FINAL

MISSION BAY SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

CITY AND COUNTY OF SAN FRANCISCO PLANNING DEPARTMENT • SAN FRANCISCO REDEVELOPMENT AGENCY

PLANNING DEPARTMENT FILE NO. 96.771E
SAN FRANCISCO REDEVELOPMENT AGENCY CASE NO. ER 919-97
STATE CLEARINGHOUSE NO. 97092068

DRAFT SEIR PUBLICATION DATE: APRIL 11, 1998 • DRAFT SEIR PUBLIC HEARING DATE: MAY 12, 1998
DRAFT SEIR PUBLIC COMMENT PERIOD: APRIL 11, 1998 TO JUNE 9, 1998
FINAL SEIR CERTIFICATION DATE: SEPTEMBER 17, 1998

VOLUME I:
PROJECT DESCRIPTION, SETTING, AND IMPACT ANALYSIS

EIP ASSOCIATES

SOURCE: San Francisco Redevelopment Agency

- COMMERCIAL INDUSTRIAL
- COMMERCIAL INDUSTRIAL / RETAIL
- MISSION BAY NORTH RETAIL
- MISSION BAY RESIDENTIAL
- MISSION BAY OPEN SPACE (allows recreation-serving retail building east of Terry A. Francois Blvd.)
- HOTEL
- UCSF (includes City school site)
- ADDITIONAL BAYFRONT OPEN SPACE (PORT PROPERTY)
- MISSION BAY PUBLIC FACILITIES
- PROPOSED BOUNDARIES OF MISSION BAY REDEVELOPMENT AREAS

COMBINATION OF PROJECT FEATURES AND VARIANTS AS ADOPTED

SEE INSIDE BACK COVER FOR THE LAND USE PROGRAM ANALYZED AS THE PROJECT IN THE DRAFT EIR

PLANNING DEPARTMENT

City and County of San Francisco   1660 Mission Street   San Francisco, CA 94103-2414

(415) 558-6378   PLANNING COMMISSION FAX: 558-6409   ADMINISTRATION FAX: 558-6426   CURRENT PLANNING/ZONING FAX: 558-6409   LONG RANGE PLANNING FAX: 558-6426

February 25, 1999

RE: **FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT, MISSION BAY PROJECT**
Planning Department Case File 96.771E, SFRA Case No. ER 919-97

To Whom It May Concern:

Enclosed is the four-volume Final Subsequent Environmental Impact Report for the Mission Bay Project. You are receiving this Final SEIR because you requested it or because you have been involved in the approval process (e.g., as a Responsible Agency).

This Final SEIR includes both the responses to comments received during the public comment period and revisions to the Draft SEIR text due to public comments and staff-initiated changes. <u>This four-volume set replaces the three-volume Draft SEIR and Summary of Comments and Responses volume you may already have</u>. You may dispose of the Draft SEIR and prior Summary of Comments and Responses volume, since all of the information presented in them is presented in the Final SEIR. There is no need to re-read the Final SEIR, if you have already reviewed the Summary of Comments and Responses and the Draft SEIR. The Final SEIR should be used for future reference when considering specific development proposals within the Mission Bay Redevelopment Areas.

As part of the project approval process, the San Francisco Redevelopment Agency, Planning Commission, and Board of Supervisors adopted changes in the project collectively referred to in the prior Summary of Comments and Responses volume as the "Combination of Project Features and Variants Currently under Consideration by the Project Sponsors." These are shown on the map in the inside front cover of each Final SEIR volume as the "Combination of Project Features and Variants as Adopted."

For further information concerning the **<u>environmental review</u>** of the Mission Bay project, contact Paul Deutsch at the Office of Environmental Review at 558-6383. For further information concerning the **<u>Mission Bay project and process</u>**, contact David Prowler of the Mayor's Office at 554-7940.

Office of Environmental Review

FINAL

MISSION BAY SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

City and County of San Francisco Planning Department ♦ San Francisco Redevelopment Agency

Planning Department File No. 96.771E
San Francisco Redevelopment Agency Case No. ER 919-97
State Clearinghouse No. 97092068

Draft SEIR Publication Date: April 11, 1998
Draft SEIR Public Hearing Date: May 12, 1998
Draft SEIR Public Comment Period: April 11, 1998 to June 9, 1998
Final SEIR Certification Date: September 17, 1998

VOLUME I
PROJECT DESCRIPTION, SETTING, AND IMPACT ANALYSIS

● Indicates material that is new or has been revised since publication of the Draft SEIR.

This report has been prepared on post-consumer recycled paper.

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• CERTIFICATION MOTIONS

CERTIFICATE OF RECORDING OFFICER

The undersigned hereby certifies that:

1. She is the duly qualified and acting Secretary of the Redevelopment Agency of the City and County of San Francisco, hereinafter called the "Local Public Agency", and the custodian of the records of the Local Public Agency including the minutes of the proceedings of the Local Public Agency, hereinafter call the "Governing Body", and is duly authorized to execute this certificate.

2. Attached hereto is a true and correct copy of Resolution Nos. 182-98 through and including 196-98, including the WHEREAS clauses (Basis for Resolution), adopted at a Special meeting of the Governing Body held on September 17, 1998.

3. Said resolutions have been duly recorded in the minutes of said meeting and are now in full force and effect.

4. Said meeting was duly convened and held in all respects in accordance with law and the bylaws of the Local Public Agency. To the extent required by law, or said bylaws, due and proper notice of said meeting was given. A legal quorum of Members of the Governing Body were present throughout said meeting and a legally sufficient number of Members of the Governing Body voted in the proper manner for the adoption of said resolutions. All other requirements and proceedings under law, said bylaws, or otherwise, incident to the proper adoption of said resolution, including any publication if required by law, have been duly fulfilled, carried out, and otherwise observed.

5. The seal that appears below constitutes the official seal of the Local Public Agency and was duly affixed by the undersigned at the time this certificate was signed.

IN WITNESS WHEREOF, the undersigned has hereunto set her hand this 21st day of September 1998.

(SEAL)

Agency Secretary

RESOLUTION NO. 182-98
(Adopted September 17, 1998)

CERTIFICATION OF A FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED MISSION BAY NORTH AND MISSION BAY SOUTH REDEVELOPMENT PLANS AND IMPLEMENTING ACTIONS REGARDING AN AREA BOUNDED GENERALLY BY TOWNSEND, THIRD AND SEVENTH STREETS, TERRY FRANCOIS BOULEVARD AND MARIPOSA STREET, BUT EXCLUDING CHINA BASIN CHANNEL

BASIS OF RESOLUTION

1. The San Francisco Redevelopment Agency (the "Agency") and the Planning Department (the "Department"), together acting as co-lead agencies for conducting this environmental review, fulfilled all procedural, format and content requirements of the California Environmental Quality Act (Cal. Pub. Res. Code Section 21000 *et seq.* ("CEQA")), the State CEQA Guidelines (Cal. Admin. Code Title 14, Section 15000 *et seq.* ("CEQA Guidelines")), Chapter 31 of the San Francisco Administrative Code (hereinafter "Chapter 31"), and the Agency's Resolution No. 59-77, adopted March 8, 1977 (the "Resolution"), to wit:

a. The Agency and the Department determined that an environmental impact report was required and provided public notice of that determination by publication in a newspaper of general circulation on September 20, 1997.

b. On April 11, 1998, the Department published the Draft Subsequent Environmental Impact Report (the "DSEIR") and provided public notice in a newspaper of general circulation of the availability of the DSEIR for public review and comment and of the date and time of the Redevelopment Agency Commission and the City Planning Commission joint public hearing on the DSEIR; the notice was mailed to the Agency's list of persons requesting such notice.

c. On April 11, 1998, copies of the DSEIR were mailed or otherwise delivered to a list of persons requesting it, to those noted on the distribution list in the DSEIR, to adjacent property owners, and to government agencies, the latter both directly and through the State Clearinghouse.

d. A Notice of Completion was filed with the State Secretary of Resources via the State Clearinghouse on April 9, 1998.

2. The Agency Commission and the Planning Commission held a duly advertised public hearing on said DSEIR on May 12, 1998 at which opportunity for public comment was given, public comment was received on the DSEIR and the public hearing was closed. The period for acceptance of written comments ended on June 9, 1998.

3. The Agency and the Department prepared responses to comments on environmental issues received at the public hearing and in writing during the 59-day public review period for the DSEIR, prepared revisions to the text of the DSEIR in response to comments received or based on additional information that became available during the public review period, and corrected errors in the DSEIR. This material was presented in a "Draft Summary of Comments and Responses," published on September 3, 1998, was distributed to the Commission and to all persons who commented on the DSEIR, and was available to others upon request at Department offices.

4. A Final Subsequent Environmental Impact Report (the "FSEIR") has been prepared by the Agency and the Department, consisting of the DSEIR, any consultations and comments received during the review process, any additional information that became available, and the Summary of Comments and Responses, all as required by law.

5. The Project and Subsequent Environmental Impact Report files have been made available for review by the Agency Commission, the Planning Commission and the public, and these files are part of the record before the Agency Commission and the Planning Commission.

RESOLUTION

ACCORDINGLY, IT IS HEREBY RESOLVED by the Agency Commission, after consideration, that:

The Agency Commission makes the following findings:

1. The Agency Commission reviewed and considered the FSEIR and hereby does find that the contents of said report and the procedures through which the FSEIR was prepared, publicized and reviewed comply with the provisions of CEQA, the CEQA Guidelines, Chapter 31 and the Resolution.

2. The Agency Commission hereby does hereby find that the FSEIR concerning File No. 96.176E reflects the independent judgment and analysis of the Agency Commission, is adequate, accurate and objective and that the Summary of Comments and Responses contains no significant revisions to the DSEIR, and hereby does CERTIFY THE COMPLETION of said FSEIR in compliance with CEQA and the CEQA Guidelines.

3. The Agency Commission in certifying the completion of the FSEIR does hereby find that the project described in the FSEIR and the project proposed for adoption, consisting of the project described in the Project Description plus Variants 1, 2, 3A and 5, as described in the Project Description and Combination of Variants Chapters of the FSEIR, would have the following unavoidable significant impacts:

a. project and cumulative traffic intersection impacts, primarily affecting intersections at or near I-280 and I-80 in the South of Market area;

b. contribution to cumulative bridge and bridge on-ramp impacts (lengthening of peak congestion);

c. project and cumulative regional air quality impacts from increased vehicular emissions (exceedance of BAAQMD significance thresholds for reactive organic gases and oxides of nitrogen, which are ozone precursors, and for particulate matter);

d. unknown, but potentially significant risks from toxic air contaminants from mobile sources, from individual stationary sources, from the combined risk due to emissions from multiple facilities, and from cumulative risks;

e. contribution to cumulative hazardous waste generation and disposal impacts;

f. cumulative water quality impacts (although the project's contribution to cumulative water quality impacts could be reduced to less than significant levels if mitigation measures are imposed).

APPROVED AS TO FORM

David M. Madway
Agency General Counsel

File No.: 96.771E
Mission Bay North Redevelopment Plan
Mission Bay South Redevelopment Plan

SAN FRANCISCO

CITY PLANNING COMMISSION

MOTION NO. 14696

ADOPTING FINDINGS RELATED TO THE CERTIFICATION OF A FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT FOR MISSION BAY NORTH AND MISSION BAY SOUTH REDEVELOPMENT PLANS AND VARIOUS OTHER ACTIONS NECESSARY TO IMPLEMENT SUCH PLANS.

MOVED, That the San Francisco City Planning Commission (hereinafter "Commission") hereby CERTIFIES the Final Subsequent Environmental Impact Report identified as case file No. 96.771E, for the Mission Bay North and Mission Bay South Redevelopment Plans and various other related implementing actions (hereinafter "Project") based upon the following findings:

1) The City and County of San Francisco, acting through the Department of City Planning (hereinafter "Department") fulfilled all procedural requirements of the California Environmental Quality Act (Cal. Pub. Res. Code Section 21000 et seq., hereinafter "CEQA"), the State CEQA Guidelines (Cal. Admin. Code Title 14, Section 15000 et. seq., (hereinafter "CEQA Guidelines") and Chapter 31 of the San Francisco Administrative Code (hereinafter "Chapter 31").

a. The Department determined that an EIR was required and provided public notice of that determination by publication in a newspaper of general circulation on September 20, 1997.

b. On April 11, 1998, the Department published the Draft Subsequent Environmental Impact Report (hereinafter "DSEIR") and provided public notice in a newspaper of general circulation of the availability of the DSEIR for public review and comment and of the date and time of the City Planning Commission public hearing on the DSEIR; this notice was mailed to the Department's list of persons requesting such notice.

c. On April 11, 1998 copies of the DSEIR were mailed or otherwise delivered to a list of persons requesting it, to those noted on the distribution list in the DSEIR, to adjacent property owners, and to government agencies, the latter both directly and through the State Clearinghouse.

d. Notice of Completion was filed with the State Secretary of Resources via the State Clearinghouse on April 9, 1998.

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2) The Commission held a duly advertised public hearing on said Draft Subsequent Environmental Impact Report on May 12, 1998 at which opportunity for public comment was given, and public comment was received on the DSEIR. The period for acceptance of written comments ended on June 9, 1998.

3) The Department prepared responses to comments on environmental issues received at the public hearing and in writing during the 59-day public review period for the DSEIR, prepared revisions to the text of the DSEIR in response to comments received or based on additional information that became available during the public review period, and corrected errors in the DSEIR. This material was presented in a "Draft Summary of Comments and Responses," published on September 3, 1998, was distributed to the Commission and to all parties who commented on the DSEIR, and was available to others upon request at Department offices.

4) A Final Subsequent Environmental Impact Report ("FSEIR") has been prepared by the Department, consisting of the Draft Environmental Impact Report, any consultations and comments received during the review process, any additional information that became available, and the Summary of Comments and Responses all as required by law.

5) Project Environmental Impact Report files have been made available for review by the Commission and the public. These files are available for public review at the Department offices at 1660 Mission Street, and are part of the record before the Commission.

6) On September 17, 1998, the Commission reviewed and considered the FSEIR and finds that the contents of said report and the procedures through which the FSEIR was prepared, publicized and reviewed comply with the provisions of CEQA, the CEQA Guidelines and Chapter 31.

7) The City Planning Commission hereby does find that the FSEIR concerning File No. 96.771E: Mission Bay Redevelopment Plans reflects the independent judgment and analysis of the City and County of San Francisco, is adequate, accurate and objective, and that the Summary of Comments and Responses contains no significant revisions to the DSEIR, and hereby does CERTIFY THE COMPLETION of said Final Subsequent Environmental Impact Report in compliance with CEQA and the CEQA Guidelines.

8) The Commission, in certifying the completion of said Final Subsequent Environmental Impact Report, hereby does find that the project described in the FSEIR, and the project proposed for adoption, consisting of the project described in the Project Description plus Variants 1, 2, 3A and 5, as described in the Project Description and Combination of Variants Chapters of the FSEIR, would have the following unavoidable significant environmental impacts, which could not be mitigated to a level of nonsignificance:

a. project and cumulative traffic intersection impacts, primarily affecting intersections at or near I-280 and I-80 in the South of Market area;

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b. contribution to cumulative bridge and bridge on-ramp impacts (lengthening of peak congestion);

c. project and cumulative regional air quality impacts from increased vehicular emissions (exceedance of BAAQMD significance thresholds for reactive organic gases and oxides of nitrogen, which are ozone precursors, and for particulate matter);

d. unknown, but potentially significant risks from toxic air contaminants from mobile sources, from individual stationary sources, from the combined risk due to emissions from multiple facilities, and from cumulative risks;

e. contribution to cumulative hazardous waste generation and disposal impacts.

f. cumulative water quality impacts (although the project's contribution to cumulative water quality impacts could be reduced to less than significant levels if mitigation measures are imposed).

I hereby certify that the foregoing Motion was ADOPTED by the City Planning Commission at its regular meeting of September 17, 1998.

Linda Avery
Commission Secretary

AYES: Commissioners Antenore, Chinchilla, Hills, Joe, Martin, Mills

NOES: None

ABSENT: Theoharis

ADOPTED: September 17, 1998

I. PREFACE

This is a Subsequent Environmental Impact Report (SEIR) for the newly proposed Mission Bay project in San Francisco (Planning Department File No. 96.771E; SFRA Case No. ER 919-97), as required by the California Environmental Quality Act (CEQA). A previous Environmental Impact Report (Planning Department File No. 86.505E, State Clearinghouse No. 86070113, certified August 23, 1990) (1990 FEIR) was prepared for a prior development program that was ultimately adopted as the Mission Bay Plan, an Area Plan of the *San Francisco General Plan*, with implementing zoning. Development under the Mission Bay Plan and zoning was never realized and a different development program is now proposed, covering a somewhat different area.

The new project would be implemented primarily through establishment of two Redevelopment Areas and adoption of two Redevelopment Plans for the 303-acre area. Whereas the previous plan for Mission Bay emphasized office and housing uses, with lesser amounts of commercial/light industrial, retail, and hotel space, the newly proposed plan emphasizes housing, commercial development (light industrial/research and development/ office), and educational/institutional uses (a major new University of California San Francisco site), with retail/entertainment and hotel space. Configuration of the proposed uses, open space/public facilities, and street pattern would also differ substantially from the previous plan. Chapter III presents the project description in detail, and Chapter IV addresses pertinent background information and presents the SEIR analysis approach.

Because the changes proposed for development of the Mission Bay area are substantial and could involve new or more severe significant environmental effects than those analyzed in the 1990 FEIR, this SEIR has been prepared pursuant to Public Resources Code Section 21166 and State CEQA Guidelines Section 15162, which discuss when a Subsequent EIR is necessary./1/ Information in the 1990 FEIR that is still accurate and relevant is incorporated by reference and summarized in this SEIR. This SEIR is intended to provide a clear understanding of the currently proposed project, its potential environmental impacts, possible mitigation measures, and other CEQA requirements, without the need for frequent reference to the original 1990 FEIR.

In addition, this SEIR is a "program" EIR pursuant to State CEQA Guidelines Section 15168, and a "redevelopment plan" EIR pursuant to CEQA Section 21090 and State CEQA Guidelines Section 15180. A program EIR is an EIR prepared for a series of actions that can be characterized as one large project, related, in this case, geographically; as logical parts in a chain of contemplated actions;

and in connection with issuance of rules, regulations, plans, and other general criteria to govern the conduct of a continuing program. Under CEQA, all public and private activities and undertakings pursuant to, or in furtherance of, a redevelopment plan shall be deemed to be a single project. A redevelopment plan EIR is, therefore, a program EIR.

This SEIR also discusses all the mitigation measures proposed in the 1990 FEIR and their current status or disposition. Many of the measures are no longer relevant, because changes in the project have avoided or changed the potential impact that led to the proposed mitigation, or because conditions have changed so that the mitigation measure is obsolete. Other mitigation measures may still be relevant but may or may not currently be proposed as part of the new project. Still other previously identified mitigation measures fall into the category of "improvement measures," measures that are not necessary to reduce or avoid significant impacts as defined by CEQA Section 21151(b) and State CEQA Guidelines Section 15382 but were listed in the 1990 FEIR as mitigation measures. These improvement measures should be considered as project enhancements that were intended to avoid less-than-significant effects. This SEIR complies with CEQA's mandate to identify significant impacts and mitigation measures and generally does not propose measures that address less-than-significant impacts. Decision-makers may consider improvement measures separately when considering approval of the proposed project.

This SEIR is organized as follows: following this Preface, Chapter II, Summary, briefly describes the project and its potential significant impacts, mitigation measures, alternatives, and areas of controversy. Chapter III, Project Description, presents the proposed development program, including implementation, and approval mechanisms and processes. Chapter III also identifies the project sponsors and their objectives.

The analyses and conclusions of this SEIR are presented in Chapters IV through IX. Chapter IV, Background and SEIR Study Approach, summarizes important technical and organizational features of the environmental analysis, and the relationship of the currently proposed project to the previously approved project. Chapter V describes the existing environmental setting and identifies the potential environmental impacts the project could cause, organized by topic. Chapter V also describes, where appropriate, the approach, assumptions, and methodology that were used to identify potential impacts. Chapter VI presents mitigation measures designed to reduce or eliminate the potential significant environmental impacts identified in Chapter V. Chapter VII presents and analyzes four variants to the project. Chapter VIII describes and analyzes three alternatives to the project, focusing on alternatives that could avoid or substantially lessen identified significant impacts. Chapter IX contains CEQA statutory discussions including a list of the significant, unmitigable impacts that could not be avoided if the project is implemented, and discusses any significant irreversible environmental changes that could result from the project.

Chapter X contains a list of SEIR preparers and those consulted in preparation of the SEIR, and Chapter XI contains the distribution list for the Draft SEIR. The Summary of Comments and Responses is presented in Chapter XII. Chapter XIII is an outline of the SEIR by chapter and section, and is followed by the Appendices for the SEIR.

NOTE: Preface

1. The California Resources Agency's guidelines for implementing CEQA are promulgated in the California Code of Regulations, Title 14, Sections 15000-15387, hereinafter referred to as the State CEQA Guidelines.

II. SUMMARY

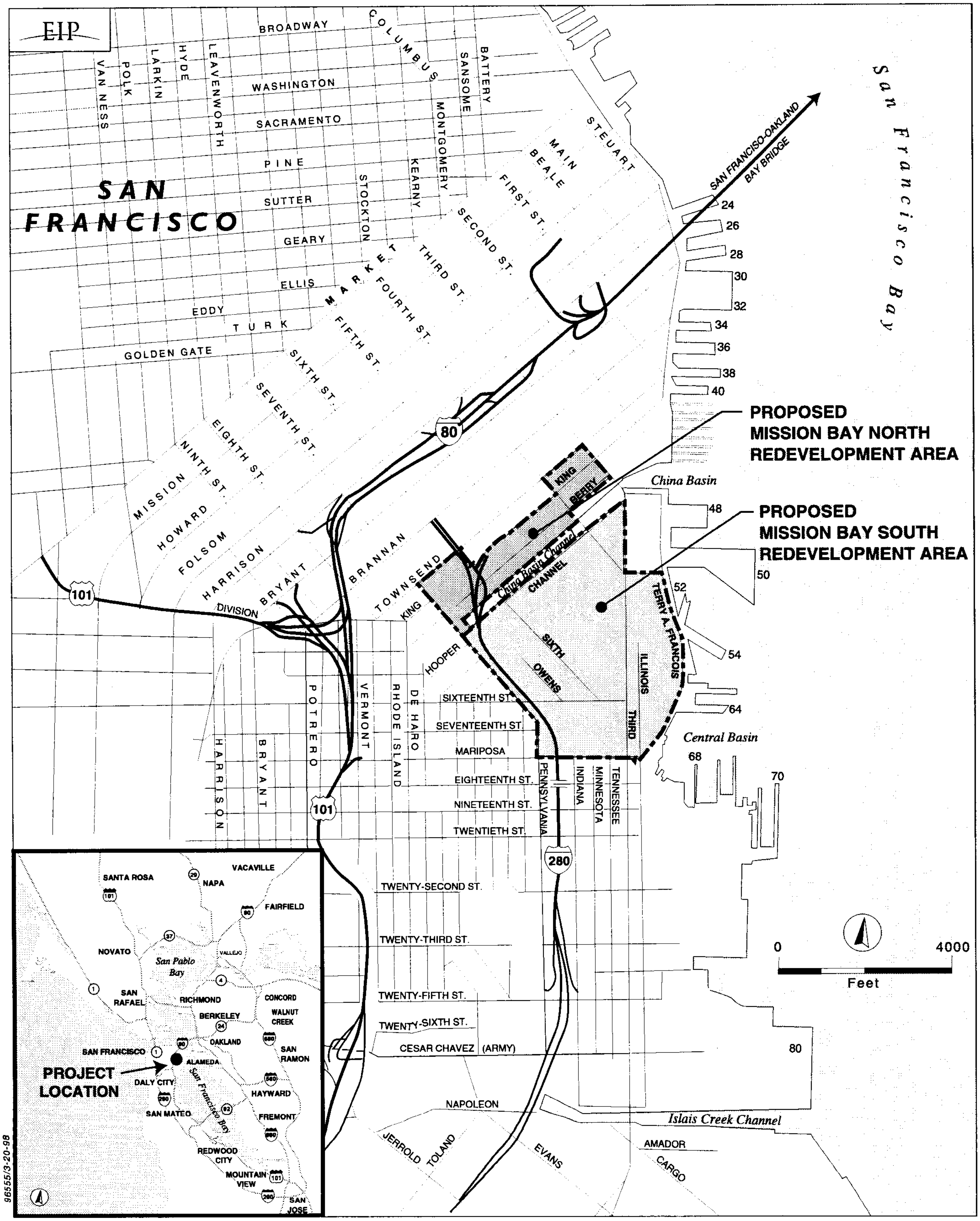
This Subsequent Environmental Impact Report (SEIR) evaluates the potential environmental effects of the newly proposed Mission Bay project in San Francisco. An Environmental Impact Report was prepared for a prior development program that was ultimately adopted in 1990 as the *Mission Bay Plan*, an Area Plan of the San Francisco General Plan, with implementing zoning. Development under the *Mission Bay Plan* and zoning was never realized and a different development program is now proposed.

A. PROJECT DESCRIPTION

PROJECT OVERVIEW

The proposed project consists of a new plan for the development of the Mission Bay Project Area (Project Area), which is approximately 303 acres in size and is located near the eastern shoreline of the City, about 1 mile south of the downtown financial district. The Project Area is generally south of Townsend Street, east of Seventh Street and Interstate 280, north of Mariposa Street, and west of Terry A. François Boulevard and Third Street, as shown in Figure II.1. The plan calls for mixed-use development, which would include about 1.5 million gross sq. ft. of retail space; a 43-acre new University of California San Francisco (UCSF) site containing 2.65 million gross sq. ft. of instruction, research, and support space, and a site to be donated for a public school; a mix of 5,557,000 gross sq. ft. of research and development, light manufacturing, and office space surrounding the UCSF site to its west, south, and east; a 500-room hotel between Third and Fourth Streets south of China Basin Channel; police and fire stations; off-street parking accessory to most uses and about 47 acres of open space (including 8 acres within the UCSF site). Approximately 6,090 residential units would be located on the north and south sides of China Basin Channel, including a mix of market-rate and affordable units, both for rental and for sale.

To implement the plan, two Redevelopment Plans would be adopted: Mission Bay North and Mission Bay South. The Redevelopment Areas would be divided by China Basin Channel. Development under each Plan would also be governed by its own Design for Development document, which would essentially constitute the specific land use controls and design standards. The *San Francisco General Plan*, the *Waterfront Land Use Plan*, and the San Francisco Planning Code and Zoning Map would be amended to conform with the proposed Redevelopment Plans; the *Mission Bay Plan,* Part II of the



SOURCE: EIP Associates

MISSION BAY SUBSEQUENT EIR

FIGURE II.1 PROJECT LOCATION

Central Waterfront Area Plan, would be rescinded. Numerous other approvals would be required by various City, regional and state agencies, as listed in Section III.C, Project Description, "Approvals Required."

Figure II.1 shows the location of the Mission Bay Project Area within San Francisco, and the boundaries of the proposed Mission Bay North Redevelopment Area (Mission Bay North) and Mission Bay South Redevelopment Area (Mission Bay South), which comprise the Project Area. The inset shows the location of Mission Bay within the Bay Area. See Table II.1 for a summary of project land uses. A map of the proposed land use development program by Redevelopment Plan land use designations is provided on the inside of the back cover of this document, and also in Figure III.B.3./1/

The project sponsors are the San Francisco Redevelopment Agency (Redevelopment Agency) and Catellus Development Corporation (Catellus). Catellus owns the majority of property within the Project Area, and is therefore a major participant in the proposed project. The public/private cooperative effort has several fundamental purposes, including: provision of substantial new housing, including affordable housing, and revitalization of the Project Area, which is currently industrial, commercial, or vacant, and is generally underutilized. Retaining and supporting the new UCSF site and biotechnology and other related development is also a primary objective. The project sponsors expect that the presence of the UCSF site with its research, instruction, and support activities would be attractive to firms involved in research and development activities, such as biotechnology firms.

The project would include expansion and/or improvement of infrastructure in the Project Area, including: a revised transportation network, new east-west streets, extension of Owens Street north and east to connect to Third Street, re-alignment and extension of Fourth Street south to Mariposa Street; expansion of the high- and low-pressure water systems; expansion of the combined sewer system and creation of a separated storm-only and sewage-only system for the central part of Mission Bay South; re-alignment of railroad tracks currently providing access to Pier 80; improvement of at-grade rail crossings connecting Seventh Street to the Project Area at Berry Street north of the Channel, and at North and South Common Streets south of the Channel; and a pedestrian bridge across the Channel. Caltrain tracks and the Channel Street Pump Station, at the southwestern end of China Basin Channel, would remain in place. Although not part of the planned project, the MUNI Third Street light rail extension would be located along Fourth and Third Streets with station platforms in the Third Street median at Mission Rock, South, and Mariposa Streets.

There are eight proposed height zones for the Project Area, which specify maximum building height by percentage of developable area (excluding ancillary mechanical devices and exhaust stacks on rooftops). Very generally, prevailing building heights would be about 65 to 90 or 120 feet tall, with

TABLE II.1
PROPOSED MISSION BAY DEVELOPMENT BY REDEVELOPMENT PLAN LAND USE DESIGNATIONS/a/

Land Use Designation	Mission Bay North Redevelopment Area	Mission Bay South Redevelopment Area	Grand Total/b/
Mission Bay Residential			
Dwelling Units/c/	1,920	3,090 /b/	5,010
Neighborhood-serving Retail (gross sq. ft.)	56,000	111,000	167,000
Mission Bay North Retail			
Entertainment-oriented Commercial (gross sq. ft.)	389,000	0	389,000
City-serving Retail (gross sq. ft.)	222,000	0	222,000
Dwelling Units /c/	1,080	0	1,080
Hotel			
Hotel (rooms)	0	500	500
Entertainment-oriented Commercial (gross sq. ft.)	0	56,000	56,000
UCSF Site/d/			
UCSF uses (gross sq. ft.)	0	2,650,000	2,650,000
City School Site (acres)	0	2.2	2.2
Open Space (acres)	0	8	8
Commercial Industrial			
Commercial Industrial (gross sq. ft.)	0	4,163,000	4,163,000
Neighborhood-serving Retail (gross sq. ft.)	0	58,400	58,400
Commercial Industrial / Retail			
Commercial Industrial (gross sq. ft.)		1,394,000	1,394,000
Neighborhood-serving Retail (gross sq. ft.)		31,600	31,600
City-serving Retail (gross sq. ft.)		23,000	23,000
Mission Bay South Retail			
City-serving Retail (gross sq. ft.)	0	560,000 /b/	560,000
Public Facilities (acres, excluding City school site)	1.5 /e/	1.5	3.0
Public Open Space (acres, excluding UCSF)	6	33	39

Notes:

a. The locations of the proposed land use designations are shown in Figure III.B.2 and on the inside of the back cover of this document. Parking is not included in the gross square feet totals given for each land use. Maximum parking requirements are outlined in this section under "Parking" and are discussed in Section V.E, Transportation.

b. The conceptual agreements between the City and Catellus do not cover portions of the proposed Redevelopment Areas not owned by Catellus. The components of the proposed development program summarized in the Grand Total that are not on land owned by Catellus consist of 90 dwelling units along Third Street, 310,000 gross sq. ft. of city-serving retail on the Castle Metals site, and 250,000 gross sq. ft. of city-serving retail on the Esprit site.

c. Of the approximately 3,000 dwelling units north of the Channel, 20% would be affordable units. Of the approximately 3,090 dwelling units south of the Channel, the Redevelopment Agency would select non-profit developers to build approximately 1,100 affordable units.

d. Refer to Table III.B.3 for details on the UCSF development program.

e. The existing Channel Pump Station, on 1.5 acres of city-owned land, is not proposed for development.

Source: Catellus Development Corporation and San Francisco Redevelopment Agency.

160-foot-tall buildings permitted in certain locations (see Figure III.B.5 and Table III.B.2 in Chapter III Project Description). Building heights would be more restricted adjacent to certain open spaces near the Bay and along the Channel.

Locations of new streets, intersection configurations, and similar aspects of the proposed street grid are described in "New Transportation Circulation Patterns in Mission Bay," in Section V.E, Transportation: Impacts. For additional detail, see "Proposed Streets in Project Area" in Appendix D. San Francisco Municipal Railway routes would be extended or altered to serve the area, as described in Section V.E, Transportation: Impacts and shown on Figure V.E.10. Bicycle and pedestrian routes would extend the existing routes in San Francisco, as described in Section V.E, Transportation: Impacts and shown on Figure V.E.9.

B. ENVIRONMENTAL TOPICS

PLANS, POLICIES, AND PERMITS

The Plans, Policies, and Permits section discusses adoption of the Redevelopment Plans and related documents for Mission Bay South and Mission Bay North and their relationship to existing plans and policies. It also discusses federal, state, regional, and local approvals and permits that would be required.

The Redevelopment Plans for Mission Bay North and Mission Bay South present a general land use plan. The plans contain general policy objectives for development in the Project Area, and provide for the proposed new University of California San Francisco site to be located within Mission Bay South. Associated with these plans are Design for Development documents which contain specific standards for potential development.

● To maintain consistency between the Redevelopment Plans and San Francisco's General Plan, the General Plan would be amended. The *1990 Mission Bay Plan* (Part II of the *Central Waterfront Area Plan)* would be rescinded and re-adopted as Mission Bay Guidelines for the parcels not covered by the Redevelopment Plans. Article 9 of the San Francisco Planning Code would be amended to apply to those parcels only.

The proposed project would include the construction of a new 43-acre site by UCSF, in the Mission Bay South Redevelopment Area. UCSF is constitutionally exempt from local planning and zoning controls whenever land under its control is used for educational purposes. However, UCSF has indicated it will cooperate with local governments to satisfy the mutual interests of local jurisdictions and UCSF.

There are a number of public agencies with some form of jurisdiction in the Project Area, in addition to the City, Port, and Redevelopment Agency. Included among these are the Bay Conservation and Development Commission (BCDC) which regulates land use within its jurisdiction as defined by the McAteer-Petris Act, the California Public Utilities Commission which approves new rail crossings and track removal, and the U.S. Coast Guard, which approves the bridging of navigable waterways and regulates the operation of drawbridges. These and other agencies are discussed in Section V.A, Plans, Policies, and Permits.

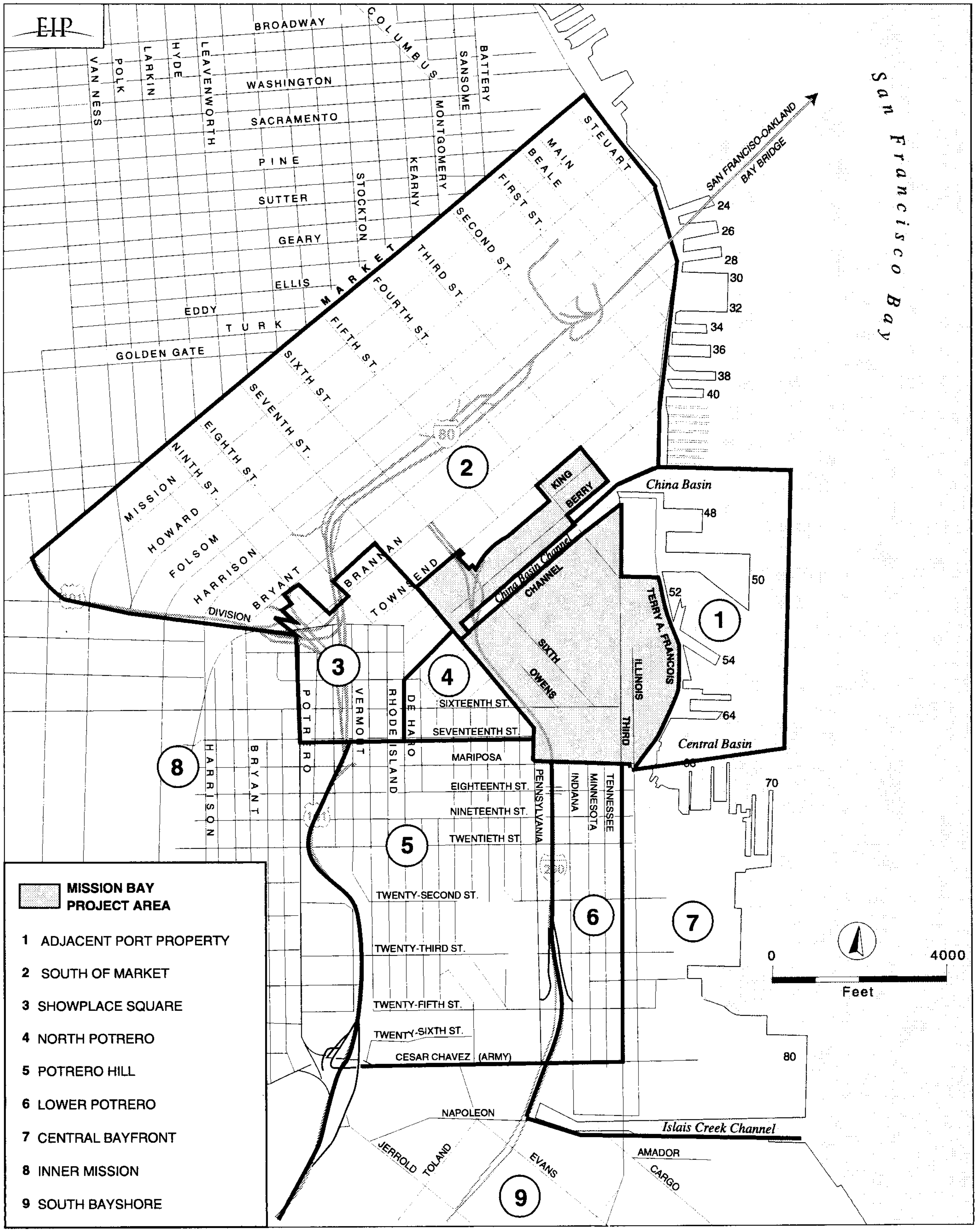
LAND USE

The land use section addresses land use compatibilities of project development both within the Project Area and for Nearby Areas (see Figure II.2). Through the course of project development, most existing buildings, primarily low-rise, warehouse or light industrial structures, would eventually be demolished. The Project Area would change from an underdeveloped industrial area with large swaths of vacant land, to a fully developed mixed use urban area, with about 30,000 employees and about 11,000 residents. The project would continue the trend that characterizes existing redevelopment areas to the north and northeast by redeveloping former industrial areas into residential and commercial neighborhoods. No significant impacts on land use from the project were identified; therefore, no mitigation measures have been identified.

