email from the Bay Area Air Quality Management District (BAAQMD) stating that the community monitoring locations would not be subject to BAAQMD enforcement authority. These community monitoring locations were voluntarily installed by the Agency's consultant, Treadwell and Rollo, with the intent of being used by Lennar as part of their asbestos air sampling network subject to the work suspension requirements. Lennar has consistently directed their subcontractor to suspend work when the community monitoring locations have exceeded the work suspension number.

In the interest of having all monitoring locations subject to the same enforcement procedures, SFDPH sent a letter on January 25, 2007 to BAAQMD asking that the community monitoring locations be added to Lennar's required asbestos monitoring sites subject to BAAQMD enforcement. SFDPH also requested that BAAQMD specifically review the data from Wednesday, January 10 and take appropriate enforcement action. BAAQMD has acknowledged receipt of these requests.

Responding to Health Concerns of Students and Staff of the Muslim University of Islam School (the "School")

SFDPH believes that direct communication with concerned individuals is an important component of response to community concerns about environmental hazards. SFPDH maintains its willingness to meet with parents, students and staff of the School; however, School staff has not responded to continued offers by SFDPH to schedule such a meeting.

Conducting Health Evaluations of Students from the School

At the January 3, 2007 meeting, attended by the San Francisco Redevelopment Agency (the "Agency"), the School and two Agency Commissioners, representatives from SFDPH made a commitment to conducting scientifically appropriate health evaluations of any individual who had health concerns related to exposure at the School. Subsequently, Dr. Rajiv Bhatia sent a draft protocol for assessing the children's health to Dr. Alim Muhammad on January 9, 2007. Dr. Muhammad acknowledged his receipt of the draft protocol today and has indicated he will send a detailed response in the next week or so. SFDPH is willing to implement this protocol but will need the assistance of the School to identify concerned parents and children. Delay in implementing the protocol may adversely affect the ability of the evaluation to assess the relationship between health concerns and the exposure concerns.

Dr. Bhatia has contacted the Chief of the Epidemiological Investigations Unit at the California Department of Health Services ("DHS"), Environmental Health Investigations Branch for advice and recommendations as to the components of a health assessment. SFDPH specifically asked what tests might be appropriate and provide useful information in this exposure context. DHS did not recommend any biological, laboratory, or radiological testing. They also felt that it is unlikely that risk assessments would yield useful results due to the limited duration of the exposure.

Conducting an Assessment of Exposures at the School to Airborne Naturally Occurring Asbestos (NOA) Generated during Grading Activity

At the January 3, 2007 meeting with the School's administrators, SFDPH agreed to review all the asbestos air sampling and particulate monitoring data collected from Parcel A and the School and use this information to estimate an upper limit of likely exposures to NOA at the School for the period covering April 25, 2006 through August 2, 2006. While definitive conclusions are difficult for the time period with no data, it is possible to use existing data to try and make an educated scientific guess about the upper limit to the possible NOA exposures. DPH is currently working with Treadwell and Rollo, the Agency's environmental consultants, on an internal draft of this assessment. A draft for public review will be available no later than the week of February 12.

Notifying the School of all Exceedances of NOA Work Suspension Thresholds

SFDPH made a commitment to communicate all NOA exceedances to the School. Ms. Brownell from SFDPH has telephoned and emailed Dean Leon Muhammad whenever Lennar has had an exceedance of the asbestos air sampling work suspension level and informed him of the required work suspension. She has also continued to work with him on any complaints or questions that he has had about Lennar's work.

San Francisco City and County
Department of Public Health
Environmental Health Section

Gavin Newsom, *Mayor*
Mitchell H. Katz, *,Director of Health*

Rajiv Bhatia, *M.D.,M.P.H.*
Director of Environmental Health

DATE: February 15, 2007

TO: All Interested Parties

FROM: Rajiv Bhatia, Medical Director

SUBJECT: Assessment of Exposure to Airborne Asbestos at Hunters Point Shipyard Parcel A' Lennar BVHP Redevelopment Project

Attached is an assessment conducted by Treadwell and Rollo on behalf and in close consultation with staff of the San Francisco Department of Public Health. This assessment evaluates airborne asbestos exposure for residents, students and workers adjacent to the Hunters Point Shipyard Parcel A' Lennar BVHP Redevelopment Project. Naturally occurring serpentinite rock on the project site contains naturally occurring asbestos. Asbestos air samples were required to be collected during the mass grading of this project to monitor the levels of naturally occurring asbestos. Due to a problem with Lennar's asbestos air sampling, there are no verifiable asbestos air samples for the project from April 25 (the start of mass grading) through August 2, 2006. Asbestos air samples have been reliably collected since August 3, 2006 on days when excavation activities have been conducted. The attached analysis was conducted to assess the possible exposure to airborne asbestos during the gap in sampling at the beginning of the project and throughout the life of the project.

Treadwell&Rollo

M E M O R A N D U M

This memorandum presents Treadwell & Rollo, Inc. and Acumen Industrial Hygiene's comments on the potential for community exposure to airborne asbestos related to grading and excavation work conducted by Lennar contractors at Parcel A' in areas where serpentinite rock containing naturally occurring asbestos (NOA) is present.

Memorandum Summary

To evaluate the potential for community exposure to airborne asbestos near the Parcel A' grading operations, Treadwell & Rollo completed the following:

- Reviewed the Asbestos Hazard Emergency Response Act (AHERA) methodology for air sampling;
- Compared the AHERA and worker personal monitoring methodology;
- Reviewed and compared the existing particulate and asbestos monitoring data;
- Estimated a possible "worst-case" exposure to asbestos; and
- Compared the worst case exposure to existing health based standards.

The AHERA methodology used for the ambient air asbestos sample collection was developed for use in clearing school buildings for rehabitation following asbestos abatement work. Under AHERA, the affected areas of a school can be reoccupied if results for air samples collected within the buildings are 20,000 structures per cubic meter or do not exceed results for samples collected outside the buildings.

Workers represent the population who experience the greatest and most direct hazards from the activity of concern due to the higher concentration of NOA and longer duration of exposures. Although results from the AHERA method and the phase contrast microscopy (PCM) method used to analyze worker personal samplers are not comparable, there have been no exceedances of worker asbestos criteria for Lennar's worker personal sampler results.

No correlation was found to exist between the asbestos and particulate data sets, i.e. high dust levels do not correlate to high asbestos levels and vice versa. Thus, particulate measurements can not be used to derive airborne asbestos levels for a period when there is no asbestos sampling data.

Based on the analysis of the asbestos air sampling data, the predicted worst case average asbestos air concentration for individuals at the Muhammad University of Islam School is 6,609 structures per cubic meter (sampling location HV-5) and the worst case average asbestos air concentration for any adjacent resident, student or worker is 5,403 structures per cubic meter. This exposure can be compared to the Bay Area Air Quality

Management District (BAAQMD) work suspension level of 16,000 structures per cubic meter which predicts an increased risk for asbestos cancers of one in ten thousand if exposed continuously for 70 years.

Background

The grading work occurring on Parcel A' is regulated by three agencies: the San Francisco Department of Public Health (SFDPH) has authority over dust control per Health Code Article 31; the Bay Area Air Quality Management District (BAAQMD) has authority over asbestos in air via the Asbestos Dust Mitigation Plan (ADMP) and by requiring a conservative work suspension level for air sampling results; and the California Occupational Health and Safety Administration (Cal OSHA) regulates worker protection. The BAAQMD asbestos work suspension level of 16,000 structures per cubic meter (s/m^3) is based on the increased likelihood of getting asbestos cancers (asbestosis, lung cancer, and mesothelioma) if an individual is exposed to this level continuously for a 70-year period. Work suspension based on exceedance of this level is intended to prevent resident exposure to asbestos for a significant duration of time.

Significant earthwork began on 25 April 2006. Lennar's environmental consultant began monitoring particulates in air for dust control on 28 June 2006. Lennar monitored asbestos in air for BAAQMD compliance from the beginning of the project; however Lennar's consultant CH2MHill discovered problems with the asbestos air monitoring data through 2 August 2006. Therefore, verifiable asbestos air monitoring data are only available starting 3 August 2006.

Because of these problems with lack of asbestos air monitoring data for three months, enhanced community monitoring protocols were developed to provide independent monitoring of Lennar's activities. In mid-September, SFDPH and the San Francisco Redevelopment Agency's (SFRA) environmental outreach consultant, ArcEcology, proposed the following protocols to Lennar:

- Independent monitoring at three new in-neighborhood community air sampling stations;
- Establish one additional monitoring station on the Shipyard near Building 101/110; and
- Acceptance of a protocol where exceedances at community monitoring locations would trigger a work suspension.

Lennar began monitoring at the additional locations on 5 December 2006. SFRA's consultant, Treadwell & Rollo, began monitoring at the additional community locations on 21 December 2006. Asbestos and particulate monitoring locations are shown on the attached Figure 1. All available verifiable data from all asbestos and particulate monitoring locations were evaluated in this exposure assessment.

Asbestos Hazard Emergency Response Act (AHERA) Methodology

The Asbestos Hazard Emergency Response Act (AHERA) method using transmission electron microscopy (TEM) is used for the asbestos air sample collection and analysis. The AHERA method was developed for asbestos abatement carried out in schools and is subject to regulations under the AHERA rule of 1986. The AHERA rule (40 CFR Part 763) specifies a bifactorial process for determining when an asbestos abatement site is clean enough for the primary containment barriers to be removed. The process consists of a thorough visual inspection of surfaces for debris, residue, or dust to establish that a "no dust criterion" has been achieved. After the abatement site has passed a thorough visual inspection, air samples are collected under aggressive sampling conditions; i.e., air blowers are used to dislodge fibers from surfaces and circulating fans keep the fibers suspended during sampling. The air samples are analyzed by TEM. If no visible debris, residue, or dust is detected by the unaided eye, the site is more likely to pass the TEM clearance air test specified in the AHERA rule. Clearance for re-habitation of the building is given if results for samples collected within the building are not statistically above levels outside the containment or building (using a z-test) or the fiber loading is less than or equal to 70 structures per square millimeter (s/mm^2) of filter area. The TEM AHERA method could pass clearance with levels of 20,000 s/m^3 (0.02 s/cc), inside a school, based on the minimum sample volume of 1,200 liters and fiber loading of 70 s/mm^2. The CARB Modified AHERA method uses a much larger volume (~3,000 liters) for the ambient air to reach the required analytical sensitivity of 1,000 s/m^3 (0.001 s/cc), and the work suspension level is 16,000 s/m^3 (0.016 s/cc)

Asbestos Air Sampling and Worker Personal Monitoring Data Comparison

The AHERA TEM and phase contrast microscopy (PCM) methods are very different. The PCM method is used to analyze worker personal samples using a much smaller volume (~400 liters) and the limit of detection would be about 0.1 fibers per cubic centimeter (f/cc) or 100,000 fibers per cubic meter (f/m^3). PCM also uses a Light Microscopy to identify fibers greater than 5 microns which may or may not be asbestos fibers, whereas the TEM AHERA method uses a larger volume (~3,000 liters) for the ambient air samplers to identify small structures down to 0.5 microns. Because the AHERA method uses TEM, it identifies actual asbestos; however the AHERA method counts fibers that are bound to particles, whereas PCM would not. Although not every regulatory agency agrees, the >5 micron fiber length represents current scientific consensus that attributes cancer-causing potential to long (>5 microns) fibers.

Although the worker and ambient air results are not directly comparable, there have been no exceedances of worker protection criteria for PCM results from the Lennar worker personal samplers. Worker exposure is relevant to the assessment of exposures adjacent to the site because workers represent a population who experience the greatest and most direct hazards from the activity of concern, both in terms of concentration of NOA and duration of exposures.

Asbestos Air Sampling and Particulate Sampling Data Comparison

Due to problems with the initial asbestos air sampling, there are no verifiable asbestos air sampling data from the start of grading 25 April through 2 August 2006. There is particulate data for part of this time period from 28 June through 2 August and there is both asbestos air sampling and particulate monitoring data available from August through the present day. If a relationship exists between particulate and asbestos air sampling data then asbestos levels during the time period from 28 June to 2 August 2006 could be estimated based on the particulate measurements.

The correlation coefficient is a statistical measure of the relationship between two sets of data. The calculations were performed using Microsoft®Excel™ which takes the covariance of the two data sets and divides by the product of their standard deviations. Correlation is a bivariate (two variables) measure of association (strength) of the relationship between two variables. It varies from 0 (random relationship) to 1 (perfect linear relationship) or -1 (perfect negative linear relationship). It is usually reported in terms of its square (r^2), interpreted as a percent of variance. For instance, if r^2 is 0.25, then the independent variable is said to explain 25% of the variance in the dependent variable.

For this site, three of the data sets evaluated are relatively large, with between 73 and 76 pairs of data, while three other data sets are smaller, with between 14 and 19 pairs of data. The correlation analysis was performed for the following six pairs of data:

- Asbestos levels at HV-1 and particulate levels at the Haul Road;
- Asbestos levels at HV-1 and particulate levels at the Hilltop;
- Asbestos levels at HV-5 and particulate levels at the Hillside;
- Asbestos levels at HV-5 and particulate levels at the School;
- Asbestos levels at HV-6 and particulate levels at the Hillside; and
- Asbestos levels at HV-6 and particulate levels at the School.

The calculated correlation coefficient (r^2) for five out of six data pairs is zero, indicating that there is no relationship between particulate (i.e., dust) levels and airborne asbestos levels in these areas at Parcel A'. For one of the smaller data sets, the value of r^2 is 0.22, which a very low value and, particularly in light of the results for the five other data pairs, is likely attributable to mere chance. Thus, elevated dust levels measured at the particulate monitoring locations at this site do not correspond to the elevated asbestos levels measured at the asbestos air sampling locations. Conversely, an elevated airborne asbestos level may be occurring at a time when particulate levels are relatively low. Therefore, it appears that soil-disturbing construction activities resulting in releases of airborne particulates (dust) do not appear to correlate to elevated asbestos levels in the air at the perimeter of Parcel A'. Hence, dust measurements at the perimeter of the site can

not be used to predict levels of airborne asbestos at the perimeter of the site during the time period of missing asbestos data.

Estimated Average Worst Case Exposure Levels

Because construction activities started on 25 April 2006, but adequate daily asbestos air monitoring only began on 3 August 2006, a gap of 100 days exist with no asbestos air monitoring data. Thus, the potential time period when unknown exposures to NOA occurred is relatively short (100 days).

The 95% Upper Confidence Limit (UCL) for the asbestos data was developed using the U.S. EPA software ProUCL Version 3.00.22, which evaluates the distribution of the data, identifies the optimum method for estimating the 95% UCL, and then estimates the actual value.

95% UCL values were developed for the available data, incorporating the following assumptions:

- The available data included samples collected at HV1, HV2, HV4, HV5, HV6, HV7, HV8, HV9, HV10, and HV11. Samples were only collected Monday through Friday of each week.
- The total structures per m^3 concentration for each sample was used.
- All available data, including duplicates (samples collected by MACTEC, CH2MHill, and Treadwell & Rollo/Acumen) were included as individual data points.
- Results reported as not detected were assumed to be a value of ½ the detection limit (consistent with U.S. EPA and Cal EPA guidance).
- Results reported as Not Available or Not Detected, but with no detection limit, were excluded from the data set.
- 95% UCL concentrations were developed for the entire data set, as well as for the data individually collected at HV1, HV2, HV4, HV5 and HV6. Insufficient data (less than 15 data points each) were available for HV7, HV8, HV9, HV10, and HV11 and most of those data points were reported as not detected.

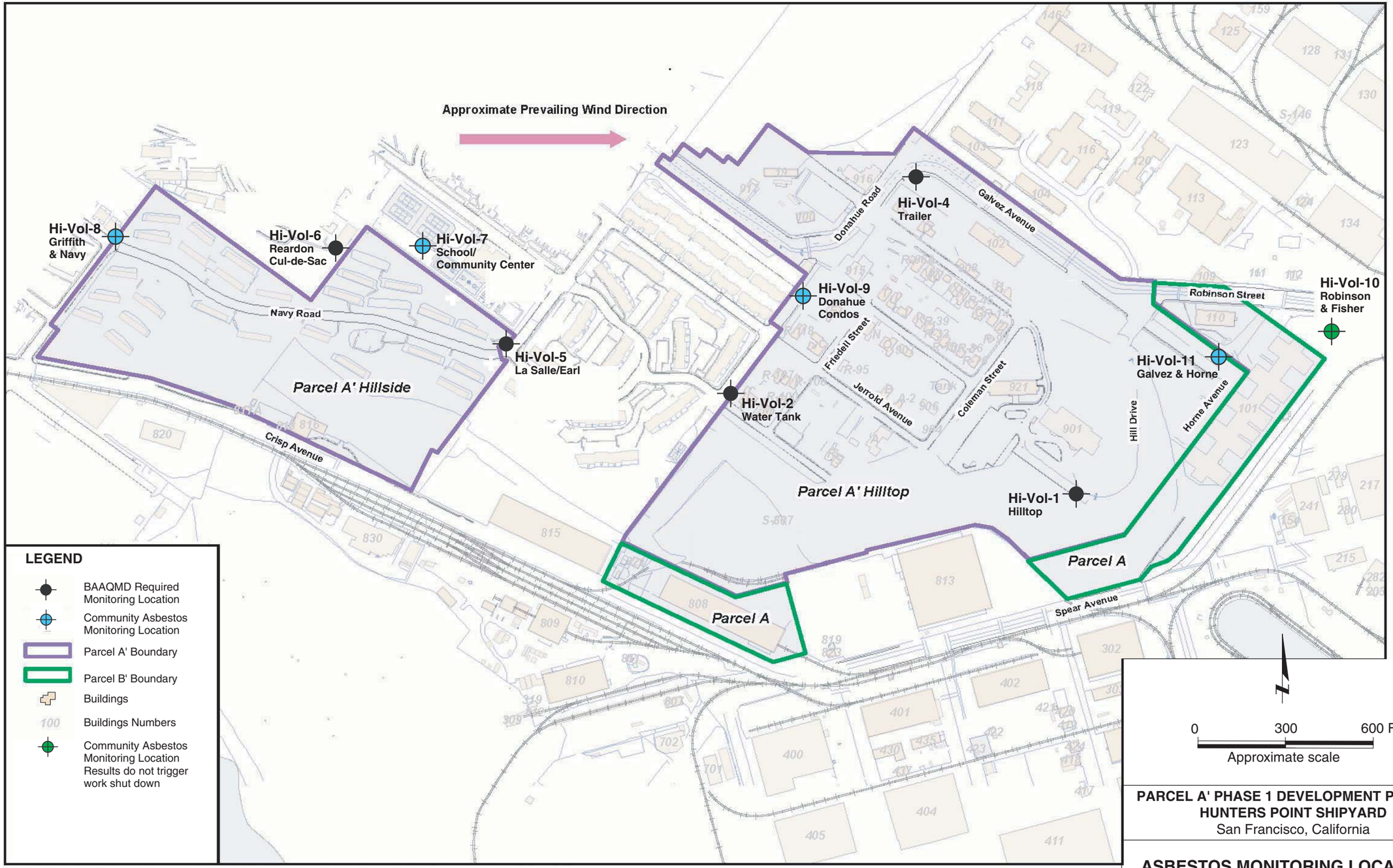
Based on these assumptions and methods the worst case average exposure levels at each location are:

- HV-1 = 9,786 structures per m3
- HV-2 = 7,133 structures per m3
- HV- 4 = 7,219 structures per m3
- HV-5 = 6,609 structures per m3
- HV-6 = 4,744 structures per m3
- Total for all data = 5,403 structures per m3

Estimates of asbestos exposure were developed based on the available air monitoring data for samples collected between 3 August 2006 and 24 January 2007. In accordance with U.S. EPA guidelines, an upper bound estimate of the average concentration was used to evaluate the overall potential asbestos exposures. U.S. EPA considers the average concentration as the most representative of the concentration that would be contacted at a given site over time. The 95 percent (%) Upper Confidence Limit (UCL) of the average concentration is a statistical upper bound estimate of the average concentration that takes into account the relative distribution of the data.

Short-term Exposure and Existing Health Based Standards

The 95% UCL concentrations, for data from the individual monitors as well as for the data combined, were all less than the BAAQMD work suspension level of 16,000 structures per m^3. As stated previously, the BAAQMD work suspension level of 16,000 structures per m^3 is based on an exposure duration assumption of 70 years. Any evaluation of potential excess cancer risks for the Parcel A' construction activities would be for less than one year. The Office of Environmental Health Hazard Assessment (OEHHA) of Cal EPA has indicated that "short –term high exposures are not necessarily equivalent to longer-term lower exposures even when the total dose is the same. OEHHA therefore does not support the use of current cancer potency factors to evaluate cancer risk for exposures of less than 9 years." Therefore, estimating cancer risk based on one year of exposure is not recommended and has not been developed for the 95% UCL values.



Source: CH2MHill, 9/2006.

PARCEL A' PHASE 1 DEVELOPMENT PROJECT
HUNTERS POINT SHIPYARD
San Francisco, California

ASBESTOS MONITORING LOCATIONS

Date 02/13/07	Project No. 3848.02	Figure 1

Treadwell&Rollo

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances
and Disease Registry
Atlanta GA 30333

June 29, 2007

Rajiv Bhatia, M.D., M.P.H.
Director, Occupational and Environmental Health
San Francisco Department of Public Health
Assistant Clinical Professor of Medicine
UCSF 1390 Market Street
Suite 822
San Francisco, California 94102

Dear Dr. Bhatia:

Thank you for the opportunity to discuss the exposure issues related to construction activities of Lennar BVHP, LLC on Parcel A at Hunter's Point. During this conversation, you requested that the Agency for Toxic Substances and Disease Registry (ATSDR) provide you with information regarding tests for asbestos exposures.

ATSDR conducted an expert panel to review the state of scientific knowledge on asbestos biomarkers. A summary report is enclosed. The discussion of the panel centered on analysis of fiber burden in the lung from living humans or autopsy samples; fiber content of sputum samples; fiber content of bronchoalveolar lavage; fiber analysis of sentinel animals; asbestos bodies counts; use of blood proteins or blood tests; and use of clinical tests such as spirometry or x-ray or CT scan for pathological change.

The panel concluded that none of the techniques are currently adequate to assess asbestos exposures or disease risk. Because of this finding, ATSDR has concluded that the best approach to assess community exposure is to conduct adequate air monitoring to confirm asbestos exposure.

If we can be of further assistance on this issue, please contact CDR Susan Muza, ATSDR Region 9, telephonically at (415) 947-4316 or via email at muza.susan@epa.gov.

Sincerely,

Tom Sinks

Thomas Sinks, Ph.D.
Deputy Director, National Center for Environmental/
Health/Agency for Toxic Substances and Disease
Registry

Enclosure

AGENDA: 4

Lennar Bay View Hunters Point Parcel A Naturally Occurring Asbestos Asbestos Dust Mitigation Plan

Kelly Wee
Director of Enforcement
October 29, 2007

Lennar BVHP Parcel A Project

- Redevelopment project on Parcel A at BVHP comprises 75 acres in NE portion of Hunters Point Shipyard.
- Lennar BVHP plans to construct 1600 attached single family homes on the site.
- Asbestos Dust Mitigation Plan (ADMP) received from Lennar in May 2005, as required by the statewide Air Toxic Control Measuring for Naturally Occurring Asbestos (ATCM).
- The Air Pollution Control Officer required that an ambient air monitoring plan be included due to nearby sensitive receptors.

Naturally Occurring Asbestos (NOA)

- Naturally occurring mineral found in Serpentinite rock
- Serpentine is the California State Rock
- NOA found in soil in 44 of California's 58 counties

Regulatory Background

- California Air Resources Board developed an Air Toxic Control Measure (ATCM) for NOA.
- The ATCM established notification and work practice requirements that reflect best dust mitigation measures.
- The ATCM was adopted into California law in July 2002. (Title 17 CA Code of Regulations Section 93105)
- Air District implemented its regulatory program in November 2002.

NOA ATCM Requirements

- Operators of large construction projects (> 1 acre) must prepare an Asbestos Dust Mitigation Plan (ADMP) subject to local air district approval.
- The plan must specify measures that will ensure dust control.
- Air monitoring is optional, based on sensitive receptors and is at the discretion of the local District.
- There are no ambient standards in the ATCM.

Lennar BVHP ADMP

Final ADMP approved October 2005

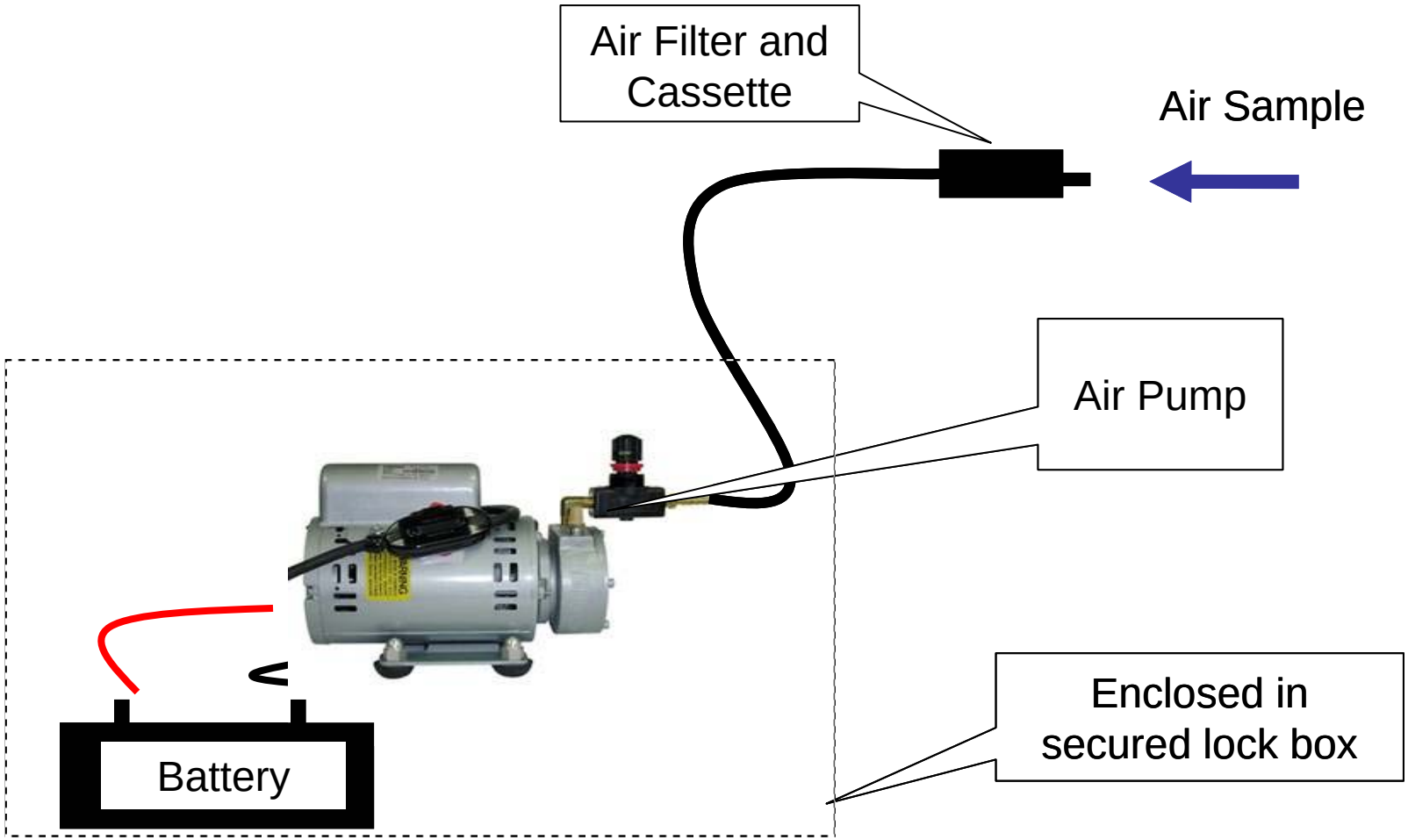
- Track–out Prevention and Control
- Cover and Water Surface Areas and Storage Piles
- Dust Mitigation for Unpaved Roads, Parking Lots, and Staging Areas
- Dust Control for Earth Moving Activities
- Control Dust from Vehicle Transport
- Upwind/downwind/perimeter air monitoring
- Post Construction Stabilization (cover with clean fill and re-plant)

Monitoring Locations

Parcel A' Phase 1 Development Project
Hunter's Point Shipyard
San Francisco, California

Source: MACTEC

Asbestos Monitoring Apparatus



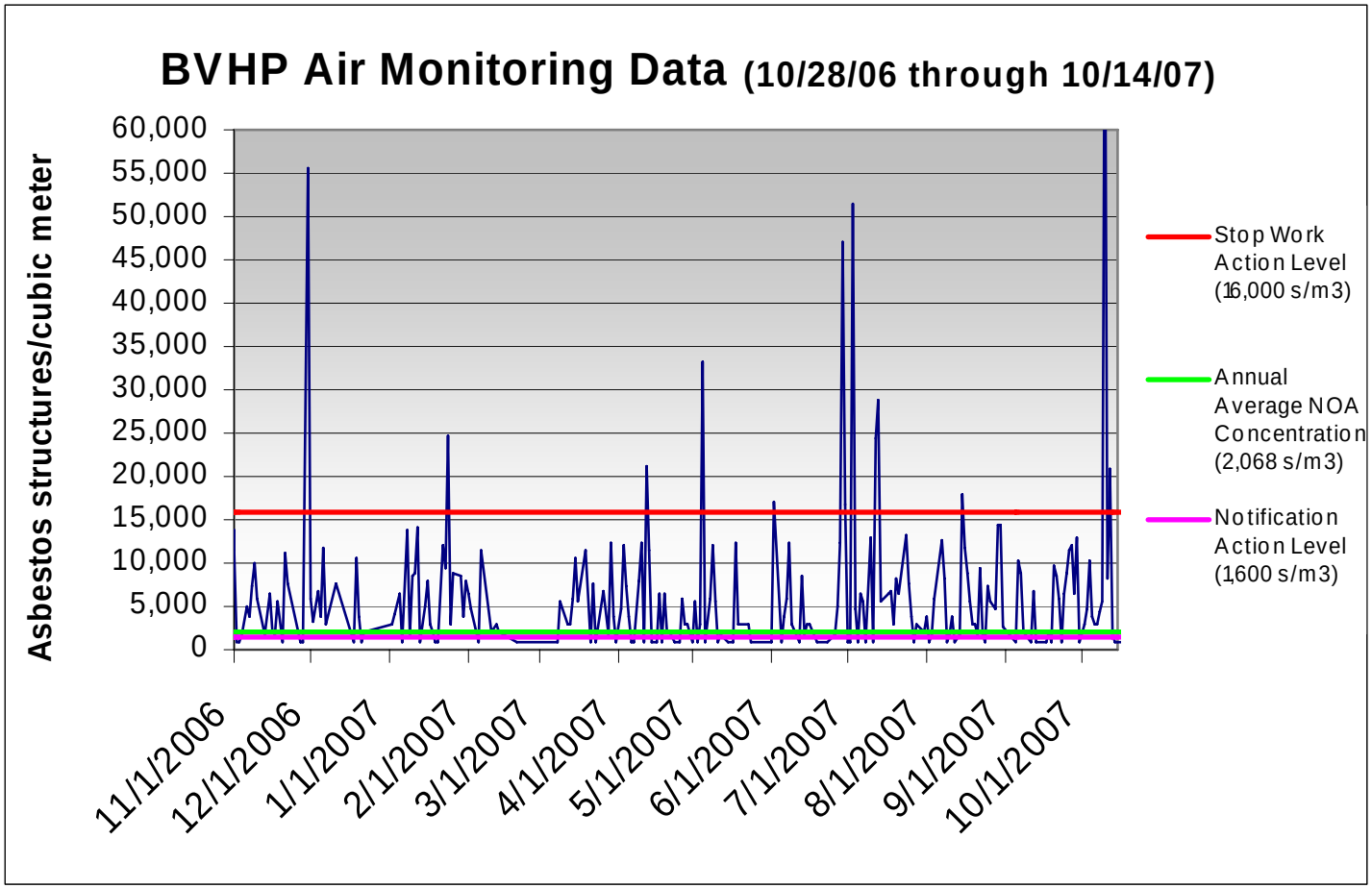
Public Health Protection

- In order to protect Public Health at the Parcel A development, the Air District set two action levels.
- The action levels are Conservative and Health Protective and provide a significant Margin of Safety.

Action Levels

- At 1,600 asbestos structures per cubic meter, project operators must notify Air District and implement more stringent dust controls.
- At 16,000 asbestos structures per cubic meter, project operators must stop work until levels decline.

Air Monitoring Results



Air Monitoring Comparisons

Monitoring Location	Sampling Dates	Number of Samples Collected	Average Concentration (s/m3)
El Dorado County[1]	Various months during 1998, 1999, 2000, and 2001	387	5,700
El Dorado County - Near Potential Source[2]	October 1998	110	13,600
Placer and Nevada Counties[3]	July 1998	37	3,200
Monterey County[4]	June 2001	98	2,800
Santa Clara County (Gilroy)[4]	July 2001 and September 2001	98	13,600
Bay View Hunters Point Parcel A[5]	**October 28, 2006 to October 14, 2007**	**1,207**	**2,068**

[1]Projects included background monitoring at four various locations throughout the County, including public buildings and schools.
[2]Samples collected near serpentine quarry.
[3]Background and road constructions samples.
[4]Background and grading samples.
[5]Grading samples.

Health Risks

- Health risk is within District Guidelines using established risk assessment protocols developed by the Office of Environmental Health Hazard Assessment (OEHHA) at the monitoring locations sited by the District at Parcel A.

- Risks are less than 3 in a million.

Compliance Assurance

- Air District staff conducts surveillance at the Parcel A site on a daily basis, making sure Lennar follows measures in the ADMP.
- During inspections, two violations were documented for which Lennar was cited. Two additional under review.
- A Notice of Violation was issued in October 2006 for non-compliance with the ADMP.

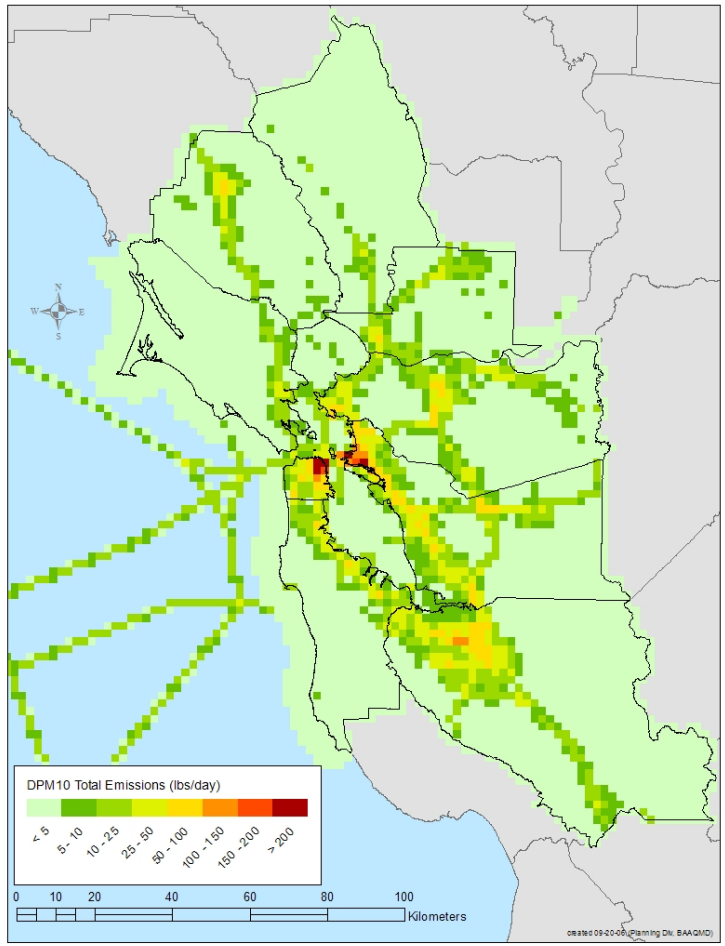
Summary

- Major grading is completed and project is moving into utility installations (trenching, foundations)
- Regular compliance inspections will continue and the Air District will continue to require stringent dust controls until the project no longer disturbs NOA.
- Asbestos ambient monitoring will continue with expansion of the network.
- The Air District is requiring ADMP enhancements.

Bay View Hunters Point & CARE

Community Air Risk Evaluation Program

- BVHP is a focus area under CARE.
- Air District will continue to look at the air pollution impacts to Bay View Hunters Point.
- Stationary Sources and Mobile Sources (Diesel PM) are included.
- Additional monitoring, outreach, and mitigation may be in the future.



To the Bayview-Hunters Point Community:

We recognize the very real health concerns that many of you face every day. That is why we are pleased to announce the findings of Dr. John Balmes, Professor of Medicine at the University of California and Chief of Occupation and Environmental Medicine at San Francisco General Hospital. After a review of relevant data, Dr. Balmes has concluded that the construction at Hunters Point Shipyard does not pose a significant risk of long-term health problems.

In particular, Dr. Balmes agrees with the San Francisco Department of Public Health that it is highly unlikely that exposure to naturally occurring asbestos found at the Shipyard poses a danger to human health.

Dr. Balmes has also concluded that a variety of symptoms reported by some residents cannot be tied to asbestos in construction dust generated at the Shipyard. "I believe that the many health concerns that the community is experiencing are likely caused by events and circumstances that are unrelated to Lennar's construction activities at Hunters Point Shipyard," he writes in his report. "Many of these health concerns predate construction and involve symptoms that are not associated with exposure to naturally occurring asbestos.

As we informed you in a letter last week, Dr. Balmes conducted his investigation at our request but his time and expenses were paid for by Lennar. However, his analysis has been objective and not influenced by the company. We are grateful for his thorough work on the community's behalf. A copy of his full findings is attached with this letter.

Finally, and most importantly, we believe that Dr. Balmes' findings will help facilitate a broader discussion of health and environmental issues in Bayview-Hunters Point. You have our promise to make these long-standing issues a priority so that health officials more aggressively pursue solutions that result in a safer and healthier community for all of us. We look forward to working with as many of you as possible to make that dream a reality.

Sincerely Yours,

African American Community Revitalization Consortium

Rev. Arelious Walker
True Hope of Christ in God Church

Rev. Joesiah Bell
The Church at San Francisco

Pastor George Lee
Shilo Gospel Church

Rev. Gary Banks

Marketplace Fellowship Church

San Francisco African American Chamber of Commerce

Bayview Merchants Association

The Tabernacle Development Group

Aboriginal Blackmen Union

Individual members of the Hunters Point Shipyard Citizens Advisory Committee and Hunters Point Project Area Committee

And scores of
Bayview-Hunters Point residents

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COEH

DIVISION OF OCCUPATIONAL AND ENVIRONMENTAL MEDICINE

SAN FRANCISCO GENERAL HOSPITAL
Building 30 - Fifth Floor
1001 Potrero Avenue
San Francisco, California 94110

TEL: (415) 206-5200

MAILING ADDRESS:
University of California, San Francisco
Box 0843
San Francisco, California 94143-0843

FAX: (415) 206-8949

September 5, 2007

Dr. Arelious Walker
True Hope Church of God in Christ
950 Gilman Ave.
San Francisco, California 94124

Dear Dr. Walker:

It was a pleasure meeting with you last month. I wanted to provide you with a status report on my efforts to date, including my initial assessment of the health issues that have been raised by the community about Lennar's construction work at Hunters Point Shipyard Parcel A.

As you know, I am a Professor of Medicine at the University of California, San Francisco, and Chief of the Division of Occupational and Environmental Medicine at San Francisco General Hospital. At your request, I have agreed to provide advice and guidance to you and other leaders of the Bayview-Hunters Point community regarding health issues, including whether naturally occurring asbestos in dust from the construction site poses a health risk.

Also at your request, Lennar has agreed to pay for my time and expenses because, as I understand it, there are no other resources to support my involvement. I agreed to this arrangement only with the express understanding that I will provide you with an objective assessment that will be independent of Lennar and the many competing interests that have dominated the health debate to date. I committed to telling you my opinion regardless of what others, including Lennar, might think.

My work to date has included reviewing the available data, reports from the San Francisco Department of Public Health (DPH) and other relevant information. Additionally, I have reached out to the government agencies looking at the site, including the DPH and the Environmental Health Investigations Branch of the California Department of Health Services (EHIB), and spoken with Lennar's own experts, Dr. Mark Utell, who is a pulmonologist and Professor of Medicine and Environmental Medicine at the University of Rochester, and Dr. Robert Scofield, a toxicologist and risk-assessor employed by ENVIRON International Corporation.

I. OBSERVATIONS

My current assessment of the health issues is consistent with the determination reached by the San Francisco Department of Public Health that Lennar's construction activities do not appear to present a significant long-term risk to public health, including to the residents of Bayview-Hunters Point.

On August 18, I had the opportunity to tour the Parcel A construction site to examine the field conditions, monitoring stations and dust abatement measures. Immediately following the tour, I was able to speak with Dr. Rick Kreutzer of the EHIB, who is consulting with the federal Agency for Toxic Substances and Disease Registry (ATSDR). Based on the information I have reviewed to date, the tour of the site and review of the dust abatement measures, combined with the available monitoring data, the site does not appear to present a significant long-term health risk to the community. In support of my preliminary assessment, I wanted to share with you and the community the following observations:

A. Grading Is Complete

I understand that the grading work is almost done and that the site will be capped to reduce any potential for future dust exposure. The end of grading will greatly reduce, if not eliminate, any potential for exposure to naturally occurring asbestos from activities at the site.

B. Asbestos Monitoring Data

I agree with DPH that it is highly unlikely that exposure to naturally occurring asbestos from grading operations at Parcel A will create a significant risk to human health in the community. The work stoppage level set by the responsible government agency -- the Bay Area Air Quality Management District -- was designed to be health-protective and ensure a low risk even assuming a person would be exposed to certain levels of asbestos on a continual and ongoing basis for 70 years. Here, by contrast, the grading period was less than eighteen months and the air monitoring data show that the average level of asbestos was significantly lower than the amount that is thought to pose a risk of long-term injury.

C. Community Health Issues

I am acutely aware that the Bayview-Hunters Point community has long been plagued by health problems, such as high rates of asthma in children, that predate Lennar's activities at the site. And I am aware that the community is concerned that these health problems may relate to exposures to airborne pollutants or other agents in the neighborhood environment.

While it is important that we remain mindful of and responsive to community health concerns, and their possible link to the neighborhood environment, it is also important that we not improperly attribute the cause of these health concerns to the recent grading activities at the Shipyard. I believe that the health problems that the community is experiencing are likely caused by events and circumstances that are unrelated to Lennar's construction activities at Hunters Point Shipyard. Many of the health concerns predate construction and involve symptoms that are not associated with exposure to naturally occurring asbestos.

II. CONSULTATION WITH STATE AND FEDERAL AGENCIES

As I believe you are aware, DPH is working with ATSDR and EHIB to conduct a public health consultation regarding certain issues relating to construction activities at the shipyard site. I have spoken with these agencies and plan on meeting with them to share information and analysis, although a date for a meeting has not yet been set. I believe that such a meeting will be helpful for the agencies, for my assessment and for the community.

I hope that you find this status report helpful. I will continue to keep you advised of my analysis and assessment as we move forward. Please do not hesitate to contact me with any questions or concerns that you might have.

Sincerely,

John R. Balmes, MD
Professor of Medicine, UCSF
Chief, Division of Occupational and Environmental Medicine,
San Francisco General Hospital

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances
and Disease Registry
Atlanta GA 30333

September 20, 2007

Rajiv Bhatia, M.D., M.P.H.
Director of Occupational and Environmental Health
1390 Market Street
Suite 910
San Francisco, California 94102

Dear Dr. Bhatia:

On July 17, 2007, you requested that the Agency for Toxic Substances and Disease Registry (ATSDR) respond to concerns related to grading operations at Hunters Point Shipyard (HPS) Parcel A in San Francisco. As you know, ATSDR funds the California Department of Public Health (CDPH), Site Assessment Section (SAS), to assist us with work within the State of California. The CDPH provided a written evaluation of your request on September 10, 2007. This evaluation is enclosed.

ATSDR concurs with the essential findings, conclusions, and recommendations made by CDPH regarding asbestos and dust levels. There was clear evidence that levels of asbestos exceeded mandated thresholds at both the fence line and in the community. The concentrations of dust could not be interpreted because of the sampling methods. It is reasonable to conclude that levels of dust and asbestos were similar during the months when sampling did not occur. The exposures did result in some increased risk for community residents, although it is not possible to quantify this risk. Medical follow-up or screening is not recommended because there are no valid tests to identify current exposures or predict developing future disease.

Public health follow-up should focus on effective efforts to further reduce exposures and to monitor and verify that these reductions occur. These steps are outlined in the CDPH letter.

You and the Bay Area Air Quality Management District have taken many steps to protect the public from the dust and asbestos generated during work activities at HPS Parcel A. ATSDR and CDPH support your efforts and are committed to helping you address the issues we have raised.

Please feel free to contact CAPT Susan Muza at (415) 947-4316; via email at Muza.Susan@epamail.epa.gov or me at (404) 498-0004; via email at TSinks@cdc.gov if you have comments or concerns.

Sincerely,

Thomas Sinks

Thomas Sinks, Ph.D.
Deputy Director, National Center for Environmental Health/Agency for Toxic Substances and Disease Registry

Enclosure:
Letter from CDPH

cc:
Dr. Rick Kreutzer, CDPH
Ms. Karen Henry, USEPA, Region 9
Mr. Clancy Tenley, USEPA, Region 9
Dr. Tina Forrester, ATSDR, Division of Regional Operations (DRO)
CAPT Susan Muza, ATSDR, DRO

State of California—Health and Human Services Agency
California Department of Public Health

MARK B HORTON, MD, MSPH
Director

ARNOLD SCHWARZENEGGER
Governor

September 10, 2007

Captain Susan L. Muza
Agency for Toxic Substances and Disease Registry
75 Hawthorne Street, Suite 100, HHS-1
San Francisco, CA 94105

Dear Captain Muza:

As part of our cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), the Site Assessment Section (SAS), within the California Department of Public Health (CDPH), is sending this letter to assist you with addressing concerns related to grading activities occurring on Parcel A in the Hunters Point district of San Francisco.

On July 17, 2007, the San Francisco City and County Department of Public Health (SFDPH) formally requested assistance from ATSDR to perform the following: 1) review and interpret available air monitoring data for residents living adjacent to Hunters Point Shipyard (HPS) Parcel A development activities and the significance of data gaps; 2) evaluate the assessment and judgments made by SFDPH on the significance of exposure and health impacts on residents and other sensitive uses adjacent to HPS Parcel A development activities; and 3) make recommendations for additional appropriate dust and exposure control and monitoring necessary to protect health of residents.

HPS Parcel A is approximately 75 acres and is located in a geologic area where Naturally Occurring Asbestos (NOA) has been identified. CDPH is aware that the community is divided over the plans to develop this site. Many steps have been taken to address the dust and naturally occurring asbestos issues at this site already (some of which are summarized in this letter).

Since July 17, 2007, the SAS, with ATSDR, has gathered technical information about Parcel A, conducted outreach to the Hunters Point community, and communicated with SFDPH to clarify details of their request and to share a preliminary draft of findings for fact verification.. Here, we provide recommendations for reducing dust/asbestos air levels from on-going and future grading/soil disturbing activities at Parcel A. These recommendations are based upon our review of the plans in place for monitoring dust and asbestos emissions from the site and review of the available monitoring data. Because grading operations are nearing an end, there was some urgency to share these findings with the hope that future dust and asbestos levels could be made even lower.

CDPH Recommendations

CDPH recommends the following actions occur to assure greater confidence, among those living near the excavation, in the safety of activities on Parcel A. These recommendations build on actions SFDPH and other agencies are already conducting at the parcel (the agencies that have authority to implement the recommendation are noted in parentheses). Information that forms the basis for these recommendations is provided in this letter and is referenced at the end of each recommendation:

- Because the contractor has exceeded the Bay Area Air Quality Management District (BAAQMD) asbestos action level that triggers work stoppage on 13% of excavation days, and because there have been complaints about dust, which may cause other health concerns, SFDPH should assign a person to continuously monitor dust production and dust abatement activities during working hours. This is an important way to prevent both dust and asbestos exposures. Essential to this recommendation is that the assigned person not only observes but has the authority to alter activity on the site based on his/her observations. Please see **Overview of Current Dust and Asbestos Monitoring Plans.**

- The assigned person should promptly report to the public what is observed and what is done as a result of the above-mentioned monitoring activities. Please see **Overview of Current Dust and Asbestos Monitoring Plans.**

- Explore additional dust control procedures such as misting at the fence line, tarping the fence, adding an on-site meteorological station, stopping activity that generates dust if winds are 15 miles per hour or more, or tarping grounds where no activity is occurring for seven days or more. It is recommended that the developer engage someone with expertise in dust control to specifically define additional mechanisms to achieve better mitigation and dust suppression. This recommendation is based upon findings in the **CDPH Review of Environmental Data** section.

- Air monitoring equipment on-site and in the community should be used to evaluate the effectiveness of added measures. If ongoing exceedances occur, then more measures should be adopted. Please see **Overview of Current Dust and Asbestos Monitoring Plans.**

- To assist the SFDPH assigned inspector in evaluating the current Dust Control Plan, the contractor should conduct real-time dust monitoring using appropriate equipment for respirable dust (PM-10) at several locations, co-located with asbestos sampling (SFDPH and BAAQMD). SFDPH should use information from monitors during the day to identify activities which are generating PM 10 and alter activity to reduce its generation. As explained below, there are validity problems with the currently used monitoring equipment. Please see **Overview of Current Dust and Asbestos Monitoring Plans.**

- Include the community monitors, especially HV-7, HV-8, and HV-9, in the official asbestos monitoring plan, as regulated by the BAAQMD. These monitors, along with the on-site monitors, create better coverage of the perimeter of such a large parcel (BAAQMD). Please see **Overview of Current Dust and Asbestos Monitoring Plans.**

- Explore ways to reduce the time lag between measuring elevated levels of naturally occurring asbestos and altering parcel activities by returning to 12-hour sampling (when samples often resulted in results the next day). Or, collect from 7 p.m. to 7 p.m., which would similarly mean a result may be available the next day. (BAAQMD for the on-site monitors; SFDPH for the community monitors). As a matter of principle, public agencies should try to be as timely in their feedback as possible. These sampling strategies will advance this goal. Please see **Overview of Current Dust and Asbestos Monitoring Plans** and **CDPH Review of Environmental Data.**

Overview of Current Dust and Asbestos Monitoring Plans

The Asbestos and Dust Control Plans required by BAAQMD and SFDPH call for air monitoring and outline steps the contractor should implement to keep dust from leaving the site perimeter. Mass grading/earthmoving activities began on Parcel A on April 25, 2006.

According to a SFDPH memorandum dated June 2007, there were complaints about dust from the very beginning of the grading activities. The memo notes that, in response to specific complaints, SFDPH would evaluate the adequacy of the dust control measures. In 2006, SFDPH issued three Notices of Violation to the developer concerning the generation of visible dust.

Under SFDPH oversight of the implementation of Article 31, consultants for the developer have conducted real-time monitoring for total dust (primarily 10 micron and smaller) since June 2006. As described in the Parcel A Dust Control Plan, an action level of 0.5 milligrams per meter cubed was established as an action level for total dust (PM 10). The monitors (two downwind and one upwind) record minute by minute readings of PM 10; however, the dust data is not reviewed as it is recorded. It may be reviewed at the end of the day or later. According to the Dust Control Plan, "if dust is generated from on-site soil disturbance or excavation activities and dust levels from these activities are recorded above the action level, the work will stop until additional controls are implemented to reduce dust generation from the specific work area causing the problems."

On August 20, 2007, SFDPH issued a Notice of Violation to the developer of Parcel A for observations that occurred on August 17 related to dust crossing the property boundary and visible dust occurring for over 90 minutes, which was observed by the SFDPH inspector from 2:45 to 4:30 p.m. In issuing the Notice of Violation, they ordered the developer to cease all dust generating activities for 48 hours in order for the developer to "establish work practices that will prevent future recurrences." SFDPH asked the developer to "review the incident for the causes of compliance failure and training of all relevant employees and subcontractors on the requirements

of the Dust Control Plan." In the Notice of Violation letter, SFDPH indicated to the developer that they will be providing a monitor (a person) who will be supervised by SFDPH staff, with costs billed to the developer. In the letter, they state that "through this monitor, SFDPH will independently verify that the dust control is meeting all Dust Control Plan requirements and assist the developer in adhering to plan requirements."

At this time, CDPH has reviewed the equipment being used to monitor dust and a limited set of the dust data. According to the manufacturer, the instrument that has been used to monitor dust at Parcel A is designed for personal/breathing zone monitoring, plant walk-through surveys, remediation site worker exposure monitoring, and indoor air quality. The instrument being used is sensitive to moisture and is a passive sampler. Dust monitors that are approved for PM 10 ambient air standards by the California Air Resources Board are all active samplers. Further, there are dust monitors available that are designed for outdoor applications where moisture is present. Due to the novel application of the equipment for fence line monitoring, CDPH is not able to interpret whether dust exposures in the community occurred that would explain some of the community health complaints such as headaches, bloody noses, adult onset asthma, respiratory symptoms, nausea, and vomiting. We recommend using dust monitors that have been certified for fence line monitoring.

Since there is naturally occurring asbestos at the site, the BAAQMD required consultants for the developer to conduct asbestos air monitoring around the perimeter of the parcel since April 2006. The SFDPH further requested air monitors for asbestos in the neighborhood. The asbestos ambient air action level that would "trigger an immediate on-site evaluation to determine if dust mitigation measures are still effective" was set at 1,600 TEM (Transmission Electron Microscope) structures/m^3. This level corresponds to a 1 in 100,000 increased cancer risk for a 70-year exposure. The ambient air asbestos action level at which grading operations are shut down was set at 16,000 structures/m^3. This level corresponds to a 1 in 10,000 increased cancer risk for a 70-year exposure. Asbestos samples have been collected daily using a vacuum pump that feeds to a filter cassette. The filter cassettes were sent to a laboratory for analysis, typically with a two-day turn around time for results. The two-day lag time delays detecting exceedances of action levels and taking actions to reduce them.

We understand that in the past, staff from SFDPH and BAAQMD have visited the site. In recent months, BAAQMD staff has visited for approximately one hour to two hours every day.

Additionally, the developer hired local community members from Young Community Developers to act as the community's "eyes and ears on the ground" to make sure the construction dust is being properly managed. ATSDR, CDPH, and SFDPH have no detailed information about the training these individuals received or the power these community members have to alter activities on-site.

CDPH Review of Environmental Data

CDPH reviewed the asbestos monitoring data collected between August 3, 2006, and August 19, 2007. There are no asbestos monitoring data available for the first few months of grading (April 25, 2006 – August 2, 2006), due to operator error and equipment malfunctions. Asbestos samples were collected for 12-hour periods starting August 3, 2006, typically from 7 a.m. to 7 p.m. Starting on October 18, 2006, samples were collected for 24 hours, from approximately 7 a.m. to 7 a.m.

The asbestos data has been plotted in a calendar format and color coded to reflect the asbestos measurements while grading activities were occurring relative to the corresponding action levels (see attached). When a recording of greater than 16,000 structures/m^3 occurred, the monitoring station that recorded that level is indicated in parenthesis. A map with names of the monitoring stations and the location of the monitoring stations is also attached. A narrative summary of these findings is also attached.

- Asbestos levels exceeded 1,600 structures/m^3 (the level that triggers an immediate determination of the adequacy of dust mitigation measures) 166 out of 200 days (83%) when grading was occurring on the site. This does not include days of non-operation.

- Asbestos levels exceeded 16,000 structures/m^3 (the level at which grading operations are shut down) 26 out of 200 days (13%) when grading was occurring on the site. This does not include the days of non-operation or of other activities on the property.
    - Exceedances of 16,000 structures/m^3 do not seem to follow a geographical pattern:
        - Exceedances of 16,000 structures/m^3 occurred at stations located along the perimeter of the project where residences or community buildings are located (HV-2, HV-4, HV-5, HV-6, HV-8) 19 times on 16 days of the 200 days. On seven of these days, there were also exceedances at monitoring stations (HV-1, HV-10, HV-11, or HV-12) on the eastern side of the "hilltop" Parcel A away from residences and the community.
        - Exceedances of 16,000 structures/m^3 occurred only at monitoring stations located on the eastern border of the "hilltop" Parcel A away from residences and the community (HV-1, HV-10 (prior to January 26, 2007), HV-11) 20 times on 10 days of the 200 days.
        - There has never been an exceedance of 16,000 structures/m^3 at the monitor on the Muhammed University of Islam School (HV-7) when grading was occurring on Parcel A. The first data from HV-7 occurred on December 5. On February 7, HV-7 recorded 17,800 structures/m^3 on a day when work was being done on the Stormwater Pollution Plan.
    - Exceedances of 16,000 structures/m^3 occurred to a lesser extent last winter during the rainy season, but otherwise do not show a temporal pattern:

        - The following is a listing of the number of exceedances of 16,000 structures/m^3 by month starting in August 2006: 5,2,2,1,1,3,0,0,1,1,3,5,2 (data are not complete for this month).
        - The following is the number of occurrences at the monitoring stations located near the community before and after December 30, 2006:
            - HV-2 5/0
            - HV-4 3/1
            - HV-5 3/3
            - HV-6 1/1
            - HV-8 0/2
    - Wind pattern data are not available for Parcel A. The nearest wind pattern monitoring station is San Francisco Airport, located approximately 10 miles away. This data can not accurately predict conditions at Parcel A.

- Between August 3 and August 10, 2006, asbestos levels exceeded 16,000 structures/m^3 on three days (no measurement reported three of the seven days), with a maximum level of asbestos measured at 24,400 structures/m^3. Grading did not occur on the two weekends during this period. Grading occurred on August 7, August 9, August 11, and August 14; however, no monitoring occurred. (Because of the prior non-detect results from April to June, the developer, as per provisions of the Naturally Occurring Dust Protocol, opted on June 24 to reduce the number of days they would monitor for asbestos to 2 days per week.) On August 15, 16, 17, and 18, no grading occurred because of the exceedances occurring earlier in the month. Apparently the asbestos results for the beginning of August were not received until August 14. This is a gap of 11 days between the first exceedance and the official ceasing of operations due to the exceedance.

- The delay in reporting asbestos levels meant that exceedances of 16,000 structures/m^3 could occur two days in a row: This happened on August 22 and 23, 2006, on January 15 and 16, June 28 and 29, and July 11 and 12, 2007. In all cases, work was stopped two days after the first exceedance.

- Exceedances of 16,000 structures/m^3 occurred on August 30, September 27, October 18, December 18, 2006, and on January 10 and 22, April 12, and July 14 and 24, 2007; work was stopped two days later. There were no exceedances of 16,000 structures/m^3 in the day between the exceedance and shutdown.

- On September 13, 2006, an exceedance of 16,000 structures/m^3 occurred; work was stopped at 11 a.m. the next day due to the exceedance.

- On October 12, 2006, an exceedance of 16,000 structures/m^3 occurred; grading operations were shut down on the afternoon of the following day, October 13.

- On November 30, 2006, asbestos levels exceeded 16,000 structures/m^3, with a maximum level of asbestos measured at 55,700 structures/m^3; grading operations were shut down four days later.

- On February 7, 2007, an exceedance of 16,000 structures/m^3 occurred in a community monitor while work on the Sediment Control Plan of the Stormwater Pollution Prevention Plan was occurring. Although no grading was occurring, this activity involved moving soil on the parcel.

- On Friday, May 4, 2007, an exceedance of 16,000 structures/m^3 occurred. Grading occurred on Saturday with no exceedances. No activity occurred on Sunday, which was the second day after the exceedance. Levels were still high on Monday, May 7. On May 9, work was stopped for the exceedance on Monday, May 7.

- On Friday, June 1, 2007, an exceedance occurred; no work occurred over the weekend. Work was shut down on Monday, June 4 and Tuesday, June 5 because of exceedances on June 1.

- On Friday, July 17, 2007, an exceedance occurred; no work occurred on the weekend because of the exceedances.

- On Friday, July 27, 2007, an exceedance occurred; no work occurred over the weekend. Work was shut down on Monday, July 30 and Tuesday, July 31 because of exceedances on July 27.

- On January 29, 30, 31, February 1 and 6, April 23 and 30, May 24, June 27, July 2, 13, 18, 20, 23, and August 8 and 9, 2007, asbestos levels exceeding 16,000 structures/m^3 were collected from two monitors (HV-10 and HV-12) located in an area believed to be influenced by another source of asbestos other than Parcel A grading operations (see attached figure). As a result, the developer was not required to shut down operations.

Summary of Findings

CDPH evaluated available monitoring data collected from 10 monitoring locations to determine whether the asbestos control measures specified in the Naturally Occurring Asbestos Dust Mitigation Control Plan, dated August 2005, are adequate to maintain compliance with air levels set by the BAAQMD. In addition, CDPH reviewed the Dust Control Plan dated February 2007.

As described in the above bullets, the operations on the Parcel A property have resulted in levels of asbestos above mandated thresholds being measured at the fence line and in the community. These elevations have required work stoppages. The two day delay in reporting air level elevations has often prevented changing the operations in a timely way to reduce these levels.

Our recommendations above are intended to build upon existing efforts to control dust and asbestos migration off-site and to decrease the likelihood of elevations above the level set by the BAAQMD.

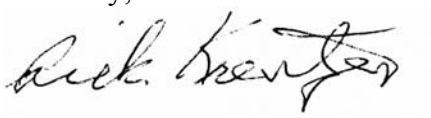
The BAAQMD mandated threshold action levels are based on numbers derived from studies of long-term (many years) exposure to high (higher than the levels being measured at and around the parcel) levels of asbestos resulting in mesothelioma to workers. However, there are studies in the scientific literature in which long term lower level/non-occupational exposures (from take home exposure and other areas of the world where naturally occurring asbestos occurs) caused a low but epidemiologically detectable excess risk of mesothelioma. For example an ecological study in California suggests an association between residential proximity to naturally occurring asbestos and mesothelioma. There are technical difficulties in estimating risk from exposures as brief as a year, using techniques that were developed for life-long exposures. Nonetheless, even a 7-year exposure to the levels of asbestos measured around this excavation was estimated to have risks that, on a personal level, would be considered low. When one considers that the exposures have occurred over the course of a year or two, the estimated risk would be even lower. Regardless, site conditions warrant the monitoring and careful dust abatement measures recommended above.

Based on CDPH scientists' review of previous studies, they would not expect to find X-ray changes as a result of the kinds of exposures that have occurred during excavation. Since X-rays carry their own risks, CDPH would not recommend them. Furthermore, there are no known blood tests for asbestos exposures.

We note that public health concerns and subsequent regulations to control the movement of naturally occurring asbestos dust have only recently arisen, e.g., on July 29, 2002, the state (California Air Resources Board) issued the regulation for asbestos airborne toxic control measures for construction, grading, quarrying, and surface mining operations, as guidance to the local Air Quality Management Districts. Guidelines and their implementation are new and will undoubtedly undergo improvements over time, in part based upon healthy discussion in communities like Bayview Hunters Point.