BUSINESS ACTIVITY, EMPLOYMENT, HOUSING, AND POPULATION

This section describes the project's implications for business activity, employment, housing, and jobs in the Project Area, and identifies the effects on citywide and regional employment and development patterns. The impact analysis addresses changes in business activity, employment, housing, and population within the Project Area and San Francisco; San Francisco's jobs-housing balance; citywide housing market conditions; and development patterns and market conditions in Nearby Areas. These Nearby Areas include Adjacent Port Property; South of Market; Potrero Hill, North Potrero, and Showplace Square; Lower Potrero, Central Bayfront; Inner Mission; and South Bayshore.

The project would have no significant environmental effects on business activity, employment, housing, and population; therefore, no mitigation measures would be required. Impacts related to the activities of the new residents or employees, such as impacts on community facilities or the transportation system, are considered secondary physical effects under CEQA and are addressed in the corresponding sections of this SEIR.



SOURCE: EIP Associates

MISSION BAY SUBSEQUENT EIR

FIGURE II.2 NEARBY AREAS

VISUAL QUALITY AND URBAN DESIGN (INCLUDING ARCHITECTURAL RESOURCES)

This section addresses the effects on visual quality, architectural resources, light and glare and urban design. Please refer to Appendix A, Initial Study, for discussion of pedestrian-level winds, shadows, and potential impacts on archaeological resources.

The Redevelopment Plan documents would include urban design standards and guidelines. They would establish major public open space corridors along China Basin Channel, the San Francisco Bay waterfront, and a new east-west linear park (The Common). They would limit building heights adjacent to open space areas near the Bay, and limit heights at the edge of the Project Area in the broad areas flanking the Channel. The Redevelopment Plan documents would establish height limits that are higher than existing limits throughout the Project Area, particularly near the Giants Ballpark, and generally direct the tallest buildings (160 feet tall) to be built along King, Third, Owens, and 16th Streets. This overall design approach would yield a high-density, urban streetscape. Proposed Redevelopment Plan land use controls would be used in conjunction with the proposed standards and guidelines to control the ultimate build-out and development of the Project Area.

Overall, views of the Project Area would change from a largely undeveloped, low-scale industrial area to a densely built urban environment, resulting in an overall change in visual character and scale of the area. Figure V.D.3 shows that most of the Project Area is visible from the residential area on Potrero Hill. Figure V.D.4 illustrates what the Project Area could look like after build-out. New development would reach up to 160 feet in height and would obstruct views from some locations of certain visual features, such as the downtown skyline, the Bay, the Bay Bridge, and the East Bay hills. Views most affected by the proposed development of Mission Bay would be from portions of Potrero Hill and I-280. Long-distance gateway views from viewpoints on I-280 (see Figure V.D.5), and views of some regional visual resources from some Potrero Hill locations would be greatly reduced or eliminated. The visual changes would not be considered significant because important views from public areas would not be substantially degraded or obstructed.

Closed Fire Station No. 30, the only notable architectural resource in the Mission Bay Project Area, would either be rehabilitated for use as a fire or police station or would be demolished. Since Fire Station No. 30 is considered potentially eligible for the National Register of Historic Places, demolition of the building or alterations that would preclude its eligibility would constitute a significant impact.

The project would have no significant visual impacts; therefore, no visual quality mitigation measures are identified. Regarding Fire Station No. 30, the proposed mitigation measure is to retain, rehabilitate, and reuse the fire station. If the fire station were demolished, a partial mitigation would be to prepare a "Historical American Building Survey" recording of the structure through measurements, drawings, and photographs.

TRANSPORTATION

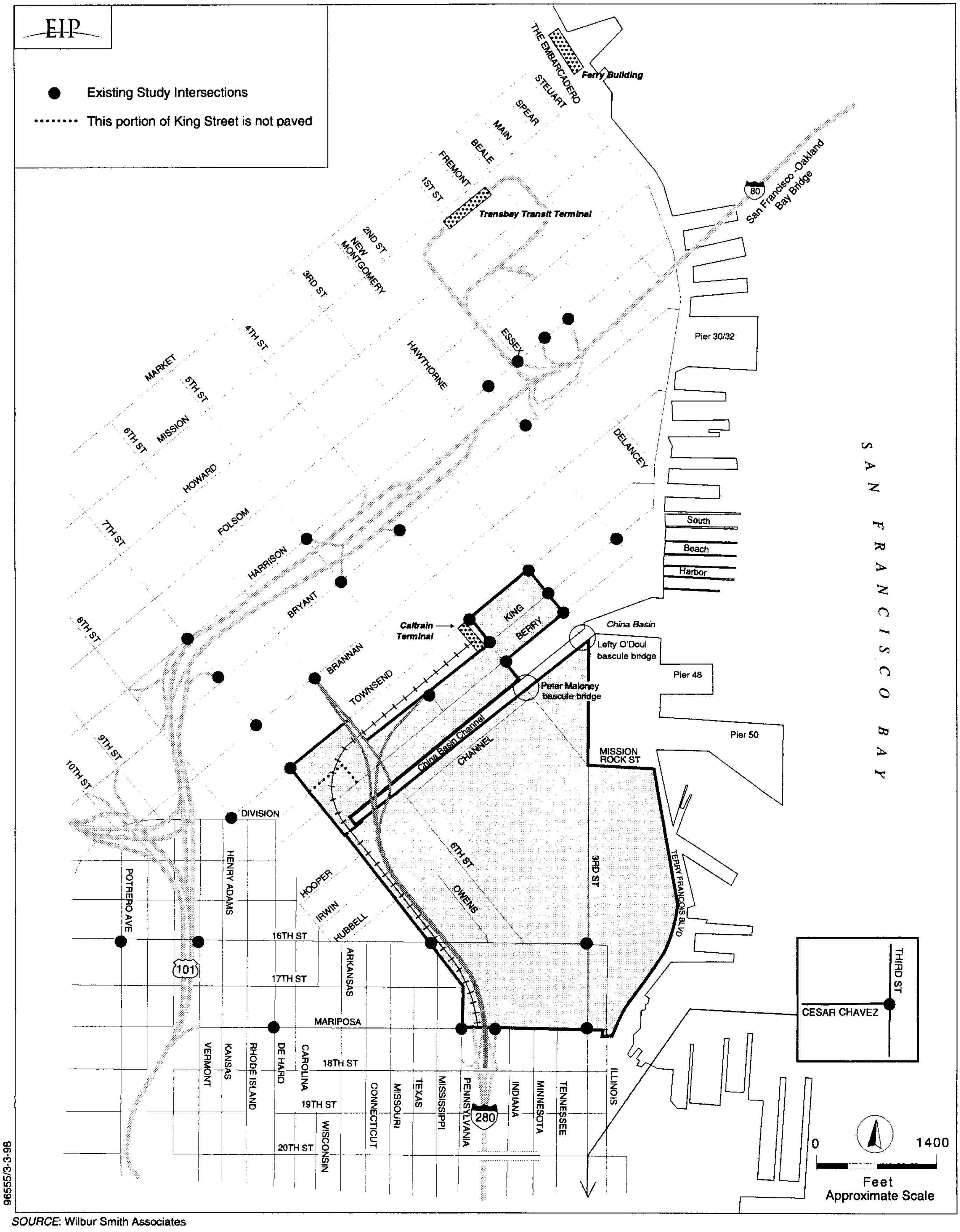
The transportation section analyzes the effects of the project in the context of the existing transportation conditions, and also places the project in its future context in an analysis of 2015 cumulative conditions. The assumptions used to prepare the 2015 cumulative analysis are based on an economic forecast of population and employment growth for the City as part of growth in the Bay Area region. This SEIR conservatively assumes that the project would be completely built out by 2015.

The transportation analysis considers proposed changes to the existing circulation patterns in the Project Area, including new streets (see Figure III.B.3 for the proposed street pattern); intersection reconfigurations, new traffic signals, and new bicycle routes. The analysis assumes that additional, planned San Francisco Municipal Railway transit service would be available.

Traffic

Traffic to and from the Mission Bay Project Area would add to existing congestion on freeways and bridges crossing boundaries between San Francisco and adjacent counties (these locations are regional analysis "screenlines" used to analyze effects on regional traffic conditions). Project traffic alone would not cause regional screenlines to exceed theoretical capacities when added to existing conditions; however, most would operate at or above 95% of their capacity during the afternoon peak hour (4:30 to 5:30 p.m.). Cumulative traffic in 2015, including that from the Project Area, would add more vehicles to the freeway system at the screenlines than could be handled during the peak hour, resulting in an expansion of the peak period from about 2½ hours under existing conditions to an estimated 3 hours with project traffic alone, and to substantially more than 3 hours with project and cumulative growth by 2015, a significant effect.

Intersections in and near the Project Area, including those leading to nearby freeway ramps, would be congested in the future with project and future cumulative traffic in 2015. A total of 41 intersections were analyzed, representative of those that are already congested and those that would be most affected by project traffic in the afternoon peak hour (see Figure II.3). Of these, Brannan at Seventh Street, Townsend at Seventh Street, and Townsend at Eighth Street would decline from existing level of service (LOS) D or better to LOS E or F as a result of project traffic alone, causing unacceptable



SOURCE: Wilbur Smith Associates

MISSION BAY SUBSEQUENT EIR

FIGURE II.3 TRANSPORTATION STUDY AREA: EXISTING

delays that are considered significant impacts. All three intersections could be mitigated to LOS D or better. Other intersections already operating at LOS E or F, especially those near freeway ramps, would continue to operate at unacceptable levels; project traffic alone would extend the time that they operate below LOS D. Some intersections may improve compared to existing conditions because of improvements such as signal timing changes, or reconfigurations such as a new signal proposed for Mariposa Street at the I-280 southbound on-ramp.

Cumulative traffic in 2015, including traffic from the project, would cause significant impacts because six additional intersections would decline from LOS D or better to LOS E or F: King at Third Street, Townsend at Third Street, Berry at Seventh Street, and Potrero Avenue at 16th Street would decline from LOS D to F; North Common Street and South Common Street at Seventh Street would decline from LOS D with the project to LOS E under cumulative conditions; and King at Fourth Street would decline from LOS C to E. Townsend at Eighth Street, and Brannan at Seventh Street would decline from LOS E to LOS F in 2015 under cumulative conditions. The project would contribute about 10% to 20% or more to total traffic volumes at many already congested intersections, causing significant traffic impacts. Mitigation measures could reduce but would not eliminate these impacts because the capacity of the Bay Bridge and the freeway approaches to the bridge determines the ability of ramps and adjacent intersections to move traffic.

When weekday afternoon events are scheduled at the Giants Ballpark, under construction across Third Street from Mission Bay North, traffic congestion would be substantially increased during the hour before the p.m. peak hour (3:30 to 4:30 p.m.), especially if the ballgame or event had high attendance, and the event ended at about 3:30 p.m., as is planned. The ballpark traffic would coincide with some early commute traffic already on the streets and freeways in advance of the p.m. peak and would lengthen the period of peak congestion on nearby freeways, access ramps, and streets.

- **Transit**

Regional transit use in 2015 with cumulative growth, including the project, would increase demand on all carriers. Some transit agencies, such as Caltrain and BART, plan to add service during this time. All regional carriers could accommodate future project and cumulative demand with currently projected service levels, except for AC Transit. An increase in cumulative passenger trips on AC Transit buses in the p.m. peak hour, including passengers from the Project Area, would increase the current load factor to beyond capacity on some routes. The project would contribute over 5% of the increased demand, and would contribute to this significant cumulative impact.

The analysis of project and cumulative effects on the San Francisco Municipal Railway (MUNI) divides the City into four quadrants: northeast, northwest, southeast, and southwest. Impacts on MUNI are assessed by corridor as MUNI lines leading to each of the four quadrants cross imaginary screenlines. The extension of MUNI Metro light rail service on Third Street from Market Street and The Embarcadero to the Bayview-Hunters Point neighborhood is planned to be in operation in 2003, and is assumed to be in place in 2015 (see Figure V.E.10).

The addition of project ridership to MUNI lines would increase ridership at all four screenlines. The southwest screenline would become the most crowded, increasing from 73% to 77% of its capacity with project riders. The southeast screenline would experience the most growth, from 63% to 77% of capacity with project passengers alone.

Cumulative growth in MUNI use by 2015, including that from the project, would cause transit lines crossing the northeast screenline to exceed capacity (112%) and buses in the Kearny/Stockton corridor (lines 30, 30X, and 30/45) to operate at 123% of capacity during the p.m. peak hour. Because 100% capacity already assumes considerable numbers of standees, these increases would mean crush loads on many transit vehicles. The southwest screenline would operate at close to capacity (96%) and the southeast screenline would have some capacity available (89% of capacity). MUNI service in the immediate vicinity of the Project Area would operate below capacity on the trolleybus routes, but would exceed capacity on the northbound Metro service (112%). The project would contribute about 65% of the trips in this direction, and would result in a significant impact on the transit system.

Parking

The parking demand analysis was based on estimated auto traffic, vehicle occupancy rates for various types of uses, and typical parking turnover rates. For the Project Area as a whole, parking demand would exceed the expected off-street supply by about 4,700 spaces. On-street parking could reduce the parking deficit by about 1,200 spaces, mainly in Mission Bay South, but some drivers may seek parking in nearby areas such as Potrero Hill west of the Project Area and Lower Potrero south of the Project Area.

Parking demand for the ballpark would exceed the expected supply for weekday afternoon, weeknight, and weekend sold-out events. Therefore, when these events were scheduled, residents, visitors, and employees in the Project Area arriving in the midday or late afternoon could find parking difficult unless they have already-reserved parking. About 80 baseball games are typically scheduled during the baseball season, and not all would be expected to sell out, so competition for parking spaces would not occur on a daily basis; however, it is not known how many other special events might be scheduled at the ballpark nor whether these events might be large enough to contribute to parking demand beyond that expected to be available for ballpark patrons. Surface parking for the ballpark is proposed to be available in the Project Area for an interim period, until at least 2005.

Pedestrians and Bicycles

Pedestrian trips would include those who walk to and from various land uses in the Project Area and those who walk to transit stops. The area around the Caltrain terminal was considered to be the most congested pedestrian location near the Project Area. Therefore, the crosswalks at Fourth and King Streets were analyzed to provide a representative discussion of pedestrian effects. Crosswalks at this intersection would continue to operate at acceptable levels with project plus cumulative pedestrian volumes. If a pedestrian bridge over the Channel were provided at Fifth Street, pedestrian volumes at Fourth and King Streets would be reduced.

New bicycle routes would be provided in the Project Area to accommodate bicycle use. Fourth Street would include a 15-foot-wide curb lane and would be signed as a bicycle route. Sixteenth Street would include Class II bicycle lanes, extending existing citywide commuter bicycle routes. North Common Street and South Common Street would provide an additional east/west bike route through the Project Area. Bicycle lanes are proposed in Terry A. François Boulevard along the Bay shore. A recreational bike trail would be included along the proposed open space on the south side of the Channel.

Phasing of New Transportation Facilities

The project includes construction of new streets, widening of some existing streets, modification of existing traffic signals and installation of new signals, and extension of existing MUNI 22 and 30/45 trolleybus lines into the Project Area. As part of the review process for each development phase, the number of p.m. peak hour vehicle trips generated by the phase would be estimated using trip rates established in the SEIR. This number would determine which project features and mitigation measures would need to be implemented as part of that development phase. If these transportation facilities were not developed at appropriate points during build-out of the project, temporary transportation impacts could occur because growth in traffic and in demand for transit could exceed the capacity of available facilities. Installation of most of the circulation and transportation facilities would be triggered by approval and construction of adjacent buildings. For major improvements such as extending Fourth Street and Owens Street, and installation of rail crossings at Berry and Seventh Streets and at Common Street and Seventh Street, triggers would be established calling for completion of these improvements based on expected p.m. peak hour vehicle trips from development phases.

Rail Freight Operations

The proposed project would relocate existing freight rail tracks near 16th Street to follow the 16th Street, Terry A. François Boulevard and Illinois Street alignments, connecting with existing Illinois Street tracks south of the Project Area. With this relocation, existing rail freight service to Piers 80 and 92-96 would remain available.

Construction Transportation Effects

Construction of buildings in the Project Area would occur in phases. Construction traffic would be generated during all phases of construction. The typical work shift for most construction workers would be from 7:00 a.m. to about 3:30 p.m. Therefore, construction worker vehicles would be part of the early commute traffic occurring before the 4:30 p.m. to 5:30 p.m. afternoon peak.

Various sidewalks and parking lanes could be closed adjacent to construction sites; any closed traffic lanes would re-open by about 4:00 p.m. for afternoon commute traffic. Construction of the San Francisco Giants' ballpark at China Basin and of the Third Street Light Rail project along Third and Fourth Streets adjacent to and in the Project Area would occur at the same time that some construction activities would be expected within Mission Bay, resulting in temporary cumulative construction traffic effects.

Mitigation Measures

The transportation mitigation measures list a number of traffic- and transit-related features included in the project and assumed in the impacts analysis. These measures include improvements, such as new signals or new signal timing, and lane reconfigurations to add through and turn lanes, for 20 intersections in the Project Area; constructing, widening and restriping of 6 street segments in the Project Area; and rerouting the 22-Fillmore and 30-Stockton or 30/45-Stockton/Union MUNI lines into Mission Bay South.

Additional mitigation measures identified in this SEIR include improving 10 additional intersections in and near the Project Area to improve levels of service to LOS D or better; improving 4 street segments in the Project Area related to the intersection mitigation measures; extending the N-Judah MUNI Metro line to Mariposa Street on the new Third Street light rail line to reduce impacts of Project Area and cumulative demand for local transit service, and encouraging the Metropolitan Transportation Commission and AC Transit to expand bus service to the East Bay to serve Project

Area and cumulative demand; and increasing Bay Bridge tolls for single-occupant vehicles to discourage non-carpool traffic.

Transportation System Management measures identified in this SEIR include providing for a Mission Bay Transportation Management Association that would prepare a Transportation System Management Plan. This measure lists a variety of activities that could be included in this plan that tend to reduce vehicle miles traveled and encourage transit use, such as selling transit passes in neighborhood stores and providing secure bicycle parking. Constraining the parking supply on the UCSF site, participating in studies to expand ferry service nearby, and providing for flexible work time for employees in the Project Area would also help to reduce traffic congestion.

Street and intersection improvements would be provided as adjacent development is constructed. In some cases intersections could reach congested conditions before adjacent development has occurred. To avoid this congestion, appropriate thresholds for providing the various intersection and street segment improvements, based on numbers of p.m. peak hour vehicle trips from development in the Project Area. During review of each development phase, the number of p.m. peak hour vehicle trips that would be generated by that phase would be estimated and added to the project's total calculated number of p.m. peak hour trips already generated by developed portions of the Project Area, to determine whether new project features and mitigation measures would be needed in addition to those included based on adjacency.

If all mitigation measures listed in the transportation mitigation section were implemented, project and cumulative traffic would contribute to significant impacts at intersections at or near freeway ramps and on the Bay Bridge and its approaches during the afternoon peak period.

AIR QUALITY

This section discusses the proposed project's contribution to regional "criteria" pollutant emissions, local carbon monoxide concentrations, and toxic air contaminant emissions. The Project Area is located in the Bay Area Air Basin which is regulated by the Bay Area Air Quality Management District (BAAQMD).

Criteria Air Pollutants

"Criteria air pollutants" include ground-level ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), small-diameter particulate matter (PM_{10}),/2/ and lead. Emissions of volatile organic compounds and nitrogen oxides, which are precursors to ozone, would contribute to continuing occasional violations of the ozone standard in the Bay Area. Motor vehicle exhaust emissions would be the primary source of air pollutants in Mission Bay. According to regional air quality modeling results, emissions associated with the maximum development anticipated in the Mission Bay Project Area in 2015 would exceed significance thresholds established by the BAAQMD for reactive organic compounds, nitrogen dioxide, and particulate matter. Although measures to reduce traffic trips could reduce this impact, due to the magnitude of the projected emissions and the limited effectiveness of such measures, these emissions would be an unavoidable significant impact.

Emissions of criteria pollutants from proposed stationary sources, such as boilers, chillers, emergency generators, and possibly a UCSF cogeneration plant, would be subject to the BAAQMD's New Source Review rule and would be mitigated to a less-than-significant level.

Motor vehicles generate carbon monoxide, which tends to build up at congested intersections and along congested streets and highways. Local carbon monoxide levels were estimated for worst-case exposures of receptors at 13 representative intersections in the Project Area, based on existing and projected traffic data. Under existing traffic conditions, several intersections likely exceed federal and state standards. By 2015, more stringent vehicle emission standards would be in force, and no exceedances of state or federal standards would be likely for cumulative traffic conditions, including the project.

Demolition and construction activities may generate particulate matter emissions. Implementation of BAAQMD recommendations for dust control should reduce PM_{10} emissions below significant levels.

Toxic Air Contaminants

Toxic air contaminants refer to a category of air pollutants that pose a present or potential hazard to human health, but which have more localized impacts than the criteria pollutants. The proposed project's stationary sources (such as research and development facilities) and mobile sources (such as motor vehicles) would emit toxic air contaminants.

A variety of regulatory mechanisms would govern the construction and operation of facilities emitting toxic air contaminants in the Project Area. The BAAQMD routinely reviews the potential health risks from toxic air contaminants for all projects requiring a permit from the BAAQMD. In addition, state law provides a mechanism for cities and counties to identify to BAAQMD projects that may emit toxic air contaminants. If toxic air contaminant emissions could be above certain "trigger levels," the BAAQMD performs a screening-level risk assessment, and may require a permit and toxic air contaminant controls. It is BAAQMD policy to deny a permit to any proposed facility that would cause an estimated increased cancer risk above 10-in-1-million to the maximally exposed individual, or an acute or chronic non-cancer risk above certain thresholds (calculated with control technology installed). Through these mechanisms, the risks from individual facilities are likely to be less than significant. In addition, UCSF intends to limit toxic air contaminant emissions from stationary sources located at the UCSF site as a whole to less than BAAQMD project significance thresholds.

In addition, state law requires consideration of health and safety risks through the school site selection process. Also, BAAQMD may require a facility that emits toxic air contaminants to submit updated emissions estimates under the state Air Toxics "Hot Spots" Information and Assessment Act when a sensitive receptor, such as a school or child care center, locates within 1,640 feet of the facility.

In the absence of specific data on proposed facilities that could locate in the Project Area, the adequacy of distances between potential sources of toxic air contaminant emissions within the Project Area and sensitive receptors cannot be assumed. The existing regulatory mechanisms to protect sensitive receptors suggest that adequate safeguards likely exist to address toxic air contaminant concentrations from individual facilities.

On the other hand, there are no adopted or regulatory standards of significance for combined risks from toxic air contaminants from multiple facilities. Because the specific types and locations of future facilities in the Project Area that could emit toxic air contaminants are unknown, combined toxic air contaminant concentrations from multiple facilities within the Project Area cannot be modeled. Without the ability to predict future toxic air contaminant concentrations, and in the absence of specific standards of significance for risks from toxic air contaminants from multiple facilities, the significance of this potential impact cannot be determined with certainty, and therefore the impact is considered potentially significant.

Mitigation Measures

Mitigation measures to reduce vehicle trips (see the Transportation section) would also reduce regional traffic-related criteria air pollutant effects, but these measures would not reduce the air quality impacts to a less-than-significant level. Construction-related particulate matter impacts would be mitigated to a less-than-significant level by BAAQMD-recommended mitigation measures, such as watering and sweeping all construction areas.

Mitigation measures to reduce risks from toxic air contaminants include ensuring that, prior to issuing a certificate of occupancy for a facility that may emit toxic air contaminants, the facility obtain written verification from BAAQMD of meeting the requirements for a permit from BAAQMD, if required by law, or that permit requirements do not apply to the facility. Additional mitigation measures include a meteorological station to gather data useful for risk assessments and prohibiting dry cleaning facilities that conduct on-site dry cleaning operations in residential areas. Finally, pre-school and child care centers would be required to notify BAAQMD and the San Francisco Department of Public Health regarding the locations of their operations, and to consult with these agencies regarding existing and possible future stationary and mobile sources of toxic air contaminants. Nevertheless, based on available information, it is not possible to conclude that these above mitigation measures would reduce the potential impact of toxic air contaminants to a less-than-significant level.

NOISE AND VIBRATION

This section discusses the existing and future noise environments in Mission Bay, and the impacts of noise from expected traffic volume increases in and near the Project Area. The section also discusses vibration effects from transportation sources in the Project Area.

Noise

Traffic Noise

Project-related traffic would cause increases in noise levels of less than 3 decibels at the two residential receptors studied and at a noise-sensitive location, Saint Gregory's Episcopal Church, located at Mariposa and De Haro Streets. Increases below 3 decibels generally are not perceptible to most people outside of a testing laboratory, and therefore would not create a significant impact. The highest 24-hour traffic noise increase of the four other study locations modeled would be about 5.2 dBA L_{dn} at the intersection of The Common Street Circle and Owens Street, with project traffic. This increase would occur gradually over 15 to 20 years and would generally not be noticed by most people.

The cumulative-plus project traffic noise effects would be similar to those described for existing-plus-project conditions.

Other Noise Sources

Based on the analysis prepared for the Giants Ballpark FEIR, traffic from a high-attendance event at the ballpark would cause noise increases of about 1.8 dBA L_{dn} at locations near the ballpark in the Project Area; this increase would not be noticeable to most occupants of new buildings in the Project

Area. Noise associated with special amplified music events would be noticed by residents in much of the Project Area but would not be considered a significant impact because large amplified music events would be limited to three per year, with mitigation measures imposed requiring noise limits on any additional amplified music concerts.

While noise from Caltrain passenger trains would be noticeable to new residents along the track alignment in Mission Bay North, noise levels would not be considered a significant impact. Freight rail tracks in 16th Street would not be close enough to new residential uses in the Project Area for train noise to be noticeable to residents (unless the train whistle were to be used) and would therefore also create a less-than-significant impact.

Construction noise, with the exception of pile driving, would have a short-term effect at each building location and therefore would not be considered a significant impact; pile-driving noise would be exceptionally loud and noticeable throughout the Project Area during build-out and would create a significant noise impact, mitigated to a less-than-significant level by a mitigation measure identified in this SEIR.

Vibration

Caltrain passenger trains could cause vibration effects at proposed residential uses in the block west of Sixth Street and north of Berry Street in Mission Bay North, as levels might exceed the Federal Transit Authority vibration impact criterion of 72 VdB. A mitigation measure would reduce this potential effect to a less-than-significant level. Residences in other parts of the Project Area, and Commercial Industrial uses in Mission Bay South would not be expected to experience substantial vibration effects due to the increased distance from the vibration source. The freight trains that may run on relocated tracks in 16th Street would not create a significant vibration impact.

Pile driving is potentially the greatest source of vibration from construction activities in the Project Area. Inside some buildings within the Project Area, vibration may disturb sensitive research instruments, depending on the proximity of pile driving activities; it is assumed that equipment installation would include vibration-isolation features. Therefore, construction vibration would not cause significant effects.

Mitigation Measures

The project would have no significant traffic-noise impacts; therefore, no mitigation measures would be required for traffic-related noise. Construction pile driving noise is addressed by a mitigation measure to reduce the impact to a less-than-significant level. The effects of Caltrain vibration on proposed residential uses also would be reduced to a less-than-significant level by a mitigation measure.

SEISMICITY

The Seismicity section addresses fault activity within the San Andreas fault system; the geo-seismic characteristics of the Project Area; seismic hazards including groundshaking, liquefaction, and earthquake-induced settlement; and the effects of tsunami and seiches on the Project Area. This section also discusses the regulatory environment in which the project would be constructed; the potential effects of population concentration in a seismically hazardous area; and the measures included in the project to reduce or eliminate those risks.

The Mission Bay Project Area is underlain by as much as 45 feet of fill, 10 to 70 feet of Bay Mud, 1 to 30 feet of alluvium, and 1 to 40 feet of Old Bay Clay, which overlie Franciscan bedrock. The groundwater table is between 1 and 18 feet below the ground surface.

The Project Area is not in an Alquist-Priolo Earthquake Fault Zone, but is in a Seismic Hazards Zone for Liquefaction, and an area subject to tsunami inundation hazards as defined in the City's Community Safety Element. The Project Area is susceptible to earthquake-related groundshaking that would be strong enough to damage buildings and infrastructure, and possibly result in injury or loss of life.

The San Francisco Building Code would require seismically resistant construction in the Project Area to reduce injury and loss of life during earthquakes. Piles would be driven to depths between 30 and about 200 feet to support major structures and reduce the effects of groundshaking and liquefaction. The likelihood of tsunami inundation is very slight.

Mitigation Measures

To address emergency preparedness and emergency response effects in the Project Area, the SEIR recommends formulation of a comprehensive emergency response plan for the entire Project Area, construction of a new fire station, and assurance of adequate east-west emergency access routes south of the Channel. With implementation of mitigation measures, project effects could be reduced to a less-than-significant level.

HEALTH AND SAFETY

This section discusses proposed project-related activities that would involve the use, storage, and disposal of hazardous materials. The project would involve greater hazardous materials use than currently exists within the Project Area, and it would involve a wider range of materials, including potentially hazardous chemicals, radioactive materials, and biological materials.

Businesses that would use substantial quantities of hazardous materials would be sited primarily within the Commercial Industrial and Commercial Industrial/Retail portions of the Project Area. The new UCSF site would also involve hazardous materials use. Legal and regulatory requirements applicable to hazardous materials operations would require businesses locating in the Project Area to meet a range of health and safety planning standards and regulatory agency oversight. The implementation of these legally required health and safety measures would adequately address most common health and safety issues.

Laws and regulations do not address certain health and safety concerns related to the use of biohazardous materials (e.g., infectious agents). Following the guidelines set forth in *Biosafety in Microbiological and Biomedical Laboratories*, *Guidelines for Research Involving Recombinant DNA Molecules (NIH Guidelines)*, and *Guide for the Care and Use of Laboratory Animals* has become common industry practice./3/ Because some UCSF research is funded by the federal government, UCSF is required to adhere to these guidelines and has adopted them as a matter of policy./4/ Unless project-related businesses are required to follow these guidelines, the project-related use of biohazardous materials and research animals could pose unacceptable health and safety hazards.

The analysis of biohazardous materials impacts assumes that project occupants would not handle any biohazardous materials considered dangerous or exotic, and posing high risks of life-threatening disease, aerosol-transmitted infection, or unknown risks of transmission. Nevertheless, some project occupants could handle indigenous or exotic agents capable of causing diseases with serious or lethal consequences. In some cases, the potential for aerosol transmission could exist, but the guidelines cited above allow for discretion in determining how to manage air exhausted to the outdoors from areas where these activities take place. As a mitigation measure, filtering exhausts for Biosafety Level 3 laboratories or equivalent measures may be necessary to avoid substantial health risks to individuals in the vicinity of the exhaust.

Regarding potential safety concerns related to possible hazardous materials accidents, such as toxic releases or explosions, Risk Management Plan requirements under state and federal law seek to minimize potential risks./5/ Implementing necessary design or operational measures in accordance with required Risk Management Plans would reduce the probability and consequences of potential accidents that could pose potential risks to neighboring residents, schools or other off-site receptors to a less-than-significant level.

Residents and businesses generate hazardous waste. San Francisco currently provides programs to help San Francisco households and businesses that generate little hazardous waste to manage their wastes properly. Businesses that generate greater quantities of hazardous waste must treat, recycle, or dispose of their hazardous wastes in accordance with applicable laws and regulations. Nevertheless, hazardous waste disposal poses some long-term environmental consequences, so waste reduction requirements apply. The project would contribute to cumulative environmental problems related to hazardous waste disposal, although these effects would often occur primarily at locations distant from the Project Area. UCSF intends to implement hazardous waste handling, minimization, and disposal measures at Mission Bay consistent with safety requirements and applicable laws and regulations./6/ San Francisco would further encourage waste reduction by overseeing state-mandated hazardous waste minimization requirements.

Mitigation Measures

To minimize the risks of using biohazardous materials, businesses conducting biological research that do not receive federal funds would be required to certify that they follow the guidelines discussed above, do not use materials requiring Biosafety Level 4 containment, and would install controls on certain exhaust stacks, as necessary. Measures to protect health and safety in the event of a major earthquake or other catastrophe are discussed in "Seismicity."

Mitigation measures would reduce project effects to a less-than-significant level, except that contribution to cumulative hazardous waste generation and disposal impacts would be an unavoidable significant impact.

CONTAMINATED SOIL AND GROUNDWATER

Since preparation of the 1990 FEIR, two types of investigations have been carried out in the Project Area: specific studies of individual locations and an investigation of the entire Project Area that was performed in 1997 for Catellus by ENVIRON International Corporation (ENVIRON).

Existing Conditions

The 1997 ENVIRON investigation detected chemicals of various types and concentrations in the soil and groundwater throughout the Mission Bay Project Area. The investigation found no defined pattern of detections that indicated specific individual sources of contamination, except in one location. In the vicinity of Illinois and 16th Streets, petroleum hydrocarbons were found in soil, in groundwater, and floating on groundwater (the latter is called "petroleum free product" or "free product"). Potential effects on near-shore aquatic organisms associated with the free product are being investigated and if necessary will be remediated by oil companies responsible for the contamination. The Regional Water Quality Control Board (RWQCB) will oversee the investigation and remediation, which will proceed independent of the project. As of April 1998, no state or local regulatory agency has indicated that current conditions require remediation in other Project Area locations.

Concentrations of contaminants in soil or groundwater do not present a human health or ecological risk under existing conditions, with the exception of the petroleum free product area. Releases associated with the former petroleum facilities will be further investigated and remediated as necessary regardless of whether the proposed project is approved.

Potential Effects of the Proposed Project

Project Development

The proposed development of the Project Area could result in potential exposure of residents, employees and visitors in the area to chemicals in soil or groundwater that could be released during construction. Some sites in the Project Area containing chemicals in the soil and/or groundwater would remain vacant and could be a source of exposed soils during part or most of the approximately 20-year development period. Construction activities involving the disturbance of contaminated soil or groundwater would affect an increasingly greater number of persons during later phases of development.

To reduce potential hazards to human health and the environment from exposure to contaminated soils and groundwater during project development, a Risk Management Plan or Plans (RMP) would be developed. The RMP would include specific measures that would be protective of human health and the aquatic environment. The risk criteria approved by the RWQCB for the Project, and that would be applied in the RMP, are a cumulative cancer risk of 10 in 1 million and a Hazard Index of 1 for non-cancer risks. The RMP would be submitted to the RWQCB staff for review and approval. If additional or alternative risk management measures are identified by RWQCB staff, the RMP would be revised and resubmitted to RWQCB staff for consideration. Measures identified in the RMP would minimize potential adverse effects to human health or the ecological environment from exposure to contaminated soils or groundwater during and after development in the Project Area.

Using human health-based risk assessment methodology, the RMP would identify locations where the concentrations of residual chemicals could pose an adverse health risk to exposed populations (based on proposed land uses) while a site remained vacant and uncovered. The RMP would include a range of site-specific risk management measures, such as limiting site access, hydroseeding, notices to Project Area building owners, and monitoring, to be used for vacant sites where chemicals in soil exceed risk-based target levels, to reduce any potential effects to less-than-significant levels.

An analysis of potential risks to human health and the nearby aquatic environment from the presence of chemicals in construction dust showed that even without any dust controls, both cancer and non-cancer risks from exposure to chemicals in soil would be below the risk criteria approved by the RWQCB, and risks from exposure to lead in soils would be less than significant. Some windblown dust from construction activities would settle on nearby surface waters but not in large quantities in any one location. The RMP would include measures to control dust from construction sites, based on the Bay Area Air Quality Management District recommended construction dust control measures (see "Mitigation Measures" under Air Quality, above). The RMP would also include a program for off-site dust monitoring. State and federal worker safety laws and regulations, including those of the California Occupational Safety and Health Administration, would provide protection for construction workers. Methods to control water removed from excavations would be specified in the RMP, and could include analysis and identification of chemicals in the groundwater, and use of sheetpiles around the excavation area to limit movement of groundwater into the excavation. Groundwater would be disposed of in accordance with the City's Industrial Waste Ordinance or RWQCB discharge requirements. Therefore, there would be no adverse environmental impacts from construction dewatering.

In addition to the RMP, Article 20 of the San Francisco Public Works Code, "Analyzing the Soil for Hazardous Waste," would require that on any development site where more than 50 cubic yards of soil was disturbed, the soil be tested for a defined list of chemicals. If chemicals were found above federal or state hazardous waste criteria, a site mitigation plan is required. Each site within the Project Area would undergo soil testing and a site mitigation plan would be prepared for review by the Department of Public Health, if testing revealed contaminants in excess of thresholds designed to protect public health.

Long-Term Occupancy (Post-Development)

A quantitative human health and ecological risk assessment was prepared by ENVIRON to evaluate potential effects on human and aquatic populations upon project completion. The risk evaluation showed that the potential risks posed by residual contaminants that would remain after project completion would be below applicable human health and aquatic ecological risk criteria. After development, currently exposed soils would be covered by buildings or other surfaces such as parking lots or roadways, or would be open space or landscaped areas, and any exposed soils would consist of imported fill meeting RWQCB-approved specifications. Future surface materials in the landscaped or open space areas would consist of approved fill materials. Thus, the project would create a protective barrier between the residual contaminants in soil and human or ecological populations.

Child care centers or schools in the areas designated for residential use would not cause any additional risks to children different from those described for the project; child care centers proposed for Commercial Industrial and Commercial Industrial/Retail land use designations in Mission Bay South would need additional, site-specific investigation to determine whether remediation would be needed or whether another site should be investigated. The RMP would include a process for investigating sites proposed for school or child care center use.

The RMP would specify measures to ensure the effectiveness of soil covering or other barriers, limit uses to prohibit exposure of residents in the Project Area, restrict groundwater use, and provide protocols for future subsurface activities. Deed restrictions would be recorded for all property, placing limits on future uses in the Project Area consistent with the provisions of the RMP, and current and future property owners would thereby be provided notice of these use restrictions and other requirements in the RMP and would be required to comply with applicable provisions of the RMP.

Mitigation Measures

The Risk Management Plan or Plans for the Project Area would be included as part of the project and would reduce potential environmental impacts to less-than-significant levels. Because the RMP is not yet completed and approved by RWQCB staff, this SEIR defines required features of the RMP that are necessary to reduce potential hazards to a less-than-significant level. No further mitigation measures have been identified as necessary in this SEIR.

HYDROLOGY AND WATER QUALITY

This section evaluates the proposed project's contribution to wastewater flows, additional pollutant loading to the San Francisco Bay and near-shore waters, and consequent water quality effects. The City, including the Mission Bay Project Area, currently produces three wastewater streams: municipal wastewater (and its treated effluent), treated combined sewer overflows, and urban stormwater runoff. Potentially affected receiving waters include the deep waters of central San Francisco Bay and near-shore waters of the Bay along the City's Bayside shoreline. Deep waters of the Bay could be affected by the increase in volume of treated municipal wastewater effluent discharged from Southeast Plant that is attributable to the project. Near-shore water quality could be affected by increased combined sewer overflows and direct stormwater discharges. Construction activities within the Project Area could cause erosion and resulting sedimentation in China Basin Channel and San Francisco Bay.

Besides the Mission Bay project, several other Bayside projects may affect water quality, and they are considered in the cumulative water quality analysis in this SEIR. These projects include the proposed Candlestick Mills Stadium and Mall project, the proposed Hunters Point Naval Shipyard Redevelopment project, and proposed development of waterfront port properties.

Under the proposed project, about one-third of the Project Area would have combined sanitary and stormwater sewers, as does the rest of the City, while about two-thirds of the Project Area would have separated sanitary and stormwater systems. The separate stormwater system would capture and route to the City's combined sewer system approximately 80% of stormwater flows, and the rest would be directly discharged to China Basin Channel and the Bay.

The City is considering alternative wastewater treatment technologies for use in the Project Area and other areas of the City. Alternative technologies include "Source Control" (those that occur before runoff), "Treatment Optimization" (those that enhance existing treatment processes), and "Post-Secondary Treatment" (those that provide additional effluent treatment) technologies. Examples are graywater systems, public education, secondary treatment modifications (such as floating aquatic plant ponds), and constructed detention basins.

Deep Water Effects

The proposed project would generate municipal wastewater and increase the total effluent from the City's Southeast Water Pollution Control Plant by about 3%. Because of the increased flow, the project would also cause about a 3% increase in the pollutant loading to San Francisco Bay from municipal wastewater effluent. Cumulatively, the volumes and loads would increase by about 4%.

The quality of municipal wastewater from the Project Area is not expected to differ in any substantial way from the quality of other City wastewater flowing to the Southeast Plant. The project would not materially change the concentrations of pollutants in the effluent. The Southeast Plant discharges its treated municipal wastewater effluent into the deep water of the Bay where it is rapidly mixed and diluted. The project would not cause a violation of San Francisco's permit requirements regarding its discharge from the Southeast Plant. In addition, a comparison of the pollutant concentrations at the outfall to water quality screening values, such as the Water Quality Objectives adopted by the Regional Water Quality Control Board, shows that the existing effluent and the future effluent (associated with cumulative development) would not have a significant effect on Bay water quality.

Near-Shore Effects

Treated combined sewer overflows currently occur at Bayside discharge facilities, including facilities at China Basin Channel, at the end of Mariposa Street, and in Islais Creek. The proposed project would marginally increase treated combined sewer overflows and direct stormwater discharges to near-shore waters of the Bay, including China Basin Channel and Islais Creek. Near-shore discharges are not subject to the same rapid mixing and dilution as the deep-water discharges from the Southeast Plant.

Effects of Treated Combined Sewer Overflows

The addition of the project's municipal wastewater to the Bayside combined sewer system would increase the average annual volume of treated combined sewage overflows by about 0.2% and increase the duration of the overflows for a few minutes per overflow. The project would not change the concentrations of pollutants in the treated overflows. Pollutant mass emissions would increase by about 0.2%. The project would not cause a violation of San Francisco's permit requirements for overflows. As the project would only slightly increase the duration and volume of treated combined sewage overflows, the project would not have a significant effect on aquatic biota.

Because combined sewer overflows include pathogenic bacteria, the City closes beaches as a precautionary measure after an overflow. The estimated average annual increase in overflow durations at the Mariposa and Islais Creek facilities due to the project translate to about 9 minutes and 11 minutes per overflow event, respectively. There is little water-contact recreation at these locations on the Bayside. Therefore, no significant impact from the increased duration of overflows would occur due to overflow discharges from the Mariposa and Islais Creek facilities.

Effects of Stormwater Discharges

Stormwater from a portion of the Project Area currently flows directly into the Bay. Under the proposed project, a separate stormwater system would be constructed for a large portion of the Project Area, which is not now served by the City's combined sewer system. The system would capture the initial flows (about 80% of the average annual flow for that part of the Project Area to be served by the proposed separated system) from storms for treatment, and would discharge the remaining 20% to the China Basin Channel and the Bay through four new stormwater outfalls—two at China Basin Channel and two at the Bay shoreline.

Under the project, the volume of stormwater directly discharged to near-shore waters of the Bay from the Project Area would increase about 2%. The concentrations of pollutants in the stormwater discharge would change, because the project would intensify land use in the Project Area. Neither the increase in stormwater flow, nor the change in pollutant concentrations would constitute a significant effect on aquatic biota.

Effects on Sediment Quality

Both China Basin Channel and Islais Creek have been identified by the Regional Water Quality Control Board as candidate toxic hot spots regarding sediment quality. The project would decrease volumes of treated combined sewer overflows slightly to China Basin Channel, but the project would result in increased flows elsewhere, most notably to Islais Creek. Increased volumes of overflow discharges to Islais Creek with the project and under cumulative conditions would cause a corresponding increase in pollutant load, including an increased load of settleable solids to Islais Creek. This would result in more sediment deposition on top of the bottom sediments and an increased load of pollutants. Stormwater volumes and load would increase to China Basin Channel due to direct stormwater discharges, but would not measurably change the sediment chemistry of China Basin Channel. Benthic (bottom-dwelling) organisms are mostly confined to the uppermost layer of the sediment. Because measurable changes in the physical or chemical composition of this layer are unlikely, biological impacts would be insignificant. In addition, the relatively small increase in sediment volume caused by the project would not be expected to affect the Regional Water Quality Control Board's determination to designate China Basin Channel or Islais Creek as a toxic hot spot, nor cause any changes to a possible remediation approach. Therefore, the project would have a less-than-significant impact on the sediment quality of both Islais Creek and China Basin Channel.

Cumulative Issues

Increasing the volumes of municipal wastewater effluent, treated combined sewer overflows, and direct stormwater discharges due to cumulative development, including the project, would increase the total mass pollutant load to receiving waters, but this would not create water quality effects with respect to toxicity on aquatic biota. The estimated cumulative pollutant loads from cumulative development would generally increase by 4-6%, and the project would cause approximately half of this cumulative increase. To put this in context, City discharges are a very small portion of the region-wide discharges to the Bay. Considering the contribution of the project and of the cumulative Bayside projects in the context of all the other pollutant inputs to the Bay, the cumulative pollutant loading from the Bayside projects would be extremely small.

Based upon an analysis similar to that discussed above for the project, effects on sediment quality in Islais Creek and China Basin Channel from cumulative development would not be significant. In addition, cumulative effects on combined sewer overflows would not have a significant effect on water-contact recreation.

- Treated combined sewer overflows generate a high degree of public concern, however, and conservative presumptions of significance are warranted when a setting may be degraded or impaired. For these reasons, and in an effort to provide for continued discussion regarding these concerns and to acknowledge the lack of conclusive evidence refuting a causal relationship between treated combined sewer overflows, stormwater discharges, and sediment quality, this report conservatively finds that the project would contribute to a potentially significant cumulative impact on near-shore waters of San Francisco Bay from treated combined sewer overflows, and direct stormwater discharges to China Basin Channel. The project contribution (0.2%) to the potential cumulative increase (11%) in Bayside combined sewer overflow volumes, and the contribution of project-related stormwater discharges to possible cumulative impacts would be reduced to a level of insignificance with the imposition of mitigation measures regarding combined sewer overflow volumes and alternative treatment technologies, as discussed below.

Mitigation Measures

- Mitigation measures to address cumulative issues include designing and building sewer improvements so that potential flows from the project do not contribute to an increase in the annual overflow volume as projected by the City's Bayside Planning Model by providing increased storage in oversized pipes, centralized storage facilities, smaller dispersed storage facilities, detention basins, or through other means to reduce or delay stormwater discharges to the City system. Another mitigation measure to address cumulative issues is to implement alternative technologies or use other means to reduce settleable solids and floatable materials in stormwater discharges to China Basin Channel to levels equivalent to, or better than, City-treated combined sewer overflows. Alternative technologies could include one or more of the following: biofilter system, vortex sediment system, catch basin filters, and/or additional source control measures to remove particulates from streets and parking lots.

- Another mitigation to address stormwater quality is developing and implementing a Stormwater Management Program for any area contributing to direct discharges of stormwater to near-shore waters. The program would include Best Management Practices, applicable during phased development of the Project Area. A feature of the project is to implement a Stormwater Pollution Prevention Plan for all construction activities within the Project Area to avoid and minimize erosion and sedimentation in China Basin Channel and San Francisco Bay.

CHINA BASIN CHANNEL VEGETATION AND WILDLIFE

This section focuses on the aquatic and wetland habitats of China Basin Channel. Terrestrial habitats in the remainder of the Project Area do not support any significant biological resources, as discussed in the Initial Study (see Appendix A).

The proposed hard-edge treatment (consisting of a layer of rocks or "rip-rap" with three promontories that may be on pilings) of the north shoreline of China Basin Channel would remove approximately 0.14 acres of salt marsh wetland habitat, consisting primarily of a narrow strip of pickleweed near the mean high water tidal level. A permit under the federal Clean Water Act, Section 404, would be required for this action. The Clean Water Act gives the U.S. Army Corps of Engineers (Corps) jurisdiction to regulate any placement of fill below the high tide line and in adjacent wetlands. If left unmitigated, the hard edge treatment would result in a net loss of wetland habitat, contrary to federal and state "no net loss" of wetlands policies, resulting in a significant impact and the likelihood of permit denial. As part of the 404 permit process, the Corps would require the project sponsors to compensate for the loss of habitat by restoring salt marsh habitat in the vicinity.

Grading of the Channel edge, pile driving construction of a proposed Fifth Street pedestrian bridge, installation of two storm drain outfalls and two section inlets in the Channel and installation of two storm drain outfalls on the Bay shoreline could cause turbidity and resuspend potentially contaminated sediments. (See "Hydrology and Water Quality," above, for discussion of sediment contamination.) Turbidity could also be caused by use of large barges and tugboats to deliver equipment or material. Resuspension could increase concentrations of toxic substances in the waters of the Channel and portions of the San Francisco Bay. These contaminants could be directly lethal to smaller organisms, and could accumulate in the food chain and become successively more concentrated in a process known as bio-accumulation. Through bio-accumulation, the toxic concentrations could reach levels in which they are lethal to larger organisms, such as birds or marine mammals. Turbidity and toxicity from resuspended sediments could also interfere with beneficial uses of the channel, such as spawning of Pacific herring. This impact could be mitigated by containing sediments within the work area using silt curtains and filter fencing and by requiring use of shallow draft tugboats and barges at slow speeds and by avoiding activities with the potential to cause turbidity in the Channel and the Bay during the herring breeding season (December 1 to March 1).

The values of the Channel habitat as a sheltered resting and foraging area for migratory waterbirds and marine mammals could be adversely affected by construction and operation of the project. The Channel does not support any breeding or nesting habitat for birds (except possibly for common gulls adapted to urban environments) or mammals, which is more important, and less available, in the region than foraging or resting habitat. Loud and visible construction activities could cause temporary abandonment of the channel by foraging and resting birds and mammals. The addition of up to 30,000 employees and 11,000 residents after build-out would result in higher levels of human activity, litter, noise, pets, and potential harassment of wildlife. These impacts of human activities on wildlife would be less than significant and require no mitigation because of the following circumstances: 1) displacement of wildlife by construction or operational activities would be unlikely to result in mortality, 2) no bird nesting (except possibly for common gulls adapted to urban environments) or mammal breeding habitat occurs in the Channel, and 3) similar foraging and resting habitat is readily available in close proximity to the Channel where any displaced animals could retreat.

Mitigation Measures

To address project effects on wetlands in the Project Area, preparation and implementation of a salt marsh habitat mitigation plan in accordance with the Section 404 permit process of the U.S. Army Corps of Engineers is identified. Impacts on herring reproduction from turbidity are addressed by a mitigation measure to avoid activities with the potential to cause turbidity in the water of the Channel or Bay (including large barge or tugboat movement) during the herring spawning season (December 1 - March 1). Potential turbidity during other times is addressed by requiring the use of shallow-draft tugboats and barges with enforced speed limits confining sediments to work sites using silt curtains and silt fences, and implementing a plan for minimizing turbidity during removal of existing pilings. Assuming that the Corps approves a salt marsh habitat mitigation plan under Section 404 and that all of the other mitigation measures are implemented, potential impacts on vegetation and wildlife would be reduced to a less-than-significant level.

COMMUNITY SERVICES AND UTILITIES

Additional community services and improved utilities infrastructure would be needed to support the increased population and new uses in the Project Area.

Fire and Police Protection

Additional fire department personnel and equipment would be needed within the Project Area at buildout in order to provide an adequate level of service, comparable to that which is currently provided citywide. A new fire station, located in Mission Bay South, would be needed to house personnel and equipment in a location that would facilitate emergency access to the area south of the China Basin Channel. Additional police personnel would likely be needed, and a facility from which to operate within the Project Area could increase community involvement in crime prevention, would make the police more easily accessible, and as a result, would help to reduce crime rates. The project includes the provision of land for fire and police stations, located adjacent to and including the site and building which was formerly Fire Station No. 30. Funding to assist in rehabilitating this station and/or to build a new one is proposed.

Public Health Services

Due to the increase in population in the Project Area, there would likely be an increase in demand for public health services in the areas of environmental health, personal health care services, and mental health services. This increased demand could be satisfied by existing and planned City facilities. Increases in staff may be required, but it is unlikely that new facilities would be needed to satisfy demand.

Recreation and Parks

Parks and open space would be developed as part of the project. New parks and open spaces would total approximately 47 acres, and would provide a linked system of parks that could accommodate both active and passive uses. Parks would be designed to take advantage of unique views and waterfront locations, including parks along the Channel and along Terry A. François Boulevard (the Bay), and would include bicycle and pedestrian pathways, and lighting for evening activities and for safety. Some parks would be large enough to accommodate athletic fields for active recreation, such as softball and/or soccer fields. The park along the Bay would include a parking lot for the Pier 52 boat launch ramp; the park located on 16th Street just west of Terry A. François Boulevard could include an electrical substation for transit facilities.

Schools

The proposed project would increase the demand on the San Francisco Unified School District (SFUSD). At full buildout, the number of school-age children residing in the Project Area could be approximately 1,615, including approximately 730 of elementary school age. About 75% of these students would be expected to attend public schools. The project includes a site for a new school, but not development of a school. The 2.2-acre site proposed could reasonably accommodate an elementary school for up to 500 students, but would not be large enough to house a middle school or high school. One elementary school probably would not be able to accommodate all of the potential new elementary school students. The SFUSD is expected to be operating at or near capacity for some number of years due to new state laws limiting class size for kindergarten through third grade. Therefore, additional classroom space would need to be developed by the School District outside of the Project Area, most likely for all grade levels.

Solid Waste

The proposed project would produce an increased amount of solid waste in the Project Area that would need to be disposed of by the City. Altamont Landfill capacity projections estimate San Francisco's contracted landfill space will reach its limit between the years 2012 and 2016. The proposed project would not significantly affect the lifespan of the landfill contract because growth in Mission Bay was assumed in landfill capacity projections.

Water Supply

Water demand of the proposed project could be satisfied without adversely affecting citywide supplies. The San Francisco Water Department has determined that its water supply is adequate to serve the water demands of the Project Area, provided available forms of conservation are used. A reclaimed water system may deliver reclaimed water to the project for use in office cooling systems and irrigation.

The project would include the expansion of the City's auxiliary water supply system (AWSS), which provides a backup supply of water for fire-fighting. At build-out, the AWSS would be able to serve the entire Project Area.

Sewers and Wastewater Treatment

San Francisco operates a combined sewer system which collects both sanitary sewer and stormwater runoff into the same sewer lines. These combined flows are directed into large storage sewers and pumped to treatment plants. The Southeast Treatment Plant, which serves the Project Area, could accommodate the increased sewage flows from the project. Project plans include the construction of a separated stormwater and sanitary sewer system in the Central/Bay drainage basin in Mission Bay South, in the area between the Channel and about 16th Street. This separated system would divert the "initial flows" of stormwater from each storm into the sewer system for treatment. Stormwater flows in excess of the "initial flows" would drain directly into the Bay or Channel. Mission Bay North and the Mariposa drainage basin (south of 16th Street in Mission Bay South) would continue to use the City's existing combined sewer system. Improvements would be made to the combined system in Mission Bay North and the Mariposa Basin to accommodate the increased demand created by the project./7/

Energy and Telecommunications Transmission Capacity and Infrastructure

The Pacific Gas and Electric Company does not anticipate any constraints in providing adequate electric and gas transmission capacity to Mission Bay, and would provide any necessary infrastructure upgrades.

Telecommunications

Demand for telecommunications services would increase in the Project Area over time as build-out occurs. Pacific Bell would provide any infrastructure necessary. At this time, fiber optic lines are expected to be installed. This may require one or more sites within the Project Area, ranging from a 12-foot by 15-foot terminal box to a 50-foot by 50-foot easement.

Mitigation Measures

In summary, six mitigation measures address community services and utilities impacts. A measure establishes the amount of development that would create sufficient demand to require transfer of land for construction of a school. Two mitigation measures require transfer of land for the construction of a fire station and provision of an engine and truck company, and extension of the high-pressure water system (AWSS), for fire protection when determined by the Fire Department to be needed. The other three mitigation measures require water conservation, proper fencing of temporary stormwater detention basins, and design standards to prevent stormwater runoff from newly constructed buildings and permanently covered surfaces in the existing Bay Basin from draining directly to the Bay, without diversion of a storm's "initial flows." With implementation of these measures, community services and utility impacts would be reduced to a less-than-significant level.

GROWTH INDUCEMENT

Project Area development and employment growth would not induce more population growth than otherwise expected in the Bay Area. The cumulative regional scenario of population and employment growth analyzed in the SEIR already incorporates the induced population growth associated with Project Area increases in economic activity.

Similarly, the cumulative analyses in the SEIR incorporate the impacts of any additional growth outside the Project Area that could be considered to be generated by Project Area activity. The scenarios of growth in the City and the region that are analyzed in the SEIR include the job and household multiplier effects of Project Area economic activity.

The project would have no significant growth inducement effects; therefore, no mitigation measures are identified.

C. MITIGATION MEASURES

1990 MITIGATION MEASURES

All of the mitigation measures identified in the 1990 FEIR, whether approved or rejected in the 1990 FEIR Findings, are listed in Tables VI.7 and VI.8. Table VI.7, 1990 FEIR Mitigation Measures Discussed in SEIR, lists those measures that are either project features or measures identified in this SEIR. The measures, updated as necessary to pertain to the current project, are listed in Chapter VI under the relevant environmental topic either as a "project feature that avoids significant impact" or as "identified in this SEIR." Table VI.8, 1990 FEIR Mitigation Measures Not Discussed in SEIR, lists the measures not proposed for the current project, and the reasoning behind the determination. Most measures in Table VI.8 are addressed or incorporated in existing regulations approved subsequent to the 1990 FEIR, or are not applicable to the SEIR project.

ADDITIONAL 1990 FEIR MITIGATION MEASURES FROM THE INITIAL STUDY

In a few instances, the proposed project would have the same impacts as the *1990 Mission Bay Plan*. The Initial Study (see Appendix A) incorporated and updated mitigation measures related to tidal flooding, pedestrian-level wind, shadows, soils, historic archaeologic resources, and historic structures that were addressed in the 1990 FEIR.

MITIGATION MEASURES DISCUSSED IN THIS SEIR

The other mitigation measures in this SEIR are divided into two categories: project features that would avoid significant impacts, and mitigation measures identified in this SEIR. The "project features" are aspects of the project designed by the project sponsors to address potential impacts. The SEIR analysis was performed assuming that these measures would be part of the project. If these measures were not implemented, significant impacts could arise that have not been evaluated in this SEIR. The second category, "mitigation measures identified in this SEIR," contains mitigation measures that would mitigate significant impacts identified in the environmental analysis in this SEIR. The mitigation measures are summarized above under each topic subheading.

Mitigation measures identified in this SEIR and from the Initial Study may be required by decision makers as conditions of project approval, if the project were to be approved. Implementation of some mitigation measures may be the responsibility of other public agencies, outside the jurisdiction of the City and County of San Francisco.

D. VARIANTS TO THE PROPOSED PROJECT

- This chapter evaluates six variants to the project, and a combination variant, that are under consideration by the project sponsors. Variants typically modify one limited area or aspect of the project.

- Each variant is available for selection by the project sponsors, the City, and the public, and any combination of variants could be approved. Even if all variants were to be adopted, no new significant impacts other than those identified below for each variant would occur, because the variants are not substantially different than the project and are geographically separated.

TERRY A. FRANÇOIS BOULEVARD VARIANT

- Under Variant 1, the alignment of Terry A. François Boulevard would be moved west, away from the Bay, so that a portion of the proposed Bayfront public open space would be adjacent to port property fronting the Bay. A proposal for expanded bayfront open space, if adopted, would include development by Catellus of approximately 2 acres of adjacent open space on port property outside of the Project Area, and include provisions within Project Area open space for a 15,000-sq.-ft. port-owned recreation-oriented retail space that could include related restaurant uses. Even with the expanded bayfront open space proposal, the realignment of the roadway would limit direct access to maritime uses on and south of Pier 54, until the two commercial buildings were removed and the open space was developed. In the interim, indirect access could be provided through a proposed parking lot and along a service roadway. Under this variant the freight rail track currently in Terry A. François Boulevard would be realigned within the proposed public open space. Project buildings would be separated from the public open space by the realigned Terry A. François Boulevard.

- Other environmental effects would be similar to those of the proposed project. The significant impacts of this variant, and of the expanded bayfront open space proposal, would be the same as those of the project. No additional mitigation measures have been identified.

ESPRIT COMMERCIAL INDUSTRIAL/RETAIL VARIANT (ESPRIT VARIANT)

Under Variant 2, the land use designation for the Esprit site would be changed from Mission Bay South Retail to Commercial Industrial/Retail. Under the project, the Esprit site is assumed to have about 250,000 gross sq. ft. of city-serving retail uses. Under the variant, the site is assumed to have about 460,000 gross sq. ft. of research, light-industrial, and office uses and 40,000 gross sq. ft. of city-serving retail uses. This would increase the amount of Commercial Industrial uses proposed in Mission Bay South. With less city-serving retail being developed in the Project Area, there could be more retail stimulated to the west and south of Mission Bay. The change in use would result in less peak-hour auto traffic in the southeastern part of the Project Area. However, no intersections projected to operate at unacceptable levels would improve to acceptable levels with the variant.

Other environmental effects would be similar to those of the proposed project. The significant impacts of this variant would be the same as those of the project. No additional mitigation measures have been identified.

NO BERRY STREET AT-GRADE RAIL CROSSING VARIANT (NO BERRY STREET CROSSING VARIANT)

Variant 3 would not include the at-grade railroad crossing at Berry Street that is proposed by the project. The rail crossing across from Hooper Street that is proposed as part of the project would also be proposed under the variant. Due to reduced access to and from the west, city-serving retail development in Mission Bay North on the block west of the I-280 King Street ramp is assumed to be reduced from 222,000 gross sq. ft. with the project to 111,000 gross sq. ft. with the variant. The number of dwelling units on that block would be reduced from 250 to 120 units, reducing the total number of dwelling units in Mission Bay North from 3,000 with the project to 2,870 with the variant.

Under this variant, access to the western portion of Mission Bay North would be constrained by physical barriers to the south, north, and west. The intersection of King and Fifth Streets would operate at LOS E under this variant, compared with LOS D under the project, creating a new significant impact. The intersections of Third and Fourth Streets with King and Townsend Streets would also be affected; they would remain at LOS F, as with the project, but delays would increase by 10% to 50%. Access to the western part of Mission Bay North by emergency vehicles would also be impeded. For this reason, seismic hazards would also be greater under the variant than the project.

All significant impacts and mitigation measures identified for the project would also apply to this variant. The new significant impacts would be mitigated to less-than-significant levels by the measures calling for elimination of a pedestrian crosswalk or widening Fifth Street, roadway restripings, and provision of access for emergency vehicles in a manner satisfactory to the San Francisco Fire Department.

MODIFIED NO BERRY STREET AT-GRADE RAIL CROSSING VARIANT (MODIFIED NO BERRY STREET CROSSING VARIANT)

Like Variant 3, Variant 3A would not include the at-grade railroad crossing at Berry Street that is proposed by the project. Under this variant, Berry Street would be extended around the western end of China Basin Channel to Common Street near the intersection of Common and Seventh Streets. The rail crossing across from Hooper Street that is proposed as part of the project would also be proposed under the variant.

Variant 3A constitutes another way to solve the access difficulties that would be created if no vehicular crossing were built at Berry Street. Due to reduced access to and from the west, city-serving retail development in Mission Bay North on the block west of the I-280 King Street ramp is assumed to be reduced from 222,000 gross sq. ft. with the project to 111,000 gross sq. ft. with the variant. In contrast to Variant 3, this variant would not reduce the number of dwelling units on that block.

The significant impact of Variant 3 on Fifth and King Streets would not occur under Variant 3A. The intersections of Fourth and King Streets would operate at LOS F under Variant 3A, in contrast to LOS E with the project, and this would be similar to Variant 3. Intersections of Third Street with

King and Townsend Streets would be affected; they would remain at LOS F, as with the project, but delays would increase. Variant 3A would eliminate the new significant emergency access impact found in Variant 3, although emergency access would be more difficult than for the project.

- All significant impacts and mitigation measures identified for the project would also apply to this variant, except those described for the intersections of Berry Street with Seventh Street and except the Mitigation Measure at Fourth and King Streets that would be modified as for Variant 3.

MISSION BAY NORTH RETAIL VARIANT

Variant 4 would change the allocation of land uses between the two blocks bounded by Townsend, Third, Berry, and Fourth Streets in the proposed Mission Bay North Retail land use designation. Under the variant, each of the two blocks would contain nearly the same amount of entertainment-oriented commercial and residential land uses as the other. The amount of total development on the two blocks with the variant would be the same as the total with the project. The Townsend Street block is more accessible to vehicular traffic than the block south of King Street because Townsend Street has more capacity than Berry Street and so is a more appropriate location for land uses with higher vehicle trip generation. This variant would have the same significant impacts as the proposed project and would require the same mitigation measures.

- **CASTLE METALS BLOCK COMMERCIAL INDUSTRIAL/RETAIL VARIANT (CASTLE METALS BLOCK VARIANT)**

- Under Variant 5, the land use designation for the entire block bounded by 16th, Third, and Mariposa Streets (the Castle Metals Block) would be changed from Commercial Industrial and Mission Bay South Retail to Commercial Industrial/Retail. Under the project, the Castle Metals Block is assumed to have about 366,000 gross sq. ft. of Commercial Industrial, 310,000 gross sq. ft. of city-serving retail, and 3,200 gross sq. ft. of neighborhood-serving retail uses. Under the variant, the block is assumed to have about 964,000 gross sq. ft. of research, light-industrial, and office uses, 50,000 gross sq. ft. of city-serving retail, and 3,200 gross sq. ft. of neighborhood-serving retail uses. This would increase the amount of Commercial Industrial uses proposed in Mission Bay South. With less city-serving retail being developed in the Project Area, there could be more retail stimulated to the west and south of Mission Bay. A new height zone for the majority of the area would allow development up to 90 ft. high on 90%, and 160 ft. high on 10%, of the developable land area. The change in use would result in less peak-hour auto traffic in the southeastern part of the Project Area. However, no intersections projected to operate at unacceptable levels would improve to acceptable levels with the variant.

- Other environmental effects would be similar to those of the proposed project. The significant impacts of this variant would be the same as those of the project. No additional mitigation measures have been identified.

- **COMBINATION OF PROJECT FEATURES AND VARIANTS CURRENTLY UNDER CONSIDERATION BY THE PROJECT SPONSORS**

- The project sponsors are considering a combination of variants to the proposed project as a result of public comments and from refinements to the project made by the project sponsors since publication of the Draft SEIR. This combination of variants, as shown on the inside front cover, includes the following:

  - A modified Variant 1, the Terry A. François Boulevard Variant, would realign Terry A. François Boulevard to the west to allow development of open space to the east closer to the San Francisco Bay, would permit Catellus to develop open space on 2 acres of adjacent port property outside the Project Area to create an expanded bayfront open space, and also would permit a small recreation-oriented commercial building to be developed on the adjacent open space within the Project Area;

  - Variant 2, the Esprit Variant, would change the land use designation on that site from Mission Bay South Retail to Commercial Industrial/Retail;

  - A new Variant 3A, the Modified No Berry Street Crossing Variant, would extend Berry Street south to Common Street, rather than have a railroad crossing at Berry Street, and would reduce the retail space in the northwestern-most project block by 50%; and

  - A new Variant 5, the Castle Metals Block Variant, would change the land use designation on that site from Mission Bay South Retail to Commercial Industrial/Retail.

- This combination of variants currently under consideration by project sponsors would not create significant impacts beyond those already identified in the Draft SEIR based on the environmental assessment of the variants individually. For example, the Berry Street extension under this combination of variants would somewhat reduce access to Mission Bay North from the west compared to the project, but not as much as would Variant 3. Even if all variants were to be adopted, the environmental assessment confirms that no new significant impacts other than those identified for each variant would occur.

E. ALTERNATIVES TO THE PROPOSED PROJECT

The Alternatives chapter evaluates three alternatives to the proposed project and, for each alternative, provides a comparative analysis of potential environmental impacts. The alternatives selected for analysis are as follows:

- No Project Alternative (Alternative 1) -- Under this alternative, the Project Area would be developed under the existing zoning, as anticipated by the Association of Bay Area Governments (ABAG) 1996 expected growth projections for the analysis year of 2015, which suggest slightly less than one-half the residential buildout and about one-half the non-residential build-out of the proposed project, and without the proposed Redevelopment Plans.

- Redevelopment North of Channel/Expected Growth South of Channel Alternative (Alternative 2) -- Under this Alternative, Mission Bay North would be developed as described for the proposed project, with a Mission Bay North Redevelopment Plan, whereas Mission Bay South would be developed under existing zoning, as anticipated by ABAG's 1996 expected growth projections for 2015. The result in 2015 would be slightly less than the project's residential buildout and about one-quarter of its non-residential buildout.

- Residential/Open Space Alternative (Alternative 3) -- Under this Alternative, the Project Area would be developed with a full build-out of 10,000 housing units and about 1.9 million square feet of commercial space, almost 70 percent more housing units than the proposed project and about one-fifth the nonresidential build-out, and without the proposed Redevelopment Plans. Larger open space areas would be located around China Basin Channel and a portion of the Bayfront, where a wetlands would be created.

All of the alternatives would result in the same project and cumulative significant unavoidable adverse impacts identified for the project (traffic, vehicular air pollution emissions, potential combined toxic air contaminants, cumulative hazardous waste generation and disposal, cumulative water quality). However, there are differences among the alternatives and the project with respect to these impacts. In general, the alternatives would reduce these identified impacts (because of reduced intensity of development), but not to a less-than-significant level.

The alternatives would involve some impacts that are different from project impacts. Some of those impacts could be mitigated and mitigation measures are identified. The applicable mitigation measures would vary among the alternatives, as described in the Alternatives section. Certain of the impacts caused by the project would be avoided in one or more of the alternatives. Accordingly, mitigation measures would not be required for those alternatives.

Alternative 3 is identified as the environmentally superior alternative. While it would not avoid the unavoidable significant impacts associated with the project, it would reduce most of them. Additional mitigation would be required to avoid impacts from existing hazardous wastes on wetlands and residential uses associated with Alternative 3. Alternative 3 also was evaluated at full build-out, as with the project analysis, while Alternatives 1 and 2 were evaluated at partial build-out in 2015. Alternatives 1 and 2 at full build-out would generate greater impacts than identified for the analysis year of 2015.

F. AREAS OF CONTROVERSY

Areas of controversy have been identified from written responses to the Notice of Preparation and in a number of public meetings of the Mission Bay Citizens Advisory Committee. Known areas of controversy about Mission Bay include concerns about: traffic impacts south of Mariposa Street; density of development; visual effects from allowable building heights, especially as would be seen from Potrero Hill; potential water quality and fish and wildlife impacts from increased sewer overflows; sufficiency of proposed risk management plans in preventing potential fish and wildlife and human health impacts from contaminated soils and groundwater; potential impacts on wildlife habitat along China Basin Channel; sufficiency of proposed open space, particularly in Mission Bay North (a project planning issue, rather than a CEQA environmental issue); availability of long-term rental units versus conversion of rental units to for-sale condominiums (a social/economic issue rather than a CEQA environmental issue).

Issues that arose during the public comment period on the Draft SEIR are addressed in Chapter XII, Summary of Comments and Responses. Other areas of controversy may arise as public hearings are held on the project.

NOTES: Summary

1. Table III.A.1 presents the total amount of development by land use designation.

2. "PM_{10}" refers to particulate matter less than 10 microns in diameter.

3. a) U.S. Department of Health and Human Services Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health, *Biosafety in Microbiological and Biomedical Laboratories*, 3rd ed., May 1993.

   b) U.S. Department of Health and Human Services, National Institutes of Health, *Guidelines for Research Involving Recombinant DNA Molecules (NIH Guidelines)*, January 1996.

   c) National Research Council, *Guide for the Care and Use of Laboratory Animals*, National Academy Press, Washington, D.C., 1996.

4. University of California, San Francisco, Office of Campus Planning, *Long Range Development Plan Final Environmental Impact Report*, SCH. No. 95123032, January 1997, Vol. II, p. 96.

5. *California Health and Safety Code*, Section 25532.

6. University of California, San Francisco, Office of Campus Planning, *Long Range Development Plan Final Environmental Impact Report*, SCH. No. 95123032, January 1997, Volume I, p. S-51.

7. See Figure V.M.7 in "Sewers and Wastewater Treatment" in Section V.M, Community Services and Utilities, showing the Central and Mariposa Basins.

III. PROJECT DESCRIPTION

A. OVERVIEW OF PROJECT

The proposed project consists of two Redevelopment Plans that together would implement the development of the Mission Bay Project Area (Project Area) in San Francisco, which is comprised of approximately 303 acres generally south of Townsend Street, east of Seventh Street and the Interstate 280 (I-280) freeway, north of Mariposa Street, and west of Terry A. François Boulevard and Third Street. Together, the Redevelopment Plans provide for approximately 6,090 housing units north and south of China Basin Channel; about 1.5 million square feet (sq. ft.) of retail space; a new University of California San Francisco (UCSF) site on about 43 acres north of 16th Street, developed by The Regents of the University of California (The Regents) to include up to 2,650,000 sq. ft. of instruction, research, and support space, and a public school site to be donated to the San Francisco Unified School District (SFUSD); up to 5,557,000 sq. ft. of mixed research and development, light manufacturing, and office space surrounding the UCSF site to its west, south, and east; a 500-room hotel between Third and Fourth Streets south of China Basin Channel; off-street parking accessory to most uses; and about 47 acres of open space (including about 8 acres within the UCSF site). A site for police and fire stations would be dedicated on Third Street at Mission Rock Street. The maximum accessory parking allowed for each land use is presented in Table V.E.17 and discussed in "Parking Impacts," in Section V.E, Transportation: Impacts.

The project would include construction, expansion, and/or improvement of infrastructure in the Project Area. The project would include a new street pattern revised from both the existing street pattern and that of the 1990 *Mission Bay Plan*; drainage improvements; expansion of the existing sewer and storm drain system, and the high- and low-pressure water systems; utility trenches and conduit ducts; provision for future rail access to Piers 48, 50 and 80; and relocation of the rail crossing on King Street, east of Seventh Street to a location south of the Channel opposite Hooper Street. See Table III.A.1 for a summary of project land uses, and Table III.A.2 for a summary of land uses by Redevelopment Plan designations./1/

As discussed above, two Redevelopment Plans would be adopted: Mission Bay North and Mission Bay South, divided by China Basin Channel. Each Plan would call for a more specific Design for Development document, which would essentially constitute the zoning and design standards./2/ The *San Francisco General Plan*, the *Waterfront Land Use Plan*, and the San Francisco Planning Code

TABLE III.A.1
SUMMARY OF PROPOSED MISSION BAY DEVELOPMENT BY LAND USE /a/

Land Use	Mission Bay North Redevelopment Area	Mission Bay South Redevelopment Area	Grand Total /b/
Residential (dwelling units)	3,000	3,090	6,090 /c/
Commercial Industrial and Office (gross sq. ft.)	0	5,557,000	5,557,000
UCSF (gross sq. ft.)	0	2,650,000	2,650,000
Retail			
Entertainment-Oriented Retail (gross sq. ft.)	389,000	56,000	445,000
City-Serving Retail (gross sq. ft.)	222,000	583,000	805,000
Neighborhood-Serving Retail (gross sq. ft.)	56,000	201,000	257,000
Hotel (rooms)	0	500	500
Public Open Space (acres)	6	41 /d/	47
Public Facilities (acres)/e/	1.5 /f/	3.7 /f/	5.2

Notes:

a. Parking is not included in the gross square footage totals given for each land use. Maximum parking allowances are outlined in this section under "Parking and Loading" under "Redevelopment Plans and Proposed Land Uses," and are discussed in Table V.E.17 and "Parking Impacts" in Section V.E, Transportation: Impacts.

b. The conceptual agreements between the City and Catellus do not cover those portions of the proposed Redevelopment Areas not owned by Catellus. The components of the proposed development program summarized in the Grand Total that are not on land owned by Catellus consist of 90 dwelling units along Third Street, 310,000 gross sq. ft. of City-serving retail on the Castle Metals site, and 250,000 gross sq. ft. of city-serving retail on the Esprit site.

c. Of the 3,000 dwelling units north of the Channel, 20% would be affordable units. Of the 3,090 dwelling units south of the Channel, the Redevelopment Agency would seek non-profit developers to build approximately 1,100 affordable units, i.e., 37%.

d. The 41 acres of public open space in Mission Bay South includes about 8 acres of open space on the proposed UCSF site.

e. The existing Channel Pump Station in Mission Bay North is on about 1.5 acres; the site is not proposed for redevelopment.

f. In addition to the acreages shown in the tables, land under the I-280 that is not otherwise designated Public Open Space would be designated Public Facilities.