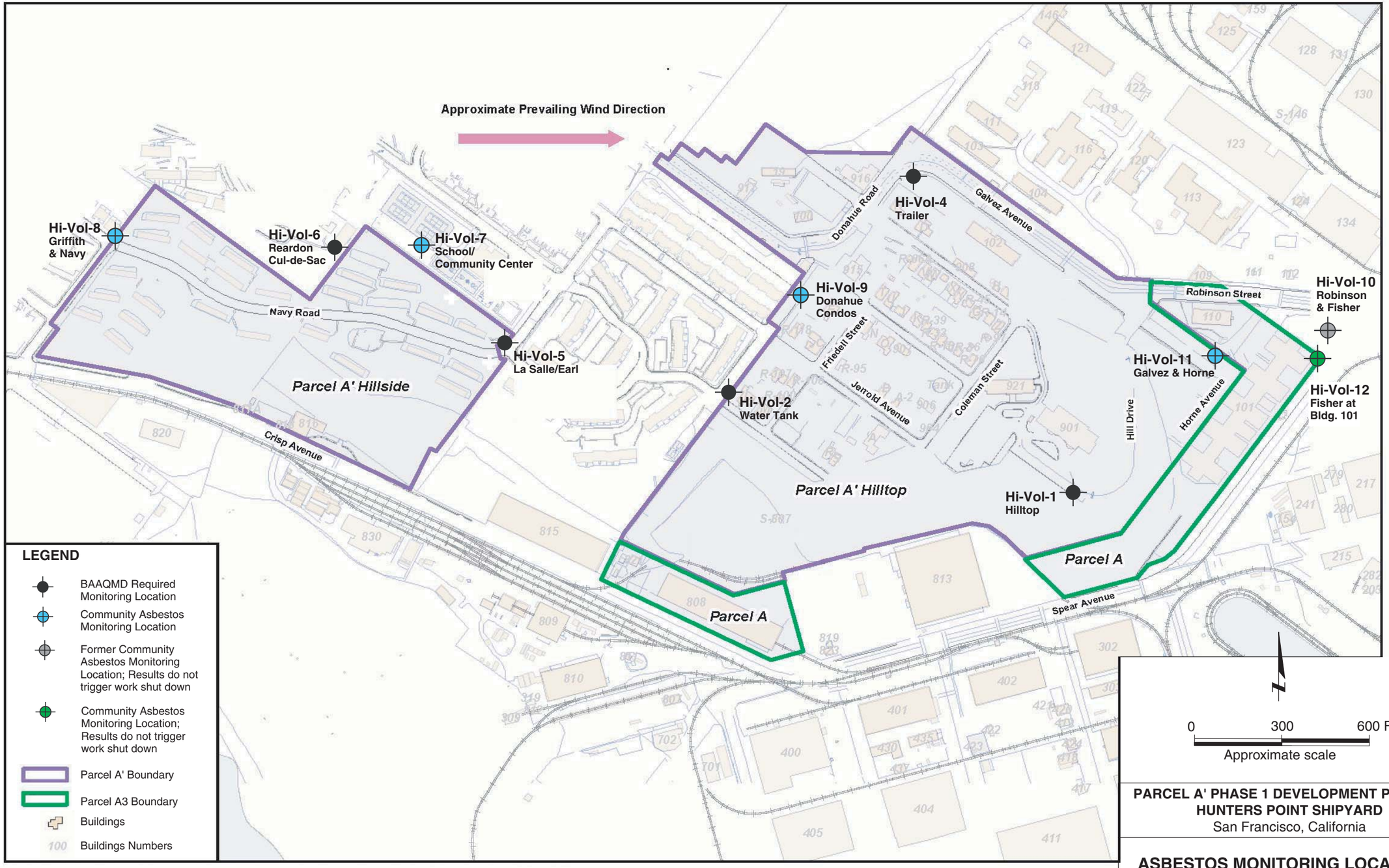
We look forward to working with you and the other agencies to address the recommendations. If you have any questions, please contact me at (510) 620-3620.

Sincerely,



Rick Kreutzer, M.D., Chief
Environmental Health Investigations Branch

Enclosure



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Source: CH2MHill, 9/2006.

PARCEL A' PHASE 1 DEVELOPMENT PROJECT
HUNTERS POINT SHIPYARD
San Francisco, California

ASBESTOS MONITORING LOCATIONS

Date 05/10/07	Project No. 3848.02	Figure 1

Treadwell&Rollo

Asbestos Monitoring Results at Parcel A, August 2006

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3 5/5 6,600; 15,000; 4,700; 7,500; 1,900	4 5/5 6,600; 24,400 (HV-2); 10,300; 16,000 (HV-5); 3,800	5
6	7 Grading No monitoring*	8 4/5 21,600 (HV-1); 18,800 (HV-2); 1,900; 4,700	9 Grading No monitoring*	10 3/5 18,800 (HV-1); 3,800; 2,800	11 Grading No monitoring*	12
13	14 Grading No monitoring*	15 5/5 7,500; 1,000; 2,000; 3,800; 900	16 2/4 1,900; 1,900	17 4/5 900; 900; 1,900; 2,800	18 3/4 7,600; 4,700; 9,500	19 3/5 9,500; 900; 900
20 0/5	21 4/4 5,700; 2,800; 3,800; 9,500	22 4/5 44,600 (HV-1); 20,900 (HV-2); 5,700; 15,200	23 5/5 27,500 (HV-1); 28,400 (HV-2); 8,500; 26,500 (HV-4); 11,400	24 4/5 15,200; 13,300; 3,800; 1,900	25 3/5 1,900; 5,700; 2,800	26 5/5 900; 900; 5,700; 900; 900
27 4/5 900; 2,800; 1,900; 900	28 2/4 1,900; 1,900	29 4/5 4,700; 3,800; 7,700; 4,700	30 5/5 8,500; 12,300; 9,500; 14,200; 5,700	31 5/5 5,700; 4,700; 9,500; 9,500; 8,500		

Asbestos Monitoring Results at Parcel A, September 2006

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 1/5 900	2
3	4	5 5/5 6,900; 9,600; 8,500; 6,600; 8,400	6 5/5 7,600; 12,300; 7,600; 9,500; 4,700	7 4/5 4,700; 7,500; 900; 8,400	8 4/5 900; 3,800; 3,800; 900	9
10	11 5/5 12,300; 6,700; 3,000; 7,600; 2,000	12 5/5 14,200; 10,300; 15,400; 7,500; 5,800	13 5/5 22,800 (HV-1); 11,700; 8,600; 18,000 (HV-4); 3,800	14 5/5 5,700; 1,900; 12,300; 6,600; 3,800	15 3/5 900; 1,900; 900	16 2/5 900; 2,800
17 2/5 900; 900	18 5/5 5,000; 10,400; 7,600; 8,500; 3,800	19 5/5 3,900; 2,800; 4,700; 4,400; 8,500	20 5/5 4,700; 7,600; 8,500; 11,400; 4,700	21 5/5 13,300; 6,600; 7,600; 14,200; 2,800	22 4/5 4,700; 3,800; 3,800; 4,700	23
24	25 5/5 1,900; 900; 2,800; 3,000; 4,800	26 5/5 3,800; 6,700; 1,000; 1,900; 1,000	27 5/5 3,700; 7,600; 5,700; 27,900 (HV-5); 4,700	28 4/5 2,900; 3,900; 1,000; 12,600	29 3/5 11,000; 1,900; 5,500	30 3/5 4,900; 3,900; 1,000

Grading: Asbestos measurements over 16,000 structures/m^3

Grading: Asbestos measurements over 1,600 structures/m^3 and below 16,000 structures/m^3

No grading (Weekend)

10/10 Fraction indicates number of asbestos detections / number of samples

Grading shut down due to exceedances

Action levels: 1,600 structures/m^3 indicate a measurement that triggers an immediate on-site evaluation to determine if dust mitigation measures are still effective; 16,000 structures/m^3 indicate a measurement that triggers an immediate shut-down of construction and/or grading operations.

Blank days indicate no information was provided.

*Under the developer's approved Dust Mitigation Plan, if results showed consistently low results, the monitoring frequencies could be reduced. On June 27, 2006, the developer reduced the monitoring frequencies to two days a week, based on no detection of asbestos since the monitoring had begun on April 25. As was discovered later, the non-detects were not credible.

Asbestos Monitoring Results at Parcel A, October 2006

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2 5/5 6,400; 5,500; 4,600; 7,300; 1,000	3 5/5 1,800; 3,700; 3,700; 5,500; 1,800	4 5/5 2,900; 1,900; 4,700; 2,800; 2,900	5 1/5 6,700	6 1/5 2,800	7 0/5
8	9 5/5 11,300; 6,500; 3,000; 4,900; 900	10 5/5 6,600; 4,700; 9,400; 5,400; 3,800	11 5/5 3,800; 1,800; 6,400; 3,900; 1,800	12 5/5 19,300 (HV-1); 1,000; 9,400; 10,000; 900	13 3/5 1,800; 5,500; 1,800	14 3/5 1,900; 2,000; 900
15	16 4/5 7,700; 2,800; 6,400; 900	17 5/5 6,600; 4,600; 35,800 (HV-4); 22,000 (HV-5); 38,100 (HV-6)	18 5/5 6,700; 5,500; 7,300; 12,800; 11,300	19 5/5 5,400; 4,600; 6,400; 5,800; 2,800	20 5/5 5,600; 13,100; 7,300; 2,900; 4,800	21 5/5 4,600; 11,000; 11,900; 5,600; 2,800
22	23 5/5 4,700; 3,700; 5,500; 1,800; 900	24 5/5 5,500; 5,000; 3,700; 1,900; 1,900	25 5/5 13,500; 2,900; 12,500; 3,900; 2,900	26 5/5 14,900; 7,300; 2,800; 6,400; 900	27 3/5 3,900; 2,800; 2,800	28 2/5 900; 2,800
29	30 4/5 4,900; 3,700; 3,800; 3,700	31 4/5 1,000; 3,100; 4,100; 13,800				

Asbestos Monitoring Results at Parcel A, November 2006

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 4/5 4,700; 11,400; 2,100; 500	2 0/5	3 1/5 900	4 1/5 1,900
5	6 3/5 900; 1,800; 4,900	7 2/5 900; 3,800	8 3/5 7,400; 3,700; 2,800	9 3/5 7,400; 4,600; 10,000	10 3/5 1,800; 2,800; 5,900	11
12	13 2/4 1,000; 1,000	14	15 3/4 6,600; 1,900; 1,000	16 3/5 2,000; 1,000; 1,000	17 1/5 1,900	18 1/5 5,500
19	20 0/5	21 3/5 11,100; 1,000; 900	22 3/5 7,700; 4,000; 1,000	23	24	25
26	27 0/5	28 1/5 900	29 0/5	30 4/5 55,700 (HV-1); 23,500 (HV-2); 2,800; 2,800		

No grading (Weekend)

Grading: Asbestos measurements over 1,600 structures/m^3 and below 16,000 structures/m^3

Grading: No measurements over 1,600 structures/m^3

Grading: Asbestos measurements over 16,000 structures/m^3

Grading shut down due to exceedances

10/10 Fraction indicates number of asbestos detections / number of samples

Action levels: 1,600 structures/m^3 indicate a measurement that triggers an immediate on-site evaluation to determine if dust mitigation measures are still effective; 16,000 structures/m^3 indicate a measurement that triggers an immediate shut-down of construction and/or grading operations.
Blank days indicate no information was provided.

Asbestos Monitoring Results at Parcel A, December 2006

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 3/6 900; 5,900; 4,900	2 3/6 1,000; 1,000; **3,100**
3	4 2/6 1,800; 6,900	5 3/9 3,900; 2,800; **8,500**	6 6/9 2,800; 11,900; 1,800; 4,100; **1,800; 3,000**	7 3/9 2,800; **1,000; 3,000**	8	9
10	11 3/9 7,700; **10,400; 1,000**	12	13	14	15	16
17	18 3/9 **5,800; 1,000; 20,100 (HV-10)**	19 5/9 10,700; **1,000; 3,000; 4,600; 7,000**	20 8/9 900; 3,900; 1,900; 3,600; **1,000; 3,900; 1,000; 17,400 (HV-10)**	21 4/9 **1,000; 1,000; 1,000; 900**	22 3/9 2,000; **1,000; 2,900**	23
24	25	26 2/3 **2,900; 8,900**	27	28	29	30

Asbestos Monitoring Results at Parcel A, January 2007

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2 5/8 1,900; 2,900; **1,000; 3,800; 2,900**	3 3/5 1,000; 3,900; 4,000	4	5 3/8 5,600; **500; 1,400**	6 0/5
7	8 6/8 900; 4,600; 13,900; 900; **1,900; 4,900**	9 7/8 1,900; 1,900; 1,000; 1,000; **4,900; 1,900; 2,900**	10 6/9 4,600; 2,800; 8,500; **2,000; 21,400 (HV-8); 2,800**	11 8/9 2,000; 2,000; 8,800; 900; **1,000; 1,900; 14,500; 3,900**	12 8/9 1,000; 900; 14,100; 2,800; 900; **1,000; 1,900; 1,900**	13 1/8 **1,000**
14 2/4 **1,900; 1,000**	15 7/9 3,900; 1,000; 4,900; **3,900; 3,900; 19,400 (HV-10); 9,700**	16 7/9 1,900; 2,900; 7,900; **3,900; 1,900; 7,800; 25,600 (HV-11)**	17 5/9 2,000; 2,900; **5,900; 14,200; 4,000**	18 5/9 2,000; **1,000; 900; 13,400; 3,800**	19 4/10 **1,900; 1,000; 6,800; 3,900**	20 1/9 **4,400**
21	22 6/10 4,900; 12,100; 1,000; **2,000; 34,900 (HV-10); 32,000 (HV-11)**	23 5/9 1,900; 4,800; 9,500; **11,000; 8,900**	24 8/9 4,700; 6,900; 2,000; 900; **7,600; 61,200; 40,700; 18,400**	25 5/9 1,000; 3,000; **2,900; 14,200; 2,900**	26 5/9 8,700; **5,900; 6,900; 13,300; 1,000**	27
28	29 6/9 900; 8,600; 900; 1,000; **17,500 (HV-10); 4,000**	30 4/10 3,800; **1,000; 33,200 (HV-10); 3,900**	31 5/9 2,900; 7,900; **13,800; 39,900 (HV-10); 13,100**			

Grading: Asbestos measurements over 1,600 structures/m^3 and below 16,000 structures/m^3

No grading (Weekend)

Grading shut down due to exceedances

Grading: Asbestos measurements over 16,000 structures/m^3

Grading: No measurements over 1,600 structures/m^3

Grading: Asbestos measurements over 16,000 structures/m^3 attributed to a source other than Parcel A grading operations; asbestos above 1,600 structures/m^3 at stations related to Parcel A; work shutdown was not required.

10/10 Fraction indicates number of asbestos detections / number of samples

Action levels: 1,600 structures/m^3 indicate a measurement that triggers an immediate on-site evaluation to determine if dust mitigation measures are still effective; 16,000 structures/m^3 indicate a measurement that triggers an immediate shut-down of construction and/or grading operations.
Blank days indicate no information was provided. Bold values indicate asbestos measurements taken from monitors not located on Parcel A.

Asbestos Monitoring Results at Parcel A, February 2007

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 7/9 2,000; 900; 6,500; **1,000; 14,800; 34,400 (HV-10); 14,400**	2 2/9 4,700; **2,900**	3 2/3 **1,000; 1,900**
4	5 3/9 900; **3,700; 5,600**	6 6/9 11,500; 3,800; **1,000; 10,500; 36,500 (HV-10); 1,000**	7 5/5 **17,800 (HV-7); 4,800; 1,900; 8,800; 28,000 (HV-11)**	8	9 0/4	10 2/5 2,000; 1,900
11	12 4/9 3,000; **1,000; 6,600; 1,000**	13 4/9 2,000; **3,000; 12,900; 3,800**	14	15	16	17
18	19	20 5/9 900; 900; **1,900; 6,600; 2,900**	21	22	23	24
25	26	27	28			

Asbestos Monitoring Results at Parcel A, March 2007

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7 2/6 1,000; **7,800**	8 5/8 1,000; **7,800; 4,800; 8,700; 1,000**	9 4/9 5,600; **1,000; 1,900; 1,000**	10
11	12 6/9 1,000; 900; 1,000; **5,800; 15,000; 13,800**	13 6/9 2,800; 1,900; 1,900; **2,800; 12,900; 1,900**	14 6/9 5,900; 900; 1,000; **1,000; 11,600; 2,900**	15 3/5 6,700; 3,000; 10,500	16 7/10 5,000; 5,700; **1,000; 1,900; 2,900; 2,900; 7,800**	17
18	19 4/9 1,900; 11,600; **4,000; 2,000**	20 0/4	21 0/5	22 5/9 900; 7,700; 900; **1,000; 7,700**	23 3/10 **1,000; 2,000; 1,000**	24
25	26 2/5 6,800; 1,800	27 2/5 1,000; 2,000	28 2/10 1,900; **2,000**	29 2/5 12,400; 10,900	30 2/9 1,000; 2,000	31 0/9

Grading: Asbestos measurements over 16,000 structures/m^3 attributed to a source other than Parcel A grading operations; asbestos above 1,600 structures/m^3 at stations related to Parcel A; work shutdown was not required.

Grading: Asbestos measurements over 1,600 structures/m^3 and below 16,000 structures/m^3

No grading (Weekend)

No grading. SWPPP (Sediment Control Plan of the Storm Water Pollution Prevention Plan) work only. Stabilization of the construction entrance; installation of gravel pads to prevent track-out.

Grading shut down due to exceedances

No grading. Drilling on Hilltop only.

Grading: No measurements over 1,600 structures/m^3

10/10 Fraction indicates number of asbestos detections / number of samples

Action levels: 1,600 structures/m^3 indicate a measurement that triggers an immediate on-site evaluation to determine if dust mitigation measures are still effective; 16,000 structures/m^3 indicate a measurement that triggers an immediate shut-down of construction and/or grading operations.
Blank days indicate no information was provided. Bold values indicate asbestos measurements taken from monitors not located on Parcel A.

Asbestos Monitoring Results at Parcel A, April 2007

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2 4/9 4,700; 900; **2,000; 2,900**	3 3/9 7,600; 12,200; **1,000**	4 4/9 7,500; 900; **4,900; 2,900**	5 2/5 3,800; 900	6 2/9 900; 900	7 3/10 900; **1,000; 900**
8	9 7/9 7,800; 1,000; 900; 2,800; **4,000; 9,000; 3,700**	10 5/10 12,500; 5,700; **3,800; 5,800; 5,700**	11 3/9 **1,000; 5,800; 2,000**	12 7/9 5,800; 1,000; 1,900; 21,100 (HV-5); **1,000; 19,700 (HV-10); 2,900**	13 2/9 5,800; 11,400	14 0/5
15	16 6/9 1,000; 900; 1,000; **4,300; 7,700; 3,900**	17 4/9 6,500; **1,000; 1,900; 2,000**	18 4/10 900; 900; **1,900; 5,900**	19 6/10 2,600; 6,400; 1,800; **5,900; 5,900; 8,700**	20 4/9 2,000; 1,000; **1,900; 1,000**	21 5/9 1,000; 1,800; 1,000; **1,000; 3,000**
22	23 3/9 **1,900; 17,500 (HV-10); 5,700**	24 4/9 1,000; **900; 8,700; 1,000**	25 4/9 1,000; **2,000; 11,800; 15,000**	26 6/9 5,800; 1,000; **2,900; 1,900; 5,800; 6,800**	27 6/10 2,000; 2,800; 1,000; 1,000; **2,000; 3,800**	28 5/9 900; 2,800; **4,900; 12,800; 1,900**
29	30 4/9 900; **3,000; 39,400 (HV-10); 5,900**					

Asbestos Monitoring Results at Parcel A, May 2007

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 7/10 1,000; 900; 2,700; 5,600; **7,900; 10,700; 2,900**	2 3/9 **1,000; 2,900; 1,000**	3 5/9 1,000; 3,000; **4,800; 8,600; 5,800**	4 2/9 19,500 (HV-6); **900**	5 3/9 **3,800; 14,600; 2,000**
6	7 8/10 4,600; 5,800; 1,000; **6,600; 900; 15,100; 14,200; 8,900**	8 7/9 11,700; 5,700; 12,000; 1,800; **4,800; 1,900; 6,700**	9 4/9 5,700; 5,700; **5,600; 13,000**	10 3/9 **2,900; 7,700; 9,900**	11 3/9 1,900; **1,000; 1,000**	12
13	14 3/9 **900; 900; 2,900**	15 2/9 **1,900; 5,800**	16 4/9 **1,000; 1,900; 3,800; 4,800**	17 6/9 1,000; 12,500; 12,200; **1,900; 4,900; 6,700**	18 4/10 2,900; **1,000; 1,900; 1,800**	19
20	21 4/9 2,800; **1,000; 1,900;1,900**	22 8/9 900; 900; 1,000; 2,800; **1,000; 900; 1,900; 8,000**	23 4/9 900; **900; 6,800; 10,400**	24 2/10 **1,900; 17,000 (HV-12)**	25 4/9 **1,000; 1,900; 1,900; 10,900**	26
27	28	29 5/10 **1,000; 900; 3,900; 6,900; 5,300**	30 5/9 1,000; **3,900; 1,000; 11,800; 7,800**	31 4/9 **1,900; 7,700; 2,900; 13,600**		

No grading (Weekend)

Grading: Asbestos measurements over 1,600 structures/m^3 and below 16,000 structures/m^3

Grading: Asbestos measurements over 16,000 structures/m^3

Grading shut down due to exceedances

No grading. Drilling on Hilltop only.

Grading: Asbestos measurements over 16,000 structures/m^3 attributed to a source other than Parcel A grading operations; asbestos above 1,600 structures/m^3 at stations related to Parcel A; work shutdown was not required.

10/10 Fraction indicates number of asbestos detections / number of samples

Action levels: 1,600 structures/m^3 indicate a measurement that triggers an immediate on-site evaluation to determine if dust mitigation measures are still effective; 16,000 structures/m^3 indicate a measurement that triggers an immediate shut-down of construction and/or grading operations.
Blank days indicate no information was provided. Bold values indicate asbestos measurements taken from monitors not located on Parcel A.

Asbestos Monitoring Results at Parcel A, June 2007

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 7/9 900; 1,900; 900; 18,400 (HV-5); 900; **1,000; 2,000**	2
3	4 4/9 1,000; **2,000; 2,800; 10,600**	5 2/9 3,700; **2,500**	6 7/10 4,000; 900; 2,900; 5,900; **1,000; 1,000; 12,300**	7 6/9 1,000; 12,300; **1,000; 1,000; 4,800; 7,800**	8 4/9 900; 3,000; 1,900; **2,000**	9
10	11 3/10 **1,900; 2,800; 11,900**	12 7/9 1,000; 8,500; 1,900; **1,000; 2,000; 5,000; 7,500**	13 5/9 1,900; 900; **1,000; 12,200; 14,900**	14 4/9 2,800; 2,800; 2,800; **8,700**	15 4/9 1,000; 2,800; **3,000; 11,800**	16
17	18 2/8 **1,000; 3,000**	19 6/9 1,000; 900; 800; **8,700; 1,000; 7,500**	20 2/8 **1,000; 11,900**	21 3/8 **1,900; 9,500; 5,900**	22 3/10 **1,000; 6,700; 4,900**	23
24	25 4/9 1,900; **1,000; 5,700; 9,900**	26 4/9 900; 4,900; **2,000; 4,000**	27 4/10 12,500; 1,100; **9,700; 18,100 (HV-12)**	28 4/9 47,200 (HV-1); 1,000; **29,300 (HV-11); 45,600 (HV-12)**	29 4/9 16,900; 1,000; **2,900; 1,000**	30 1/9 **1,000**

Asbestos Monitoring Results at Parcel A, July 2007

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 0/5	2 6/9 51,500; 900; 2,700; 900; **14,400; 26,600 (HV-12)**	3 1/10 4,800	4 2/9 **7,600; 5,000**	5 4/9 6,600; 4,500; **7,600; 10,800**	6 4/9 5,600; 1,000; **9,500; 12,700**	7 0/5
8	9 4/9 12,800; 4,900; **11,300; 10,800**	10 3/9 **1,000; 2,900; 3,900**	11 5/9 24,500 (HV-1); 12,900; 21,700 (HV-4); **3,900; 34,100 (HV-12)**	12 5/10 28,900 (HV-1); 8,300; 11,100; **27,100 (HV-11); 33,300 (HV-12)**	13 5/9 3,900; 1,900; 5,700; **3,800; 16,300 (HV-12)**	14 2/4 **1,000; 2,000**
15	16 4/9 6,500; **1,000; 7,000; 10,400**	17 3/9 6,800; **1,000; 2,000**	18 4/9 2,800; **3,900; 2,000; 25,500 (HV-12)**	19 6/9 8,300; 1,800; 900; **900; 27,500 (HV-11); 24,100 (HV-12)**	20 5/10 3,700; 6,500; **11,900; 12,800; 30,000 (HV-12)**	21
22	23 3/9 13,300; **3,900; 28,900 (HV-12)**	24 5/10 7,600; 1,900; **9,900; 24,200 (HV-11); 33,900 (HV-12)**	25 4/9 3,700; 2,900; **8,800; 11,400**	26 2/9 **6,700; 6,900**	27 4/9 2,900; **1,000; 23,300 (HV-11); 5,700**	28
29	30 4/9 2,000; **1,900; 4,800; 10,700**	31 3/9 3,700; **4,800; 9,900**				

Grading: Asbestos measurements over 16,000 structures/m^3

Grading: Asbestos measurements over 1,600 structures/m^3 and below 16,000 structures/m^3

No grading (Weekend)

Grading: Asbestos measurements over 16,000 structures/m^3 attributed to a source other than Parcel A grading operations; asbestos above 1,600 structures/m^3 at stations related to Parcel A; work shutdown was not required.

Grading shut down due to exceedances

10/10 Fraction indicates number of asbestos detections / number of samples

Action levels: 1,600 structures/m^3 indicate a measurement that triggers an immediate on-site evaluation to determine if dust mitigation measures are still effective; 16,000 structures/m^3 indicate a measurement that triggers an immediate shut-down of construction and/or grading operations.
Blank days indicate no information was provided. Bold values indicate asbestos measurements taken from monitors not located on Parcel A.

Asbestos Monitoring Results at Parcel A, August 2007

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 4/10 1,000; **1,000; 5,900; 10,500**	2 3/9 1,900; **3,900; 14,800**	3 6/9 3,800; 3,900; 5,900; 2,000; **1,000; 3,000**	4
5	6 3/10 12,700; **7,500; 14,300**	7 5/9 8,100; 6,200; 900; **3,000; 10,900**	8 4/9 **1,000; 4,000; 2,000; 27,400 (HV-12)**	9 4/9 1,900; **1,000; 8,500; 55,000 (HV-12)**	10 7/9 1,900; 3,900; 900; **2,900; 1,000; 4,900; 4,800**	11 2/9 **2,000; 3,800**
12	13 5/9 1,800; 900; **1,900; 2,900; 12,900**	14 7/9 6,600; 1,900; 17,800 (HV-5); **1,900; 2,000; 3,000; 8,900**	15 8/9 1,000; 2,900; 11,700; 1,800; **1,000; 1,900; 9,600; 11,500**	16 7/10 1,000; 8,900; 3,000; **4,800; 1,000; 33,200 (HV-11); 53,200 (HV-12)**	17 7/10 1,900; 1,000; 2,900; 5,700; 900; **46,000 (HV-8); 3,800**	18 6/10 900; 2,900; **10,900; 1,000; 9,000; 3,000**
19 1/5 2,800	20	21	22	23	24	25
26	27	28	29	30	31	

Grading: Asbestos measurements over 1,600 structures/m^3 and below 16,000 structures/m^3

No grading (Weekend)

Grading: Asbestos measurements over 16,000 structures/m^3 attributed to a source other than Parcel A grading operations; asbestos above 1,600 structures/m^3 at stations related to Parcel A; work shutdown was not required.

Grading: Asbestos measurements over 16,000 structures/m^3

Grading shut down due to exceedances

10/10 Fraction indicates number of asbestos detections / number of samples

Action levels: 1,600 structures/m^3 indicate a measurement that triggers an immediate on-site evaluation to determine if dust mitigation measures are still effective; 16,000 structures/m^3 indicate a measurement that triggers an immediate shut-down of construction and/or grading operations.
Blank days indicate no information was provided. Bold values indicate asbestos measurements taken from monitors not located on Parcel A.

San Francisco City and County
Department of Public Health
Environmental Health Section

Gavin Newsom, *Mayor*
Mitchell H. Katz, *,Director of Health*

Rajiv Bhatia, *M.D.;M.P.H.*
Director of Environmental Health

October 9, 2007

Dr. Rick Kreutzer
Chief Environmental Health Investigations Branch
Division of Environmental and Occupational Disease Control
California Department of Public Health
850 Marina Bay Parkway, Building P, Third Floor
Richmond, CA 94804

Dear Dr. Kreutzer:

On September 20, 2007, the San Francisco Department of Public Health received your assessment of hazards associated with development at Hunters Point Shipyard Parcel A in a letter from California Department of Public Health (CDPH) to the Agency for Toxic Substances Disease Registry (ATSDR). At the same time, we also received ATSDR's concurring letter.

The Department of Public Health deeply appreciates your agency's detailed review of the available air monitoring data as well as the many supportive recommendations for optimizing control of airborne dust and asbestos. We share your frank assessment of the limitations of human exposure and risk assessment in this situation, yet we are also heartened by your judgment that the risks of serious asbestos-related health impacts for community residents from development at Parcel A are likely to be low on a personal level even if those exposures were to have occurred over seven years. We also concur with your conclusions that radiological testing of residents for asbestos exposures is not recommended and blood tests for asbestos exposures do not exist.

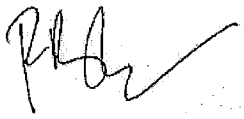
Most important, we agree that the primary goal for environmental health is preventing exposure to hazards. We believe that the pro-active regulatory controls established by the Bay Area Air Quality Management District (BAAQMD) and the San Francisco Department of Public Health (SFDPH) both for naturally occurring asbestos and nuisance dust were developed to achieve precautionary and environmental justice ends. When adopted, these regulations clearly recognized asbestos from natural sources as a potential health hazard. We take very seriously our responsibility to critically review and optimize our pro-active regulatory scheme on an ongoing basis. The recommendations you have provided to us in this regard will be invaluable.

As you know, major earthmoving activities at Parcel A have ceased, and the soil on a large section of the parcel is now stabilized. Still, SFDPH has begun to move forward with a number of the CDPH recommendations anticipating ongoing development activities at the Shipyard.

At this point, we would like to share an early status report on all the CDPH recommendations (See attached table). You will note that we have already implemented some of the recommendations CDPH made in whole or part. In the near future, we would hope to take advantage of your expertise on specific technical questions.

Again, please accept my personal thanks for all of the efforts you and your staff have made on behalf of the health of San Francisco residents. Do not hesitate to contact me at 415-252-3931 if you would like to discuss the status of our efforts or if you have additional recommendations to provide.

Sincerely,



Rajiv Bhatia, MD, MPH
Medical Director, Occupational and Environmental Health

Cc: Tom Sinks, ATSDR
Susan Muza, ATSDR
Amy Brownell, SFDPH
Mitch Katz, SFDPH
John Balmes, UCSF

Attachment

Status of California Department of Public Health Recommendations for Asbestos and Nuisance Dust Control at Parcel A at Hunters Point Shipyard

CDPH recommendation (September 20th, 2007):	Status (October 9, 2007)
SFDPH should assign a person to continuously monitor dust production and dust abatement activities during working hours. This is an important way to prevent both dust and asbestos exposures. Essential to this recommendation is that the assigned person not only observes but has the authority to alter activity on the site based on his/her observations.	**We agree with benefit of direct agency observation of regulatory compliance.** SFDPH routinely conducts regular unannounced random site inspections to verify compliance with the Dust Control Plan, and inspectors have had the power to alter activity and stop work at the site if they observe violations of the Dust Control Plan. A recent violation of the plan resulted in a two day suspension of work activities. SFPDPH has not observed dust plan violations in the vast majority of observations in the current year and no current year dust complaints from the public have been verified on inspection. Nevertheless, because continuous SFDPH presence might provide some benefit over random inspections, SFDPH will explore the mechanisms available to us for employing a full-time dust inspector while Lennar is conducting dust generating activities.
The assigned person should promptly report to the public on what is observed and what is done as a result of the above-mentioned monitoring activities.	**We agree with the need for more timely public communication.** SFDPH has created a website for Hunters Point development that includes: frequently asked questions; resources and referral information; the dust control plan; and Notices of Violation. Future plans are to update the status of development activities on a weekly or monthly basis. The SFDPH Hunter's Point website is accessible at: http://www.dph.sf.ca.us/eh/hunterspoint/Index.htm

Explore additional dust control procedures such as misting at the fence line, tarping the fence, adding an on-site meteorological station, stopping activity that generates dust if winds are 15 miles per hour or more, or tarping grounds where no activity is occurring for seven days or more. It is recommended that the developer engage someone with expertise in dust control to specifically define additional mechanisms to achieve better mitigation and dust suppression.	**We agree that all of the listed dust control methods merit consideration and evaluation.** Lennar has maintained an on-site meteorological station since the inception of the project. (See: http://clients2.engeo.com/weather/hunterspoint/) In addition, Lennar as already installed misting systems and tarping of the fence line for many areas of the site - including many, if not all, the areas adjacent to residents. We will verify these efforts and whether additional areas would merit misting or tarping. We will explore the other listed dust control procedures. Finally, SFDPH recently obtained a complete copy of historical data (temperature, humidity, wind direction, wind speed and other parameters) from the weather station and we are conducting an analysis to determine if there are any correlations between meteorological data and asbestos results at the site.
Air monitoring equipment on-site and in the community should be used to evaluate the effectiveness of added measures. If ongoing exceedances occur, then more measures should be adopted.	**We agree with this recommendation.** We have used in the past and will continue to use the air monitoring equipment to evaluate dust control measures. We have also, in the past, revised our dust control plans and requirements for the developer based on regulatory history. We expect to continue to use this adaptive approach in the future.
To assist the SFDPH assigned inspector in evaluating the current Dust Control Plan, the contractor should conduct real-time dust monitoring using appropriate equipment for respirable dust (PM-10) at several locations, co-located with asbestos sampling (SFDPH and BAAQMD). SFDPH should use information from monitors during the day to identify activities which are generating PM 10 and alter activity to reduce its generation. As explained	**We agree with the recommendation about co-locating dust and asbestos monitoring equipment.** According to our records, several of the particulate dust monitors are already co-located with several of the asbestos sampling stations. We will evaluate co-locating some of the other sampling stations. Our consultants reviewed your concerns about use of the particulate monitoring equipment and concluded the current equipment was appropriate for perimeter monitoring. We

below, there are validity problems with the currently used monitoring equipment.	are considering installation of alternative monitoring equipment on an experimental basis in order to do a side by side comparison with the current monitors. We will also investigate further with the BAAQMD and other experts to see if there is agreement on the optimal choice of equipment.
Include the community monitors, especially HV-7, HV-8 and HV-9, in the official asbestos monitoring plan, as regulated by the BAAQMD. These monitors, along with the on-site monitors, create better coverage of the perimeter of such a large parcel (BAAQMD).	**We agree with this recommendation.** In January 2007, SFPDH made the same request to BAAQMD. We will follow-up with them to review this issue again.
Explore ways to reduce the time lag between measuring elevated levels of naturally occurring asbestos and altering parcel activities by returning to 12-hour sampling (when samples often resulted in results the next day). Or, collect from 7 p.m. to 7 p.m., which would similarly mean a result may be available the next day. (BAAQMD for the on-site monitors; SFDPH for the community monitors). As a matter of principle, public agencies should try to be as timely in their feedback as possible. These sampling strategies will advance this goal.	**We agree with this recommendation.** SFDPH will be meeting with BAAQMD to review the pros and cons of 12 hour vs. 24 hour sampling and the possibility of changing the pickup time of the samples so that results can be received in time to influence the next day's activities. Please note that the samples are currently collected at 7 am and results are reported by the lab no later than 5 pm that day.

Technical Summary of EPA's Analysis of Hunters Point Air Monitoring Filters for Asbestos
December 22, 2009

EPA conducted a re-analysis of the asbestos filters from perimeter samplers at Hunter's Point Parcel A during redevelopment to ascertain if, at this site under these conditions, similar conclusions would be reached using EPA's measure of asbestos hazard as compared to the measure described in the California Airborne Toxic Control Measure (ATCM), implemented as part of the Asbestos Dust Mitigation Plan. Overall, the ATCM criteria resulted in more work stoppages and dust mitigation measures then would have been triggered if using only the EPA asbestos measure.

Background

The former Hunter's Point Naval Shipyard Parcel A is located in the Bayview Hunters Point neighborhood of San Francisco and is approximately 75 acres in size. Parcel A is being redeveloped by the City of San Francisco and its developer, and the construction involves excavating and grading large amounts of soil and bedrock. The rock and soil in the Bayview neighborhood is partially comprised of the mineral serpentine, which contains naturally occurring asbestos (NOA). Construction projects larger than one-acre in size in areas with naturally occurring asbestos are required to file an Asbestos Dust Mitigation Plan (ADMP) with the Bay Area Air Quality Management District ("Air District") following the ATCM.

As part of the ADMP, the Air District required the developer to install five stationary air monitors on and around the site. The locations of the Air District monitors (HV-1, 2, 4, 5 and 6) were determined by geophysical modeling based on the terrain and meteorological information to present the best possibility to evaluate dust levels at the fence line. Samples are generally collected for each 24 hour period Monday through Friday. The Air District established a trigger level of 0.016 total structures per cubic centimeter of air (reported as 1.6E-2 s/cc). Under the ADMP, a reading at any monitor above the trigger level requires that the developer stop work for the day and subsequent days until all monitors are below the trigger level. The purpose of the work stoppages is to decrease asbestos releases by re-evaluating procedures and methods to reduce dust levels before work resumes. It is important to note that the trigger level established by the Air District for this project is not a legal standard and that results above the trigger level do not constitute a violation. The monitors and the trigger level are part of the specific ADMP for the development project and are intended to help minimize generation of asbestos from construction activities, not as a method to assess health risks in the community.

Due to feedback from the community about placement of the Air District monitors, the City required the developer to install an additional five monitors at points of community concern. Three of the City monitors (HV-7, 9, and 11) are generally sampled daily, analyzed following the same protocols as the Air District monitors, and similar to the Air District monitors, the City required that work stop on days that results are above the trigger level. HV-8 is located upwind of the project and is thus sampled one day per week at random rather than daily, though its results are also compared to the trigger level and used in the stop work process. HV-12 is located the furthest downwind of the project and is sampled daily. It was originally included in

the stop-work process but because the results at HV-12 did not correlate with grading and excavating activities, the City now collects the data for informational purposes, but results do not trigger work stoppages. The Air District formally added the City monitors HV-7, 8, 9, and 11 to the Asbestos Dust Mitigation Plan in the latest update, finalized in August of 2009.

General Analysis and Risk Calculation Methods for Asbestos

Asbestos hazard assessments are based on epidemiological studies conducted several decades ago on occupational exposures to asbestos. The best method available at that time for measuring asbestos was phase contrast microscopy (PCM) which uses a magnification of 400X. The epidemiological studies correlated risk with asbestos fibers measured with the PCM method, which was able to measure fibers longer than 5 micrometers (μm) and with an aspect ratio greater than 3. Such fibers are called the PCM equivalents.

The current method used to count asbestos fibers is transmission electron microscopy (TEM) which has a magnification of 20,000X. TEM can resolve fibers as small as 0.5 μm in length, as well as definitively determine the asbestos type and provide a more accurate fiber size distribution. However, the specific causative asbestos fiber type and fiber size associated with disease is not known, therefore the PCM equivalents were used as a surrogate of exposure. This leads to a problem with utilizing the newer data in risk assessments since TEM can resolve both the short and long fibers, but the epidemiological data are based on the longer fibers.

One approach to work around this problem is to convert the total fiber counts from the current TEM measurements back to the original epidemiologic measures. This is the approach that the California Air Resources Board (CARB) requires in their asbestos ATCM. CARB utilizes a modified version of the procedures outlined in the Asbestos Hazard Emergency Response Act (AHERA) published in 1987 in response to asbestos material in schools. The CARB procedure counts all the fibers greater than 0.5 μm in length, then converts the total count to PCM equivalents by applying a conversion factor of 320 total fibers/1 PCM equivalents. This is based on observations that with chrysotile asbestos, a common commercial mineral form, the fiber distribution is heavily weighted to fibers shorter than 5 μm in length. However, site specific conversion factors may vary in situations with naturally occurring asbestos.

EPA prefers to use the International Organization for Standardization (ISO) 10312 method published in 1995. This method also uses TEM but provides a count of both the total number of fibers as well as a count of the strict PCM equivalents. The PCM equivalents count can then be used directly in the risk calculations. Another significant difference between the CARB and the EPA procedures is in how individual fibers are categorized and tabulated. The EPA preferred method allows the analyst to identify and tabulate any distinguishable fiber that meets the dimensional requirements regardless of the complexity, while the CARB procedure counts any complex of fibers as a single entry as long as one fiber is visible that meets the size definition. Both the CARB method and the ISO 10312 method preferred by EPA use similar sample collection methods, preparation, instrumentation and resolution. However, the fiber dimensions of concern are different and the procedures for how individual fibers or complexes are tallied can result in differences in the totals based on the complexity of the asbestos structures and size distribution. Therefore, the results from the two methods cannot be directly correlated.

Analysis of Data from Parcel A

EPA oversaw the re-analysis of 34 filters – including at least one from each of the ten monitors. The filters used in the re-analysis include a range of detected fibers, with a bias towards those with the highest counts (e.g., December 29, 2008). Our re-analysis employed both the CARB and EPA procedures and fiber counting rules and definitions.

More than half of the filters originally analyzed by the CARB method over the life of this project were non-detect -- that is, no asbestos fibers were measured in 4,153 out of 7,278 filters. In the original CARB analysis, approximately two percent of the filters had results above the trigger level. Ninety-four percent of the filters that we chose for re-analysis had detectable levels of asbestos under the CARB method and 41 percent of the filters had results from the original CARB analysis above the trigger level. The time frame from which the filters were selected was between December 2008 and August 2009. The results of the re-analysis using the EPA method detected no asbestos fibers in 25 out of the 34 filters, even though these filters were selected to represent some of the worst case situations from the original analyses.

The listing of each filter location and date, along with the original CARB result and the PCM equivalents re-analysis result, is shown in the table below. The results in bold denote filters whose original CARB results were above the trigger level of 1.6E-2 structures/cc.

Monitor	Date	Original CARB Total s/cc	PCM Equivalents (re-analysis) s/cc
HV-2	4/2/2009	8.00E-04	0
HV-1	5/7/2009	<8.00E-04	0
HV-8	3/2/2009	9.00E-04	0
HV-5	5/15/2009	9.00E-04	0
HV-9	4/9/2009	1.00E-03	9.90E-04
HV-4	2/27/2009	<1.10E-03	0
HV-11	5/5/2009	2.00E-03	0
HV-7	3/10/2009	2.80E-03	0
HV-1	4/21/2009	2.90E-03	0
HV-4	3/20/2009	2.90E-03	0
HV-2	5/1/2009	2.90E-03	0
HV-9	6/5/2009	3.90E-03	0
HV-1	5/1/2009	4.80E-03	0
HV-11	4/13/2009	5.90E-03	0
HV-12	5/15/2009	7.70E-03	0
HV-12	4/20/2009	9.70E-03	0
HV-11	4/29/2009	1.28E-02	9.80E-04
HV-4	6/5/2009	1.38E-02	0
HV-4	7/17/2009	1.41E-02	0
HV-4	5/6/2009	1.44E-02	0
HV-4	**5/29/2009**	**1.71E-02**	**9.20E-04**
HV-12	**3/10/2009**	**2.00E-02**	**3.80E-03**
HV-4	**5/18/2009**	**2.04E-02**	**9.70E-04**

HV-11	4/14/2009	2.32E-02	0
HV-12	4/14/2009	2.32E-02	9.90E-04
HV-4	5/5/2009	3.11E-02	0
HV-12	3/12/2009	3.23E-02	0
HV-09	4/21/2009	3.34E-02	2.90E-03
HV-4	5/14/2009	4.15E-02	0
HV-09	5/21/2009	4.35E-02	0
HV-4	5/15/2009	4.53E-02	9.20E-04
HV-11	4/21/2009	5.22E-02	1.90E-03
HV-12	12/29/2008	9.53E-02	0
HV-11	12/29/2008	1.92E-01	0

Seventy-four percent of the filters re-analyzed by the EPA method did not have any detectable PCM equivalents fibers, even though the CARB method results for these filters were frequently above the trigger level. The re-analysis also confirmed that the crystalline form of asbestos found at this site is primarily chrysotile asbestos and the fiber distribution heavily favors shorter fibers or fibers less than 5 μm in length. Using the PCM equivalents counts from our re-analysis, EPA would determine a level of concern for continuous exposure over the approximately five year project life at 2.2E-3 PCM equivalents structures. Most of the PCM equivalents data in the above table were either non-detect or were below this level indicating that the risk is at acceptable levels. Interestingly, all of the samples that had elevated PCM equivalents counts were samples that had CARB results above the Air District trigger level, while none of the filters with CARB results below the trigger level had elevated PCM equivalents counts. This indicates that a high CARB result may or may not correlate with the presence of PCM equivalents fibers, but a low CARB result does correlate with low PCM equivalents results.

In considering potential health effects from asbestos exposures, disease was correlated with cumulative, average lifetime exposure. Since the perimeter sampling is designed to assess the level of airborne asbestos at the fence line and not a continuous individual exposure, it is not appropriate to calculate an average exposure number by combining all the sampling stations; and, with such a large number of non-detects, the average exposure at any single station would be low. We can conclude, however, that if the trigger level were based on the PCM equivalents fiber counts, the result would be far fewer shut-down days than required using the CARB method. This does not mean that one method is better or worse than the other, but the CARB method does result in a more conservative approach for the conditions found at Parcel A.

Therefore, the Dust Mitigation Plan and the Air District monitoring procedures are operating in an effective manner in minimizing dust generation and limiting asbestos exposure. Based on our review of both the CARB data and EPA results, EPA believes that the Air District oversight of the project is appropriate and sees no reason to suspend or stop the construction project.

THE MAYOR'S HUNTERS POINT SHIPYARD
CITIZEN'S ADVISORY COMMITTEE

BVHP Shipyard Site Office
P. O. Box 882403
San Francisco, CA 94188

Phone: 415.822.4622
Fax: 415.822.4840
Email: SanFranciscoCAC@aol.com

October 17, 2007

President Mark Sanchez
San Francisco Board of Education
555 Franklin Street Room #106
San Francisco, CA 94102

Dear President Sanchez:

I write at the direction of the Mayor's Hunters Point Shipyard Citizens Advisory Committee (CAC) to express our collective disappointment with your recent resolution regarding the purported public health hazards of shipyard redevelopment. While the Board has a responsibility to protect the health of its students and staff, we do not see how your action will do so. We believe the Board's action was taken absent the minimal homework that could and should have informed its deliberation and decision taking.

In calling for an "independent study" of the dust issue, the School Board ignored the activity of six regulatory agencies: US EPA; the Agency for Toxics Disease Registry (an arm of the U.S. Centers for Disease Control); California Dept. of Toxic Substances Control; California Dept. of Health Services; the Bay Area Air Quality Management District; and the San Francisco Department of Health. US EPA and California DTSC approved the transfer of Parcel A for residential development. The other agencies (staffed by at least four public health physicians), participated in developing the dust control and monitoring regimens, and have recently reviewed those regimens, the monitoring data and the health risks associated with the known exposures, and other possible exposures reasonably inferred where data is not 100% reliable.

Additionally, two private physicians, Dr. John Balmes and Dr. Sarah Jule, associated with the University of California and experts in the area of asbestos exposure, as well as the CAC's own environmental consultant, Arc Ecology (which has studied shipyard contamination for over 25 years), have also reviewed the environmental data. Collectively, all parties which have reviewed the monitoring regime and the data agree on the following conclusions:

1.) The threshold standard for airborne asbestos established by the Bay Area Air Quality Management District is the strictest in the State of California. To protect public health, the standard requires the halting of project work when the threshold standard is exceeded.

2.) Lennar's mandated dust/asbestos control plan is also the striotest in California and has been made more stringent over time. Off-site stations have been added to on-site air monitoring stations, plus inoreased watering, perimeter water misters, and on-site dust marshals.

2.) Lennar's mandated dust/asbestos control plan is also the strictest in California and has been made more stringent over time. Off-site stations have been added to on-site air monitoring stations, plus increased watering, perimeter water misters, and on-site dust marshals.

3.) Despite monitoring gaps in the first three months of activity, and intermittent problems with the maintenance of the dust/asbestos control program, overall compliance has been protective of public health with respect to dust and airborne asbestos generated by construction on Parcel A.

All of the agencies and expert advisers acknowledge and are troubled that many residents of Hunters Point Hill and the Bayview Hunters Point community suffer poor health relative to other San Francisco neighborhoods. What they challenge are scientifically unsupported, primarily anecdotal claims that dust and asbestos from Parcel A grading activity caused or significantly exacerbated these problems. The CAC is not aware of any credible medical evidence or expert opinion to confirm a causal rather than circumstantial relationship of symptoms to shipyard development.

The CAC considers the conclusions of the regulators and other experts at this point to be definitive. We would suppose that the Board, itself a public agency, would by any reasonable standard consider those Federal, State and municipal agencies to be independent, trustworthy sources of environmental technical assessment. As for the others; admittedly, the physician experts were engaged by Lennar on behalf of a group of neighborhood pastors; and Arc Ecology's consulting contract is with the Redevelopment Agency. But we think it unlikely that those respected physicians and that organization would knowingly deceive the public and thereby risk their professional credibility for a nominal consulting fee.

We further question the Board's assertion that this is a failure of environmental justice. Serpentine rock is ubiquitous throughout San Francisco and the entire state. Yet virtually no other community in this city or in California has an equivalent asbestos and dust program. Even with intermittent compliance problems this project provides far greater protection to Hunters Point Hill and Bayview residents than is afforded any other neighborhood in the City. These careful provisions result from our environmental justice concerns.

The Board's invocation of the precautionary principle here is also questionable. Halting construction pending further study will harm Bayview Hunters Point economically. 80 Bayview Hunters Point residents and 35 local service providers and contractors are at work on the project. Layoffs and demobilization will not only hurt Lennar but also cut employees' incomes by 60% (or more if they don't qualify for unemployment compensation). Even if Lennar fully paid its workforce during a lay off, as some suggest, the delay in starting housing construction would postpone hundreds of desperately needed, long awaited construction jobs for residents. We would argue that poverty and the lack of access to health care continue to be the main cause of public health problems in the neighborhood. Implementing the Board's resolution to stop the project has much greater potential to cause tangible, versus speculative, harm.

Since 1991, the CAC has been involved in every aspect of shipyard redevelopment planning and implementation. We participated in drafting the Health Code ordinance focusing precisely on Parcel A development, as well as the initial dust control procedures. We constantly review and have continuously improved the dust control plan. We have sponsored seven public workshops on such matters, the first occurring six months ahead of earthmoving and construction activity. On September 10, the CAC sponsored a community forum on the issue wherein a panel

Among members of your Board, only the author of the resolution called a CAC member to discuss this matter. The conversation, reported to have lasted about 10 minutes, occurred just hours before the Board's vote. The Board would have benefited from consulting any of several knowledgeable parties, and conducting a more thoughtful, thorough investigation, prior to voting on its well intended but misinformed resolution.

The Board's action further muddied the waters of this debate by yielding to politics where the science of public health should be deferred to. Sound science (or any proposition) can be made to seem suspect or ridiculous by selective dissection and determined rhetorical assault. The public relies on its officials and representatives to make reasoned judgments as to what are matters of facts or matters of opinion. The issue has come before both the Board of Supervisors and the Redevelopment Commission on several occasions. After weighing the science against the public testimony, heartfelt though it was, of a fraction of the community, both bodies declined to take any action on the claims of imminent peril and long term risk. Your Board, acting on what it believed to be true, did what it believed to be right. Unfortunately what you've taken to be true is completely contrary to the judgment of every expert evaluating the facts as they are known. What you've done will at best do very little about real problems. At worst it will sow more fear and mistrust, and delay the reaping of such positive benefits as shipyard redevelopment may bring to the community.

The facts were and are readily available to you, and we strongly urge you to consult them in any future action you may take on this subject. I have enclosed copies of the most recent information for your reference.

Very truly yours,

Scott Madison

Scott Madison
CAC Chairman

cc. Mr. Norman Yee, San Francisco Board of Education Commissioner
Ms. Jane Kim, San Francisco Board of Education Commissioner
Mr. Eric Mar, San Francisco Board of Education Commissioner
Ms. Kim-Shree Maufas, San Francisco Board of Education Commissioner
Ms. Hydra Mendoza, San Francisco Board of Education Commissioner
Ms. Jill Wynns, San Francisco Board of Education Commissioner
Mr. Fred Blackwell, San Francisco Redevelopment Agency, Executive Director
Mr. Michael Cohen, Director, Base Reuse and Development Mayor's Office of Economic and Workforce Development

Attachment 20

Proposition P and the Precautionary Principle

Attachment 20
Proposition P and the Precautionary Principle

Proposition P was approved by the voters of San Francisco on November 7, 2000 and called upon the Navy to remediate the Shipyard to the highest levels practical to ensure flexible reuse of the property. The Board of Supervisors subsequently passed Resolution 634-01, adopting Proposition P as official City policy and urging the Navy and USEPA to take actions to implement Proposition P. The Resolution recognizes that the unrestricted cleanup standard called for in Proposition P identifies a cleanup level acceptable to the community; urges the Navy and regulatory agencies not to rely on barriers to protect future occupants and the public from exposure to pollution, unless other remedies are technically infeasible, and urges the Navy to cleanup the Shipyard in a manner fully consistent with the Reuse Plan and with remedies that do not make implementation of the Reuse Plan economically infeasible.

Proposition P is a general statement of policy for a desired result for the Navy and regulators achieve in implementing the Shipyard cleanup. Three years after the passage of Proposition P, the Redevelopment Agency Commission approved the Conveyance Agreement with the Navy. The Conveyance Agreement is a legally binding agreement that sets forth specific cleanup standards for each parcel, and requires the Navy to obtain concurrence from the regulators that the property is safe for its intended use. The 1997 Shipyard Redevelopment Plan calls for a mix of uses, including residential, mixed use, industrial, research and development, maritime industrial, cultural and educational, and recreational open space. The Conveyance Agreement was produced with substantial community input. The Conceptual Framework for the integrated planning adopted by the Board of Supervisors in May 2007 reaffirmed the Conveyance Agreement cleanup standards, stating, "there is an urgent need for the Navy to fulfill *its obligations under the Conveyance Agreement to remediate and convey this land to the City as quickly as possible in a condition that is consistent with the City's reuse plan"* [emphasis added]. Eight years after the voters passed Proposition P related to the Shipyard, they passed Proposition G related to the redevelopment of the Project area, including the Shipyard. One of the stated objectives set forth in Proposition G is to "transform the contaminated portions of the Shipyard property into economically productive uses, or public open space, as appropriate".

It has been suggested that if the Agency enters into an early transfer agreement with the Navy and agrees to assume responsibility for portions of the cleanup, Proposition P would apply directly to the Agency's cleanup decisions, rather than simply being a policy statement about how the Navy should make decisions. Proposition P addresses the type of cleanup remedy that the Navy should select and the regulators should approve for the Shipyard. The ROD (see Attachments 3 and 4) for a parcel sets forth the selected remedy.

Under the early transfers envisioned at the Shipyard, all radiological cleanups will be completed and RODs issued. The Navy has already issued RODs for Parcels B, D-1, G, UC-1, and UC-2. The Navy has also conducted substantial remediation. By the time the Navy offers parcels being considered for early transfer to the Agency (with concurrence of USEPA and the Governor of California) the remedy will have already been selected and significant remediation completed. For Parcels B and G, which are the first early transfers being considered, the Navy will have prepared and the regulators will have approved the remedial design documents. If the Agency accepts the property under an early transfer, it would simply be contracting with a remediation firm to complete the implementation of the Navy's selected remedy, with funds provided by the Navy. Therefore, Proposition P does not apply any differently to early transfer parcels than to other parcels because in both instances the Navy is selecting and federal and state regulators are approving the remedy.

Proposition P was approved by 87 percent of the voters in reference to the provisions in CERCLA (Attachment 3) related to community acceptance as a criteria in selecting a cleanup remedy. “Community acceptance” is required to be factored into these cleanup decisions. Proposition P does not apply directly to the CERCLA process. The regulations that the Navy and regulators must follow in implementing CERCLA are collectively referred to as the National Contingency Plan (NCP) and set forth nine criteria that must be considered in selecting a cleanup remedy: two “threshold criteria” (overall protection of human health and the environment, and compliance with other applicable or relevant legal requirements); five “balancing criteria” (long-term effectiveness and permanence; reduction in toxicity, mobility or volume through treatment; short-term effectiveness; implementability; and cost) and two “modifying criteria” (state acceptance and community acceptance). Community acceptance is an important criterion considered in remedy selection, but it is one of nine criteria and is typically evaluated based on comments received from the public during the public comment period for the Proposed Plan. It would be appropriate for members of the public to cite Propositions P or G as evidence of community sentiment in public comments submitted to the Navy and regulatory agencies on Proposed Plans during the remedy selection process.

Precautionary Principle Policy Statement

In July 2003, the Board of Supervisors adopted Precautionary Principle Policy Statement that “the Board of Supervisors encourages all City employees and officials to take the Precautionary Principle into consideration and evaluate alternatives when taking actions that could impact health and the environment, especially where those actions could pose threats of serious harm or irreversible damage.” (Chapter 1 of the San Francisco Environment Code, Section 104.) The policy statement sets forth the key elements of the Precautionary Principle approach to decision-making as (1) Anticipatory Action to prevent harm; (2) Right to Know of the community about “potential human health and

environmental impacts associated with the selection of products, services, operations or plans"; (3) Alternative Assessment designed to select the alternative with the least potential impact on human health and the environment; (4) Full Cost Accounting to consider all the reasonably foreseeable costs, including raw materials, manufacturing, transportation, use, cleanup, eventual disposal, and health costs; and (5) Participatory Decision Process, with decisions applying the Precautionary Principle being transparent, participatory, and informed by the best available science and other relevant information (Chapter 1 of the *San Francisco Environment Code,* Section 101).

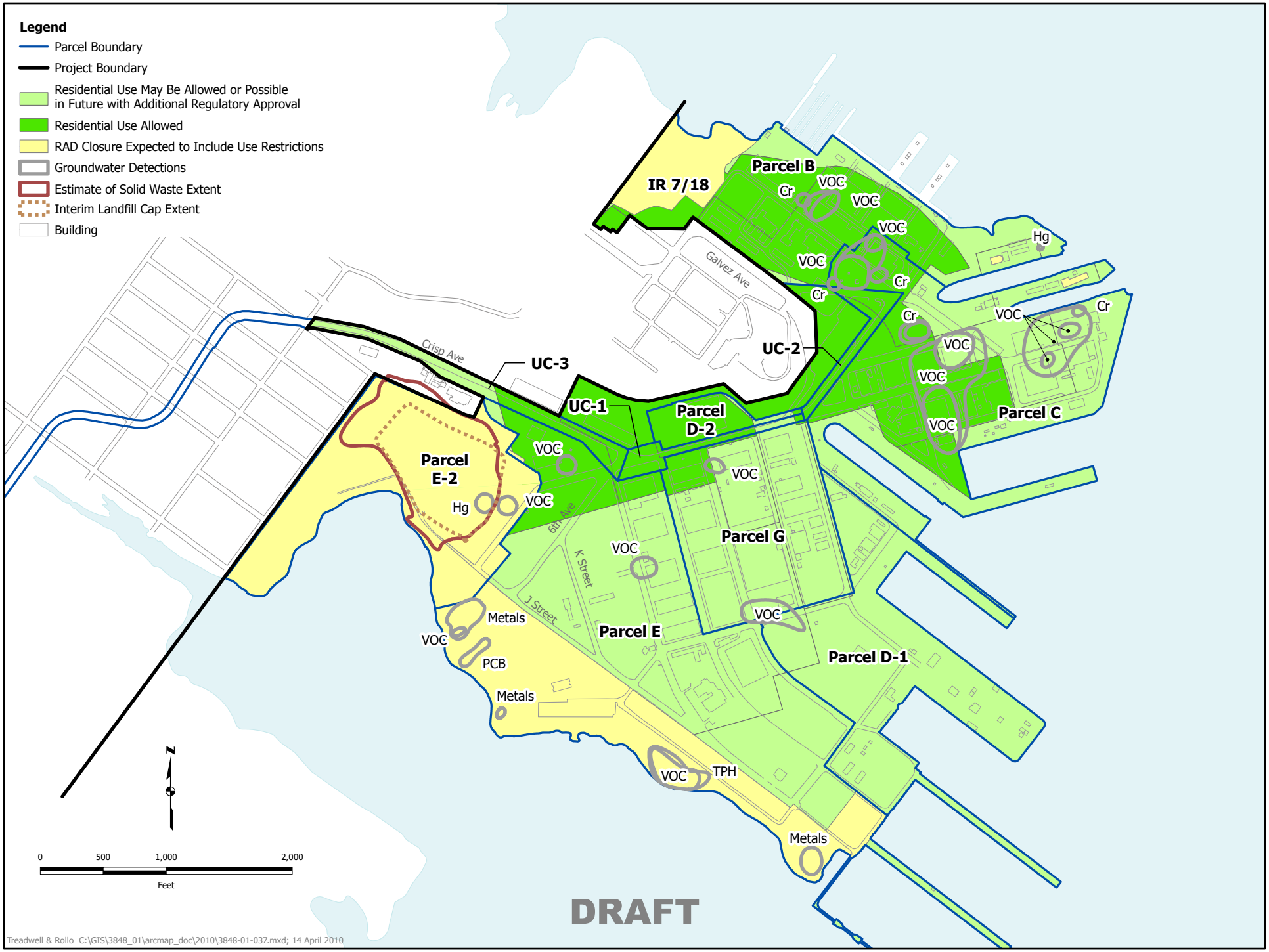
The ordinance adopting the Precautionary Principle Policy Statement expressly provides, "This ordinance does not impose specific duties upon any City employee or official to take specific actions." (Chapter 1 of the *San Francisco Environment Code*, Section 104). The Precautionary Principle of the City by its terms applies only to City employees and officials and does not apply to the Navy or federal or state regulators overseeing the cleanup of the Shipyard. The "right to know" aspects of the Precautionary Principle are addressed through the notification protocols and requirements (See Attachment 13, Notification Requirements).

Attachment 21

Residential Use Areas Table and Map

Table 21-1
Remediation Required for Residential versus Commercial Development

	Remediation Requirement	Required for Residential Areas	Required for Commercial Areas
Soil Remedy	Physical Barrier = Building or Street or Sidewalk or Park area cover (2' clean soil)	**Yes**	**Yes** - same as residential areas
Groundwater Remedy	Most areas - nothing required. Some small areas with vapors - special foundations for buildings	**Yes**	**Yes** - same as residential areas
Regulatory Oversight	continues throughout project	**Yes**	**Yes** - same as residential areas


Legend
Parcel Boundary
Project Boundary
Residential Use May Be Allowed or Possible in Future with Additional Regulatory Approval
Residential Use Allowed
RAD Closure Expected to Include Use Restrictions
Groundwater Detections
Estimate of Solid Waste Extent
Interim Landfill Cap Extent
Building
IR 7/18
Parcel B
UC-2
UC-3
UC-1
Parcel D-2
Parcel C
Parcel E-2
Parcel G
Parcel E
Parcel D-1
Galvez Ave
Crisp Ave
6th Ave
K Street
J Street
VOC
Cr
Hg
Metals
PCB
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0
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Treadwell & Rollo C:\GIS\3848_01\arcmap_doc\2010\3848-01-037.mxd; 14 April 2010

Attachment 22

Sea Level Rise

Attachment 22
Sea Level Rise

Typically the design of coastal developments is conducted per Federal Emergency Management Agency (FEMA) and local agency guidelines to set interior grades throughout a community such that the elevation of the first floor of inhabitable space would be above the present-day *Base Flood Elevation* (BFE) or 100-year return period water level. Improvements along shorelines are required only to protect structures and facilities adjacent to the shoreline against storm wave run-up and overtopping. The flood elevation along the shoreline as specified by FEMA is the *1% Annual Chance of Occurrence Event*. FEMA maps flood zones based on this present day flood stage caused by rainfall, or a combination of rainfall, tides, storm surge, and waves.

Over the past century, the National Oceanic and Atmospheric Administration (NOAA) estimates sea level rise has been approximately 8 inches and was within the allowances that traditional coastal developments included in their design. Based on climate change studies over the past two decades, the rate of sea level rise appears to be accelerating and climate change models are predicting greater rates of sea level rise in the future in response to warmer temperatures and melting ice caps.

California Executive Order S-13-08 recognizes the impact that sea level rise may have on coastal development in California and directs the California Resources Agency to complete the first California Sea Level Rise Assessment report by December 2010. The report will advise how California communities should plan for sea level rise.

In reviewing development proposals regarding public infrastructure, regional and local agencies have taken a more proactive approach. The San Francisco Bay Conservation and Development Commission (BCDC) is recommending that bayfront developments consider a 16-inch sea level rise value by 2050 (mid-term) and a 55-inch sea level rise value by 2100 (long-term)[7]. The California State Coastal Conservancy (SCC) (the "Conservancy") has issued a similar guidance policy[8], with the same mid-term and long-term values. Although no guidance policy related to sea level rise has been adopted by federal, state, or local agencies, the Shipyard development team recognizes that it is critical that sea level rise be accounted for in the planning process to prevent future flooding or loss of infrastructure resulting from shoreline erosion and have developed a project-specific approach for sea level rise.

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[7] BCDC (San Francisco Bay Conservation and Development Commission). 2009. Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline, Draft Staff Report. April 7.

[8] California State Coastal Conservancy. 2009. *Policy Statement on Climate Change.* Adopted at the June 4 Board Meeting. Available online at <http://www.scc.ca.gov/index.php?p=75&more=1>

Approach to Address Sea Level Rise Effects on Flooding

A specific sea level rise study for the Shipyard which included an assessment of shoreline conditions was prepared to develop planning and design guidance through the various phases of the project[9]. The studies included an assessment of the existing shoreline and shoreline structures; a coastal engineering analysis of tidal, wind-wave, and storm-wave processes for the vicinity; a review of published literature on sea level rise to develop future sea level rise allowance estimates; a review of state and regional guidance and policy documents to establish design parameters for shoreline elevation and grades for development areas and open-space; and developing a strategy to address sea level rise at the Shipyard.

The primary factors which influence coastal flooding are water levels driven by tides and storm surges, and wave overtopping caused by wind waves. These factors are present at any given time and it is necessary to estimate the frequency of their combined occurrence. Tidal information was analyzed to estimate the BFE buildings and open space for the redevelopment. Methods recommended by FEMA and the Technical Advisory Committee on Flood Defense recommended perimeter elevations were then developed based on allowable overtopping rates to achieve safe conditions for pedestrians during the 1% chance run-up event. Allowances for sea level rise were then added to the minimum required grades in the interior and along the perimeter, and a strategy for the future was then developed for even higher sea level rise estimates such that the level of protection provided at construction continues into the future.

A summary of the most commonly quoted estimates of sea level rise in the scientific and planning literature, with particular reference to California and San Francisco Bay is presented in Table 22-1.

[9] Moffatt & Nichol. Candlestick Point/Hunters Point Redevelopment Project Shoreline Structures Assessment. October 2009.

Table 22-1
Summary of Reviewed Documents
on Sea Level Rise Estimates

Document	Sea Level Rise Estimate/Projection		Time frame (years)
	inches	meters	
California Climate Change Center, 2009	24 to 55	0.6 to 1.4	2000–2100
CALFED Bay-Delta Program, 2007	20 to 55	0.5 to 1.4	2100
Intergovernmental Panel on Climate Change, 2007 (AR4)	7 to 30	0.18 to 0.76	1990–midpoint of 2090–2099
Rahmstorf, 2007	20 to 55	0.5 to 1.4	1990–2100
California Climate Change Center, 2006	8 to 31	0.2 to 0.8	2000–2100
Intergovernmental Panel on Climate Change, 2001 (TAR)	4 to 35	0.09 to 0.88	1990–2100
US Environmental Protection Agency, 1995	5 to 34	14 to 86	2100
National Research Council, 1987	20, 39, and 59	0.5, 1.0, and 1.5	2100

Summary and Adopted Approach

Estimates of sea level rise vary widely, from an observed value of 8 to about 35-inches per century based on IPCC high estimates. Empirical studies and news articles have stated that sea level rise over the next 100 years could be substantially higher and could be as much as 55 inches by 2100. Through 2009, high-resolution altimetry data indicate that global mean sea level has risen at a rate close to projections that correspond to an increase in global mean sea level of around 10 inches by 2050 and 30 inches by 2100. It is clear is that the science of climate change and sea level rise is evolving, making it prudent to develop community designs that can accommodate various levels of sea level rise over the development planning horizon rather than design to a specific report or estimate.

Prior to the completion of the report on sea level rise per Executive Order S-13-08, the Conservancy will consider the following sea level rise scenarios in assessing project

vulnerability and, to the extent feasible, reducing expected risks and increasing resiliency to sea level rise:

a. 16 inches (40 cm) by 2050

b. 55 inches (140 cm) by 2100

The strategy for the Shipyard uses mid-term (16 inches) sea level rise values for the shoreline edge and storm drainage system. For long-term planning beyond 50 years from now, the evolving nature of climate change and sea level rise science needs to be recognized and no single sea level rise value should be relied upon at this point in time. Instead, an adaptive management strategy will be put in place such that improvements for sea level rise beyond the mid-term planning horizon can be designed and implemented as sea levels rise.

Mitigation Measures for Potential Sea Level Rise Hazards

Based on the coastal study, literature review and numerous discussions with SFPUC and DPW, the Mitigation Measures for the Project in the DEIR related to Sea Level Rise are as follows:

- Before the first Small Lot Final Map is approved, the Project Applicant must petition the appropriate legislative body to form (or annex into if appropriate) and administer a special assessment district or other funding mechanism to finance and construct future improvements necessary to ensure that the shoreline, public facilities, and public access improvements will be protected should sea level rise exceed 16 inches at the perimeter of the Project. Prior to the sale of the first residential unit within the Project, the legislative body shall have acted upon the petition to include the property within the district boundary. The newly formed district will also administer a Monitoring and Adaptive Management Plan to monitor sea level and implement and maintain the protective improvements. Shoreline and public access improvements shall be designed to allow future increases in elevation along the shoreline edge to keep up with higher sea level rise values, should they occur. Design elements shall include providing adequate setbacks to allow for future elevation increases along the shoreline.

- To reduce the flood impacts of failure of existing shoreline-structures, the Project Applicant shall implement shoreline improvements for flood control protection, as identified in the Candlestick Point/Hunters Point Development Project Proposed Shoreline Improvements report. Where feasible, elements of living shorelines shall be incorporated into the shoreline protection improvement measures.

- Construction of buildings and vital transportation infrastructure at elevations that would not be exceeded by flood waters even if the shoreline protection does not function, for present and projected long-term conditions.

This design approach for sea level rise meets both near term and longer term objectives and incorporates an adaptive management strategy to address improvements related to future sea level rise.

For shoreline protection, it is not practical to build a high wall around the Shipyard for a condition that may not happen for several decades as it would pose a visual obstruction and limit public access. It is also not prudent to build to present sea level conditions and keep raising the development as sea levels rise. Therefore, an interim sea level rise estimate for the year 2050 of 16 inches, as put forth by BCDC and the Conservancy, was selected as the design criteria to use for design and initial construction. If sea level rise tracks according to current projections, this design criteria will ensure that adaptive management construction activities are not triggered until at least the year 2050.

The storm drain system will be constructed with an initial sea level rise allowance of 16 inches, and will be adaptable to higher levels of sea level rise with minimal intervention. It will function as a gravity-drained system until about 2050, beyond which the Adaptation Strategy will be implemented that will consist of installing storm drain pumps using funds generated by the development.

All buildings and entrances to subterranean parking and streets would be set at an elevation that is 36-inches higher than the present day BFE and an additional 6 inches of freeboard will establish the finished floor elevations for buildings. It is important to note that due to the topography of the site and the proposed grading program to accommodate the new development program, most if not all, of the developed footprint will be constructed at elevations that will accommodate the long term projection of 55 inches in sea level rise.

A project-specific sea level rise Adaptation Strategy will be implemented that will provide guidance, identify relevant stakeholders, define appropriate management actions and triggers, and establish a project-specific funding mechanism.

The strategy envisions incorporating ongoing measurements of sea level rise from the scientific community into a Monitoring Program that would guide the decision-making process for future improvements. The Monitoring Program will include protocol to compare observed changes in sea level with the as-built perimeter elevations. This would use updates of changes in sea level provided by the NOAA, National Geodetic Survey, or other appropriate agency. The monitoring program would be administered by a Geologic Hazard Abatement District (GHAD), Community Facilities District (CFD) or other public entity with similar funding responsibility. This entity would guide the decision-making process for implementation of future improvements, such as raising the perimeter.

The Adaptive Management Plan will define specific triggers for action, based on observed changes in sea level. The Plan will require 5- or 10-year updates based on observed changes in sea levels as well as any other effects of climate change (e.g., more

or less extreme storm wave conditions). The initial strategy, as well as any updates, will be coordinated with relevant stakeholders including the City and County of San Francisco, State Parks, FEMA, and BCDC.

Proposed development setbacks will enable a variety of future perimeter modifications to accommodate the 55-inch long term projection. The adaptive management strategy described above is based on elevation and structural characteristics of the shoreline along the project boundaries. The varied nature of this shoreline, ranging from protected and unprotected slopes, beaches, seawalls, and wharves, may require a multitude of potential adaptive management measures.

Sea Level Rise Effects on Movement of or Exposure to Toxics

Sea levels will increase over time creating a potential for residual chemicals left in place to interact with groundwater. As described in Attachment 4 Parcel-by-Parcel Summary and Expected Transfer Dates, there are ongoing remediation programs related to former Navy operations. The Navy is providing soil and groundwater remediation (cleanup) to reduce chemical concentrations to meet cleanup levels approved by federal and state regulatory agencies. If the potential for the interaction with groundwater were to present a risk to human health or the environment then further remedial activities would be required by law. Additionally, the Institutional Controls placed on areas with residual contaminant, would enforce action to maintain the protection to the environment and prevent human exposure.

Mitigation Measures for Other Potential Sea Level Rise Hazards

Anticipated sea level rise is being taken into account as part of the development design process to ensure that planned land uses can be achieved. Specific building designs will take the anticipated sea level rise into consideration. The buildings will be designed for the anticipated groundwater levels to prohibit groundwater from entering basements or parking structures.

Residual chemicals that may remain in soil after cleanup will be located under a physical barrier (e.g. pavement, building, or 2 feet of clean soil) that prevents human exposure to the residual chemicals. This requirement to install a physical barrier on the entire site to prevent access to this residual contamination is a part of the Navy CERCLA cleanup documents (Attachments 3 and 4), which have been approved by the USEPA, DTSC and the RWQCB. Furthermore, the requirement to install a physical barrier will be a requirement of each and every landowner within the former Shipyard. Sea level rise is not expected to compromise covers and/or engineered caps that may be placed on top of an area of known or suspected residual contamination (see Figures 22-1 through 22-3). Attachment 23 shows how these physical barriers relate to measures the project is taking to address sea level rise. Operation and maintenance plans for these covers and engineered caps will be carried out to monitor and repair potential breaches. Emergency

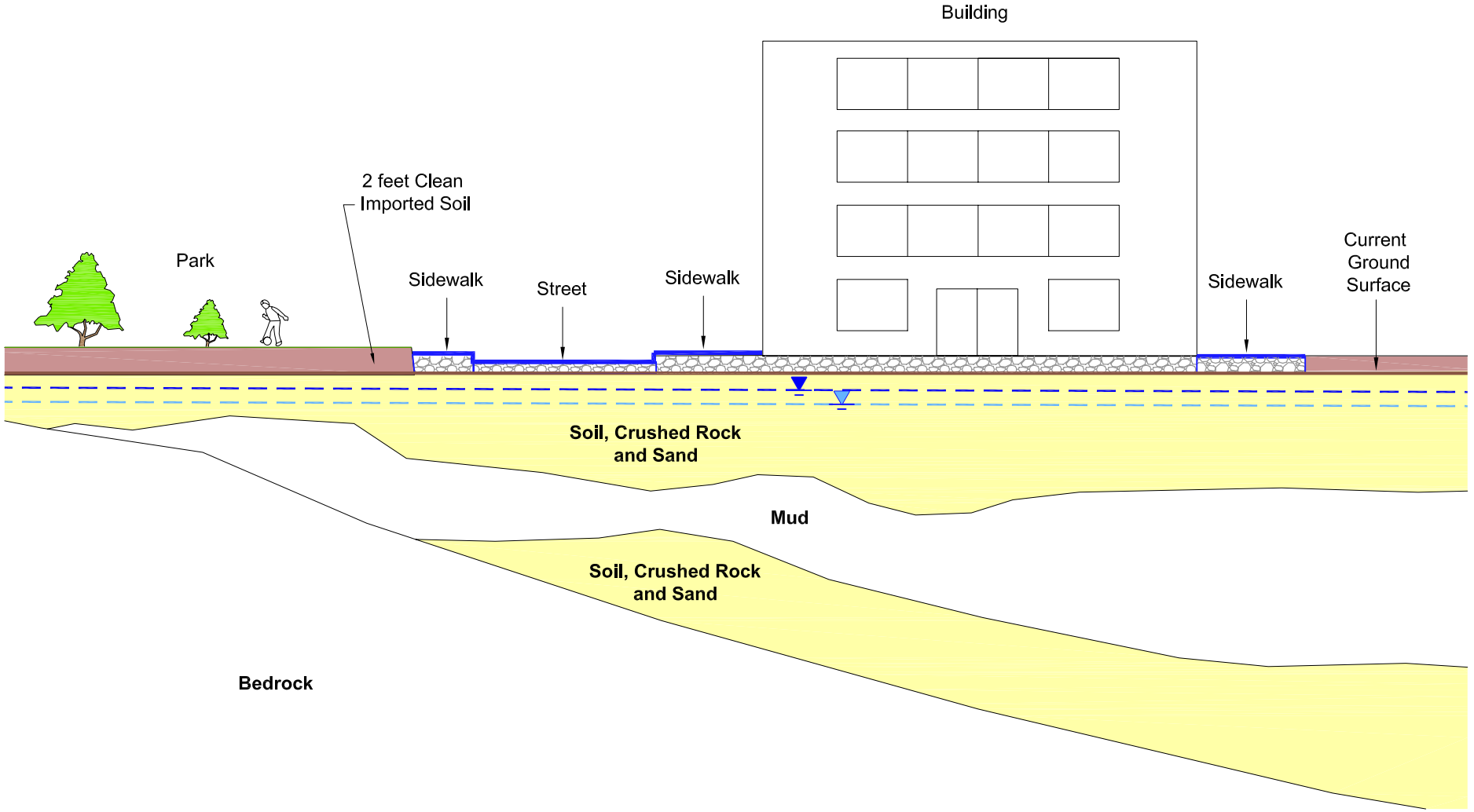
response plans will be carried out following major flooding events, at which time engineered caps and covers will be investigated for potential breaches and repaired.

Residual chemicals in soil will largely consist of certain specific metals, which are typically associated with the rock and soil that were historically used to fill in the Bay to expand the Shipyard. They are not part of a "spill" or "release" of contaminants, but reflect metals concentrations normally associated with Franciscan Formation bedrock found in fill used during the period when areas of the Shipyard were filled. These metals are not readily soluble and will not dissolve into groundwater at concentrations of concern to human or ecological health. Thus, a rise in the groundwater level caused by a rise in sea level would not mobilize these metals (see Figures 22-1 and 22-2). There will be a strict prohibition against pumping groundwater for domestic, commercial, industrial or irrigation purposes.

Under CCR Title 27, Section 21090, all closed landfills are required to have an engineered landfill cap if landfill materials are left onsite. The landfill cap is intended to maintain a protective seal and keep moisture and rain from penetrating the landfill waste and prevent human and environmental exposure to the disposed waste. If the Navy proposes and USEPA concurs that an engineered cap may be placed on top of the Parcel E-2 landfill to prevent unsafe exposures from chemicals allowed by the regulators to be left in place, operation and maintenance plans will be developed and carried out to monitor for and repair potential breaches should they occur. Any breach of cover would be repaired so that no long-term health risks would occur. Sea level rise is not expected to compromise the landfill cap (see Figure 22-3).

Existing groundwater contamination will be remediated prior to development to levels that will allow safe reuse. After cleanup, there may still be low levels of residual volatile organic compounds (VOCs) in groundwater and soil that could potentially produce vapor intrusion into buildings constructed over these areas. To address this potential, the Navy will conduct a sub surface soil vapor sampling program to define areas where vapor intrusion may be an issue. If soil vapor sampling results indicate areas where vapor intrusion could be an issue, vapor mitigation systems will be designed and constructed within and underneath building foundations. These vapor mitigation systems are common, well tested, and protective of residential or commercial building occupants. These soil vapor sampling programs, defining areas requiring vapor controls and the design and installation of vapor mitigation systems will be overseen and further approved by the regulators (USEPA, DTSC, and RWQCB). Soil vapor mitigation systems will be subject to periodic inspection and maintenance to ensure proper operation. VOC vapors occur in soil that is not totally saturated with water. Therefore, if sea level were to rise and if there was an associated rise in groundwater, the volume of VOC vapors under a building might be reduced. VOC vapors migrate from impacted soil and groundwater into soil pore spaces which would become saturated due to this higher groundwater level. If the potential for the interaction with groundwater were to present a risk to human health or the environment then further remedial activities would be required by law.

Additionally, the Institutional Controls placed on areas with residual contaminant would enforce action to maintain the protection to the environment and prevent human exposure.



EXPLANATION

Groundwater Level After Sea Level Rise

Current Groundwater Table

DRAFT

Not to Scale

HUNTERS POINT SHIPYARD
San Francisco, California

ALL AREAS SEA LEVEL RISE

Date 04/21/10	Project No. 3848.02	Figure 22-1

Treadwell&Rollo

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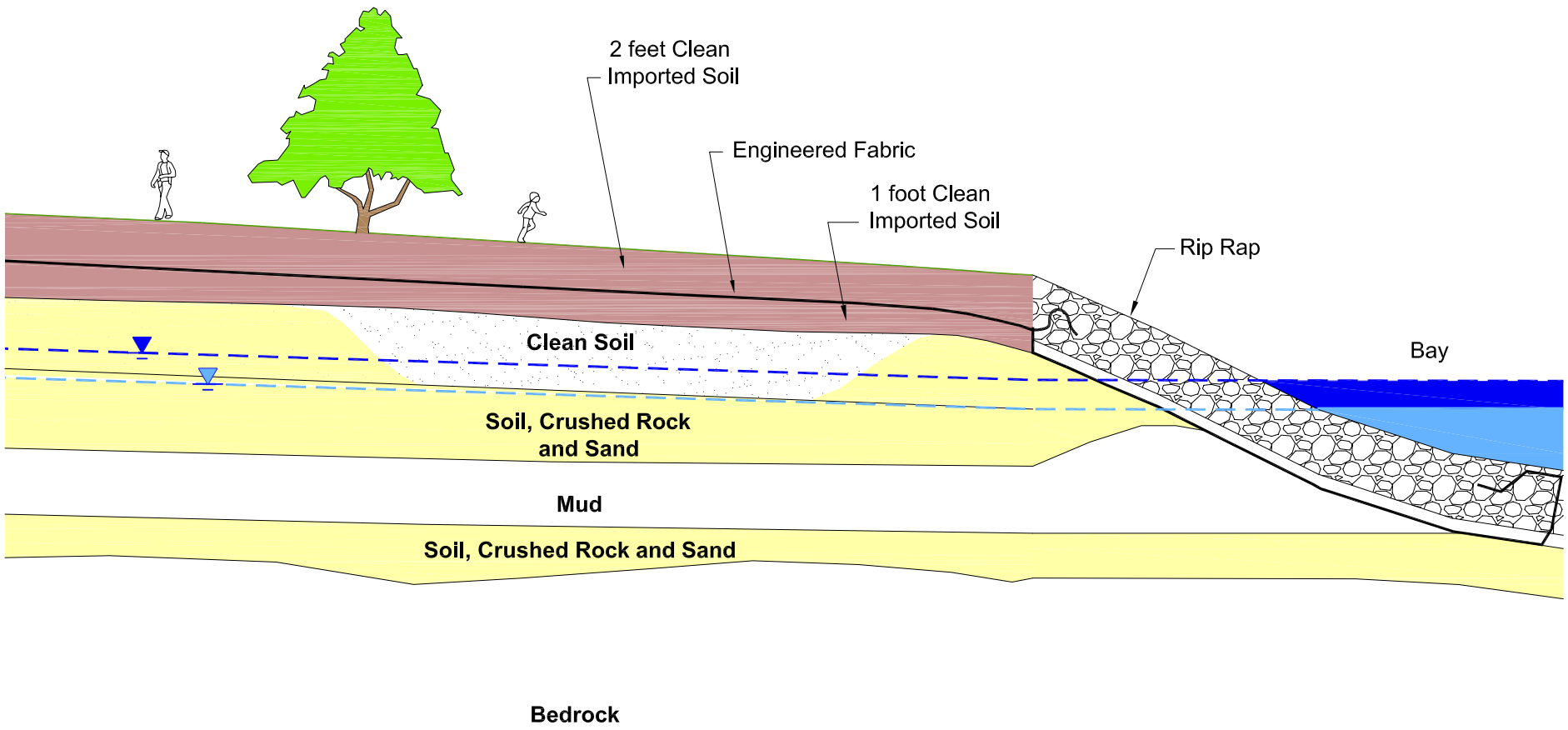

EXPLANATION

Groundwater Level After Sea Level Rise

Current Groundwater Table

DRAFT

Not to Scale

HUNTERS POINT SHIPYARD
San Francisco, California

PARCELS 7/18 AND E SHORELINE SEA LEVEL RISE

Date 04/21/10	Project No. 3848.02	Figure 22-2

Treadwell&Rollo

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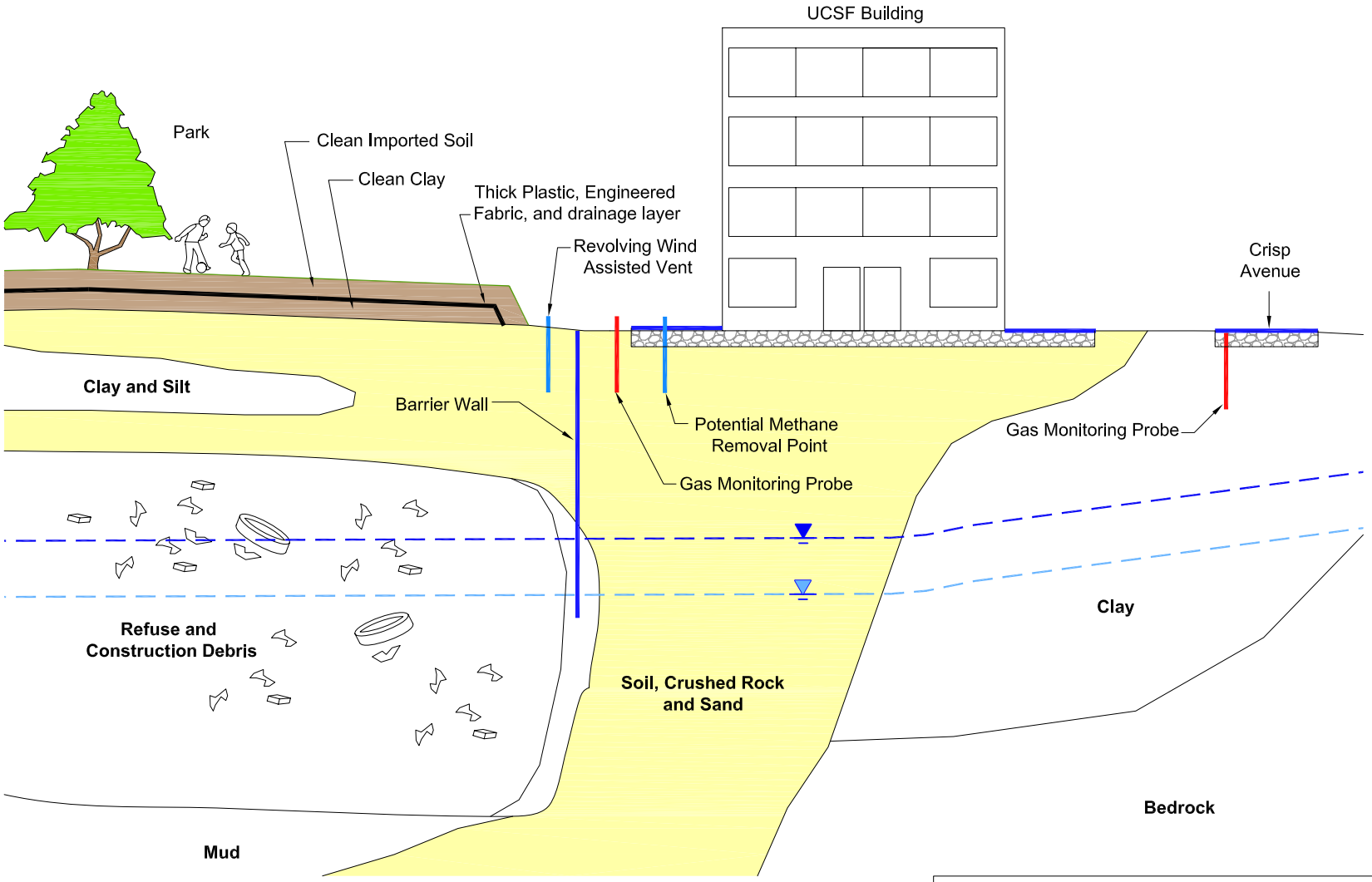


EXPLANATION

Groundwater Level After Sea Level Rise

Current Groundwater Table

DRAFT

Not to Scale

HUNTERS POINT SHIPYARD
San Francisco, California

PARCEL E-2 LANDFILL
SEA LEVEL RISE

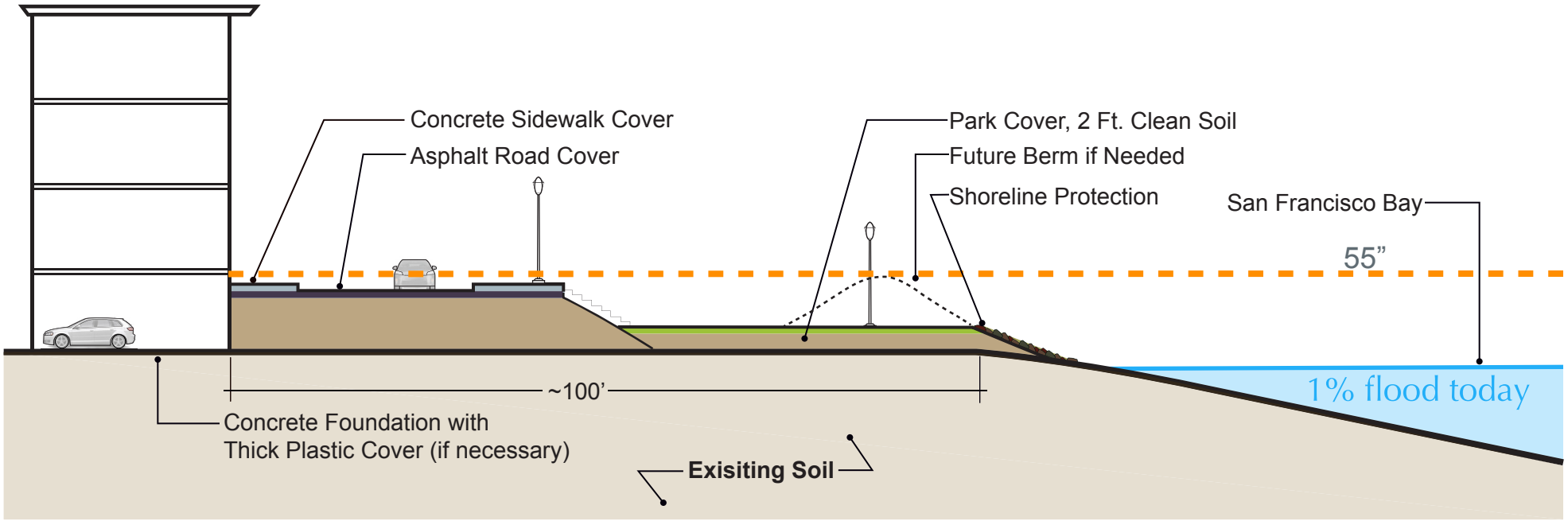
Date 04/21/10	Project No. 3848.02	Figure 22-3

Treadwell&Rollo

R:\Trgraphics\3800's\3848.02\White Paper Figures\3848.02 Sea Level and Liquefaction Before and After 2.dwg 4/27/10

Attachment 23

Physical Barriers and Sea Level Rise Figure


Concrete Sidewalk Cover
Asphalt Road Cover
Park Cover, 2 Ft. Clean Soil
Future Berm if Needed
Shoreline Protection
San Francisco Bay
55”
~100’
1% flood today
Concrete Foundation with
Thick Plastic Cover (if necessary)
Exisiting Soil

DRAFT

Attachment 24

Seismic Hazards and Liquefaction

Attachment 24
Seismic Hazards and Liquefaction

The Shipyard and the entire San Francisco Bay Area are in a seismically active region and active nearby faults could potentially generate an earthquake. As evidenced by the level of development throughout the San Francisco Bay, successful building construction is possible in a seismically active zone and can be readily accomplished even where seismic hazards exist through the implementation of appropriate structural and foundation design and/or ground improvement measures. Seismic activity associated with a large earthquake on a nearby fault could potentially result in seismic hazards at the site such as groundshaking, fault rupture, liquefaction, lateral spreading, ground settlement, ground oscillation, and seismic slope instability. These seismic hazards and their likelihood of occurring at the Shipyard are described below.

- Groundshaking is expected to occur at the Shipyard during a large earthquake on one of the nearby faults. The intensity of seismic shaking or strong ground motion during an earthquake at any particular location is dependent on a number of factors, including the distance and direction of the site from the earthquake epicenter, the earthquake magnitude, and the geologic conditions at and in the vicinity of the site. Site-specific seismic and geotechnical studies will be undertaken prior to final building design to evaluate the peak ground acceleration from an earthquake expected at the site and the structure will be designed to accommodate the anticipated groundshaking under the peak ground acceleration.
- No known active faults cross the site, rendering hazards from fault rupture at the site unlikely.
- Earthquake-induced settlement, other than that which occurs only in soil below the groundwater level, could potentially occur in areas where loose sand is present above the groundwater (differential compaction). The upper fill layer at the Shipyard has been characterized as a heterogeneous mix of gravel, sand, silt, and clay that contains varying amounts of debris (wood, glass, etc.). There could be zones of soil within this layer above the groundwater level that contain loose sand. Because of the heterogeneous nature of the fill layer, settlements resulting from differential compaction could occur both uniformly and differentially, unless mitigation measures such as ground improvement and/or structural/foundation solutions are implemented.
- Portions of the Shipyard have been mapped in a zone designated to have the potential for seismically induced landslides. Hazards associated with seismically induced landslides can be mitigated using methods generally accepted by California Certified Engineering Geologists (CEG) and California Registered Geotechnical Engineers (GE), including ground improvement and/or structural/foundation solutions.

- Ground oscillation is a phenomenon where the surface soil layer, riding on a buried liquefied layer, is thrown back and forth by the shaking and can be severely deformed. While areas of the site have been identified as containing potentially liquefiable soils, there is no evidence of a broadly spanning buried liquefiable layer above or below the existing groundwater table on which the surface layer could be oscillated. Therefore, the potential for this hazard at the Shipyard would be considered low. Furthermore, mitigation measures, which would be implemented where liquefiable soils are identified, would also reduce the risk of damage to structures from ground deformation.

Site-Specific, Design-Level Geotechnical and Seismic Studies

The Seismic Hazard Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. The Act requires site-specific geotechnical investigations to identify potential seismic hazards and formulate corrective measures prior to permitting of developments designed for human occupancy within the Zones of Required Investigation. The Seismic Hazard Map for the City and County of San Francisco shows portions of the Shipyard to be within a Zone of Required Investigation for liquefaction potential. For projects in a hazard zone, the Department of Building Inspections (DBI) requires that the geologic and soil conditions of the Project site be investigated and appropriate mitigation measures, if any, incorporated into development plans.

Site-specific, design-level geotechnical and seismic studies, will be performed prior to issuance of any building permits to identify the potential for seismic hazards at the Shipyard. These studies will consist of geotechnical investigations with site-specific seismic analysis and will provide ground improvement/mitigation and/or foundation design recommendations to address potential seismic hazards, should they exist. Seismic studies will evaluate the anticipated site-specific peak ground accelerations that will induce groundshaking so that the structure (foundation and superstructure) can be designed to accommodate the anticipated shaking. All structural designs will incorporate and conform to the requirements and recommendations in the site-specific geotechnical and seismic investigations. Furthermore, the City's DBI permit application, review, and inspection process ensures that structures will be designed and built to Code. The geotechnical engineer will review Project plans and specifications and observe ground improvement and foundation installation to check for conformance to the geotechnical and seismic recommendations and requirements.

Mitigation Measures to Address Potential Seismic Hazards

Mitigation measures to address potential seismic hazards include structural measures and ground improvement. All structures, including the foundation (below ground portion) and superstructure (above ground portion), will be designed to accommodate the anticipated groundshaking under the peak ground acceleration (as determined by the site-

specific seismic study) and other potential seismic hazards, including earthquake-induced ground settlement. Foundation mitigation measures could include the construction of deep foundations, which transfer building loads to competent soil or rock below the zone where seismic densification/differential compaction could potentially occur, or use of a structural, sufficiently-reinforced mat foundation and/or a geotextile/geogrid beneath structures to distribute loads and reduce the potential for damage to the structure from earthquake-induced ground settlement. Ground improvement measures could include (1) overexcavation and replacement of soil potentially subject to earthquake-induced settlement with engineered compacted fill; (2) dynamic compaction (such as deep dynamic compaction or rapid impact compaction) to densify the loose soil; and (3) stone columns, soil-cement columns, or rammed aggregate piers to densify the loose soil and provide additional bearing support beneath building foundations.

If the design-level, site-specific geologic, seismic, and geotechnical studies identify the presence of landslides that could be triggered by an earthquake, recommendations for slope stabilization procedures will be provided and implemented. Slope stabilization procedures could include (1) use of retaining walls, rock buttresses, screw anchors, or concrete piers; (2) provision of slope drainage or removal of unstable materials; (3) provision of rockfall catch fences, rockfall mesh netting or deflection walls; (4) provision of setbacks at the toe of slopes; and/or (5) avoidance of highly unstable areas.

Amplification effects can occur when seismic waves travel through soft soils underlain by shallow bedrock. During the design-level site-specific seismic hazards assessment, appropriate attenuation relationships will be selected to account for amplification affects. All structures and improvements will be designed based on the appropriate seismic design parameters based on the seismic hazards assessment.

Liquefaction Potential and Associated Hazards

The Shipyard, like the Marina, Embarcadero, Financial District, South of Market Street, and Mission Bay neighborhoods, is in an area of San Francisco that has been designated as potentially liquefiable. However, many buildings and structures have been successfully constructed within potentially liquefiable zones through the implementation of proper foundation design and/or ground improvement. The majority of the Shipyard is covered by artificial fill, which is a heterogeneous mix of gravel, sand, silt, and clay that contains varying amounts debris (wood, concrete, glass, etc.). There could be zones of soil within this layer that contain loose granular soil that may be susceptible to liquefaction. However, because of the heterogeneous nature of the fill, liquefaction within the fill is expected to occur in random layers and pockets, limiting the extent of seismically induced settlement and lateral spreading[10] to localized zones within the fill. There is a

[10] Lateral spreading is a phenomenon in which surficial soil displaces along a shear zone that has formed within an underlying liquefied layer. Upon reaching mobilization, the surficial blocks are transported downslope or in the direction of a free face by earthquake and gravitational forces.

hydraulically placed sand fill in the vicinity of the southeast-facing shoreline of Parcels D and E at HPS Phase II that consists of a thick unit of predominantly uniform loose, dredged sand and is, therefore, more susceptible to liquefaction.

Evidence of liquefaction includes: flow failure, lateral spreading, differential settlement, loss of bearing strength, ground fissures, and sand boils (see Figures 24-1 through 24-3). Based on existing data, there is little or no risk of large translational ground movements at the Shipyard as a result of liquefaction. However, should liquefaction occur, there are five common liquefaction-associated hazards, which site-specific, design-level studies should address. Mitigation measures require that structures be designed to accommodate potential liquefaction-associated hazards or ground treatment/site improvement techniques are implemented prior to construction. The specific potential liquefaction-associated hazards are (1) potential foundation bearing failure, or large foundation settlements caused by ground softening, (2) potential structural and/or site settlements, (3) localized lateral displacement; "lateral spreading" and/or lateral compression, (4) flotation of light structures with basements, or underground storage structures, and (5) hazards to lifelines (utilities critical to emergency response). The regulatory scheme that exists in California to address these liquefaction hazards and how the project will mitigate hazards is described below.

Site-Specific, Design-Level Liquefaction Studies

California Public Resources Code Division 2, Chapter 7.8 (the Seismic Hazards Mapping Act) and 2007 California Code of Regulations (CCR), Title 24, Part 2 (the California Building Code [CBC]) contain regulations protecting the public from geo-seismic hazards, such as liquefaction. The Seismic Hazard Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. The Act requires site-specific geotechnical investigations to identify potential seismic hazards and formulate corrective measures prior to permitting of developments designed for human occupancy within the Zones of Required Investigation. The Seismic Hazard Map for the City and County of San Francisco shows portions of the Shipyard to be within a Zone of Required Investigation for liquefaction potential. For projects in a hazard zone, the DBI requires that the geologic and soil conditions of the Project site be investigated and appropriate mitigation measures, if any, incorporated into development plans. Measures that can be employed, depending on the specific site conditions, include (1) over excavation and replacement of potentially liquefiable soil with engineered compacted fill, (2) compaction grouting to densify the loose, potentially liquefiable soil, (3) dynamic compaction (deep dynamic compaction or rapid impact compaction) to densify the loose, potentially liquefiable soil, (4) vibro-compaction (also known as vibro-flotation) to densify the loose, potentially liquefiable soil, (5) stone columns to provide pathways for pore pressure to dissipate in potentially liquefiable soil, thus reducing the potential for liquefaction-induced settlement, and (6) soil-cement columns to densify the loose, potentially liquefiable soil and provide additional bearing support beneath building foundations.

Alternatively, if appropriate and depending on the specific site conditions, structures can be designed to accommodate the potential liquefaction-associated hazards, such as ground settlement.

Site-specific, design-level liquefaction studies will be performed prior to issuance of any building permits. These studies will consist of geotechnical investigations with site-specific seismic analysis and will provide ground improvement and/or other mitigative recommendations to address potential liquefaction-related ground hazards, should they exist. The recommendations will identify the specific recommended techniques for achieving the site-specific performance goals to mitigate liquefaction-related hazards (e.g., performance standards for specific ground improvement techniques, such as the level of densification to which the soil needs to be improved to mitigate liquefaction). Available, possible techniques include overexcavation and replacement of liquefiable soil, compaction grouting, deep dynamic compaction, vibro-compaction and stone or soil-cement columns. All project structural designs will incorporate and conform to the requirements and recommendations in the geotechnical investigations. Furthermore, the geotechnical engineer will review project plans and specifications and observe ground improvement and foundation installation to check for compliance to the geotechnical recommendations and requirements.

Seismic and Liquefaction Effects on Movement or Exposure to Toxics

As described in Attachment 4 Parcel-by-Parcel Summary and Expected Transfer Dates, there are ongoing remediation programs related to former Navy operations. The Navy is providing soil and groundwater cleanup to reduce chemical concentrations to meet cleanup levels approved by federal and state regulatory agencies. Surface covers (e.g. physical barriers) will be installed as part of the cleanup to support the development (e.g., building slabs, pavement for roads, concrete for sidewalks, 2 feet of clean soil for landscaped areas) and minimize exposure to background metals. These physical barriers will limit exposure and protect humans from long-term health risks even if breaches in the barriers temporarily occur. Operation and maintenance plans for these barriers will be carried out to monitor and repair any breaches. Therefore, if ground rupture were to occur, contaminants should not be released at levels presenting a concern to human or ecological health (see Figures 24-1 and 24-2). Additionally, the Institutional Controls placed on these areas would enforce action to maintain protection of the environment and prevent human exposure.

Under CCR Title 27, Section 21090, all closed landfills are required to have an engineered landfill cap if landfill materials are left onsite. The engineered landfill cap is intended to maintain a protective seal and keep moisture and rain from penetrating the landfill waste and prevent human and environmental exposure to the disposed waste. If the Navy proposes and USEPA concurs that an engineered cap may be placed on top of the Parcel E-2 landfill to prevent unsafe exposures from chemicals allowed by the regulators to be left in place, operation and maintenance plans will be developed and

carried out to monitor for and repair potential breaches should they occur due to seismic events or liquefaction (see Figure 24-3). Any breach of the engineered cap would be repaired so that no long-term health risks would occur.

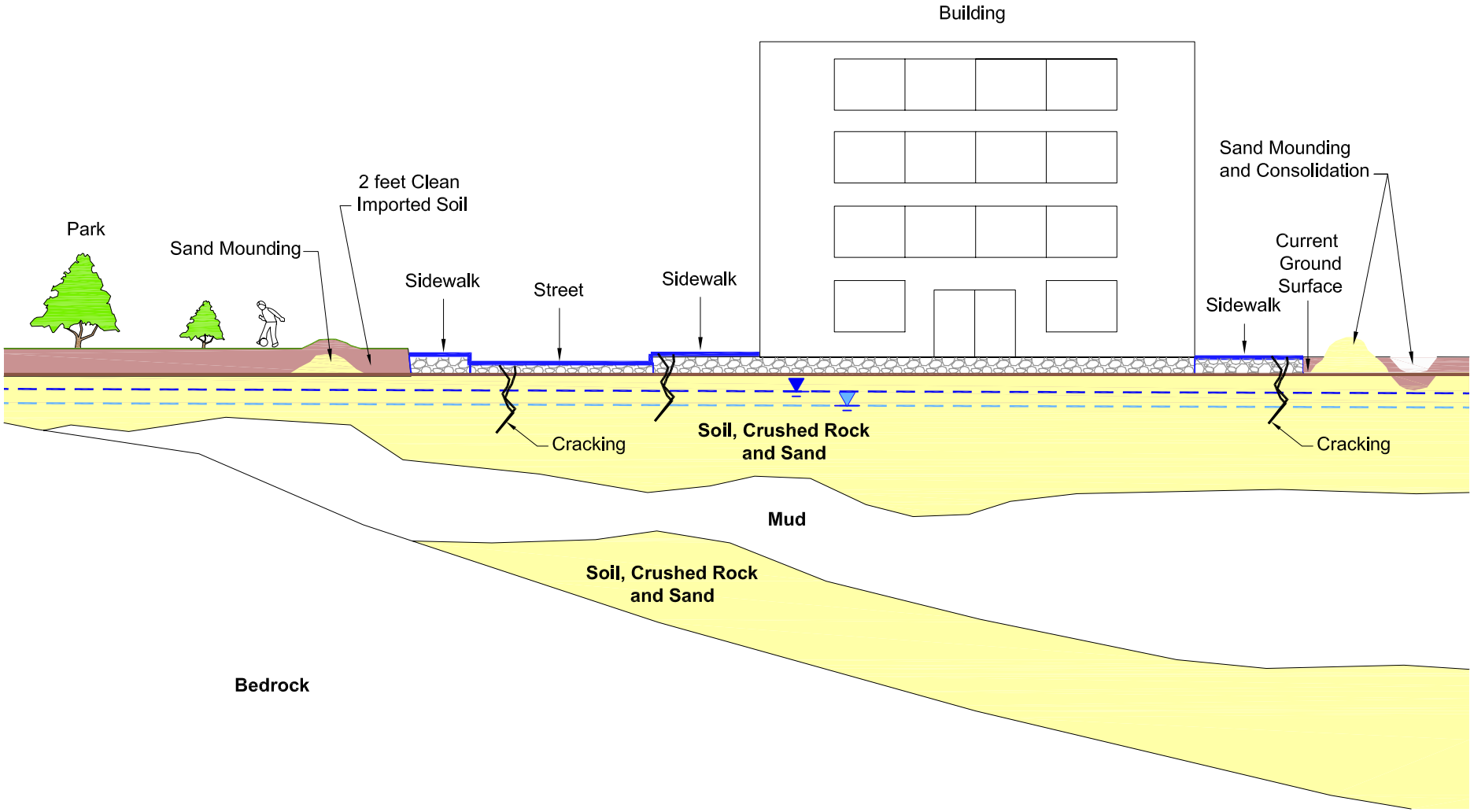
Sea Level Rise Effects on Liquefaction Potential

If sea level should rise in the future, it is anticipated that the groundwater table elevation would also rise. As liquefaction can only occur in saturated soils located below the groundwater table, this would cause soil not currently beneath the groundwater table to become saturated and potentially susceptible to liquefaction in the future. Site design will accommodate a future sea level rise of 36 inches. To account for the future impact of sea level rise, design-level liquefaction analysis and modeling will be based on a groundwater table elevation that assumes groundwater is 36 inches higher than present conditions. Since liquefaction occurs only in soil below the groundwater table and the groundwater table would be higher because of sea level rise, depending on the site-specific soil conditions, the thickness of the liquefiable layer and corresponding liquefaction-induced settlement could be increased. Another, mitigating consideration, however, is that as the groundwater level rises, the thickness of soil that would potentially be subject to seismically induced differential compaction settlement (loose non-saturated sand above the groundwater level) would decrease. Depending on site-specific soil conditions, the settlement of soil induced by liquefaction (saturated soil below the groundwater) and the settlement of soil induced by differential compaction (non-saturated soil above the groundwater) would be expected to be of similar magnitude; therefore, the overall impact on the site from liquefaction would be unaffected or negligibly affected by sea level rise (see Figures 22-1 through 22-3). Thus, the net effect of sea level rise on seismically induced settlement (increased thickness of potentially liquefiable layer and decreased thickness of layer subject to differential compaction) is expected to be minimal.

Mitigation Measures to Potential Liquefaction-Related Hazards

Mitigation measures can reduce or avoid potential liquefaction-related hazards and include structural measures and ground improvement methods. Structural measures could include the construction of deep foundations, which transfer building loads to competent soil or rock below the potentially liquefiable zone, or use of a structural, sufficiently reinforced mat foundation to distribute loads and reduce the potential for damage to the structure from liquefaction-induced ground settlement with flexible utility connections to allow some settlement beneath the buildings. If liquefaction estimates are such that these treatments would not address liquefaction and settlement-related impacts adequately, ground improvement measures could include (1) over excavation and replacement of potentially liquefiable soil with engineered compacted fill, (2) compaction grouting to densify the loose, potentially liquefiable soil, (3) dynamic compaction (deep dynamic compaction or rapid impact compaction) to densify the loose, potentially liquefiable soil, (4) vibro-compaction (also known as vibro-flotation) to densify the loose, potentially

liquefiable soil, (5) stone columns to provide pathways for pore pressure to dissipate in potentially liquefiable soil, thus reducing the potential for liquefaction-induced settlement, and (6) soil-cement columns to densify the loose, potentially liquefiable soil and provide additional bearing support beneath building foundations. Performance standards that must be achieved are set forth in the geotechnical report recommendations specific to the site-specific ground improvement technique.



EXPLANATION

Groundwater Level After Sea Level Rise

Current Groundwater Table

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Not to Scale

HUNTERS POINT SHIPYARD
San Francisco, California

ALL AREAS EARTHQUAKE AND LIQUEFACTION

Date 04/21/10	Project No. 3848.02	Figure 24-1

Treadwell&Rollo

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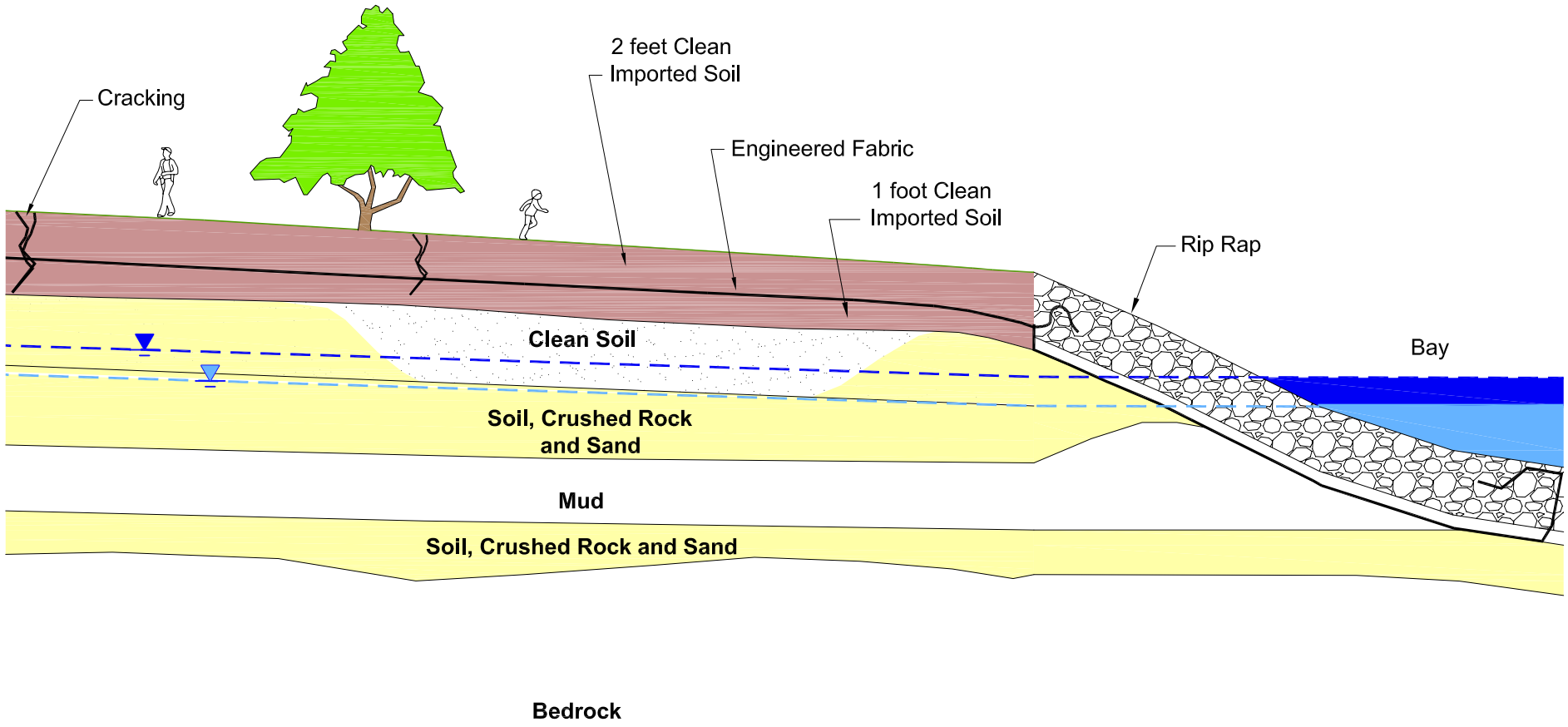

EXPLANATION

Groundwater Level After Sea Level Rise

Current Groundwater Table

DRAFT

Not to Scale

HUNTERS POINT SHIPYARD
San Francisco, California

PARCELS 7/18 AND E SHORELINE EARTHQUAKE AND LIQUEFCATION

Date 04/21/10	Project No. 3848.02	Figure 24-2

Treadwell&Rollo

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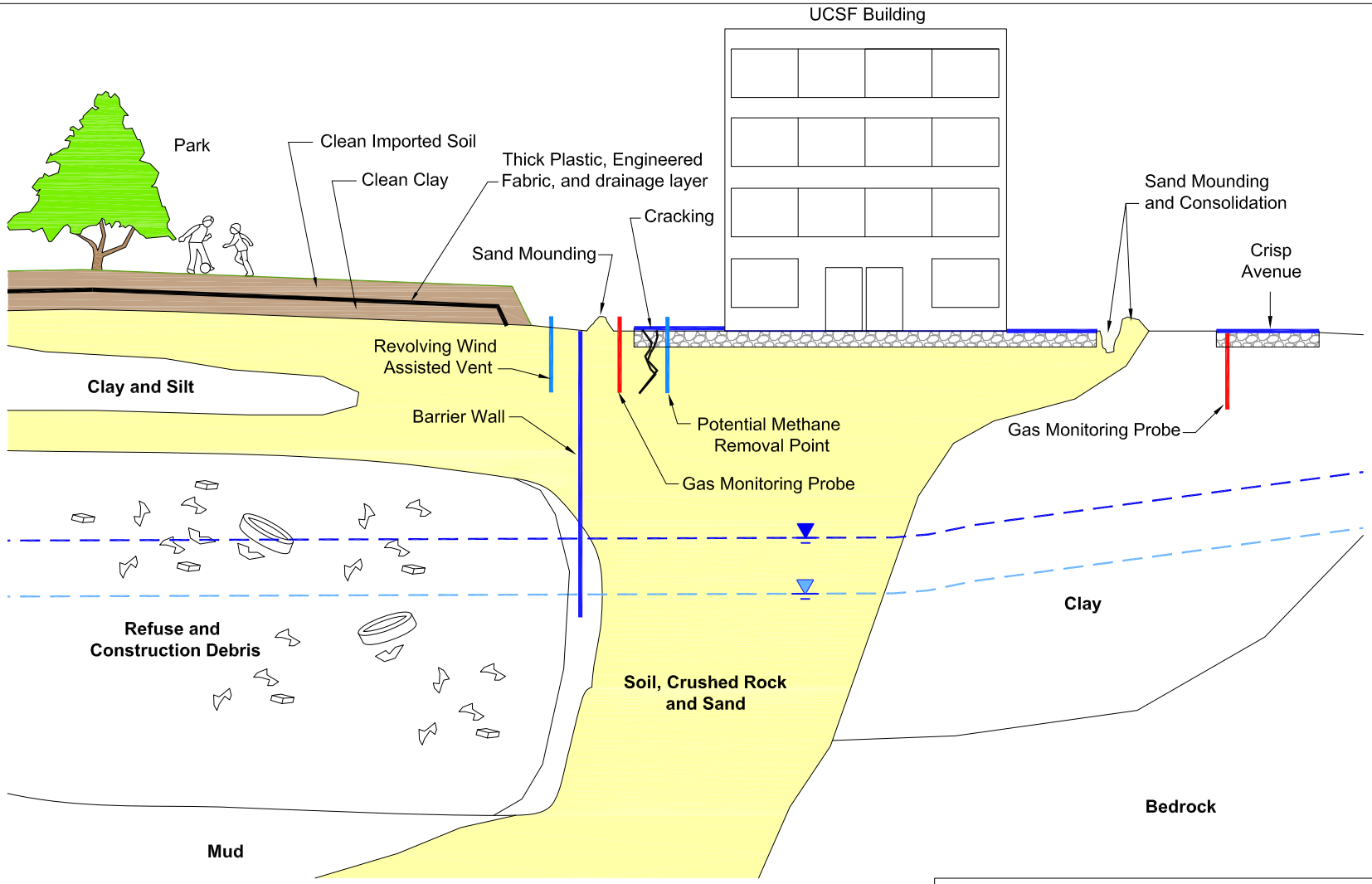

EXPLANATION

Groundwater Level After Sea Level Rise

Current Groundwater Table

DRAFT

Not to Scale

HUNTERS POINT SHIPYARD
San Francisco, California

PARCEL E-2 LANDFILL
EARTHQUAKE AND LIQUEFACTION

Date 04/21/10	Project No. 3848.02	Figure 24-3

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Attachment 25

Acronym List

Acronym List

ABM	sandblast grit
ACI	Aircraft Components, Inc.
ACM	asbestos containing materials
ADMP	Asbestos Dust Mitigation Plan
Agency	San Francisco Redevelopment Agency
AOC	Administrative Order on Consent
ARICs	Areas Requiring Institutional Controls
ATSDR	The Federal Agency for Toxic Substances and Disease Registry
BAAQMD	Bay Area Air Quality Management District
BCDC	the San Francisco Bay Conservation and Development Commission
BFE	Base Flood Elevation
Cal/OSHA	the California Occupation Safety and Health Administration
CBC	the California Building Code
CCR	California Code of Regulations
CDPH	California Department of Public Health
CEG	California Certified Engineering Geologists
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act.
CFD	Community Facilities District
COPC's	Contaminants of Potential Concern
CRUP	Covenant to Restrict Use of Property
DBI	Department of Building Inspection
DCP	Dust Control Plan
DEIR	Draft Environmental Impact Report
DHS	Department of Health Services
DMMO	Dredged Material Management Office
DTSC	Department of Toxics Substances Control

Acronym List
(Continued)

EC	Engineering Controls
EDB	ethylene dibromide
EIR	Environmental Impact Report
ETCA	Environmental Transfer Cooperative Agreement
FEIR	Final Environmental Impact Report
FEMA	Federal Emergency Management Agency
FFA	Federal Facility Agreement
FOSET	Finding of Suitability for Early Transfer
FOST	Finding of Suitability for Transfer
FS	feasibility study
GE	Geotechnical Engineers
GHAD	Geologic Hazard Abatement District
GMPs	gas monitoring probes
HASP	health and safety plan
HPS	Hunters Point Shipyard
HRA	Historical Radiological Assessment
IR	Parcel Installation Restoration
LBP	lead-based paint
LUC RD	Land Use Control Remedial Design
LUCs	Land Use Covenants
MMR	Massachusetts Military Reservation
MMRP	Mitigation Monitoring and Reporting Program
Montrose	Montrose Chemical Corporation
NCP	National Contingency Plan
NOAA	National Oceanic and Atmospheric Administration
PAHs	polycyclic aromatic hydrocarbon
PCBs	polychlorinated biphynols

Acronym List
(Continued)

RI/FS	Remedial Investigation / Feasibility Study
RMPs	Risk Management Plans
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SCC	California State Coastal Conservancy
SFDPH	San Francisco Department of Public Health
SFRA	San Francisco Redevelopment Agency
Shipyard	Hunters Point Shipyard
SLR	Sea Level Rise
SVOCs	semi-volatile organic compounds
SWPPP	Storm Water Pollution Prevention Plan
UC	Utility Corridor
USEPA	Unites States Environmental Protection Agency
VOCs	volatile organic compounds

Draft Report
April 2010

Candlestick Point & Hunters Point Shipyard Phase II

Transportation Plan


FEHR & PEERS
TRANSPORTATION CONSULTANTS
AECOM
LENNAR
URBAN

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1 Executive Summary

1.1 Introduction

The Candlestick Point and Hunters Point Shipyard Phase II Development Plan contemplates a new, mixed-use community in southeastern San Francisco. Lennar, the lead developer of the community, is working in partnership with various City agencies and departments to define the Development Plan. The Development Plan is subject to environmental review and approval by various city, state, and federal authorities.

This Transportation Plan is one of several plans and reports describing the proposed Development Plan. The Transportation Plan presents goals, principles, and strategies to meet the travel demand needs of an emerging mixed-use, urban neighborhood in southeast San Francisco. Incorporating innovative practices and sustainable development principles, the Plan seeks to provide residents, employees, and visitors of the two neighborhoods with high-quality transportation infrastructure and services.

Goals & Principles

The Transportation Plan's (referred to throughout as "the Plan") elements prioritize walking, bicycling, and transit travel, making these attractive and practical transportation options. At full build-out, the project targets a weekday PM peak hour work trip mode split of not more than 45 percent auto, and not less than 30 percent transit, 20 percent walk, and 5 percent bike, as shown in **Table 1**. This aspirational goal compares with an existing PM peak hour work trip mode split in Superdistrict 3 (SD 3) of 66 percent auto, 16 percent transit, 16 percent walk, and 2 percent bike. Integrating transportation and land use, providing new and improved transit options, an effective Transportation Demand Management (TDM) Program, and properly designed streets will help achieve this goal. The project also enhances the self-sufficiency and sustainability of adjacent neighborhoods (such as the Bayview, Executive Park / Visitacion Valley, the Central Waterfront, India Basin and across the border in Brisbane) by linking these areas to the project's strong transit, bicycle and pedestrian networks, and neighborhood services within close proximity while providing seamless transit to regional employment center and destinations. This linkage should also serve to reduce overall trips and vehicle miles traveled in the area.

Table 1: Project Mode Split Goals - PM Peak Hour Work Trips

Mode	SD-3 Mode Split[1]	Project Travel Behavior Goal[2]	Difference
Auto/Carpool	66%	45%	**-21%**
Transit	16%	30%	**+14%**
Walk	16%	20%	**+4%**
Bike	2%	5%	**+3%**
Total	100%	100%	

Source: Fehr & Peers – May 2009

1 The Metropolitan Transportation Commission (MTC) maintains a set of regional travel analysis zones for use in MTC planning studies. In addition to regional travel analysis zones and counties, MTC supports an intermediate geographic scale, "superdistricts," for analysis and reporting purposes. There are 34 superdistricts in the nine-county Bay Area.

2 Goals are based on precedents described in Table 3 at full project build-out. Auto mode share is a maximum, others are minimums.

It is important to note that even small differences in the current SD-3 mode split and the project travel behavior goal will have a large effect due to the scale of the Project.

In addition, the project aims to create a community with all of the services necessary to achieve self-sufficiency, and serve as a model of sustainable development and transportation.

Integration of Transportation & Land Use

The land use plan incorporates a dense, compact development pattern centered around mixed-use transit nodes. The following illustrate a few features of the plan designed to promote pedestrian, bicycle, and transit travel:

- The development pattern is designed to facilitate walking and cycling for internal trips, and bus service for internal trips, trips downtown and to regional transit hubs;
- Significant portions of the project area are preserved as open space;
- Streets are designed to support a variety of travel modes at moderate to low speeds, and are arranged in a pedestrian-oriented grid of small blocks;
- All of the homes within each community are within a 15-minute walk of a transit stop, where frequent service will be available;
- Neighborhood services and retail are integrated into residential blocks;
- The mixed-use center of each community will serve as an arrival point and activity hub, and provide a source of identity; and
- The phasing of development and supporting transportation infrastructure is designed to support the goals above at each major increment.

Integration of Transportation Improvements with Surrounding Bayview Neighborhood

The proposed street and transit improvements would be integrated with the surrounding transportation network and facilities to benefit the entire Bayview Hunters Point neighborhood, in addition to serving the proposed project demands.

1.2 Project Definition

The proposed land use program for the redevelopment of Candlestick Point and Hunters Point Shipyard, summarized in **Table 2**, includes residential, regional and local-serving retail, research and development space, office, hotel, and open space. In addition to these uses, the program includes a new stadium for the San Francisco 49ers and an arena that could be used for smaller events and performances.

Table 2: Land Use Program

Land Use	Candlestick Point	Hunters Point Shipyard
Residential	7,850 homes	2,650 homes
Regional-Serving Retail	635,000 sqft	---
Neigborhood-Serving Retail	125,000 sqft	125,000 sqft
Office	150,000 sqft	---
Research & Development	---	2,500,000 sqft
Hotel	220 rooms	---
Stadium	---	69,000 seats
Arena	10,000 seats	---
Parks & Open Space	105 acres	231 acres
Artist Studios	---	255,000 sqft[1]
Community Services	50,000 sqft	50,000 sqft

Source: Lennar Urban – October 2009

1 The Project includes 225,000 sq. ft. of existing artist studio space that would be renovated and replaced.

The density and arrangement of land uses at Candlestick Point and Hunters Point Shipyard are designed to actively encourage the use of walking and bicycling as primary travel modes within the project area. The street network is intended to better manage vehicle access while supporting transit ridership, public character, and sustainability.