Source: Catellus Development Corporation and San Francisco Redevelopment Agency.

and Zoning Map would be amended to conform with the proposed Redevelopment Plans; the *Mission Bay Plan,* Part II of the *Central Waterfront Area Plan,* would be rescinded. The UCSF site would be developed by The Regents as described in the UCSF *1996 Long Range Development Plan* (LRDP)/3/, and as analyzed in the UCSF LRDP Final EIR./4/

The project sponsors are the San Francisco Redevelopment Agency (Redevelopment Agency) and Catellus Development Corporation (Catellus). The public/private cooperative effort has several

TABLE III.A.2
PROPOSED MISSION BAY DEVELOPMENT BY REDEVELOPMENT PLAN LAND USE DESIGNATIONS/a/

Land Use Designation	Mission Bay North Redevelopment Area	Mission Bay South Redevelopment Area	Grand Total/b/
Mission Bay Residential			
Dwelling Units/c/	1,920	3,090 /b/	5,010
Neighborhood-serving Retail (gross sq. ft.)	56,000	111,000	167,000
Mission Bay North Retail			
Entertainment-oriented Commercial (gross sq. ft.)	389,000	0	389,000
City-serving Retail (gross sq. ft.)	222,000	0	222,000
Dwelling Units /c/	1,080	0	1,080
Hotel			
Hotel (rooms)	0	500	500
Entertainment-oriented Commercial (gross sq. ft.)	0	56,000	56,000
UCSF Site/d/			
UCSF uses (gross sq. ft.)	0	2,650,000	2,650,000
City School Site (acres)	0	2.2	2.2
Open Space (acres)	0	8	8
Commercial Industrial			
Commercial Industrial (gross sq. ft.)	0	4,163,000	4,163,000
Neighborhood-serving Retail (gross sq. ft.)	0	58,400	58,400
Commercial Industrial / Retail			
Commercial Industrial (gross sq. ft.)		1,394,000	1,394,000
Neighborhood-serving Retail (gross sq. ft.)		31,600	31,600
City-serving Retail (gross sq. ft.)		23,000	23,000
Mission Bay South Retail			
City-serving Retail (gross sq. ft.)	0	560,000 /b/	560,000
Public Facilities (acres, excluding City school site) /f/	1.5 /e/	1.5	3.0
Public Open Space (acres, excluding UCSF)	6	33	39

Notes:

a. The locations of the proposed land use designations are shown in Figure III.B.3. Parking is not included in the gross square footage totals given for each land use. Maximum parking allowances are outlined in this section in "Parking and Loading," under "Redevelopment Plans and Proposed Land Uses," and are discussed in Table V.E.17 and "Parking Impacts" in Section V.E, Transportation: Impacts.

b. The conceptual agreements between the City and Catellus do not cover portions of the proposed Redevelopment Areas not owned by Catellus. The components of the proposed development program summarized in the Grand Total that are not on land owned by Catellus consist of 90 dwelling units along Third Street, 310,000 gross sq. ft. of city-serving retail on the Castle Metals site, and 250,000 gross sq. ft. of city-serving retail on the Esprit site.

c. Of the 3,000 dwelling units north of the Channel, 20% would be affordable units. Of the 3,090 dwelling units south of the Channel, the Redevelopment Agency would select non-profit developers to build approximately 1,100 affordable units.

d. Refer to Table III.B.1 for details on the UCSF development program.

e. The existing Channel Pump Station, on 1.5 acres of city-owned land, is not proposed for development.

f. In addition to the acreages shown in the tables, land under I-280 that is not otherwise designated Public Open Space would be designated Public Facilities.

Source: Catellus Development Corporation and San Francisco Redevelopment Agency.

fundamental purposes (see "Project Sponsors and Their Objectives," below), including: to provide substantial new housing, including affordable housing; to attract and support the new UCSF site and anticipated spinoff biotechnology and other related development; and to eliminate blight and revitalize the Project Area, which is currently industrial, commercial, or vacant, and is generally underutilized.

B. PROJECT DESCRIPTION

PROJECT AREA AND LOCATION

The Mission Bay Project Area (defined below) lies within the City and County of San Francisco, California (the City), which is located at the northern end of the San Francisco Peninsula, near the center of the nine-county San Francisco Bay Area (Bay Area). The Project Area lies near the eastern shoreline of the City, about 1 mile south of the City's downtown financial district.

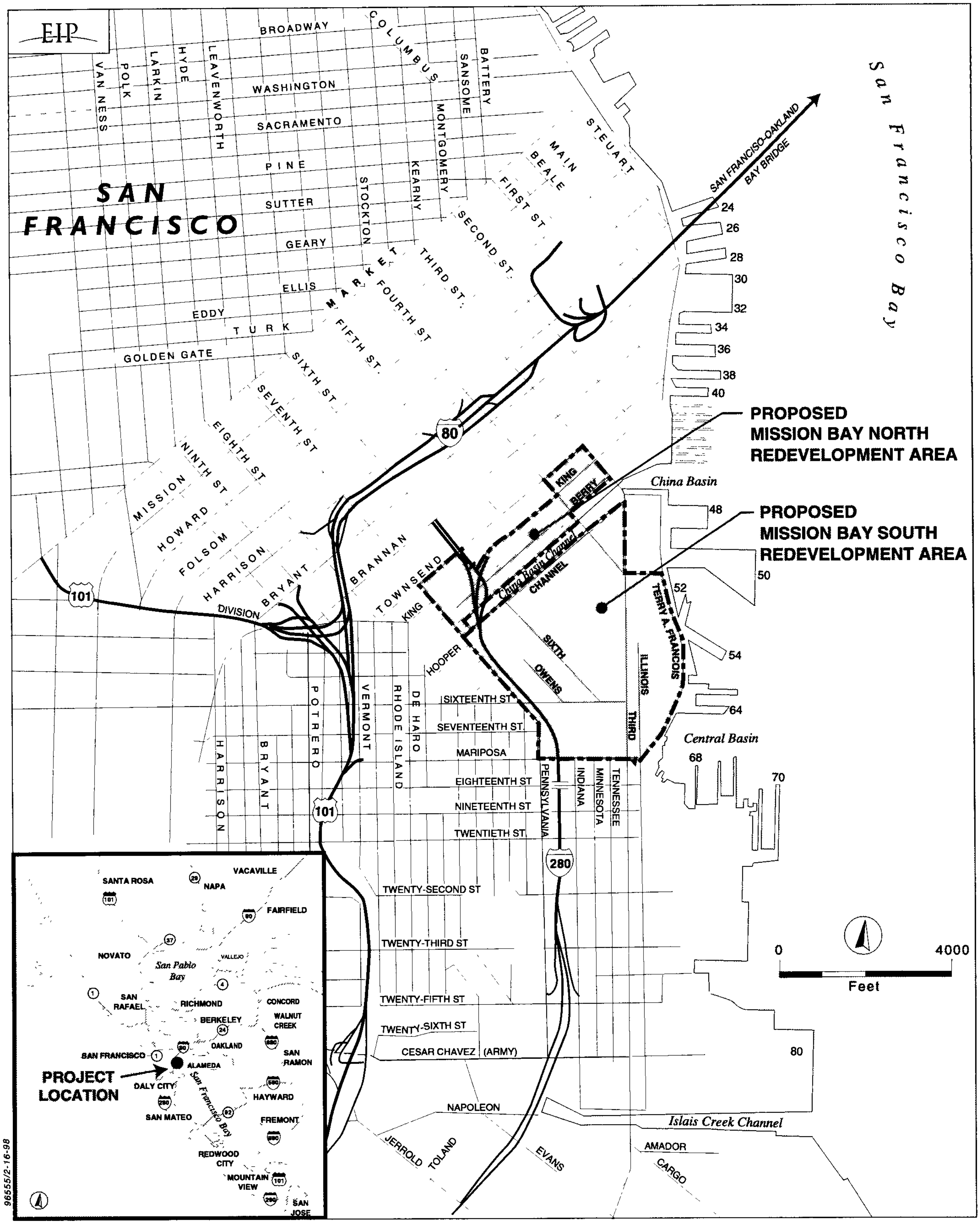
Figure III.B.1 shows the location of Mission Bay within San Francisco, and the boundaries of the proposed Mission Bay North Redevelopment Project (Mission Bay North) and Mission Bay South Redevelopment Project (Mission Bay South), which comprise the Project Area. The inset shows the location of Mission Bay within the Bay Area. For clarity, these two proposed redevelopment projects are referred to herein as the Mission Bay North Redevelopment Area and the Mission Bay South Redevelopment Area.

The Mission Bay Project Area consists of approximately 303 acres, including about 65 acres north of China Basin Channel (the Channel) and 238 acres south of the Channel. The Mission Bay Project Area is generally bounded by Third and Townsend Streets on the north, Seventh and Pennsylvania Streets on the west, Mariposa Street on the south, and Terry A. François Boulevard (formerly China Basin Street) and Third Street on the east. The Project Area does not include the Channel.

Catellus owns the majority of property within the Project Area and is, therefore, a major participant in the proposed project. Other owners of property in the Project Area include the City and County of San Francisco, the Port of San Francisco, the State of California, and other private parties./5/ Figure III.B.2 shows Project Area land ownership as of January 1, 1998.

PROJECT SPONSORS AND THEIR OBJECTIVES

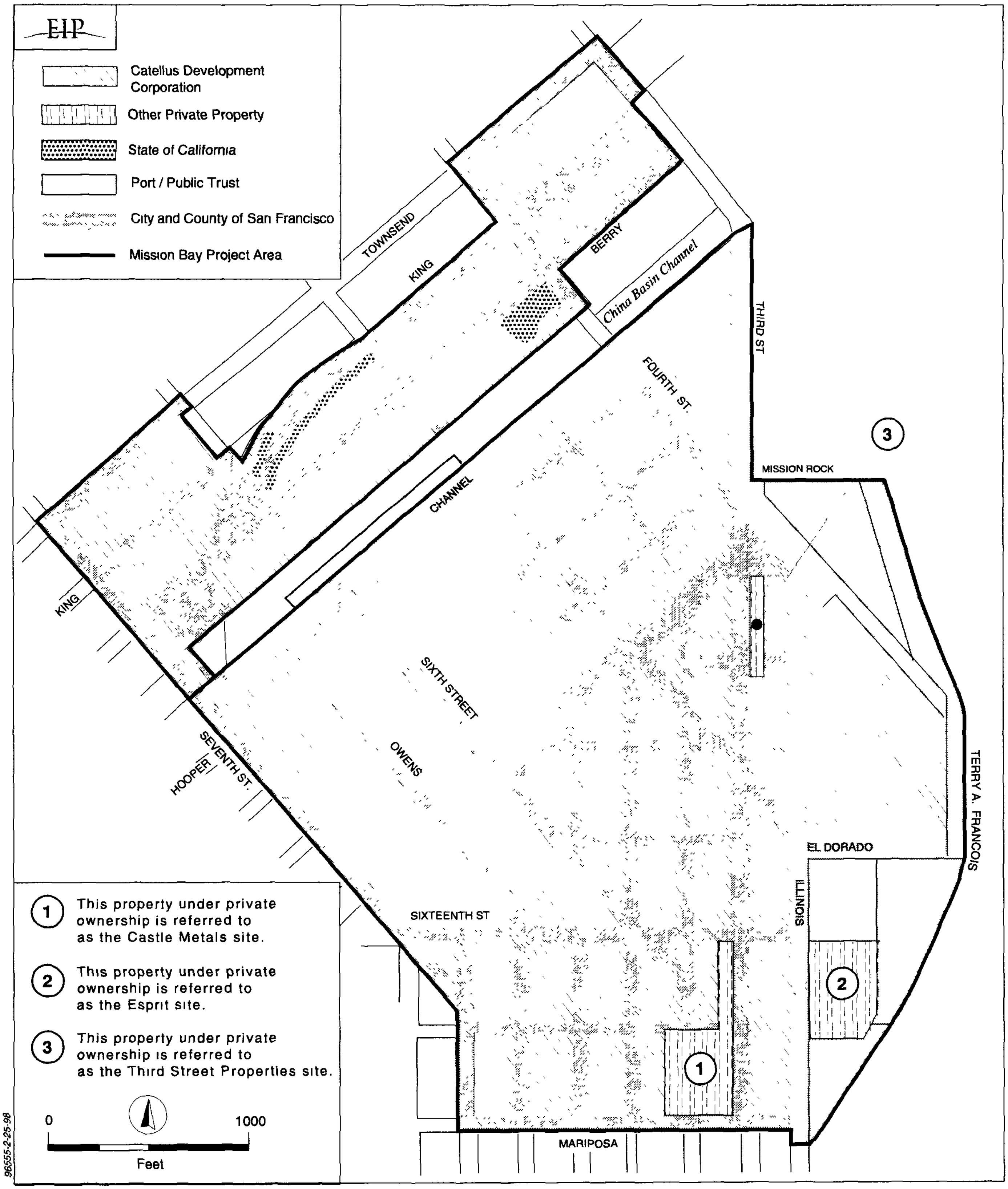
The proposed Redevelopment Plans are the means for implementing concepts set forth by the Mayor of San Francisco. On September 30, 1996, Mayor Willie L. Brown, Jr. sent a letter to the San Francisco Redevelopment Commission describing and supporting Catellus' proposal for Mission Bay



SOURCE: EIP Associates

MISSION BAY SUBSEQUENT EIR

FIGURE III.B.1 PROJECT LOCATION



SOURCE: KCA Engineers, San Francisco Department of City Planning

FIGURE III.B.2 MISSION BAY PROJECT AREA LAND OWNERSHIP AS OF JANUARY 1, 1998

North. In a subsequent letter dated March 3, 1997, Mayor Brown outlined the conceptual agreement between Catellus and the City with regard to the development of Mission Bay South. This non-binding letter included a general description of land uses proposed for Mission Bay to be studied for feasibility as well as a discussion of the proposed land transfers by the City and Catellus to The Regents (for the development of the new UCSF site). In a July 7, 1997, letter, the Mayor forwarded the "conceptual framework" for Mission Bay South to the Redevelopment Agency and requested that the Redevelopment Agency begin preparation and review of pertinent study documents.

The Redevelopment Agency and Catellus are the co-sponsors of the project. The primary objectives of the project sponsors are:/6/

A. Eliminating blighting influences and the correction of environmental deficiencies in the Project Area, including, but not limited to, abnormally high vacancies, abandoned buildings, incompatible land uses, depreciated or stagnant property values, and inadequate or deteriorated public improvements, facilities, and utilities.

B. Retaining and promoting, within the City and County of San Francisco, academic and research activities associated with the University of California San Francisco, which seeks to provide space for existing and new programs and consolidate academic and support units from many dispersed sites at a single major new site which can accommodate the 2,650,000-gross-sq.-ft. program analyzed in the UCSF 1996 LRDP.

C. Assembling of land into parcels suitable for modern, integrated development with improved pedestrian and vehicular circulation in the Project Area.

D. Replanning, redesigning, and developing of undeveloped and underdeveloped areas which are improperly utilized.

E. Providing flexibility in the development of the Project Area to respond readily and appropriately to market conditions.

F. Providing opportunities for participation by owners in the redevelopment of their properties.

G. Strengthening the community's supply of housing by facilitating economically feasible, affordable housing through the installation of needed site improvements and expansion and improvement of the housing supply by the construction of approximately 6,090 market-rate units, including 1,700 units of very low-, low- and moderate-income housing.

H. Strengthening the economic base of the Project Area and the community by strengthening retail and other commercial functions in the Project Area through the addition of approximately 1.5 million gross sq. ft. of retail space, a major hotel, and about 5,557,000 gross sq. ft. of mixed office, research and development, and light manufacturing uses.

I. Facilitating emerging commercial-industrial sectors, including those expected to emerge or expand due to their proximity to the UCSF new site, such as research and development, biotechnical research, telecommunications, business service, multi-media services, and related light industrial through improvement of transportation access to commercial and industrial areas, improvement of safety within the Project Area, and the installation of needed site improvements to stimulate new commercial and industrial expansion, employment, and economic growth.

J. Facilitating public transit opportunities to and within the Project Area to the extent feasible.

K. Providing land in an amount of approximately 47 acres for a variety of open spaces.

L. Achieving the objectives described above in the most expeditious manner feasible.

REDEVELOPMENT PLANS AND PROPOSED LAND USES

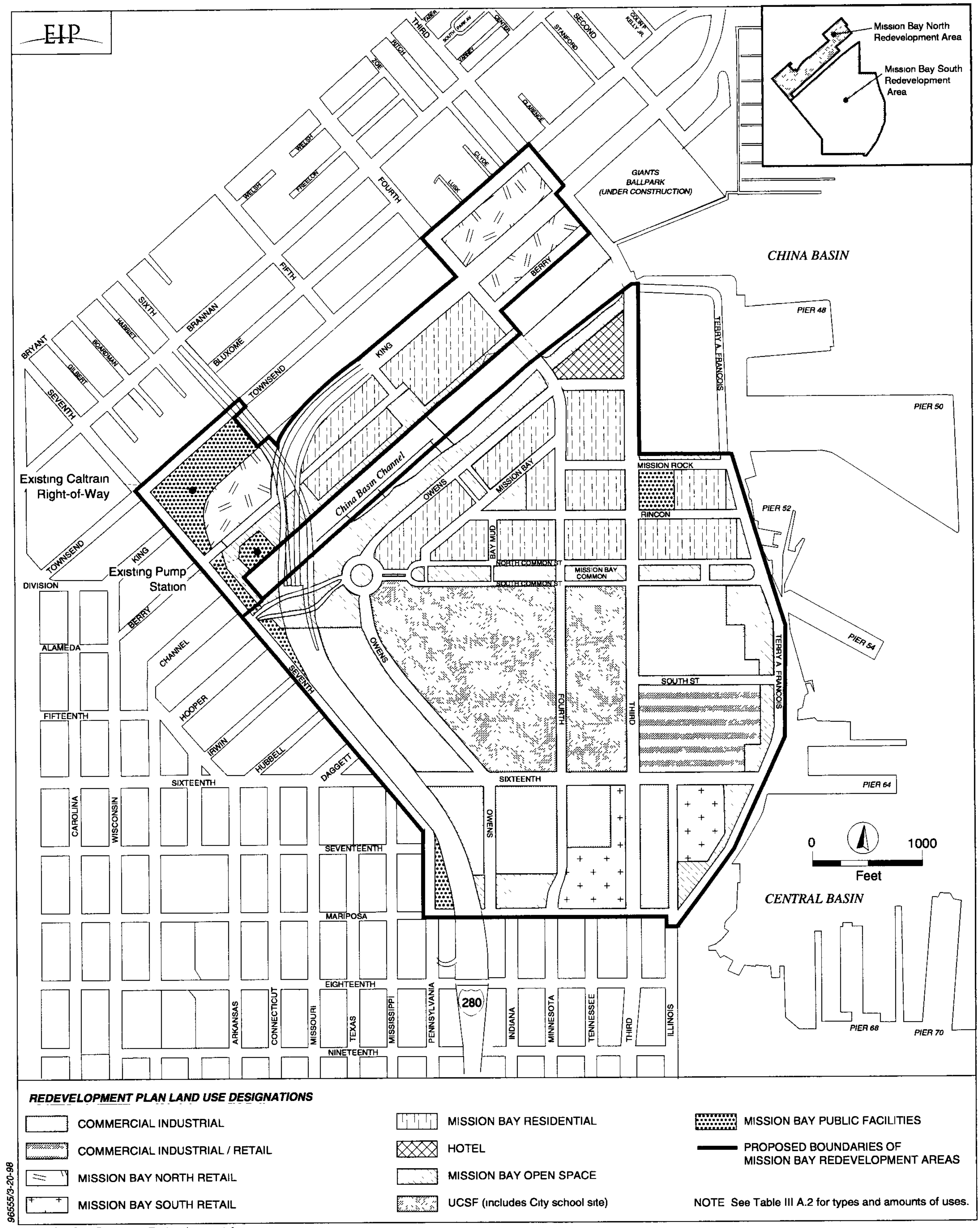
Proposed Land Uses

The proposed Redevelopment Plans for Mission Bay North and Mission Bay South set forth land uses under the following land use designations: Mission Bay Residential, Mission Bay North Retail, Hotel, UCSF, Commercial Industrial, Commercial Industrial/Retail, Mission Bay South Retail, Public Facilities, and Open Space, as shown in Figure III.B.3 and as described below. The land use descriptions provide a broad overview of the types of uses contained in the Redevelopment Plans and analyzed in this SEIR.

Mission Bay Residential

The principal uses in the Mission Bay Residential land use designation, included in both the Mission Bay North and Mission Bay South Redevelopment Plans, would be residential (including live/work) and neighborhood-serving retail. Neighborhood-serving uses would be designed primarily to serve the residents and employees of the immediate neighborhood (referred to as local-serving businesses in the Redevelopment Plans). Uses could include neighborhood-serving retail sales and services, arts activities, home and business services, restaurants, and small (local-serving) offices, such as professional and medical services offices above the ground floor. Secondary uses within this land use designation include uses such as group housing; small offices on the ground floor; small institutional uses, such as residential care, child care, job training, church, and social service facilities; and animal care (e.g., veterinarian) services./7/

Approximately 6,090 residential units would flank the north and south sides of China Basin Channel, including a mix of market rate and affordable/8/ units, as well as a mix of rental and for-sale units. Of these 6,090 units, approximately 5,000 are planned for the Mission Bay Residential blocks and the balance would be included in the blocks designated Mission Bay North Retail, as discussed below.



SOURCE: San Francisco Redevelopment Agency

MISSION BAY SUBSEQUENT EIR

FIGURE III.B.3 LAND USE PROGRAM IN THE PROPOSED REDEVELOPMENT PLANS

To meet the project objective of expansion and improvement of the community's supply of very low-, low-, and moderate-income housing, approximately 1,700 units of the 6,090 total units would be affordable units. Approximately 4,390 units would be market rate.

Differentiating between Mission Bay North and Mission Bay South, of the approximately 3,000 dwelling units north of the Channel, 600 (20%) would be affordable units, and 2,400 (80%) would be market rate. Of the approximately 3,090 dwelling units south of the Channel, 1,100 (36%) would be affordable units, and 1,990 (64%) would be market rate./9/

It is anticipated that the majority of the dwelling units would be contained in five-story structures of flats and apartments on top of one or two levels of at-grade and above-grade parking. Dwelling units may also be constructed in tower structures up to 160 feet in height, except within 100 feet of the north side of the Channel, and on those parcels fronting Terry A. François Boulevard as further discussed below in "Height and Bulk" under "Redevelopment Plans and Proposed Land Uses." Some dwelling units with street-level entries may screen parking uses by wrapping around shorter parking garages within the Mission Bay Residential areas. Common private open space could be developed on these interior parking podiums. There may also be freestanding parking garages.

Portions of the ground floors of residential buildings would contain neighborhood-serving uses, such as retail sales and services. Neighborhood-serving offices would be permitted above the ground floor and would be authorized as secondary uses at the ground floor, within residential buildings./10/ There would be up to 56,000 gross sq. ft. of neighborhood-serving retail north of the Channel and 111,000 gross sq. ft. south of the Channel within the Mission Bay Residential land use designation./11/

Mission Bay North Retail

The Mission Bay North Retail land use designation would contain predominantly retail uses (611,000 gross sq. ft. of retail space, including 389,000 gross sq. ft. of entertainment-oriented commercial and 222,000 gross sq. ft. of city-serving retail), with approximately 1,100 units of housing (including potential live/work). Uses could include retail sales and services; institutional uses; group housing; arts activities and spaces; neighborhood-serving offices; assembly and entertainment, including theaters; restaurants; bars; automotive services; and animal care services (as defined previously).

Up to 389,000 gross sq. ft. of entertainment-oriented commercial uses would be located at the northern end of the Project Area across Third Street from the approved San Francisco Giants Ballpark. Entertainment-oriented commercial means commercial uses that have an entertainment purpose or support nearby entertainment uses. These entertainment-oriented uses are intended to complement the ballpark. Various retail programs could be built under the proposed Redevelopment Plan. For purposes of analysis in this SEIR, the land use program is assumed to include a state-of-the-art theater complex with up to 25 screens, retail uses with an emphasis on sports, small stores that promote a street-level experience, theme restaurants, new technology and/or game-related retail uses, and other restaurants./12/

Approximately 222,000 gross sq. ft. of retail space, in the western corner of the north of Channel area, would be designed to draw customers from the entire City (referred to as city-serving retail in this SEIR).

Off-street parking to accommodate the above land uses would be provided either within separate structures or in attached garages.

Mission Bay South Retail

Similar to the Mission Bay North Retail land use designation, the Mission Bay South Retail designation would include up to 560,000 gross sq. ft. of city-serving retail, which would primarily be located on Mariposa and Third Streets (310,000 gross sq. ft. on the Castle Metals site) and on Illinois Street (250,000 gross sq. ft. at the Esprit site), as shown in Figure III.B.3. Principal uses are substantially similar to those in the Mission Bay North Retail designation, except that residential uses and theaters are excluded. Secondary uses could include institutions, entertainment uses, and automotive services.

Hotel

The Hotel land use designation would include a 500-room hotel, and associated facilities, including banquet and conference facilities and up to 56,000 gross sq. ft. of entertainment-oriented commercial uses between Third and Fourth Streets on the south side of the Channel. Principal uses in the hotel district could include retail business and personal services, arts activities and spaces, nighttime entertainment, catering, and animal care services (as defined previously). Movie theaters would not be allowed under this land use designation.

University of California San Francisco Site

The University of California is exempt under Article 9, Section 9, of the State Constitution from local planning, zoning, and redevelopment regulations whenever land under its control is used for educational purposes. That portion of the Project Area within the UCSF site to be developed as a city school site for the San Francisco Unified School District or as public open space, and the dedicated public streets (e.g., Fourth Street) would be subject to the jurisdiction of the City, the Redevelopment Agency, and the School District and state agencies with jurisdiction over public school construction. UCSF has chosen to work cooperatively with local governments regarding land use and planning issues in order to assure that the mutual interests of the local jurisdiction and UCSF are addressed. To that end, the Goals and Objectives for the UCSF *1996 Long Range Development Plan* (LRDP) indicate that UCSF will develop its uses and plan for growth consistent with city planning and zoning codes and applicable land use plans./13/

The UCSF site would be developed on about 43 acres of land that will be donated by Catellus and the City to The Regents. Up to 2,650,000 gross sq. ft. of space at full build-out, exclusive of parking and the proposed public school, but including instruction, research, and support functions would be developed, as shown in Table III.B.1./14/ In addition to the building space, parking would be developed at a ratio of two spaces per 1,000 gross sq. ft., totaling up to 5,300 parking spaces in structured parking garages./15/

The site would include about 8 acres of open space plus internal pedestrian and vehicle circulation areas. As shown in Table III.B.1, UCSF plans to build approximately 1,220,000 gross sq. ft. of research space, 160,000 gross sq. ft. of classroom space (instruction), and 1,270,000 gross sq. ft. of support space. The research space would include laboratories. There would be no major clinical space, meaning no hospital; however, a small community clinic staffed by UCSF physicians could be located at the site.

Research space would include research conducted in laboratories and offices with their associated research support activities, such as cold rooms, glass wash, and microscopy. The minor amount of classroom space would support seminar type instruction associated with the post-doctoral biomedical research function of the major new site for UCSF./16/ Support space would include four different types of space as indicated in Table III.B.1: academic support, academic and campus administration, campus community, and logistics. Academic support space would be used for functions that support the academic enterprise, such as library and animal care. Academic and campus administration support space would house all administrative activities, including offices for senior administrators (deans, directors, etc.) as well as related academic service facilities, such as conference rooms and copying facilities. It would also be used for nonacademic support functions typically serving the site as a whole, such as police, personnel, and accounting. Campus community space would provide space for activities and amenities such as relaxation and socializing, enjoyment of the natural environment, recreation, fitness, child care, food service, and community clinic. Logistics space

TABLE III.B.1
UNIVERSITY OF CALIFORNIA SAN FRANCISCO
DEVELOPMENT PROGRAM FOR MISSION BAY SITE

Type of Space		Gross Sq. Ft.
Instructional		160,000
Research		1,220,000
Clinical		0
Support:		
Academic Support	265,000	
Academic/Campus Administration	475,000	
Campus Community	160,000	
Logistics	370,000	
Subtotal Support		1,270,000
TOTAL /a/		**2,650,000**

Note:
a. Excluding parking.

Source: University of California San Francisco, *1996 Long Range Development Plan*, adopted January 1997, p. 170.

would be used for the variety of activities involved in operating, maintaining, and repairing the physical facility, such as materials delivery and storage, machine shops, service yards, and utilities.

To serve the needs of the major new site, a utility master plan would be developed./17/ A new central utilities plant to supply the new site with its own steam and electric power would likely be built once a critical mass of buildings is constructed./18/ The central utilities plant could include a cogeneration unit. Boilers, chillers, primary electrical service, and emergency generators would be consolidated at one location. The plant would provide centralized utilities management systems, centralized fire and alarm systems, and centralized maintenance. Until a central utilities plant is built, individual buildings would rely on local public utility services.

The UCSF site would include 2.2 acres of land set aside for an SFUSD public school./19/ The school location would be identified in consultation with the SFUSD but would likely be located adjacent to The Common within the UCSF site.

Commercial Industrial

The Commercial Industrial land use designation would meet the project sponsors' objective of facilitating emerging commercial industrial sectors, such as research and development, biotechnical or semiconductor research, telecommunications, business service, multimedia services, and related light industrial, to the extent possible. The principal land uses within Commercial Industrial would include uses such as light manufacturing; industrial or chemical research laboratories; experimental laboratories; wholesaling, including warehousing; office; home and business services, including construction contractors' offices, printing, and carpentry; animal care services (e.g., commercial kennel); and automotive services./20/ Proposed Commercial Industrial uses in the Project Area total about 5,557,000 gross sq. ft. Up to 4,163,000 gross sq. ft. of Commercial Industrial uses would be allowed within this land use designation. The remaining 1,394,000 gross sq. ft. are included in the Commercial Industrial/Retail designation below./21/ Up to 58,400 gross sq. ft. of neighborhood-serving retail would also be developed. Heavy manufacturing, including large production-scale manufacturing, semiconductor manufacturing, and other similar manufacturing uses would not be included in this land use category. Secondary uses could include uses such as institutions and nighttime entertainment.

The project sponsors expect that the types of research and development may include biotechnology, semiconductor, and computer work. Because a major UCSF site would likely be a magnet for biotechnology research, an emphasis on biotechnology is anticipated. In addition, multimedia and software companies are expected to locate in the Project Area due to the presence of such companies to the north and west of the Project Area and to the increasing demand for such space.

Commercial Industrial buildings are expected to be developed to the lot lines. The neighborhood-serving retail would occupy ground-floor space in various buildings and parking structures within the Commercial Industrial areas. Usable private open space could include at-grade plazas and courtyards.

Commercial Industrial/Retail

The principal land uses within the Commercial Industrial/Retail land use designation would be as described for the Commercial Industrial areas and would include city-serving retail and institutional uses. Up to 1,394,000 gross sq. ft. of research/light industrial/office, and up to 23,000 gross sq. ft. of city-serving retail uses would be allowed. About 31,600 gross sq. ft. of neighborhood-serving retail would occupy ground-floor space in various buildings and parking structures within the Commercial Industrial/Retail area. Secondary uses could include uses such as institutions and nighttime entertainment.

Public Facilities

Several existing and planned public facilities would comprise the Public Facilities land use designation.

Fire Station No. 30, which is no longer in service, is on Third Street at Mission Rock Street. Catellus would convey approximately 1.26 acres adjacent to the existing station to the City for a police/fire station within Mission Bay South. Combined with the area containing the existing fire station, the total acreage would be 1.52 acres.

The Channel Pump Station at the southwestern end of China Basin Channel pumps combined sanitary sewage and rainfall runoff to the Southeast Water Pollution Control Plant. The pump station would not be changed by the project.

Within the Mission Bay Project Area are the Caltrain tracks running through the block bounded by Townsend, Sixth, Berry, and Seventh Streets and turning south under I-280./22/ These tracks would not be altered as part of the project. There are also open lots and storage areas under the elevated I-280 freeway which would not be altered as part of the project.

Open Space

Approximately 47 acres of public open space would be provided as part of the project, 6 acres in Mission Bay North and 41 acres in Mission Bay South, including 8 acres within the UCSF site. Public open space would be created and improved along the Channel, and within the residential and retail areas. Public open space would include a square at Fifth Street, a promenade along the north side of the Channel, a linear park along the south side of the Channel, park areas near the pump station, and a triangular park in the middle of the southern residential areas. The Common, a landscaped open space approximately 130 feet wide between two parallel streets, would bisect the Project Area from east to west. The Channel edges would be improved with public open space and viewing promontories, and a pedestrian bridge is proposed to be built across the Channel at approximately Fifth Street, subject to obtaining the required permits and approvals. The existing pump station at the western end of the Channel would remain. Public open space would be outfitted with amenities appropriate for the proposed use. These could include, for example, public restrooms, furniture, picnic areas, drinking fountains, and/or play equipment. Proposed public open space is discussed in "Proposed Project Open Space," under "Recreation and Parks: Impacts" in Section V.M, Community Services and Facilities.

Existing, Temporary, and Interim Uses

Existing Uses

Under the proposed Redevelopment Plans, existing uses could remain in the Project Area until new development implementing the Redevelopment Plan is undertaken. Some limited ability would be provided to change uses and to enlarge, intensify, extend, or expand existing structures to accommodate business operations. A discussion of existing business activity and employment is provided in "Existing Business Activity and Employment" under "Project Area" in Section V.C, Business Activity, Employment, Housing, and Population: Setting.

Temporary Uses

Temporary uses such as fairs, carnivals, truck parking and loading, seasonal sales lots, and convention staging facilities would be permitted in the Project Area for up to 90 days under the proposed Redevelopment Plans.

Interim Uses

Interim uses would be permitted throughout the Project Area at the discretion of the Redevelopment Agency pending ultimate build-out with development program uses. Under the proposed Redevelopment Plans, the Redevelopment Agency may use or permit the use of any land in the Project Area for interim uses, as defined below, for an initial time period of up to 15 years, with additional five-year extensions at the discretion of the Redevelopment Agency. As defined in the Redevelopment Plans, interim uses would include temporary structures and offices that are incidental to the proposed new development. These might include sales or rental offices for new residential development, construction staging for development, and other staging that would occur in connection with the development of proposed project uses. Open recreational uses, parking, truck parking, and storage would also be allowable interim uses. Uses that require permits and are not exempt from the California Environmental Quality Act (CEQA) would require separate environmental review at the time they are proposed; such uses are not covered in this SEIR because their type, location, and timing are unknown.

Proposed Interim Use - Giants Ballpark Parking and UCSF Surface Parking

There are two interim surface parking uses currently proposed by the project sponsors in Mission Bay South. Parking just south of the Channel would be for San Francisco Giants Ballpark use and parking north of 16th Street and west of Third Street would be for UCSF site uses as shown in Figure III.B.4. Current plans are that the ballpark lots would occupy the site until 2005. The UCSF surface parking would continue until UCSF determines that structured parking is necessary. Additional interim parking may also be provided for UCSF depending on the timing and scope of future development, and whether such development supports construction of structured parking. Parking lots currently proposed on the UCSF site include about 1,000 parking spaces on about 15 acres in the southern portion of the UCSF site.

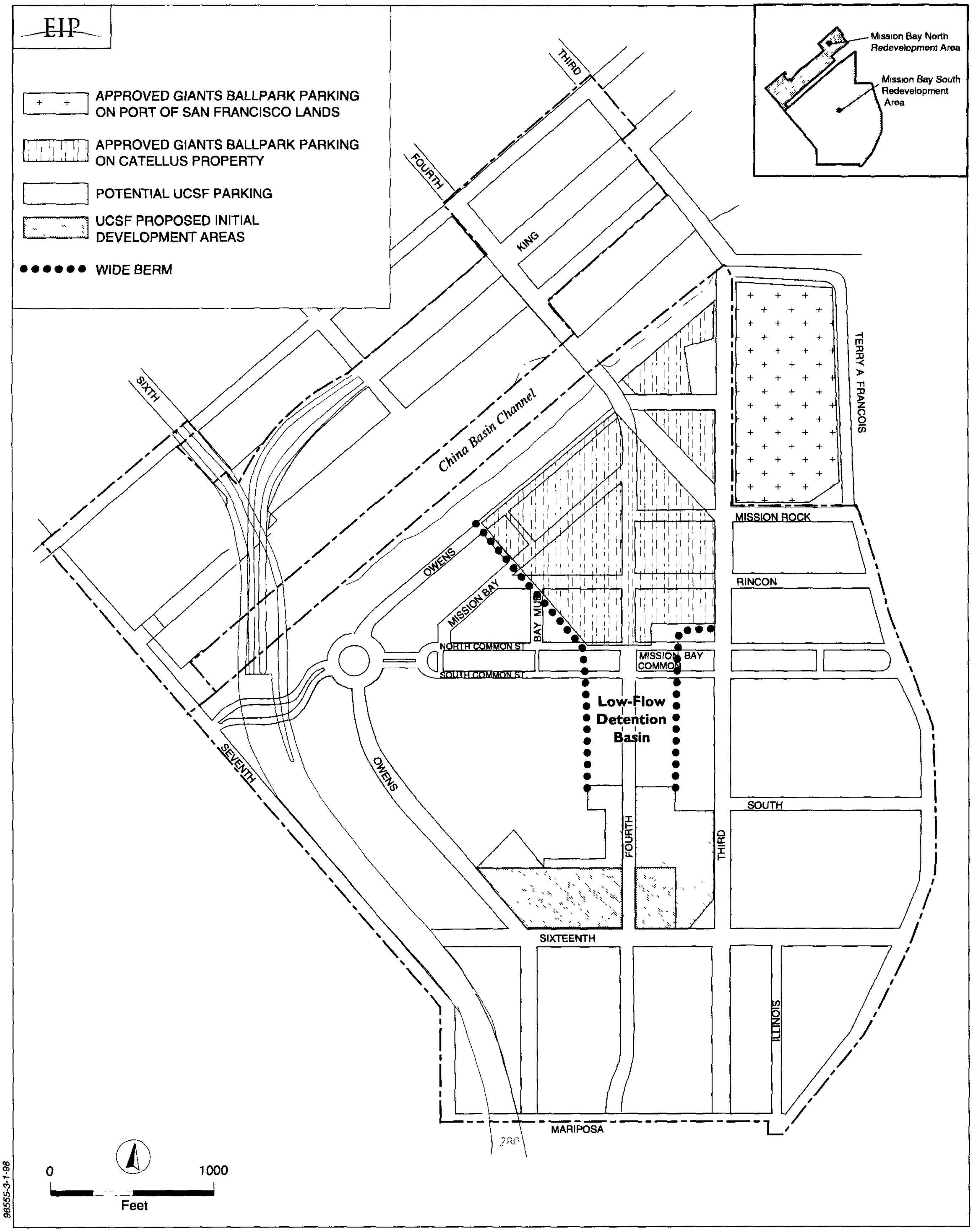
Parking agreements between Catellus and the Giants for the first five years of ballpark operation include surface parking for about 3,250 vehicles on about 20 acres. Ballpark parking areas include Catellus and port-owned land on both sides of Third Street south to the proposed North Common Street. On about 13 acres of port property adjacent to the Project Area, surface parking for about 2,000 vehicles would be provided for the first 10 years of ballpark operation, until 2010. The ballpark parking for about 5,000 vehicles has been approved by the Zoning Administrator in conjunction with approval of the Giants Ballpark. It would be consistent with the interim use provisions of the proposed Mission Bay South Redevelopment Plan.