A comprehensive set of roadway improvements, shown with transit improvements in Figure 1, have been identified to meet the project's increase in auto travel demand. These include, but are not limited to:

- Major roadway access improvements that would provide four to six lanes from US 101 / Harney Way to Candlestick Point and four lanes from US 101 / Cesar Chavez Street to Hunters Point Boulevard;
- A new Yosemite Slough Bridge to provide a Bus Rapid Transit (BRT), pedestrian/bicycle, and game day-only auto connection between Hunters Point Shipyard and Candlestick Point; and
- Various location-specific improvements discussed later in this document.

1.3 Transportation Program

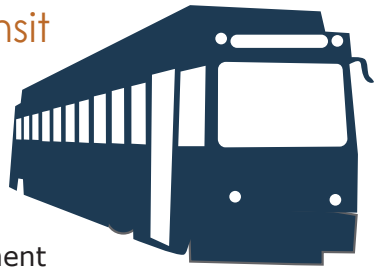
The Transportation Program consists of strategies to contain as many trips as possible within Candlestick Point and Hunters Point Shipyard, maximize the usefulness of walking and bicycling, and discourage the overall use of private automobiles through a parking plan, increased transit service, and a Transportation Demand Management (TDM) Program. The Transportation Program is shown in **Figure 1** and described below.

Internal Trip Capture & Pedestrian and Bicycle Facilities

The mixed-use neighborhoods proposed by the Development Plan will include office, retail, recreation, and entertainment centers designed to meet residents' and employee needs, and reduce the demand for off-site trips. Travel within the project will be facilitated by a network of pedestrian and bicycle routes, secure bike parking, traffic-calmed streets, and urban design that makes walking and bicycling comfortable and convenient.

Figure 1: **Potential Transportation Improvements**

New and Improved Transit



Current Muni service to Candlestick Point and Hunters Point Shipyard is limited, and no circulation is provided between the two areas. Connections to major employment centers in Downtown San Francisco and the Peninsula are inefficient. To maximize the effectiveness and convenience of transit service to and within the project site, the following strategies have been developed:

- Extensions of existing Muni routes to Candlestick Point and Hunters Point Shipyard, and new express buses providing direct service to Downtown San Francisco;
- New BRT (Muni Line 28L) service operating between Candlestick Point and Hunters Point Shipyard, and connecting to SamTrans, BART, Caltrain, and the T-Third Metro line at the Bayshore Caltrain station and Balboa Park BART station;
- A transit center at Hunters Point Shipyard to enable efficient and convenient transfers;
- Bus service throughout the day, evening, and weekends at high levels of service to provide convenient connections to employment and activity centers and the regional transit network; and
- Other areawide improvements associated with the Transit Effectiveness Project (TEP) and Muni's Service Plan

Transportation Demand Management Program

Also included in the Plan is a comprehensive TDM program that will include elements to facilitate carpools and vanpools, encourage carsharing, increase the convenience of transit services, and create a walkable and bikeable community. Specific components of the TDM program include:

- A full-time Transportation Coordinator to manage the real-time transportation needs of residents, employees and visitors to Candlestick Point and Hunters Point Shipyard;
- Residential parking sold or leased separately from units[3];
- Bicycle support facilities to encourage bicycling, including parking facilities (racks, lockers and showers), stations at key locations with attended bicycle parking and repair facilities, and potentially a bike sharing program;
- The inclusion of a transit pass with monthly homeowner's dues; and
- Visitor parking charges at variable market rates to encourage transit use. This can be accomplished by increasing parking rates during the peak period when transit service is most frequent, or increasing parking rates progressively to favor short-term parking over long-term parking, discouraging commuter parking.

3 This arrangement would not apply to the 1,655 "Agency Affordable" units, which are limited by tax-credit financing requirements.

Implementation and Monitoring

A phasing strategy has been developed for the transportation improvements and programs to coincide with the project's development. Some specific components of the monitoring plan include:

- The Plan will be implemented at the earliest stages of development and specific phasing of the programs and services will be adopted;
- Outreach to residents, employees and visitors will inform them of all available transportation options; and
- The impact of events at the football stadium and performance venue will be monitored to determine the opportunities for applying TDM to encourage the use of non-auto modes.

1.4 Game Day Considerations

As part of the development of Hunters Point Shipyard, a new state-of-the-art 69,000-seat stadium for the San Francisco 49ers is planned. Based on input from the operators of the existing stadium and the 49ers staff, parking, access, and operations have been analyzed for typical football game day events, with the following results:

- The new stadium would provide approximately 17,415 parking spaces for all types of game day attendees;
- Secured valet bike parking should be provided for a minimum of one percent of all expected participants and be located within a one block radius of an entrance to the stadium;
- The new stadium would be served by more transit-only routes (streets or lanes closed to all traffic other than buses) including regular and game-day service to and from regional transit connections (e.g., BART, Caltrain, etc.) compared to the existing stadium;
- At build-out, the new stadium would be expected to clear 46 percent faster following events than the existing stadium at Candlestick Point; and
- As a key improvement for the stadium, the project proposes a network of traffic signals, overhead lane use control signals, changeable message signs, and reversible lanes to optimize intersection operations during pre- and post-game conditions.

1.5 Non-Stadium Variants

Alternate plans have been developed in the event that the 49ers franchise elects not to build a new stadium at Hunters Point Shipyard. These alternatives place an expanded research and development campus on the stadium site, adding between one half and two and a half million square feet of space to the two million square feet indicated in **Table 2**. The non-stadium alternatives aspire to achieve the same mode split goals as the stadium alternative.

1.6 Analogies

Comparison to other San Francisco Neighborhoods

The project's mode split goals have been compared with 2000 U.S. Census data on existing travel behavior in other San Francisco neighborhoods. As shown in Table 3, at least eight other neighborhoods in San Francisco exhibit travel behavior comparable to the project's goals.

The auto mode share goal of 45 percent is a desired maximum share, while the transit, walk and bike mode share goals are desired minimum mode shares.

Table 3: Mode Split Comparison - San Francisco Neighborhoods

Neighborhood	PM Peak Hour Residential Work Trips		
	Transit	Walk/Bike	Auto/Carpool
Marina	40%	11%	49%
Mission	39%	14%	47%
Nob Hill	39%	32%	29%
North Beach	30%	40%	30%
Parkmerced	31%	4%	65%
Russian Hill	35%	15%	50%
Telegraph Hill	31%	29%	40%
Western Addition	45%	16%	39%
% That Would Achieve **Project Goals**	**30%**	**25%**	**45%**

Source: U.S. Census Bureau – 2000

TDM Program Case Studies

In an effort to evaluate the effectiveness of the TDM measures proposed by the project, other projects that have implemented similar programs and conducted post-implementation monitoring and analysis have been reviewed.

Case studies from northern California (including San Jose, Stanford University, Berkeley, and Sacramento), Oregon, British Columbia, and Florida have been identified that evaluate the effectiveness of TDM measures, such as transit passes and improved bus service, that are similar to those proposed for this project. These TDM case studies are presented in detail in Section 7.2 of this Plan. Since the TDM case studies relate primarily to employers at office or campus uses, additional strategies and innovations for large scale residential and retail will be needed.

While it is difficult to isolate the effectiveness of any one of the TDM elements described in the Plan, it is clear from these case studies that comprehensive, multi-faceted TDM plans can achieve dramatic shifts in mode choice.

2 Introduction

2.1 The Development Plan

The Candlestick Point and Hunters Point Shipyard Phase II Development Plan (the Development Plan, referred to throughout as "the project") contemplates a new, mixed-use community within the Bayview Hunters Point Redevelopment Area. The project consists of 10,500 homes; over 3 million square feet of retail, office, and research and development uses; one hotel; over 300 acres of new and restored parklands, and recreational open spaces; civic and community uses; and a new stadium site for the San Francisco 49ers. Additional research and development uses are proposed for the site should the 49ers select another location for the stadium. This Transportation Plan (referred to throughout as "the Plan") is one of several plans and reports (including a Sustainability Plan and Urban Design Plan) describing the project and the existing and future circumstances of the project site and surrounding areas.

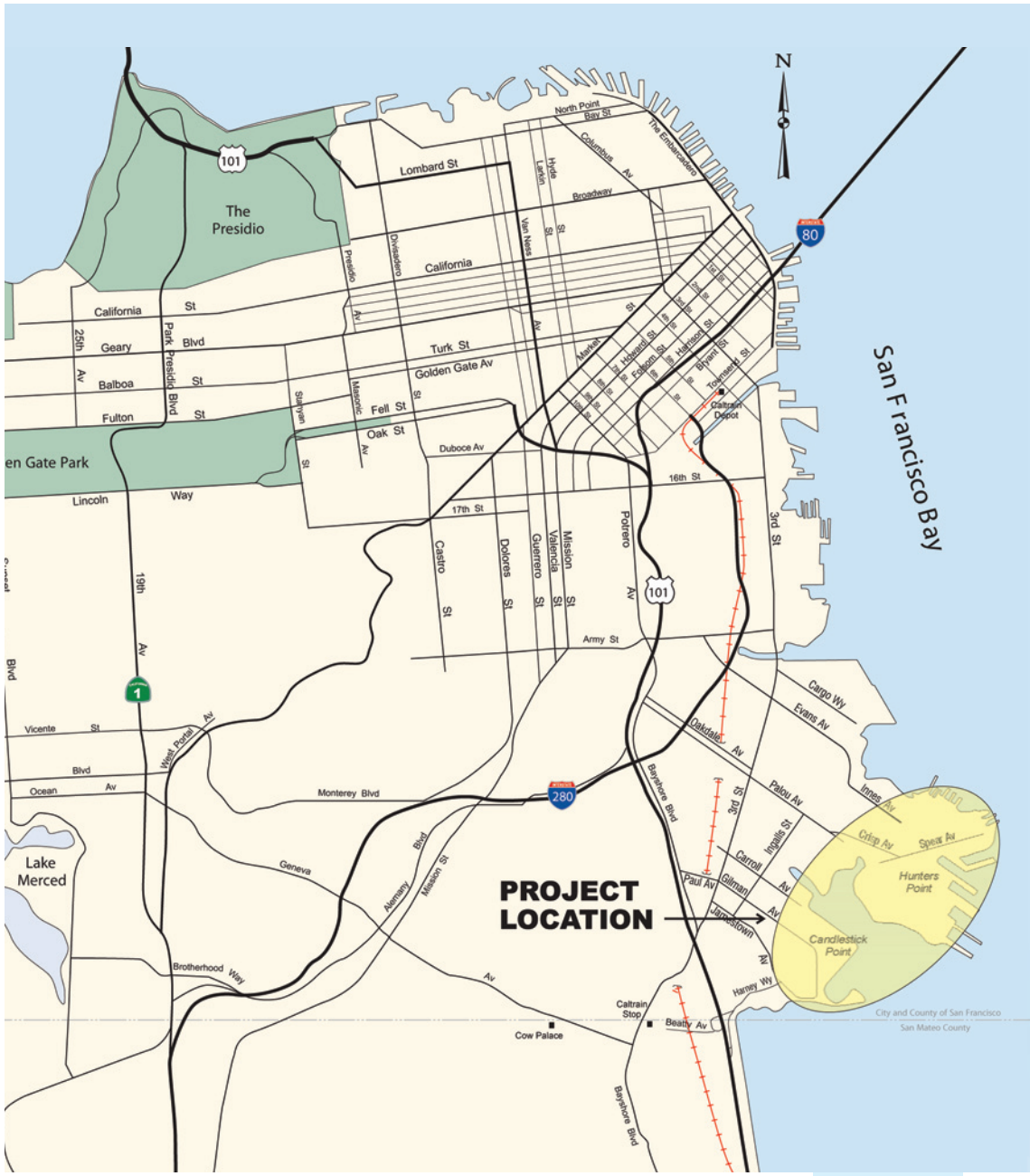
Lennar is the lead developer for the Development Plan. Lennar is working in partnership with various City agencies and departments to define the project and plan for its implementation, including, among others, the Mayor's Office of Economic and Workforce Development, the Redevelopment Agency, the Planning Department, and the Municipal Transportation Agency (SFMTA). The project's components and design have been informed by feedback obtained at over 200 public meetings and workshops with the Bayview Hunters Point communities and presentations before the Bayview Project Area Committee (PAC) and Shipyard Citizens Advisory Committee (CAC).

The project is subject to environmental review under the California Environmental Quality Act, and the approval of the Redevelopment Commission, the Planning Commission, and the Board of Supervisors as well as other city, state, and federal permitting authorities. The Transportation Plan has been refined through discussions with City representatives and the environmental review process. Implementation of the final Transportation Plan will require commitments from Lennar, the City (including SFMTA), and other transportation agencies.

2.2 Project Location

The Candlestick Point and Hunters Point Shipyard Phase II Development Plan site is located along the San Francisco Bay waterfront in the Bayview Hunters Point neighborhood in southeastern San Francisco, as shown in **Figure 2**. The neighborhood is generally bounded by Cesar Chavez Street to the north, US 101 to the west, the San Mateo County line and the City of Brisbane to the south, and San Francisco Bay to the east.

Figure 2: **Project Location**



The project site includes Candlestick Point, a 267-acre site within the Bayview Hunters Point Redevelopment Plan Area; and Hunters Point Shipyard Phase II, a 421-acre site within the Hunters Point Shipyard Redevelopment Plan Area. Phase I of the Hunters Point Shipyard is a 75-acre site within the Shipyard Redevelopment Plan Area and is under development with 1,600 new homes and approximately 20,000 square feet of retail uses.

2.3 Goals, Principles & Strategies

The Candlestick Point and Hunters Point Shipyard Phase II Transportation Plan presents goals, principles, and strategies to meet the travel demand needs of an emerging mixed-use, urban neighborhood in southeast San Francisco. Incorporating innovative practices and sustainable development principles, the Plan seeks to provide residents, employees, and visitors of the two neighborhoods with high-quality transportation infrastructure and services.

The Plan's elements prioritize walking, bicycling, and transit, making these attractive and practical transportation options, which are consistent with the City's Climate Action Plan (CAP) (September 2004). The CAP outlined a number of transportation strategies, which, when combined with other strategies, will help the City reduce its overall greenhouse gas emissions to 20 percent below 1990 levels by the year 2012. The CAP's recommended transportation actions are grouped into six categories:

- Increase the use of public transit as an alternative to driving
- Increase the use of ridesharing as an alternative to single occupancy driving
- Increase bicycling and walking as an alternative to driving
- Support trip reduction through employer based programs
- Discourage driving
- Increase the use of clean air vehicles and improve fleet efficiency

The goals, principles, and strategies in this Transportation Plan are centered around these six themes, and are supported by investment in infrastructure and services that provide alternatives to private auto travel. Also included in the Plan are travel demand management strategies designed to encourage the use of transit and alternative modes of travel.

Another objective of the project is to integrate the proposed roadway and transit improvements with the surrounding neighborhood, as many of these improvements will have impacts on adjacent communities. The Plan seeks to create transportation solutions that benefit the entire Bayview Hunters Point neighborhood in addition to serving the proposed project demands.

Goals

- The project targets a weekday PM peak hour mode split of not more than 45 percent auto travel, and not less than 30 percent transit, 20 percent walk and 5 percent bike;
- The project will create a lively community with a strong sense of place and the services necessary to help achieve self-sufficiency;
- The project proposes a balance of uses that will enable residents to meet their daily needs with reduced automobile dependency;
- The project will serve as a model for the region and the nation of sustainable development and transportation and land use integration; and
- The project will reduce vehicle miles traveled and carbon emissions compared to traditional development patterns.

Principles

- Transportation systems should be fully integrated with existing networks to provide seamless connections and service;
- The development pattern is designed to facilitate walking, cycling, and transit trips;
- Internal streets are designed to support a variety of travel modes at moderate to low speeds (between 15 and 25 mph), arranged within a pedestrian-oriented grid of small blocks;
- Arterials have a design speed of 35 mph to allow for rapid transit service competitive with the private car;
- The mixed-use center of each community should serve as an arrival point and activity hub, and provide a source of identity;
- All of the homes within each community should be within a quarter mile of a transit stop, where frequent bus service will be available;
- All residences should also be within walking distance of basic neighborhood retail;
- Transit service to and from Candlestick Point and Hunters Point Shipyard should operate throughout the day, evening, and weekends at high levels of service to provide convenient connections to employment and activity centers and the regional transit network;
- Auto access should be discouraged through traffic calming, parking management, and other policies;
- Transportation demand measures should support transit, pedestrian, and bicycle travel and will be directed at residents, employees and visitors; and
- Phasing of development and transportation infrastructure shall be coordinated to support the achievement of the goals above in each major increment of development.

Strategies

To achieve the project goals according to the above principles, the Plan includes the following elements:

- Homeowners' dues will include the cost of a transit pass that can be used on Muni, Caltrain, or BART services;
- Residential parking will be "unbundled", i.e., sold or leased separately from units[4];
- All non-residential parking will be unbundled from residential and visitor uses, and incur a parking charge at variable market rates to encourage transit use (potentially with increased rates during peak periods and/or for long-term parking);
- A full-time Transportation Coordinator will be employed to manage the real-time transportation needs of residents, employees, and visitors;
- Travel within the development areas will be facilitated by bike lanes and frequent bus rapid transit service operating in dedicated lanes and with signal priority;
- Elements of the Transportation Demand Management Program will be implemented at the earliest stages of development and specific phasing of the measures and services will be adopted;
- The TDM program will be monitored for its effectiveness in meeting the Plan objectives. Outreach to residents, employees, and visitors will inform them of all available transportation options. The TDM Plan is an Appendix to this Transportation Plan;
- The impact of events at the stadium and performance venue will be monitored to determine opportunities for applying TDM to encourage the use of non-auto modes; and
- Development controls and design guidelines will require the public and private spaces to be designed to create a high quality pedestrian environment.

4 This arrangement would not apply to the 1,655 "Agency Affordable" units, which are limited by tax-credit financing requirements.

2.4 Outreach & Community Feedback

This plan relies extensively on community outreach and input. Input and guidance from City agencies and long-standing agreements with members of the Bayview/Hunters Point community have been carried into this Plan, ranging from the high-level (e.g., San Francisco's "Transit First" policy and SFMTA's policies supporting safe pedestrian and bicycle circulation) to specific neighborhood-related transportation goals and objectives of the Bayview/Hunters Point area.

To complement the broader policies and agreements, input and feedback reflecting the most current conditions informed by new developments in the transportation system is included. An extensive multi-agency series of workshops, panels, hearings and presentations was conducted between 2008 and 2010 to update and refine information for this Transportation Plan.

Community-Based Outreach & Input

The specially-formed, community-staffed, Project-based Policy Advisory Committee (PAC) and Citizens Advisory Committee (CAC) presided over numerous meetings focused on transportation and held in the project area. In the spring and summer of 2009, a transportation workshop series with a brainstorming / report-back format was held with three focus areas:

- India Basin Roundtable (specific focus on the India Basin area)
- Northern Connections Workshop (brainstorming/report-back, broad scope with special focus on Hunters Point)
- Southern Connections Workshop (brainstorming/report-back, broad scope with special focus on Candlestick Point and Yosemite Slough)
- Workshop summary presentations to the CAC and the PAC

To complement these workshops and broaden the discussion to adjoining neighborhoods and regional connections, other specific community meetings were held with these areas of focus:

- Adjoining neighborhoods: Visitacion Valley, India Basin, Bayview,
- Environmental sustainability
- The San Francisco Bay Trail
- The San Francisco Bicycle Plan
- Bi-County Study (San Francisco County/San Mateo County transportation & land use coordination)

Community Priorities

These community-based workshops informed a set of goals to guide the decisions, multi-modal balance, and phasing/implementation strategies of this Plan, expressing the following priorities and focus areas:

- **Safety:** to address perceived safety concerns as well as incidents
- **Equity:** to avoid a "gated community" effect
- **Connectivity:** to ensure efficient and fast transit to other city neighborhoods and the region, and for seamless travel for all modes between neighborhoods
- **Community:** to create a walkable "village" context
- **Sustainability:** to emphasize transit, pedestrian and bicycle circulation

- **Vitality:** to promote economic and aesthetic health of the area
- **Quality of Life:** to address noise and other impacts to residential areas
- **Adaptability:** to ensure "complete" communities in all phases

The community also provided specific direction related to the design of key arterials such as Harney Way, Innes Avenue, and Palou Avenue, defining alternative transportation paths and routes (including over and around Yosemite Slough and India Basin), managing impacts on residential areas, refining transit and bicycle route extensions and service plans, protecting the on-street parking supply, integrating the safety and design enhancements of the San Francisco Better Streets Plan, and implementing development and infrastructure on phases.

Public Agency Review

Input and feedback from the public agencies involved in the development of the Transportation Plan was obtained from a series of technical meetings to focus on such transportation engineering issues as emergency vehicle access, Muni service planning needs, land use and transportation coordination and phasing, street greening, truck route circulation, highway and interchange design, waterfront transportation access and parks access.

The agencies engaged include, among others:

- San Francisco Planning Department and Commission
- SF Redevelopment Agency and Commission
- Board of Supervisors and its various committees
- SF Municipal Transportation Agency (MTA Board, Board CAC, Traffic Engineering, Muni Capital and Service Planning)
- San Francisco County Transportation Authority: Bi-County project and CAC
- Bayview Transportation Improvements Project
- TASC (includes SFMTA, DPW, SF Police Department and SF Fire Department)
- Mayor's Office on Disability
- SF Public Utilities Commission
- SF Environment and Commission
- SF Department of Public Health
- SF Greening
- City/County Association of Governments for San Mateo County
- City of Brisbane
- Caltrain/SamTrans
- Association of Bay Area Governments
- Metropolitan Transportation Commission
- Water Emergency Transportation Authority
- California Department of Transportation
- California State Parks Foundation

Through these processes, the Plan incorporates community priorities, coordination between local and regional networks and between transportation and land use phases, and recommendations following technical review and refinements from responsible agencies. The outreach and input also assisted in accommodating a variety of goals, reconciling conflicts and ensuring the over-arching accommodation of safety and sustainability in the Project area.

3 Existing Conditions

The Project site is located in the southeastern portion of San Francisco along the Bayview Waterfront. The Candlestick Point and Hunters Point Shipyard Phase II portions of the project lie within the Bayview Hunters Point Redevelopment Plan Area and the Hunters Point Shipyard Redevelopment Plan Area, respectively.

The site is relatively isolated from the rest of the City. The surrounding topography of hills and Yosemite Slough create a context with limited connections to the existing regional transportation network. Essentially, only two main roads serve the site, Harney Way on the south and Innes Avenue on the north, and many intermediate streets do not connect through to other neighborhoods. These conditions create challenges with respect to providing convenient transit service and accommodating traffic demand.

3.1 Transit Challenges

In the existing transit network, shown on **Figure 3**, two Muni lines currently reach the edge of the project area: 19-Polk and 29-Sunset. This is inadequate to serve the project, as the lines do not provide any circulation within the project area, nor do they directly serve employment centers in San Francisco or the Peninsula. Both lines provide access to Downtown San Francisco via a transfer to the T-Third Metro line. Although the 29-Sunset connects to the regional rail system at Balboa Park BART station, it is accessed via a circuitous route that is subject to congestion. Further, neither the 19-Polk nor the 29-Sunset connects to Caltrain, which operates in the project's vicinity[5] and serves as the primary connection to the major employment centers on the Peninsula and in the South Bay.

Bayshore remains the only Caltrain Station in the project area after the closure of Paul Avenue Station in 2005. No other transit services connect directly to Bayshore Station, which is served only by local trains running on an hourly basis during peak periods. An average of only 171 weekday boardings was recorded at the station in 2007. Without convenient transit connections from Candlestick Point and Hunters Point Shipyard and with limited service, the existing Bayshore Station is insufficient to serve the project area. In addition to the two lines previously mentioned, four additional Muni lines – 23-Monterey, 24-Divisadero, 44-O'Shaughnessy and 54-Felton – serve the greater Bayview neighborhood west of Candlestick Point and Hunters Point Shipyard.

Muni has recently conducted a comprehensive review of its services in an effort to improve its performance and efficiency. This "Transit Effectiveness Project" (TEP) specifies changes to several of the lines that would serve Candlestick Point and Hunters Point Shipyard. One of the proposals from the TEP involved replacing the 19-Polk line with the 48-Quintara line in the study area. These changes would improve service to the Bayview Hunters Point neighborhood, but additional improvements beyond the TEP proposals would be needed to serve the project.

5 Bayshore Caltrain Station is located in San Mateo County.

Figure 3: **Existing Transit Network**

3.2 Traffic Challenges

The existing street network at Hunters Point Shipyard has served relatively little traffic since the shipyard that occupied the site closed. The street network within Candlestick Point also sees comparatively low levels of traffic, except on game days at Candlestick Park, where the 49ers currently play home games. Streets in both areas have been only marginally maintained and are not sufficient for the high-density development of the proposed land use plan.

Further outside the project boundaries, the arterial streets in the area – Third Street, Cesar Chavez Street, and Harney Way – lack the capacity needed to accommodate frequent transit service and the level of auto traffic expected to be generated by the project. Hunters Point Shipyard in particular has only two access points and an indirect route to the freeway network. Access to Candlestick Point is currently constrained by the narrow right-of-way between Executive Park and San Francisco Bay. East-west access is inhibited by the limited number of streets that cross the Caltrain tracks, some of which are narrow or have steep grades. Current Candlestick Park game-day and special event conditions present additional challenges related to street traffic and on-street parking prohibitions. These include use of sidewalks for parking, private automobiles on streets designated for transit and taxis only, overcrowded buses delayed on congested streets, and numerous automobile/pedestrian/bicycle conflict points.

Other transportation challenges that exist in the area include:

- Third Street cuts across the street grid at an angle, with no direct alternate routes;
- Industrial and residential land uses are mixed together in Bayview, resulting in truck traffic in some residential areas; and
- Streets are relatively wide, potentially encouraging higher vehicular speeds.

For regional access to the project area, the project is near US 101, part of the regional freeway network. The US 101 interchanges that serve the project area (at Harney Way, Third Street, Paul Avenue, Silver Avenue, Alemany Boulevard / Industrial Avenue, and Cesar Chavez Street / Jerrold Avenue) will likely lack the capacity to accommodate the additional auto travel demand for a project of this size in the future. There is no direct on-ramp from westbound Cesar Chavez Street to southbound US 101 or from southbound Third Street to northbound US 101. The interchanges on I-280 that serve the project area (Silver Avenue / Alemany Boulevard / Industrial Street, and Cesar Chavez / 25th Street) are underutilized and are close to Hunters Point Shipyard. The existing roadway network is shown in **Figure 4**.

3.3 Pedestrian & Bicycle Challenges

Pedestrian access throughout the project site is limited due to topographic constraints and minimal connectivity within the street network. Existing land uses are primarily industrial and not conducive to pedestrian activity. Currently waterfront access is limited to a portion of the Bay Trail, a Class I facility that provides a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians, which extends along the southern shoreline of the Candlestick Point State Recreation Area.

Currently, bicycle facilities within the project area include Class III bicycle routes, which provide for a right-of-way designated by signs and pavement markings for shared use with motor vehicles. Existing Class III bicycle facilities are located on Carroll Avenue, Fitch Street, Hunters Point Expressway and Jamestown Avenue. The existing bicycle facilities provide minimal access to the proposed project site. There are no Class II on-street bicycle facilities separating vehicular traffic from bicycles within the project site.

Figure 4: **Existing Roadway Network**

3.4 Other Proposed Developments in the Project Area

There are also a number of other new development projects underway or at the planning stage in the area of the project site that will increase transit demand and automobile traffic. These proposed developments are summarized below, in terms of their net overall increases. **Figure 5** shows the location of these proposed developments in relation to the two project areas and to major transportation facilities.

Executive Parks (far left) and Visitacion Valley (left) will be part of the proposed developments

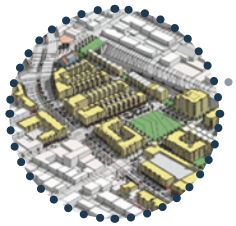
Executive Park
3,400 homes
90,000 sq. ft. of retail / restaurant

Hunters View
800 homes
6,400 sq. ft. of retail
21,600 sq. ft. of community services

India Basin Shoreline Area C
1,240 homes
100,000 sq. ft. of retail
1,365,000 sq. ft. of commercial space

Hunters Point Shipyard Phase I
1,600 homes
20,000 sq. ft. of retail

Brisbane Baylands
8,400,000 sq. ft. of development

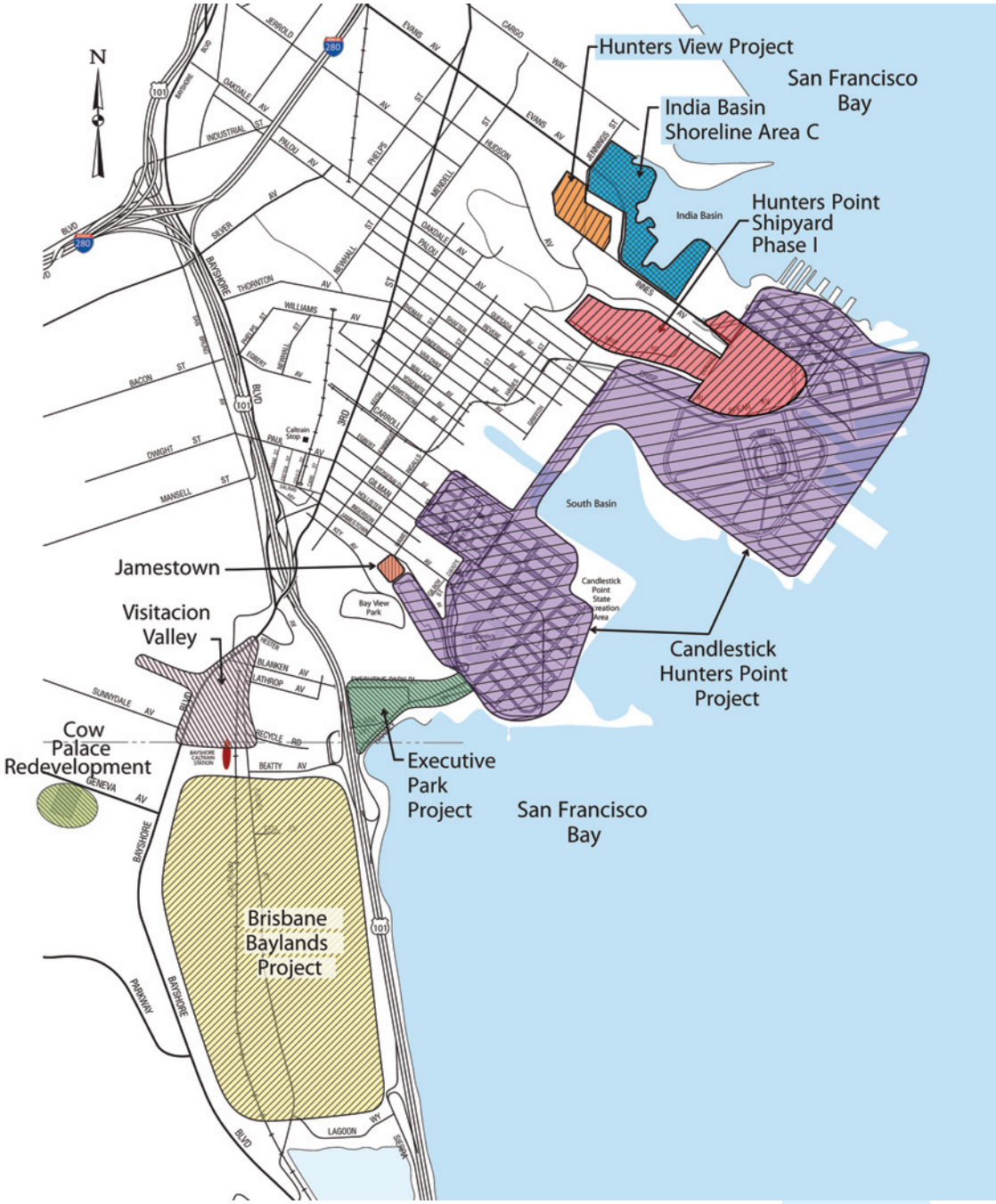


Cow Palace Redevelopment
1,700 homes
550,000 sq. ft. of commercial / research & development

Jamestown
approximately 200 homes

Visitacion Valley
1,600 homes
170,000 sq. ft. of retail
25,000 sq. ft. of community services

Figure 5: **Proposed Nearby Developments**



4 Project Definition

4.1 Land Use Program

The proposed Candlestick Point and Hunters Point Shipyard Phase II Development Plan land use program includes 10,500 homes; 885,000 square feet of retail uses; 150,000 square feet of office space; a research and development campus; one hotel; a 10,000-seat performance venue, and a National Football League stadium. The Plan also includes a number of city parks, sports fields, and new and restored open space in the Candlestick Point Recreation Area. A total of 336 acres are designated for recreational uses, including dual-use fields, and as open space. **Table 4** summarizes the proposed land use program for Candlestick Point and Hunters Point Shipyard Phase II. The locations of the project's proposed land uses are shown in **Figure 6**. A project alternative that does not include the stadium is discussed in Chapter 7.

Table 4: Land Use Program			
Land Use	**Candlestick Point**	**Hunters Point Shipyard**	**Project Total**
Residential	7,850 homes	2,650 homes	10,500 homes
Regional-Serving Retail	635,000 sq. ft.	-	635,000 sq. ft.
Neighborhood-Serving Retail	125,000 sq. ft.	125,000 sq. ft.	250,000 sq. ft.
Office	150,000 sq. ft.	-	150,000 sq. ft.
Research & Development	-	2,500,000 sq. ft.	2,500,000 sq. ft.
Hotel	220 rooms	-	220 rooms
Community Facilities	50,000 sq. ft.	50,000 sq. ft.	100,000 sq. ft.
Stadium	-	69,000 seats	69,000 seats
Arena	10,000 seats	-	10,000 seats
Parks & Open Space	105 acres	231 acres	336 acres
Artists Studios	-	255,000 sq. ft [1]	255,000 sq. ft
Source: Lennar Urban – October 2009			

1 The Project includes 225,000 sq. ft. of existing artist studio space that would be renovated and replaced.

Candlestick Point

At Candlestick Point, 7,850 new residential units are proposed. These units would be developed as two-story townhomes, four-to-eight-story mid-rise buildings, and high-rise towers. Some residential buildings will be mixed-use with residential units above ground-floor retail or office uses. Other residential buildings may include corner-store retail.

The housing program includes the redevelopment of the San Francisco Housing Authority's Alice Griffith site (also known as "Double Rock"), replacing the 263 existing units with a total of about 1,000 townhomes and four-story stacked flats. These new units will be made available to existing residents before the existing units are removed, so that no residents will have to be relocated.

A 635,000-square foot regional retail center is also envisioned at Candlestick Point. The proposed retail program is anticipated to include large-format shopping venues, restaurants, and entertainment uses such as a multi-screen movie theater and clubs with live music. The retail center is also proposed to include a 75,000-square foot performance venue seating 8,000 to 10,000. In addition, a hotel with 220 suites would be located at the regional-serving retail center. A parking structure adjacent to the regional retail center would accommodate approximately 2,600 vehicles.

An additional 125,000 square feet of neighborhood-serving retail space, such as grocers, coffee shops, and 150,000 square feet of office uses, is planned for Candlestick Point.

Hunters Point Shipyard Phase II

Hunters Point Shipyard Phase II includes 2,500 new residential units. These units would be developed as a mix of housing types including townhomes, four-story flats over parking, and residential towers. Some residential buildings will be mixed-use with residential units above ground-floor retail or office uses. Other residential buildings may include corner-store retail.

In addition, 125,000 square feet of neighborhood-serving commercial development would also be located at Hunters Point Shipyard, adjacent to an approximately two and a half million square-foot research and development campus, focused on "clean / green technology."

A site for a new, approximately 69,000-seat stadium for the San Francisco 49ers has also been designated at Hunters Point Shipyard. This site would accommodate an expanded research and development campus if the stadium is not built.

Figure 6: **Land Use Program**

4.2 Street Network & Urban Form

As noted earlier, Candlestick Point and Hunters Point Shipyard are relatively isolated and currently have limited connections to the existing roadway network and US 101 interchanges in the immediate vicinity. The condition of the existing streets is insufficient to meet the travel demand that the project will generate and there is no existing direct connection between Hunters Point Shipyard and Candlestick Point.

Both Candlestick Point and Hunters Point Shipyard have extensive waterfronts; however, access to the waterfront is currently limited to a portion of the Bay Trail at the southern end of Candlestick State Recreation Area. This project prioritizes multimodal access to the waterfront, which has been coordinated with Executive Park and other local developments.

The street network proposed for Hunters Point Shipyard and Candlestick Point is an extension of the existing grid of the adjacent Bayview neighborhood, using typical Bayview block sizes. This street pattern allows the axes of most streets to lie perpendicular to the Bay Shore with terminating vistas of the bay.

The proposed internal street network is intended to provide improved vehicular access while supporting transit ridership, public character, and sustainability. Streets are designed to emphasize non-auto travel and moderate the speed of auto traffic where required, successfully facilitating all movements. Proposed techniques include driveway access management; traffic calming features such as signage and striping, pedestrian bulbouts at intersections, and refuge islands; streetscape amenities including street furniture, lighting, and plantings; and other features that will assist in creating a high-quality pedestrian and bicycle network. Streets are designed to reflect their roles as the community's organizing framework while providing a safe and comfortable environment for all users.

The internal street network is composed of eight types of streets, as classified by the *San Francisco Better Streets Plan* (Draft for Public Review, June 2008): *Commercial Throughway, Residential Throughway, Neighborhood Commercial Street, Neighborhood Residential Street, Mixed-Use Street, Parkway, Park Edge Street and Alley.*

The guidelines of San Francisco's Better Streets Plan (BSP) were consulted throughout the planning of the project streets and sidewalks. In some cases, constraints in topography, transportation engineering and abutting land uses resulted in proposed sidewalk widths narrower than the idealized suggestions of the BSP. In extreme cases, constraints resulted in proposed sidewalks that, while ADA-complying, are narrower than the suggested BSP minimums.

The locations of each street type and sections for the variations of each are presented in **Figures 7A through 7P** on the following pages. The San Francisco Better Streets Plan strives to, when possible, have minimum sidewalk widths of 10 feet. The American Association of State Highway and Transportation Officials (AASHTO) and the San Francisco Bicycle Plan recommend a minimum on-street bicycle lane width of 5 feet when adjacent to a curb. All cross-sections strive to be consistent with the objectives of the San Francisco Better Streets Plan, AASHTO, and San Francisco Bicycle Plan:

The spine of the project's street network is a continuous arterial beginning in the northwest of Hunters Point and traveling south to Candlestick Point that connects the two project sites. The portion of the arterial within Hunters Point incorporates Innes Avenue, Robinson Street, and Crisp Road, growing wider as it moves south (as shown in **Figure 7A**). The portion of the arterial connecting Hunters Point and Candlestick Point incorporates an improved Griffith Street, Thomas Avenue, Ingalls Street and Carroll Avenue (**Figure 7B**). The final portion, Arelious Walker Drive, lies on the western edge of Candlestick Point and connects to an improved Harney Way at the southernmost point of Candlestick Point (**Figure 7C**).

Most locations on the project site would be within four to five blocks of this roadway spine, affording convenient access to residences and offices. The arterial skirts the edge of the two mixed-use "village centers" at Hunters Point Shipyard and Candlestick Point, providing access to their parking facilities and to transit services. The arterial is intended to provide extra capacity for truck traffic, which would use interior streets only as a direct connection from the arterial to a particular destination.

The Hunters Point Shipyard and Candlestick Point arterial streets would function as the primary thoroughfares of the project, with generally perpendicular collector, parkway and park edge streets (**Figures 7D, 7E and 7F**) playing a subordinate role.

BRT (Muni Line 28L) lanes would be coupled with Harney Way before diverting through the Candlestick Point site, using the Yosemite Slough Bridge to reach Hunters Point Shipyard. Automobiles would not be permitted to use the Yosemite Slough Bridge except on game days, and would instead be routed along an auto route alignment via Carroll Avenue, Ingalls Street, Thomas Avenue and Griffith Street. (**Figure 7B**).

The local streets which form the balance of the street network are Neighborhood Residential streets, of which there are four variations, and both private and public alleys. Their cross-sections are shown in **Figure 7G**. Auto travel lanes are uniformly ten feet except in instances where the travel lane is shared by a bicycle or bus route in which case they are eleven feet wide. Local streets at the stadium site are comprised of an inner and outer ring road, as shown in **Figure 7H**.

The proposed Yosemite Slough Bridge would extend Arelious Walker from Candlestick Point to Crisp Avenue in Hunters Point Shipyard. The bridge would contain a landscaped greenway, two BRT lanes, and a Class I bicycle/pedestrian path. On 49ers game days, the landscaped greenway would be converted to four peak direction travel lanes for game day auto traffic. The Yosemite Slough Bridge would not be used for vehicular traffic during secondary events or other non-game day purposes, excepting emergency vehicle access, as needed. In the case of the non-stadium variants, the bridge would have the same profile, less the landscaped greenway, as shown in **Figure 7I**.

Several roadway lane configurations would be temporarily changed to allow for the efficient egress of auto traffic from the proposed 49ers stadium after a game's conclusion. These roadways include Innes Avenue, Robinson Avenue, and Fisher Avenue on the north side of the Hunters Point Shipyard; Crisp Avenue on the southern side of the Hunters Point Shipyard

(**Figure 7J**); Griffith Street, Thomas Avenue, and Ingalls Street between the Shipyard and Candlestick Point (**Figure 7K**); and Arelious Walker and Harney Way on Candlestick Point (**Figure 7L**). In all cases, a lane of inbound traffic will be dedicated for local traffic and emergency access vehicles.

Initially, Harney Way would be designed with a wide landscaped strip between the general-purpose roadway and the state park along the waterfront, as shown in **Figure 7C**. If needed, a portion of this landscaped area would be rebuilt to provide an additional lane from the proposed Harney interchange east to Arelious Walker Drive, as shown in the corresponding Sections in **Figure 7M**. Refinements to this configuration (number, locations, and design of turn lanes, for example) may be necessary following completion of ongoing studies related to the Executive Park development site and the Harney Way interchange.

In the case of the non-stadium variants (discussed in Chapter 7), three types of Neighborhood Commercial streets would serve the research and development campus (**Figure 7N**), and the width of Crisp Road would be reduced, as shown in **Figure 7O**.

A number of improvements would be made to off-site streets, generally those that provide east-west access to Third Street. **Figure 7P** shows the improvements to off-site streets, including Jamestown Avenue, Gilman Avenue, and Innes Avenue/Hunters Point Boulevard. Improvements would also be made to Palou Avenue and Ingerson Avenue; however the cross-sections of those streets would remain unchanged.

Dedicated BRT (Muni Line 28L) lanes are shown in these cross-sections and in plan to illustrate the continuity of this transit alignment through the project area. The project intends to construct most or all of these lanes with "greenways" (permeable surfaces with durable landscaping/planting) as an innovation supporting the principles of San Francisco's Better Streets Plan. Greenways are also planned where BRT or auto traffic does not regularly travel to serve as a visual, permeable green buffer between traffic/travel lanes and sidewalks. On game days, these greenways would accommodate either transit or extra traffic to provide an additional travel lane for vehicle traffic. This innovative treatment has been successfully employed in several other cities in the US.

Many street cross-sections include asterisks and/or alternative dimensions that indicate how key streets would function in accommodating post-game traffic on days when the stadium is in use. These complement the more detailed information about traffic lane configurations on select streets and access to regional arterial and freeways covered in Chapter 6.5.

For maximum flexibility, the grades, width, and turning radii for the BRT lanes are designed to be consistent with SFMTA design standards for light rail operations. However, no light rail is proposed as part of this project.

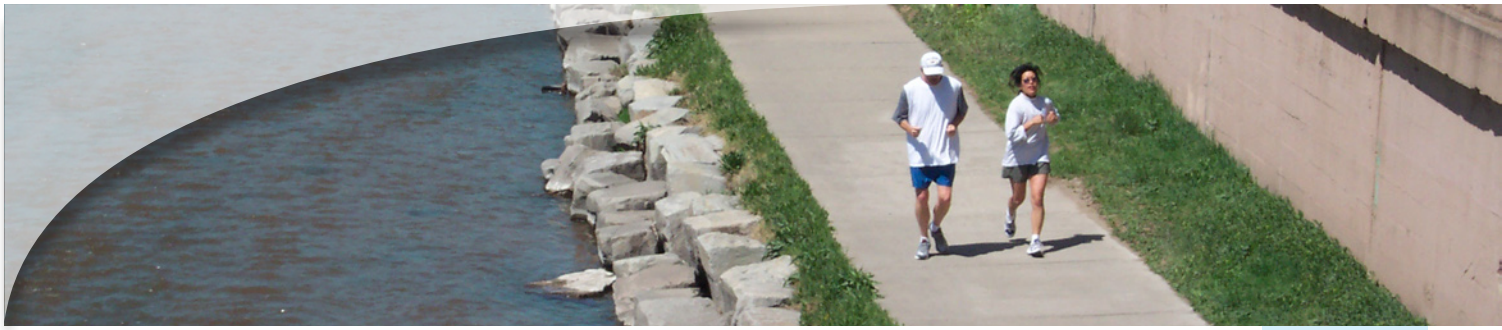


Figure 7A: **Hunters Point Shipyard Arterials**

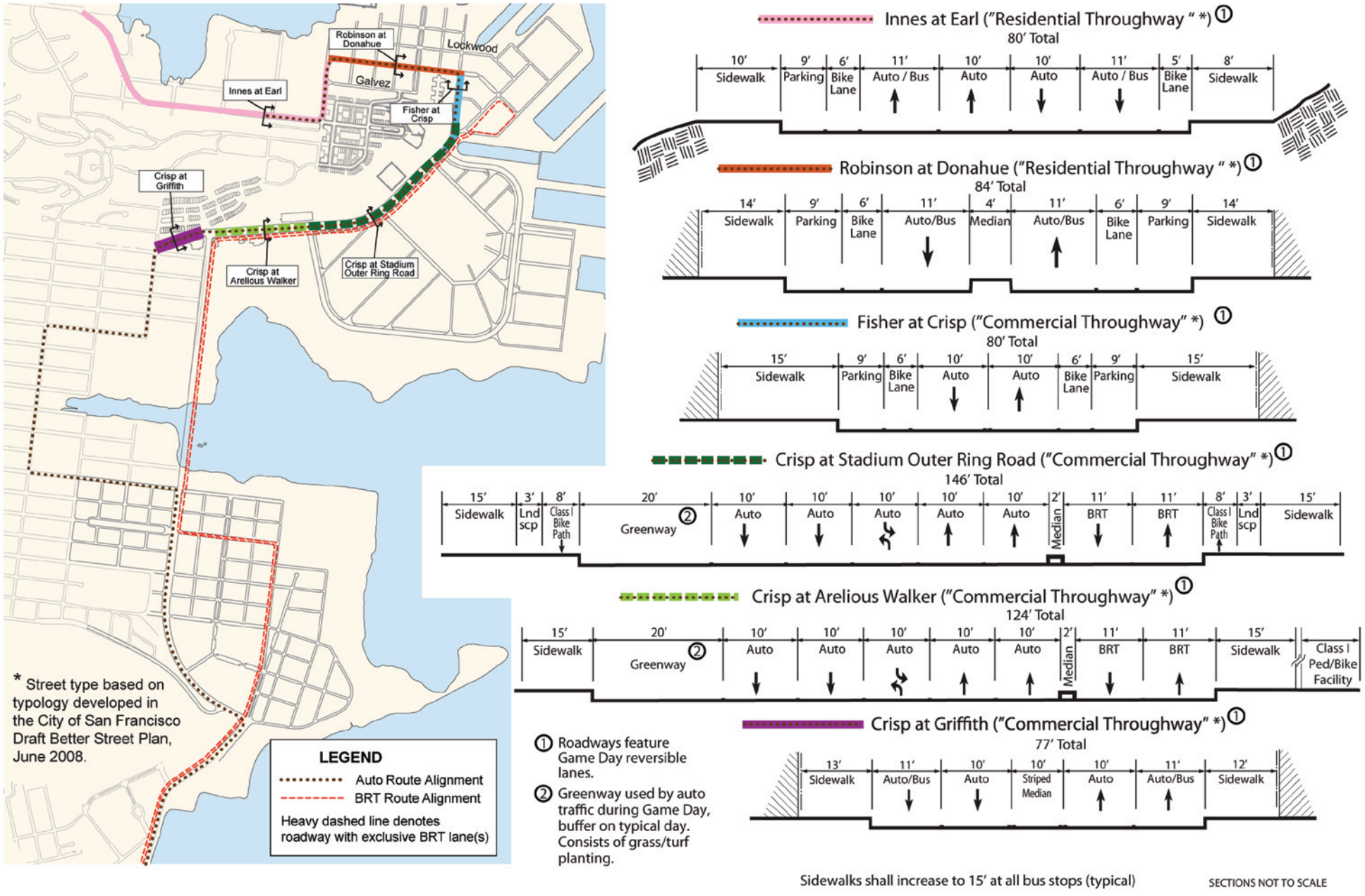
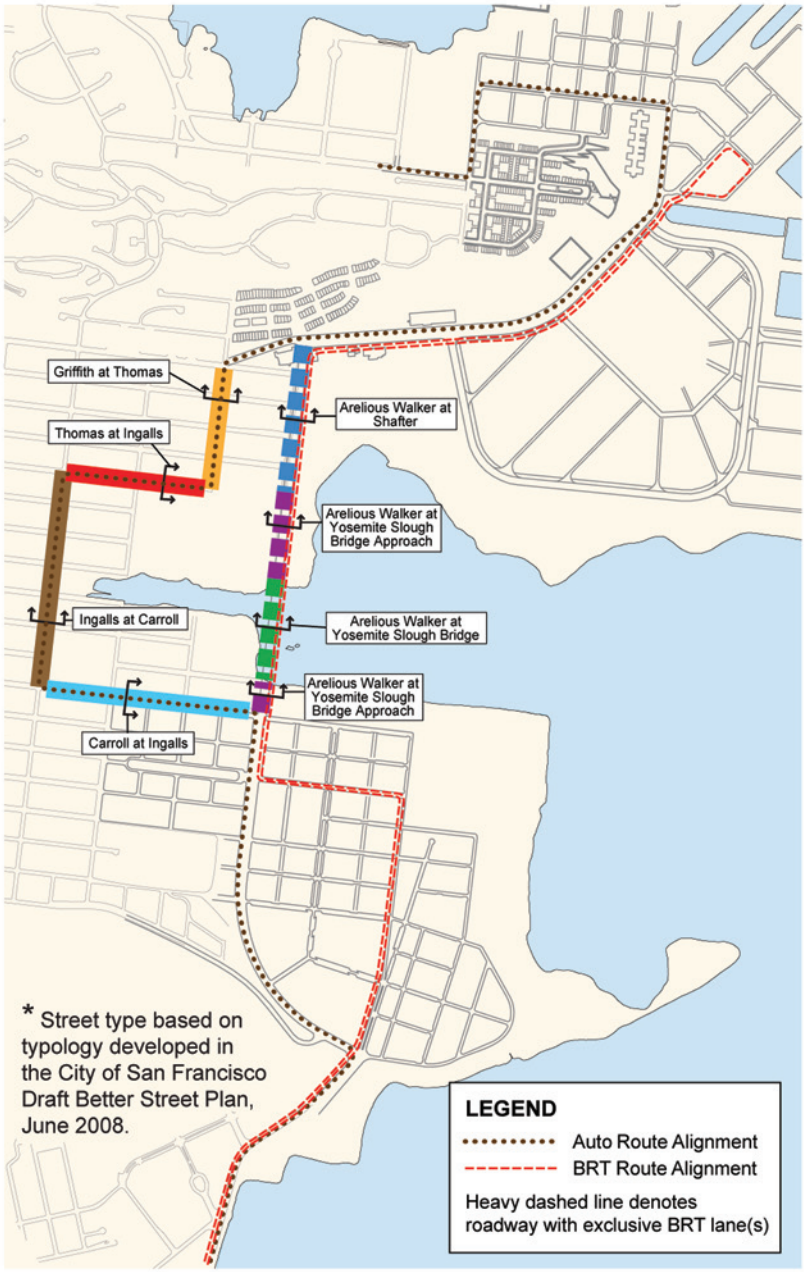
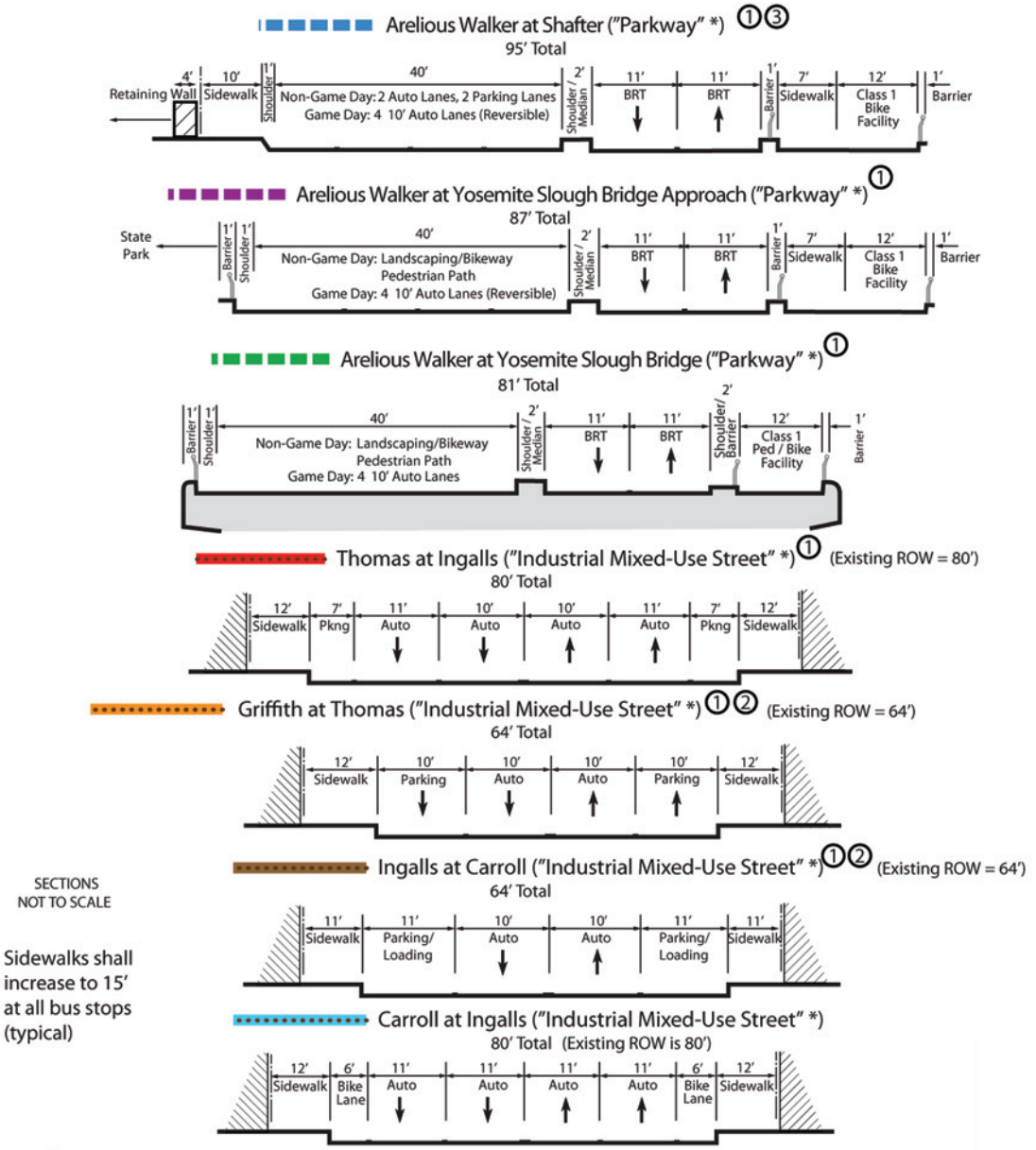


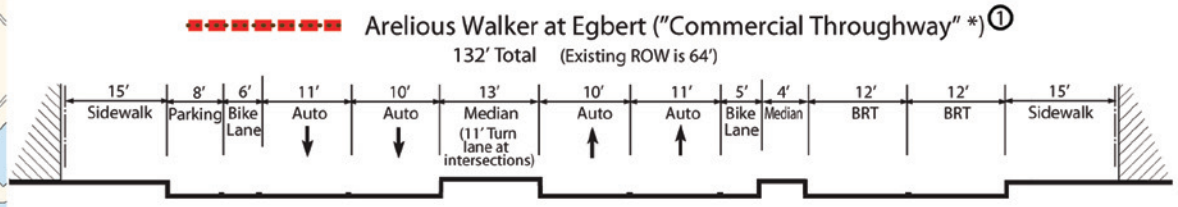
Figure 7B: **Yosemite Slough Arterials**

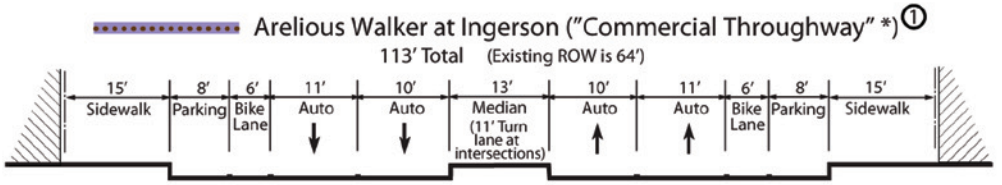


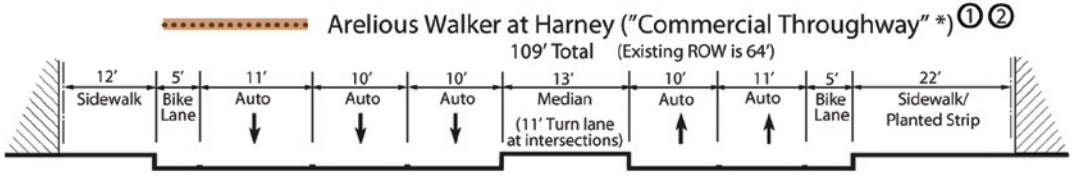


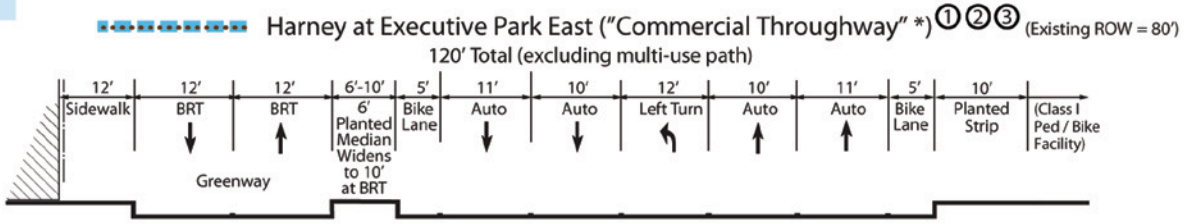
① Roadways feature Game Day reversible lanes.
② Truck loading is permitted on either side of Ingalls and Griffith from 6 AM to 4 PM; parking/loading lane becomes auto travel lane from 4 PM to 7 PM.
③ Park with multi-use paths is adjacent to the street right-of-way.

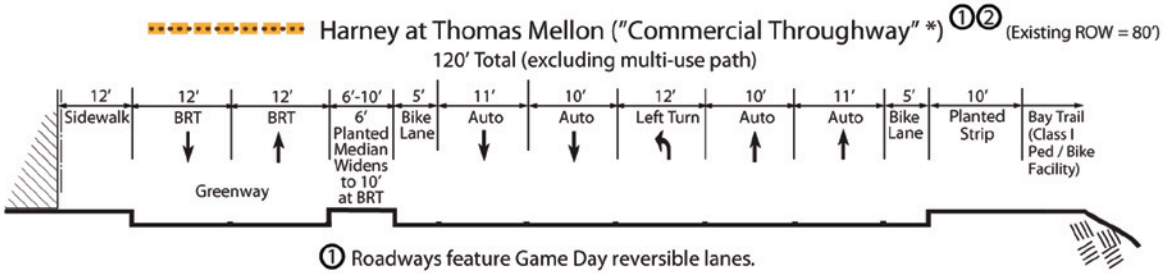
Figure 7C: **Candlestick Point Arterials**











SECTIONS NOT TO SCALE

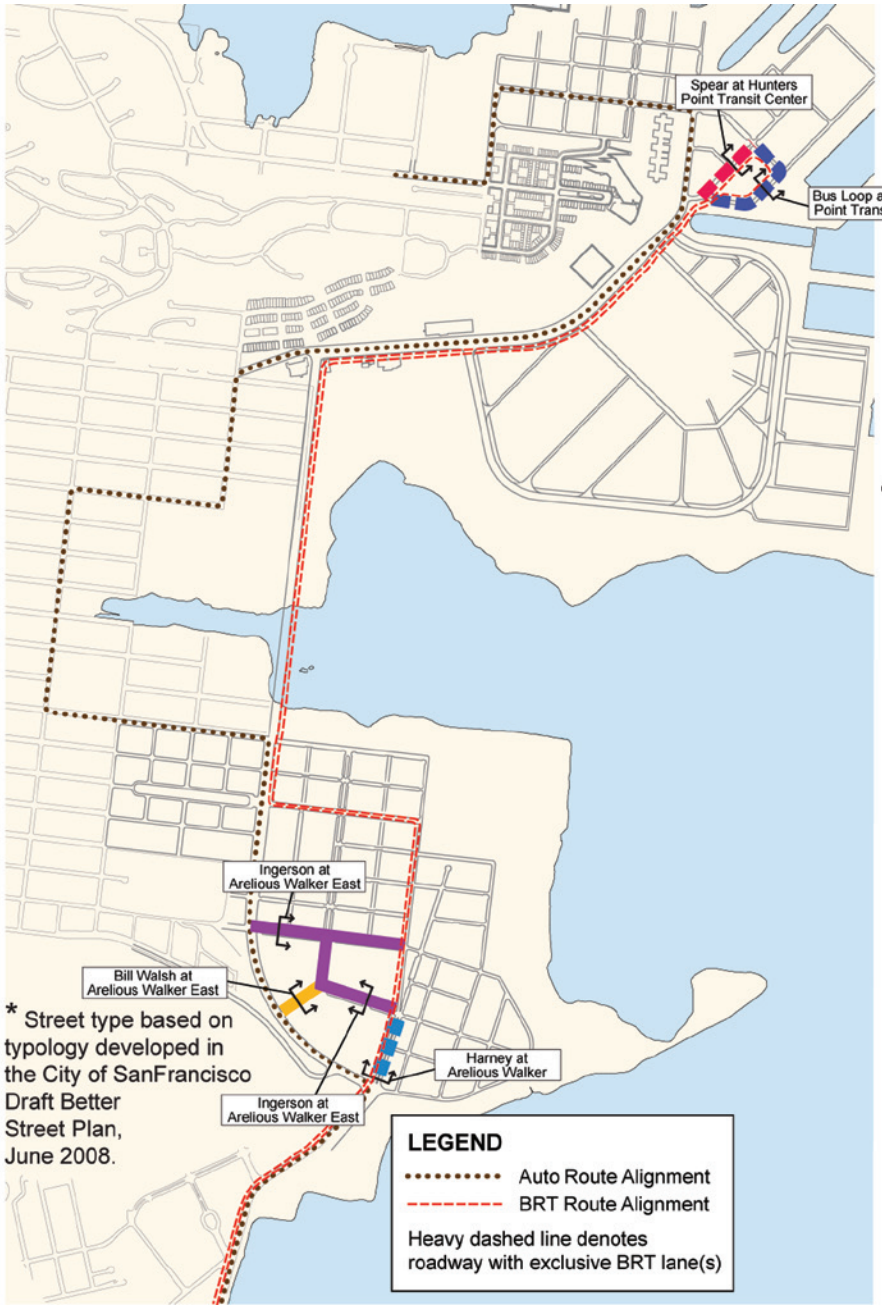
① Roadways feature Game Day reversible lanes.