The proposed interim parking lots would contain lighting as well as a minimum amount of raised curbs to facilitate efficient surface drainage. It is unlikely that major capital improvements would be constructed and thus, only limited landscaping would be installed. The development of interim use surface parking in these areas would likely require an interim drainage system to offset the increased amount of overland flows from the increase in impervious surface (about 35 acres in total under the illustrative scenario shown in Figure III.B.4).

The development of interim paved parking lots would increase surface water flows in the Project Area. The interim drainage plan, as currently conceived, would include the construction of one or more shallow, surface detention basins bounded by berms. Drainage from the lots would be connected with the City's combined collection system. "Interim and Temporary Uses," under "Sewers and Wastewater Treatment: Impacts" in Section V.M, Community Services and Utilities, includes a discussion of interim drainage.

Transportation Facilities and the Revised Street Pattern

As shown in Figure III.B.3, the existing street pattern (shown in Figure III.B.1) would be changed, although Third Street, 16th Street, and the lower portion of Owens Street would remain in substantially their current alignments. Owens Street would be extended south to Mariposa Street and north to a circle and then northeast along the southern Channel edge to Fourth Street, to the south of



SOURCE KCA Engineers

MISSION BAY SUBSEQUENT EIR

FIGURE III.B.4 ILLUSTRATIVE INTERIM PARKING AND DRAINAGE PLAN

the current Channel Street, which would be replaced as part of the development of a park along the Channel. Berry Street would be vacated and closed between Fourth and Fifth Streets, except for driveway access to residential buildings. Fourth Street would be realigned south of the Channel; Fourth Street would no longer intersect with Third Street, but would run south parallel to Third Street, ending at Mariposa Street opposite Minnesota Street's intersection with Mariposa Street. A series of new east-west streets would be created. Streets in the Project Area would contain on-street parking for all or part of the day, except for parts of Owens Street and Berry Street, and all of (proposed) South Street, 16th Street, and Third Street. Street names, such as South Street, are not permanent names but are assumed for the purpose of this SEIR analysis.

Within certain large areas, including the UCSF site, and the area between South Common Street, 16th Street, and the area east of Third Street, there would be few improved public streets open to vehicular traffic, as shown in Figure III.B.3. These large areas would contain private streets and public easements for public access and use, which could function primarily as utility corridors, and/or view corridors.

The Caltrain tracks would remain in place. Regarding other rail access, the Port of San Francisco and Catellus have developed options for the relocation of rail access through the developable parcels in the Project Area to facilitate development. For the purposes of this SEIR, it is assumed that the rail access would be relocated along 16th Street.

To provide a pedestrian link between the northern and southern sides of the Channel in addition to the existing Lefty O'Doul and Peter Maloney Bridges (on Third and Fourth Streets), the project is proposed to include a pedestrian bridge approximately in alignment with Fifth Street, subject to acquisition of the necessary permits and approvals. The bridge would be controlled in coordination with the operation of the Lefty O'Doul and Peter Maloney Bridges to allow boat traffic underneath.

Although not part of the planned project, the MUNI Third Street light rail extension between Market Street and the Bayshore station is proposed to be located along Fourth and Third Streets through the Project Area. A MUNI substation is proposed to be located in the proposed public open space at Terry A. François Boulevard and Mariposa Street. MUNI estimates that the first phase of light rail operation will begin in 2003.

Infrastructure Improvements

The project includes improvements and extensions of existing infrastructure as well as new construction for the low- and high-pressure water supply systems and sewer systems.

In Mission Bay North and Mission Bay South, the project includes improvements to the existing low-pressure water system and construction of new water supply lines to unserved areas of the project. See "Low-Pressure Water System," under "Water Supply: Impacts" in Section V.M, Community Services and Utilities.

The existing Auxiliary Water Supply System (AWSS), which is used for fire-fighting, is not fully developed in the center of the Project Area; therefore, it would be extended into the Project Area. The project's AWSS would connect to the City's AWSS through existing lines in Third Street and Mariposa Street. The Mission Bay North system would be connected with the proposed Mission Bay South system by a new line near Seventh Street and Berry Street, and a relocated line connecting the Fourth Street line with the Third Street line. Three new suction inlets used for fire-fighting water supply would be located in the Channel and four in the Bay; these would provide Mission Bay with a total of 11 suction inlets (6 in the Channel and 5 in the Bay). See "Fire-Fighting Water Supply," under "Water Supply: Impacts" in Section V.M, Community Services and Utilities.

Major changes are proposed to the existing sewer infrastructure to accommodate the project. The City and County of San Francisco are generally served by combined sewers, which are sewers that carry both sanitary sewage and stormwater. North of the Channel additional combined sewer lines would connect to existing combined sewer facilities.

The area south of the Channel would have an area served by combined sewers and an area served by separated sewers. The existing combined sewer system along 16th Street and between 16th Street and Mariposa Street would be improved with new combined sewer lines. A new auxiliary sewer line would be constructed in the southeastern portion of the Project Area to increase storage capacity. See "Sewer Infrastructure Improvements," under "Sewers and Wastewater Treatment: Impacts" in Section V.M, Community Services and Utilities, for further explanation.

In the central area south of the Channel, roughly between the Channel and 16th Street, a system of separate sanitary-sewage-only and stormwater-only lines is proposed. The sanitary sewer system would transport sewage to the City's existing combined sewer system. Sewage west of Fourth Street would flow to the existing Channel Street storage sewer near the existing Sixth Street overflow outfall, and sewage east of Fourth Street would drain to the east end of the Channel Street storage sewer near the Peter Maloney Bridge. Some existing sewer lines would need to be relocated to conform with proposed street rights-of-way. The stormwater-only system would divert the "initial flows" of each storm to the Channel Street storage sewer for later treatment at the City's Southeast Water Pollution Control Plant. Stormwater flows in excess of the initial flows would be diverted to the Bay or the southern edge of the Channel through four new stormwater outfalls.

Urban Form and Design

Each of the two Redevelopment Plans provides for a Design for Development document that includes more specific design standards, such as height, bulk, and density parameters that apply to all of the proposed development, except UCSF. The design standards, for the most part, reflect the Goals and Objectives of the UCSF *1996 Long Range Development Plan*, which in turn has been adopted by UCSF. In addition, development in each of the Redevelopment Areas will be subject to Owner Participation Agreements and other agreements which generally include, among other components, Scope of Development documents that provide additional design guidelines. The following describes the design standards and guidelines and the conceptual development plan. The conceptual development plan is subject to change, within the parameters set forth by the Redevelopment Plans and the Design for Development documents.

The Redevelopment Agency, together with the Mission Bay Citizens Advisory Committee (CAC), its Design Subcommittee and Catellus Development Corporation, have prepared a Design Standards and Guidelines document (as revised March 30, 1998). This document will not be adopted by the Redevelopment Agency Commission or the Board of Supervisors; however, it has been endorsed and accepted by the CAC and is the underlying document for the Designs for Development for Mission Bay North and Mission Bay South. The design standards and area-wide guidelines in the CAC-endorsed Design Standards and Guidelines will be incorporated in the two Design for Development documents, along with Planning Code Standards as referenced in this environmental document (e.g., loading requirements). Those parcel- or owner-specific guidelines will be incorporated in the scope of development documents for Mission Bay North and Mission Bay South.

Overview

The northernmost two blocks of the proposed Mission Bay North Redevelopment Area, bounded by Third, Townsend, Fourth, and Berry Streets, facing the approved San Francisco Giants Ballpark, would emphasize entertainment-oriented commercial uses. Twenty percent of the area within these blocks could include buildings from 120 feet to 160 feet tall.

The remainder of the Mission Bay North Redevelopment Area would include housing and retail. Close to the Channel (within 100 feet), building heights would step down to an average height of 65 feet and to an average height of 50 feet within 20 feet of the landscaped walkway along the Channel. Retail and housing would lie on the western side of I-280, connected by Berry Street and a northbound surface roadway adjacent to the I-280 off-ramp, and by public open space under the I-280 freeway to the rest of Mission Bay North.

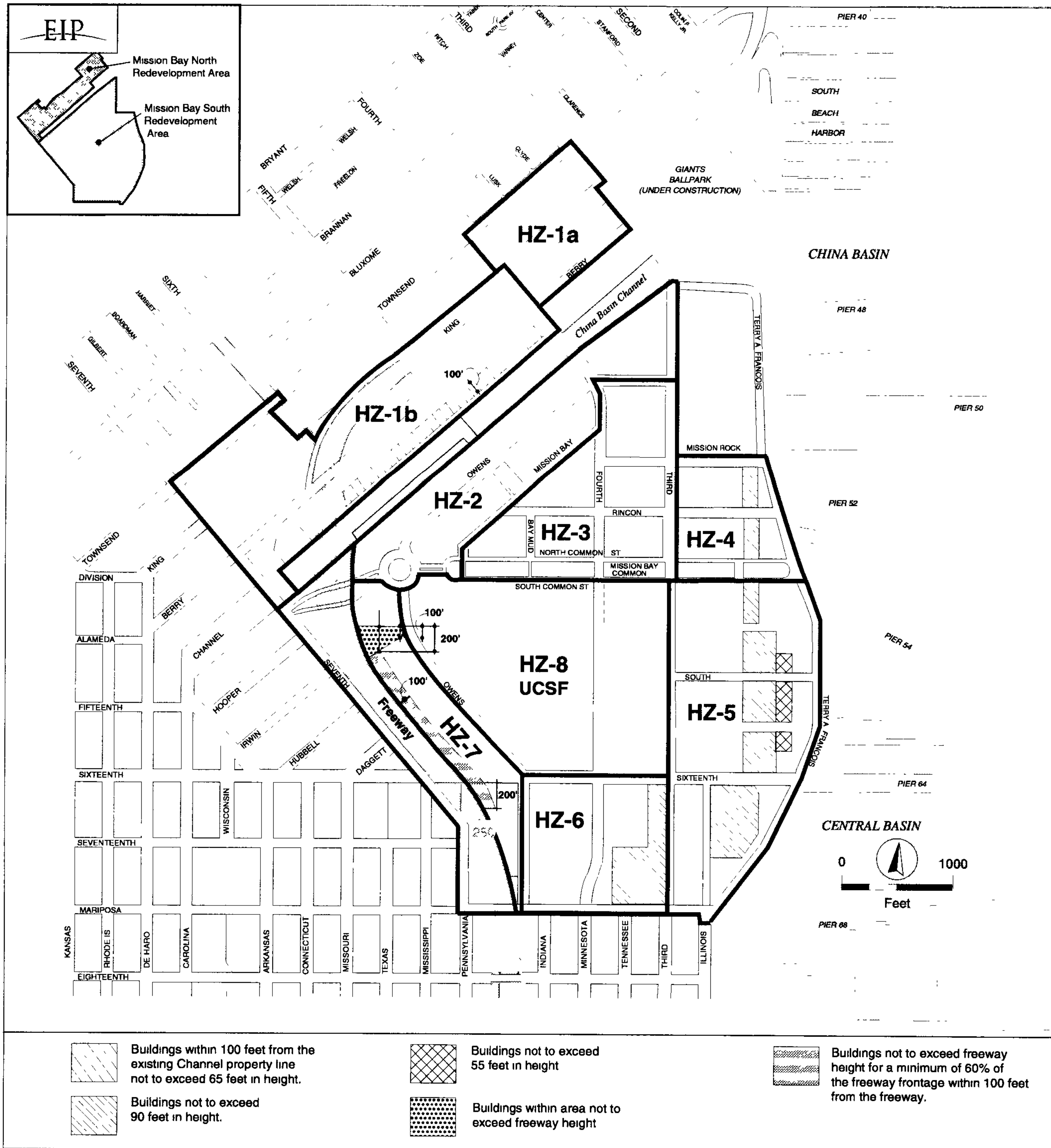
The Channel edges would be modified to provide public access through improvements that include a pedestrian circulation system along the top of the Channel banks on the north and south sides; promontory areas overlooking the Channel; a proposed pedestrian bridge over the Channel linking Fifth Street to the future Owens Street; stabilization of the banks of the Channel with riprap/23/; and landscaping with salt-tolerant vegetation.

Within the Mission Bay South Redevelopment Area, the area along the southern edge of the Channel would be public open space and residential. The rest of the primarily residential uses would lie between the Channel and the UCSF and Commercial Industrial areas. Some residential towers of up to 160 feet are anticipated to be built along certain locations of intense activity, such as King Street, Third Street, and Fourth Street.

Proceeding south, UCSF would be bordered by Commercial Industrial areas to the west, south and east. As shown in Figure III.B.5, buildings within certain areas adjacent to the freeway would not exceed the height of the freeway. Buildings adjacent to I-280 from Irwin Street to just south of 16th Street, would be partially restricted within the first 100 feet adjacent to the freeway, and would not exceed the height of the freeway for a minimum of 60% of that freeway frontage for each of the adjacent development blocks. Buildings on the Castle Metals and Esprit sites and along the public open space on Terry A. François Boulevard would be restricted in height to 90 feet or less. There would be large retail uses in the south between 16th and Mariposa Streets near Third Street. Along the edge of Terry A. François Boulevard near the Bay, a park would stretch from Mission Rock Street to Mariposa Street.

Height and Bulk

Figure III.B.5 shows the nine proposed height zones for the Project Area. Height zones specify maximum building height, excluding ancillary mechanical devices and exhaust stacks on rooftops./24/ Mechanical penthouses could extend an additional 15 feet for residential and office uses above the heights discussed below. Mechanical penthouses for light industrial, research and development uses, and the instructional, research, and support uses at the UCSF site, could extend higher, about an average of 20 to 24 feet. Exhaust stacks above these mechanical penthouses could extend an additional height of 12 feet or more. Proposed height zones would provide flexibility in locating the taller buildings within each zone. The height zones specify limits by percentage of developable area as shown in Figure III.B.5 and Table III.B.2. Developable area means all land within a height zone except designated public open space, the streets, or utility easements. The Design for Development documents would apply bulk restrictions (except on the UCSF site) to control the length and width of all buildings above 90 feet tall./25/



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SOURCE. San Francisco Redevelopment Agency
NOTE: See Table III.B 4 for additional detail

MISSION BAY SUBSEQUENT EIR

FIGURE III.B.5 REDEVELOPMENT PLANS BUILDING HEIGHT LIMITS

TABLE III.B.2
PROVISIONS GOVERNING HEIGHT ZONES IN PROPOSED MISSION BAY REDEVELOPMENT AREAS

Height Zones/a/	HZ-1a	HZ-1b
Base Height	80 ft.	65 ft.
% of developable area	30%	75%
sq. ft. of developable area/b/	111,078 sq. ft.	606,682 sq. ft.
Mid-Rise Height	120 ft.	90 ft.
% of developable area	50%	10%
sq. ft. of developable area	185,130 sq. ft.	80,891 sq. ft.
Tower Height	160 ft.	160 ft.
% of developable area	20%	15%
sq. ft. of developable area	74,052 sq. ft.	121,336 sq. ft.
Maximum number of towers at maximum bulk and height	4	6
Location	N.A.	No buildings above 65 ft. within 100 ft. of existing north Channel property line; no buildings above 90 ft. south of Berry Street. Maximum average height of 50 ft. to a depth of 20 ft. along channel edge.
Corners	No intersection to allow more than 3 towers within 50 ft. of a corner	No intersection to allow more than 3 towers within 50 ft. of a corner
Tower Separation	N.A.	Minimum 125 ft. when located on one block. Exceptions considered for slim/twin tower designs with special review.

Notes:
N.A. = not applicable.
a. See Figure III.B.5 for the location of the height zones.
b. Calculations developed by EIP Associates.

(Continued)

Height Zone 8, which encompassses the UCSF site, is not included in this table.

TABLE III.B.2 (Continued)

Height Zones/a/	HZ-2	HZ-3	HZ-4	HZ-5	HZ-6	HZ-7
Base Height	65 ft.	65 ft.	65 ft.	90 ft.	90 ft.	90 ft.
% developable area	75%	80%	80%	93%	90%	85%
sq. ft. of developable area/b/	313,635 sq. ft.	549,206 sq. ft.	177,387 sq. ft.	87,624 sq. ft.	381,843 sq. ft.	468,746 sq. ft.
Mid-rise Height	90 ft.	90 ft.	90 ft.	N.A.	N.A.	N.A.
% developable area	10%	13%	13%	N.A.	N.A.	N.A.
sq. ft. of developable area	41,818 sq. ft.	89,246 sq. ft.	28,824 sq. ft.			
Tower Height	160 ft.	160 ft.	160 ft.	160 ft.	160 ft.	160 ft.
% developable area	15%	7%	7%	7%	10%	15%
sq. ft. of developable area	62,726 sq. ft.	48,055 sq. ft.	15,520 sq. ft.	65,954 sq. ft.	42,427 sq. ft.	82,720 sq. ft.
Maximum number of towers at maximum bulk and height	3	3	1	3	2	4
Location	N.A.	N.A.	No towers within hatched areas, see Figure III.B.4. Max. 50 ft. average on Bayfront to a depth of 20 ft.	No towers within hatched areas, see Figure III.B.4.	No towers within hatched areas, see Figure III.B.4.	Buildings above height of freeway in limited locations, see hatched areas in Figure III.B.4.
Corners	No intersection to allow more than 2 towers within 50 ft. of corner in Height Zones 2, 3, 4, 5, 6, and 7.					
Tower Separation	Minimum 125 ft. when located on one block in Height Zones 2, 3, and 4. Exceptions considered for slim/twin tower designs with special review.			Minimum 100 ft. when located on one block in Heights Zones 5 and 6.		Minimum 200 ft. in Height Zone 7.
Orientation	Tower width along 3rd Street not to exceed 160 ft. in Height Zones 2, 3, 4, 5, 6, and 7.					

Notes:
N.A. = not applicable.
Height Zone 8, which encompassses the UCSF site, is not included in this table.
a. See Figure III.B.5 for the location of the height zones.
b. Calculations developed by EIP Associates.

Source: San Francisco Redevelopment Agency, *Design Standards and Guidelines, Mission Bay*, Draft C, prepared by Catellus Development Corporation; as adopted by the Mission Bay Citizens Advisory Committee on December 11, 1997, revised March 30, 1998.

Height Zone 1a, at the northern tip of the Project Area, provides that 50% of the developable area could extend up to 120 feet, and an additional 20% could extend up to 160 feet; the remaining area (30%) would be limited to 80 feet. Four 160-foot-high towers with plan lengths of 165 feet and plan diagonals of 190 feet, above 120 feet could be developed in Height Zone 1a.

Height Zone 1b, which covers the remainder of the Mission Bay North Redevelopment Area, provides that 10% of the developable area could extend up to 90 feet, and an additional 15% could extend up to 160 feet; the remaining area (75%) could extend up to 65 feet. In addition, buildings within 100 feet of the Redevelopment Plan boundary along the Channel would be limited to 65 feet. Buildings fronting the Channel edge would maintain an average height of 50 feet to a depth of 20 feet. Six 160-foot-high towers with plan lengths of 160 feet and plan diagonals of 190 feet above 90 feet could be developed in Height Zone 1b.

Height Zone 2, along the southern side of the Channel, provides that 10% of the developable area could extend up to 90 feet, and an additional 15% could extend up to 160 feet; the remaining area (75%) could extend up to 65 feet as shown in Figure III.B.5. Three 160-foot-high towers with residential plan lengths of 160 feet and plan diagonals of 190 feet above 90 feet and hotel plan lengths of 200 feet above 90 feet could be developed in Height Zone 2.

Height Zone 3, in the middle of the Mission Bay Residential areas south of the Channel, provides that 13% of the developable area could extend up to 90 feet, and an additional 7% could extend up to 160 feet; the remaining area (80%) could extend up to 65 feet, as shown in Figure III.B.5. Three 160-foot-high towers with plan lengths of 160 feet and plan diagonals at 190 feet above 90 feet could be developed in Height Zone 3.

Height Zone 4, to the east of Third Street, including The Common and the area to the north, provides that 13% of the developable area could extend up to 90 feet, and an additional 7% could extend up to 160 feet; the remaining area (80%) could extend up to 65 feet, as shown in Figure III.B.5. As shown in Figure III.B.5, along the public open space on Terry A. François Boulevard, building height could extend up to 90 feet abutting the public open space. Within 20 feet of the Bayfront open space, development along Terry A. François Boulevard would maintain an average height of 50 feet. One 160-foot-high tower with a plan length of 160 feet and plan diagonal of 190 feet above 90 feet could be developed in Height Zone 4.

Height Zone 5, to the east of Third Street and south of The Common, provides that 7% of the developable area could extend up to 160 feet; the remaining area (93%) could extend up to 90 feet. Designated areas in Figure III.B.5 indicate additional height restrictions up to 55 feet in height along the bayside linear park. Buildings fronting the public open space along Terry A. François Boulevard could extend up to 90 feet in height. In the middle portion of the area fronting the open space along Terry A. François Boulevard, the maximum height would be 55 feet. Three 160-foot-high towers with plan lengths of 200 feet above 90 feet could be developed in Height Zone 5.

Height Zone 6, between 16th, Third, Mariposa, and Owens Streets, provides that 10% of the developable area could extend up to 160 feet; the remaining area (90%) could extend up to 90 feet. As shown in Figure III.B.5, building height on the Castle Metals site could extend up to 90 feet. Two 160-foot-high towers with plan lengths of 200 feet above 90 feet could be developed in Height Zone 6.

Height Zone 7, between I-280 and Owens Street south of The Common, provides that 15% of the developable area could extend up to 160 feet; the remaining area (85%) could extend up to 90 feet. Buildings within 100 feet of the freeway could extend above the height of the freeway for a maximum of 40% of the freeway frontage for each of the development blocks. Figure III.B.5 indicates additional height restrictions where no buildings would exceed the height of the freeway. Just south of the Owens Street circle, buildings would not exceed the height of the freeway. The purpose of the limitation on heights adjacent to the freeway is to reduce blocking of views from the freeway. Four 160-foot-high towers with plan lengths of 200 feet above 90 feet could be developed in Height Zone 7.

Height Zone 8 encompasses the UCSF site. No height limit would be established for Zone 8. UCSF expects typical building heights of 110 feet or less and does not envision development of buildings higher than 160 feet (excluding rooftop mechanical equipment and exhaust stacks, which could extend up to an average of an additional 36 feet), corresponding to the proposed surrounding height limits./26/

The existing height limits in the Project Area are discussed in "Proposed Redevelopment Plans," under "Urban Design" in Section V.D, Visual Quality and Urban Design: Impacts.

Density

In the Mission Bay North Redevelopment Plan, the total number of housing units would be approximately 3,000. The average density on land designated Mission Bay Residential would be about 140 dwelling units per acre. In addition, there would be some neighborhood-serving retail uses on the ground floor. The amount of total retail and commercial development allowable under the Redevelopment Plan for land designated Mission Bay North Retail would result in an average floor area ratio/27/ (FAR) of about 1.1:1. There would be an average of about 80 dwelling units per acre in this land use designation.

In the Mission Bay South Redevelopment Area, the total number of housing units would be approximately 3,090, and the average density on land designated Mission Bay Residential would be about 110 dwelling units per acre. There would also be neighborhood-serving retail on the ground floor. Hotel development would be limited to 500 rooms, plus banquet and conference facilities.

Retail development allowable in the Mission Bay South Retail land use designation would result in an average FAR of about 1.5:1.

The average FAR analyzed in this SEIR for the Commercial Industrial and Commercial Industrial/Retail designations combined is 2.9:1. This SEIR analyzes an overall amount of commercial industrial development and retail development that is consistent with the maximum amount of development allowable under the Redevelopment Plan for Mission Bay South.

The amount of development proposed in the UCSF LRDP for the UCSF site—about 2,650,000 gross sq. ft.—would result in an average FAR for the UCSF area of about 2.6:1, calculated on the developable area exclusive of the proposed public school site and public open space.

Coverage

The Design for Development documents generally would allow 100% lot coverage at ground level, in other words, buildings flush with the edges of sidewalks and interior lot lines./28/ In the residential and hotel districts, there would be a coverage limit of 75% above 40 feet in height, requiring building setbacks above the third story. Usable private open space would be provided in residential areas in the amount of 70 square feet per unit. In the Mission Bay North Retail district, usable open space would be provided for residential uses in the amount of 35 square feet per unit. Usable private open space could include individual unit space and common open space.

Setbacks

The Design for Development documents include setback requirements (in addition to specified sidewalk widths) for three streets, Third, Mariposa, and Owens Streets./29/ The setbacks provide space for pedestrian and bicycle path links and for connection of major open spaces. A 5-foot setback would be required on the east and west side of Third Street from one block south of the Channel to Mariposa Street solely for a wider sidewalk. A 20-foot setback would be required on the north side of Mariposa Street from Terry A. François Boulevard to Owens Street for a pedestrian/bicycle connection. Lastly, a 20-foot setback would be required on the east side of Owens Street from 16th Street to the Owens Street circle for a pedestrian pathway. Other pedestrian and bicycle facilities would be provided within public rights-of-way, as described under "Bicycle Circulation" below.

Treatment of the Channel Edges

The edges of China Basin Channel would be modified as part of the project to increase public access and to stabilize the Channel banks, as described in "Proposed China Basin Channel Edge and Bridge Treatments" and as shown in Figure V.L.2 in Section V.L, China Basin Channel Vegetation and Wildlife: Impacts. At the top of the northern bank, a pedestrian walkway would parallel the Channel edge. Promontories would be developed within the Project Area at locations near Fourth, Fifth, and Sixth Streets, and could extend from this paved walkway out over the water. The Project Area boundaries encompass some of the Channel edges, banks, and water. The pedestrian circulation system and the promontories are proposed to afford opportunities for passive recreation, such as strolling, sitting, socializing, and viewing. At various places along the northern and southern edges of the Channel, rip-rap and landscaping would be installed to stabilize the Channel banks. Treatments for some areas have not been specifically defined. A pedestrian bridge over the Channel is proposed to link Fifth Street to the future Owens Street, subject to obtaining the required permits and approvals.

Circulation

Traffic Circulation

Figure III.B.3 shows the proposed street pattern. The Redevelopment Plans designate the major public streets through and around the Project Area as Berry, King, Townsend, Owens, Channel, Third, Fourth, Fifth, Sixth, Seventh, 16th, and Mariposa Streets, and Terry A. François Boulevard.

Catellus, the City, and the Port would exchange various lands. The land transfer agreements provide for land exchanges between Catellus, the City, and the Port which will accommodate a new public street pattern. Catellus would build and dedicate new public streets on portions of its private property.

Locations of new streets, intersection configurations, and similar aspects of the proposed street grid are described in "Changes to Circulation Pattern in Mission Bay" under "Year 2015 Transportation System Assumptions" in Section V.E, Transportation: Impacts. For additional detail, see "Proposed Streets in Project Area" in Appendix D.

Bicycle Circulation

The bicycle routes for Mission Bay are intended to complement and extend the established bicycle routes in San Francisco. Figure V.E.9, in Section V.E, Transportation, shows the proposed bicycle circulation plan. Five major routes would be constructed as part of the project.

Four major routes would cross the Project Area: two north-south routes, one on Fourth Street and one on Terry A. François Boulevard, and two east-west routes, one on North and South Common Streets and one on 16th Street. The proposed Fourth Street route would extend from Third Street at the Lefty O'Doul Bridge in the north across Owens Street to Fourth Street and south to Fourth and Mariposa Streets. This route would connect the existing Third and Fourth Streets routes in the South of Market area to the existing Illinois Street route at the southern boundary of the Project Area. The proposed Terry A. François Boulevard route would begin at Mission Rock Street (the segment between the Lefty O'Doul Bridge and Mission Rock Street is not part of this project) in the north and would extend down to Mariposa Street in the south. This route would be dedicated bicycle lanes and would connect to existing routes on Third Street and on Mariposa Street as part of the San Francisco Bay Trail. The proposed route on The Common would extend from the waterfront to Seventh Street. The proposed 16th Street route would be an extension of the existing 16th Street route.

One other route along Owens Street would likely be parallel to a meandering pedestrian pathway. This route primarily would serve recreational uses. The Owens Street route would start at the Lefty O'Doul Bridge and extend west to the circle and then to Seventh Street. This recreational route would connect to existing routes at Third Street, Fourth Street, Seventh Street, and to the other routes proposed as part of the project.

Pedestrian Circulation

The main recreational pedestrian routes would be along the Channel, through the open space by the Bay, and along the extended Owens Street. The project is proposed to include a pedestrian bridge across the Channel at Fifth Street, subject to obtaining the required permits and approvals. Figure V.E.9, in Section V.E, Transportation, shows the proposed pedestrian circulation plan.

Rail Access

Current railroad usage is primarily the Caltrain commuter train, and infrequent rail freight service (as described in "Rail Freight" under "Existing Project Area Transportation Facilities" in Section V.E, Transportation: Setting)./30/ The Caltrain terminal and active tracks would remain in place.

Regarding other rail access, the Port of San Francisco and Catellus have developed options for the relocation of rail access through the Project Area to facilitate development. The plan is designed to preserve flexibility for development while maintaining rail access to Port properties. It provides that existing rail access to Pier 80 be terminated only when a new rail lead is established; it also accommodates the potential relocation of rail access to Piers 48 and 50 outside of developable parcels in the Project Area. For the purposes of this SEIR, it is assumed that the rail access would be relocated along 16th Street to Terry A. François Boulevard.

The project also includes relocation of the existing at-grade rail crossing of Seventh Street from King Street to near Hooper Street. (The project assumes use of an existing at-grade rail crossing at Berry Street. Variant 1 describes the effects of the project without a crossing at Berry Street.) The connection would consist of an at-grade crossing with automatic gates. Rubberized surfaces would be installed across the tracks at the crossing. The project would include public safety improvements, including: installation of controllers for operation of the rail signals; installation of rail crossing flashers and arms; construction of a parallel fence adjacent to the east side of Seventh Street contiguous with the rail right-of-way from Mariposa Street to King Street; installation of traffic signals at the intersections of Seventh Street and Berry Street, Seventh Street and The Common, and Seventh Street and 16th Street; upgrade of the traffic signal at the intersection of Townsend Street and Seventh Street; coordination of traffic signals to work in a synchronized fashion; and construction of signage, channelization, and paving improvements to the at-grade crossings at Berry Street, The Common, and 16th Street. In consultation with the Peninsula Corridor Joint Powers Board and the California Public Utilities Commission, the project proposes to reduce the number of rail tracks from five to three.

Parking and Loading

The Design for Development documents set forth parking standards and loading requirements. These are presented here and discussed in detail in Table V.E.17 and in "Parking Impacts" in Section V.E, Transportation: Impacts.

Parking

The maximum number of off-street parking spaces allowed for uses other than UCSF within the Mission Bay Project Area, are prescribed in the Design for Development documents and shown in Table III.B.3. In general, Planning Code minimum parking requirements for various uses would be established as maximum allowable parking amounts for such uses. In the Mission Bay Residential areas, one space would be the maximum allowed for each dwelling unit. In the Mission Bay North

TABLE III.B.3
MAXIMUM OFF-STREET PARKING SPACE REQUIREMENTS

Use	Maximum Number of Parking Spaces
Mission Bay Residential	One space for each dwelling unit.
Mission Bay Hotel	One space per 16 guest bedrooms.
Mission Bay Retail	One for each 500 square feet of occupied floor area up to 20,000 square feet, plus one space for each 250 square feet of occupied floor area in excess of 20,000 square feet. For retail greater than 50,000 square feet, at a ratio to be established by the Redevelopment Agency based on a development specific parking demand and not to exceed 10% greater than the limit stated herein.
Restaurants, bars, clubs, pool hall, dance hall, or similar enterprise.	One space for each 200 square feet of occupied floor area, where the occupied floor area exceeds 5,000 square feet.
Theater	One space for each eight seats up to 1,000 seats where the number of seats exceeds 50 seats, plus one for each 10 seats in excess of 1,000 seats.
Commercial Industrial and Commercial Industrial/Retail	One space for each 1000 gross square feet of occupied floor area.

Source: San Francisco Redevelopment Agency, *Design Standards and Guidelines, Mission Bay*, Draft C, prepared by Catellus Development Corporation; as adopted by the Mission Bay Citizens Advisory Committee on December 11, 1997, revised March 30, 1998, p. 45.

Retail and Mission Bay South Retail areas, generally no off-street parking spaces would be allowed for occupied areas of less than 5,000 gross sq. ft.; for uses with an occupied area above 5,000 gross sq. ft., a maximum of one space for each 500 gross sq. ft. of occupied floor area up to 20,000 gross sq. ft. would be allowed, plus one space for each 250 gross sq. ft. of occupied floor area in excess of 20,000 gross sq. ft. Within the retail areas, for all restaurants, bars, clubs, pool hall, dance hall, bowling alley or similar enterprises a maximum of one space for each 200 gross sq. ft. of occupied floor area would be allowed, where the occupied floor area exceeds 5,000 gross sq. ft. Theaters in the Mission Bay North Retail area would be allowed to have a maximum of one space for each eight seats up to 1,000 seats where the number of seats exceeds 50 seats, plus one for each 10 seats in excess of 1,000 seats. In the hotel, one space per 16 guest bedrooms would be the maximum allowed. For the Mission Bay North Retail area, the Design for Development documents would also include a minimum required number of parking spaces, established at 75% of the maximum. In the Commercial Industrial and Commercial Industrial/Retail areas, one space would be allowed for each 1,000 gross sq. ft. of occupied floor area.

In addition, UCSF would develop parking at a planning ratio of two spaces per 1,000 gross square feet, totaling up to 5,300 spaces. However, actual construction of parking would occur in phases in accordance with estimated demand at each stage of development. It is anticipated that the total number of spaces at full build-out would approximate the estimated demand of 4,200 spaces.

Loading

Off-street loading space requirements are based on the type of land use and the gross square footage of floor area of the use as shown in Table III.B.4. In general, Planning Code loading requirements have been proposed for the Redevelopment Plans. For retail stores, bars, restaurants, and drug stores of less than 10,000 gross sq. ft., no off-street loading spaces would be required; one space would be required for development from 10,001 to 60,000 gross sq. ft.; two spaces would be required for development from 60,001 to 100,000 gross sq. ft.; and three loading spaces would be required for development over 100,000 gross sq. ft. plus one for each additional 80,000 gross sq. ft.

For residential and commercial industrial areas, one space would be required for development from 100,001 to 200,000 gross sq. ft.; two spaces would be required for development of 200,001 to 500,000 gross sq. ft.; and three spaces would be required for development over 500,000 gross sq. ft., plus one loading space for each additional 400,000 gross sq. ft. UCSF requirements would generally be two spaces per 200,000 gross sq. ft. with one additional loading space required if the facility included academic research support space.

CONSTRUCTION AND GRADING

Extensive land forming in the Project Area is not planned; however, some excavation for basements below the water table may occur./31/ Approximately 300,000 cubic yards of fill could be imported, to raise the ultimate surface grade of future buildings and to provide top soil for public open space areas. In general, the Project Area would be treated as one construction site and cut and fill would be minimized by, for example, using excavated screened fill material from one part of the Project Area to raise surface grades in another part of the Project Area. It is anticipated that building slabs would be placed at grade, although in some cases a level of parking may be built below grade.

Proposed Demolition

Except for a few businesses, most of the existing uses in the Mission Bay Project Area would be considered non-conforming uses under the Redevelopment Plans, and the businesses would be relocated or discontinued and the buildings demolished over time. Demolition would occur as phases

TABLE III.B.4
OFF-STREET LOADING SPACES REQUIRED

Use	Spaces	Gross Sq. Ft. of Building Area
Retail Stores, Bars, Restaurants, Drug Stores		
	0	0 to 10,000
	1	10,001 to 60,000
	2	60,001 to 100,000
	3	Over 100,000 plus 1 for each additional 80,000
Commercial Industrial, Commerical Industrial/Retail, and Residential		
	0	0 to 100,000
	1	100,001 to 200,000
	2	200,001 to 500,000
	3	Over 500,000 plus 1 for each additional 400,000

Source: San Francisco Redevelopment Agency, *Design Standards and Guidelines, Mission Bay*, Draft C, prepared by Catellus Development Corporation; as adopted by the Mission Bay Citizens Advisory Committee on December 11, 1997, revised March 30, 1998, p. 46.

of new construction are proposed. The buildings to be demolished include active warehouses, light industrial and transportation facilities, and other inactive or abandoned structures. The golf driving range and Bladium also would be demolished as project build-out occurs. Addresses of buildings to be demolished are provided in Table V.B.1, in Section V.B, Land Use.

The Channel Pump Station and the Amtrak police facility at 580 King Street would not be demolished. There are no plans to demolish Fire Station No. 30 at this time; the City would decide whether to demolish it in the future.

PHASING OF CONSTRUCTION OF INFRASTRUCTURE AND IMPROVEMENTS IN THE PROJECT AREA

For the purposes of this SEIR, full build-out under the proposed Redevelopment Plans is assumed to occur by the year 2015. It is unlikely that the Project Area would actually be built out by that time, but this assumption presents a conservative case for the purpose of environmental analysis. Construction would occur in phases. The timing and geographic extent of these phases have not been determined, and would depend upon market demand for the various types of uses proposed. Phasing of development on the UCSF site would depend upon the space needs of UCSF and the availability of funds to construct new space. Except for the UCSF site, development of the Project Area would be subject to the Subdivision Map Act and local laws and regulations adopted pursuant to it. Construction of infrastructure to serve each phase of development would generally follow a pattern of adjacency, as described in "Concept of Adjacency" below.

Review Process for Proposed Phases

The construction and phasing of all major infrastructure for Mission Bay North and Mission Bay South, including the circulation network, utilities, and public open space, would be governed both by the documents and plans adopted pursuant to the redevelopment process, and the Subdivision Map Act and local laws and regulations adopted pursuant to it, as described below. When a specific development phase is proposed, the project sponsors would submit preliminary infrastructure plans, maps and supporting documentation to the Redevelopment Agency and to the Department of Public Works (DPW) for processing in accordance with the Subdivision Map Act, the Redevelopment Plan, the Design for Development, and related documents, including the applicable Owner Participation Agreement (OPA). DPW would conduct a review of the infrastructure plans in conjunction with other agencies with relevant expertise such as the Department of Parking and Traffic, the San Francisco Municipal Railway (MUNI), and the San Francisco Public Utilities Commission's Clean Water Program. The Redevelopment Plans provide that all reviewing agencies will perform their analysis and issue determinations and conditions of approval consistent with the redevelopment plan and the infrastructure plan that would be included in the applicable OPA./32/ Through this process, reviewing entities would confirm that the infrastructure proposed for each phase of development is adequate, based upon the applicable infrastructure plan that is a part of the OPA.

To evaluate consistency of each phase with the applicable infrastructure plan, DPW and other participating agencies would review the preliminary infrastructure plans for the phase against the infrastructure phasing methodology described below. Thus, if the development proposed under the phase triggers an infrastructure improvement, then that specific improvement would be required as a condition to the approval of the development phase. In their review, the agencies would consider infrastructure requirements for a specific phase based on the amount and location of new development proposed under such phase together with existing development within each redevelopment area, consistent with the infrastructure plan included in the applicable OPA.

The parcels within the Project Area that are currently owned by private landowners other than Catellus are not subject to the proposed OPA between Catellus and the Redevelopment Agency; however, these parcels would be subject to the Mission Bay South Redevelopment Plan. If development on these parcels is proposed, compliance with infrastructure requirements would be established through separate OPAs entered into between the Redevelopment Agency and these owners.

Concept of Adjacency

Development of a specific area or phase would generally be accompanied by the development of adjacent infrastructure and improvements, including utilities and public open space./33/ As is explained below under "Financing," the adjacency concept allows maximum utilization of existing infrastructure where appropriate and gives the project sponsors flexibility in developing a cost-effective approach, consistent with the Redevelopment Plans and applicable infrastructure plan, to the necessary development of infrastructure and improvements which would occur over an extended time period, perhaps 20 years. As discussed in Section V.E, Transportation, and Section V.M, Community Services and Utilities, the Project Area is largely undeveloped land lacking a complete transportation system, high- and low-pressure water systems, drainage system, or other utilities. While the Subdivision Map Act requires the construction of necessary infrastructure attendant to any particular phase of development or area as part of the map approval process, the interagency review process and the concept of adjacency provides a particularized review process to ensure that the development of infrastructure and improvements proceeds consistent with the overall redevelopment plans and infrastructure plans for the entire Project Area. In some situations, adjacency would not be sufficient, for example where non-adjacent infrastructure would be needed to serve a development phase or building project or to accomplish a logical infrastructure completion relating to the ultimate infrastructure plan. Such situations would be evaluated and addressed through performance criteria established in the Redevelopment Plan documents or identified as mitigation measures, and would be implemented through the interagency review process described above.

Transportation Infrastructure

The project's transportation infrastructure would generally be developed based on the adjacency concept. Under the adjacency concept, in connection with each development phase, most immediately adjacent roadway improvements would be constructed. In addition, certain major improvements such as construction of Fourth Street would be triggered prior to significant deterioration in traffic congestion by cumulative project development calculations based on p.m. peak hour vehicle trip generation factors for the various land uses in the project. See Section VI.E, Mitigation Measures: Transportation, for the thresholds or timing requirements for constructing major transportation infrastructure.

As part of the review process for a development phase, the developer would submit preliminary infrastructure plans that indicate adjacent roadway and other transportation improvements to be constructed, as well as a description of the land use type and approximate floor area proposed in the phase, and an identification of any required major circulation improvements triggered by the proposed development. As described above, these infrastructure plans would be submitted to DPW for review by MUNI and other relevant City and other governmental agencies.

Utilities

Utility infrastructure generally would be constructed based on the adjacency principle described above and would be installed in conjunction with roadway construction. The preliminary infrastructure plans for each phase would include a description of the proposed utility infrastructure, together with supporting analysis. The preliminary infrastructure plans for development of some specific phases would include plans for improvements not necessarily adjacent. For example, the extension of the Auxiliary Water Supply System may require construction of several blocks of pipeline, rather than the pipeline in the adjacent street.

The infrastructure plan included in each OPA would be designed to accommodate demand from the project at full build-out; the purpose of the supporting analysis is to confirm that the infrastructure components proposed for a specific phase are appropriate in light of the total land use mix and density proposed in the Project Area. This analysis would establish whether the existing infrastructure together with infrastructure proposed for the phase are adequate to address anticipated demand. It would also address whether the existing system has adequate capacity to address the increased demand. For instance, in the case of stormwater flows, the analysis would indicate whether adequate capacity exists to handle existing flows from the proposed phase. "Construction and Phasing of Infrastructure," under "Water Supply: Impacts," and "Construction and Phasing of Infrastructure," under "Sewers and Wastewater Treatment: Impacts" in Section V.M, Community Services and Utilities, and "Phased Development and Interim Uses" in Section V.K, Hydrology and Water Quality: Impacts, describe phasing of utilities infrastructure in more detail.

Open Space

Public open space areas to be constructed in conjunction with each phase would be indicated on the applicable preliminary infrastructure plans. Public open space areas in Mission Bay North generally would be constructed pursuant to the adjacency concept. In Mission Bay South, the area would be divided into two zones. One zone would begin north of The Common and would extend to the northern boundary of Mission Bay South. The second zone would begin south of The Common and would extend to the southern boundary of Mission Bay South. The Common may be counted as public open space within either of the two zones. Under the proposal, when development is proposed within one of the zones, open space must be indicated on the infrastructure plans in the amount of at least 0.46 acre of open space to each 1.0 acre of developable area. The open space provided must be within the same zone as the proposed development until all open space is developed in that zone. It is likely that much of the open space would be constructed in larger increments than required by the minimum ratio and would, where feasible, generally be constructed in proximity to the proposed development. Additional open space may be developed in conjunction with each phase, and any amount exceeding the above ratio would be credited toward future development within the zone.

UCSF Development of Infrastructure, Improvements, and Open Space

The transportation and utility network described in the infrastructure plans would include sufficient capacity to serve the phased development of the UCSF site. Generally, Catellus will be responsible for constructing circulation and utilities infrastructure to the perimeter of the UCSF site in accordance with the circulation and utilities triggering principles described above. Catellus will also be responsible for construction of Fourth Street and utilities infrastructure running under Fourth Street and may provide additional utilities infrastructure within the UCSF site if necessary to serve the larger Project Area.

Land under the control of The Regents and used for educational purposes is not subject to the Subdivision Map Act and therefore not subject to the city process described above. As a result, for development within the UCSF site, UCSF will follow The Regents' regular procedures for development. Usually, circulation and utilities infrastructure would be developed on a building-by-building basis as funding is approved for each development project. If multiple buildings were proposed for development at the same time, then the necessary utilities infrastructure for the development phase could be evaluated and approved by The Regents as a separate capital project. In either case, UCSF would consider its overall circulation and utilities infrastructure needs for the entire UCSF site in developing infrastructure for any particular project or phase.

Financing

Public infrastructure, improvements, and public open space in the Project Area would be funded using special taxes, or bonds secured by special taxes, under the California Mello-Roos Community Facilities Act of 1982. The Redevelopment Agency would establish community facilities districts (CFDs). The special taxes of the community facilities districts would be levied against the privately held property in the Project Area. The Redevelopment Agency would also use tax increment revenues to reduce the special taxes, pay or redeem outstanding bonds, or pay directly the costs of the infrastructure or improvements in the Project Area.

As part of the process to adopt Redevelopment Plans for the Mission Bay North and Mission Bay South Redevelopment Areas, the Redevelopment Agency would present a report to the Board of Supervisors for each plan area which would set forth a detailed analysis of the proposed methods of financing and feasibility pursuant to California Health and Safety Code Section 33344.5 (a portion of the "Community Redevelopment Law"). That report would also include a description of the physical and economic conditions existing in the plan areas, a description of the plan area, an assessment of the method of financing of the redevelopment of the plan area, including the assessment of the economic feasibility of the project and the reasons for pursuing various available funding sources and other criteria.

The special tax approach to financing of improvements, including infrastructure and open space, is designed, in part, to enable the project sponsors to develop the most cost-effective approaches to infrastructure and improvements requirements, consistent with the Redevelopment Plans and applicable infrastructure plan. This financing approach takes into account a phasing scheme which would allow the construction of infrastructure and improvements, including open space, to serve the incremental build-out of the project as outlined above.

PROJECT EMPLOYMENT AND POPULATION

At build-out, there would be approximately 5,000 people living in Mission Bay North and 5,900 people living in Mission Bay South, for a total of 10,900 residents.

Total expected employment within the Mission Bay Project Area at build-out would be approximately 30,000. There would be about 8,800 office workers and 6,500 workers in research and development and light industrial uses. Total employment for retail and hotel uses would be approximately 4,700./34/ UCSF would employ approximately 9,100 persons. About 900 additional workers would be employed at the community facilities, for parking structures, building maintenance, security, and housing-related needs.

IMPLEMENTATION

Development of the Project Area includes the adoption of Redevelopment Plans and subsequent and associated documents for Mission Bay North and Mission Bay South. The project also includes conforming amendments to the *San Francisco General Plan*, the City Planning Code and Zoning

Maps, as well as other related documents, and actions of various state, federal, regional, and local agencies, as described in Section III.C, Approvals Required. Implementation of the project also requires numerous other approvals and permits. In addition, development of the UCSF site would require a parallel implementation process that includes approvals by The Regents. These components and processes are discussed below.

Redevelopment Plans for Mission Bay North and South

As discussed above, the Redevelopment Agency has prepared two sets of documents that contain the primary controls for land development for the Project Area. These documents consist of the Redevelopment Plans for Mission Bay North and Mission Bay South and their associated Design for Development documents. Land development that could occur as a result of implementing these Redevelopment Plans would consist of urban mixed uses including residential, commercial, and light industrial land uses.

The Redevelopment Agency prepared the proposed Mission Bay North and Mission Bay South Redevelopment Plans pursuant to the Community Redevelopment Law of the State of California (Health and Safety Code Section 33000 *et seq.*), the California Constitution, and applicable local laws and ordinances. The Redevelopment Plans vest the Redevelopment Agency with powers, duties, and obligations to implement the program generally formulated in the Redevelopment Plans for the redevelopment, rehabilitation, and revitalization of the Project Area. The Redevelopment Plans present a process and a basic framework within which more specific projects could be undertaken. The Design for Development documents complement each of the Plans by providing more detailed design controls for the Project Area.

As a predicate to the adoption of Redevelopment Plans, detailed economic feasibility studies must be conducted, generally in the form of a report to the legislative body. The Redevelopment Plans for both Mission Bay North and South consist of text, a legal description of the Project Area boundaries, a Project Area Map, a Redevelopment Land Use Map, and a list of proposed public improvements. The Community Redevelopment Law sets forth a number of goals and objectives that the Redevelopment Plans are designed to achieve. Primary goals include the elimination of blight in the Project Area and the provision of affordable housing. The Redevelopment Plans also contain broadly framed objectives aimed at bolstering economic activity as well as objectives tailored specifically to the Redevelopment Area. Redevelopment Plans and their Design for Development documents include land use categories and controls, generally found in the General Plan and City Planning Code. In addition, individual Owner Participation Agreements often include Scope of Development documents which provide a level of detail that augments the Design for Development.

Planning objectives and policies outlined in the Redevelopment Plans focus on land use, urban design, neighborhood character, open space, commerce and industry, and transportation. Specific land uses are defined as either primary or secondary. Secondary uses are allowed by the Redevelopment Agency if they are consistent with the criteria established in the Redevelopment Plans./35/

The Redevelopment Plans also contain provisions regarding construction, rehabilitation of existing properties, the overall number of housing units to be built, and general development controls covering the type, size, and heights of potential buildings. More detail is contained in the Design for Development documents, discussed below under "Design for Development Documents."

The responsibility for building affordable units would be shared between Catellus and the Redevelopment Agency. Of the approximately 6,090 total dwelling units, about 1,700 would be affordable dwelling units. Catellus would build up to 255 affordable units, and the Redevelopment Agency would seek nonprofit developers to construct approximately 1,445 units of affordable housing on land dedicated to the Redevelopment Agency by Catellus./36/

Broken down by Redevelopment Area, in Mission Bay North, Catellus would build up to 255 affordable units, and the Redevelopment Agency would sponsor nonprofit developers to build approximately 345 affordable units on up to 3.8 acres of land dedicated to the Agency by Catellus. In Mission Bay South, Catellus would dedicate approximately 12.2 acres of land to the Redevelopment Agency, on which nonprofit developers would build approximately 1,100 affordable units.

General actions that the Redevelopment Agency could take as part of the implementation of the Redevelopment Plans include: acquisition of property (possibly through eminent domain), demolition of buildings, construction of public improvements, provision of relocation assistance to eligible displaced occupants, and redevelopment of land by private enterprise or public agencies. One of the Redevelopment Agency's duties is to provide opportunities for owners and business tenants to participate in the redevelopment process by developing or improving their property so that it conforms to the Plans. The Redevelopment Agency will issue Owner Participation rules that will define the terms for such participation and the nature of participation agreements.

Finally, the Redevelopment Plans outline a variety of mechanisms used by the Redevelopment Agency to implement redevelopment activities. These could include:

- Cooperation by public bodies with the Redevelopment Agency for the purposes of undertaking the project as well as required actions by the City and County of San Francisco;

- Property acquisition and property management;
- Relocation of persons and businesses displaced by the project;
- Demolition, clearance, and building and site preparation;
- Property disposition and development; and
- Methods of financing the project, particularly tax-increment funds.

Design for Development Documents

The Design for Development documents for Mission Bay North and Mission Bay South set forth the design guidelines and controls for the Project Area. These documents are intended to serve as a set of standards to ensure that any development occurring in the Project Area would conform to the Redevelopment Plans. As noted above, the Design for Development documents present policies, objectives, and standards that are more detailed than those found in the Redevelopment Plans, similar to area plans and planning codes. They provide particular criteria for land uses, height and bulk limits, building density, setbacks, coverage, open space, access, wind and shadow, view corridors, parking, and loading. Also included are the types of buildings to be constructed within the different land use categories as well as design standards for those buildings. As described earlier in "Urban Form and Design" under "Redevelopment Plans and Proposed Land Use," the Design for Development documents are substantially the same as the Design Standards and Guidelines document which was endorsed by the Mission Bay CAC. Those parcel- or owner-specific guidelines in the CAC-endorsed document would be included in the Scope of Development documents to be attached as part of the Owner Participation Agreements. Design guidelines include provisions for views and open space; scale, setbacks, and storefronts; height and roofscapes; facades; and signs, lighting, and landscaping. Parameters associated with land use controls and building design are discussed more completely in "Urban Form and Design," above. These parameters vary according to land use classification and, therefore, are somewhat different for Mission Bay North and Mission Bay South.

Amendments to the San Francisco General Plan and the City Planning Code

Adoption of the proposed Redevelopment Plans would require that San Francisco's General Plan be amended so that all plans would be consistent. The General Plan contains a number of elements and area plans that would be affected. Among them are the Commerce and Industry Element, the Recreation and Open Space Element, the 1990 *Mission Bay Plan*, and the *Central Waterfront Plan*. Most of the revisions relate to General Plan maps, and are required to provide cross-references to the Redevelopment Plans or to reflect the new proposed street pattern and land use plan. The 1990

Mission Bay Plan, which is Part Two of the *Central Waterfront Area Plan*, would be rescinded and re-adopted as Mission Bay Guidelines for the parcels not covered by the Redevelopment Plans. Article 9 of the City Planning Code, which details zoning and land use controls for Mission Bay, would be amended to exclude the Mission Bay North and Mission Bay South Redevelopment Areas. The latter action would also entail changes to the City's Zoning Map.

Amendments to Land Transfer Agreements

The City and Catellus are in the process of amending the 1993 Mission Bay Port Land Transfer Agreement (PLTA) and the City Land Transfer Agreement (CLTA). Amendments to these agreements also require amendments to the "Agreement Concerning the Public Trust" (ACPT) entered into by the City, the Port, the State Lands Commission, and Catellus. Together, these documents comprise the land transfer agreements. The purpose of the land transfer agreements is to resolve long-standing title and ownership disputes between the parties and to transform the patchwork ownership of the land into developable parcels for both public and private interests. The amendments to these agreements continue that purpose and facilitate the assembly of adjusted development parcels to allow development to occur in Mission Bay and to facilitate the location of a new UCSF site in Mission Bay. The amendments to the land transfer agreements would modify the size and location of developable parcels originally envisioned; reflect updated information about hazardous materials on the sites to be transferred; address the timing of the land transfers; address the related street vacations; and address relocation of the various trust interests, for commerce, navigation, fisheries, and recreation held by the state. The ACPT is separately authorized pursuant to Public Resources Code Section 6307.

The CLTA, as proposed to be amended, would provide as follows: the City would transfer approximately 32 acres of city-owned property to Catellus for development purposes and Catellus would transfer approximately 36 acres to the City for street and open space purposes. These acreages are subject to change as the agreements are negotiated.

The PLTA, as proposed to be amended, would provide as follows: the Port would transfer approximately 18 acres of port property to Catellus for development purposes; the Redevelopment Agency would lease approximately 7 acres of port property for provision of open space and community facilities in the Project Area; and Catellus would transfer approximately 29 acres of Catellus property outside the Project Area (the "WP Parcel," located adjacent to Pier 80, and bound by 25th, César Chavez, and Illinois Streets) to the Port for development purposes. The Port has not yet approved specific development on the WP Parcel. Thirteen acres on the western portion of the WP Parcel is proposed as a possible location for a MUNI storage and maintenance facility for MUNI light rail. The use of the WP Parcel would be separately analyzed prior to approval of any specific development.

Approximately 1.34 acres of city-owned land and 3.64 acres of Catellus-owned land have been approved for transfer to UCSF for development of instruction, research, and support facilities. This land, totaling approximately 4.98 acres, already approved for transfer to UCSF, is a portion of the 43-acre UCSF site considered part of the project analyzed in this SEIR.

University of California San Francisco Implementation

On May 16, 1997, The Regents approved the selection of Mission Bay as the location of a major new UCSF site. UCSF proposes to build in the Mission Bay South Redevelopment Area on approximately 43 acres to be donated by the City and Catellus. The new UCSF site would meet the objectives of the Redevelopment Agency and Catellus to retain and promote, within the City and County of San Francisco, UCSF's academic and research activities and to retain within San Francisco the more than 8,000 net new jobs that will be associated with the UCSF expansion. Mission Bay was selected as the new site for the following reasons:/37/

- It provides a sufficient amount of land capable of accommodating the new site space program and parking.
- It can be readily accessed from major highways or streets, and is served by public transit or can be linked to public transit.
- It is located in an area with uses and densities of development which would be generally compatible with UCSF's proposed uses.

UCSF recently completed its *1996 Long Range Development Plan* (1996 LRDP)/38/, which identified the need for a major new site to meet its projected space needs through year 2010, especially research space needs. The *UCSF Long Range Development Plan Final Environmental Impact Report* (UCSF LRDP FEIR)/39/ evaluates the environmental impacts of UCSF's proposed growth through 2010, including the impacts associated with locating a major new UCSF site at three possible locations, including Mission Bay. The Regents certified the UCSF LRDP FEIR and adopted the UCSF LRDP in January 1997.

UCSF entered into a Memorandum of Understanding/40/ (MOU) with the City in 1987 regarding communication and oversight of land uses as well as development, maintenance and use of UCSF physical facilities within the City's boundaries. This MOU provides for reporting between UCSF and the City through the Planning Department on UCSF actions that concern master planning, construction, and use of UCSF's real property that may impact the City. It also provides a dispute resolution mechanism with participation by the Mayor and the Chancellor of UCSF.

Land for the UCSF site at Mission Bay will be owned by The Regents and developed for educational purposes. Thus, The Regents will be the lead agency under CEQA with respect to UCSF's development of the Mission Bay major new site. As individual development projects are proposed, The Regents would determine whether the potential environmental effects of the proposed development project have been adequately analyzed in the UCSF LRDP FEIR or whether additional environmental review will be required. If additional environmental review is required, it would be prepared by UCSF and approved by The Regents prior to action on individual development proposals to implement specific UCSF development projects at Mission Bay. In doing so, the environmental analysis contained in the UCSF LRDP FEIR also would be supplemented, as relevant, by the environmental analysis in this SEIR.

University of California, state, and Regents approvals could be required depending on the size of the proposed specific development project, its funding source and whether it involves amendment of the UCSF 1996 LRDP. Additionally, development of the major new site could involve preparing detailed specifications and construction documents, letting a construction contract through a competitive contract process with a firm eligible to work on University of California projects, permit applications and approvals, and preparing and distributing a range of public information documents.

C. APPROVALS REQUIRED

ENVIRONMENTAL REVIEW

This Draft SEIR will undergo a 45-day public review period, including a joint public hearing before the Planning Commission and the San Francisco Redevelopment Agency Commission, during which comments on the accuracy and completeness of the information presented herein will be accepted. Following the public review period, responses to written and oral comments received from the public and agencies will be prepared. The Draft SEIR will be revised accordingly, and a Final SEIR will be presented to a joint public meeting of the Planning Commission and the Redevelopment Agency Commission. The Commissions will then consider certification of the Final SEIR as adequate under the California Environmental Quality Act, including consideration of whether it is accurate, objective, and complete. The Final SEIR will serve as the environmental review document for the entire Mission Bay project, including the Mission Bay North and Mission Bay South Redevelopment Areas, subsequent development and related approvals as described below, except for actions by UCSF and The Regents as described earlier in "University of California San Francisco Implementation," under "Implementation."

REDEVELOPMENT PLAN APPROVALS AND RELATED AMENDMENTS TO THE SAN FRANCISCO GENERAL PLAN AND SAN FRANCISCO PLANNING CODE

As discussed above under "Implementation," the Mission Bay project includes two separate Redevelopment Plans, and two separate Design for Development documents. For the project to proceed, the Redevelopment Plans will require a finding of consistency with the General Plan and a recommendation for the Plans by the Planning Commission and approval by the Redevelopment Agency Commission and the Board of Supervisors. Pursuant to Planning Code Section 101.1(c), the City must find that the proposed project is consistent with the Priority Policies set forth in Section 101.1(b). The Design for Development documents will require approval by Redevelopment Agency Commission.

The Redevelopment Plans and Design for Development documents would supersede most of the 1990 *Mission Bay Plan* and Article 9 of the Planning Code (Mission Bay) for the Project Area. Accordingly, the project would require the Planning Commission and the Board of Supervisors to rescind the 1990 *Mission Bay Plan* and amend Article 9 of the City Planning Code, and to adopt any required amendments to the General Plan to ensure conformity with the proposed project. These amendments primarily would include changes to maps and text to delete current references to the 1990 *Mission Bay Plan* and to replace them with references to the Mission Bay North and South Redevelopment Plans. The Port Commission would also amend the *Waterfront Land Use Plan* to update discussions of the Mission Bay area and to provide specific detail as applicable regarding the Mission Bay area. The Redevelopment Plans also provide for coordination of all city agencies and the undertaking of all actions in a manner consistent with the Redevelopment Plans, Design for Development documents, Owner Participation Agreements, and associated documents including infrastructure plans.

SUMMARY OF CITY PERMITS AND APPROVAL PROCESSES

The following specific major actions would need to be taken by the Redevelopment Agency Commission, various city commissions and departments, and the Board of Supervisors to adopt and implement the project:

<u>Redevelopment Agency Commission</u>:

- Issues a joint certification of the Final SEIR with the Planning Commission.
- Adopts CEQA findings and mitigation monitoring program.
- Adopts Redevelopment Plans and Design for Development documents for both Mission Bay North and Mission Bay South Redevelopment Areas.

- Approves Owner Participation Agreements for both Redevelopment Areas.
- Authorizes issuance of Mello-Roos bonds.
- Seeks budget amendment from Board of Supervisors to authorize expenditures of tax increment (when available) to service Mello-Roos bonds.

Planning Commission:

- Issues a joint certification of the Final SEIR with the Redevelopment Agency Commission.
- Adopts CEQA findings and a mitigation monitoring program.
- Adopts and recommends to the Board of Supervisors amendments to the General Plan, including rescission of the 1990 *Mission Bay Plan*. Approves its re-adoption as Mission Bay Guidelines for the parcels not covered by the Redevelopment Plans.
- Approves, and recommends to the Board of Supervisors, amendment of Article 9 of the City Planning Code and Zoning Map as necessary.
- Determines consistency of the Redevelopment Plans, street vacations, land transfer agreements, and other approvals with the General Plan and Planning Code Section 101.1 Priority Policies, and recommends their adoption to the Board of Supervisors.

Port of San Francisco:

- Adopts CEQA findings and a mitigation monitoring program.
- Approves uses and activities on port properties.
- Adopts Public Trust/Burton Act findings.
- Adopt amendments to the *Waterfront Land Use Plan*.
- Approves street vacations for streets within port jurisdiction.
- Approves amendments to the Port Land Transfer Agreement and the Agreement Concerning the Public Trust.
- Issues building permits for port property, subject to possible coordination agreements between the Port and the Department of Building Inspection.
- Approves Redevelopment Plan for Mission Bay South.

Board of Supervisors:

- Adopts CEQA findings and a mitigation monitoring program.
- Adopts Redevelopment Plans.
- Adopts General Plan amendments, including rescission of the 1990 *Mission Bay Plan*.
- Adopts amendment of Article 9 of the City Planning Code and Zoning Map, as necessary.
- Makes Planning Code Section 101.1 Priority Policies findings.
- Approves amendments to the land transfer agreements.
- Approves street vacations, subdivision maps, and dedication of streets.
- Adopts amendments to the Subdivision Ordinance.
- Approves Redevelopment Agency pass-through payment pursuant to California Health and Safety Code, Section 33607.5 (f) (a portion of the "Community Redevelopment Law").

Department of Public Works:

- Approves and applies subdivision regulations.
- Approves subdivision parcel and condominium maps for development.
- Permits and accepts street improvements.
- Approves design of all public infrastructure improvements, including dimensions and grades of all public streets.

Department of Building Inspection:

- Issues demolition, site, building, and fire safety permits on non-port property, subject to possible coordination agreements between the Port and the Department of Building Inspection.

Department of Public Health:

- Issues food and beverage permits.
- Implements the site mitigation plan requirements of San Francisco Public Works Code Article 20 (Maher Ordinance).
- Administers requirements for hazardous materials Business Plans.

San Francisco Public Utilities Commission:

- Approves sewerage and drainage systems and oversees installation of water and sewer pipes.
- Approves sewer/stormwater system.

San Francisco Community College District:

- Approves Redevelopment Agency pass-through payment pursuant to California Health and Safety Code, Section 33607.5 (f) (a portion of the "Community Redevelopment Law").

San Francisco Unified School District:

- Approves Redevelopment Agency pass-through payment pursuant to California Health and Safety Code, Section 33607.5 (f) (a portion of the "Community Redevelopment Law").

SUMMARY OF REGIONAL, STATE, AND FEDERAL APPROVALS

Bay Conservation and Development Commission:

- Reviews compliance with requirements set forth in the San Francisco Bay Plan and San Francisco Waterfront Special Area Plan.
- Issues permits for development within the Bay and the 100-foot shoreline band, such as Channel promontories and rip-rap.

State Lands Commission:

- Reviews compliance with applicable public trust restrictions.
- Approves amendments to agreements concerning the public trust.

Bay Area Air Quality Management District:

- Issues permits for stationary sources of air pollutants as required by BAAQMD rules and regulations, such as facilities for industrial or research and development land uses.
- Approves Redevelopment Agency pass-through payment pursuant to California Health and Safety Code, Section 33607.5 (f) (a portion of the "Community Redevelopment Law").

Bay Area Rapid Transit District:

- Approves Redevelopment Agency pass-through payment pursuant to California Health and Safety Code, Section 33607.5 (f) (a portion of the "Community Redevelopment Law").

Regional Water Quality Control Board:

- Approves Risk Management Plans for the Project Area and provides final site clearance for specific development sites.
- Issues National Pollutant Discharge Elimination System permit for storm water discharges from construction areas.
- Issues Clean Water Act Section 401 certification or waiver for projects requiring Clean Water Act Section 404 permit.
- Issues NPDES permit for new separated stormwater system.
- Acts as Lead Administering Agency under AB 2061, to oversee the investigation and remedial action of hazardous materials release sites.

Peninsula Corridor Joint Powers Board:

- Grants easements to City and County of San Francisco for new public streets/crossings over railroad rights-of-way.
- Requires contract with City and County of San Francisco for operation and maintenance of street/crossing.

Department of Fish and Game:

- Enters into Fish and Game Code Section 1603 Streambed Alteration Agreement as required for proposed reconfiguration or bridging of the Channel, installation of rip-rap, or other modifications of the Channel bed or banks.

California Public Utilities Commission:

- Approves new rail crossings and rail crossing relocations.

U.S. Army Corps of Engineers:

- Issues Clean Water Act, Section 404 permit for any proposed discharges of fill material into "Waters of the United States," including, for example, placement of rip-rap, and any other fill, in the Channel below the high tide level.

- Issues River and Harbors Act Section 10 permit for any structures or work in "Navigable waters of the United States," including placement of rip-rap, pilings, or bridging of the Channel.

U.S. Coast Guard:

- Approves bridging of the Channel (a navigable waterway) under Section 9 of the Rivers and Harbors Act of 1899, as amended.

Agencies with Jurisdiction Over Hazardous Materials and Wastes:

- Agencies with potential permitting and/or oversight authority regarding hazardous materials handling and hazardous waste management include: the San Francisco Department of Public Health, the Regional Water Quality Control Board, the Bay Area Air Quality Management District, the California Division of Occupational Safety and Health Administration, the California Environmental Protection Agency, the California Highway Patrol, the California Department of Transportation, the California Department of Toxic Substances Control, the federal Occupational Safety and Health Administration, and the U.S. Department of Transportation.

SUMMARY OF UNIVERSITY OF CALIFORNIA APPROVALS

State Department of Finance:

- Approves all state-funded capital improvements.

The Regents:

- Act as lead agency under CEQA regarding CEQA compliance for development of the major new site at Mission Bay.
- In conjunction with UCSF and the state, approve project components, which will vary depending on the size of the specific development project, its funding source, and whether it involves amending the UCSF 1996 LRDP.
- Approve amendment of the UCSF 1996 LRDP, if necessary.
- Approve project components using external financing or major gifts exceeding $10 million.
- Approve design for all construction exceeding $10 million or any building of historic value or public trust.

D. VARIANTS TO THE PROJECT

Chapter VII of this document describes and evaluates variants to the project that the project sponsors have considered. Variants typically modify limited areas or aspects of the project and have substantially the same impacts and cumulative impacts, except where noted. Section G in Chapter VII analyzes a combination of those variants currently under consideration by the project sponsors.

NOTES: Project Description

1. Table III.A.2 presents the land use designations of the Redevelopment Plans documents. These designations include a mix of uses which are described in Table III.A.1.

2. San Francisco Redevelopment Agency, "Draft Redevelopment Plan for Mission Bay North Redevelopment Project" and "Draft Redevelopment Plan for Mission Bay South Redevelopment Project," March 30, 1998, Attachment 6 in each document. *

3. University of California San Francisco, *1996 Long Range Development Plan*, adopted January 1997.

4. The 1996 LRDP and Final EIR may be amended from time to time.

5. Several properties within the Project Area that are under other private ownership include: 1) the Castle Metals site at Third and Mariposa Streets, which consists of 1900 Third Street owned by 1900 Third Street, L.L.C., 1830 Third Street owned by Sheila O. Carraro, and 1800 Third Street owned by Rinaldo Carraro; 2) the Esprit site at Illinois and 16th Streets owned by Esprit de Corps; and 3) the Third Street Properties at Third Street south of Mission Rock Street, which consists of 1401 Third Street owned by Potter Electric Inc., 1455 and 1475 Third Street owned by Harms Land Company, and 1481 and 1501 Third Street owned by ARES Commercial Properties.

6. San Francisco Redevelopment Agency, "Draft Redevelopment Plan for the Mission Bay North Redevelopment Project" and "Draft Redevelopment Plan for the Mission Bay South Redevelopment Project," March 30, 1998.*

7. Animal care services could include facilities for animal housing, handling, treatment, and support.

8. "Affordable units" are dwelling units with rents or purchase prices affordable to low- and moderate-income households. The definition of "affordable" is found in California Health & Safety Code, Section 5025.5 and in California Code of Regulations, Title 25, Section 6910 *et seq*.

9. Several parcels of land within the Project Area are owned by property owners other than Catellus. Of these, the Third Street Properties would be designated for up to 90 units of housing and would provide for a realigned Mission Rock Street right-of-way.

10. San Francisco Redevelopment Agency, "Draft Redevelopment Plan for Mission Bay North Redevelopment Project" and "Draft Redevelopment Plan for Mission Bay South Redevelopment Project," March 30, 1998, p. 9 in each document.*

11. An efficiency factor of 0.9 was used to calculate gross square feet from gross leasable square feet, and the results were rounded. Thus, 50,000 gross leasable square feet converts to 55,555 gross sq. ft., and this figure was rounded to 56,000 gross sq. ft.

12. This land use program was evaluated in the transportation analysis in this SEIR and represents a conservative scenario as it represents fairly high trip-generating uses. The Redevelopment Plan does not confine the uses to exactly this mix and would allow a broader mix of uses within the Mission Bay North retail area.

13. University of California San Francisco, *1996 Long Range Development Plan*, adopted January 1997, pp. 63-64.*

14. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report,* State Clearinghouse No. 95123032, certified January 1997, p. 30.*

15. The UCSF *1996 Long Range Development Plan* projects for planning purposes two spaces per 1,000 gross sq. ft. totaling up to 5,300 parking spaces for the major new site (University of California San Francisco, *1996 Long Range Development Plan*, adopted January 1997, p. 211). The UCSF LRDP Final EIR projects the parking demand by mode split to be about 4,200 spaces (University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, certified January 1997, p. 350). UCSF anticipates that development of parking will be phased and that the total number of parking spaces at full build-out will approximate the estimated demand.*

16. The description in this section is summarized from University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, certified January 1997, pp. 21-22.*

17. University of California San Francisco, *University of California San Francisco 1996 Long Range Development Plan*, adopted January 1997, p. 157.*

18. The phasing for development of a central plant is not yet known.

19. Catellus would convey approximately 2.2 acres to the City for a school, of which approximately 0.7 acre would be used for a school building and 1.5 acres would be open space for a play yard. The School District would be responsible for building the school and maintaining this site.

20. For purposes of analysis, an assumption was made in this SEIR regarding the proportion of office space within the Commercial Industrial land use category. Office was assumed to be 50% of the space: research and development, light industry, and other such uses were assumed to be the remaining 50%. While less office development is anticipated to be developed, the assumption of more office development is conservative for EIR analysis purposes because there are more employees, and consequently more vehicle trips, for office space.

21. Note: 5,000,000 gross square feet is equivalent to 5,557,000 gross leasable square feet.

22. The Caltrain terminal, located at Fourth and Townsend Streets, is outside the Mission Bay North Redevelopment Area, and is not part of the project.

23. Riprap is a layer of loose rock or aggregate placed over an erodible soil surface to protect soil from the erosive forces of water. It is typically used on storm drain outlets, channel banks and bottoms, roadside ditches, drop structures, shorelines, and any other place where soil may erode. (Association

of Bay Area Governments, *Manual of Standards for Erosion and Sediment Control Measures*, 2nd Ed., May 1995, p. 7.15.)

24. The Design for Development documents will exclude rooftop mechanical equipment and appurtenances (i.e., stacks) from the maximum height calculation.

25. San Francisco Redevelopment Agency, *Design Standards and Guidelines, Mission Bay*, Draft C, prepared by Catellus Development Corporation; as adopted by the Mission Bay Citizens Advisory Committee on December 11, 1997, revised March 30, 1998, pp. 28-29.*

26. Robin Jones, Assistant Vice Chancellor, Campus Planning, University of California San Francisco, personal communication, September 24, 1997. The UCSF LRDP goals and objectives include Land Use goals that address compatibility with surroundings at both the existing UCSF sites and the major new site (University of California San Francisco, *1996 Long Range Development Plan*, adopted January 1997, p. 75). The UCSF LRDP Final EIR states UCSF's intention to work with local jurisdictional land use planning and zoning guidelines (University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report,* State Clearinghouse No. 95123032, certified January 1997, p. 300).*

27. The floor area ratio is the ratio of the gross floor area of all the buildings on a lot to the area of the lot (San Francisco Planning Code, Article 1 Section 102.11, as amended September 10, 1998). As used in the calculations in this section, the developable land area in each land use designation is assumed to be exclusive of vara streets, public rights-of-way, and utility easements.

28. San Francisco Redevelopment Agency, *Design Standards and Guidelines, Mission Bay*, Draft C, prepared by Catellus Development Corporation; as adopted by the Mission Bay Citizens Advisory Committee on December 11, 1997, revised March 30, 1998, pp. 32-33.*

29. San Francisco Redevelopment Agency, *Design Standards and Guidelines, Mission Bay*, Draft C, prepared by Catellus Development Corporation; as adopted by the Mission Bay Citizens Advisory Committee on December 11, 1997, revised March 30, 1998, pp. 30-31.*

30. Freight train operations on the rail connections in Mission Bay are restricted to 1 a.m. to 4 a.m. when passenger service does not occur on the Caltrain tracks. The existing usage data received from Union Pacific Railroad shows one train delivery to Pier 54 two years ago; the only other reported usage is 15 cars per year to Pier 80, using the "Y" connection to Illinois Street, and then southerly on Illinois to Pier 80.

31. When the Initial Study was published (Appendix A of this document), excavation for basements was not anticipated. Subsequent plans include some excavation. Effects from excavation are addressed in Section VI.H, Seismicity: Impacts and Section VI.J, Contaminated Soils and Groundwater: Impacts.