② If necessary, the section will be reconfigured to add an additional auto lane to serve increased traffic levels.

③ Median separator BRT lanes and westbound auto/bike travel lanes narrows to 2' to accomodate 10' max westbound right-turn lane at Executive Park Boulevard East.

Sidewalks shall increase to 15' at all bus stops (typical)

Figure 7D: **Collectors**



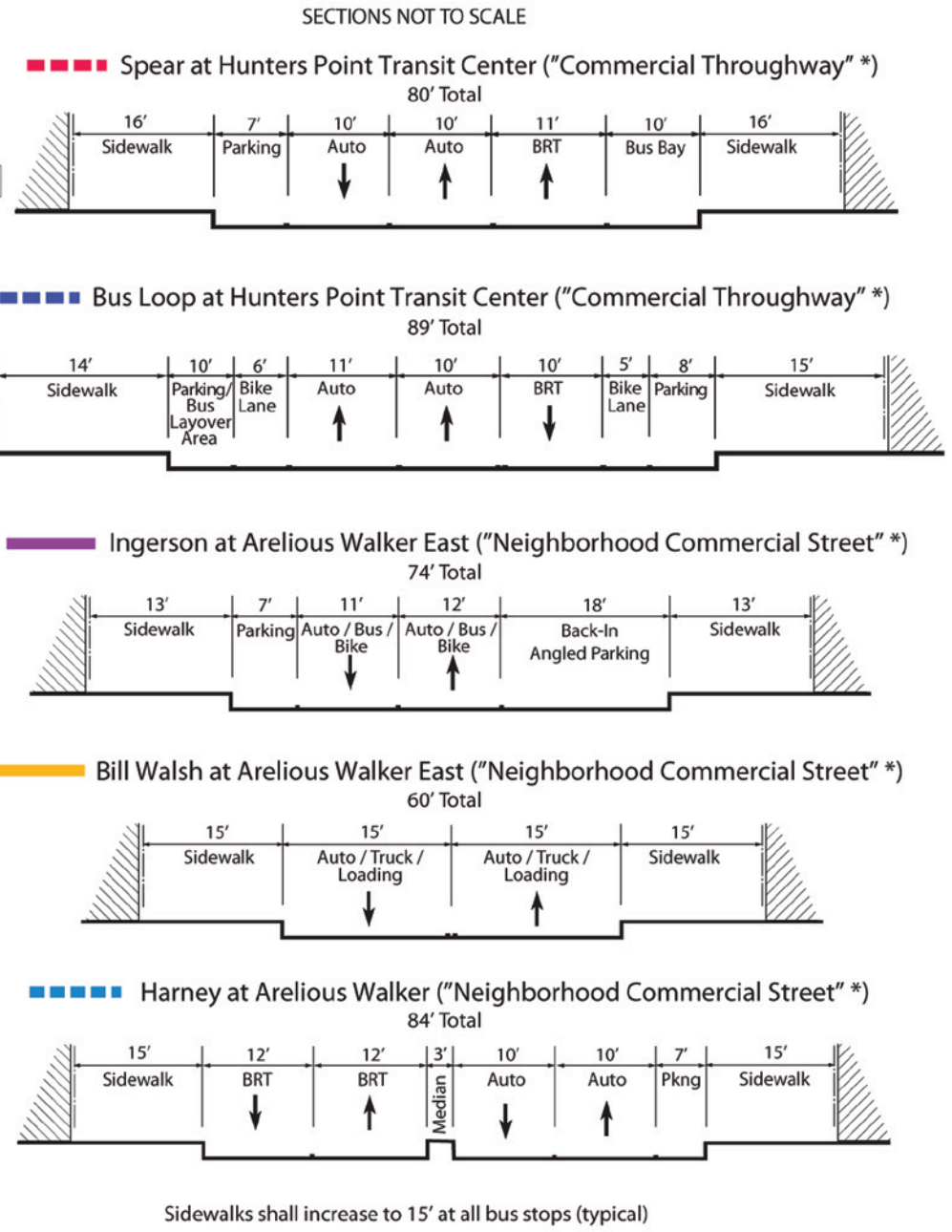
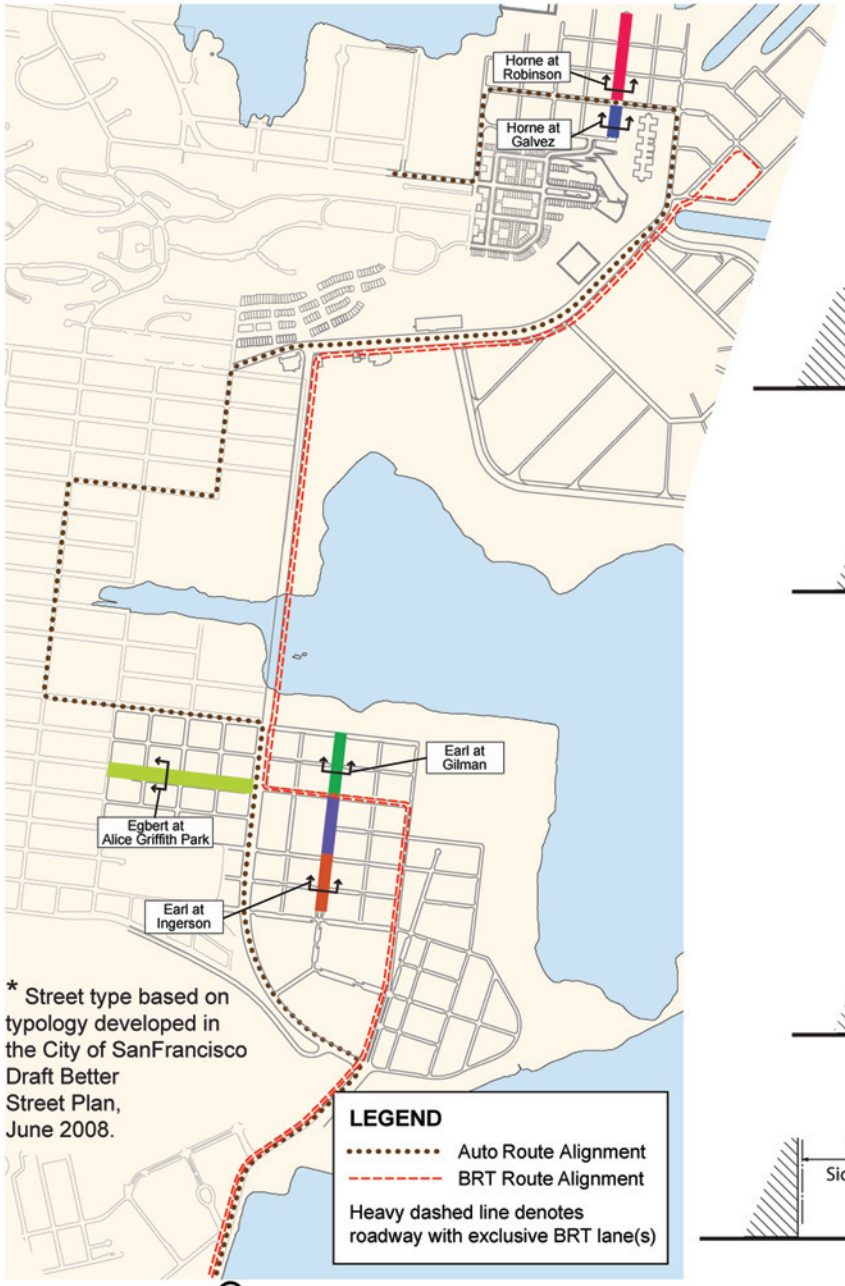
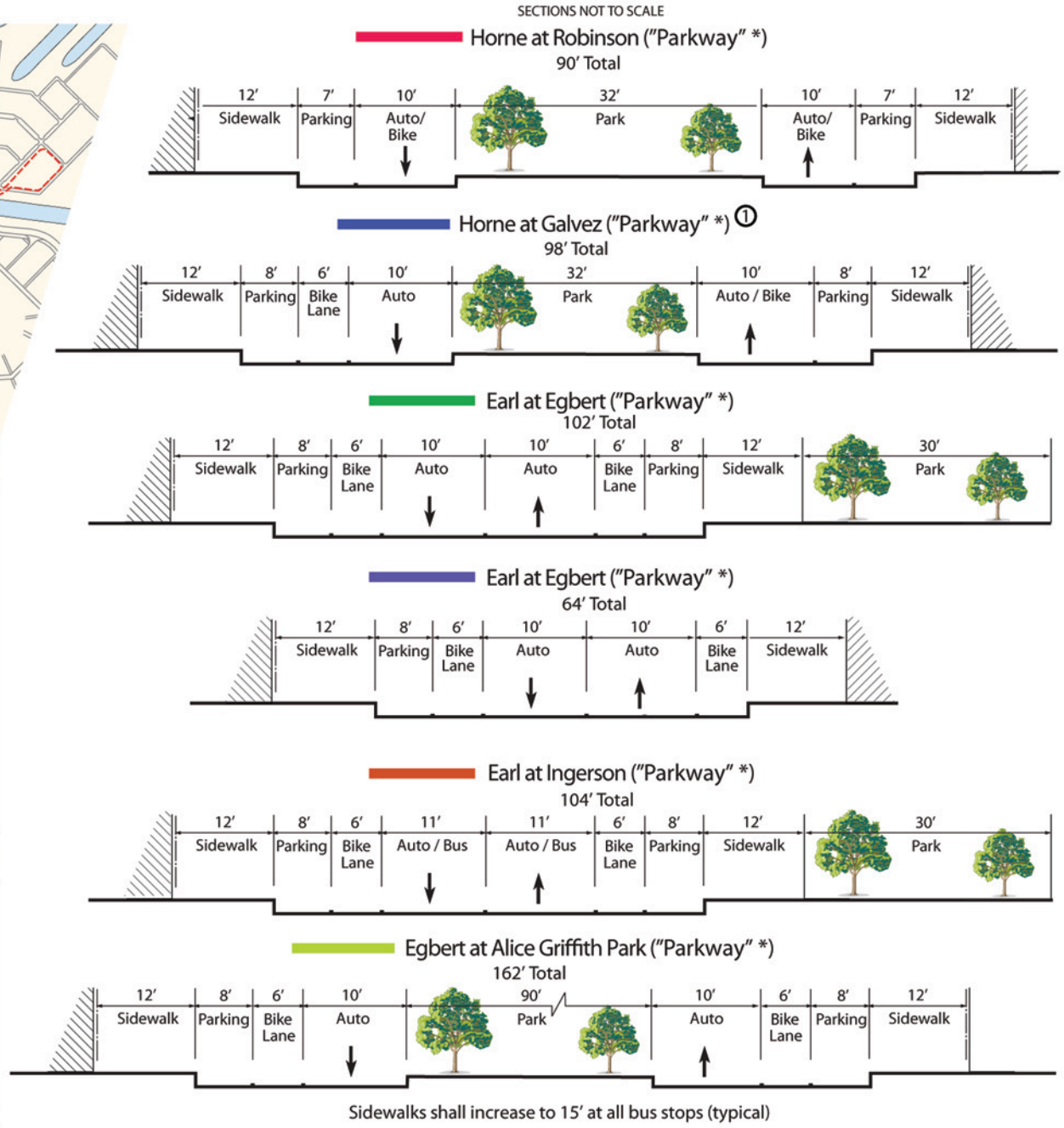


Figure 7E: **Parkways**



① Class II bicycle lane provided in uphill direction.



Sidewalks shall increase to 15' at all bus stops (typical)

Figure 7F: **Park Edge Streets**

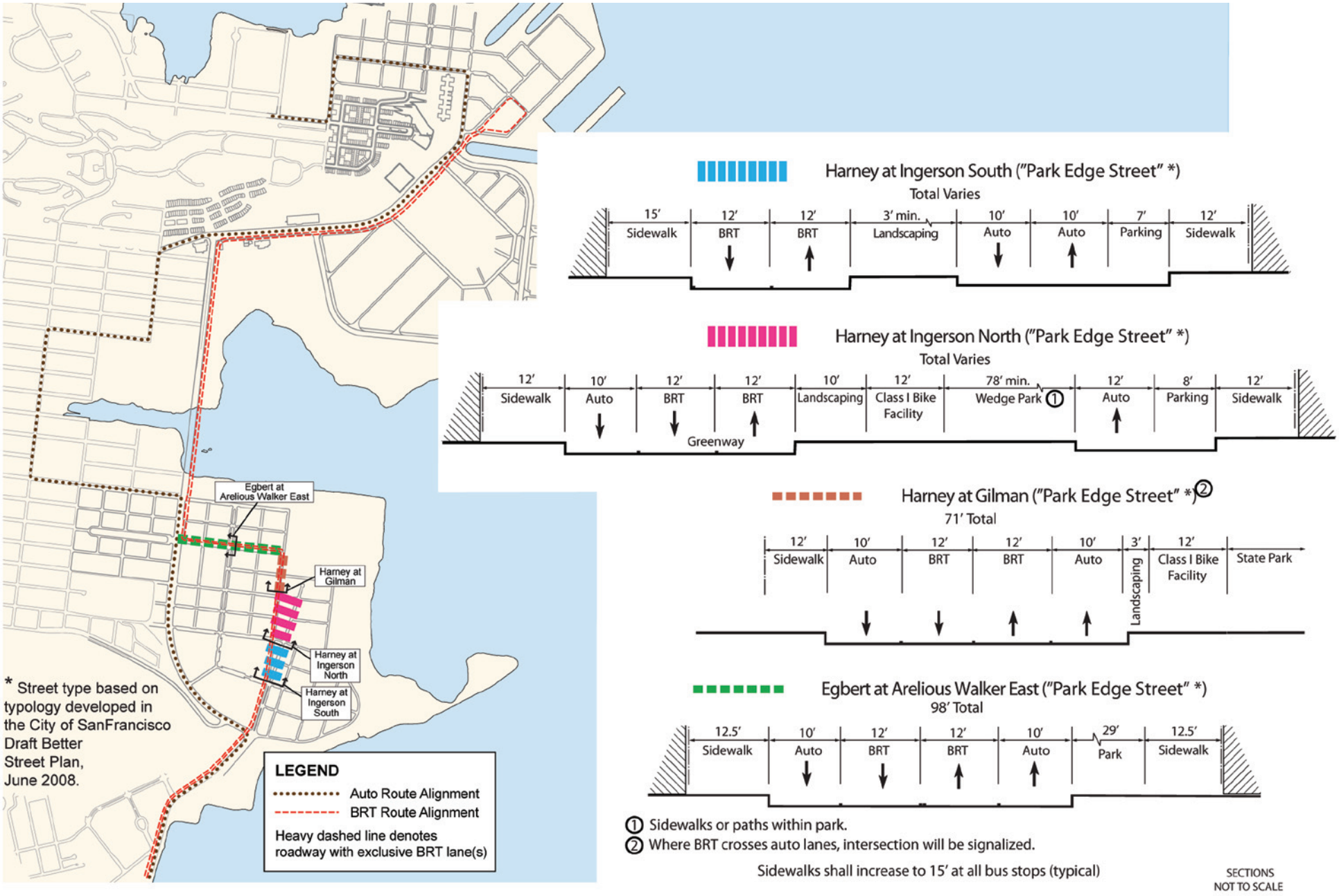
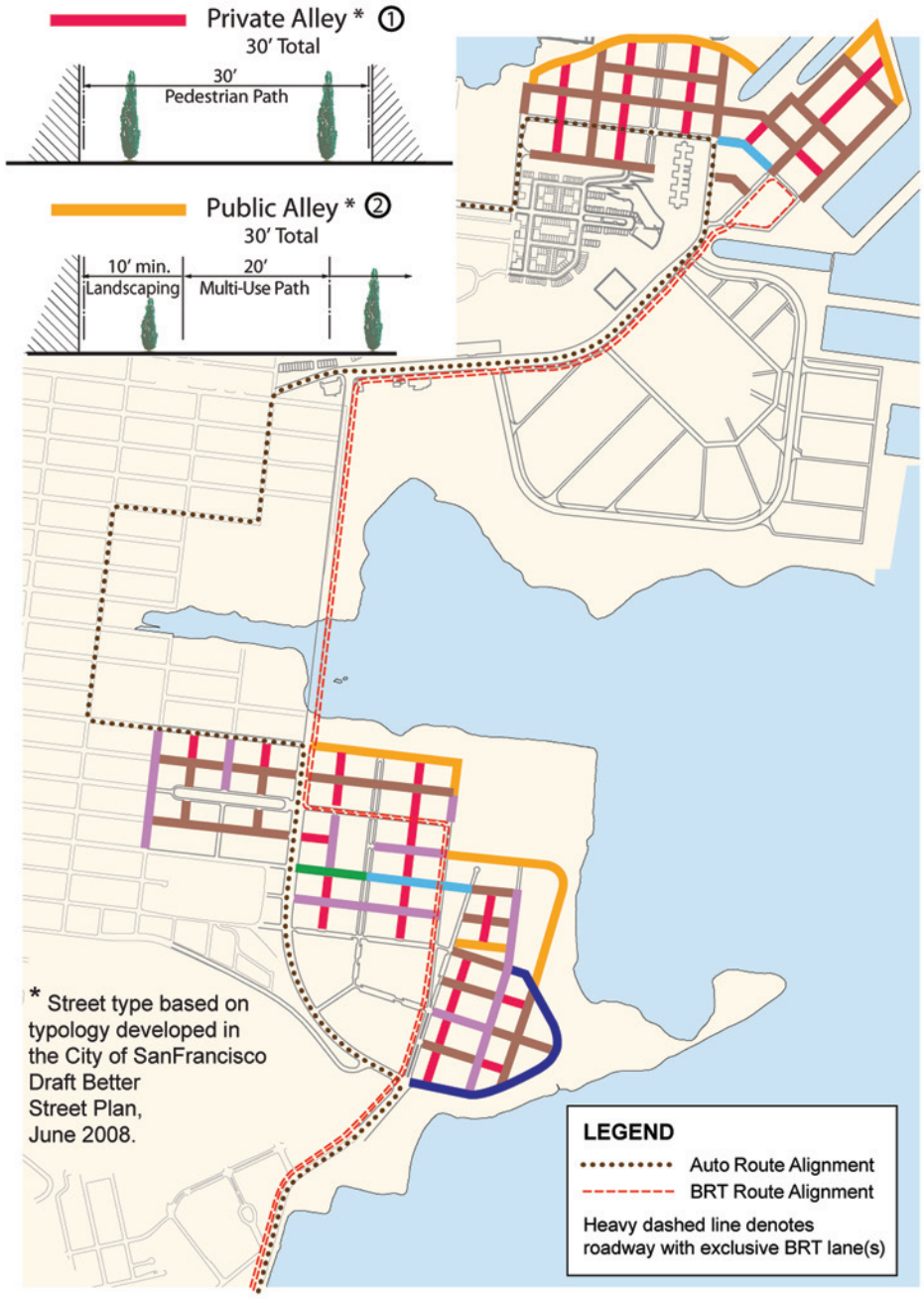
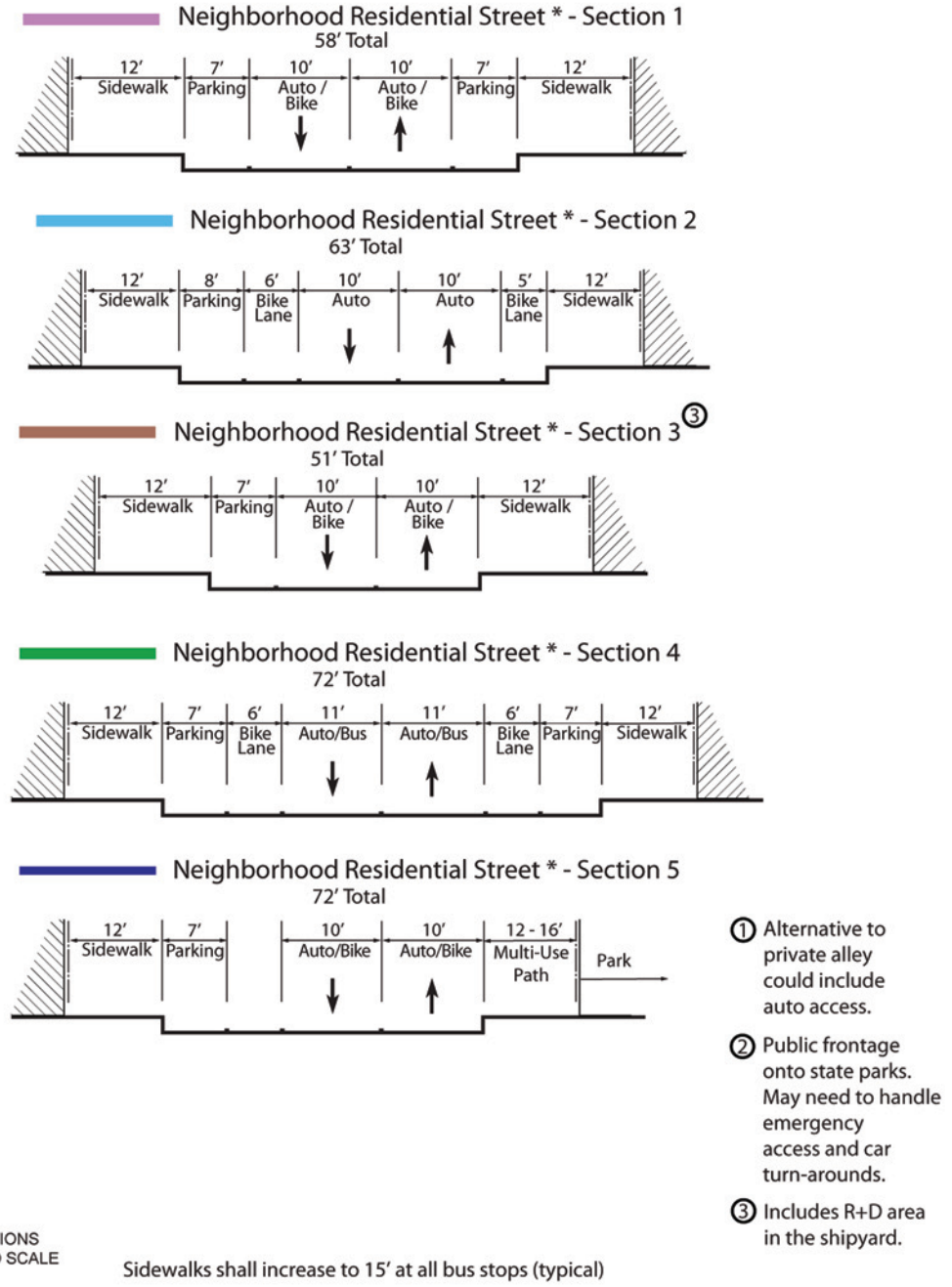


Figure 7G: **Local Streets**





① Alternative to private alley could include auto access.

② Public frontage onto state parks. May need to handle emergency access and car turn-arounds.

③ Includes R+D area in the shipyard.

SECTIONS NOT TO SCALE

Sidewalks shall increase to 15′ at all bus stops (typical)

Figure 7H: **Stadium Roads**

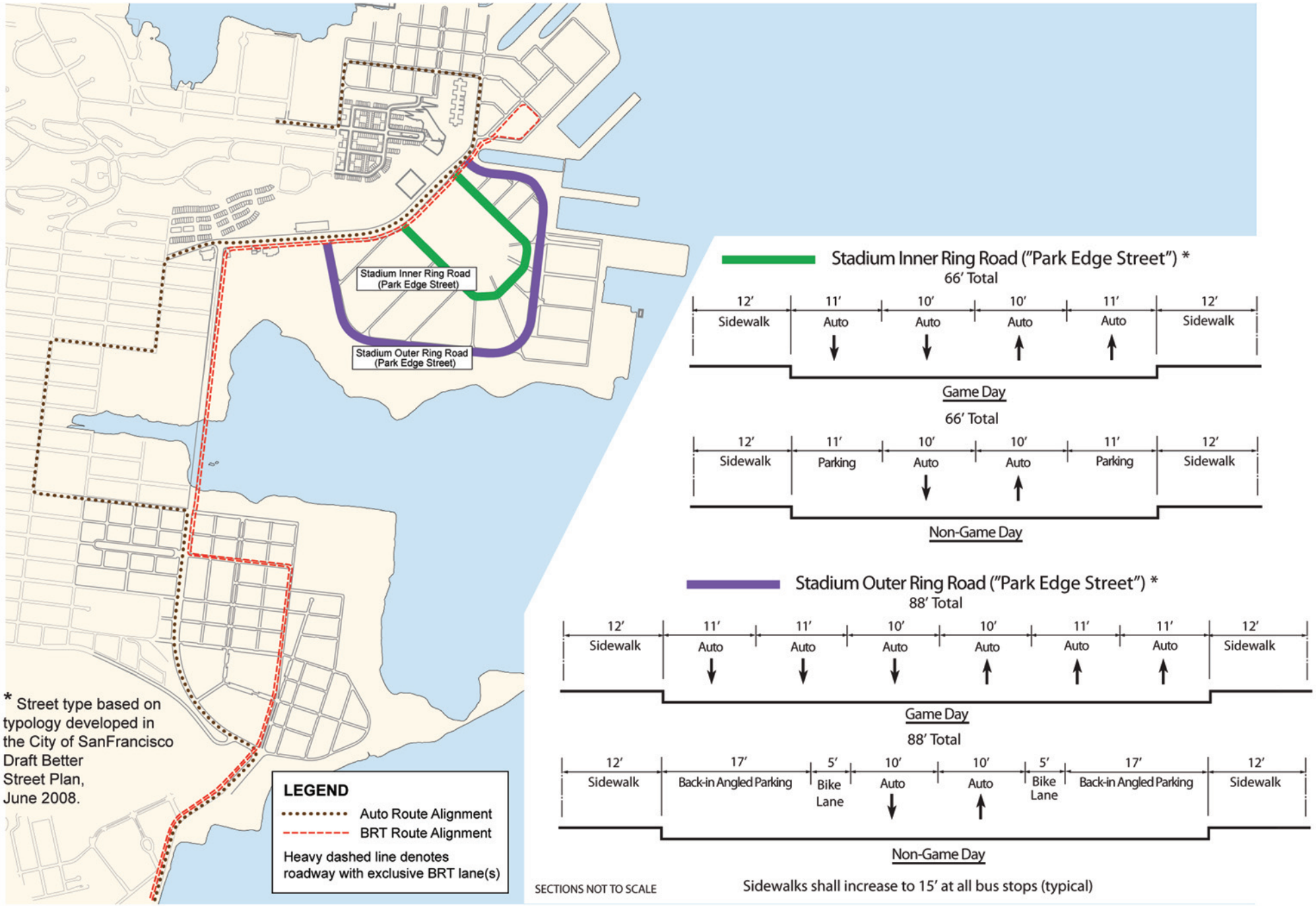
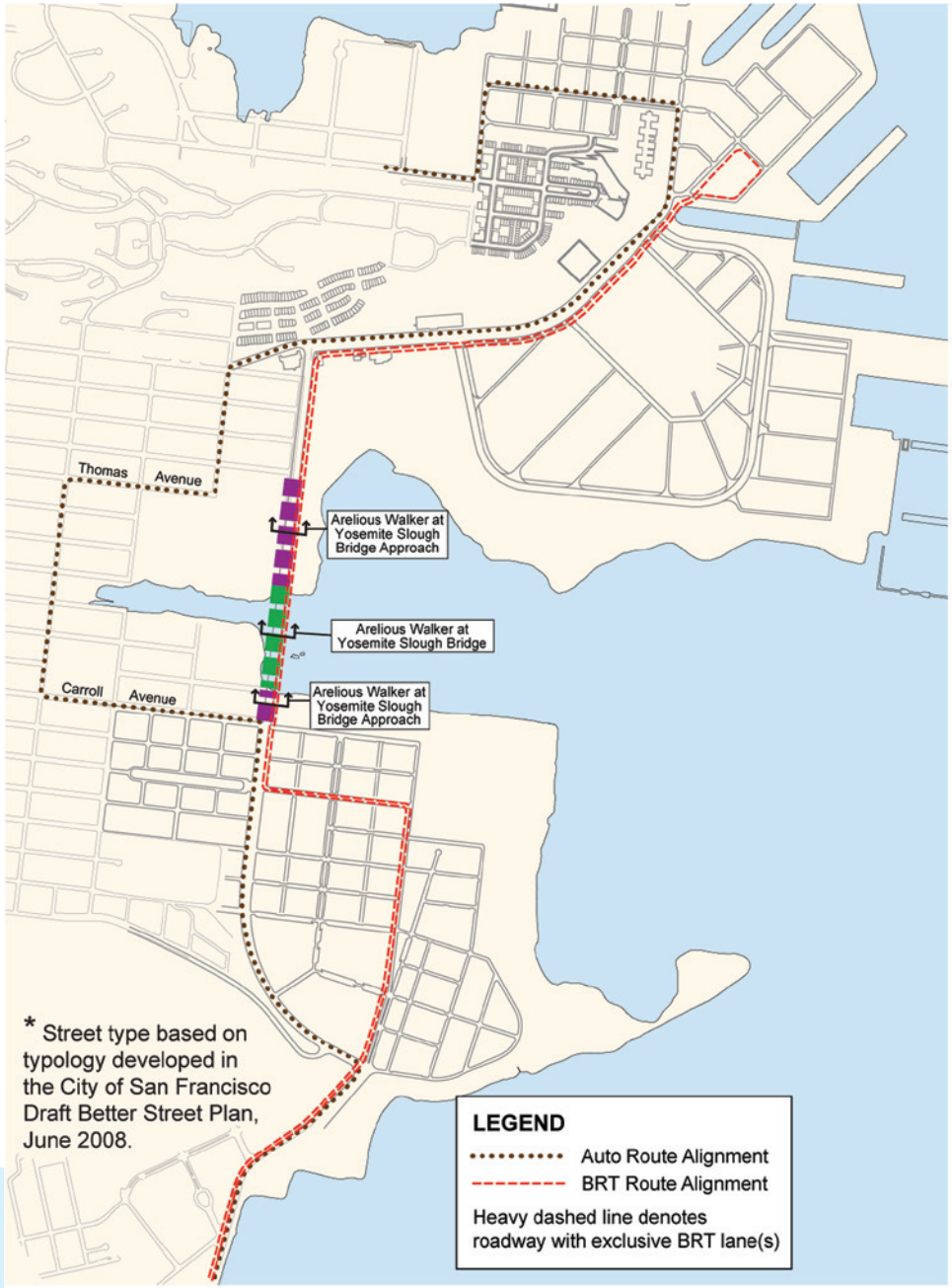


Figure 7I: **Yosemite Slough Bridge Concepts**



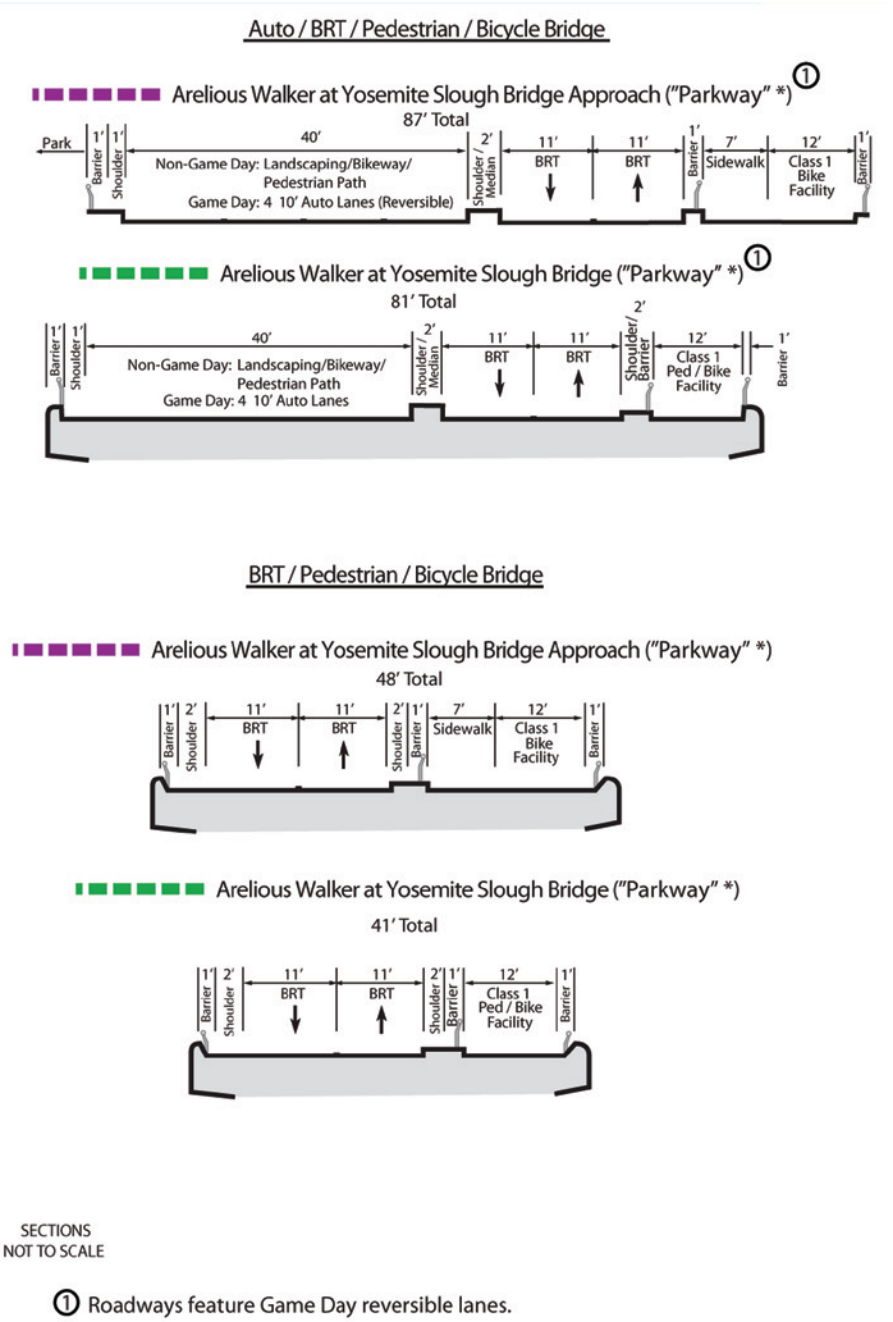
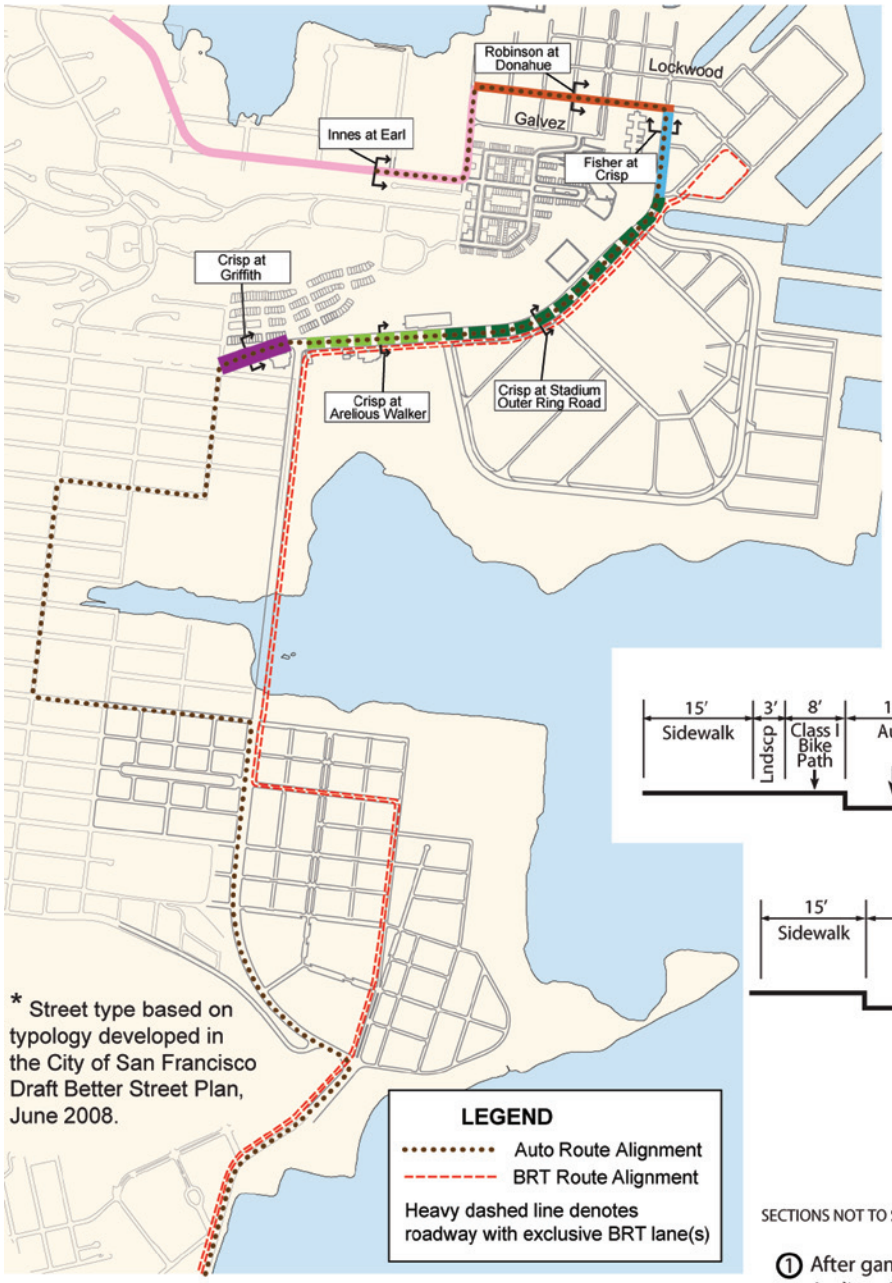
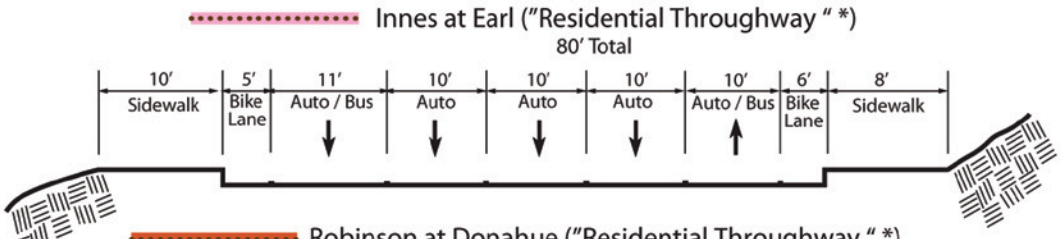
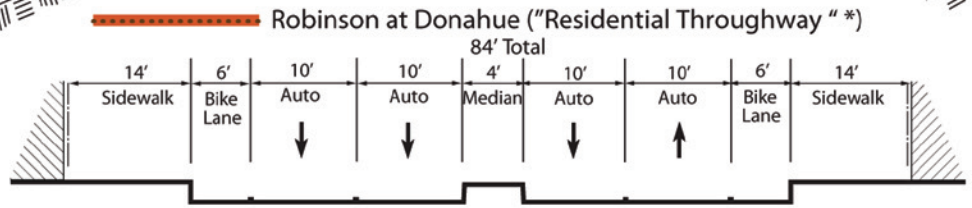
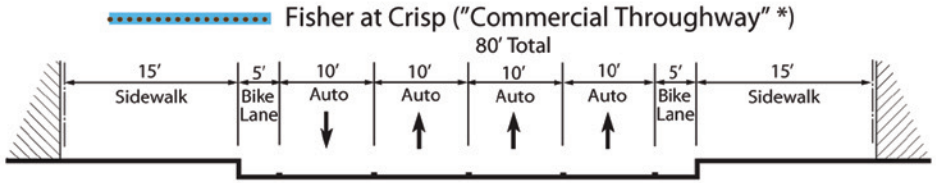


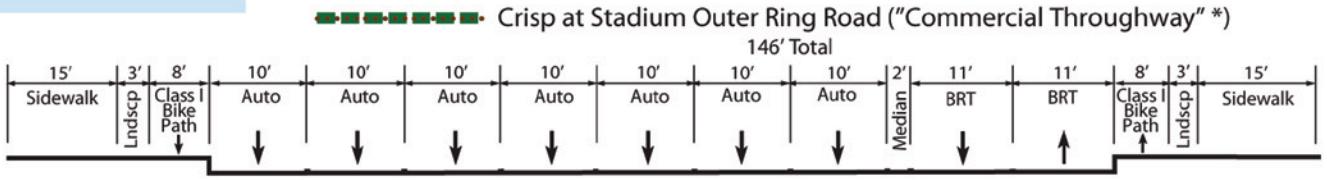
Figure 7J: **Post-Game Lane Configurations: Hunters Point Shipyard Arterials**

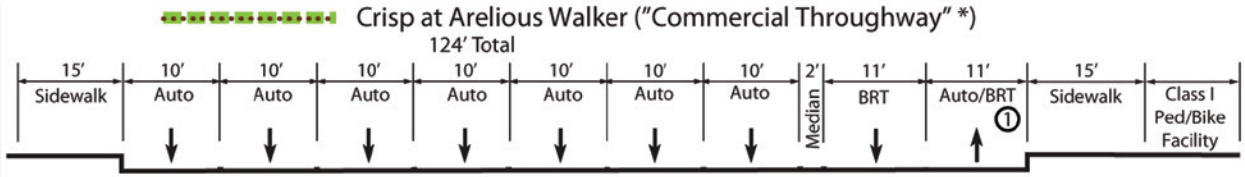


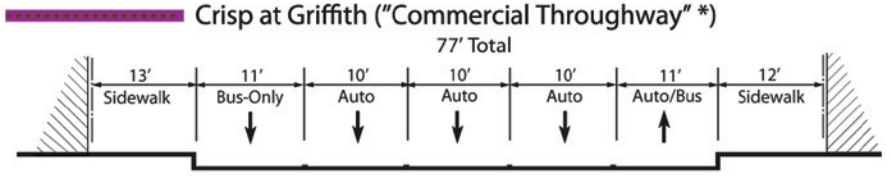










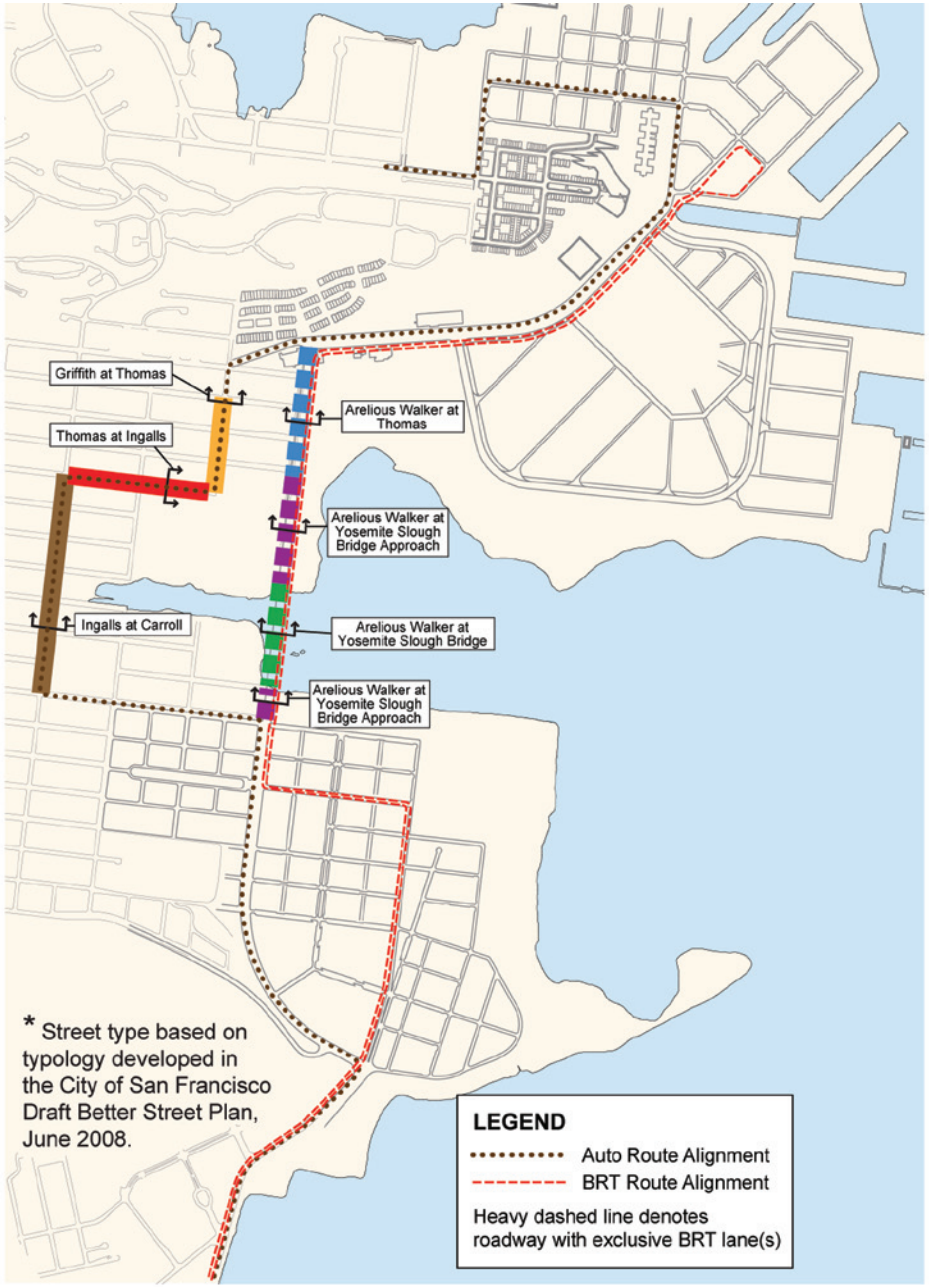


SECTIONS NOT TO SCALE

Sidewalks shall increase to 15' at all bus stops (typical)

① After games, autos "inbound" to Hunters Point Shipyard would be allowed to use the bus-only lane on Crisp Road between Arelious Walker and Outer Ring Road. Inbound autos would be routed along Outer Ring Road to the north side of the stadium.

Figure 7K: **Post-Game Lane Configurations: Yosemite Slough Arterials**



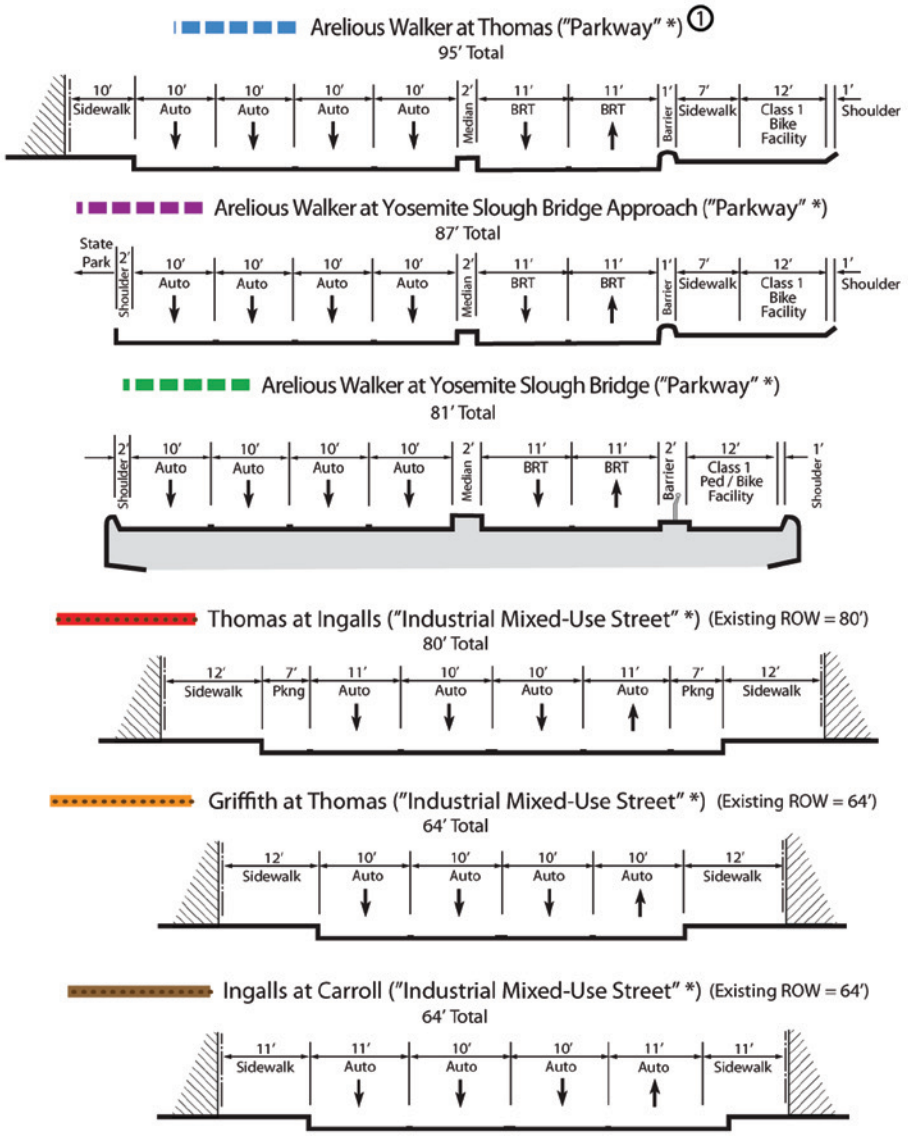


Figure 7L: **Post-Game Lane Configurations: Candlestick Point Shipyard Arterials**

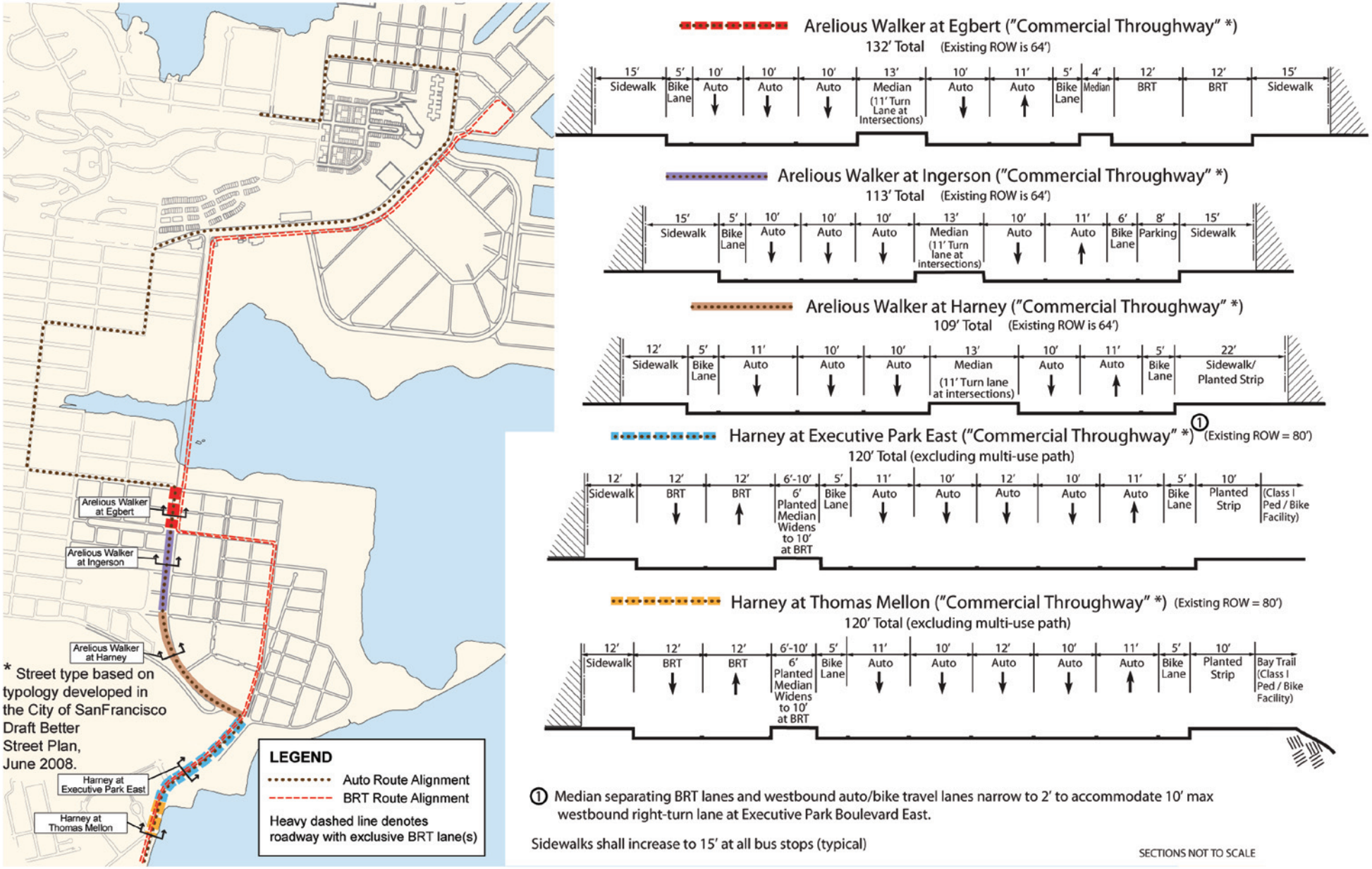


Figure 7M: **Harney Way Potential Long-Term Configuration**

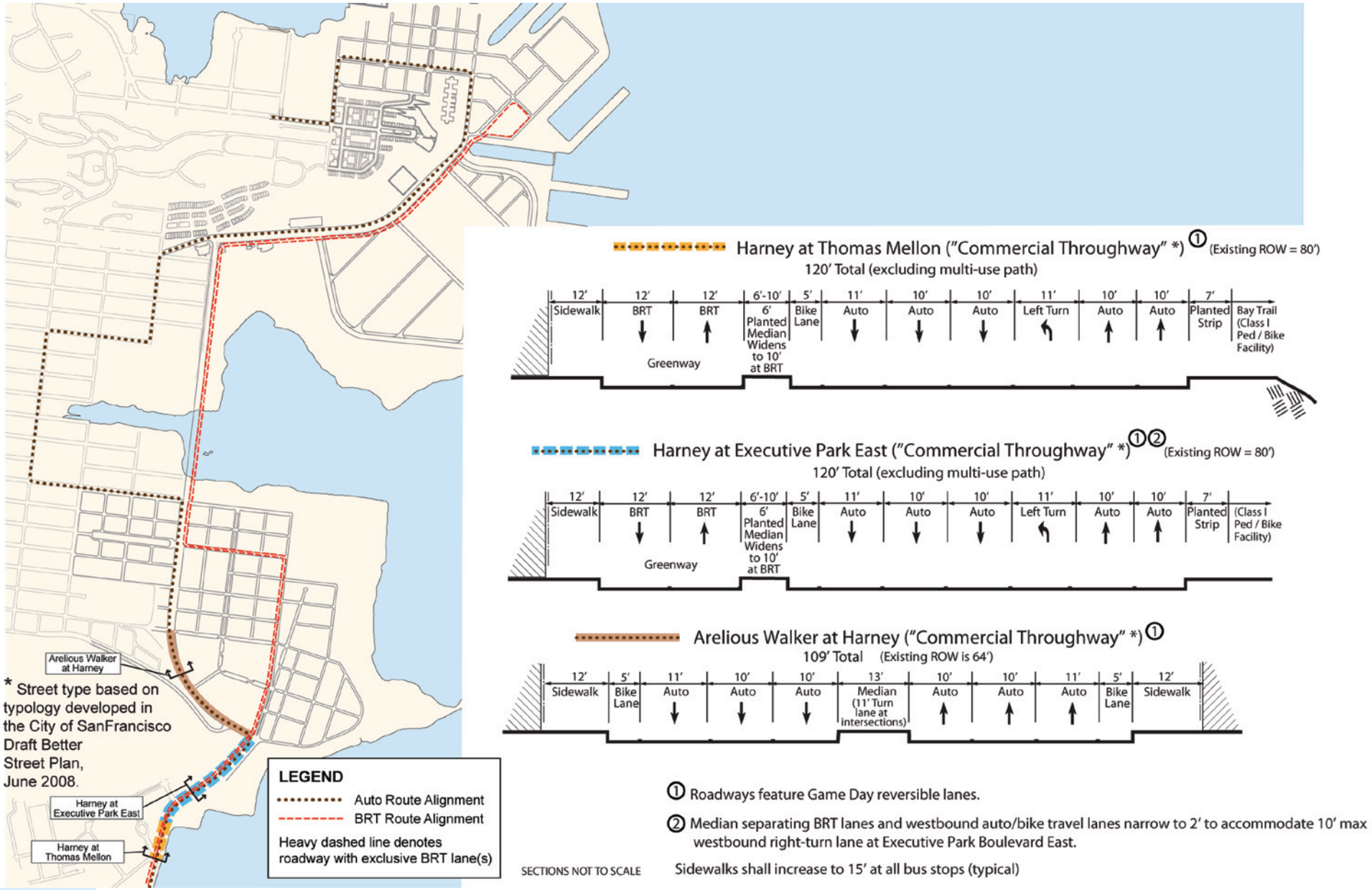


Figure 7N: **Non-Stadium Alternative: Hunters Point Shipyard Local Streets**

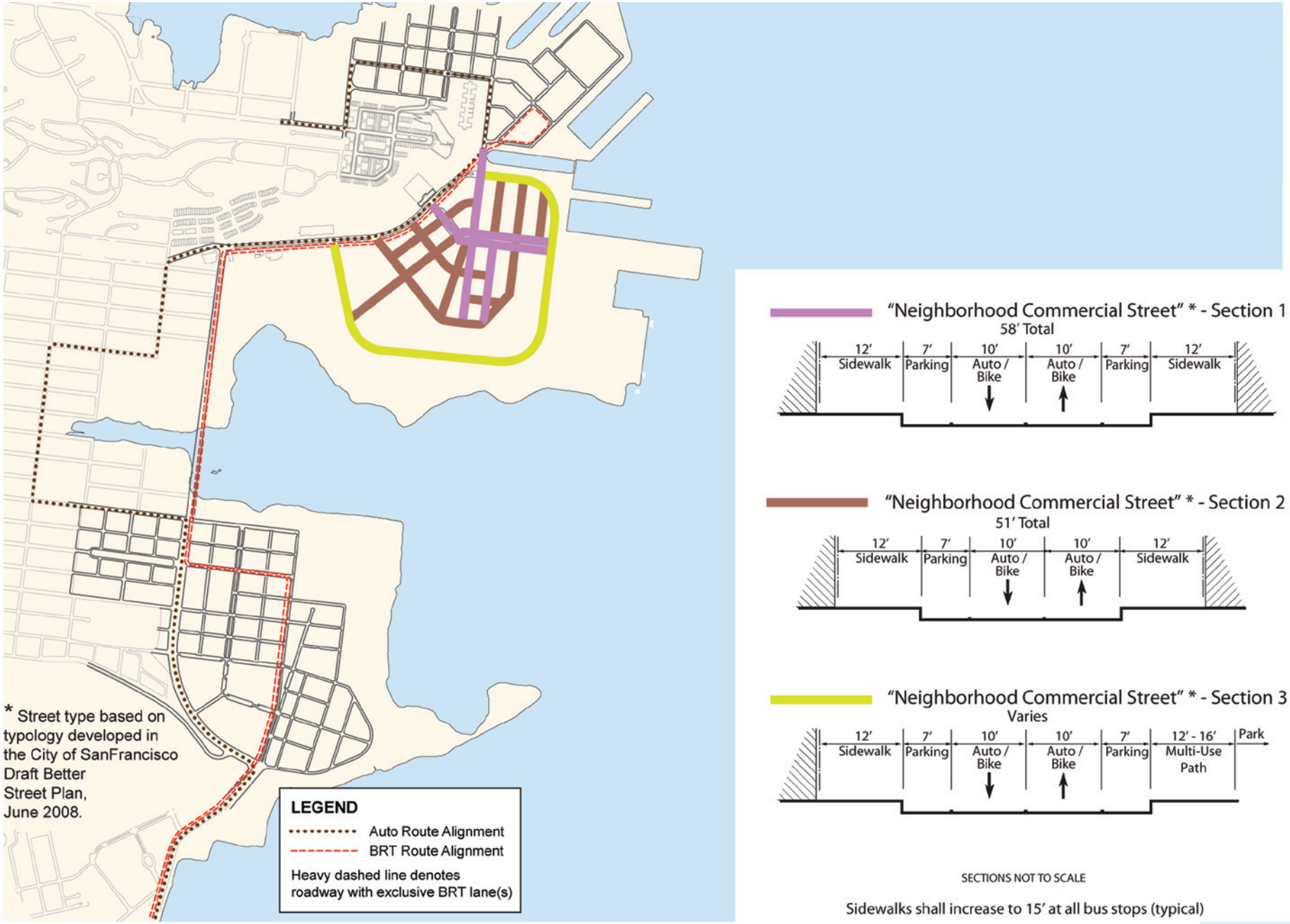
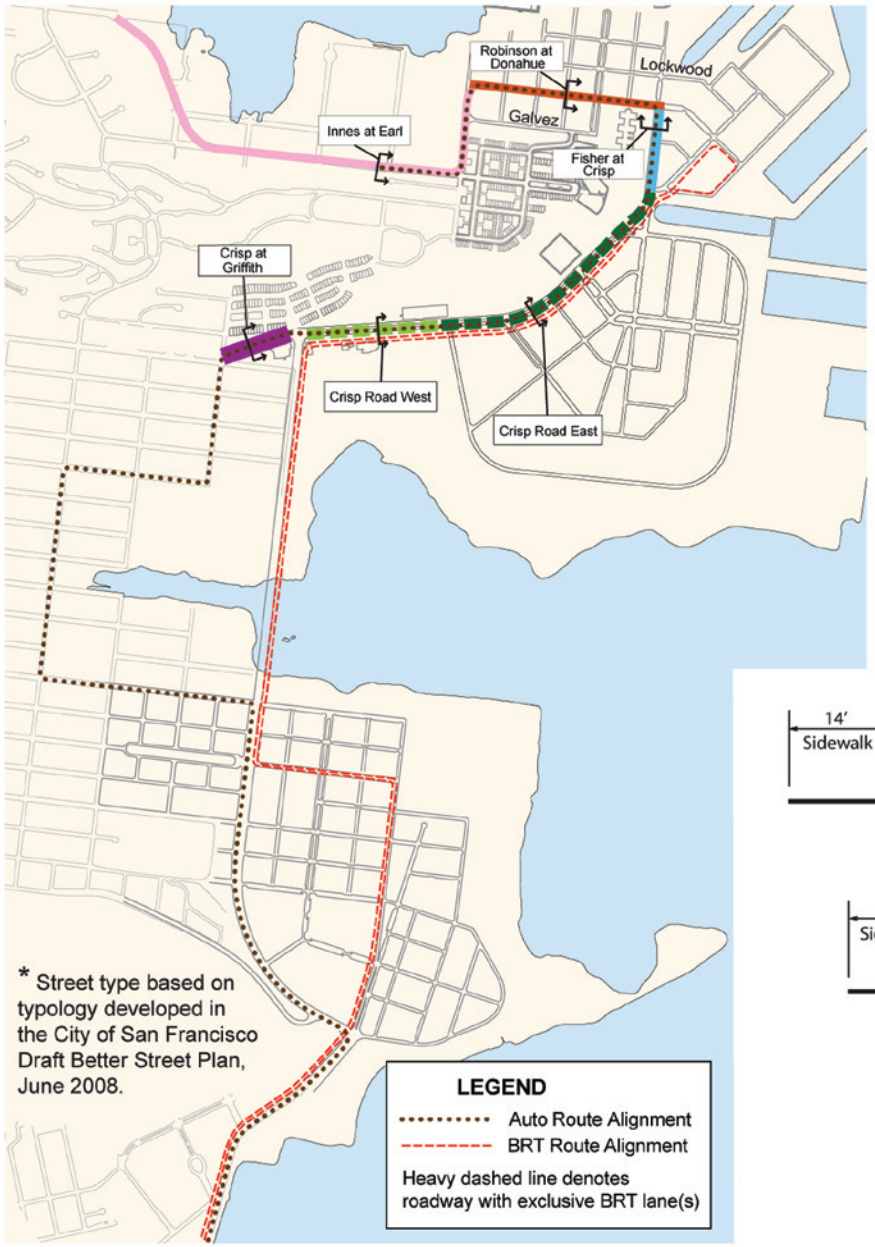