32. San Francisco Redevelopment Agency, "Draft Redevelopment Plan for Mission Bay North Redevelopment Project" and "Draft Redevelopment Plan for Mission Bay South Redevelopment Project," March 30, 1998, Attachment 6 in each document.*

33. As outlined in the Conceptual Agreement for Mission Bay South (letter from Willie L. Brown, Jr., Mayor of San Francisco, to Nelson Rising, President of Catellus Development Corporation, March 3, 1997), "public infrastructure improvements, including parks, should be phased to the extent possible to serve the incremental buildout of the project. Further, the City and Redevelopment Agency will work closely with Catellus to take full advantage of surplus capacity in existing infrastructure to support initial development."

34. 2,300 employees for city-serving retail, 1,270 employees for entertainment-oriented retail, 730 employees for neighborhood-serving retail, and 370 employees for the hotel, equals 4,670, rounded to 4,700.

35. San Francisco Redevelopment Agency, "Draft Redevelopment Plan for Mission Bay North Redevelopment Project" and "Draft Redevelopment Plan for Mission Bay South Redevelopment Project," March 30, 1998, Section 303 in each document.*

36. Catellus would develop half, minus 45 dwelling units, of the affordable units in Mission Bay North, and not-for-profit developers selected by the Redevelopment Agency would develop the other half, plus 45 dwelling units. In addition to units developed by Catellus, Catellus would dedicate up to 3.8 acres to the Redevelopment Agency for its affordable housing development. "Mission Bay Conceptual Framework for a Proposal for the North of Channel Redevelopment Plan Area," September 26, 1996.*

37. University of California San Francisco, *1996 Long Range Development Plan*, adopted January 1997, p. 157. The UCSF LRDP Final EIR analyzes the potential environmental impacts associated with development of the major new site anywhere within Mission Bay and shows as an illustrative site plan a location that differs from that currently proposed. Neither the program-level analysis in that EIR, nor the analysis in this SEIR, are affected by the differences. Additional goals and objectives of UCSF are outlined in the *1996 Long Range Development Plan*, pp. 160-161.*

38. University of California San Francisco, *1996 Long Range Development Plan*, adopted January 1997.*

39. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report,* State Clearinghouse No. 95123032, certified January 1997.*

40. Memorandum of Understanding between the University of California San Francisco and the City and County of San Francisco, February 17, 1987 (see Appendix E of the UCSF *1996 Long Range Development Plan Final EIR*, certified January 1997).*

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

IV. BACKGROUND AND SEIR STUDY APPROACH

This chapter summarizes background information as well as important technical and organizational features of the Mission Bay Subsequent Environmental Impact Report (SEIR). The Background section provides information about the 1990 FEIR, and differences in the prior and present project to provide context for the analysis in the rest of the document. The SEIR Study Approach section explains the structure of the impact assessment and basic conventions of the SEIR analysis. First, this section presents the Project Area subareas used solely for environmental analysis. In addition, the nearby and adjoining areas around the Project Area are described within their established planning area boundaries. This section also defines local and cumulative impact perspectives. Finally, this section describes the organization of this SEIR.

A. BACKGROUND

As described in the 1990 FEIR/1/, most of the Project Area was originally a shallow, wide-mouthed bay called Mission Bay. By the 1850's, shipyards and other industrial uses occupied the Project Area. In the late 1860's, the California Legislature granted two railroad companies land in the Mission Bay tidelands to develop a railroad terminal. Eventually, Mission Bay was nearly completely filled in, and the resulting land was occupied by rail yards, along with a variety of industrial uses. Today, Catellus Development Corporation (Catellus), successor to the railroads, owns and manages most of the property in the Project Area.

The Mission Bay Plan, Proposal for Citizen Review, published by the San Francisco Planning Department in January 1987, provided a land use program and a plan, social and economic programs, design guidelines, and land use controls. The Mission Bay Plan area encompassed 294 to 309 acres, depending on whether port land east of Third Street near Piers 50 to 54 was included./2/

Under the California Environmental Quality Act (CEQA), the Planning Department, as lead agency for the City and County of San Francisco, prepared an Environmental Impact Report (EIR) for the Mission Bay project. A Draft EIR was published in August 1988, and a Draft EIR Supplement was published in March 1989. The Mission Bay Final EIR (1990 FEIR) was certified in August 1990./3/

The 1990 FEIR analyzed three development alternatives at an equal level of detail, and 12 variants on those alternatives. Alternatives A and B were integrated mixed-use development programs.

Alternative A consisted of 7,700 dwelling units, 4.1 million gross square feet (gross sq. ft.) of office, 3.6 million gross sq. ft. of S/LI/RD space, a 500-room hotel, 250,000 gross sq. ft. of retail, 125,000 gross sq. ft. of community facilities, and 55 acres of open space (including the 12-acre China Basin Channel which is not included in the open space tabulation for the current project)./4/

Alternative B contained more housing and open space and less commercial space than Alternative A. Alternative B consisted of 10,000 dwelling units, 1.0 million gross sq. ft. of office, 420,000 gross sq. ft. of service/light industrial/research and development (S/LI/RD) space, 300,000 gross sq. ft. of retail, 293,000 gross sq. ft. of community facilities, and about 94 acres of open space (including the 12-acre Channel)./5/ Alternative B also included three wetlands./6/

Alternative N, the no project alternative, presented a development scenario likely to occur in the future under then-existing M-2 (Heavy Industrial) zoning with no master development program for the area. Alternative N consisted of 5.0 million gross sq. ft. of industrial uses, 1.05 million gross sq. ft. of port-related industrial uses, 1.0 million gross sq. ft. of office, 100,000 gross sq. ft. of retail, and 42,000 gross sq. ft. of community facilities.

A variant of Alternative A that included about 500 more residential units than Alternative A, more office and retail space, less S/LI/RD space, and 10.8 acres of reclaimed wetlands was ultimately approved. The San Francisco City Planning Commission certified the 1990 FEIR on August 23, 1990. In September 1990, the Planning Commission adopted CEQA findings and a mitigation monitoring program, approved the 1990 *Mission Bay Plan* (an area plan) as part of the *San Francisco General Plan*, and adopted conforming amendments to other elements and area plans of the General Plan. In September 1990 and February 1991, the Commission adopted resolutions recommending to the San Francisco Board of Supervisors (Board) that it adopt amendments to the City Planning Code and Zoning Map to add Article 9 (Mission Bay District) to the Planning Code and Mission Bay districts to the Zoning Map, and approve a Development Agreement with Catellus. The Planning Commission approved the amendments to the *Mission Bay Plan* in February 1991. In February 1991, the Board adopted CEQA findings and a mitigation monitoring program, approved the Mission Bay development proposal, approved a development agreement, and adopted amendments to the City Planning Code and Zoning Map implementing the 1990 *Mission Bay Plan*./7/

Although approved, the prior Mission Bay project analyzed in the 1990 FEIR was never built. The City's office market slowed during the recession of the early 1990's, and construction never commenced. On April 14, 1996, the development agreement was terminated. In 1996-97, the San Francisco Redevelopment Agency (Redevelopment Agency) and Catellus proposed the project evaluated in this SEIR. The Planning Department and the Redevelopment Agency are joint lead agencies responsible for preparation of this SEIR (Planning Department File No. 96.771E and SFRA Case No. ER 919-97).

DIFFERENCES IN PROJECT AREA BOUNDARIES BETWEEN THE 1990 FEIR AND THIS SUBSEQUENT EIR

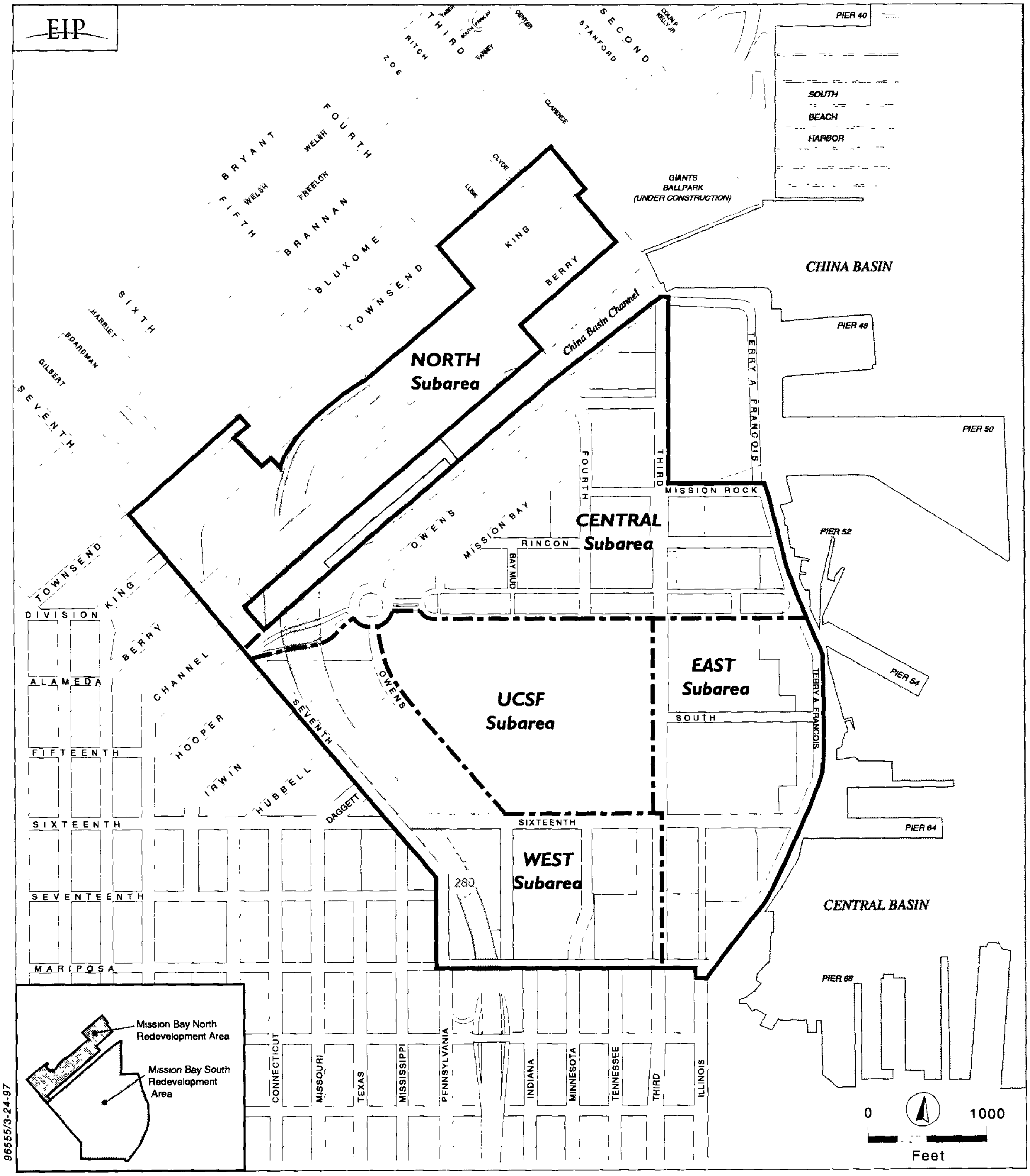
There are a number of differences between the current Project Area and the project area considered in the 1990 FEIR./8/ Figure III.B.1 shows the Mission Bay Project Area, and Figure V.A.1 shows the boundaries of the prior plan./9/ Unlike the previous project area, the current Project Area excludes most of China Basin Channel and does not include the Mission Creek leasehold, the houseboats, or pleasure craft berths./10/ The current Project Area also does not include the backland to Pier 48 (Seawall Lot 337), stopping at Third Street and the realigned Mission Rock Street. In addition, the current Project Area does not include the two blocks of the Caltrain terminal between Townsend, King, Fourth, and Sixth Streets. The current Project Area does include the Castle Metals site at Third and Mariposa Streets and the Esprit site at Illinois and 16th Streets, which, were not included in the 1990 *Mission Bay Plan*.

B. SEIR STUDY APPROACH

PERSPECTIVES FOR IMPACT ASSESSMENT

Project Area Subareas for Environmental Analysis

To facilitate the environmental analysis of the proposed Mission Bay project, the Project Area is divided into subareas, as shown in Figure IV.B.1. The subareas make the environmental analysis flexible by taking into account the siting of particular land uses (such as residential and retail) within the land use designations such as Mission Bay South Retail of each Redevelopment Plan Area. Information was aggregated by subarea for the analysis, so that the location of land uses could change within a subarea without substantially affecting the SEIR results. These subareas are strictly for SEIR purposes and have no meaning with respect to the proposed Redevelopment Plans, construction phasing, or any other aspects of the project. The proposed Mission Bay North Redevelopment Area is equivalent to the North Subarea. The Mission Bay South Redevelopment Area is divided into four subareas. The Central Subarea consists of the northern portion of the proposed Mission Bay South Redevelopment Area. The UCSF Subarea consists of the central portion of the Mission Bay South Redevelopment Area, where the UCSF site would be located. The West Subarea lies between Interstate 280 (I-280) and the UCSF Subarea, and extends to Third Street at the south end of the



SOURCE EIP Associates

MISSION BAY SUBSEQUENT EIR

FIGURE IV.B.1 PROJECT SUBAREAS FOR ENVIRONMENTAL ANALYSIS

Project Area, south of 16th Street. The East Subarea lies between Third Street and the Bay, south of The Common.

Nearby Areas

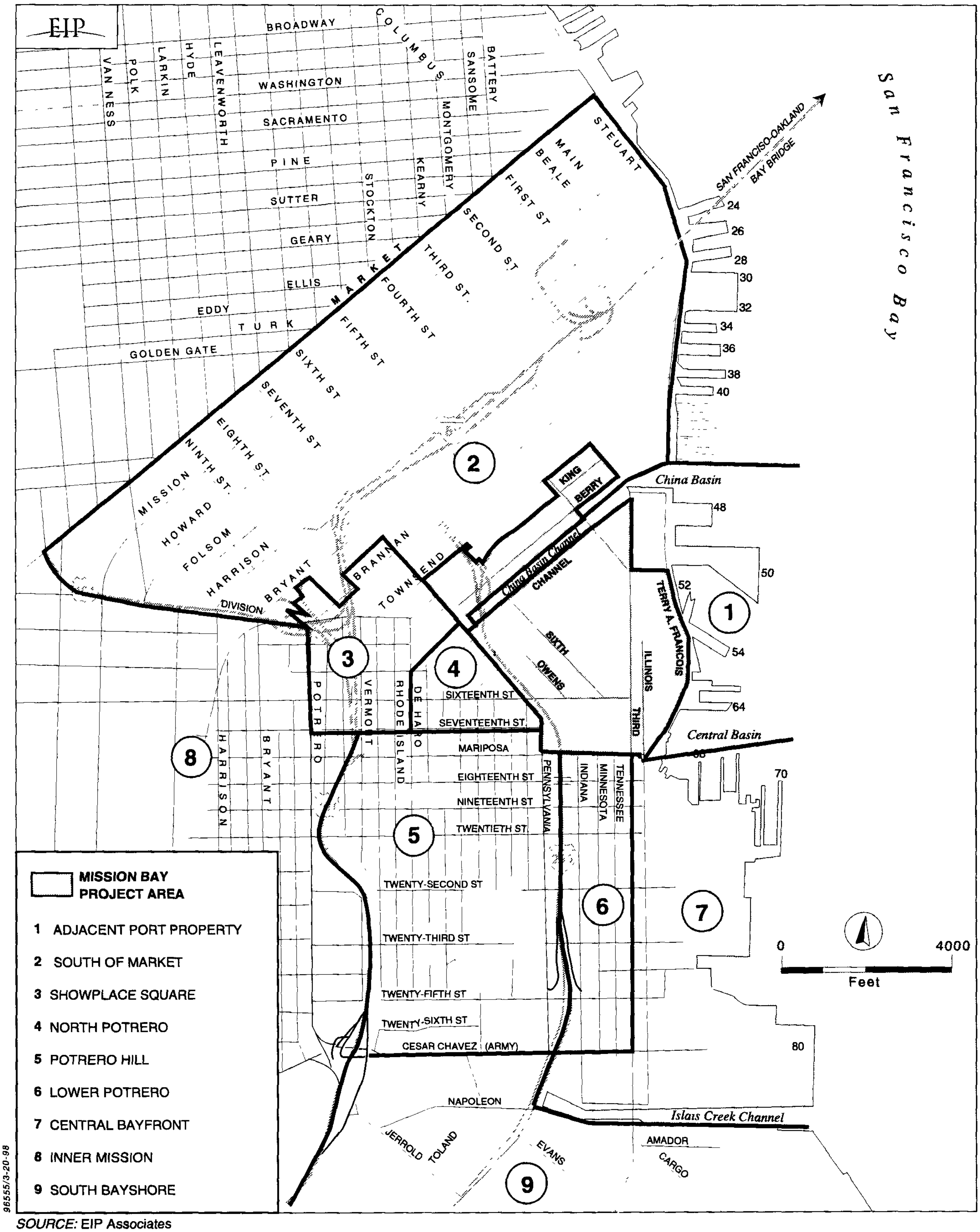
Figure IV.B.2 shows the Project Area and Nearby Areas. In some cases, growth in one or more Nearby Areas provides a background context for the SEIR analysis. The Nearby Areas are primarily defined according to established planning area boundaries. The Nearby Areas pertinent to this SEIR are:

- Adjacent Port Property
- South of Market
- Showplace Square
- North Potrero
- Potrero Hill
- Lower Potrero
- Central Bayfront
- Inner Mission
- South Bayshore

The last two Nearby Areas are more distant from the Project Area and less affected by the project, and so are treated at a lesser level of detail than those that are closer./11/

The Adjacent Port Property Nearby Area includes China Basin Channel between Mission Bay North and Mission Bay South and part of the southern shoreline of the Channel. North and northeast of the Project Area is the South of Market Nearby Area. The northern border of the South of Market area extends to Market Street, to encompass the Rincon Hill and Transbay areas. The area includes the Yerba Buena Center Redevelopment Area and most of the area covered by the *South of Market Plan*. To the northwest is the Showplace Square Nearby Area near Eighth and Townsend Streets.

The Potrero Hill and North Potrero Nearby Areas are located south and west of the Project Area, on the other side of the I-280 freeway and the Caltrain railroad tracks. The Lower Potrero Nearby Area and Central Bayfront Nearby Area border the Project Area south of Mariposa Street. The Inner Mission Nearby Area is bounded roughly by U.S. 101 on the east, Dolores Street on the west, 16th



SOURCE: EIP Associates

MISSION BAY SUBSEQUENT EIR

FIGURE IV.B.2 NEARBY AREAS

Street on the north, and Cesar Chavez Street on the south. The South Bayshore Nearby Area, about 1 mile south of the southern boundary of the Project Area, extends from Islais Creek to the county line, from U.S. 101 to the Bay. The Nearby Areas and existing uses are described in "Existing Land Uses in the Nearby Areas" in Section V.B, Land Use: Setting.

Analysis Years

Setting

The SEIR describes existing conditions for the Project Area, as well as for Nearby Areas and the City as a whole, where appropriate. The setting year for the Mission Bay SEIR is 1997. Project Area data collection for most sections of the 1990 FEIR was completed in 1985 and 1986. Most of this initial information has been updated for the SEIR and is current as of late 1997.

Future Context

Development of Mission Bay would be a long-term effort. The amount of building space represented by the development program (whether commercial or residential space) would be built and occupied in phases over a long time period.

Analysis of commercial and residential development in the Project Area in the context of growth trends and potentials in the City and the region indicates that build-out and full occupancy of the Mission Bay Project Area would take at least 20 years after the first buildings are occupied. Assuming occupancy starts around 2000, the 20-year build-out period would extend through 2020. For purposes of a conservative environmental analysis, the build-out analysis year was chosen to be 2015.

The year 2015 was chosen as the analysis year to provide a basis for studying the impacts of the full project as well as cumulative impacts (the project in conjunction with other known projects and expected growth and development). Cumulative impacts were assessed on the basis of the most current available regional population and employment projections for the year 2015 made by the Association of Bay Area Governments (ABAG)/12/, as adjusted to provide for slightly higher expected growth in San Francisco than the ABAG forecast./13/ Because it is unlikely that the project would actually be fully built out by 2015, the assumption of full build-out is conservative for SEIR analysis purposes (i.e., impacts are probably overstated). Other assumptions about future conditions are described under relevant topics in Chapter V, Environmental Setting and Impacts. For example, the transportation system assumed to be in place for the 2015 analysis year is described in "Year 2015 Transportation System Assumptions" in Section V.E, Transportation: Impacts.

University of California San Francisco

The University of California San Francisco adopted the *1996 Long Range Development Plan*/14/ in 1997, which identifies the need for a major new site in addition to its existing Parnassus Heights site and other sites to meet the projected decompression, expansion, and consolidation of UCSF's activities over the next 15 years and beyond. The *UCSF Long Range Development Plan Final Environmental Impact Report* (UCSF LRDP FEIR)/15/, certified by The Regents in 1997, evaluates the environmental impacts of locating 2.65 million gross sq. ft. of UCSF research, institution, and support uses at three locations, including a site in Alameda, one partially in Brisbane and partially in San Francisco, and one in Mission Bay. On May 16, 1997, The Regents approved the selection of Mission Bay for its "Major New Site." The UCSF LRDP FEIR analysis forms the basis for many of the assumptions regarding UCSF activities in Mission Bay.

ORGANIZATION OF THIS SEIR

The amount of information collected and analyzed for this SEIR is voluminous and a considered approach to presentation of data in the text was necessary. The text provides sufficient detail for a complete and thorough understanding of the project's potential impacts. Tables and figures included in the text highlight information about the effects of the project. More technical or detailed information is included in the SEIR Appendices. Still more technical or detailed background or supporting documentation is maintained in the project SEIR file. This approach to data presentation avoids repetition of similar statistics and communicates most clearly and economically the information of greatest interest to the reader. Supporting documentation, including detailed documentation of all analyses, is available for public review at the San Francisco Planning Department, 1660 Mission Street, San Francisco, California 94103.

In the SEIR, page, table, and figure numbers reflect the chapter to which they pertain. Chapter V, Environmental Setting and Impacts, is divided into sections by major topics, such as Section V.F, Air Quality, and Section V.M, Community Services and Utilities. To provide the reader with continuity, the Impacts subsection for each major topic immediately follows the Setting subsection for that topic. Section V.M, Community Services and Utilities, is an exception to this organization, with the Setting and Impacts subsections for each minor topic placed together for ease of reference. In Chapter V, page, figure, and table numbers reflect major topic subsections.

Chapter XIII, Report Outline, presents an outline showing the subheadings used in the various chapters of the SEIR. The outline will assist the reader in finding specific information and in locating subsections referred to in other parts of the document.

NOTES: Background and SEIR Study Approach

1. San Francisco Planning Department, *Mission Bay Final Environmental Impact Report*, Planning Department File 86.505E, State Clearinghouse No. 86070113, certified August 23, 1990.

2. 1990 FEIR, Volume One, p. III.4.

3. The 1990 FEIR is incorporated by reference into this SEIR. The 1990 FEIR is available at the San Francisco Planning Department, 1660 Mission Street, 5th floor. Pertinent information from the 1990 FEIR is summarized throughout this document.

4. 1990 FEIR, Volume One, pp. II.7-II.11.

5. 1990 FEIR, Volume One, pp. II.11-II.14.

6. Alternative B from the 1990 FEIR (Volume One, pp. V.13-V.16) is the basis of Alternative 3 in this 1997 SEIR, with some modifications. See Section VIII.C, Alternative 3: Residential/Open Space Development Alternative, for a description of Alternative 3.

7. A development agreement is an agreement between a developer and a city or county that sets forth obligations of the developer and city or county regarding subsequent development of a specific area.

8. 1990 FEIR, Volume One, p. II.8.

9. The Project Area does not include China Basin, China Basin Channel, China Basin Landing, Pier 48 or its environs, or the Caltrain terminal.

10. Regarding the China Basin Channel, the proposed Mission Bay North Redevelopment Area extends to the Channel Street right-of-way on the northern edge. The Mission Bay South Redevelopment Area's boundary in the Channel is more complicated. The boundary is along the edge of the Mission Creek Harbor Association leasehold, which runs in the water of China Basin Channel and includes 50 parking spaces, as well as a landscaped shoreline area along the length of the marina (860 feet). The proposed Mission Bay South Redevelopment Area does not include the houseboats.

11. In the 1990 FEIR, the downtown area was extensively analyzed because the proposed Mission Bay project included approximately 4 million square feet of office space north of the Channel, a land use more akin to downtown than the land uses currently proposed. In this SEIR, the analysis extends northward to the South of Market Nearby Area because the proposed Mission Bay Project Area land uses would be more like those in the South of Market.

12. Association of Bay Area Governments, *Projections '96*, December 1995.

13. Since publication of the Draft SEIR, an environmental review application has been received by the Planning Department for 185 Berry Street, proposing a three-story addition to the existing China Basin Landing office building that would add about 170,000 square feet of office space. The site is the northerly portion of a parcel consisting of the entire block bounded by Fourth Street, Berry Street, Third Street, and China Basin Channel. The resulting building would be similar in size and bulk to the existing wharfside office building on the same parcel to the south, bordering the north side of China Basin Channel. The site is bordered on its Berry Street and Fourth Street sides by the Project Area, and across Third Street by the Giants ballpark site.

The SEIR's transportation and other analyses of Mission Bay project impacts do not assume this specific development project. The SEIR analyses do assume, for cumulative impact assessment purposes, considerable additional office and other development in the area. The assumptions of cumulative growth are based on ABAG projections of population and employment, adjusted to account for anticipated potential major projects in San Francisco, as described on pp. V.E.38-V.E.39. Therefore, transportation and other cumulative impacts associated with 185 Berry Street and other development projects that will accommodate future population and employment growth are included in the SEIR cumulative analyses, based on the forecast general locations for such growth.

Individual projects, such as 185 Berry Street, may have location-specific impacts not accounted for in the SEIR analysis. Such location-specific impacts are not possible to predict with certainty, since detailed project features, transportation plans, and mitigation measures for the specific project will emerge and evolve as environmental analysis is conducted for that project. The environmental review documents for 185 Berry Street and other future projects will analyze and describe any such specific impacts, using the cumulative future scenario in this SEIR as the 2015 baseline. Those future documents would also suggest applicable mitigation measures in the event significant project-specific impacts are found.

14. University of California San Francisco, *1996 Long Range Development Plan*, adopted January 1997.

15. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report,* State Clearinghouse No. 95123032, certified January 1997.

V. ENVIRONMENTAL SETTING AND IMPACTS

A. PLANS, POLICIES, AND PERMITS

This section of this SEIR updates the 1990 FEIR discussion based on changes to the proposed development and the regulatory framework that have occurred since certification of the 1990 FEIR.

This section discusses the city, regional, state, and federal plans and policies applicable to the proposed project. It also describes permits and approvals that would be required and identifies the agencies that would issue them. Some agencies maintain policies or plans that may affect the nature of land use development in the Project Area, while others may pertain only to specific permitting activities of the proposed project. This section incorporates relevant discussion from the 1990 FEIR wherever possible. See Section III.C, Approvals Required, for a comprehensive list of approvals.

Two aspects of the proposed project present new major jurisdictional and permitting circumstances not considered in the 1990 FEIR. First, the Redevelopment Agency proposes to create two Redevelopment Areas that together would comprise the Project Area: the Mission Bay North Redevelopment Area and the Mission Bay South Redevelopment Area. The Redevelopment Agency's planning process and its implications for the plans and policies governing the Project Area are addressed in this section. A second new element of the proposed project is the decision by The Regents of the University of California and the University of California San Francisco to locate and develop a major new instruction, research, and support site in Mission Bay.

The endnotes for this section begin on p. V.A.44.

<u>SETTING</u>

Planning and regulatory control over the proposed Project Area is exercised by many governmental agencies. Land in the Project Area is under private, City, and Port ownership, and some land is subject to the public trust, with oversight by the State Lands Commission. The Project Area is covered by the General Plan of the City and County of San Francisco, but certain small areas also fall under the Port of San Francisco's *Waterfront Land Use Plan*. For proposed project development within 100 feet of the Bay shoreline and in China Basin Channel, the San Francisco Bay Conservation and Development Commission has jurisdiction over certain aspects of the project. These agencies and others with jurisdictional authority in the Project Area are discussed in "Regional Agencies," "State Agencies," and "Federal Agencies," later in this Setting subsection.

Local, regional, state, and federal policies regarding transportation are discussed in "Existing Transportation Plans, Policies, and Programs" in Section V.E, Transportation: Setting.

SAN FRANCISCO REDEVELOPMENT AGENCY

The San Francisco Redevelopment Agency (the Redevelopment Agency) was established by the Board of Supervisors in 1948 pursuant to the 1945 Community Redevelopment Law./1/ While the Redevelopment Agency's jurisdiction is limited to the City, it is a creation of the state and is thus a separate legal entity. The Redevelopment Agency wields a number of powers, such as the ability to initiate tax-increment financing, that are based on the creation of redevelopment areas through the adoption of redevelopment plans for those areas. The first major step in creating a redevelopment area is the establishment of a redevelopment survey area. The final project area for a redevelopment plan when it is adopted must be located within the boundaries of the survey area. In this instance, the Project Area for the two proposed redevelopment plans consists of two survey areas. The Mission Bay North Survey Area was adopted on August 19, 1996. The Mission Bay South Redevelopment Survey Area was adopted on August 25, 1997. While the Redevelopment Agency adopts redevelopment areas, the Board of Supervisors takes the final action approving them. Redevelopment areas must be found to be blighted and must be predominantly urban; without a finding of blight, a redevelopment project cannot be established.

Following establishment of a redevelopment survey area, Planning Department staff prepare a Preliminary Plan, which includes a basic project description. The Planning Commission then selects the preliminary redevelopment project area boundaries, approves the Preliminary Plan, and forwards it to the Redevelopment Agency. The Planning Commission selected the Redevelopment Area boundaries and approved the Preliminary Plans for Mission Bay North and Mission Bay South on December 12, 1996, and October 23, 1997, respectively.

The final redevelopment plan for a redevelopment area is adopted by the Board of Supervisors only after a number of steps are completed, including environmental review and a report to the Board prepared by the Redevelopment Agency. The report discusses, among other things, the feasibility of the proposed plan and the manner in which it would eliminate blight pursuant to Community Redevelopment Law. The Redevelopment Agency imposes land use controls primarily as embodied in the redevelopment plans.

Any land within the boundary of a redevelopment plan area that is owned by public bodies or that is otherwise within the jurisdiction of agencies other than the redevelopment agency, remains under the purview of those public bodies and is subject to the plans, policies, and permitting requirements called for by the governing agency. Port land in the plan area that is intended for development as part of the redevelopment plans must conform to the Port's policies and land use controls, unless it is ceded or transferred to the Redevelopment Agency or unless alternative arrangements are made under the Redevelopment Plans and approved by the Port and Board of Supervisors. Redevelopment plans would be subject to regulations pertaining to any state-owned land and any land that is part of the public trust (see "California State Lands Commission," later in this Setting subsection) that may be incorporated into the plan area. The Redevelopment Agency is also required to adhere to plans and policies issued by state and federal bodies that may affect land included in the redevelopment areas.

PLANS, POLICIES, AND PERMITS OF LOCAL AGENCIES

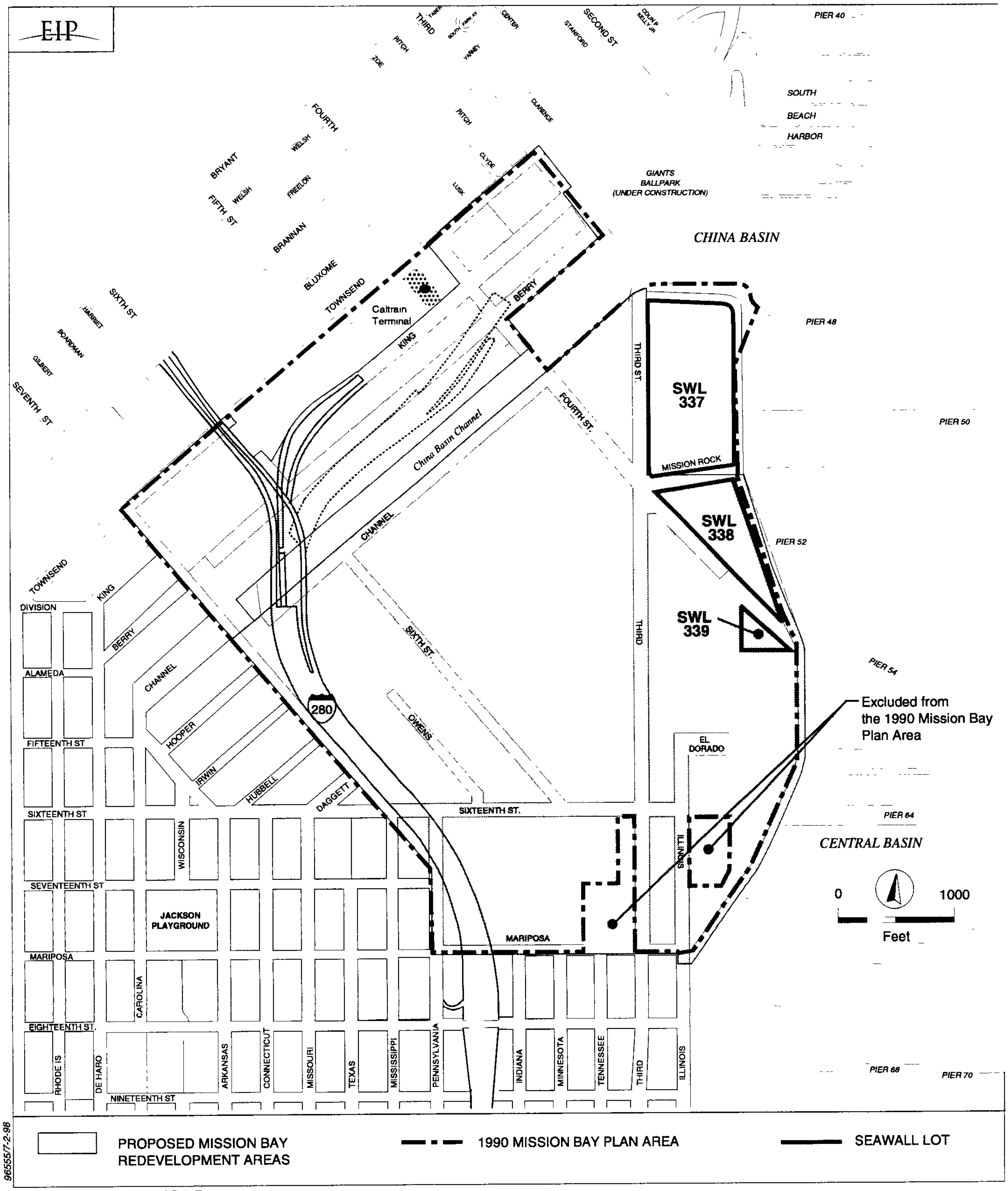
Plans of the City and County of San Francisco

San Francisco General Plan

The San Francisco General Plan (General Plan), adopted by the Planning Commission and the Board of Supervisors, contains the comprehensive, long-term land use policy for San Francisco, as required by the California Government Code, Section 65300 and City Charter Section 4.105. The General Plan consists of Elements covering a variety of land uses and related activities as well as Area Plans that allow specific local application of jurisdiction-wide policies. Elements and Area Plans relevant to the project are discussed below. Selected Area Plan boundaries are shown in Figures V.A.1 and V.A.2.

Central Waterfront Plan

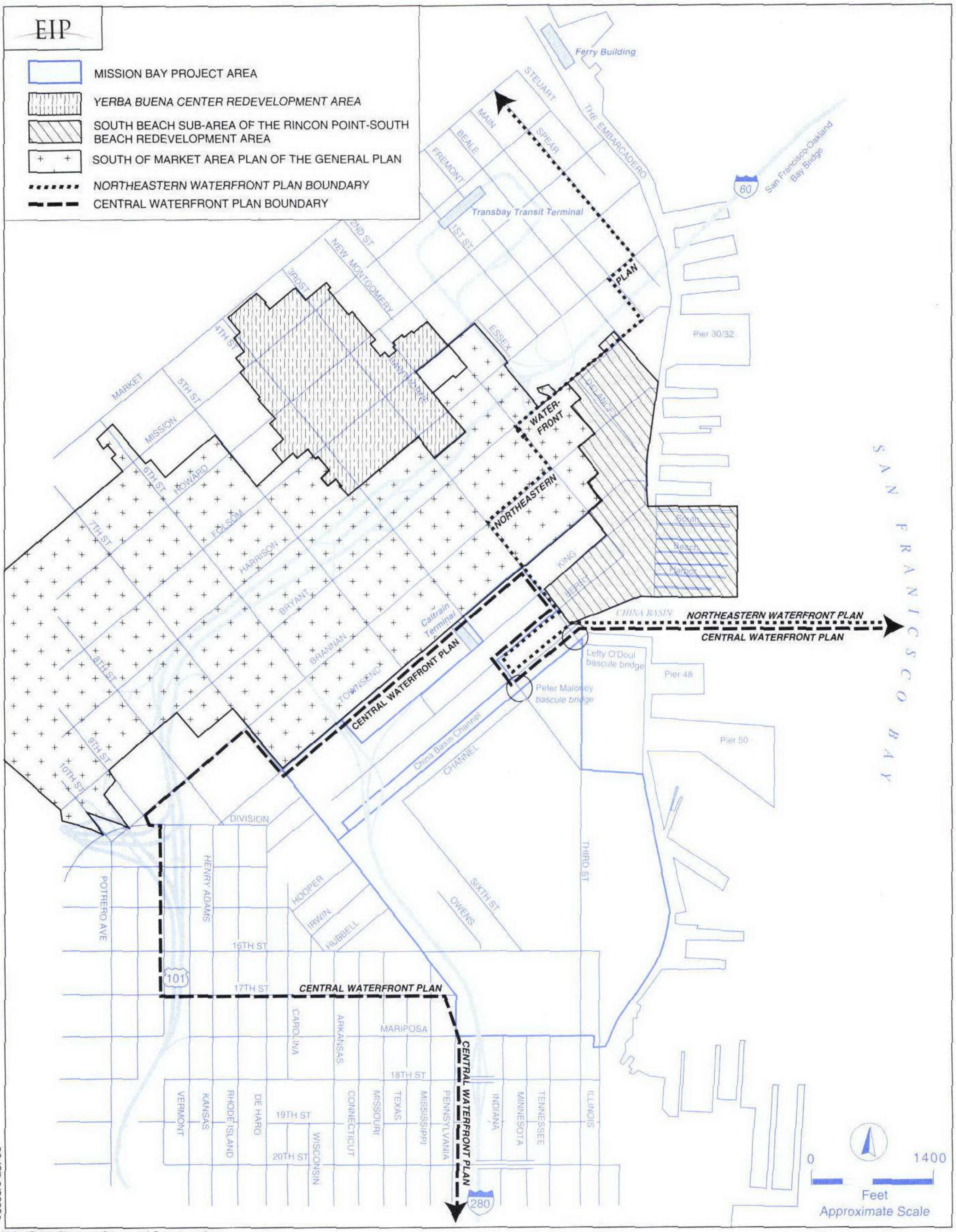
The Mission Bay Project Area is entirely within the area currently covered by the *Central Waterfront Plan*. The *Central Waterfront Plan*, adopted in July 1980 and since amended, is intended to fulfill a goal of the Commerce and Industry Element calling for diversification of San Francisco's economic base and improvement of industrial and maritime sectors./2/ The *Central Waterfront Plan* generally covers the area from China Basin to Islais Creek inland to about U.S. 101 north of 17th Street, along Seventh Street to I-280, and I-280 from 17th Street south to Islais Creek (see Figure V.A.2). The overall goal of the *Central Waterfront Plan* is "to create a physical and economic environment conducive to the retention and expansion of San Francisco's industrial and maritime activities, to reverse the pattern of economic decline in the area and to establish a land base for the industrial and maritime components of the San Francisco economy."/3/ This plan was amended in 1990 to add



SOURCE. City and County of San Francisco

MISSION BAY SUBSEQUENT EIR

FIGURE V.A.1 PLAN AREA BOUNDARIES



SOURCE: City and County of San Francisco

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MISSION BAY SUBSEQUENT EIR

FIGURE V.A.2 SAN FRANCISCO GENERAL PLAN–SELECTED AREA PLAN AND NEARBY REDEVELOPMENT PLAN BOUNDARIES

Part II — the *Mission Bay Plan*. Part I presents land use policies for the Islais Creek, Central Basin, Lower Potrero, North Potrero, and Showplace Square areas, while Part II defines land use development and policies for the Mission Bay area.