Figure 70: **Non-Stadium Alternative: Hunters Point Shipyard Arterials**



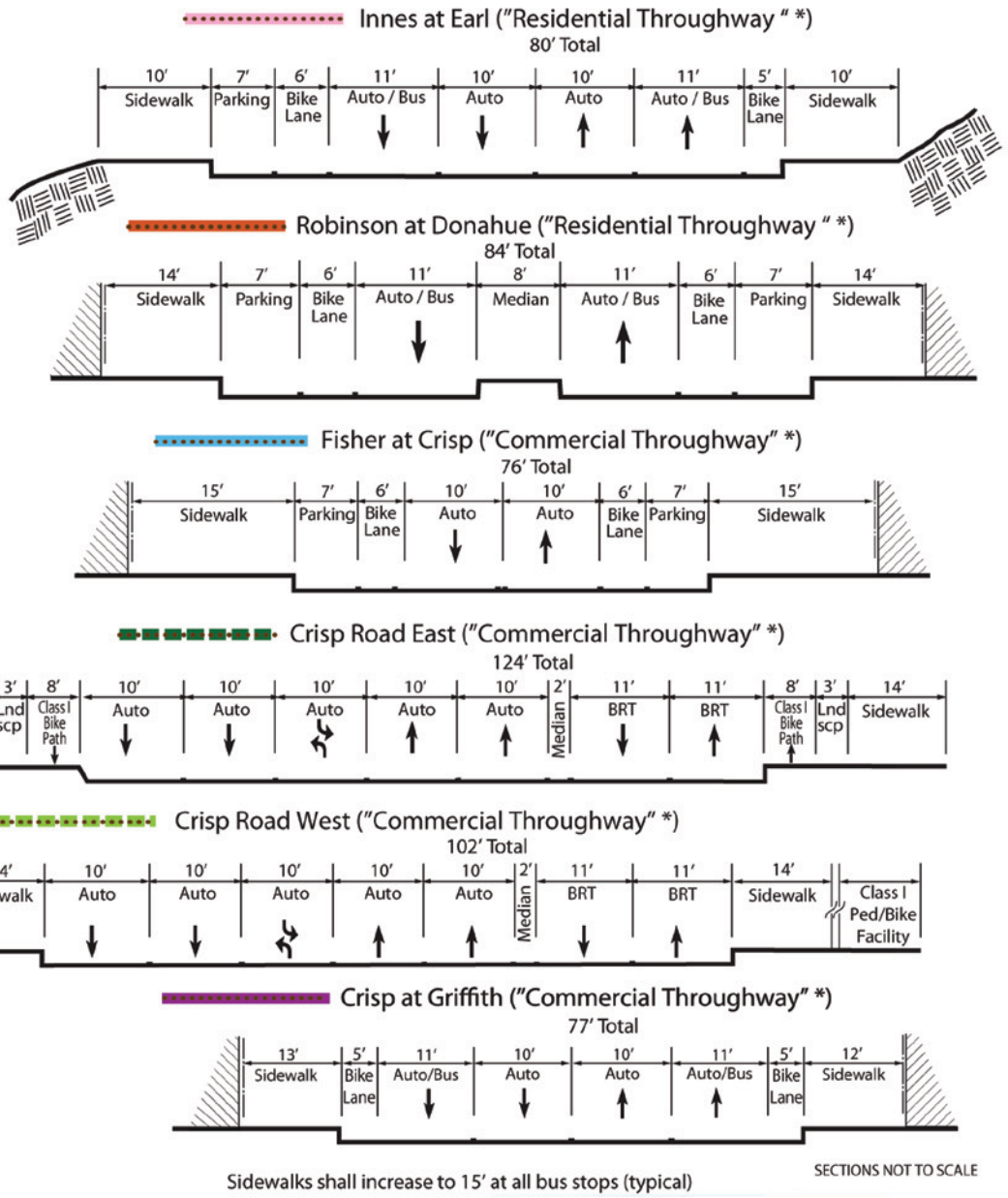
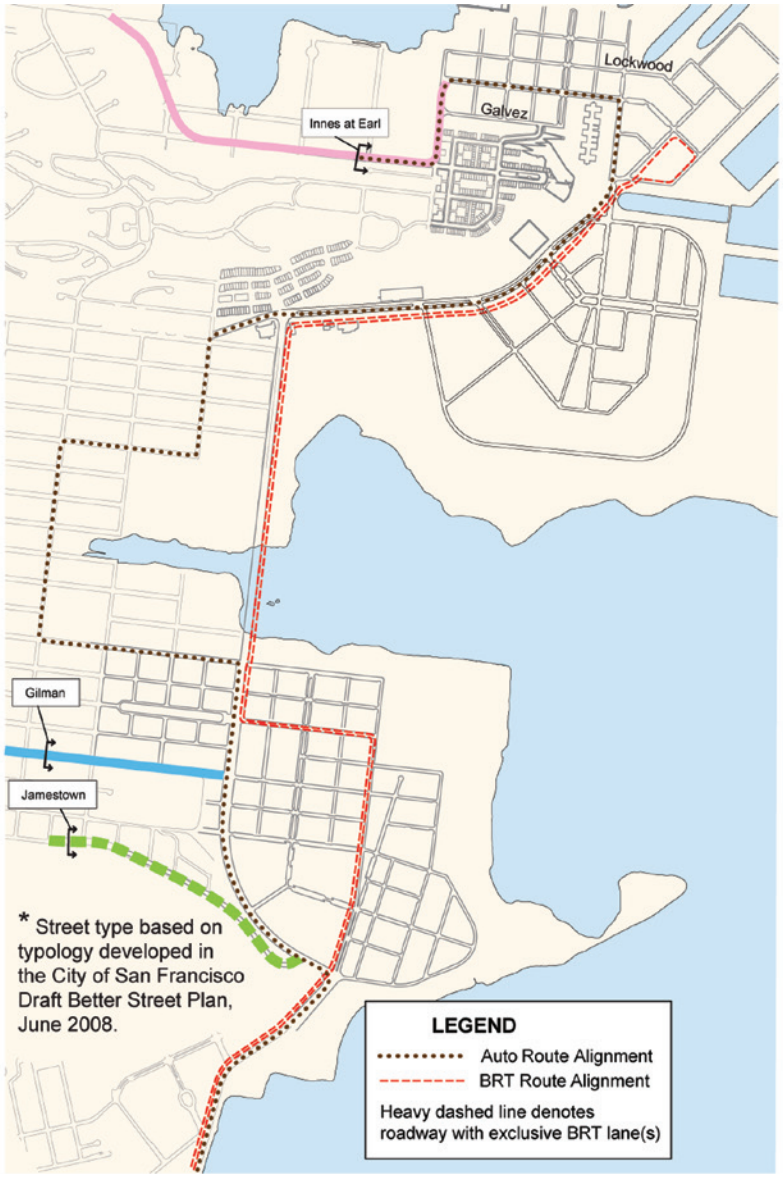
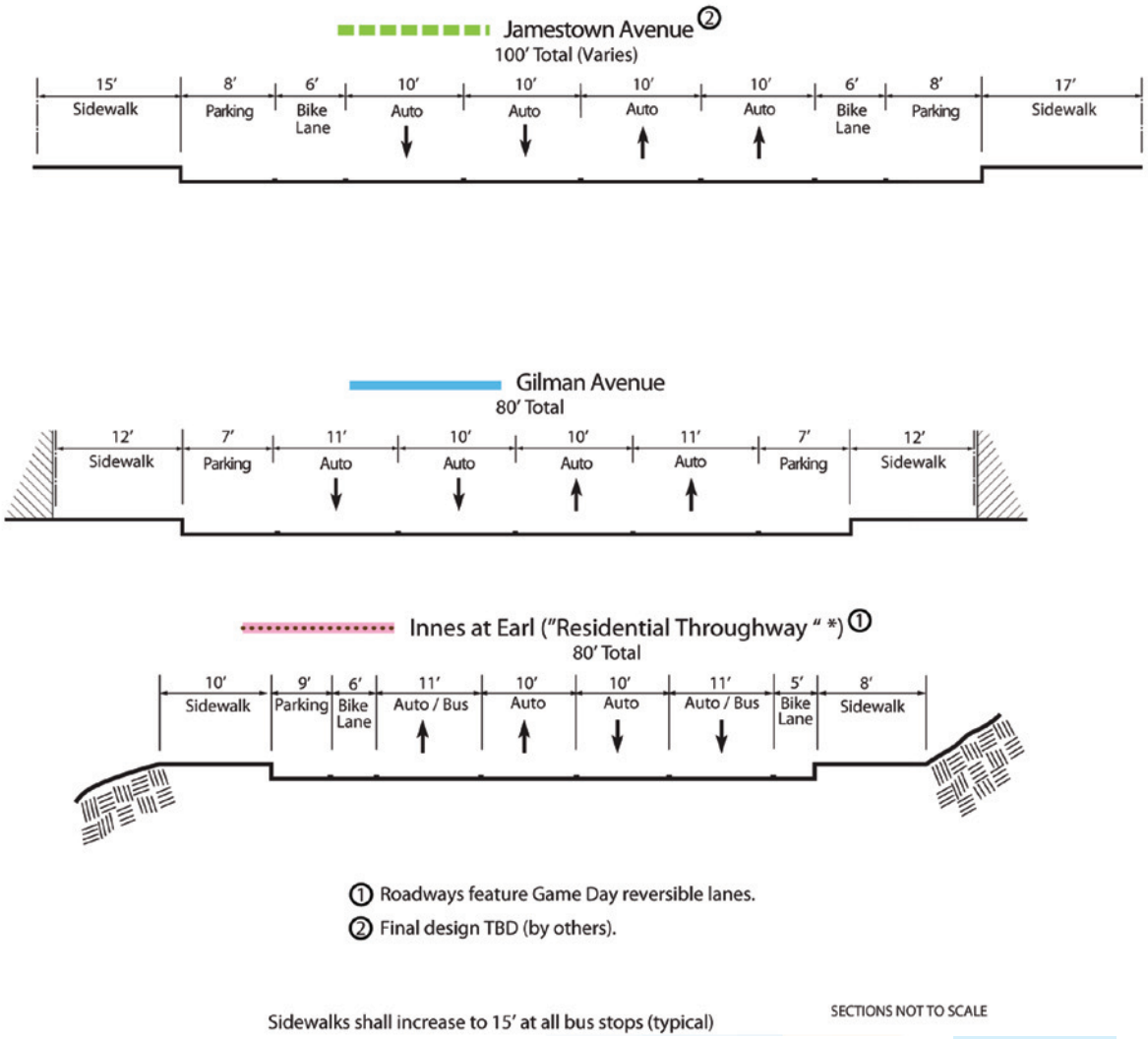


Figure 7P: **External Street Improvements**





4.3 Proposed Roadway Improvements

Existing roadways will be expanded and new facilities built to serve Candlestick Point and Hunters Point Shipyard and the surrounding Bayview neighborhoods. This expansion will include a new special-access bridge, widening of existing streets, and other improvements, as shown in Figure 8 and described below.

1. Harney Way Widening

Harney Way, with its access to the US 101 Freeway, will function as the southern gateway to the project. The existing four-lane facility would be rebuilt as a new five-lane auto facility (Figure 9) with right-of-way reserved for an additional auto lane to be built in the future as needed to serve increased traffic levels (Figure 10). In addition, a left turn lane on eastbound Harney Way would be incorporated at both the Thomas Mellon Drive and Executive Park East Boulevard intersections to provide access to Executive Park. A westbound right turn lane will be provided at Executive Park East Boulevard to provide access to Executive Park. New traffic signals will be installed at Thomas Mellon Drive and Executive Park East Boulevard. In addition to the auto lanes, two lanes would be constructed adjacent to the roadway to accommodate exclusive BRT operations and Class I or Class II bicycle lanes would be provided on both sides of the roadway.

2. New Primary Roadway through Candlestick Point

Candlestick Point will be served by a new four- to five-lane roadway approximately following the current path of Giants Drive and Arelious Walker Drive. The roadway would also have a 13-foot median to accommodate left turn lanes at major intersections. Sidewalks, curb ramps, and streetlights would be upgraded. New traffic signals will be installed at the Harney Way / Arelious Walker Drive intersection and at the Ingerson, Gilman, and Carroll Avenue intersections. Portions of the roadway would accommodate exclusive BRT operations. Class II bicycle lanes would be provided on both sides of the roadway.

3. New Connecting Roadways

Roadway connections between Hunters Point Shipyard and Candlestick Point will be served by Ingalls Street, connecting to Crisp Road via Thomas Avenue and Griffith Street. Ingalls Street and Griffith Street would contain two travel lanes and on-street parking/loading on both sides of the roadway. Thomas Avenue will be converted from a two-lane to four-lane facility with on-street parking retained on both sides of the roadway. During the evening peak period, on-street parking would be prohibited on Griffith Street and Ingalls Street, such that there would be four travel lanes connecting the entire auto route around Yosemite Slough (Carroll Avenue, Ingalls Street, Thomas Avenue, Griffith Street, and Crisp Avenue). New signals will be installed at the intersections of Thomas Avenue / Ingalls Street and Palou Avenue / Crisp Road.

4. Streetscape Improvements

Streetscape improvements are planned for several key Bayview Hunters Point roadways: Innes, Palou, Carroll and Gilman, Ingerson, and Jamestown Avenue. These streets will serve as primary routes for pedestrians, bicyclists, transit riders, and drivers. They are proposed to enhance the safety and experience of road users and existing residents.

Enhanced streetscape design, including street trees, sidewalk plantings, furnishings, and paving treatments will be designed to visually tie together the proposed project with the greater Bayview neighborhood. Specific streetscape treatments will vary depending on existing right-of-way and traffic demands. Careful consideration will be given to improving visibility at all four-way stops.

5. Yosemite Slough Bridge

A new Yosemite Slough bridge would extend Arelious Walker Drive from Candlestick Point to Hunters Point Shipyard. The bridge would have an 81-foot wide right-of-way and would contain a 40-foot wide landscaped greenway, two 11-foot wide BRT lanes, and a Class I bicycle/pedestrian path. On 49ers game days, the 40-foot wide landscaped area would be converted to four peak direction travel lanes for game day auto traffic. The Yosemite Slough Bridge would not be used for vehicular traffic during secondary events.

The Class I bicycle/pedestrian path would provide the most direct connection between Candlestick Point and Hunters Point Shipyard for pedestrians and bicyclists and BRT service. During game days, the 40-foot wide landscaped median would serve as the primary and most direct route between the stadium parking areas and U.S. 101.

6. Transportation Management System

In conjunction with the roadway facilities and improvements described above, a transportation management system will be implemented. The system will allow for the coordination of signals at over 25 intersections in the Development Plan area and surrounding area using fiber-optic or equivalent technology. On game-days, some intersections would be controlled by a Traffic Control Officer. Several variable message signs will be installed on roadways with reversible lanes. These signs will be able to convey messages for drivers, pedestrians and cyclists for game-day and emergency vehicle circulation. Software and hardware for a Transportation Management Center (TMC) on the stadium grounds will be developed. The TMC would be operated by the SFMTA on game days.

New Roadway Improvements Under Study

Additional roadway improvements have been identified that may serve the project site and surrounding development. These improvements, requiring approval by the City of Brisbane, will be studied through the environmental review process required by the California Environmental Quality Act (CEQA). The improvements are shown in Figure 8 and described below.

7. Geneva Avenue Extension

Geneva Avenue which currently ends at Bayshore Boulevard, would be extended east to meet Harney Way, improving east-west access in the area. The Geneva Avenue Extension would have three eastbound and three westbound travel lanes between Bayshore Boulevard and a new interchange with U.S. 101. Currently, the nearest east-west access road is Blanken Avenue, which is designed as a neighborhood collector roadway and could not accommodate the additional east-west traffic generated by area projects. The lead agency for this project is the City of Brisbane, with the Caltrans Project Study Report (PSR) expected to be completed in 2010.

Existing roadways will be expanded and new facilities built to serve Candlestick Point & Hunters Point Shipyard

Figure 8: **Proposed Roadway Improvements**

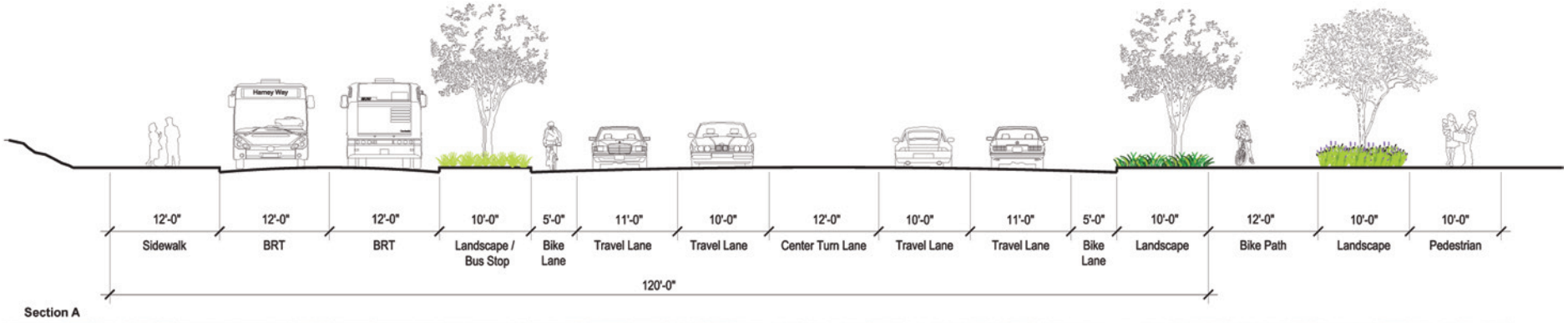
8. Geneva/Harney/US 101 Interchange

In conjunction with the extension of Geneva Avenue east, the existing Harney Way interchange would be redesigned as a typical diamond interchange. Caltrans and the City of Brisbane are the lead agencies for this project, and a PSR is currently being prepared. Two alternatives are currently being assessed; one with Geneva Avenue/Harney Way crossing under U.S. 101, and one with Geneva Avenue/Harney Way crossing over U.S. 101. A separate environmental review and approvals by Caltrans, the City of Brisbane, SFCTA, and the City of San Francisco will be required to implement this improvement, supported by analysis from the San Francisco County Transportation Authority's Bi-County study.

9. Geneva Avenue to Balboa Park BART

In conjunction with the projects above, specific transit-preferential treatments along Geneva Avenue and related roadway improvements (including signal work, street design, and safety improvements) would be implemented.

Figure 9: **Proposed Harney Way Initial Configuration**



Section A

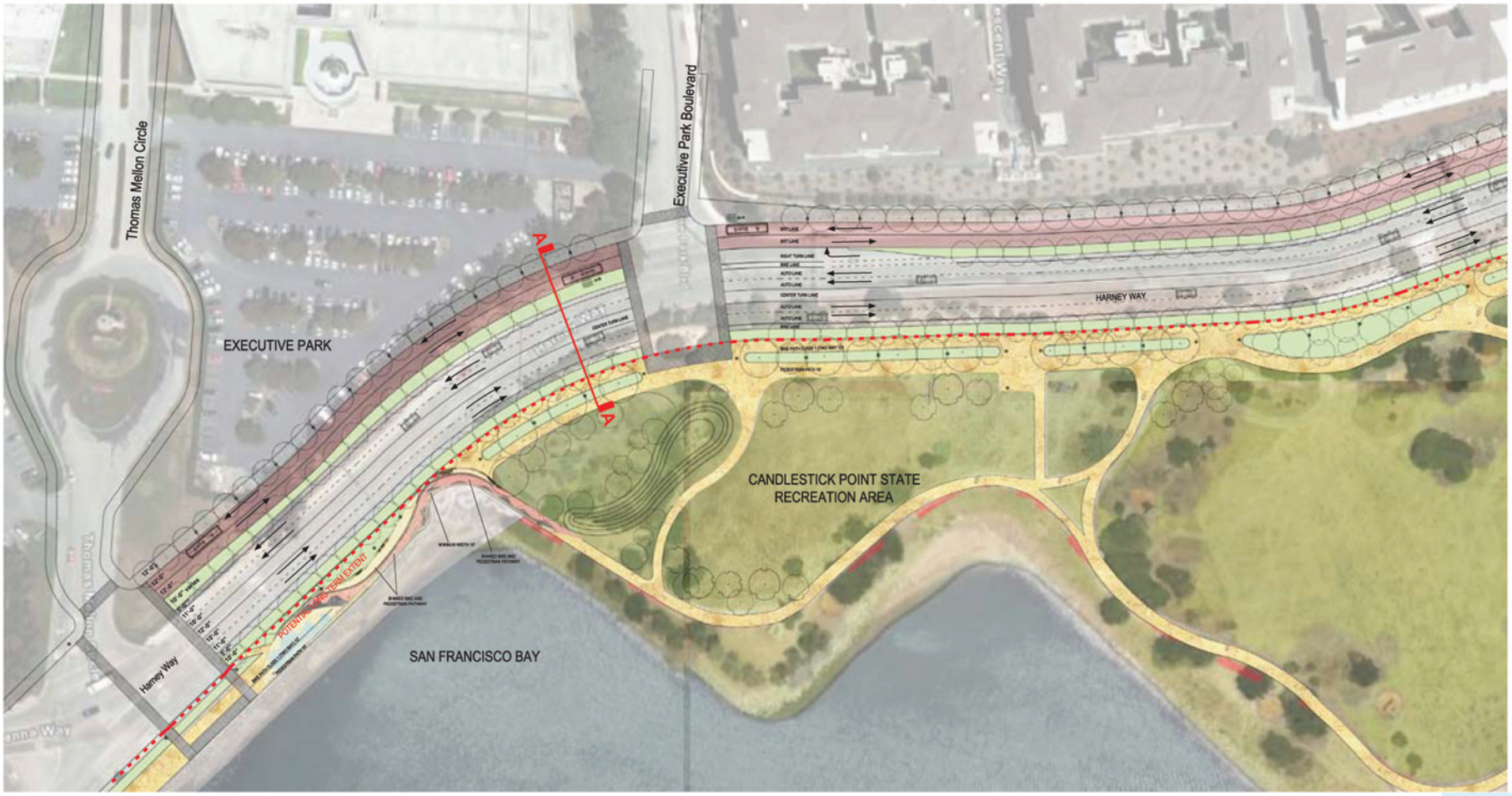
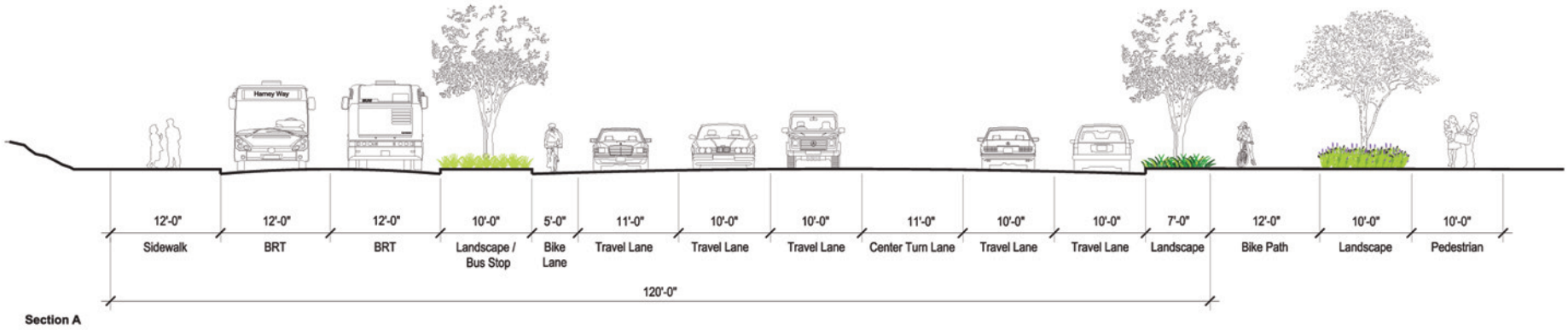
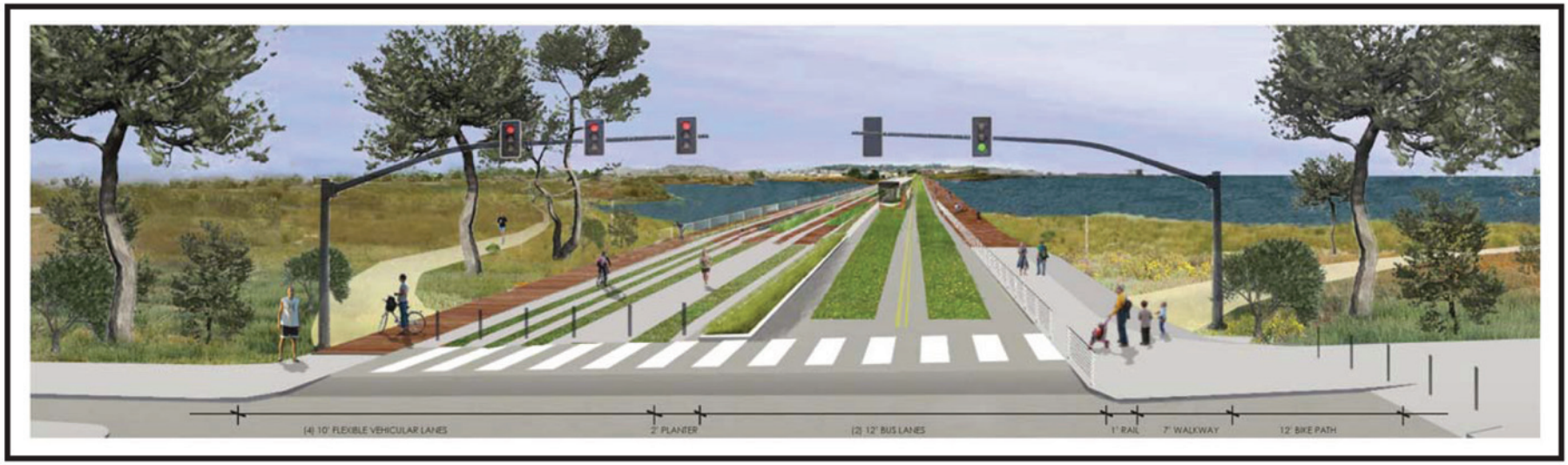


Figure 10: **Proposed Harney Way Potential Long-Term Configuration**



Section A

Figure 11: **Yosemite Slough Bridge Concept**



Candlestick Point approach to Yosemite Slough Bridge

Yosemite Slough Bridge

5 Transportation Program

5.1 Introduction

Currently, about two-thirds of all trips in the southeast quadrant of San Francisco are car trips. If the trips generated by the project exhibit this level of automobile use, the existing vehicular transportation facilities in this area would be insufficient to handle the projected demand. Thus, the policies and programs outlined in this chapter target a significant redistribution of trips from auto to transit and non-motorized modes. The following sections outline the specific means designed to encourage the use of modes other than private automobile, achieve the project mode split goal, as well as enhance alternatives to transportation in surrounding neighborhoods by developing a stronger transit, bicycle, and pedestrian network.

The Candlestick Point and Hunters Point Shipyard Phase II Development Plan Environmental Impact Report (EIR), has been prepared independently from this Plan, and models and evaluates the travel demand of this project.

Existing Travel Behavior

Within the City and County of San Francisco, travel behavior for new developments is typically estimated using the SF Guidelines[6], which contains detailed survey data used to estimate trip generation, mode split, and origins/destinations based on land use and trip type. The data is organized by superdistricts (SD), one in each quadrant of San Francisco.

Candlestick Point and Hunters Point Shipyard are located in SD-3, the southeastern quadrant of the City. According to historical data from the SF Guidelines, the modal split of travel demand for a new project located in SD-3 would be expected to exhibit the modal split shown in **Table 5**.

Table 5: SD-3 Calculated Mode Split – Weekday PM Peak Hour

Mode	SD-3 Mode Split[1] (Inbound and Outbound Trips)
Auto/Carpool	66%
Transit	16%
Walk	16%
Bike	2%
Total	100%

The mode split above reflects data collected in the 1990s for land uses and transit service within a large area of San Francisco that has since undergone significant change. It is also based on much less dense development and a different mix of uses than what is proposed for the project area. Therefore, the data from the SF Guidelines alone is not a sufficient estimator for mode split for a project of this size and character.

1 Estimates per AECOM – October 2008

6 2002 Transportation Impact Analysis Guidelines for Environmental Review. Planning Department, City and County of San Francisco. October, 2002.

Project Travel Behavior Goal

Although past travel behavior can be a useful tool to forecast future mode splits, many factors can result in changes to travel patterns. The Candlestick Point and Hunters Point Shipyard Phase II project aspires to a mode share of not more than 45 percent of person-trips by auto, and not less than 30 percent by transit, 20 percent on foot and 5 percent as bike trips for work trips during the weekday PM peak hour. **Table 6** shows that to achieve this mode split goal, approximately 21 percent of peak hour trips would need to shift from private auto to either transit, walk or bike based on historical travel behavior data. The project is also linked to surrounding neighborhoods by its strong transit, bicycle and pedestrian networks, and neighborhood services which should serve to reduce overall trips and vehicle miles traveled in the area.

Table 6: Project Mode Split Goal - Weekday PM Peak Hour

Mode	SD-3 Mode Split[1]	Project Travel Behavior Goal	Difference
Auto/Carpool	66%	45%	**-21%**
Transit	16%	30%	**+14%**
Walk	16%	20%	**+4%**
Bike	2%	5%	**+3%**
Total	100%	100%	

1 Estimates per Fehr & Peers – May 2009

5.2 Strategies

The strategies outlined in this section, which include new and improved transit options as well as a comprehensive package of TDM measures, would help achieve the desired mode shift.

Maximize Internal Trips

The Development Plan envisions mixed-use neighborhoods that will incorporate new office, retail, and entertainment centers. These will allow trips that might be otherwise attracted to external destinations to remain within the project area. Internal trips are shorter and are thus more likely to shift from auto to non-auto modes.

Internal trips will be maximized by the following strategies:

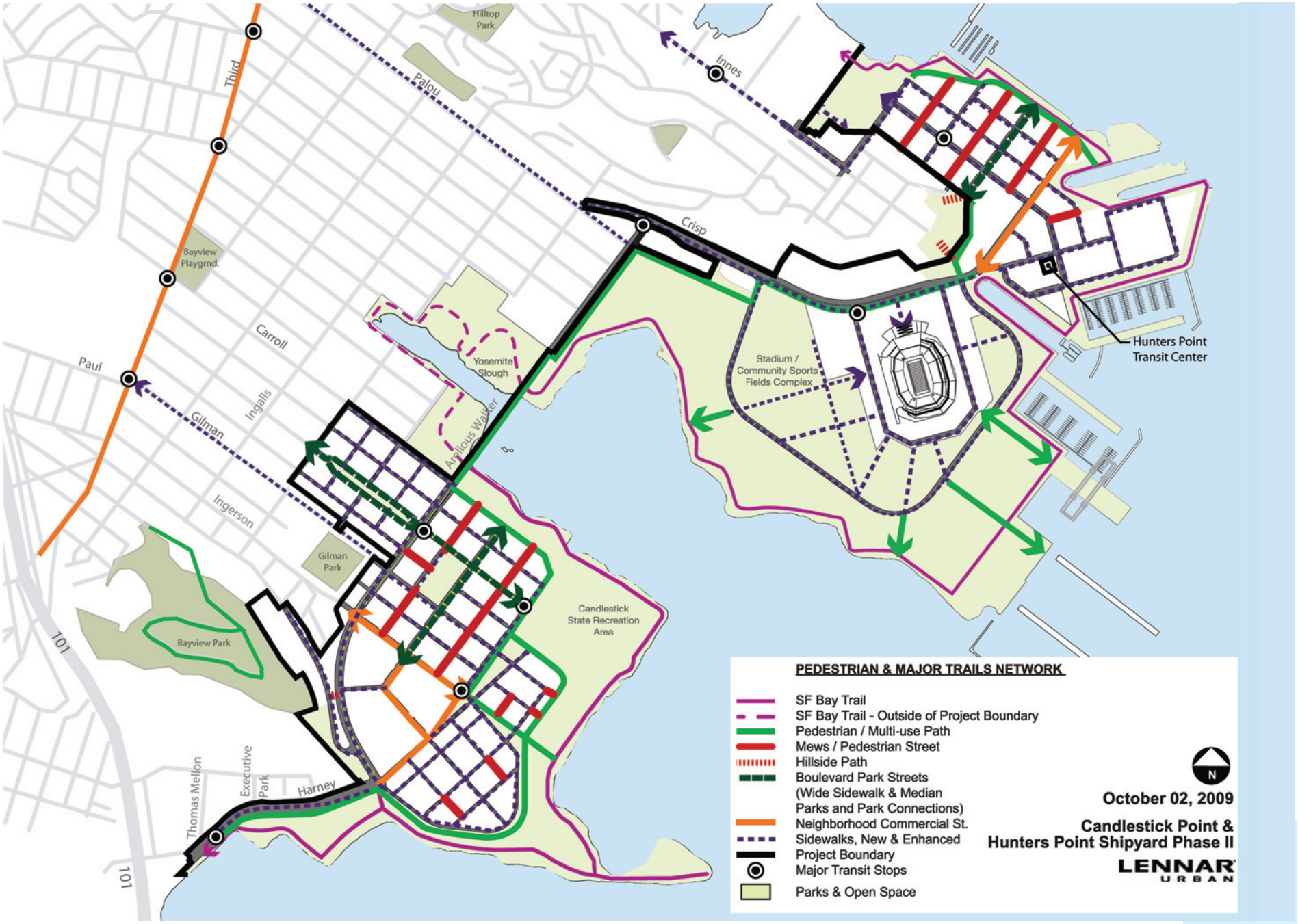
- Support services will be included in the commercial land use program. These uses will be designed and located in a manner that minimizes the need to use the automobile;
- Neighborhood-serving retail and a food store will be located within a half mile of every household;
- Opportunities for residents to work within the project site will be encouraged; and
- Appropriate street design that accommodates pedestrian-friendly design speeds and levels of congestion.

Maximize Pedestrian Travel

The density and configuration of the project are designed to actively encourage the use of walking as a primary travel mode. The project will be served by a network of pedestrian routes as illustrated in **Figure 12**. The following concepts will encourage pedestrian travel:

- The proposed residential densities are consistent with other dense and walkable San Francisco neighborhoods, such as North Beach, the Mission and the Marina, and are comparable to successful walkable and transit-oriented communities elsewhere;
- The highest residential densities will be within a five-minute walk of the Hunters Point Shipyard Transit Center and the Candlestick Point BRT Stops, and all residences will be within a fifteen-minute walk;
- The community-oriented land uses – markets, schools, and other public facilities – are located within short walking distances of project residents;
- Site design elements such as the configuration and orientation of buildings, landscaping and streets will be designed to provide a comfortable walking environment;
- Sidewalks conforming as closely as possible to the Better Streets Plan will be provided on all streets;
- A comprehensive wayfinding signage program will support the network of walkways and shared-use paths; and
- The project will be designed and built to be ADA-accessible to residents and visitors.
- Pathways will be provided between residential areas and to key entrances of parks and open space.

Figure 12: **Pedestrian Circulation Plan**



- Many residences in the adjacent neighborhoods of Bayview, Hunters View, India Basin, Executive Park, and the City of Brisbane will also be within a 15-minute walk of the improved transit facilities and new neighborhood services and retail.
- Streets will be designed to be pedestrian-friendly and incorporate the following characteristics:
  - » Separate pedestrians effectively from moving traffic through the use of wide sidewalks, on-street parking, and landscaping
  - » Facilitate pedestrian circulation with continuous pedestrian paths of travel and short block distances
  - » Enhance safety at crossings with shorter crossing distances, clearly marked crosswalks, and pedestrian crosswalk signals. Intersections should be designed with curb extensions where possible and tight corner radii (except on streets with delivery trucks or buses)
  - » Install vibrant streetscape elements including street trees, continuous "street wall", openings for activity and gathering space; and street furniture and lighting.

Maximize Bicycle Travel

The existing bicycle routes in the project vicinity, illustrated in **Figure 13**, are not sufficient to accommodate the level of bicycle activity expected in the area after the proposed project is built. To facilitate bicycle travel, the project will be served by an expanded network of bicycle routes, as proposed in **Figure 14**[7]. The following concepts have been developed to facilitate bicycle travel in a safe and convenient manner:

- Bicycle routes will be established within a quarter mile of all residences and employment, consistent with the City's current guidelines and bicycle plans;
- The development's roadways or adjacent roadways will incorporate Class II bicycle lanes for safe and efficient bike mobility through the project site. Appropriate signage and pavement markings (sharrows) will also be included for Class III bicycle routes;
- Shared-use paths will provide safe, direct, convenient and attractive routes between all of the development's major destinations. The project's bicycle route network will connect to the Bay Trail and to recreational paths on the project site;
- Internal streets will be designed to be low-speed (15-25mph), creating an environment that is attractive and safe for bicycling. Arterials will have a design speed of 35 mph;
- Directional signage along the bicycle routes and shared-use paths will point out key destinations;
- Bicycle routes will be designed to improve connectivity from within the project area to surrounding neighborhoods, and to increase bicycle access from outside the area to new destinations and regional transit hubs within;
- Safe and secure bicycle parking will be provided within each residential garage or within each residential building, with a minimum of 25 parking spaces for the first 50 dwelling units plus one space for every four dwelling units thereafter. Each commercial parking facility will provide bicycle parking at a minimum rate of 15 percent of car spaces;
- Supplemental bicycle parking racks will be provided near major destinations, and a bike parking station will be included at the Hunters Point Shipyard Transit Center;
- Showers and locker facilities will be provided within each new commercial building with greater than 10,000 square feet of uses; and
- Discounted space will be provided to encourage a bicycle station offering rentals, repairs, and storage to locate at Candlestick Point / Hunters Point Shipyard.

7 The proposed route improvements shown in Figure 14 and other local bike route revisions may be explored in the future per TDM, Bike Plan Revisions, or other programs.

Figure 13: **Existing Bicycle Routes**

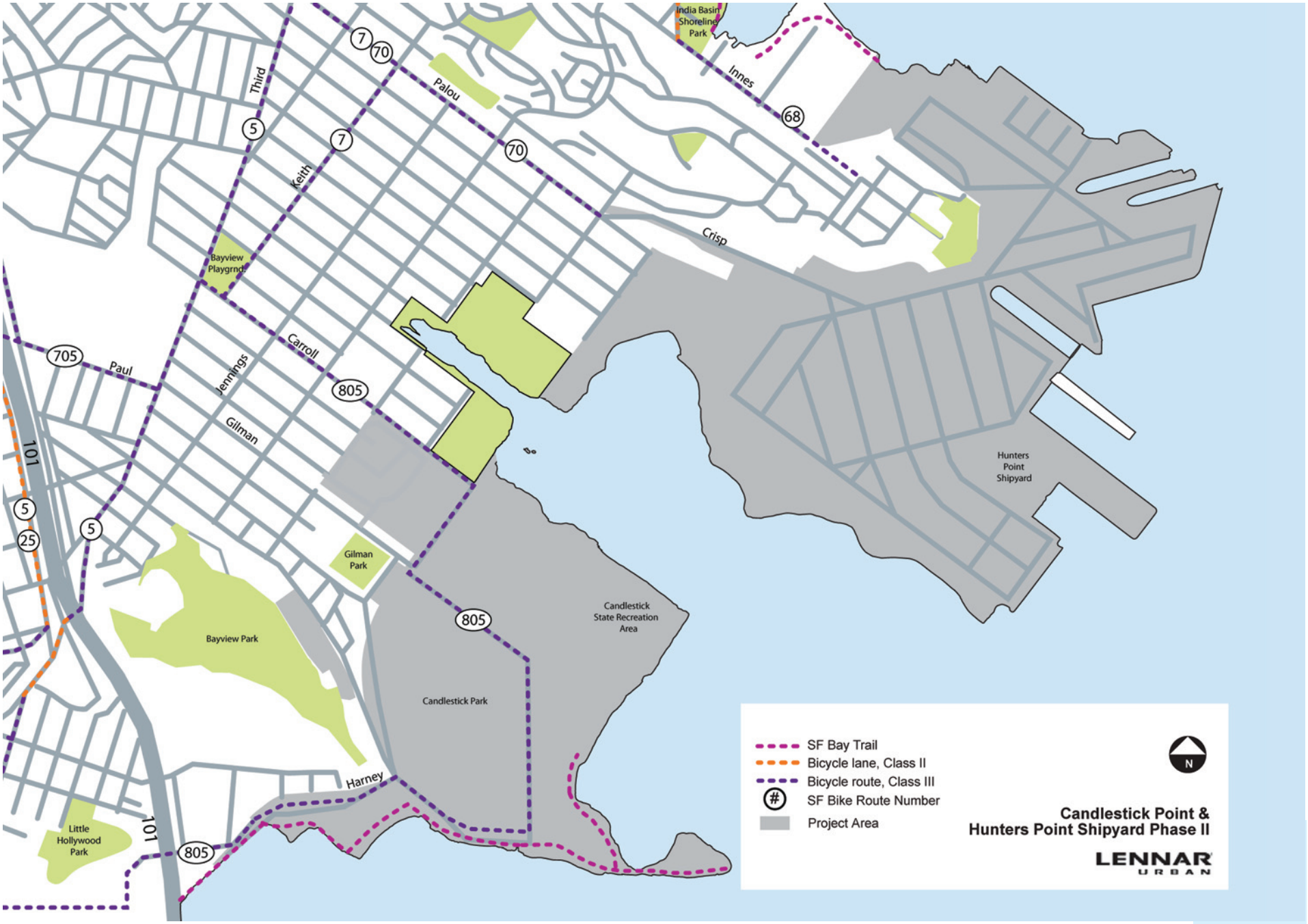
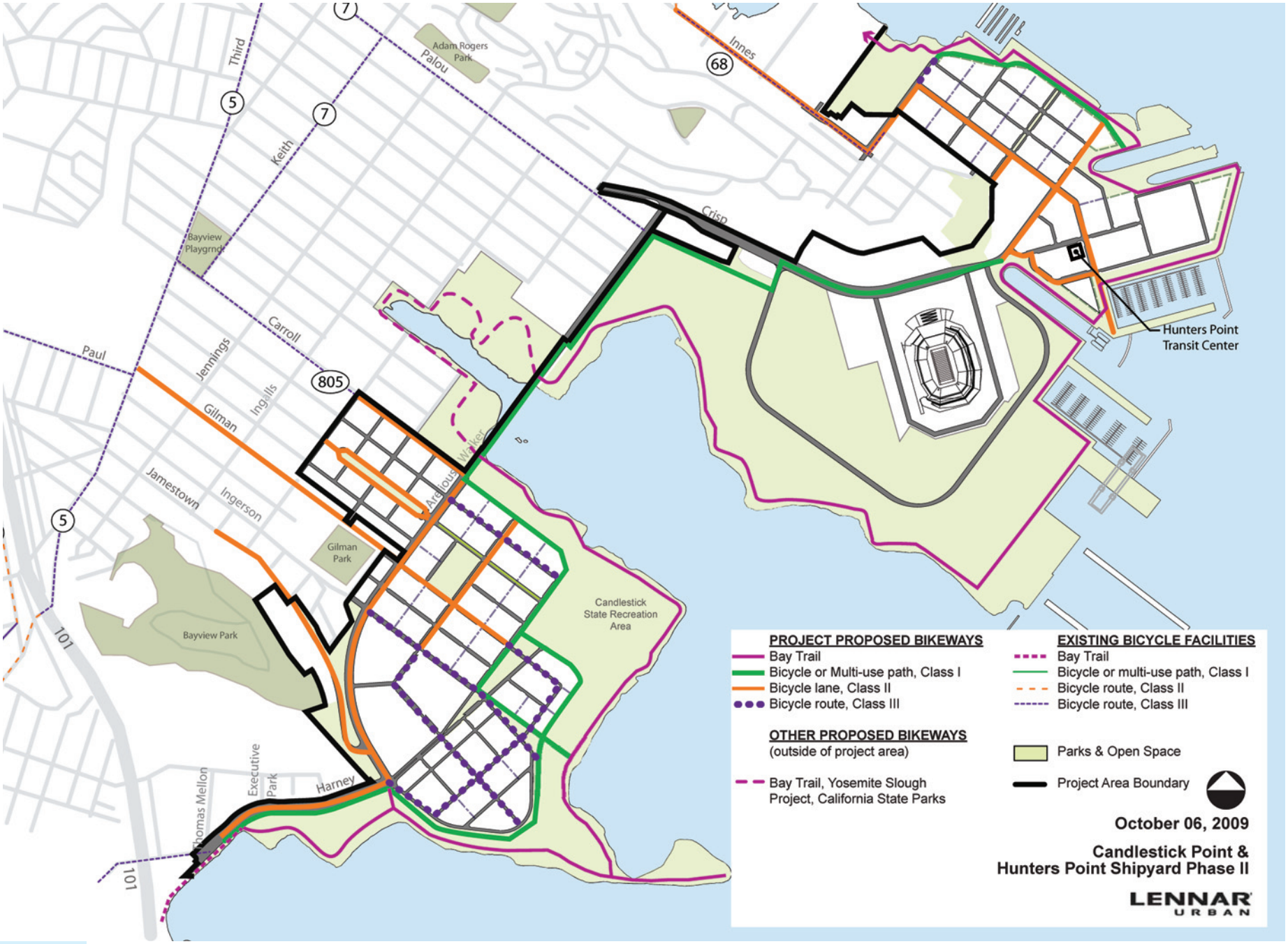


Figure 14: **Proposed Bicycle Routes**



Expand & Improve Transit Services

The Plan targets a near doubling of the current mode share of transit in the vicinity of Candlestick Point and Hunters Point Shipyard. Reaching this goal depends upon maximizing the effectiveness and convenience of transit service to and within the project site.

Ongoing dialogue with the San Francisco Municipal Transportation Agency (SFMTA) has identified new transit services to serve the project site. The ultimate network of new and improved transit services will be implemented by SFMTA. In addition, the City has initiated discussions to ensure complementary and mutually-reinforcing system connections with SamTrans and Caltrain.

In order to attain the project's transit usage goal, the strategies below have been developed. Rather than proposing a single major transportation facility, such as a new BRT, the strategies build upon the existing transit network and infrastructure. The following strategies will also benefit the surrounding Bayview and Hunters Point Shipyard neighborhoods:

- Extend existing Muni routes in coordination with phases of development to better serve the project area, with local and rapid transit service within a quarter or half mile of all residences and employment, respectively;
- Increase frequencies on existing routes to provide more capacity and increase the capacity of key routes, such as the T-Third;
- Complement these routes with new transit facilities and routes in coordination with phases of development in order to reduce transfers and better serve the project's proposed land use program and transit demand;
- Increase connections to the regional transit network (BART, Caltrain) to help reduce the current perception of the area's transit isolation;
- Specifically create a new BRT (Muni Line 28L) connecting Balboa BART Station, Bayshore Caltrain Station and T-Third Muni with several bus lines; and
- Ensure that new regional transit hubs within the project area are accessible by local transit, bicycle, pedestrians, shuttles, and taxis from adjacent neighborhoods on both sides of the City limits.

The need for new transit vehicles to serve the project presents an opportunity to introduce low- or zero-emission buses. SFMTA has targeted a reduction in greenhouse gas emissions from its vehicles to 30 percent below 1990 levels by 2012, and plans to become 100 percent emission-free by 2020.

Proposed Transit Improvements

New direct one-seat transit service is proposed to serve the high employment concentration of Downtown San Francisco. Fast and efficient connections to the regional transit network (BART, Caltrain, T-Third/Central Subway) also serve these destinations, as well as the employment centers of the Airport, the East Bay, the Peninsula, and the South Bay. BART and Caltrain stations south of the project site are generally well-served by local bus routes and shuttles that would provide connections to Peninsula workplaces.

The proposed transit improvements, illustrated in **Figure 15**, are described in the list to follow.

Figure 15: **Proposed Transit Improvements**

A. New and Expanded Bus Lines

Existing Muni lines 24, 44, and 48 would be extended to Hunters Point Shipyard; line 29 would be extended into Candlestick Point. Service frequencies on these lines would be increased to accommodate greater demand. New Downtown Express routes would connect both Candlestick Point and Hunters Point Shipyard with the Transbay Terminal. As transit-preferential elements are implemented on Palou Avenue, as well as Harney Way to support BRT (Muni Line 28L) service, new lines would be introduced to serve these corridors as well (see D and E below). The proposed expansion is summarized in **Table 7**.

B. Harney / Geneva BRT / Transit Preferential Street

To facilitate access to the regional transit system, bus rapid transit and transit preferential improvements will be implemented in the Harney Way / Geneva Avenue corridor. Exclusive bus lanes and BRT elements will be installed along the route connecting Hunters Point Shipyard Transit Center and Bayshore Caltrain Station through Candlestick Point. These lanes will be designed to be "rail ready" in that they will be able to accommodate the geometric curves, grades, and widths that support light rail operation, although light rail is not proposed as part of this project. Transit preferential elements would be implemented along Geneva Avenue between Bayshore Caltrain Station and Naples Street, and BRT elements from Naples to Balboa Park BART Station. BRT service in this corridor would connect Hunters Point Shipyard and Candlestick Point to Caltrain, T-Third Metro and BART service. In addition, transfers to SamTrans will be facilitated at the Bayshore Boulevard and Geneva Avenue intersection.

C. Hunters Point Shipyard Transit Center

The Hunters Point Shipyard Transit Center will serve the northern half of the project and would be located along two blocks adjacent to the Hunters Point Shipyard Village Center. Along with ten bus bays, the facility will include shelters, ticketing kiosks, real-time transit information technology and operator restrooms. Most of the bus lines serving Hunters Point Shipyard will stop at the transit center allowing quick and immediate transfers to other lines. The transit center will be located just one block away from the Hunters Point Shipyard Village Center retail street.
The intention of the Transit Center is to consolidate the terminus of all transit lines in one location to allow for convenient transfers and bus layovers. It is located at the nexus of residential, retail, and research and development land uses.

D. BRT Stops

BRT (Muni Line 28L) stops will be located at Hunters Point Shipyard Transit Center, three locations within Candlestick Point and at two intermediate locations. At the BRT stops, the roadway would be widened to allow for curbside bus loading zones or station platforms. The stops will include shelters, ticketing kiosks, real-time transit information and other amenities.

E. Palou Avenue Transit Preferential Street

One Muni line will be extended along Palou Avenue to serve the Hunters Point Shipyard Transit Center. In addition, two other lines will operate along Palou Avenue with service near the project. In order to provide efficient, attractive service on these lines, transit preferential treatments including transit-priority technology would be implemented, including installation of up to thirteen new traffic signals along Palou Avenue. To improve pedestrian comfort and the accessibility of transit in this corridor, new bus shelters will be installed and the street will be upgraded with ADA ramps, bulbouts, and crosswalks.

Other Potential Transit System Improvements Under Study

A number of additional transit projects under study have been identified that would facilitate access to the project but are not part of this Plan.

F. Bayshore Transit Center

The Harney/Geneva bus rapid transit corridor intersects Caltrain at the Bayshore Station, which would allow for convenient intermodal connections between Candlestick Point, Hunters Point Shipyard, and Peninsula destinations. A vertical circulation connection would be introduced to seamlessly connect the two services. The connection would include elevators and stairs, and a potential extension of the station platform. Consideration will be given to include a bicycle station to facilitate Intermodal connections.

Table 7: Muni Service to the Project – Existing and TEP Equivalents		
Existing Muni Line	**Equivalent under TEP Proposals and Summary of Changes**	**Additional Proposed Service Enhancements**
23 – Monterey	**18 – 46th Ave:** would be combined with Line 23, providing direct service to the Outer Sunset and Outer Richmond	Same as proposed TEP service
24 – Divisadero	**24 – Divisadero:** would be modified to serve the Mission and the Marina Districts	Extension along Palou, Crisp and Spear Aves. to Hunters Point Shipyard Transit Center
28L – 19th Ave/ Geneva Limited (BRT)	**28L – 19th Ave Limited:** would be modified to serve Balboa Park BART. Service would extend to 9 PM.	Extension along Geneva Ave through Candlestick Point with terminus in Hunters Point Shipyard. Conversion to BRT in the project area, with enhancements along Geneva Ave as supported in the Bi-County Study
29 – Sunset	**29 – Sunset:** minor changes only	Extension along Gilman Ave to Harney Way
44 – O'Shaughnessy	**44 – O'Shaughnessy:** no changes	Extension along Innes Ave to Hunters Point Shipyard Transit Center
48 – Quintara to 24th St	**48 – Quintara to 24th St:** would cover portion of Line 19 on Evans and Innes	Extension to Hunters Point Shipyard Transit Center
54 – Felton	**54 – Felton:** minor changes only	Same as proposed TEP service
T – Third (light rail)	**T – Third:** increase frequency and capacity and extend into Chinatown via the Central Subway	Same as proposed TEP service
Candlestick Point Express (CPX)	Not proposed in TEP	Provide new express bus service between Candlestick Point and Downtown San Francisco
Hunters Point Express (HPX)	Not proposed in TEP	Provide new express bus service between Hunters Point Shipyard and Downtown San Francisco
Source: San Francisco Municipal Transportation Agency and Fehr & Peers – March 2009		

G. Oakdale Caltrain Station Improvements

Until 2005, the Bayview District was served by the Paul Avenue Station, which has since been closed. San Francisco County Transportation Authority (SFCTA) is considering a new station serving this area at Oakdale Avenue. If implemented, bus services on Palou Avenue would intersect Caltrain at this location, creating an intermodal station. This would forge a second connection from Hunters Point Shipyard and Candlestick Point to Caltrain, offering a fast, convenient connection to the South of Market District.

H. SamTrans

Facilitate new shared routes with SamTrans to directly serve South San Francisco employment centers.

Muni Transit Effectiveness Project

Muni has proposed changes to several of the lines that would serve Candlestick Point and Hunters Point Shipyard as part of its Transit Effectiveness Project (TEP). Service extensions and modifications beyond the TEP proposals would be required to serve the project site. **Table 7** presents each existing line proposed to serve Candlestick Point and Hunters Point Shipyard, the line's equivalent under the TEP proposals, and the modification to the existing or equivalent line that would be required to provide service to the project.

Regional Transit Efficiency

The new and stronger Muni links to local trunk lines and regional transit corridors helps provide multiple options for transit riders heading to Mission Bay and Downtown San Francisco via connections to the T-Third/Central Subway, BART, Caltrain, and the one-seat Muni express ride. Furthermore, the development of mixed uses in the project area will help to create "reverse commute" job and recreation destinations that take advantage of transit capacity in the regional networks in the serving the non-peak direction. This phenomenon will help balance the network and increase fare box revenue for corridors where capacity currently exists. These include BART to the Airport and Peninsula and Caltrain to the Peninsula and Silicon Valley.

Additional Transit Elements

In addition to the extension of Muni service to the project site, as described above, the following elements will support and encourage transit ridership:

- Real-time transit arrival information using NextBus technology and passenger waiting shelters will be provided at the transit center and key bus stops;
- All bus stops will be clearly marked on the pavement, and will include either bus bulbs or bus pull-outs if requested by Muni;
- Transit maps, schedules, on-line passes, real-time arrival information, and internet links will be provided on the Candlestick Point / Hunters Point Shipyard website for all nearby transit operators;
- A Guaranteed Ride Home program supported by employer participation would reimburse transit riders for return trip travel in the event of an emergency when an alternative means of travel is not available;
- Residents will be charged for and provided a transit pass as part of their homeowner's dues, which would be valid for use on the various transit systems that serve the site;
- Tickets for special events and cultural activities at the project site, including 49ers games, could be priced to include the cost of a roundtrip transit ride; and
- In addition to a pass for residents, opportunities to provide employees with an "EcoPass" will also be pursued, similar to the programs already underway at the University of California and the City of Berkeley. These passes would allow unlimited transit use and could be purchased on a monthly and/or annual basis, and then be made available to all employees who work on the project site.

Implement Transportation Demand Management Program

An effective Transportation Demand Management (TDM) Program will reduce the amount of auto use and encourage residents, employees, and visitors to use alternative modes of travel, such as transit, walking, and bicycling. In addition, a TDM program provides measures to reduce the demand for travel during peak times.

The TDM program for Candlestick Point and Hunters Point Shipyard project will be consistent with the policies of the various agencies within the City of San Francisco, and work seamlessly with the ongoing plans at nearby developments. The proposed TDM program will target residents, employees and visitors, and could include the strategies described in the following sections.

Transportation Coordinator and Website

An on-site Transportation Coordinator (TC) will provide residents, employers, employees and visitors with the information they need to make the best use of the transportation alternatives available to them.

The TC will implement and administer the various TDM elements, and will coordinate with the City, the various transit agencies, and other nearby uses. The TC will be in regular communication with the transit agencies and will work with them to monitor transit usage and make appropriate changes to services to match demand. In addition, the TC will be responsible for operating and maintaining a website for the Candlestick Point / Hunters Point Shipyard project, which will include transportation-related data and real-time transit information.

The TC will keep residents, employees, and employers apprised of travel incentives or changes to travel options, and will be responsible for coordinating with visitors and groups holding large events at Candlestick Point or Hunters Point Shipyard.

The TC will be responsible for coordinating the production and distribution of travel brochures and educational documentation to increase resident, employee and visitor awareness of the various available TDM elements and travel options. The TC will also be responsible for conducting new employee/ resident orientation and education programs and performing individualized marketing of transportation alternatives.

Employers will be required to participate in TDM programs

The responsibilities of the TC include the following:

- Managing the carpooling/vanpooling database and Guaranteed Ride Home program;
- Coordinating carsharing organizations on the project site;
- Monitoring bicycle parking provision and usage; and
- Reporting maintenance issues.

Each year, the TC will be responsible for conducting surveys of residents, employees, and visitors to determine the current mode split (percentage of travelers who drive alone, carpool, ride transit, walk, or bike) and demographic information (such as location of work and commute time to and from work). This information will be used to improve the effectiveness of the TDM program if the project's modal split goals are not being met.

Employee TDM Elements

The TDM program will include elements designed to assist employers to encourage the use of transit and facilitate walking and bicycling among their employees. All project site employers would be required to participate in the TDM program, and the TC would work with employers to monitor progress and provide support. It is expected that the TDM program will be a single document, which will cover the program monitoring to be performed by the TC. The project's TDM program will detail what elements are required of employers of different sizes and each employer will be required to designate a single contact for transportation purposes.

In addition, employers will be expected to provide the following:

- Bicycle parking in a controlled access or secure area with showers and clothes lockers;

- Carpool and vanpool ridematching services, with allocated parking spaces and reduced parking charges;
- Guaranteed Ride Home program for registered carpool, vanpool and transit riders in emergency situations;
- Information boards/kiosks displaying transit routes and schedules; carpooling and vanpooling information; bicycle lanes, routes, paths and facility information.

Furthermore, employers will be encouraged to offer programs to reduce auto use and support the use of alternative modes including the following:

- Alternative commute subsidies and/or parking cash-out, where employees are provided with a subsidy if they use transit or commute by alternative modes;
- Opportunities to purchase commuter checks;
- Opportunities to provide subsidized vanpool service;
- Marketing of alternative travel options, with employers encouraged to provide information to customers regarding alternative modes of travel;
- Compressed work week and flextime, where employees adjust their work schedule to reduce vehicle trips to the worksite; and
- Telecommuting options.

The TC will work with employers to ensure that employees are kept fully informed of the available programs and promotional activities, and will be available to assist with new employee orientation. In addition, the TC will be available to coordinate these services on behalf of the smaller employers.

Carpool/Vanpool Elements

Carpool and vanpool ridematching services would be offered through the TDM program, and designated spaces in parking facilities would be provided free to vanpools. A designated signed area near the transit centers would be reserved for casual carpooling.

Proposed implementation measures include the following:

- Within the commercial zone, preferential parking spaces will be reserved for carpoolers;
- A casual carpool pick-up point will be designated;
- All employees and residents who are registered carpool/vanpool users will be guaranteed a ride home when carpooling or vanpooling;
- A database of carpool/vanpool participants will be collected and maintained by the TC; and
- A real-time carpool match program will be provided on the Candlestick Point / Hunters Point Shipyard website.

Carshare Elements

The Transportation Coordinator will work with local carsharing organizations to provide a network of carshare vehicles parked in neighborhood "pods", each within a half mile of all residences. Members will be allowed to use vehicles when needed, paying based on how much they drive, thus reducing the fixed costs associated with private automobile ownership.

It is expected that many residents would become members of the carsharing organizations, reserving a car by phone or online on an as-needed basis. At the carshare "pods", members would check in with a personalized key card to gain access to the car.

This program provides an effective incentive for residents and others to opt for transit as a primary mode of travel because they know that a car is readily available when they need one. The growth and success of these programs in the Bay Area and in other cities throughout the US has shown their effectiveness in reducing auto dependency.

The carshare operators would determine the appropriate number of cars to be located at the project site, based on market demand. Parking spaces for carshare vehicles would be provided at strategic locations throughout the project site. The number of car share parking spaces is determined on the number of users as outlined in **Table 8** below.

Table 8: Car Share Parking Space Requirements

Number of Residential Units	Number of Required Car Share Parking Spaces
0-49	0
50-200	1
201 or more	2, plus 1 for every 200 dwelling units over 200
Number of Parking Spaces Provided for Non-Residential Uses or in a Non-Accessory Parking Facility	**Number of Required Car Share Parking Spaces**
0-24	0
25-49	1
50 or more	1, plus 1 for every 50 parking spaces over 50

Proposed implementation measures include the following:

- The TC will coordinate with carshare providers to establish long-term carshare use. This will reduce the need for private vehicle ownership for vacations or weekend trips;
- The availability of carsharing and information on the various carshare operators will be included in all rental and leasing information and on the Candlestick Point / Hunters Point Shipyard website;
- Within the commercial zones, free parking spaces will be reserved for short-term carshare parking;
- All carshare parking spaces and hub locations will be clearly identified and directional signage will be provided, and real-time availability of carshare vehicles will be provided on the Candlestick Point / Hunters Point Shipyard website (to supplement the information on the carshare operators' websites); and
- Carshare vehicle hubs will be established throughout the project site in coordination with the design of garages and parking facilities.

Additional Elements and Implementation Strategies

The following additional TDM strategies are best implemented in conjunction with complementary strategies among the previously-described TDM elements:

- A personalized commute plan will be offered for all new residents. The TC will meet with each resident and develop a customized transit, carpool, vanpool or bicycle program. The TC will show residents their various commute options, comparing costs and travel times, and identifying any employer-based programs.

- The TC will coordinate with major employers in San Francisco and the Peninsula to develop employer-based TDM measures. Transit usage and carpool/vanpool need to be supported on both ends to be successful. There is a higher incentive to use transit if free parking is not provided at the workplace. Employers control the ability to institute alternative work hours and telecommuting. Housing at Candlestick Point / Hunters Point Shipyard could also be marketed to new employees at these workplaces.
- The TC will institute a TDM committee staffed by residents and employees. The committee will participate in setting TDM goals and developing programs, which would give residents and employees a greater stake in its success.
- Performance goals will be set upon occupancy of each phase. Goals could be established as a given decrease in single-occupant vehicle mode split or reduction in peak hour traffic volumes at driveways.
- All TDM information will be included in rental packets and home ownership documents as well as all office, R&D, and retail lease documents.
- Surveys of residents, employers, and employees will be conducted on an annual basis to document TDM effectiveness and to develop additional program measures.
- High-speed wireless internet will be provided to encourage telecommuting.
- All deliveries to the grocery store and other high-volume commercial uses will be scheduled to avoid peak commute periods.
- A bike sharing program will be considered as an alternative transportation program where bike kiosks are set up at intervals along major corridors and riders can pick up and drop off bicycles in seconds.

Parking

The parking program is designed to reduce the overall usage of private automobiles through pricing, supply, new technologies and effective monitoring programs. The following sections outline some of the key elements of the parking plan.

Residential Parking

Residential parking will be unbundled from the units and each parking space will be sold or leased separately to individual units[8]. Residential parking rates will be set equivalent to fair market value and parking will be provided at a rate of one space per unit on average.

In areas outside of Downtown San Francisco, the *Planning Code* generally requires a minimum 1.0 parking ratio – one off-street parking space for each dwelling unit. However, minimum parking requirements have recently been removed for Downtown Residential (DTR) and C-3 districts – including Union Square, the Financial District, Rincon Hill, and portions of SOMA surrounding the Transbay Terminal. Maximum parking ratios now apply in these areas, which in some cases are well below the otherwise 1.0 parking ratio minimum. A 1.0 parking ratio maximum is proposed for this project.

The San Francisco General Plan discourages automobile use and encourages alternative means of travel in high-density, congested areas, and recognizes that not every resident needs parking provided with their unit. The policy of providing less than one parking space per residential unit has been incorporated in the Market and Octavia Neighborhood Plan, and is under consideration in the Eastern Neighborhoods Area Plans.

8 This arrangement would not apply to the 1,655 "Agency Affordable" units, which are limited by tax-credit financing requirements.

Unbundling takes this concept one step further and links parking requirements to auto ownership instead of home ownership. In typical units where parking is bundled, tenants pay for the unit and the parking space as a single cost. Unbundling removes the parking component from the cost of residential or commercial space and allows residents and tenants to buy or lease parking only if they need it.

There are two primary benefits to unbundling[9]:

Reduced housing costs and greater housing affordability. Tenants who do not intend to use off-street parking can save the expense of purchasing a parking space with their unit. Unbundling parking can thus increase the affordability of housing, which is an especially important issue in San Francisco, where the cost of housing can be beyond the means of many households.

Induced changes in travel behavior. Bundled off-street parking gives the impression that parking is "free", when in reality; the cost of the unit is greater than a unit without off-street parking. Unbundling parking reveals the actual cost of parking to the tenant and can affect the perception of the cost of owning a car compared to the cost of alternative modes of travel such as transit. By increasing awareness of the hidden costs of auto ownership, unbundling parking could ultimately help to induce changes in travel behavior, such as decreasing auto dependency and encouraging more sustainable travel patterns on transit, bicycles, and by foot.

Unbundled parking is currently required in the Transbay, Rincon Hill, Central Waterfront and Eastern Neighborhoods, and is a standard condition for any housing projects needing approval of the Planning Commission.

Employee / Visitor Parking Elements

- Parking will be designed to serve all commercial land uses. Where shared parking opportunities exist (e.g., a facility provides parking for service uses during the day and a restaurant during the evening), the parking requirements will be reduced accordingly;
- All on- and off-street parking will be paid parking;
- Parking rates will ideally be set equivalent to fair market value and not subsidized by tenants or building operators;
- No discounts will be allowed for "early bird" or "in by / out by" long-term parking, and no discounted monthly parking passes will be allowed; and
- Preferred parking spaces will be reserved for carpool/ vanpool/carshare vehicles.

In addition to the above elements, off-street parking will be priced according to the following principles:

- Free or discounted parking will be available for rideshare/ vanpool users;
- Parking will be more expensive than transit options;
- Parking fee structures will encourage short-term retail trips and strongly discourage long-term parking / employee parking; and
- Assessment of parking fees would begin before the morning commute period and end after the evening commute period to discourage use of automobiles for home-based work trips among project residents.

9 Klipp, Luke. "The Real Costs of San Francisco's Off-Street Residential Parking Requirements: An analysis of parking's impact on housing finance ability and affordability." (2004).

Retail and Hotel Parking

- Shoppers and hotel guests will not receive validation for parking;
- Parking will be more expensive than transit options;
- Hotel room rates will include a transit pass surcharge to encourage transit use among hotel guests;
- TDM programs will be instituted for retail and hotel employees; and
- TDM programs will be instituted for special events which would be expected to draw large numbers of visitors to project retail uses and hotels.

Parking Requirements

Table 9 summarizes parking requirements calculated for the project land use program. These numbers represent maximum off-street parking spaces for uses within the project area. The Planning Department may require that parking be shared across uses. The development plan anticipates utilizing the Design for Development (D4D) process for development controls, and thus the parking and loading requirements will be tailored to this development. Stadium parking needs are discussed separately in Section 6.4.

Table 9: Parking Requirements

Land Use	Rate	Number of Spaces		
		Candlestick Point	Hunters Point Shipyard	Total
Residential	1 per unit	7,850	2,650	10,500
Commercial				
Regional Retail	2.7 per 1,000 sq.ft.	1,570	-	1,570
Neighborhood Retail	1 per 1,000 sq.ft. (CP) 3 per 1,000 sq.ft.(HP)	125	375	500
Office	1 per 1,000 sq.ft.	150	-	150
*Research and Development**	1.3 per 1,000 sq.ft.	-	2,600-3,500	2,600-3,500
Hotel	0.25 per room	55	-	55
Arena	1 per 23.5 seats	425	-	425
Artists' Space	1 per 2,000 sq.ft.	-	130	130
Community Uses	1 per 2,000 sq.ft.	25	25	50
Total		**10,200**	**5,780-6,670**	**15,980-16,800**

Source: Fehr & Peers 2009 based on San Francisco Planning Code and discussions with San Francisco Redevelopment Authority.

These requirements present the base number for the proposed project required spaces, although it does not include the Stadium site. It should be noted that different requirements may apply based on the type of office and research and development tenants. The project parking supply for residential uses meets requirements. The parking supply for commercial uses falls within the low and high code requirements for Hunters Point Shipyard, but would not meet requirements for Candlestick Point, providing only two-thirds of the required number of spaces. This reflects the project's commitment to reduce automobile use and encourage the use of alternative travel modes.

* To achieve game day parking requirements if the 49ers stadium is constructed at Hunters Point Shipyard, parking requirements for R&D on Crisp Road only will be increased to 1.8.

Parking Supply

The proposed parking supply program is summarized in **Table 10**. On average, residential uses are provided up to one space per dwelling unit, although some residents may not require parking spaces due to use of alternative modes. The majority of commercial parking spaces would be located in structures. Parking by location and type is illustrated in **Figure 16**.

Table 10: Proposed Parking Supply

Parcel	Number of Spaces					
	Residential	Commercial[1]		General On-Street	Stadium Only[2]	Total
		Structure	On-Street			
Candlestick Point						
Alice Griffith/ Jamestown	1,535	0	0	450	0	1,985
North	3,070	0	25	450	0	3,545
Center	275	2,321	0	170	0	2,766
South	2,970	0	0	290	0	3,260
Subtotal	7,850	2,321	25	1,360	0	11,556
Hunters Point Shipyard						
Hunters Point Shipyard	2,085	75	0	319	0	2,479
Village Center	125	89	0	47	0	261
Research and Development	440	2,939	0	317	0	3,696
Stadium Site	0	925	0	0	12,665	13,590
Subtotal	2,650	4,028	0	683	12,665	20,026
Total	10,500	**6,349**	**25**	**2,043**	**12,665**	**31,582**

Source: Lennar Urban – May 2009

Bicycle Parking Supply

The proposed bicycle parking program is summarized in **Table 11**. Hotels, Residential Buildings and Live/Work Units are excluded from shower/locker requirements.

Table 11: Proposed Bicycle Parking Supply and Facilities

Land Use	Size of Use	Number of Bicycle Spaces Required	Showers	Lockers
Residential	0 - 50 dwelling units	1 per 2 units	n/a	n/a
	> 50 dwelling units	25 spaces plus 1 for every 4 units over 50		
Medical, Office, Institutional, R&D, Theater, Hotel, Artist Space, & Community Uses	10,000 – 20,000 sq.ft.	3	1	2
	20,000 – 50,000 sq.ft.	6	2	4
	> 50,000 sf	12	4	8
Retail and Eating/ Drinking Uses	25,000 – 50,000 sq.ft.	3	1	2
	50,000 – 100,000 sq.ft.	6	2	4
	> 100,000 sf	12	4	8
Structured Parking	< 500 automobile spaces	1 per 20 auto spaces	n/a	n/a
	> 500 automobile spaces	25 spaces plus 1 for every 20 auto spaces over 500, maximum of 100		

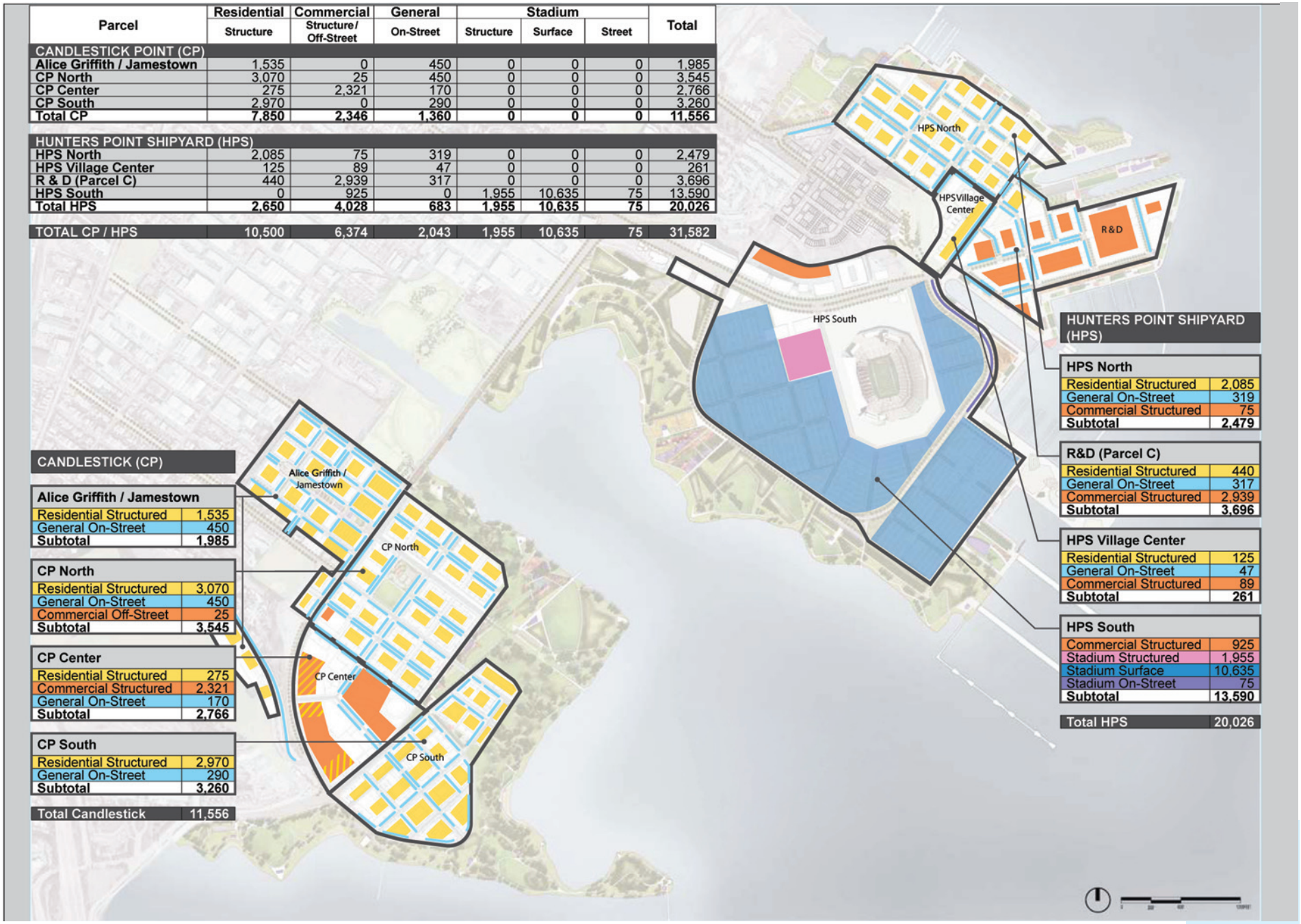
Source: Fehr & Peers – October 2009

1 Includes regional retail, neighborhood retail, office, hotel, and arena uses for Candlestick Point and neighborhood retail, artists' space, and research and development for Hunters Point Shipyard.

2 Additional game day parking will be available in commercial structured parking in the Research & Development area of Hunters Point Shipyard.

Figure 16: **Proposed Project Parking**

Parcel	Residential	Commercial	General	Stadium			Total
	Structure	Structure / Off-Street	On-Street	Structure	Surface	Street	
CANDLESTICK POINT (CP)							
Alice Griffith / Jamestown	1,535	0	450	0	0	0	1,985
CP North	3,070	25	450	0	0	0	3,545
CP Center	275	2,321	170	0	0	0	2,766
CP South	2,970	0	290	0	0	0	3,260
Total CP	7,850	2,346	1,360	0	0	0	11,556
HUNTERS POINT SHIPYARD (HPS)							
HPS North	2,085	75	319	0	0	0	2,479
HPS Village Center	125	89	47	0	0	0	261
R & D (Parcel C)	440	2,939	317	0	0	0	3,696
HPS South	0	925	0	1,955	10,635	75	13,590
Total HPS	2,650	4,028	683	1,955	10,635	75	20,026
TOTAL CP / HPS	10,500	6,374	2,043	1,955	10,635	75	31,582



Non-Stadium Variants

The non-stadium variants assume either an additional 2,500,000 sq.ft. of research and development space in place of the stadium (Variant 1) or an additional 500,000 sq. ft. of research and development space plus a shift of 1,625 dwelling units from the Candlestick Point site to the Hunters Point Shipyard site (Variant 2A). These alternatives would remove the 12,665 parking spaces associated with the stadium and replace them with structured and on-street parking consistent with the Design for Development guidelines. The Non-Stadium parking supply is discussed in Chapter 7.

Loading

The loading program is designed to facilitate access required by freight vehicles (commercial delivery and moving trucks) and passenger vehicles (private vehicles, vans and shuttles), while mitigating the negative impacts that loading and unloading activities might have on other traffic modes, particularly the pedestrian environment. The program must be managed effectively in order to prioritize pedestrians and enhance safety. The following sections outline the key elements of the loading plan.

On-street Loading

On-street loading spaces are designed to facilitate short-term parking near building entrances to meet the needs of disabled individuals and as a general convenience. They also allow package and other commercial deliveries to be made. Loading spaces also facilitate traffic flow by reducing the incidence of double-parking. However, even the frequent movements of vehicles in and out of loading spaces can hinder traffic, including bikes and transit service. The following guidelines will apply to the location and management of on-street loading spaces:

- The prime street frontage directly in front of building entrances will not be designated for parking but reserved for use as short-term loading zones;
- The sizes of loading zones will be tailored to the specific uses of the adjacent properties;
- Retail streets featuring angled parking on one street face will have loading spaces on the opposite street face, and include additional spaces to accommodate the needs of both sides of the street; and
- Loading spaces will not be designated on BRT streets. The loading needs of blocks adjacent to BRT streets will be accommodated on other block faces.

Off-street Loading

To provide access from the street, off-street loading spaces require curb cuts and driveways, which can be intrusive to the bicycling and pedestrian environment. In addition, the turning movements of vehicles leaving or entering the street can impede the flow of traffic, which is of particular concern with regard to transit vehicles. The following guidelines will apply to the location and design of off-street loading spaces:

- Where possible, curb cuts and driveways providing access to off-street loading spaces should be consolidated into a single location on any block face to minimize their impact;
- No curb cuts accessing off-street loading will be created on the BRT streets or on the local streets with bike lanes, where alternative frontages are available;
- Individual buildings will be limited to one opening of up to 22 feet in width to provide access to off-street loading. Shared openings for parking and loading will be encouraged, with a maximum width of 27 feet;

- Loading spaces will be designed to serve all commercial land uses. Where opportunities to share loading spaces exist (e.g., loading area for a supermarket with a peak of morning deliveries and restaurants with afternoon deliveries), the off-street loading requirements will be reduced accordingly; and
- The Redevelopment Agency may regulate truck access from arterial streets to loading docks based on development-specific loading needs.

Tables 12 and **13** present permitted and required off-street freight loading space for various project uses, based on Section 152 of the San Francisco Planning Code. The Code stipulates off-street loading space requirements that apply generally outside of the downtown commercial core and the South of Market District, but includes special conditions for Downtown Residential (DTR) districts. DTR districts are transit-oriented, high-density mixed-use residential neighborhoods in and around downtown. Reflecting the greater pedestrian activity in such districts, off-street loading is limited to a certain number of permitted spaces, rather than a prescribed number of spaces.

The off-street loading limits of DTR districts, shown in **Table 12**, are proposed for the medium-density residential and high-density residential blocks, as shown in the Land Use Program presented in **Figure 6**. In all other areas of the project, the City's general requirements for off-street loading spaces will apply, as presented in **Table 13**.

Table 12: Proposed Off-Street Freight Loading Space Limits Medium- and High-Density Residential Blocks

Land Use	Size of Use	Number of Spaces Permitted (per block)
Non-Residential Uses	0 - 50,000 sq. ft.	1
	> 50,000 sq. ft.	1 space per 50,000 sq. ft.
Residential – low density	0 - 100 units	1
Residential – high density	> 100 units	1, plus 1 additional loading space for every 200 additional units
Total Number of Loading Spaces Allowed for Any Single Building (all uses)		4

Source: Fehr & Peers – October 2008

Table 13: Proposed Off-Street Freight Loading Space Requirements Outside of Medium- and High-Density Residential Blocks

Land Use	Size of Use	Number of Spaces Required (per block)
Retail, Wholesale, Manufacturing, Live/Work	0 - 10,000 sq. ft.	0
	10,000 - 60,000 sq. ft.	1
	60,000 - 100,000 sq. ft.	2
	> 100,000 sq. ft.	3, plus 1 for each additional 80,000 sq. ft.
Offices, Hotels, Residential, and all other uses	0 - 100,000 sq. ft.	0
	100,000 - 200,000 sq. ft.	1
	200,000 - 500,000 sq. ft.	2
	> 500,000 sq. ft.	3, plus 1 for each additional 400,000 sq. ft.

Source: Fehr & Peers – October 2008

5.3 Phasing

The Plan calls for a comprehensive set of transportation solutions to serve the travel demands of residents, employees and visitors and to meet the project goals of sustainability and livability. Because of their cost and complexity, these improvements to the transit and roadway networks will be phased during the development of the project. Because the project is expected to be constructed over a relatively long period (full buildout expected by 2032), it is crucial that transportation improvements be timed to provide the optimal level of mobility relative to the amount of development throughout the buildout process.

Development of the project has been grouped into three major development phases. **Table 14** presents the anticipated land development phasing.

Table 14: Land Development Phasing

Land Use	Phase 1	Phase 2	Phase 3
Hunters Point Shipyard			
Residential Units	2,650 homes	0	0
Neighborhood-Serving Retail	125,000 sq. ft.	0	0
Research & Development	722,000 sq. ft.	1,778,000 sq. ft.	0
Stadium	69,000 seats	0	0
Artists Studios	225,000 sq. ft.	0	0
Candlestick Point			
Residential Units	1,253 homes	3,835 homes	2,762 homes
Regional-Serving Retail	0	635,000 sq. ft.	0
Neighborhood-Serving Retail	0	125,000 sq. ft.	0
Office	0	150,000 sq. ft.	0
Hotel	0	220 Rooms	0
Arena	0	10,000 seats	0

Source: Lennar Urban, February 2010

These development assumptions anticipate construction of the majority of the Hunters Point Shipyard site in Phase 1 (including a new NFL stadium) and the majority of the Candlestick Point site (including a new arena seating up to 10,000 spectators) in Phase 2. Additional residential development in the Candlestick Point site will occur in Phase 3.

Tables 15 - 16 summarize the programmed roadway and transit improvements, respectively. Roadway improvements are identified by the numbers corresponding to **Figure 8** and transit improvements are keyed by the letter they are identified with in **Figure 15**. Phase 1 improvements are generally expected to be built and operational to coincide with the first stage of residential development and to meet the needs of the new NFL stadium. Subsequent improvements are expected to be built and operational to coincide with project build-out.

Table 15: Roadway Improvement Phasing

Roadway Improvement	Phase 1	Phase 2	Phase 3
1A. Harney Way Widening (Initial Configuration)	♦		
1B. Harney Way Widening (Ultimate Configuration)		♦	
2. New Roadway through Candlestick Point		♦	
3. Ingalls Avenue/Thomas Avenue/Carroll Avenue/Griffith Street Improvements	♦		
4A. Innes Avenue Streetscape Improvements	♦		
4B. Palou Avenue Transit Preferential St Treatments and Streetscape Improvements	♦		
4C. Carroll Avenue Streetscape Improvements			
4D. Gilman Avenue Streetscape Improvements			
4E. Ingerson Avenue Repaving	♦		
4F. Jamestown Avenue Improvements	♦		
5. Yosemite Slough Bridge	♦		
6. Transportation Management System	♦		
7. Geneva Avenue Extension*		♦	
8. Harney Way / US 101 Interchange Reconstruction*		♦	

*Source: Fehr & Peers– March 2010; *Included to indicate anticipated infrastructure development timeline; under study.*

Generally, improvements to roadways that are expected to carry traffic to and from the new NFL stadium will be constructed in Phase 1. (See Chapter 6 for a more detailed discussion of gameday traffic conditions). These include Harney Way, the Yosemite Slough Bridge, and improvements to Ingalls Avenue, Thomas Avenue, Carroll Avenue, and Griffith Street (the auto route around Yosemite Slough). If the stadium is not constructed, some of these improvements may be delayed until typical traffic volumes associated with the development reach levels that warrant the improvements. A more detailed discussion of the development-related "triggers" for roadway improvements is included in the project's Infrastructure Plan.

A similar concept has been developed for the transit improvements, as shown in Table 16. Transit routes serving the Hunters Point Shipyard (Hunters Point Express (HPX), 23-Monterey/24-Divisadero, 44-O'Shaughnessy, and 48-Quintara) would be extended to serve the site in the early stages of Phase 1, at somewhat lower frequencies than expected with full buildout. Gradually, as development in the Hunters Point Shipyard occurs, frequencies of these routes will be increased to correspond to the level of development.

Similarly, routes serving Candlestick Point (Candlestick Point Express (CPX) and 29-Sunset) will be extended into the site in the relatively early stages of Phase 2, when the bulk of the Candlestick Point development is scheduled to occur. The 1,253 homes in Candlestick Point associated with Phase 1 would be served by the existing 29-Sunset route, and no modifications are necessary in this phase.

The 28L/BRT route would be implemented and extended in Phase 2, with completion of the Geneva Avenue extension and US 101/Harney Way interchange reconstruction and with the beginning of substantial development of the Candlestick Point site.

Table 16: Transit Improvement Phasing

Transit Improvement	Phase 1	Phase 2	Phase 3
A. New and Expanded Bus Lines			
Route	Frequency (Minutes)[1]		
Hunters Point Express (HPX)	20	12	12
Candlestick Point Express (CPX)		15 - 20	10
Extension of 23-Monterey (Temporary)	15		
Extension of 24-Divisadero (23-Monterey Returns to Existing Route)		10	7.5
Extension of 28L/BRT[2]		8	5
Extension of 29-Sunset		10	5
Extension of 44-O'Shaughnessy	7.5	6.5	6.5
Extension of 48-Quintara	15	10	10
Increased service on T-Third light rail	*8-10*	*6*[3]	*5*[3]
B. Harney / Geneva BRT / Transit Preferential Street[4]		♦	♦
C. Hunters Point Shipyard Transit Center	♦	♦	♦
D. BRT Stops		♦	♦
E. Palou Avenue Transit Preferential Street	♦	♦	♦
F. Bayshore Transit Center	Unknown – Currently Under Study		
G. Oakdale Caltrain Station Improvements	Unknown – Currently Under Study		
H. Connections to SamTrans	♦	♦	♦

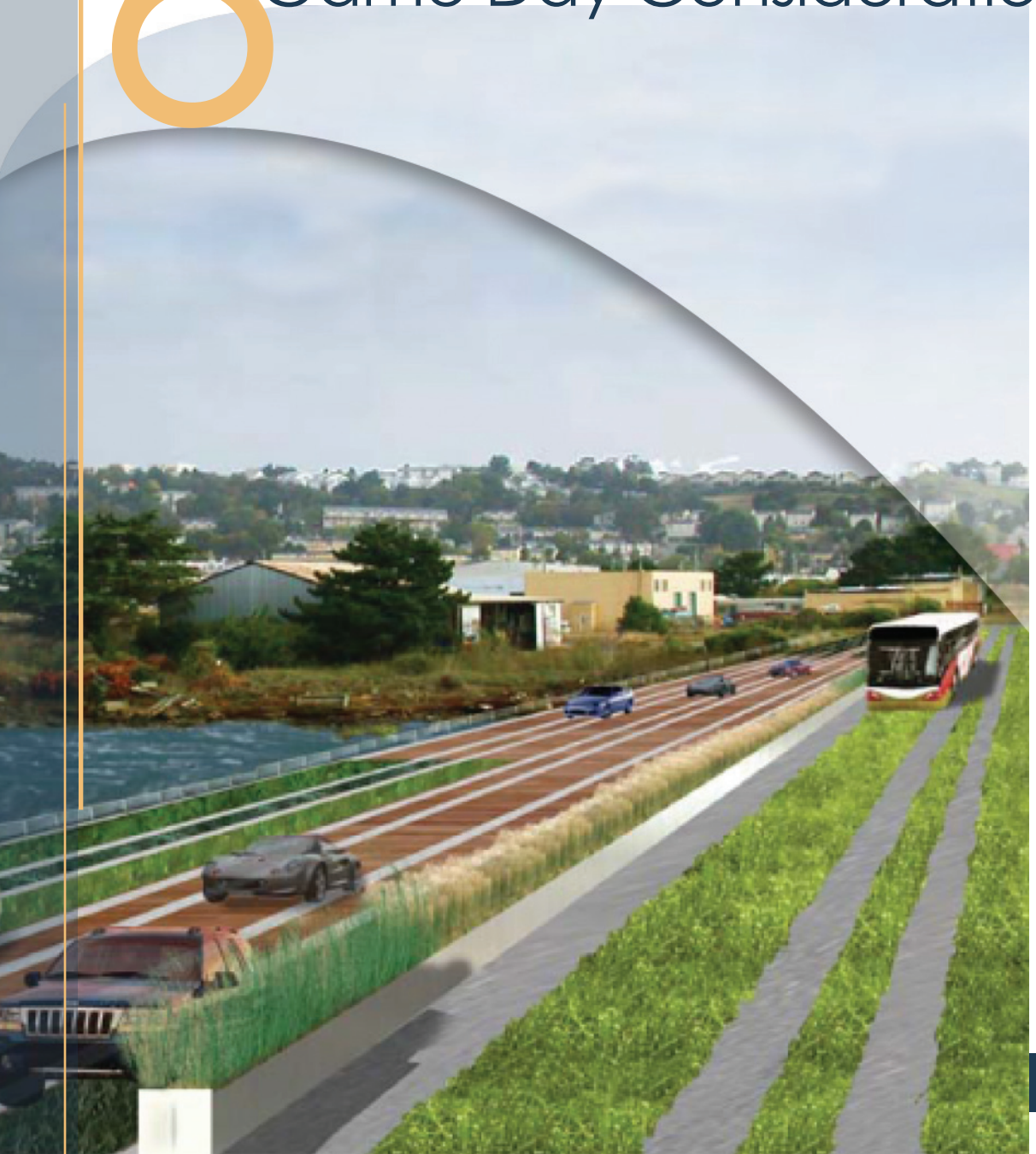
1 Transit frequencies shown represent the frequencies at the beginning of the associated phase. Certain development triggers may increase frequencies within phase on some routes.

2 Until construction of the Geneva Avenue extension, the BRT service may operate independently from the 28L – 19th Avenue/Geneva Avenue limited between the Hunters Point Transit Center and the Bayshore Caltrain Station via Alana Way and Beatty Avenue.

3 Increased capacity on the T-Third shown here is accommodated within the overall implementation of the Central Subway service capacity and frequency enhancements. Extension to the Bayshore Caltrain station is also proposed as part of the overall Bi-County study. In Phase 3, service will likely be provided by two-car trains.

4 Improvement currently under study – phasing shown is anticipated but subject to change.

6 Game Day Considerations



As part of the redevelopment of Hunters Point Shipyard, a new stadium for the San Francisco 49ers is proposed. The facility would have a capacity of 69,000 seated patrons and provide parking and loading spaces for about 16,400 cars and buses near the stadium with an additional 1,000 spaces at the Candlestick Point retail center. This chapter considers the travel demand generated by a capacity crowd at football games in the proposed stadium. The facility is expected to host other events, such as concerts, that would have a comparable or lower level of attendance. Thus, the travel demand associated with these events would also be accommodated by the parking and roadway capacities outlined below.

6.1 Game Day Travel Demand

Historical data provided by the 49ers franchise found that travel to games occurs predominantly by private auto (81 percent) while the remaining trips utilize transit (19 percent), consisting of publicly-operated buses and private charter buses. Existing data also indicates average vehicle occupancy of about three people per vehicle. With the proposed new stadium at Hunters Point Shipyard, more efficient transit connections to regional transit are proposed, including Harney BRT and Palou Transit Priority Treatment. These service improvements will provide better accessibility via new game day transit configurations. As a result, it is expected that the mode split for the new stadium would shift to approximately 75 percent private auto and 25 percent transit. **Table 17** summarizes the expected travel demand patterns for the new stadium.

The expected mode split could be achieved in part through incentives for transit riders. The 49ers could explore the inclusion of a transit ride to and from a game with admission, or providing discounted passes for game-day use.

Table 17: Proposed Game Day Mode Split

Mode	Mode Split	Number of Patrons	Number of Vehicles	Patrons per Vehicle
Auto				
Private Automobile (Spectator)	70.9%	48,892	18,073	2.7
Private Automobile (Staff)	3.9%	2,683	2,000	1.3
Limousine	0.1%	50	17	3
Recreational Vehicles	0.3%	220	44	5
Auto Subtotal	75.2%	51,845	20,134	2.6
Bus				
Chartered Buses	5.3%	3,656		
Transit Buses[1] *(Spectator)*	18.5%	12,732		
Transit Buses[1] *(Staff)*	1.0%	725		
Transit Subtotal	24.8%	17,113		
Total	100.0%	68,958[2]	20,134[3]	

Source: San Francisco 49ers, Fehr & Peers – May 2009

6.2 Game Day Modes of Travel

During a typical football game day, there will be numerous types of trips, including visitors to the stadium and residents/visitors to the project site and surrounding neighborhoods. The following modes and trip types would be expected to operate on a typical game day:

Regularly Scheduled Muni Service

During game days, regularly scheduled Muni service to and from Hunters Point Shipyard would continue to operate, although frequencies may increase prior to and following games. **Figure 15** illustrates the proposed modifications to Muni routes and other transit improvements designed to serve the project.

Game Day Transit Service

In order to serve the game day transit demand and to achieve the 25 percent transit mode share as shown in **Table 17**, accommodations for transit loading/unloading and parking are necessary to facilitate safe and efficient transit connections. The following types of game day service have been identified based on current stadium operations as well as an estimate of the types of transit services that could reasonably be implemented to increase game day transit service to the site. Specifically, the types of transit service that would be provided on game days may include:

1 Operated by Muni, Silverado Stages, Golden Gate Transit, Eastern Contra Costa County Transit and Valley Transportation Authority.

2 Includes 5% reduction for spectator "no shows."

3 Excludes transit vehicles.

Shuttles to Regional Transit Connections – these buses would provide service to and from the Bayshore Caltrain and/or Balboa Park BART station in a continuous loop before and after the game. Typically, Muni would operate this service, but other Bay Area transit providers may provide buses and/or drivers since there is generally available fleet on Sundays.

Long-Haul San Francisco Service – Muni typically operates some game day express services that provide service to the outlying areas of San Francisco such as the Geary Corridor, the Marina District, and San Francisco State University.

Regional Bus Service – other buses operated by Golden Gate Transit, AC Transit and/or Silverado Stages may provide regional bus service to the North, East and South Bay. These buses would be expected to make only one trip to and from the stadium due to the extended run time to the regional destination.

Charter Buses – privately-operated buses that arrive before the game, park in a specific parking area dedicated to these buses, and leave shortly after the game (depending on the group).

Emergency Vehicles

Emergency vehicle trips must also be accommodated on game days. During the pre- and post-game condition, an adequate route will be provided at all times that allows emergency vehicles to and from the site to respond to an emergency situation.

Private Auto

As shown in **Table 17**, the majority of visitors to events at the stadium are expected to arrive via private auto. A sufficient supply of game day parking is an integral part of the planning of the stadium area, as is discussed in detail in Section 6.4. There would also be auto traffic in the project area for other non-stadium uses, which would need to be accommodated during a typical game day through proper traffic control in the project area and surrounding streets.

6.3 Game Day Applications of Improvements

The roadway and transit improvements described in Chapters 4 and 5 would substantially enhance game day access and operations for pre- and post-game conditions. In addition, the following improvements would be incorporated into the transportation program to increase capacity and facilitate stadium access on game days.

Transportation Management System (TMS)

A TMS Center located at the proposed stadium would control traffic signals, overhead lane use control signals and changeable message signs to react to pre- and post-game lane closures and game traffic-related congestion on a real-time basis. The TMS would be operated by SFMTA staff and would only be active on game days.

Overhead lane use control signals and changeable message signs controlled by the TMS will be installed on the following exit routes:

- Arelious Walker to Harney Way
- Harney Way and Executive Park Boulevard
- Griffith Street to Thomas Avenue to Ingalls Street
- Innes Avenue to Hunters Point Boulevard to Evans Avenue
- Jennings Street to Cargo Way to Illinois Street

Palou Avenue Transit Preferential Street (TPS)

On game days, Palou Avenue would be a dedicated transit-only street for use by charter and public buses, although residents would still be allowed to access their homes. Most of the signals along Palou Avenue would likely be manually controlled to provide long segments of free-flow bus travel, and enable local access at some intersections.

Harney Bus Rapid Transit (BRT)

In addition to BRT operated by SFMTA, other public and charter buses providing game-day express service from around the Bay Area would use the exclusive BRT lanes through Candlestick Point and over the Yosemite Slough Bridge.

Yosemite Slough Bridge

On game days, the bridge would accommodate four lanes of auto traffic in addition to the two dedicated BRT lanes. These lanes would be configured to provide four auto lanes to the stadium during pre-game conditions and four auto lanes away from the stadium during post-game conditions. The two BRT lanes would remain configured with one lane in each direction for all types of buses (charter and public).

6.4 Stadium Parking Supply

Candlestick Park has approximately 17,500 parking stalls in its immediate vicinity. Additional parking is provided in remote lots to the north and west of the stadium. The proposed Hunters Point stadium offers approximately 16,400 on-site stalls at the stadium and adjacent R&D campus, plus 1,000 spaces at the Candlestick Point retail center. Additional parking is expected to be accommodated in a number of nearby off-site parking facilities. **Figure 17** summarizes the proposed Game Day parking supply.

Approximately 50 percent of the parking stalls would be accommodated in dual-use sports fields and unpaved open space. When events are not taking place at the stadium, these parking areas would be used as baseball and football/soccer fields. Approximately 15 percent of the supply would be parking at the research and development campus immediately north of the stadium that would be made available for stadium events. The remainder will be housed in parking structures and lots immediately adjacent to the stadium.

6.5 Game Day Operations

Overview of Existing Game Day Operations

The existing Candlestick Park operates with reversible lanes and traffic control officers at many key intersections before and after events. Ingerson Avenue is used as a transit-only street, allowing for efficient bus travel during post-game conditions. Game day operations are focused on the post-game condition since typically the travel demand surges once the event is over, while patrons tend to arrive over a longer period of time prior to a game. **Table 18** summarizes the number of lanes in each direction during the post-game condition for the existing stadium.

Table 18: Post-Game Lane Configuration – Existing Stadium		
Route	Inbound	Outbound
Auto Traffic		
Via Carroll Avenue	1	1[1]
Via Gilman Avenue	1	3
Via Jamestown Avenue	1	2
Via Harney Way	0	4
Auto Subtotal	3	10
Transit Vehicles		
Via Ingerson Avenue	1	1
Transit Subtotal	1	1
Total	4	11

Source: AECOM – October 2008

Game Day Transit

To improve transit service to the new stadium at Hunters Point Shipyard, the Palou TPS treatment and Harney BRT route are expected to serve game day transit service in addition to the regularly-scheduled Muni bus service during game days. The proposed game day transit service is illustrated in **Figure 18**. A brief description of the operation of each transit facility is provided below:

Palou TPS

Palou Avenue between Griffith and Third Streets would be closed to auto traffic and be available for bus traffic only. Buses that would be using this stretch of Palou would be the regularly-scheduled Muni buses, charter buses, and regional buses. Muni buses would operate in both directions as part of the Muni schedule for game days. The other two types of buses that serve the stadium would only operate in one direction (to the stadium pre-game and from the stadium post-game) to eliminate unnecessary conflicts at the intersections of Palou / Crisp Road and Palou / Arelious Walker Drive where these buses would be potentially conflicting with peak game day auto traffic, as is illustrated later in this section.

Harney BRT

During game days, the two lanes for the exclusive use of the Harney BRT would also be made available for other game day transit service. Since there are two exclusive lanes (one in each direction), buses on this route would have no conflicts in either direction (except at intersections where the BRT alignment crosses auto traffic). Therefore, shuttles to and from the Bayshore Caltrain station and Balboa Park BART station could operate on this route efficiently to complement BRT service on gamedays. This BRT route is also a designated emergency vehicle access route.

Game Day Bicycles

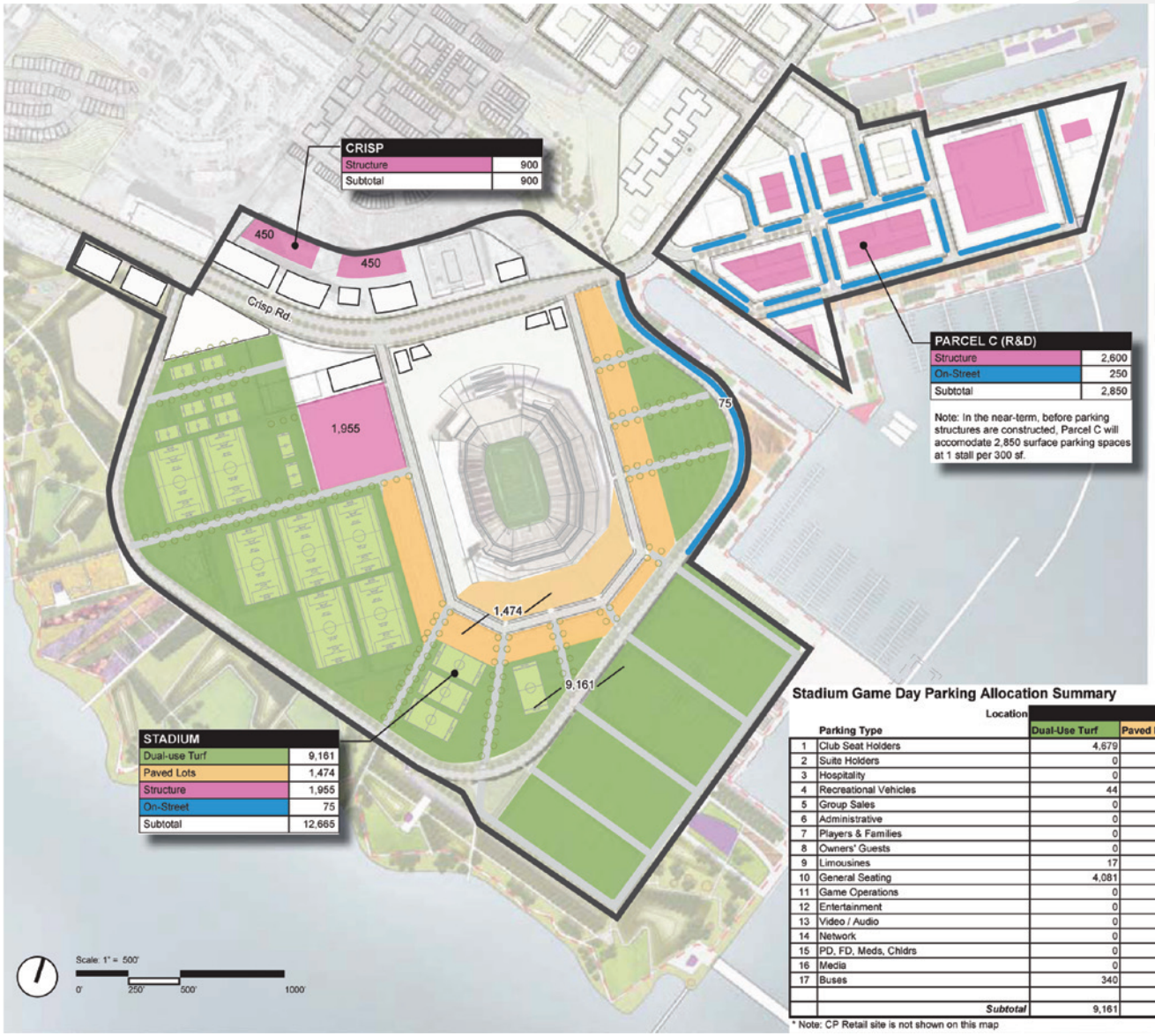
To promote bicycling, secured valet parking should be provided for a minimum of 1% of all expected participants (approximately 690 patrons). Bicycle regulations approved by the San Francisco Board of Supervisors require monitored bicycle parking for events with an anticipated number of participants greater than 2000. The parking facilities should be located within a one block radius of a regular entrance to the event.

All event publicity should include information on the availability and location of the Secured Valet Bike Parking in the same format, with equal amount of space, as other transportation information. All event personnel should be aware of the Secure Valet Bike Parking location and event maps must indicate the location as well.

Bicycle parking will be open for two hours before the game and remain open until 60 minutes after the game.

1 Carroll Avenue has three outbound lanes, but they merge into one right turn lane at Third Street.

Figure 17: **Proposed Stadium Game Day Parking**



Stadium Game Day Parking Allocation Summary

	Location	STADIUM					CRISP	PARCEL C			CP RETAIL*	TOTAL
	Parking Type	Dual-Use Turf	Paved Lots	Structure	On-Street	Subtotal	Structures	Structures	On-Street	Subtotal	Structures	
1	Club Seat Holders	4,679	0	0	0	4,679	0	0	0	0	0	4,679
2	Suite Holders	0	0	1,202	0	1,202	0	0	0	0	0	1,202
3	Hospitality	0	44	0	0	44	0	0	0	0	0	44
4	Recreational Vehicles	44	0	0	0	44	0	0	0	0	0	44
5	Group Sales	0	0	20	0	20	0	0	0	0	0	20
6	Administrative	0	0	25	0	25	0	0	0	0	0	25
7	Players & Families	0	220	0	0	220	0	0	0	0	0	220
8	Owners' Guests	0	60	0	0	60	0	0	0	0	0	60
9	Limousines	17	0	0	0	17	0	0	0	0	0	17
10	General Seating	4,081	680	483	75	5,319	900	2,600	250	2,850	1,000	10,069
11	Game Operations	0	0	225	0	225	0	0	0	0	0	225
12	Entertainment	0	30	0	0	30	0	0	0	0	0	30
13	Video / Audio	0	30	0	0	30	0	0	0	0	0	30
14	Network	0	60	0	0	60	0	0	0	0	0	60
15	PD, FD, Meds, Chldrs	0	200	0	0	200	0	0	0	0	0	200
16	Media	0	150	0	0	150	0	0	0	0	0	150
17	Buses	340	0	0	0	340	0	0	0	0	0	340
	Subtotal	9,161	1,474	1,955	75	12,665	900	2,600	250	2,850	1,000	17,415

* Note: CP Retail site is not shown on this map

Figure 18: **Game Day Transit**

Game Day Auto

As part of the proposed new stadium, reversible lanes and traffic control officers would be available to promote better access. In addition, real-time traffic signal coordination, overhead lane control signs, and changeable message signs would also be built to control traffic before and after major events.

During game days, several roadways in the project area would be reconfigured to promote easier access to the stadium. Sections of Evans Avenue, Innes Avenue, Griffith Street, Thomas Avenue, Ingalls Street, and Harney Way would be reconfigured to provide additional lanes in the peak direction of travel (pre-game to the stadium, post-game away from the stadium). **Table 19** summarizes the number of lanes in each direction for the proposed new stadium on Hunters Point Shipyard.

Table 19: Post-Game Lane Configuration – Proposed Stadium

Route	Inbound	Outbound
Auto Traffic		
Via Innes Avenue / Cargo Way	0	2
Via Innes Avenue / Evans Avenue	1	2
Via Griffith Street / Ingalls Street	1	3
Via Yosemite Slough Bridge	0	4
Auto Subtotal	2	11
Transit Vehicles		
Via Yosemite Slough Bridge	1	1
Transit Subtotal	1	1
Total	3	12

Source: AECOM – October 2008

Post-Game Auto Exit Capacity

One of the factors used to evaluate the accessibility of the proposed stadium is to determine how the surrounding roadway network would serve the post-game travel demand. Specifically, this is determined using a hypothetical stadium clearance time (i.e., the amount of time it takes all patrons to leave the stadium vicinity). The critical mode is the clearance of the private auto facilities (parking lots for general admission guests). The game day lane configurations and transportation improvements presented above are key elements that directly relate to post-game roadway capacity. **Table 20** summarizes the current roadway exit capacity (in vehicles per hour) of the existing 49ers stadium.

Table 20: Peak Direction Exit Capacity – Existing Stadium

Route	Existing Exist Capacity (vehicles per hour)
Exiting North of Stadium (destinations North & South)	
Via Carroll Avenue	900
Via Gilman Avenue	1,800
Via Jamestown Avenue	900
North Subtotal	3,600
Exiting South of Stadium (destinations North & South)	
Via Harney Way	4,100
South Subtotal	4,100
Total	7,700

Source: AECOM – October 2008

One of the key considerations in constructing a new stadium is providing improved accessibility for a better fan experience, including an increase in post-game exit efficiency. **Table 21** summarizes the roadway exit capacity (in vehicles per hour) of the proposed new stadium. The only difference between the exit capacity between opening day and build-out conditions is related to the new US 101 / Harney / Geneva interchange, as it would increase the south gate capacity. The exit capacity was calculated for Opening Day Conditions and project build-out conditions. The proposed project exit capacities for the two conditions are illustrated in **Figures 19** and **20**, respectively.

Table 21 is based on several assumptions:

- The local street network, with the help of advanced traffic signal technology and traffic control officers, would be able to process approximately 800 vehicles per hour per lane;
- Where the exit routes interface with Third Street, a major transit corridor, a lower capacity was assumed;
- Freeway ramps could process up to 1,600 vehicles per hour per lane (a total of 3,200 vehicles per hour at the existing Harney Way interchange; and
- Stadium exit gates can process up to 1,000 vehicles per hour per lane.

Table 21: Peak Direction Exit Capacity – Proposed Stadium		
Route	Exit Capacity: Opening Day Conditions	Exit Capacity: Project Build-Out Conditions
To the North		
Via Innes Ave. / Evans Ave. / Mendell St.	400	400
Via Innes Ave. / Evans Ave. / Cesar Chavez St.	900	900
Via Innes Ave. / Evans Ave. / Third St.	900	900
Via Innes Ave. / Illinois St. / 25th St.	1800	1800
North Subtotal	4,000	4,000
To the South		
Via Griffith St. / Ingalls Ave. / Third St.	2,700	2,700
Via Yosemite Slough Bridge / Harney Way	*3,200*	*4,300*
South Subtotal	5,900	7,000
Total	9,900	11,000
Source: AECOM – October 2008		

Post-Game Event Clearance Time

Based on the theoretical lane capacities presented in the above tables, an approximation of stadium clearance time was calculated for the existing stadium and compared to the proposed project stadium configuration.

Approximately 16,400 vehicles (autos, buses and RVs) are expected to park at the stadium during an event. For stadium clearance time calculations, the buses were removed from the total post-game demand since they would be exiting the stadium by transit-only routes. Therefore, only 16,000 vehicles (autos and RVs) would be using the auto routes during post-game operations.

Existing 49ers Stadium

At the existing stadium, it takes approximately two hours and ten minutes to serve the 16,500 vehicles (excludes buses) expected during game days at the new stadium, based on the existing roadway capacity of 7,700 vehicles per hour.

In making this comparison, it should be noted that the existing stadium has a lower transit mode share compared to what is expected at the proposed new stadium; therefore, the existing stadium has a larger theoretical post-game exit demand than 16,500 vehicles.

Proposed Stadium

The proposed exit capacity for the new stadium under Opening Day Conditions was calculated at 9,900 vehicles per hour. It would take approximately one hour and 40 minutes to serve 16,000 (autos and RVs) vehicles.

The proposed capacity for the new stadium under build-out conditions was calculated at 11,000 vehicles per hour. It would take approximately one hour and 30 minutes to serve 16,000 vehicles.

The above calculations were made using the most conservative assumptions. In reality, some vehicles would likely leave early, and a portion would also stay in the area after the event. Therefore, a more qualitative look at this analysis is summarized as follows:

- The Opening Day Condition would result in a 29 percent faster clearance time when compared to the existing stadium. The Build-Out Condition would result in a 43 percent faster clearance time when compared to the existing stadium.
- The on-site amenities and additional land uses developed as a part of the project would likely affect post-game travel behavior (some patrons may choose to stay after the game to visit the nearby retail or open space uses).
- The transit improvements proposed as a part of the project would likely make transit a more convenient and efficient option for game day travel compared to private autos. The above calculations assume that 25 percent of all game day attendees would travel by transit. The robust package of post-game transit services proposed as a part of the project have the potential to serve a much larger patronage compared to the existing transit service.
- The 49ers and the City may explore additional opportunities to delay vehicle departures following games, which could include such measures as preferred parking areas, promotion of post-game tailgating, and music performances.

Figure 19: **Post-Game Auto Exit Capacity – Opening Day Conditions**

Figure 20: **Post-Game Auto Exit Capacity – Project Build Out Conditions**

Game Day Traffic Routes

Figure 21 illustrates the auto and transit routes that would operate on a typical game day during the post-game condition. In an effort to maintain effective and safe traffic flow after a typical event, many of the intersections require traffic control officers while others can be controlled effectively via traffic signals and the Transportation Management System.

In addition to intersection control, many of the roadway segments would serve stadium traffic via reversible lane control similar to how the existing stadium operates.

During game days, the following roadways outside the project site would have reversible lanes to promote more efficient access to and from the stadium (see **Figure 7J-L** for cross-sections):

North Gate:

- Innes Avenue between the project site and Evans Avenue; and
- Evans Avenue between Innes Avenue and Mendell Street.

South Gate:

- Crisp Road between the project site and Griffith Street / Palou Avenue;
- Griffith Street between Palou Avenue / Crisp Road and Thomas Avenue;
- Thomas Avenue between Griffith Street and Ingalls Street;
- Ingalls Street between Carroll Avenue and Underwood Avenue;
- Arelious Walker Drive between Crisp Road and Harney Way (including over Yosemite Slough Bridge); and
- Harney Way between the project site and the US 101 / Harney Interchange.

Game Day Traffic Control

Inside the project site, the Hunters Point Shipyard Arterials and the Candlestick Point Arterials would have reversible lanes on game days.

The following intersections will be under control by the TMS center or a Traffic Control Officer as shown on **Figure 22**:

- 25th Street and Pennsylvania Avenue
- 25th Street and 3rd Street
- Illinois Street and Cesar Chavez Street
- Oakdale Avenue and Barneveld Avenue
- Industrial Street and Palou Avenue
- Industrial Street and Oakdale Avenue
- Oakdale Avenue and Phelps Street
- Phelps Street and Jerrold Avenue
- Evans Avenue and Mendell Street
- Hunters Point Boulevard and Galvez Avenue
- Hunters Point Boulevard and Innes Avenue
- Jennings Street and Evans Avenue
- Robinson Street and Donahue Street
- Crisp Road and Fischer Avenue
- Crisp Road and Arelious Walker Drive
- Palou Avenue and Griffith Street
- Palou Avenue and Hawes Street
- Palou Avenue and Ingalls Street
- Palou Avenue and Jennings Street

Figure 21: **Game Day Routes**

Figure 22: **Game Day Traffic Control**

- Palou Avenue and Keith Street
- Palou Avenue and Lane Street
- Carroll Avenue and Ingalls Street
- Arelious Walker Drive and Carroll Avenue
- Arelious Walker Drive and Gilman Avenue
- Arelious Walker Drive and Ingerson Avenue
- Arelious Walker Drive and Harney Way
- Harney Way and Executive Park Boulevard

7 Non-Stadium Variants

The proposed project includes a new stadium for the San Francisco 49ers at Hunters Point Shipyard. However, should the 49ers franchise choose to build a new stadium elsewhere, alternative development plans for Parcels D and E has been considered. Two of those variants are described in this Chapter. One variant, known as Variant 1, includes an expanded research and development campus. The other variant, known as Variant 2A, includes a mix of additional housing and research and development instead of a new stadium.

The roadway improvements, transit improvements and TDM programs introduced in Chapters 4 and 5 would all be implemented as part of the non-stadium alternatives. Under the alternatives, the same project goals of reducing auto use to approximately 45 percent, and increasing transit ridership, walk and bike trips to 30, 20, and 5 percent, respectively, would apply.

7.1 Variant 1 – Research & Development

One of the two non-stadium variants is known as Variant 1 and includes a more extensive research and development campus in the Hunters Point Shipyard site.

Land Use Program

Current plans for this variant would include an additional two and a half million square feet of research and development space in a "green-technology" campus, creating a substantial new employment center. This would create more opportunities for residents of the proposed project to work on-site without requiring private autos for off-site work trips. The land use program for Variant 1 is summarized in **Table 22** and illustrated in **Figure 23**. In this variant, all other uses outside of the stadium site in both Candlestick Point and Hunters Point Shipyard would remain the same.

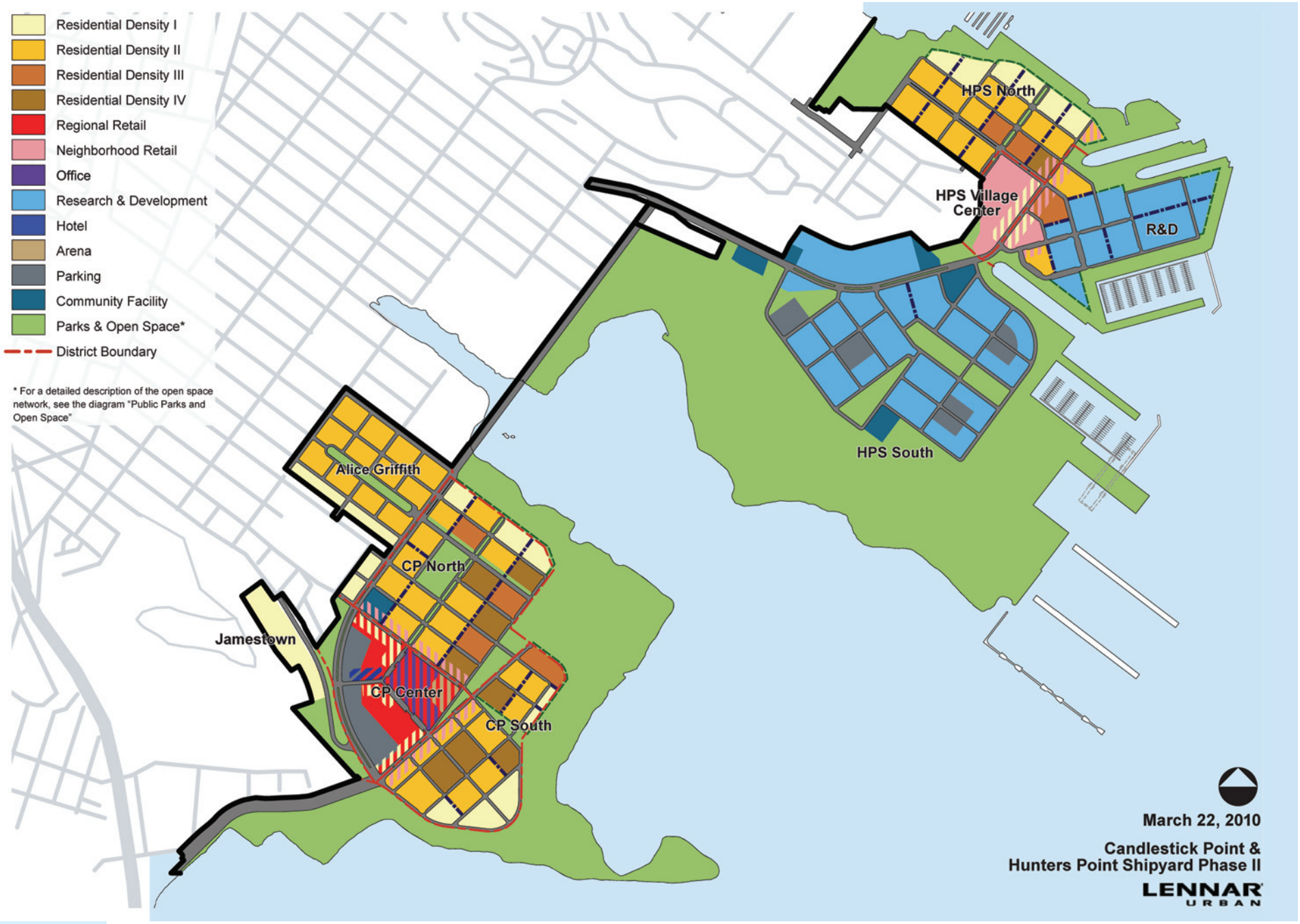
Table 22: Land Use Program (Variant 1 - Research & Development)

Land Use	Candlestick Point	Hunters Point Shipyard	Project Total
Residential	7,850 homes	2,650 homes	10,500 homes
Regional-Serving Retail	635,000 sq. ft.	-	635,000 sq. ft.
Neighborhood-Serving Retail	125,000 sq. ft.	125,000 sq. ft.	250,000 sq. ft.
Office	150,000 sq. ft.	-	150,000 sq. ft.
Research & Development	-	5,000,000 sq. ft.	5,000,000 sq. ft.
Hotel	220 rooms	-	220 rooms
Arena	10,000 seats	-	10,000 seats
Parks & Open Space	105 acres	222 acres	327 acres
Artists Studios	-	255,000 sq. ft[1]	255,000 sq. ft
Community Services	50,000 sq. ft.	50,000 sq. ft.	100,000 sq. ft.

Source: Lennar Urban – October 2009

1 Carroll Avenue has three outbound lanes, but they merge into one right turn lane at Third Street.

Figure 23: **Land-Use Program: Non-Stadium (Variant 1 – Research & Development)**



Parking Supply

The project parking supply for Variant 1 removes the spaces associated with the stadium and includes approximately 6,000 additional parking spaces to serve the expanded research and development campus. The parking supply for the non-stadium alternative land use program is presented in **Table 23**.

Table 23: Proposed Parking Supply (Variant 1 - Research & Development)

Parcel	Number of Spaces			
	Residential	Commercial Off-Street[1]	General On-Street	Total
Candlestick Point	7,850	2,346	1,360	11,556
Hunters Point Shipyard	2,650	7,028	1,678	11,356
Total	**10,500**	**9,374**	**3,038**	**22,912**

Source: Lennar Urban – December 2008

1 Includes regional retail, neighborhood retail, office, hotel, and arena uses for Candlestick Point and neighborhood retail, artists' space, and research and development for Hunters Point Shipyard.

7.2 Variant 2A – Housing/ Research & Development

The second non-stadium variant is known as Variant 2A and includes a combination of additional research and development space and housing in the Hunters Point Shipyard site.

Land Use Program

This variant would be similar to Variant 1, except that 1,625 residential units would be shifted from Candlestick Point to the Hunters Point Shipyard and only 3 million square feet of research and development space would be constructed in the Hunters Point Shipyard instead of the 5 million proposed under Variant 1. Similar to Variant 1, the research and development space would be focused on a "green-technology" campus, creating a substantial new employment center. The land use program for Variant 2A is summarized in **Table 24** and illustrated in **Figure 24**.

Table 24: Land Use Program (Variant 2A - Housing/Research & Development)			
Land Use	**Candlestick Point**	**Hunters Point Shipyard**	**Project Total**
Residential	6,225 homes	4,275 homes	10,500 homes
Regional-Serving Retail	635,000 sq. ft.	-	635,000 sq. ft.
Neighborhood-Serving Retail	125,000 sq. ft.	125,000 sq. ft.	250,000 sq. ft.
Office	150,000 sq. ft.	-	150,000 sq. ft.
Research & Development	-	3,000,000 sq. ft.	3,000,000 sq. ft.
Hotel	220 rooms	-	220 rooms
Arena	10,000 seats	-	10,000 seats
Parks & Open Space	105 acres	222 acres	327 acres
Artists Studios	-	255,000 sq. ft[1]	255,000 sq. ft
Community Services	50,000 sq. ft.	50,000 sq. ft.	100,000 sq. ft.
Source: Lennar Urban – February 2010			

1 The Project includes 225,000 sq. ft. of existing artist studio space that would be renovated and replaced.

Parking Supply

Similar to Variant 1, the project parking supply for Variant 2A also removes the spaces associated with the stadium and includes additional parking spaces to serve the expanded research and development campus and shifts residential parking spaces from Candlestick Point to Hunters Point Shipyard. The parking supply for the Variant 2A (Housing/Research & Development) land use program is presented in **Table 25**.

Table 25: Proposed Parking Supply (Variant 2A - Housing/Research & Development)				
Parcel	**Number of Spaces**			
	Residential	**Commercial Off-Street[1]**	**General On-Street**	**Total**
Candlestick Point	6,225	2,346	1,360	9,931
Hunters Point Shipyard	4,275	4,428	1,428	10,131
Total	**10,500**	**6,774**	**2,788**	**20,062**
Source: Lennar Urban – December 2008				

1 Includes regional retail, neighborhood retail, office, hotel, and arena uses for Candlestick Point and neighborhood retail, artists' space, and research and development for Hunters Point Shipyard.

Figure 24: **Land-Use Program: Non-Stadium (Variant 2A - Housing/Research & Development)**

8 Analogies

The mode split goal of the project – 45 percent auto, 30 percent transit, 20 percent walk, and 5 percent bike are analogous to other San Francisco neighborhoods. In addition, automobile travel has declined and alternative modes have gained popularity in projects and neighborhoods in San Francisco and other cities through effective TDM strategies. The following sections draw analogies to Candlestick Point and Hunters Point Shipyard, showing that dense, mixed-use development and a comprehensive TDM program can achieve the project's modal split goal.

8.1 Comparison to Other San Francisco Neighborhoods

With respect to current travel patterns in southeastern San Francisco, the mode split shift sought by the project goals might appear ambitious. However, many San Francisco neighborhoods currently exhibit comparable levels of auto, transit, and walk/bike travel, as shown in **Table 26**. Percentages of residential work trips in other San Francisco neighborhoods that meet or exceed the project modal split goal appear in the table in bold.

All of the featured neighborhoods have a level of transit use greater or equal to 30 percent for residential work trips. Areas of the City where at least a quarter of trips are made on foot or by bike include Nob Hill, North Beach, and Telegraph Hill. Private automobiles are used for 45 percent or less of residential work trips in Nob Hill, North Beach, Telegraph Hill, and the Western Addition.

With a development density, mixed-use character and level of transit service comparable to these neighborhoods, Candlestick Point and Hunters Point Shipyard will achieve a modal split similar to these transit-oriented and walkable San Francisco neighborhoods.

8.2 TDM Case Studies

While it is difficult to isolate the effectiveness of any one of the TDM elements described in Chapter 5, it is clear from the following case studies that comprehensive, multi-faceted TDM plans can achieve dramatic shifts in mode choice. The policies and programs outlined in Section 5.2.4 intend to create this synergy, achieving results comparable to the following case studies.

Table 26: Mode Split Comparison - San Francisco Neighborhoods

Neighborhood	PM Peak Hour Residential Work Trips		
	Transit	Walk/Bike	Auto/Carpool
Marina	40%	11%	49%
Mission	39%	14%	47%
Nob Hill	39%	32%	29%
North Beach	30%	40%	30%
Parkmerced	31%	4%	65%
Russian Hill	35%	15%	50%
Telegraph Hill	31%	29%	40%
Western Addition	45%	16%	39%
% That Would Achieve **Project Goals**	**30%**	**25%**	**45%**

Source: U.S. Census Bureau – 2000

Stanford University, Palo Alto, California

In 2002, four percent of Stanford University employees rode Caltrain to work. By 2007, this figure jumped to nearly 18 percent. During the intervening five years, the following were implemented:

- GO Passes are provided free to all employees who live off-campus, which allow unlimited rides on Caltrain;
- Caltrain introduced "baby bullet" service, with Palo Alto as an express station; and
- "Clean Air Cash" was instituted, an incentive which pays university employees $234 (the cost of a permit) if they do not purchase a parking permit.

TDM plans can achieve dramatic shifts in mode choice

Station Tower, Surrey, British Columbia

Intrawest Corporation developed a trip reduction program for its Station Tower, an office building where 700 people are employed. The tower is located in a suburban area, yet nearly 50 percent of the employees use transportation alternatives. This is due to the tower's location at a SkyTrain rapid transit station, as well as TravelChoices, a TDM program including the following elements:

- Each organization in the building has a TravelChoices representative who administers the program;
- Showers and secure bike lockers are provided for cyclists;
- Free access to fitness facilities, showers and lockers are provided;
- A ride-matching service links potential carpool partners within the complex;
- Preferential parking is reserved for carpools and vanpools;
- A guaranteed ride home program is offered; and
- An incentive program awards "TravelBucks" to each employee that uses alternative transportation to and from work. Prizes include coffee, transit tickets, ski passes and rental car certificates.

North Natomas Transportation Management Association, Sacramento, California

The North Natomas Transportation Management Association (NNTMA) has targeted a 35 percent reduction in single-occupant vehicle trips by residents of the community. Each developer must submit a transportation management plan (TMP) prior to development, which is a commitment to a combination of trip reduction measures. The TMP must be approved by the City of Sacramento. NNTMA's TDM program includes the following TDM elements:

- Baseline telephone survey;
- Association website;
- Online guaranteed ride home program;
- Brochure for residents;
- Subsidized bicycle program; and
- "Spare the Air" cash giveaways.

Marquam Hill Partnership Plan, Portland, Oregon

Three major medical facilities combined efforts to develop a plan to manage the daily transportation demand of 10,000 employees, students, patients and visitors. In the first year after the plan's implementation, single-occupant vehicle trips declined by 15 percent and transit ridership increased by 46 percent. The plan included the following:

- New express buses;
- Coordinated carpool/vanpool database;
- Reduced-cost transit passes and an extensive marketing program

Employee Commute Options (ECO) – Oregon Department of Environmental Quality

The Oregon Department of Environmental Quality's ECO program aims to reduce vehicle trips in the Portland metropolitan area. Employers with over 100 employees at a work site are required to provide incentives for alternative commute options that have a combined potential to reduce single occupant vehicle commute trips by ten percent from an established baseline. The program estimates the trip reduction potential for various TDM elements among the percentage of employees they are made available to, which are summarized in **Table 27**.

Table 27: Employee Commute Options (ECO) Program	
TDM Element	**Trip Reduction Potential**
Telecommuting (among employees expected to participate)	
Full Time	82-91%
1-2 Days/Week	14-36%
Compressed Work Week (among employees expected to participate)	
9/80 Schedule	7-9%
4/40 Schedule	16-18%
3/36 Schedule	32-36%
Full Transit Pass Subsidy	
High Transit Service	19-32%
Medium Transit Service	4-6%
Low Transit Service	0.5-1%
Half Transit Pass Subsidy	
High Transit Service	10-16%
Medium Transit Service	2-35%
Low Transit Service	0-0.5%
Employee Parking Cash-Out	
High Transit Service	8-20%
Medium Transit Service	5-9%
Low Transit Service	2-4%
Parking Subsidy Elimination	
High Transit Service	8-20%
Medium Transit Service	5-9%
Low Transit Service	2-4%
Reduced Cost Parking for High Occupancy Vehicles (HOV)	1-3%
On-Site Services	1-2%

Table 27: Employee Commute Options (ECO) Program	
TDM Element	**Trip Reduction Potential**
Bicycling Program (employees who live < 6 miles from work site)	0-10%
Walking Program	0-3%
On-site Rideshare Matching	
Without support strategies[1]	1-2%
With support strategies	6-8%
Company-provided Vanpools (with fee)	15-25%
Company-subsidized Vanpools	30-40%
Gifts/Awards for Alternative Mode Use	0-3%
Time Off with Pay for Alternative Mode Use	1-2%
Company Cars for Business Travel	0-1%
Source: Oregon Department of Environmental Quality – October 2008	

Long Range TDM Plan – Hillsborough County, Florida

Researchers at the University of South Florida analyzed the potential of TDM strategies to reduce congestion and air pollution in the Tampa Bay Area. The Environmental Protection Agency's COMMUTER Model was used to measure the effectiveness of different combinations of TDM strategies.

The analysis was applied to the activity centers of Downtown Tampa, Brandon, USF/Busch/New Tampa, and Westshore, with commuting workforces ranging from 23,000 to 58,000 in 2000. Downtown Tampa had a single occupancy vehicle (SOV) mode split of 63 percent, while the other, suburban activity centers ranged from 81 to 83 percent. The results of the analysis are summarized in **Table 28**.

1 Support strategies include employee transportation coordinators, marketing/education campaigns, preferential HOV parking, on-site transit pass sales, pre-tax transit pass sales, employee recognition programs, and shuttles.

Table 28: Hillsborough County Long Range TDM Plan			
Scenario	Elements	Reduction of SOV Mode Share	
		2000 Baseline	2025 Baseline [1]
Scenario A *(Alternative Work Schedule)*	• 1% increase in 4/40 compressed work week • 2% increase in 9/80 compressed work week • 2% increase in telecommuting	1.0-1.1%	4.1-4.5%
Scenario B *(Alternative Work Schedule & Employer-based TDM Programs)*	• Compressed workweek and telecommuting, as in Scenario A • Preferential parking program • Transit/vanpool subsidy • 10% workforce participation	1.3%	4.4-4.8%
Scenario C *(Employer-based TDM Program II)*	• Same as Scenario B, but with 35% workforce participation and greater employer support levels	2.4-2.5%	5.5-5.9%
Scenario D *(Employer-based TDM Program III)*	• Same as Scenario B, but with 50% workforce participation and greater employer support levels	3.8-3.9%	6.6-7.0%
Source: Florida Department of Transportation, "Incorporating TDM into the Land Development Process" – October 2005			

An employer-level baseline was also analyzed, using Hillsborough County Government as the employer. In 2000, the county employed 2,860 in downtown Tampa. The model found that a reduction of SOV mode split of up to 11.7 percent could be achieved under the most aggressive scenario.

Santa Clara Valley Transportation Authority (VTA), San Jose, California

Transportation Impact Fee (TIF) credits are offered to developers in Santa Clara County, California, based on the maximum trip reduction potential of the given project elements. **Table 29** summarizes the accepted maximum trip reduction potential for various project elements.

Table 29: Santa Clara Valley Transportation Authority Trip Reductions	
Project Element	Maximum Trip Reduction Potential
Mixed-use Development Project	
With housing and retail components	13%
With hotel and retail components	10%
With housing and employment	3%
With employment and employee-serving retail	3%
Location within 2,000-foot walk of a transit facility	
Housing near Light Rail or Caltrain station	9%
Housing near a major bus stop (≥10 min service)	2%
Employment near Light Rail or Caltrain station	3%
Employment near a major bus stop (≥10 min service)	2%
Effective TDM Program	
Financial Incentives	5%
Project-funded dedicated shuttle, not combined with employment	3%
Project-funded dedicated shuttle, combined with employment	1.5%
Partially-funded multi-site shuttle, near Light Rail or Caltrain station	2%
Source: Santa Clara Valley Transportation Authority – October 2008	

1 Baseline assumes expected telecommuting growth and existing and committed transit improvements.

City of Berkeley, California Employee TDM Programs

The City has implemented a number of programs benefiting its 1,500 employees. As a result, single-occupant vehicle use has dropped 25% (from 47 percent to 36 percent) between 2001 and 2005. These programs include:

- Annual EcoPasses are purchased for all employees, at a cost of $60 each ($84,000 total);
- Pre-Tax Commute Benefits;
- Fleet of ten bicycles for employee use;
- Two secure bike parking locations at City Hall;
- Shower facilities available through deeply discounted YMCA membership (adjacent to City Hall);
- Carpool/vanpool parking is discounted 70%;
- City vehicle fleet has been partially replaced with carshare vehicles, saving $87,000 - $130,000 annually; and a
- Guaranteed ride home program.

City of Boulder and the University of Colorado

The City of Boulder's 1996 Transportation Master Plan sought to hold traffic to 1994 levels and reduce single-occupant vehicle mode share to 25 percent. As a result of the Plan, the number of trips on transit doubled between 1990 and 2000; 17.4 percent of work trips shifted from SOV to bike (10.6 percent) and transit (5.8 percent); and transit pass holders jumped from 4,000 in 1994 to 60,000 in 2001. The following strategies have been implemented in conjunction with the Plan:

- A "Community Transit Network" of small buses has been developed with identity and amenities shaped with community input and direction;
- University of Colorado provides transit passes for 29,000 students and 6,000 employees (students pay a mandatory fee, while staff passes paid through parking revenues, general fund and head tax);
- 65,000 people have access to a transit pass;
- City matches 25 percent of the cost of bus passes for neighborhood residents, who cover the balance through voluntary contributions or through a General Improvement District (GID). With a GID, all residents are eligible for passes, which are paid for through annual property tax assessments;
- Developers of new residential subdivisions are required to buy each household three years' worth of unlimited transit passes. After the third year, residents pay to HOA or through rent to continue;
- Downtown parking revenues pay for marketing of business area, maintenance of pedestrian area and for employee transit passes;
- Bike routes, paths and lanes have been added; bike-actuated and grade-separated crossings have been implemented; bike racks have been installed on all buses; and CU has a free bicycle check-out program; and
- A "safe ride home" service is funded with $2 of each $50 transit pass.

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BAYVIEW JOBS, PARKS AND HOUSING INITIATIVE

Section 1. Title.

This Initiative shall be known and may be cited as the "Bayview Jobs, Parks and Housing Initiative."

Section 2. Findings.

The People of the City and County of San Francisco (the "City") make the following findings:

(a) Improving the quality of life of the residents of the Bayview Hunters Point community (the "Bayview") is one of the City's highest priorities. Expediting the revitalization of the Bayview will provide long overdue improvements that also will benefit the City as a whole. Both the Hunters Point Shipyard (the "Shipyard") and Candlestick Point are part of the Bayview and together make up the largest area of underused land in the City. Combining planning and development for the remainder of the Shipyard that is not already underway (the "Shipyard Property") and Candlestick Point as an integrated revitalization project will provide hundreds of acres of much needed public parks and public open space, significant jobs and economic development opportunities, particularly for residents and businesses of the Bayview, and a substantial number of new affordable and market-rate housing units, including a mix of rental and for-sale units. Integrated development of these areas can also provide a world-class site for a new stadium for the San Francisco Forty Niners (the "49ers"), including improvements in transportation and other infrastructure. The Shipyard Property and Candlestick Point, subject to any final adjustments as described in Section 9, are referred to in this Initiative as the "Project Site." A map of these two areas is attached for reference as Exhibit A.

(b) The Shipyard was once a thriving, major maritime industrial center that employed generations of Bayview residents. Following World War II, the Shipyard was a leading hub of employment for the Bayview, providing logistics support, construction and maintenance for U.S. naval operations. At its peak, the Shipyard employed more than 17,000 civilian and military personnel, many of whom lived in the adjacent Bayview neighborhood. In 1974, the United States Department of the Navy (the "Navy") ceased operation of the Shipyard. The closure of the Shipyard had profoundly negative impacts on the economic base of the Bayview. In 1993, the United States Congress passed special legislation that gave the Navy authority to convey the Shipyard to the City.

(c) Candlestick Point includes: (i) the Alice Griffith Housing Development, also known as Double Rock ("Alice Griffith Housing"), which, although in need of repair or replacement for its residents, has few governmental resources for those repairs; (ii) the Candlestick Point State Recreation Area, much of which is severely under-improved, under-utilized and under-funded, and the restoration and improvement of which has been a long-term goal of the Bayview, the City and the State; and (iii) the City-owned stadium, named Monster Park, that is nearing the end of its useful life.

(d) The Yosemite Slough, which lies between Candlestick Point and the Shipyard Property, was once a pristine wetland area but has been subject to environmental distress caused by illegal dumping and neglect. The California State Parks Foundation and California State Parks are in the process of implementing the Yosemite Slough Restoration plan, which will reopen the Yosemite Slough to public access, create the largest contiguous wetland area in the City and make the wetlands pristine again.

(e) The City's lease of Monster Park to the 49ers is scheduled to expire in May 2013, although the 49ers have the right to extend that date by exercising certain extension options. In the fall of 2006, the 49ers announced their intention to explore relocating to Santa Clara. Since then, the 49ers have continued to evaluate the feasibility of building a new stadium both there and in San Francisco. Regardless of the 49ers' final decision, the City would like to proceed with the integrated revitalization of the Project Site, with or without a new stadium.

(f) Community and elected officials and San Francisco voters have consistently expressed their support for revitalizing the Project Site and demanded accountability from the federal government to clean up the Shipyard. In July 1997, the Board of Supervisors adopted and the Mayor approved a redevelopment plan for the Shipyard (the "Shipyard Redevelopment Plan"), and in June 2006, after a ten-year planning process, the Board of Supervisors adopted and the Mayor approved a redevelopment plan covering large portions of the Bayview, including most of Candlestick Point (the "Bayview Redevelopment Plan"). Both those redevelopment plans are designed to create economic development, affordable housing, parks and open space and other community benefits by developing underused lands like those comprising the Project Site. More recently, in May 2007 the Board of Supervisors and the Mayor approved a resolution endorsing a Conceptual Framework for the integrated development of the Project Site with a major mixed-use project, including hundreds of acres of new waterfront parks and open space, thousands of new units of housing, a robust affordable housing program, extensive job-generating retail and research and development space, permanent space for the artist colony that exists in the Shipyard and a site for a new stadium for the 49ers on the Shipyard Property.

(g) In furtherance of the Board's May 2007 resolution and in compliance with the California Environmental Quality Act ("CEQA"), on August 31, 2007 the Redevelopment

Agency of the City and County of San Francisco (the "Agency") and the San Francisco Planning Department published a Notice of Preparation of an Environmental Impact Report (the "NOP") and solicited public participation in determining the scope of an Environmental Impact Report ("EIR") for the development of the Project Site. Both the NOP and the Conceptual Framework contemplate that integrated development of the Project Site should proceed whether or not the 49ers elect to build a new stadium on the Project Site and contemplate that, if a new 49ers' stadium is not constructed because the 49ers move to Santa Clara or elsewhere, other uses, including additional green office, science and technology, research and development and industrial space or housing–or a combination of those uses–will be developed on the Project Site instead of the stadium and associated parking.

Section 3. Purpose.

In light of the findings set forth in Section 2 above, the purpose of this Initiative is to express the voters' intent that the City and other applicable agencies move forward with the revitalization of the Project Site to provide tangible benefits for the Bayview in particular and the City generally and a new stadium site for the 49ers. Toward that end, the voters wish to repeal Propositions D and F, establish policies to guide the revitalization planning efforts, authorize the lease or conveyance of City-owned park land at Candlestick Point under certain conditions and encourage all local, state and federal agencies with applicable jurisdiction to take all steps necessary to proceed with the development of the Project Site consistent with this Initiative.

More specifically, the People of the City declare their purposes in enacting this Initiative to be as follows:

(a) Improving and creating additional public parks and public open space in the Bayview, particularly along the waterfront. This Initiative will permit the City's park property at Candlestick Point, including land currently used for Monster Park and associated surface parking, to be transferred for development consistent with the objectives described in Section 4 below. At the same time, this Initiative requires that any park property transferred by the City be replaced with other public park and public open space property of at least the same size in the Project Site, all as provided in Section 6 below. It also encourages the improvement of the Candlestick Point State Recreation Area and the extension of the Bay Trail along the Project Site's waterfront.

(b) Improving the quality, availability and affordability of housing in the Bayview. This Initiative encourages the development of new housing in the Project Site with a mix of rental and for-sale units, both affordable and market-rate.

(c) Improving the quality of Alice Griffith Housing. This Initiative encourages the rebuilding of Alice Griffith Housing as a part of the development of the Project Site, subject to consultation with the residents of Alice Griffith Housing and to approval by applicable government agencies. If such approvals are obtained and Alice Griffith Housing is included in the integrated development project, such development must be consistent with the objectives in subsection (3) of Section 4 below that relate to Alice Griffith Housing.

(d) Elevating the Project Site into a regional center for green development and the use of green technology. This Initiative encourages the use of green building construction practices and the incorporation of environmental sustainability principles in the design and development of the Project Site, including the use of renewable energy. In addition, this Initiative encourages the

inclusion of green development projects on the Project Site, such as green office, research and development or industrial projects, including a green office, science and technology, biotechnology or digital media campus.

(e) Providing commercial opportunities and jobs for the residents of the Bayview. This Initiative encourages and anticipates construction and permanent jobs for local economically disadvantaged residents, particularly in the Bayview, and a range of economic development opportunities, including retail and commercial space.

(f) Encouraging the 49ers to remain in San Francisco. The 49ers are an important source of civic pride and have contributed to the Bayview. They are closely identified with San Francisco, having played in San Francisco since the 1940s and in Candlestick Point since the 1970s. This Initiative encourages the 49ers to remain in San Francisco by providing a world-class site for a new stadium on the Shipyard Property, together with supporting infrastructure.

(g) Repealing the earlier stadium mall framework and financing propositions. In June 1997, the City's voters adopted two ballot measures—Proposition D and Proposition F—relating to stadium and mall development at Candlestick Point. Proposition D authorized the City to use lease financing to borrow up to $100 million toward building a new stadium at Candlestick Point. Proposition F changed various City zoning and other laws so that a new stadium, an entertainment and regional shopping center and new residential developments could be built. In the fall of 2006 the 49ers decided that the proposed stadium did not meet their needs. The plan envisioned by Propositions D and F for a stadium and adjoining retail and entertainment center partially financed through the use of a $100 million bond issuance by the City is no longer viable. Accordingly, this Initiative repeals both Propositions D and F.

Section 4. Policies.

It is the Policy of the People of the City that, consistent with the objectives set forth in this Section 4 and subject to the public review process generally described in Sections 5 and 9 below, the City shall encourage the timely development of the Project Site with a mixed-use project that includes the following major uses, together with supporting transportation and other infrastructure improvements (collectively, the "Project"): (i) over 300 acres of public park and public open space improvements, including the improvement of the existing Candlestick Point State Recreation Area, the establishment of a new State park area on the Shipyard Property, the creation of a number of recreation facilities, sports fields and neighborhood-oriented parks and the extension of the Bay Trail along the waterfront of the Project Site; (ii) between about 8,500 and 10,000 residential housing units across the Project Site, including a mix of rental and for-sale units, both affordable and market-rate; (iii) about 600,000 square feet of regional retail on Candlestick Point and about 100,000 square feet of neighborhood-serving retail on the Shipyard Property; (iv) about 2,000,000 square feet of green office, science and technology, biotechnology or digital media office, research and development and industrial uses on the Shipyard Property and about 150,000 square feet on Candlestick Point, with more of such uses on the Project Site if the stadium is not built on the Shipyard Property; (v) if practicable, a site for an arena or other public performance venue; (vi) if the 49ers and the City determine it is feasible to build a new stadium for the 49ers and the 49ers elect in a timely manner to do so, a site on the Shipyard Property for a new National Football League stadium for the 49ers, including green parking surfaces that would both accommodate parking for stadium events and serve as public playing fields at other times; and (vii) if a new stadium is not built, then additional green office, science and technology, research and development and industrial space, or housing–or a combination of

those uses–instead of the stadium and associated parking. Development of the Project Site shall be consistent with the following objectives:

(1) **The integrated development should produce tangible community benefits for the Bayview and the City**, and in so doing should:

- Improve the Candlestick Point State Recreation Area to enhance public access to the waterfront and enjoyment of the Bay.
- Create new public recreational and public open spaces in the Project Site.
- Preserve the shoreline of the Project Site primarily for public park and public open space uses, including an extension of the Bay Trail along the Project Site's waterfront.
- Afford a range of job and economic development opportunities for local, economically disadvantaged individuals and business enterprises, particularly for residents and businesses located in the Bayview.
- Include neighborhood-serving retail.
- Subsidize the creation of permanent space on the Shipyard Property for the existing artists.
- Transform the contaminated portions of the Shipyard Property into economically productive uses or public open space, as appropriate.

- Encourage the timely development of the Project Site and its public benefits, whether or not the 49ers decide to remain in San Francisco, including developing alternate uses for the stadium site on the Shipyard Property that are consistent with the other objectives set forth in this Section 4, but recognizing that the overall financial feasibility of the development of the Project Site and the phasing of the integrated development depends on the 49ers' vacating the current site of Monster Park, whether to a new stadium on the Shipyard Property or elsewhere outside of the Project Site.

(2) **The integrated development should reunify the Project Site with the Bayview and should protect the character of the Bayview for its existing residents**, and in so doing should:

- Foster the creation of strong commercial, institutional, cultural and urban design ties between the development in the Project Site and the Bayview in particular and the City in general.

- Provide automobile, public transportation and pedestrian connections between the Shipyard Property and Candlestick Point to facilitate the integration of the Project Site and reunification with the Bayview.

- Afford substantial affordable housing, jobs and commercial opportunities for existing Bayview residents and businesses.

- Prohibit, in implementing the Project, the use of eminent domain to acquire any property that is currently residentially zoned, is improved with a building that contains one or more legally occupied dwelling units, is a church or other religious institution, or is publicly owned, including, without limitation, property owned by the Housing Authority of the City and County of San Francisco.

(3) **The integrated development should include substantial new housing in a mix of rental and for-sale units, both affordable and market-rate, and encourage the rebuilding of Alice Griffith Housing**, and in so doing should:

- Provide substantial opportunities for new affordable housing that is targeted to the lower income levels of the Bayview population, including new units that are suitable for families, seniors and young adults.

- Include housing at levels dense enough to: create a distinctive urban form and at levels sufficient to make the development of the Project Site financially viable, consistent with the objectives stated in subsection (6) below; attract and sustain neighborhood retail services and cultural amenities; create an appealing walkable urban environment served by transit; help pay for transportation and other infrastructure improvements; and achieve economic and

public benefits for the Bayview in particular and the City generally.

- Subject to consultation with Alice Griffith Housing residents and the receipt of all required governmental approvals, rebuild Alice Griffith Housing to provide at least one-for-one replacement units targeted to the same income levels as those of the existing residents and ensure that eligible Alice Griffith Housing residents have the opportunity to move to the new, upgraded units directly from their existing Alice Griffith Housing units without having to relocate to any other area.

- Include a mix of stacked flats, attached town homes and–in appropriately selected locations–low-rise, mid-rise and high-rise towers, to help assure the economic feasibility of the development and provide a varied urban design.

(4) **The integrated development should incorporate environmental sustainability concepts and practices**, and in so doing should:

- Apply sustainability principles in the design and development of public open spaces, recreation facilities and infrastructure, including wastewater, storm water, utility and transportation systems.

- Apply green building construction practices.

- Include energy efficiency and the use of renewable energy.

- Encourage green development projects, such as green office, research and development or industrial projects, including a green technology, biotechnology or digital media campus.

(5) **The integrated development should encourage the 49ers—an important source of civic pride—to remain in San Francisco by providing a world-class site for a new waterfront stadium and supporting infrastructure,** and in so doing should:

- Provide parking, transportation, transit and other infrastructure necessary for the operation of the stadium, including automobile, public transit and pedestrian connections between the Shipyard Property and Candlestick Point in order to facilitate the efficient handling of game day traffic.

- Prohibit the issuance by the City of lease revenue bonds or other debt that will be secured by or repaid from revenues on deposit in the City's General Fund to finance development of the new stadium.

(6) **The integrated development should be fiscally prudent, with or without a new stadium,** and in so doing should:

- Minimize any adverse impact on the City's General Fund relating to the development of the Project Site by relying to the extent feasible on the development to be self-sufficient.

- Promote financial self-sufficiency by: encouraging substantial private capital investment; leveraging land value created through the entitlement process for the Project Site; allowing the City or the Agency, subject to the review process generally described in Section 5 below, to contribute real property in the Project Site, so long as the contribution is linked to the provision of public benefits consistent with the objectives in this Section 4 or to the grant of rights to the City or the Agency to share in surplus revenues from development of the Project Site; and permitting the use of certain tax exempt financing tools such as the allocation of property tax-increment from the Project Site, the issuance of tax allocation bonds based on such increment and the issuance of community facilities (Mello-Roos) bonds secured by private property in the Project Site.

- Allow the Agency to use its city-wide Affordable Housing Fund to help finance affordable housing projects in the Project Site.

- Except as provided immediately above, prohibit the use of property tax increment from any part of a redevelopment area outside of the

Project Site to finance construction of improvements in the Project Site.

- To the extent feasible, use state and federal funds to pay for environmental remediation on the Project Site and help pay for transportation and other infrastructure improvements, and provide ways for other development projects outside the Project Site to pay their fair share for new infrastructure improvements.

Section 5. Governmental and Public Review of Development Plan.

Any development plan proposed for the Project Site, including the Project, will be subject to extensive public review and input. For example, any development plan will require public approvals from the City and the Agency, including conforming amendments to the City's General Plan and the existing Bayview Redevelopment Plan and Shipyard Redevelopment Plan, following environmental review under CEQA. Further, under federal and state laws, aspects of the development plan may also be reviewed by various regional, state and federal agencies, which may include the State Department of Parks and Recreation, the San Francisco Bay Conservation and Development Commission, the State Lands Commission, the State Regional Water Quality Control Board and the Navy.

Section 6. Disposition of City Land at Candlestick Point.

Under San Francisco Charter Section 4.113, the voters of the City approve the following (each a "Permitted Transfer"): (1) the sale, conveyance or lease for non-recreational purposes of any of the park land that is under the jurisdiction of the San Francisco Recreation and Park Commission and located within the boundary of Candlestick Point, including the property

currently used in connection with the existing stadium and related parking areas; and (2) the construction, maintenance and use for non-recreational purposes of any structure on such property. Each Permitted Transfer may be free from any restriction that the affected real property be used for park or recreation purposes, so long as: (a) the City's approval of such Permitted Transfer requires a binding obligation to create new public park or public open space land areas, at least equal in size to the real property subject to the Permitted Transfer, that are located in the Project Site; and (b) the Board of Supervisors finds in approving a Permitted Transfer at the conclusion of the review process generally described in Section 5 above, that: (i) new land areas are suitable for public park or public open space and will be dedicated for such uses; and (ii) the Permitted Transfer furthers development of the Project Site consistent with the objectives set forth in Section 4 above. The voters' approvals granted under this Section 6 are not intended to modify or abrogate any existing legal commitment of the City or to limit any other authority to sell, convey, lease or otherwise transfer any other City-owned land in the Project Site or to build, maintain or use any such land or structures on such land under any City ordinance or other applicable law.

Section 7. Repeal of Proposition D.

The approval of the voters to lease-finance a stadium development at Candlestick Point, in principal amount not exceeding $100 million, as more particularly set forth in Proposition D adopted in June 1997, a copy of which is attached for reference as Exhibit B, is repealed in its entirety. Accordingly, the City no longer has voter authority as required under its Charter to issue lease revenue bonds under Proposition D for a stadium development.

Section 8. Repeal of Proposition F.

Proposition F, adopted by the voters on June 3, 1997, a copy of which is attached for reference as Exhibit C, is repealed in its entirety.

Section 9. Implementing Actions.

The People of the City encourage the City, the Agency and other public agencies with applicable jurisdiction to proceed as expeditiously as possible to implement this Initiative, including, but not limited to, adopting land use controls for the Project Site consistent with the objectives set forth in Section 4 above and subject to the review process generally described in Section 5 above.

As a result of the public process generally described in Section 5 above and certain variables, including, for example and without limitation, market changes, economic feasibility and the timing of the 49ers departure from Monster Park, the final development plan for the Project Site may be materially different from the Project and the boundaries of the Project Site may be materially different from those identified on Exhibit A. The People of the City encourage the Board of Supervisors and other public agencies with applicable jurisdiction to approve such final development plans at the conclusion of the review process generally described in Section 5 above, so long as the Board of Supervisors and the Mayor then determine that such plans are generally consistent with the objectives set forth in Section 4 above.

Section 10. Interpretation.

The title of this Initiative and the captions preceding the sections of this Initiative are for convenience of reference only. Such title and captions shall not define or limit the scope or purpose of any provision of this Initiative. The use of the terms "including," "such as" or words of similar import when following any general term, statement or matter shall not be construed to

limit such term, statement or matter to the specific items or matters, whether or not language of non-limitation is used. Rather, such terms shall be deemed to refer to all other items or matters that could reasonably fall within the broadest possible scope of such statement, term or matter. The use of the term "or" shall be construed to mean and/or.

Section 11. Severability.

If any provision of this Initiative or any application thereof to any person or circumstance is held invalid, such invalidity shall not affect any provision or application of this Initiative that can be given effect without the invalid provision or application. To this end, the provisions of this Initiative are severable.

Attachments:

Exhibit A	Map of the Shipyard Property and Candlestick Point
Exhibit B	Proposition D (June 1997)
Exhibit C	Proposition F (June 1997)

EXHIBIT A

Map of the the Shipyard Property and Candlestick Point

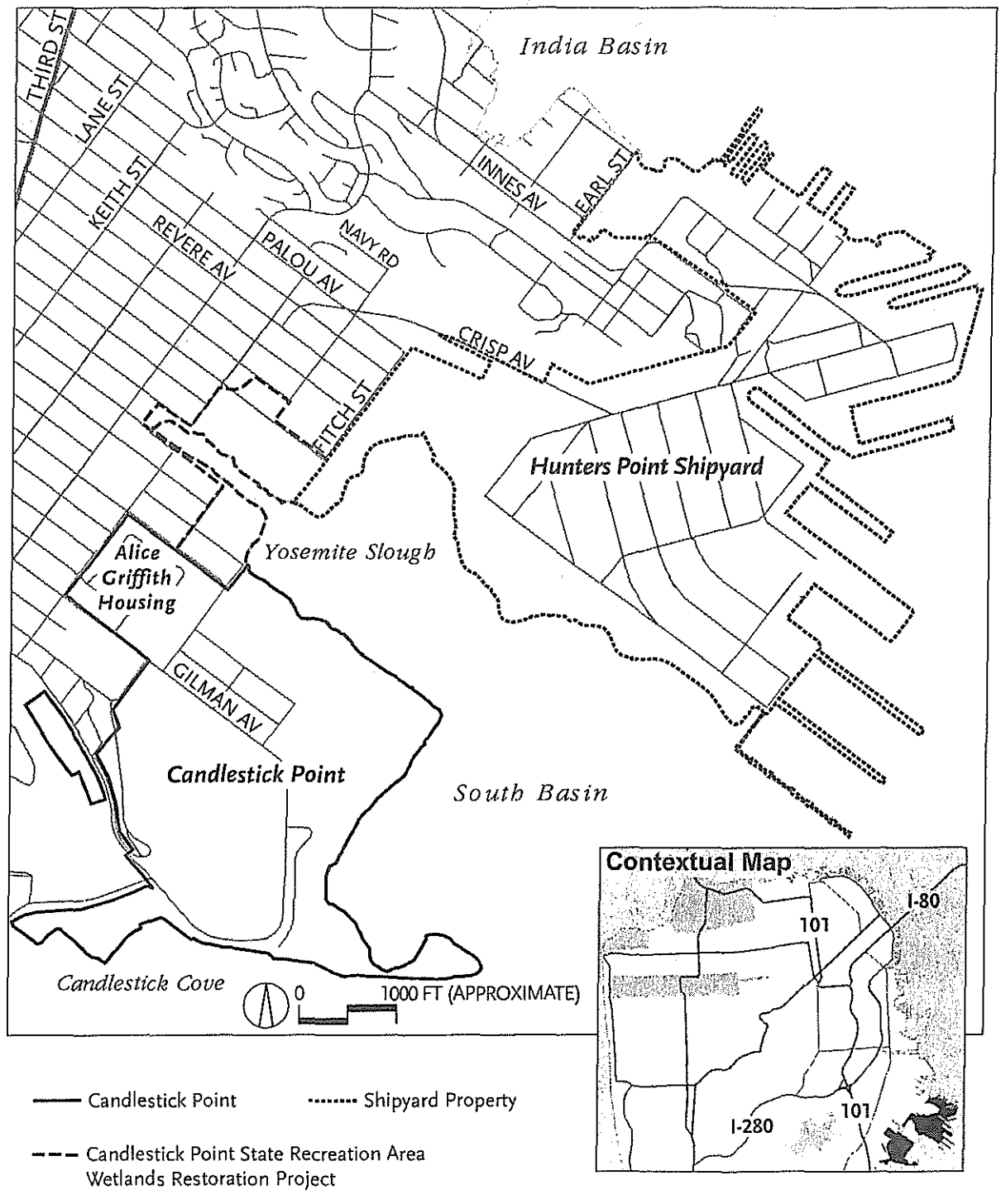


EXHIBIT B

PROPOSITION D

SUBMITTING A BALLOT PROPOSITION FOR THIS YEAR'S JUNE 3RD SPECIAL ELECTION, AUTHORIZING THE CITY TO LEASE-FINANCE A STADIUM DEVELOPMENT AT CANDLESTICK POINT, IN PRINCIPAL AMOUNT NOT EXCEEDING $100,000,000, PROVIDED NO CITY TAXES ARE INCREASED OR NEWLY IMPOSED WITHOUT PROPOSITION 218 VOTER APPROVAL; AND FINDING THE LEASE-REVENUE BOND PROPOSITION IS IN CONFORMITY WITH THE EIGHT PRIORITY POLICIES OF PLANNING CODE SECTION 101.1 AND THE CITY'S GENERAL PLAN.

- RESOLVED, That pursuant to Charter Section 9.108, the Board of Supervisors hereby submits to the electorate of the City and County of San Francisco the following proposition:

Shall the City lease-finance a stadium development at Candlestick Point, in principal amount not exceeding $100,000,000, provided no City taxes are increased or newly imposed without Proposition 218 voter approval.

The proposition shall be submitted to the electorate at the Special Election to be held on June 3, 1997. The proposition shall be placed on the ballot as a separate proposition in the form set forth above; and, be it

- FURTHER RESOLVED, That the stadium development shall consist of the development, acquisition and/or construction of the stadium and related infrastructure, facilities, structures, equipment and furnishings, in whole or in part (collectively, the **"Stadium Development"**); and, be it

- FURTHER RESOLVED, That the term "infrastructure" shall mean the physical systems and services which support, in whole or in part, the Stadium Development and its users, including, but not limited to, parking, streets, highways, water systems and sewer systems; and, be it

- FURTHER RESOLVED, That the term "Candlestick Point" shall mean Candlestick Point, the adjacent land and any other lands deemed necessary by the Board of Supervisors for the completion of the Stadium Development; and, be it

- FURTHER RESOLVED, That the authorized principal amount of $100,000,000 shall be used to finance (1) a portion of the total cost of the Stadium Development; (2) cost of issuance; (3) capitalized interest; (4) reserve accounts; and (5) any other related cost designated by the Board of Supervisors; and, be it

- FURTHER RESOLVED, That the City shall not impose any new taxes or increase or extend any existing taxes for the Stadium Development without voter approval to the extent required by Proposition 218 passed by the voters on November 5, 1996; and, be it

• FURTHER RESOLVED, That the Board of Supervisors having reviewed the proposed legislature, finds and declares that the proposed lease-revenue bond proposition is, on balance, in conformity with the General Plan and is consistent with the Eight Priority Policies of the Planning Code Section 101.1 and hereby adopts the findings of the City Planning Department, as set forth in Planning Commission Resolution No. 14295, adopted February 6, 1997 and incorporates said finding by reference; and, be it

• FURTHER RESOLVED, That the City shall not issue the bonds until the following conditions have been negotiated and concluded with the Mayor's Office:

1. The Forty-Niners shall provide a written commitment to the City that it will play all of its home games in the stadium until the retirement of the City's bonds for the Stadium Development.

2. A certification from the Controller that the total net proceeds of bonds available for construction shall not exceed $100,000,000. The City's contribution for construction shall be reduced by any net proceeds received from any tax allocation bonds that the Redevelopment Agency elects to issue based on tax increment generated by the Project.

3. The City determines, through the Mayor's office, that sufficient financial commitments are in place to construct an adjacent retail shopping center.

4. A written commitment to comply with all the requirements of Administrative Code Sections 12B and 12C that are applicable to the Stadium Development, including nondiscrimination in benefits based on domestic partner status.

5. A written commitment to provide an opportunity for 1000 permanent jobs at the Project to recipients of general assistance who become eligible through a training program.

6. A written commitment to use good faith efforts to provide that 50% of the construction jobs will be held by residents of the Bay-View Hunters Point-South Bayshore Community and 25% of permanent jobs available at the Project will be held by the community residents.

7. A written commitment that the City will only be responsible for no more than 50% of football related operations and maintenance expenses of the stadium, based on a budget approved by the City and the Forty-Niners.

8. A written commitment that there will be adequate provision for labor union representation at the project, including a card check neutrality agreement.

9. A written commitment to pay any reduction in property tax revenues due to a reassessment to the extent necessary to service any tax allocation bonds issued for the Stadium Development.

10. The City, through the Mayor's office, has determined that the City's contribution towards construction of the Project will be provided on a 20/80 prorata basis.

11. For purposes of these conditions, Project shall be defined to mean both the Stadium Development and the proposed shopping retail center to be located at Candlestick Point. The Mayor shall deliver a certificate to the Board of Supervisors that the foregoing conditions have been met. Upon the Board of Supervisors approving the issuance of the bonds, such certificate shall be final and conclusive in all respects as to the satisfaction of all the foregoing conditions. Bonds includes bonds, lease-financing arrangements, and certificates of participation.

EXHIBIT C

PROPOSITION F

Be it ordained by the People of the City and County of San Francisco:

Section 1. [Policy, Purpose]

It shall be the Policy of the People that a new professional football stadium, retail shopping and entertainment center, and related open space and parking be constructed, developed and operated at Candlestick Point consistent with the following principles:

The San Francisco Forty Niners are an invaluable source of civic pride and an integral part of San Francisco's image as a world-class city. The City and County of San Francisco must take immediate action to ensure that the Forty Niners have a suitable stadium in which to play their home games after the current lease at the existing stadium known as 3COM Park at Candlestick Point (formerly known as Candlestick Park) expires.

The City and County of San Francisco should have a state-of-the-art professional football stadium suitable for hosting the National Football League's Super Bowl on a regular basis.

Candlestick Point and the surrounding area is the most suitable location within San Francisco for the construction of a new professional football stadium for the San Francisco Forty Niners and retail shopping and entertainment center that will assist in revitalizing the economy of the Bayview-Hunters Point-South Bayshore area and provide jobs.

The stadium shall be designed and constructed by the San Francisco Forty Niners, or an affiliate thereof, or a developer selected by the San Francisco Forty Niners or an affiliate thereof, through a combination of public and private financing.

The stadium shall be constructed in conjunction with the retail shopping and entertainment center.

The City and County of San Francisco shall retain ownership of the land upon which the stadium and retail shopping and entertainment center shall be built.

The City and County of San Francisco shall enter into one or more ground leases with the San Francisco Forty Niners, or an affiliate thereof, or the developer of the stadium and/or retail shopping and entertainment center, selected by the San Francisco Forty Niners or its affiliate, for the stadium and retail shopping and entertainment center site.

Development of the stadium and retail and entertainment center shall incorporate open space and shall be consistent with the purposes of the Candlestick Point State Recreation Area and the recreational opportunities presently available in that area, including shoreline trails and shoreline access to San Francisco Bay.

The existing stadium shall be demolished once the new stadium is completed and ready for occupancy, provided that the Giants baseball team has relocated to a new facility.

The stadium and retail stopping and entertainment center will produce substantial economic and public benefits for San Francisco residents generally and for the residents and business owners of the Bayview-Hunters Point-South Bayshore community specifically.

The stadium and retail shopping and entertainment center, and all related parking, will satisfy any public trust requirements and restrictions applicable to any portion of the site consisting of former tidelands and submerged lands.

Section 2. [Implementation]

Promptly following the effective date of this ordinance, the City and County of San Francisco, through the Board of Supervisors, the Planning Commission, Redevelopment Agency and other appropriate officials, boards or commissions, shall proceed to cooperate with the San Francisco Forty Niners, or its affiliate, in taking all action necessary to achieve the purposes of this ordinance, including but not limited to assisting in the negotiations for property acquisition and applying for conforming amendments to all applicable state and regional plans and regulations.

Section 3. [Election Under Charter Section 4.113]

Pursuant to San Francisco Charter Section 4.113, the electors of the City and County of San Francisco hereby approve the lease for non-recreational purposes of, and the construction, development, operation, maintenance, repair and replacement of structures for non-recreational purposes on, any and all of the park land presently under the jurisdiction of the City's Recreation and Park Commission and located within the boundaries of the Candlestick Point Special Use District as defined in this ordinance, including the property currently used for the existing stadium and paved stadium parking.

Section 4. [General Plan; Amendment]

The General Plan of the City and County of San Francisco is hereby amended as follows:

(a) Figure 3 ("Generalized Land Use and Density") of the South Bayshore Area Plan Element shall be amended to redesignate the property generally bounded by Jamestown Avenue Extension, Giants Drive, Gilman Avenue, Arelious Walker Drive (Fitch Street), Carroll Avenue, Griffith Street, and San Francisco Bay, as the "Candlestick Point Special Use District."

(b) Figure 4 ("Candlestick Point Perimeter Proposed Revitalization Area") of the South Bayshore Area Plan Element shall be amended to indicate that the property within the Candlestick Point Special Use District shall be devoted to "Stadium, Commercial, Parking and Open Space" uses.

(c) New Policy 7.4 shall be added to the South Bayshore Area Plan Element to read as follows:

POLICY 7.4

Encourage commercial development within the Candlestick Point Special Use District that will complement a new sports stadium and the other commercial areas within the South Bayshore Area and the City, and that will create job opportunities for South Bayshore residents.

The existing sports stadium within this district may be replaced with a new professional football stadium of a size and character suitable for hosting the National Football League's Super Bowl on a regular basis. The construction of a new football stadium should be accompanied by development of retail and entertainment uses complementary to the stadium that will assist in revitalizing the economy of the area and create employment opportunities for South Bayshore residents. The City should require developers of new uses within the district to make good faith efforts to provide both construction and permanent jobs to South Bayshore residents.

Commercial development within the district should consist primarily of destination-oriented uses that will supplement, and not substitute for, neighborhood-serving retail services within the South Bayshore area and particularly in the Third Street core commercial area. Structures to house retail and entertainment uses within the Candlestick Point Special Use District should be integrally linked to, and should be planned and developed as a comprehensive unit with, the stadium complex. The existing shoreline trail should be retained and enhanced. In addition, commercial development within the district should incorporate open space areas to the extent feasible. Transportation and transit improvements should be made in conjunction with development within the district. The City, with public input, should coordinate development within the Candlestick Point Special Use District with on-going revitalization efforts for the South Bayshore area.

(d) Map 1 of the Recreation and Open Space Element shall be amended so that all property within the Candlestick Point Special Use District that is shown as property owned by the "Recreation and Park Department" shall be shown instead as property owned by "Other City Departments".

(e) Maps 2, 4, 8 and 9 of the Recreation and Open Space Element shall be amended by deleting all property within the Candlestick Point Special Use District from the "Existing Public Open Space" designation on Maps 2 and 4; the "Public Open Space" designation on Map 8; and the "Public Recreation and Open Space" designation on Map 9.

(f) Map 2 of the Commerce and Industry Element shall be amended to add a notation for all property within the Candlestick Point Special Use District that states, "Candlestick Point Special Use District; see applicable Planning Code provisions."

(g) Map 4 of the Urban Design Element shall be amended to add a notation for all property within the Candlestick Point Special Use District that states, "Candlestick Point Special Use District; see applicable Planning Code provisions."

(h) The Land Use Index shall be amended to conform to the amendments made above in subsections (a) through (g) in this Section 4.

Section 5. [Special Use District].

Part II, Chapter II of the San Francisco Municipal Code (City Planning Code) is hereby amended by adding Section 249.19 to read as follows:

"Section 249.19 Candlestick Point Special Use District.

A Special Use District entitled the "Candlestick Point Special Use District," the boundaries of which are designated on Sectional Map No. 10 SU of the Zoning Maps of the City and County of San Francisco, and which is generally bounded by Jamestown Avenue Extension, Giants Drive, Gilman Avenue, Arelious Walker Drive (Fitch Street), Carroll Avenue, Griffith Street, and San Francisco Bay, is hereby established for the purposes set forth below. The following provisions shall apply within the Candlestick Point Special Use District:

(a) Purposes. The following controls, imposed in the Candlestick Point Special Use District, shall accommodate the development of a stadium suitable for professional football and the National Football League's Super Bowl ("Stadium") and a retail shopping and entertainment center ("Retail/Entertainment Center"), together with open space and related parking facilities (collectively, the "Combined Project"), as principal uses, and other uses as conditional uses.

(b) Controls. The specific controls set forth herein shall apply only to the principal uses and conditional uses described in this Section 249.19(b). Any other development not described herein shall be governed by the underlying zoning controls.

(1) Principal Uses. The following uses shall be permitted as principal uses in this Special Use District:

(i) Stadium: A stadium, primarily to be used for professional football, but which may also be used for other sporting events or outdoor entertainment events, and which may include other assembly and entertainment uses, and other uses related to the stadium, including retail sales and personal service uses, sports clubs, restaurants and office uses accessory to the stadium (which shall not be deemed an "office development" subject to the provisions of Planning Code Sections 309 through 325 et seq.).

(ii) Retail/Entertainment Center: A Retail/Entertainment Center which may include any type or size of retail establishment, restaurant, bar, entertainment use (including but not limited to movie theaters), amusement enterprise (including but not limited to arcades, nightclubs, bowling alleys, and skating rinks), and amusement park. Principal uses allowed under this subsection (ii) shall be limited to a total of 1,400,000 square feet of occupied floor area.

(iii) Open Space: Areas devoted to landscaping, shoreline access, shoreline trails, and active or passive recreational uses. The areas used for passive or active recreational uses may also be used as temporary parking areas to support stadium events, provided that such areas shall not be paved and shall include drainage and other improvements appropriate for both open space and temporary parking uses.

(iv) Parking: Off-street vehicle parking, provided by surface parking lots or underground or above ground parking garages to serve the Stadium and Retail/Entertainment Center.

(2) Conditional Uses. The Planning Commission may authorize the following uses within the Special Use District as a conditional use:

(i) Any principally permitted uses allowed under Section 249.19(b)(1)(ii) which exceed a total of 1,400,000 square feet of occupied floor area.

(ii) Any use not specified in subsection (b)(1) above and permitted in any C District, as that term is defined in Planning Code Section 102.5.

(3) Prohibited Uses. Adult entertainment establishments, as defined in Planning Code Section 790.36, massage establishments as defined in Planning Code Section 790.60 and any type of gaming, wagering or gambling establishment, shall not be permitted within the Special Use District.

(4) Floor Area Ratio. There shall be no floor area ratio limitation for the Combined Project or any approved conditional use.

(5) Design Review By Planning Commission. Any application for a new structure, or major alteration of an existing structure, to house a use permitted by this section as a principal use under Section 249.19(b)(1) shall be subject to design review and approval by the Planning Commission. The Planning Commission shall approve such application if it finds that the proposed development meets the applicable height, bulk, floor area limitation and parking standards of this Section 249.19(b), and is consistent with the Priority Policies set forth in Planning Code Section 101.1, and that the architectural design of the structures, the landscaping, and the quantity and design of usable open space are appropriate for the intended use, location and purpose of the structure(s). The Planning Commission shall take final action on any completed application for a development permitted by this section within 60 days of its first public hearing on the application. The procedures and criteria in this subsection shall govern in lieu of the discretionary review process set forth in Section 26 of Part III of the San Francisco Municipal Code. The fee for review of any application under this subsection shall be based on the cost of the time and materials (calculated at a rate of $77/hour as may be adjusted by the Consumer Price Index) up to a maximum fee of $14,800.

(6) Parking. Parking shall be governed by Article 1.5 of the Planning Code unless otherwise specified in this subsection.

(i) Planning Code Section 159 and subsections (a), (b), (h) and (p) of Planning Code Section 155 shall not apply to parking provided within the Special Use District. Planning Code Sections 155(i) and (j) shall apply only to the amount of parking required under Section 151.

(ii) For the purposes of calculating minimum required parking under Planning Code Section 151, in no case shall the total number of required parking spaces for the

Combined Project exceed the greater of either the parking spaces calculated for the Stadium or the parking spaces calculated for the Retail/Entertainment Center, standing alone.

(7) Appeal. The Planning Commission's determination on the design of the Combined Project pursuant to Section 249.19(b)(5) shall be a final determination on all design issues, except that the Arts Commission shall review the design, if required by Charter Section 5.103. Notwithstanding the provisions of Section 26 of Part III of the San Francisco Municipal Code, review by the Board of Appeals on the issuance of any demolition permit, building or site permit in this Special Use District shall be limited to compliance with the San Francisco Building Code, Health Code and Fire Code.

(c) State Park Land. To the extent any land owned or otherwise under the jurisdiction or control of the California Department of Parks and Recreation is included within the boundaries of the Special Use District, any development on such land shall be consistent with the purpose of the Candlestick Point State Recreation Area and shall continue to make available to the people the recreational opportunities that are offered by the shoreline, waters and environment of San Francisco Bay. To this end, no development shall be permitted within 120 feet of the shoreline of the San Francisco Bay, as measured at mean low tide.

Section 6. [Height Limit; Exceptions]

(a) Part II, Chapter II of the San Francisco Municipal Code (City Planning Code) is hereby amended by adding Section 263.14 to read as follows:

"Section 263.14. Height Restrictions for Candlestick Point Special Use District.

In the 60/150-200-X Height and Bulk District as designated on Sectional Map No. 10H of the Zoning Map, the height limit shall be 60 feet, except that heights up to 200 feet shall be permitted for any stadium use permitted within the Candlestick Point Special Use District. An exception to the 60 foot height limit may be granted by the Planning Commission as a conditional use within the Candlestick Point Special Use District, up to a maximum height of 150 feet. In the event any stadium constructed within the Special Use District is integrated into a retail shopping center or other structure, any transitional structures which connect or otherwise attach the stadium to the other structure shall be considered part of the stadium for purposes of determining the permissible height of the transitional structure. All structures within the Candlestick Point Special Use District shall be exempt from the provisions of Planning Code Section 295.

(b) Part II, Chapter II of the San Francisco Municipal Code (City Planning Code) is hereby amended by adding subsection (L) to Section 260(b)(1) to enact the following exemption from height limits otherwise established by the City Planning Code:

"(L) In the Candlestick Point Special Use District, light standards for the purpose of the lighting the stadium, scoreboards associated with the stadium, and flagpoles and other ornamentation associated with the stadium."

Section 7. [Signs]

Part II, Chapter II of the San Francisco Municipal Code (City Planning Code) is hereby amended by adding Section 608.51 to read as follows:

"Section 608.4A. Signs for Uses Within the Candlestick Point Special Use District.

Any sign that directs attention to a business, commodity, service, industry or other activity that is or will be sold, offered or conducted within the Candlestick Point Special Use District and that either is greater than 200 square feet in area or extends above the roofline of the building upon which the sign is located ("SUD Sign") shall be permitted within the Candlestick Park Special Sign District if approved by the Planning Commission as a conditional use. Planning Code Sections 608.4, 608.5 and 609.2, or any other regulation applicable to signs within the Candlestick Park Special Sign District, shall not apply to SUD Signs. SUD Signs shall conform to the restrictions set forth in Planning Code Section 607 for signs in C-3 Districts, except that there shall be no height limit for SUD Signs. The Planning Commission may authorize an SUD Sign as a conditional use if the design of the sign and any associated sign structure is appropriate for the intended use and location. This criterion shall be in lieu of the criteria set forth in Planning Code Section 303(c)(1) through (4). Any scoreboard or sign within a stadium located in the Candlestick Point Special Use District shall be exempt from regulation under Article 6 of the Planning Code. Principally permitted signs within the Special Use District shall be consistent with a sign program submitted and approved by the Planning Commission as part of the design review process for the Candlestick Point Special Use District.

Section 8. [Special Use District Boundaries; Zoning Maps]

(a) The boundaries of the Candlestick Point Special Use District created by this Ordinance are shown in Figure 1 attached hereto, which is provided for general orientation purposes only.

(b) Special Use Map. Part II, Chapter II of the San Francisco Municipal Code (City Planning Code) is hereby amended by amending Sectional Map No. 10 SU of the Zoning Maps of the City and County of San Francisco to include the Candlestick Point Special Use District, the boundaries of which are hereinafter described.

The Special Use District shall include property bounded as follows, with street boundaries following the centerline of the referenced streets: Beginning at the point which is the intersection of Giants Drive and Gilman Avenue (the point of beginning), along Gilman Avenue to Arelious Walker Drive (also known as Fitch Street), along Arelious Walker Drive to Carroll Avenue, along Carroll Avenue to Griffith Street (a mapped but unconstructed street), along Griffith Street to the San Francisco Bay shoreline, then continuing south along the San Francisco Bay shoreline to Alvord Street (a mapped but unconstructed street), then continuing south and west along a line extending from Alvord Street to the San Francisco Bay shoreline, continuing east along the San Francisco Bay shoreline to Coleman Street (a mapped but unconstructed street), then north and east along Coleman Street to Jamestown Avenue Extension, then along the Jamestown Avenue Extension to the farthest west point of Assessor's Block No. 5000, then

along the north west border of Assessor's Block No. 5000 to Giants Drive, then along Giants Drive to the intersection of Giants Drive and Gilman Avenue (the point of beginning).

Existing Use Districts	Use District Hereby Approved
P, M-1, M-2, RH-2	To Existing Use Districts Add the Candlestick Point Special Use District Overlay

(c) Height and Bulk. Part II, Chapter II of the San Francisco Municipal Code (City Planning Code) is hereby amended by amending Sectional Map No. 10 H of the Zoning Maps to enact the following changes in the height and bulk classifications for the property within the Candlestick Point Special Use District, as more particularly described in subsection (b) in this Section 8.

Height and Bulk Districts to be Superseded	Height and Bulk District Hereby Approved
OS; 40-X	60/150-200-X

Section 9. [Waterfront Plan]

Chapter 61 of the San Francisco Administrative Code ("Waterfront Land Use"), adopted by the People of the City and County of San Francisco pursuant to Proposition H, is hereby amended as follows:

(a) Section 61.2(d) shall be amended by adding the following subsection:

"(3) This provision shall not be applicable to any new development within the Candlestick Point Special Use District."

(b) Section 61.4 shall be amended by adding the following subsection:

"(i) Within the Candlestick Point Special Use District, any use that is permitted as a principal or conditional use under Planning Code Section 249.19."

Section 10. [Public Contracting Provisions]

Notwithstanding any provision of the San Francisco Municipal Code (the "Municipal Code") or any other ordinance or regulation of the City and County of San Francisco to the contrary, the Stadium, Retail/Entertainment Center and related physical improvements and infrastructure to be constructed in the Candlestick Point Special Use District shall not be deemed to be a "public work or improvement" as that term or any similar term is used in any provision of the Municipal Code or any other ordinance or regulation of the City and County of San Francisco,

including but not limited to, Chapter 6 of the San Francisco Administrative Code. No provision of the Municipal Code, nor any other ordinance or regulation of the City and County of San Francisco shall be deemed to require the person or entities, including the City and County of San Francisco, constructing any portion or all of the Stadium, Retail/Entertainment Center and related improvements and infrastructure, to follow any particular procedure, comply with any bidding or advertising requirements, or otherwise engage in any particular practice with respect to the selection of contractors or sub-contractors for the award of contracts or subcontracts for the design, construction, purchase of materials, management or operation of any portion or all of the stadium, retail shopping and entertainment center and associated improvements; provided, however, the design and construction of the Stadium, Retail/Entertainment Center and related improvements and infrastructure shall be subject to the applicable provisions of Chapter 12B, 12C and 12D of the San Francisco Administrative Code and to the terms and conditions of any public financing and the ground lease or leases. It is the intent of the people of the City and County of San Francisco, in adopting this section of this Ordinance, that the design and construction of the Stadium, Retail/Entertainment Center and related improvements and infrastructure shall be done in an expeditious manner, and shall not be undertaken as if such design and construction were the design and construction of conventional public work or improvement. This section shall be liberally construed to fulfill this intent.

Section 11. [Redevelopment Agency]

The Candlestick Point Special Use District is within the South Bayshore Redevelopment Survey Area. In the event that a Redevelopment Project Area is adopted which includes the Combined Project, the Combined Project shall be subject to the authority of the Redevelopment Agency of the City and County of San Francisco authority pursuant to state law.

Section 12. [Compliance With Laws]

Except as otherwise specified herein, the construction of the Combined Project shall be subject to all federal, state and local laws, ordinances and regulations (as the same may be amended), including but not limited to the California Environmental Quality Act (Public Resources Code Section 21000, et seq.).

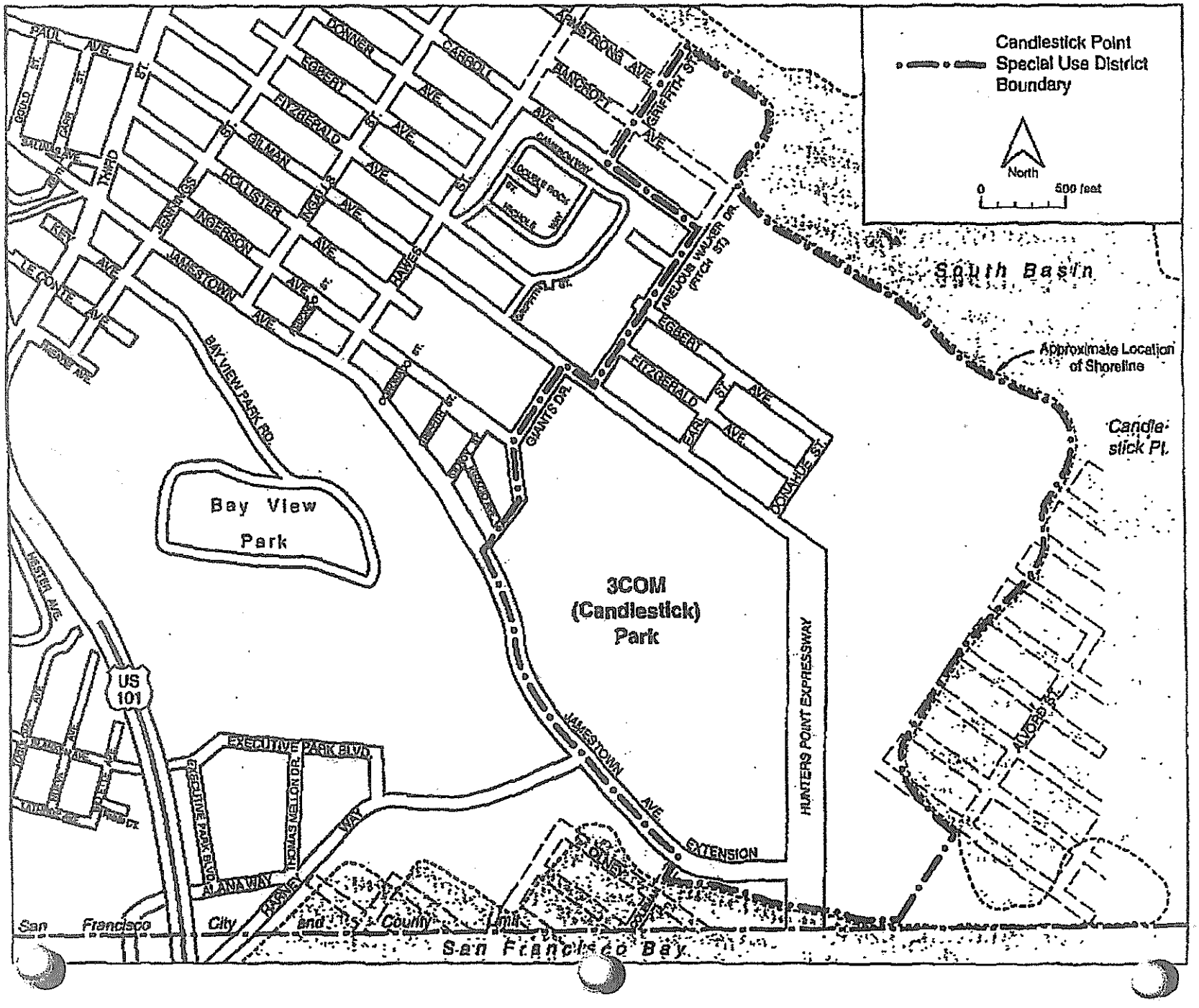
Section 13. [Amendment]

Any provision of this ordinance may be amended by the Board of Supervisors and shall not require the vote of the electors of the City and County of San Francisco, provided that such amendments are consistent with the purpose and intent of this ordinance.

Section 14. [Severability]

If any provision of this ordinance, or any application thereof to any person or circumstance, is held invalid, such invalidity shall not affect any provision or application of this ordinance that can be given effect without the invalid provision or application. To this end, the provisions of this ordinance are severable.

Figure


Candlestick Point
Special Use District
Boundary
North
0
500 feet
South Basin
Approximate Location of Shoreline
Candlestick Pt.
Bay View Park
3COM (Candlestick) Park
HUNTERS POINT EXPRESSWAY
US 101
BAY VIEW PARK RD.
GILMAN AVE.
HOLLISTER AVE.
INGERSON AVE.
JAMESTOWN AVE.
EGBERT AVE.
FITZGERALD AVE.
EARL AVE.
DONAHUE ST.
GIANTS DR.
ARELIOUS WALKER DR.
(PITCH ST.)
ARMSTRONG AVE.
GRIFFITH ST.
CAROLL AVE.
BANCROFT AVE.
BONNER AVE.
PAUL AVE.
LE CONTE AVE.
KEITH AVE.
EXECUTIVE PARK BLVD.
THOMAS MELLON DR.
ALANA WAY
JAMESTOWN AVE. EXTENSION
ALVORD ST.
San Francisco City and County Line
San Francisco Bay