As can be seen in Figure V.A.1, several sites in the *Mission Bay Plan* would not be part of the proposed project and are not included in the Project Area: the blocks located between Townsend, King, Fourth, and Sixth Streets, which include the Caltrain terminal and tracks; Seawall Lot 337, located at the mouth of China Basin Channel and Third Street; and portions of Seawall Lots 338 and 339. Under the *Mission Bay Plan*, the Caltrain terminal would have been relocated. Seawall Lot 337 was designated as a wetlands site and Seawall Lots 338 and 339 were designated as open space under the *Mission Bay Plan*.

Two sites are included in the currently proposed Project Area that were not included in the 1990 *Mission Bay Plan*: the Castle Metals site at Mariposa Street and Third Street, and the Esprit site at 16th Street near Illinois Street (see Figure III.B.2)./4/ These sites currently fall under Part I of the *Central Waterfront Plan*.

As applicable, the following are summaries of general objectives and policies of the *Central Waterfront Plan*, Part I, that currently apply to the parcels occupied by Castle Metals and Esprit:

- Land Use: Preserve and promote the Central Waterfront area for San Francisco's industrial activities while developing residential, commercial and recreational uses on surplus land that complement industrial and maritime activities.
- Industry: Retain, expand and protect industrial activity by rehabilitating old structures, developing vacant land, consolidating retail operations, establishing job training, financing programs for new development, and removing overly restrictive city codes related to industry.
- Maritime: Retain and expand existing maritime activities, encourage development of container terminals along the waterfront, and reserve land adjacent to the waterfront for maritime support use.
- Commerce: Provide commercial and water-oriented recreational activities to serve the area's residents and businesses while preserving office development that is not directly related to industrial and maritime uses.
- Residence: Retain existing housing and residents, and promote new housing in established residential areas and near China Basin Channel, including development of low- and moderate-income units.
- Transportation: Improve citywide and regional auto, truck and pedestrian access to the Central Waterfront, including extending light-rail service to the area.

- Recreation and Open Space: Provide public access to the waterfront and recreational resources in the area, compatible with industrial and maritime activities.

- Urban Design: Design new development to be compatible with existing topography, limit height and bulk along the waterfront, and protect and create views of downtown and the Bay.

Summary objectives for the Central Basin subarea, which currently includes the Esprit site, are as follows:

- Objective 1: Expand maritime activity by reserving the water area, piers, seawall lots and 6 acres of backland/5/ for development of a container facility and by retention and promotion of ship repair and maintenance and general cargo activities.

- Objective 2: Retain and expand industrial uses by encouraging more intensive use of existing industrial land and facilities.

- Objective 3: Improve and expand waterfront recreation.

- Objective 4: Relate the scale of new development to San Francisco's distinctive hill form, to the adjacent waterfront, and to existing development.

Summary objectives for the Lower Potrero subarea (as defined by the *Central Waterfront Plan*), which currently includes the Castle Metals site, are as follows:

- Objective 1: Retain and expand industrial uses in the Lower Potrero area.

- Objective 2: Preserve and improve the existing residential neighborhood.

Mission Bay Plan

The *Mission Bay Plan*, adopted on September 27, 1990, as Part II of the *Central Waterfront Plan* and amended thereafter, is the current policy document guiding land use and development for the Mission Bay Planning Area (as defined by the *Central Waterfront Plan*; see Figure V.A.2). The *Mission Bay Plan* calls for approximately 8,270 new housing units, 4.8 million gross square feet (gross sq. ft.) of office space, up to 900,000 gross sq. ft. of commercial-light industrial space, 750,000 gross sq. ft. of retail, and a 500-room hotel. The plan also designates 68 acres of open space and 25 acres for facilities such as a school, fire station, and other community and cultural facilities. The 68 acres of open space includes about 12 acres of open water comprising China Basin Channel, which is not included in open space calculations for the currently proposed project. Open space and recreation are discussed further in "Recreation and Parks: Setting and Impacts" in Section V.M, Community

Services and Utilities. The 1990 *Mission Bay Plan* contains objectives and policies designed to guide development within the area. They include the following:

- Create a variety of uses in Mission Bay with housing as a priority.
- Emphasize in Mission Bay the characteristic San Francisco development patterns which give its neighborhoods image and means of orientation.
- Preserve continuity with Mission Bay's past and preserve notable landmarks and areas of historic, architectural value.
- Relate the scale of new development to the adjacent waterfront and to existing development.
- Develop new residential neighborhoods with the character and quality of traditional San Francisco neighborhoods.
- Develop a pattern of neighborhood-scaled open space to serve residents.
- Assure that use of Mission Bay land resources respects and preserves the natural values of the land and serves the best interests of the City and the Mission Bay Community.
- Encourage development which is sensitive to the needs for solar access, shelter from wind, and ventilation.

Commerce and Industry Element

The Commerce and Industry Element, adopted in 1978, "sets forth objectives and policies that address the broad range of economic activities, facilities and support systems that constitute San Francisco's employment and service base."/6/ The Element's three primary goals are continued economic vitality, social equity, and environmental quality. Specific objectives concern major economic sectors and include manufacturing and industry, maritime activities, office and administrative services, neighborhood commercial retailing, and visitor trade. The Element sets forth policies to diversify San Francisco's economic base and to retain and enhance industrial maritime activities that the *Central Waterfront Plan* and *Northeastern Waterfront Plan* are intended to implement.

South of Market Plan/7/

The South of Market Area Plan contains goals, objectives, and policies intended to conserve and develop the South of Market (SOM) area of San Francisco. The South of Market Area Plan covers an irregular area from roughly 13th Street on the west, Mission Street and Folsom Street on the north, Essex Street on the east, and Townsend Street on the south, where it borders the Mission Bay North Redevelopment Area (see Figure V.A.2).

The South of Market Area Plan recognizes SOM as a stable residential and business community and as an area in which a mixture of employment opportunities, especially for San Franciscans, can be balanced with the need to maintain and encourage the light industrial, home, and business service industries which characterize it. The primary goals of the South of Market Plan are as follows:

- Protect and facilitate the expansion of industrial, artisan, home and business service, and neighborhood-serving retail and community service activities.
- Protect existing economic, social and cultural diversity.
- Preserve existing housing and encourage the development of new, affordable housing.
- Preserve existing amenities and improve neighborhood liveability for South of Market residents, workers, and visitors.

Northeastern Waterfront Plan

The *Northeastern Waterfront Plan*, adopted in December 1980 and amended several times thereafter, complements the *Central Waterfront Plan* in that it provides planning objectives and policies for the northern half of San Francisco's waterfront and nearby inland areas./8/ The plan generally covers the area from Aquatic Park to China Basin. The southern limits of the plan area, at China Basin, are adjacent to the proposed project (see Figure V.A.2). The policies for the northern waterfront call for retaining and enhancing maritime and industrial uses as long as those uses are practical, and developing uses other than industrial/maritime where appropriate. The North China Basin subarea of the *Northeastern Waterfront Plan* (Piers 26 through 46) is directly north of the Project Area.

The *Northeastern Waterfront Plan's* land use goals include maintaining activities that will contribute significantly to the City's economic vitality. On lands no longer needed for maritime purposes, the predominant uses should be open space and water-oriented public recreation; inland areas could be for residential and office uses. Other objectives include:

- To develop limited additional office and commercial space in order to serve the City's economic needs and to encourage a mixture of land use activities along the northeastern waterfront.

- To develop and maintain residential uses along the northeastern waterfront in order to assist in satisfying the City's housing needs and capitalize on the area's potential as a desirable living environment.

The *Northeastern Waterfront Plan* was amended on June 27, 1997, with Board of Supervisors approval on July 7, 1997, to allow for the construction of a 45,000-seat ballpark, and was amended by the City Planning Commission on October 29, 1997 and by the Board of Supervisors on January 5, 1998, for consistency with the *Waterfront Land Use Plan*.

Urban Design Element

The Urban Design Element provides a set of policies pertaining to city pattern, conservation, major new development, and neighborhood environment./9/ The objectives of the Urban Design Element are:

- Objective 1 (City Pattern): Emphasis of the characteristic pattern that gives to the City and its neighborhoods an image, a sense of purpose, and a means of orientation.
- Objective 2 (Conservation): Conservation of resources that provide a sense of nature, continuity with the past, and freedom from overcrowding.
- Objective 3 (Major New Development): Moderation of major new development to complement the city pattern, the resources to be conserved, and the neighborhood environment.
- Objective 4 (Neighborhood Environment): Improvement of the neighborhood environment to increase personal safety, comfort, pride, and opportunity.

This Element also contains guidelines for building height and bulk, building form, streetscapes, and view corridors. Objective 1, Policy 1 states that new development should "recognize and protect major views in the city, with particular attention to those of open space and water."/10/ Also, three conservation policies stress the need to be cautious in giving up street areas for private use./11/

Recreation and Open Space Element

The Recreation and Open Space Element, adopted in 1973, identifies "objectives and policies to meet San Francisco's needs for recreation and open space at regional, city-wide, and neighborhood levels."/12/ The Element includes land use policies, open space requirements, public access, and urban design measures for new development in the San Francisco shoreline zone. The shoreline zone covers the City's entire shoreline but varies in the degree to which it extends inland, depending on the quality of the existing open space and public recreation facilities in the area and on the amount of new development anticipated. The Eastern Shoreline Plan map identifies the eastern edge of Mission Bay and the shoreline of China Basin Channel as areas in this zone. Open space and recreation and proposed plans in Mission Bay are discussed under "Recreation and Parks: Impacts" in Section V.M, Community Services and Utilities.

Residence Element

The Residence Element, adopted in 1984, provides data and information to assess housing conditions and needs in San Francisco./13/ It contains objectives and policies to deal with the identified needs and constraints, and proposes implementation programs to carry out these housing objectives and policies. Objectives of the Residence Element are:

- Objective 1: To provide new housing for all income groups in appropriate locations.
- Objective 2: To increase substantially the supply of housing without overcrowding or adversely affecting the prevailing character of existing neighborhoods.
- Objective 3: To retain the existing supply of housing.
- Objective 4: To maintain and improve the physical condition of housing.
- Objective 5: To provide housing affordable by all income groups, particularly low and moderate income households.
- Objective 6: To provide a quality living environment.
- Objective 7: To provide maximum housing choice.
- Objective 8: To avoid or mitigate hardships imposed by displacement.
- Objective 9: To address housing needs through a coordinated regional approach.

Housing Supply Policy 2 states: "Facilitate the conversion of underused industrial and commercial areas to residential use." The Element's inventory of land suitable for residential development includes the Project Area as a housing opportunity site.

Sustainability Plan

The Sustainability Plan for the City of San Francisco was endorsed by the Board of Supervisors on July 21, 1997 (Resolution No. 692-97), as a non-binding guideline for policy and practice in the City and County. The City's Department of the Environment was formed to address sustainability issues, including implementing the Sustainability Plan.

The basic goal of the Sustainability Plan is to enable the City and its people to meet its present needs without sacrificing the ability of future generations to meet their own needs. The Plan contains short-term (five-year) and long-term objectives and specific actions related to various topics (air quality, energy, hazardous materials, parks, solid waste, transportation, water, wastewater, economic development, environmental justice, risk management, etc.). Although there is no specific "land use" topic, a number of Sustainability Plan objectives have land use implications, particularly those related to building design, landscaping, transportation, and neighborhood design.

<u>San Francisco City Planning Code</u>

The City Planning Code, Chapter 11 of the Municipal Code, is the primary legal mechanism for guiding growth and development in accordance with the General Plan. The City Planning Code establishes land use districts and regulates land uses and location, building size, bulk, dimensions, siting, access, and parking. The code includes maps of Use Districts and Height and Bulk Districts.

Along with the adoption of the *Mission Bay Plan*, the Board of Supervisors adopted Article 9, Mission Bay Districts, of the City Planning Code. The intent of Article 9 is "to provide a comprehensive and flexible zoning system for Mission Bay use districts consistent with the objectives and policies set forth in the Mission Bay Plan."/14/

Zoning controls vary according to Mission Bay land use districts and include density (with floor area ratios ranging from 2.5 to 1 to a maximum of 4.5 to 1), open space, and parking requirements. The area of Mission Bay north of the Channel currently has land use districts that include Mission Bay Office, Mission Bay Community Facility, Mission Bay Open Space, and some high-density Mission Bay Residential. In Mission Bay south of the Channel, Mission Bay Open Space districts are located primarily in areas along the Channel and along Terry A. François Boulevard, with smaller areas demarcated in the central part of Mission Bay. Generally, Mission Bay Residential land use districts are located in the interior of the area south of the Channel, surrounded by Mission Bay Open Space districts. Mission Bay Neighborhood Commercial districts are concentrated along Third Street, and Mission Bay Commercial-Industrial and M-1 industrial districts follow the freeway in the western part of Mission Bay. The Castle Metals and Esprit sites, not part of the 1990 *Mission Bay Plan*, are in M-2 industrial districts. Current land use districts are depicted in Figure V.A.3.

Height and bulk districts in Article 9 consistent with the 1990 *Mission Bay Plan* regulate building height, bulk, and form (lot coverage and building articulation) (see Figure V.A.4). Height and bulk districts for the area north of the Channel allow structures of up to 110 feet, the tallest possible in Mission Bay under the current controls. The area of Mission Bay south of the Channel has a variety of allowable height limits, ranging from 45 feet in the lower-density Mission Bay Residential districts and the Mission Bay Hotel district, to 85 feet in the Mission Bay Commercial-Industrial district along the freeway, and to 95 feet in high-density Mission Bay Residential areas in the western section of Mission Bay South along Owens Street. Allowable heights for the Castle Metals and Esprit sites are 80 feet and 40 feet, respectively.

In March 1996, the Northeast China Basin Special Use District was designated by adding Section 249.18 to the City Planning Code pursuant to voter passage of Proposition B. The purpose of this Special Use District, which is adjacent to the Project Area, is to accommodate the development of a ballpark and related commercial uses.

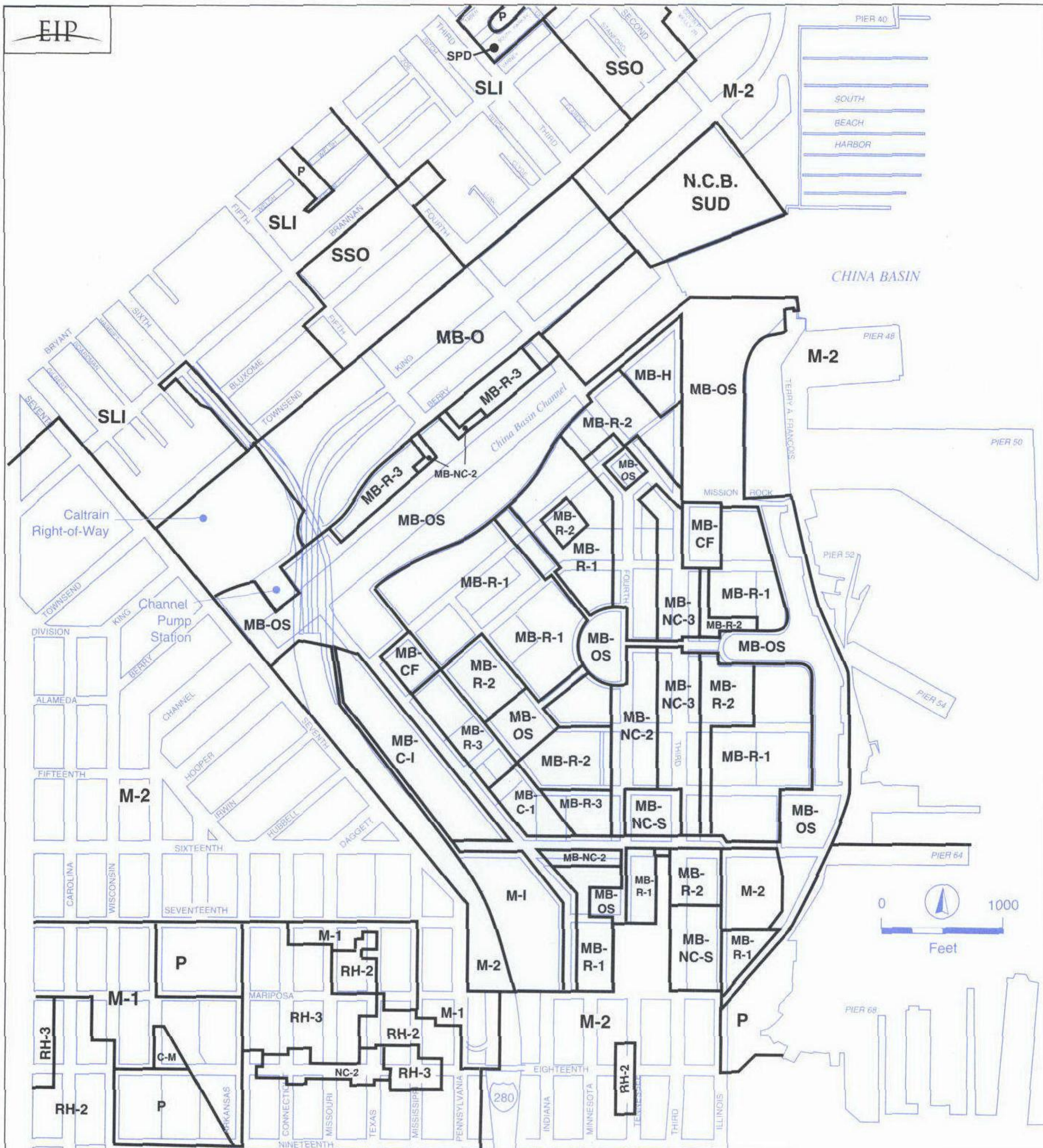
Accountable Planning Initiative

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which established eight Priority Planning Policies. The policies, contained in Section 101.1 of the City Planning Code, are: 1) preservation and enhancement of neighborhood-serving retail uses; 2) protection of neighborhood character; 3) preservation and enhancement of affordable housing; 4) discouragement of commuter automobiles; 5) protection of industrial and service land uses from commercial office development and enhancement of resident employment and business ownership; 6) earthquake preparedness; 7) landmark and historic building preservation; and 8) protection of open space. Before issuing a permit for any project or adopting any legislation that requires an Initial Study under the California Environmental Quality Act, or adopting any zoning ordinance or development agreement, and before taking any action which requires a finding of consistency with the General Plan, the City is required to find that the proposed project or legislation is consistent with the Priority Policies.

Proposition M also placed yearly limits on the amount of office space that can be developed in the City. Section 981 of the City Planning Code states that Mission Bay Use Districts, which are the current land use districts in the Project Area (with the exceptions of the Castle Metals and Esprit sites), are subject to Proposition M limitations unless any development is exempted by an adopted ballot measure. Proposition M also applies to the Castle Metals and Esprit sites under City Planning Code Sections 320 and subsequent sections.

Subdivision Map Act

The Subdivision Map Act (California Government Code 66410 *et seq.*) and local subdivision provisions regulate the subdivision process. Subdividing land is the process of splitting a tract of land



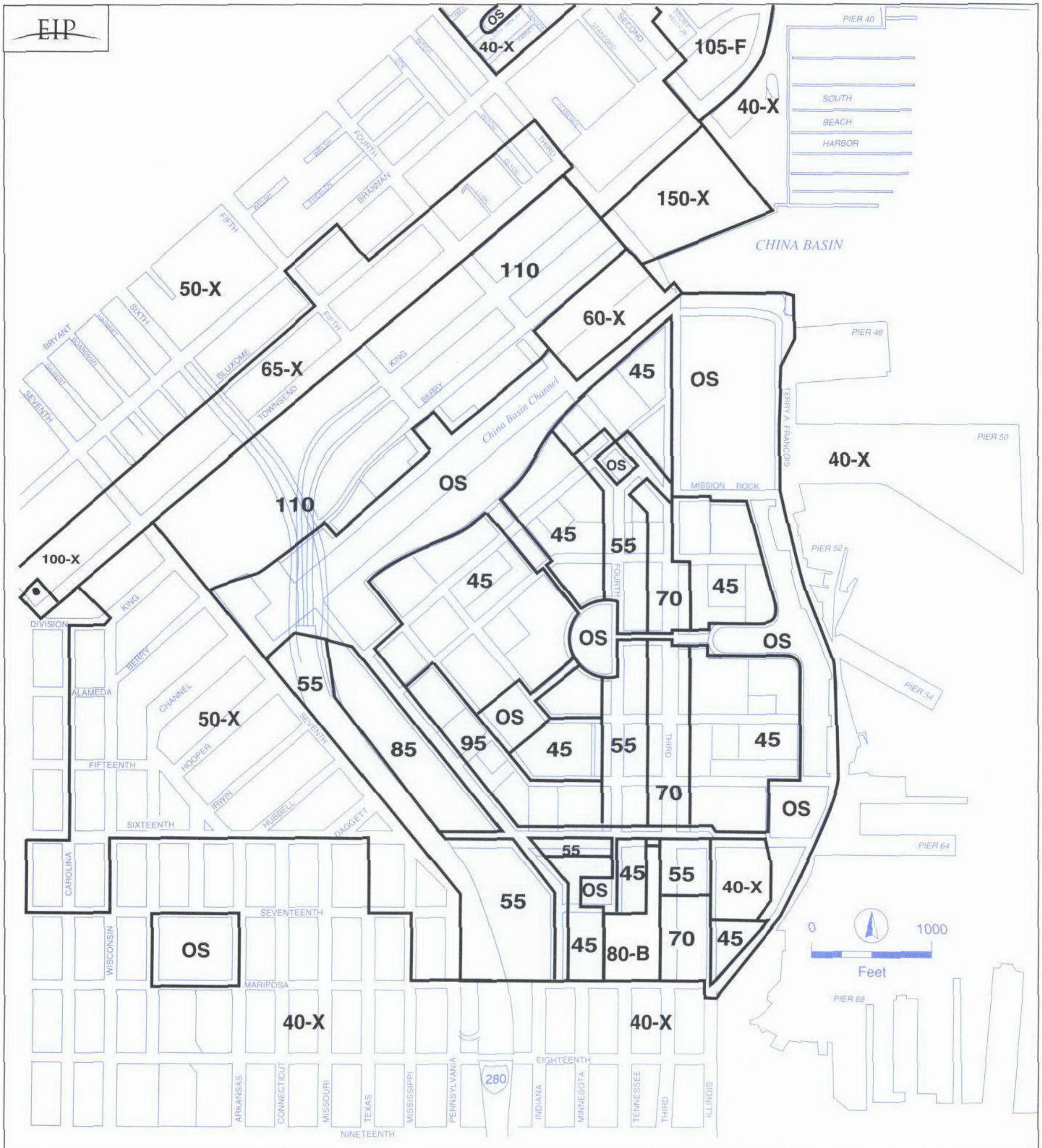
M-1, M-2	Industrial	C-M	Heavy Commercial	MB-H	Mission Bay Hotel
P	Public Use	N.C.B.SUD	Northeast China Basin Special Use District	MB-CF	Mission Bay Community Facility
NC-2&3, NC-S	Neighborhood Commercial	MB-O	Mission Bay Office	MB-R-1, 2&3	Mission Bay Residential
RH-2, RH-3	Residential	MB-C-I	Mission Bay Commercial	MB-OS	Mission Bay Open Space
SPD	South Park	MB-NC-2, 3&5	Mission Bay Neighborhood Commercial		Land Use District Boundary
SLI	Service/ Light Industrial				1990 Mission Bay Plan Area
SSO	Service/Secondary Office				

96555/3-26-98

SOURCE: City and County of San Francisco

MISSION BAY SUBSEQUENT EIR

FIGURE V.A.3 EXISTING LAND USE DISTRICTS IN MISSION BAY AND THE VICINITY



OS — OPEN SPACE DISTRICT	B — SETBACKS MAY BE REQUIRED ABOVE 50 FT.	F — SETBACKS MAY BE REQUIRED ABOVE 80 FT.
00-Z — NUMBERS ARE HEIGHT LIMITS IN FEET; LETTER SYMBOLS REFER TO BULK LIMIT IN CITY PLANNING CODE SEC. 270	X — BULK LIMITS NOT APPLICABLE	1990 MISSION BAY PLAN AREA
	OS — SEE PLANNING CODE SECTION 290	

96555/3-23-98

SOURCE: City and County of San Francisco Planning Code Zoning Maps (as amended, 1996)

MISSION BAY SUBSEQUENT EIR

FIGURE V.A.4 EXISTING PLAN HEIGHT AND BULK DISTRICTS IN MISSION BAY AND THE VICINITY

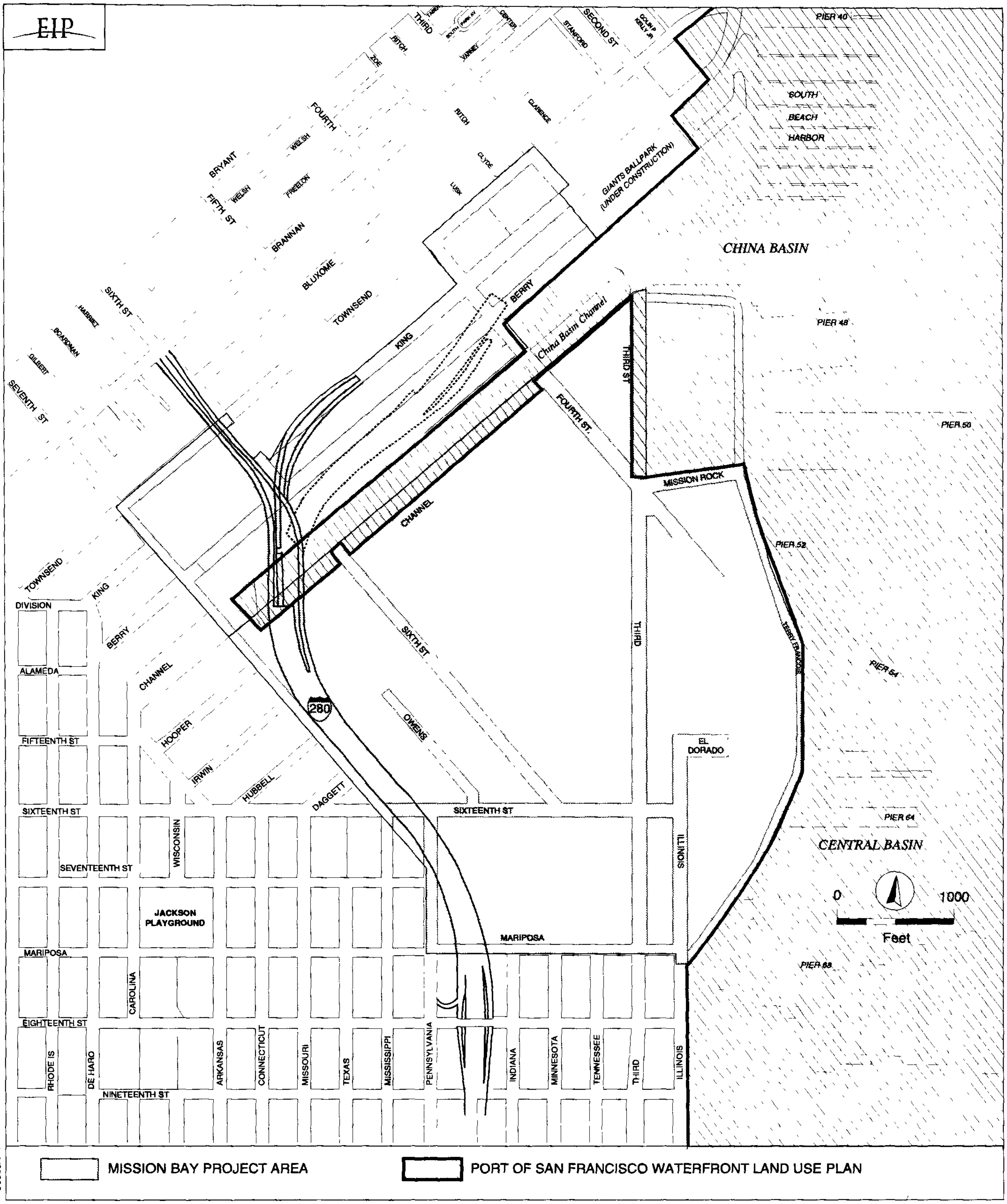
into separate parcels for the purpose of sale, lease, or financing the development of those parcels./15/ This process has been delegated in large part to local agencies. For the City and County of San Francisco, regulations pertaining to land subdivision are found in the San Francisco Subdivision Code and the San Francisco Subdivision Regulations. Generally, the purpose of the subdivision laws or ordinances is to ensure that proper infrastructure is present or provided for in any development that would occur as a result of land subdivision. For subdivisions involving five or more parcels, tentative and final subdivision maps are required.

Port of San Francisco

In 1968, the Burton Act and accompanying Transfer Agreement, transferred the administration and control of all port property from the San Francisco Port Authority, a state agency, to the City and County of San Francisco, to be held in trust by the Port Commission as trustee for the people of California and administered separately from other city property. Under the Burton Act, the Port of San Francisco has power to manage, operate, and administer port lands, consistent with the public trust and Burton Act trust. Approval of the Port is required for any uses on, or transfer of, land under its jurisdiction. Port-owned land within Mission Bay extends roughly from the waterfront (including the piers) to Illinois Street and includes an area along the southern bank of the Channel.

The Port, the Redevelopment Agency, and Catellus propose to amend the Port Land Transfer Agreement to provide for the transfer of property in order to accommodate development by both the Port and Catellus and provision of open space by the Redevelopment Agency. The amendments propose to: transfer approximately 18 acres of port property to Catellus; lease about 7 acres of port property to the Redevelopment Agency; and transfer about 29 acres of Catellus property to the Port. These transfers will provide the Port and Catellus with sites that are useful for development purposes and will enable the Redevelopment Agency to provide for open space and community facilities in the Project Area.

In June 1997, by Resolution 97-50, the Port adopted the *Waterfront Land Use Plan*, the comprehensive land use planning document for the agency (see Figure V.A.5 for the boundaries of the *Waterfront Land Use Plan*). This document supersedes the *Conceptual Maritime Master Plan* for the Southern Waterfront./16/ On October 29, 1997, the Planning Commission adopted amendments to General Plan Elements and Area Plans that establish land use policies consistent with the *Waterfront Land Use Plan*; these amendments were adopted by the Board of Supervisors on January 5, 1998. These amendments also address open space, public access and urban design improvements included in the Waterfront Design & Access Element of the *Waterfront Land Use Plan*. As part of the implementation of the *Waterfront Land Use Plan*, amendments will be considered to the



SOURCE Port of San Francisco

MISSION BAY SUBSEQUENT EIR

FIGURE V.A.5 PORT OF SAN FRANCISCO WATERFRONT LAND USE PLAN BOUNDARY

San Francisco Bay Plan and the *San Francisco Waterfront Special Area Plan* (both are discussed below under "San Francisco Bay Plan"). The Port is working with the Bay Conservation and Development Commission to achieve consistency between the new port plans and regional waterfront policies.

The *Waterfront Land Use Plan* goals "establish a framework for determining acceptable land uses for port property. In general, the goals call for a wide variety of land uses which retain and expand historic maritime activities at the Port, provide revenue to support new maritime and public improvements, and significantly increase public access."/17/ The *Waterfront Land Use Plan* sets forth policies for a variety of land uses, including maritime, open space and public access, residential, and a variety of interim uses. Subarea plans present more detailed land use policies in relation to geographical areas. A small portion of the Project Area is under port jurisdiction and is located in the South Beach/China Basin Waterfront subarea.

The Port sees the decline in maritime activity in San Francisco as an opportunity both to provide open space along the waterfront and to increase public access to the Bay or generate revenue which can be used to achieve these purposes. For the South Beach/China Basin sub-area, the *Waterfront Land Use Plan* states that "new activities on inland sites should incorporate local-serving businesses or amenities to help provide a transition, where necessary, between larger scale water-side attractions and residential neighborhoods." For the portion of the Project Area that lies within the South Beach/China Basin subarea of the *Waterfront Land Use Plan* boundaries (see Figure V.A.5), the *Waterfront Land Use Plan* calls for maintaining existing open space and public access and for planning new open space and public access. *Waterfront Land Use Plan* land use policies regarding open space include the following:

- Ensure a diversity of Open Spaces and Public Access, which may be achieved in different ways depending on location.
- Provide public facilities in Open Spaces and Public Access areas wherever desirable and feasible.
- Provide public access around the perimeter of piers, wherever safe and feasible.
- Protect open spaces from shadow and wind impacts from adjacent development according to applicable law.

Specific design and development guidelines in the Development Standards section of the South Beach/China Basin subarea include:

- Provide shoreline improvements, where feasible, to support expanded recreational boating and water activities between Pier 50 and the San Francisco Boatworks near Mariposa Street for a new small boat hoist, temporary storage, or other support services for the recreational boating community.

- Accommodate expanded boat trailer parking areas in the design of Mission Bay waterfront open space on the west side of Terry A. François Boulevard.

- Address the parking needs of recreational boaters in the design of the Mission Bay open space near the Pier 52 public boat launch.

- Permit existing commercial uses and future ancillary services and activities including convenience retail and food services to enhance the use of the area by water recreation enthusiasts and to generate supporting revenue.

Areas covered by the *Waterfront Land Use Plan* that are adjacent to the Project Area are comprised mainly of piers. Policies guiding the use of piers call for consolidation of maritime support services (Pier 38); development of revenue-generating uses consistent with the public trust (Pier 40); and maintenance of cargo-related uses and maritime support services (Piers 48, 50, and 54). At Piers 48, 50, and 54, a cafe or restaurant would be an allowable interim use for portions of the bulkhead building closest to the new ballpark (currently under construction). The *Waterfront Land Use Plan* also calls for the repair and enhancement of the public boat launch at Pier 52, and that the design of open space in Mission Bay address the parking needs of recreational boaters near the boat launch. Interim use of port property east of Third Street includes surface parking for the Giants Ballpark, as discussed in "Interim Uses" under "Summary of Project Area Impacts" in Section V.B, Land Use: Impacts.

Development policy for approximately 10.8 acres of Seawall Lot 337, referred to as Parcel PP, which under the 1990 *Mission Bay Plan* had been reserved for wetlands use but is not now a part of the Project Area, is under review by the Port. The portions of Seawall Lots 338 and 339 that had been a part of the 1990 *Mission Bay Plan* (as open space) that are not part of the proposed project are under similar review; the Port and Catellus are no longer including these properties in a land exchange, which previously had been part of the 1990 Mission Bay development program covered in the 1990 FEIR. Seawall Lot 345 contains a variety of uses that may be expanded in the future, including fishing industry activities, retail, and public access. Seawall Lots 340, 343, and remaining portions of 338 and 339, are within the Project Area, but not within the boundary of the *Waterfront Land Use Plan*. There are no port development policies that pertain explicitly to them. These lots are in the process of being transferred to Catellus.

REGIONAL AGENCIES

Bay Conservation and Development Commission

McAteer-Petris Act

The McAteer-Petris Act, which preceded most of the major federal and state environmental statutes of the early 1970's, created the Bay Conservation and Development Commission (BCDC) in 1965 and authorized preparation of the *San Francisco Bay Plan* to respond to piecemeal filling of the Bay that had reduced the size of the open Bay by about one-third and the Bay's wetlands by more than 75%./18/ The act covers permit authority for fill or other development activities in four geographic areas: 1) all Bay water areas and some tributaries up to the line of highest tidal action ("Bay" jurisdiction); 2) all shoreline located within 100 feet of the Bay ("shoreline band" jurisdiction); 3) salt ponds and managed wetlands; and 4) Suisun Marsh. BCDC's "Bay" jurisdiction also extends into areas that may be opened to tidal action, e.g., new waterways, canals, or channels.

Under the provisions of the McAteer-Petris Act, BCDC may approve Bay fill/19/ in areas under its jurisdiction only for certain "water-oriented" uses specified in the law or "minor fill for improving shoreline appearance or public access to the Bay."/20/ Water-oriented uses include port facilities, water-related industry, bridges, wildlife refuges, and water-oriented recreation and public assembly. Furthermore, placement of fill is limited to: 1) fill necessary for public health, safety, or welfare; 2) fill for water-oriented uses; or 3) minor fill to improve shoreline appearance and public access./21/ Fill must be the minimum necessary for these purposes and can be permitted only when no alternative upland location exists.

BCDC also regulates dredging/22/ in its jurisdiction, on the basis of two main policies: 1) dredge spoils must be disposed of by placement on dry land for approved fill projects, or at locations in the Bay approved by the U.S. Army Corps of Engineers; and 2) all proposed waterways and canals should be designed to maintain the stability of any adjacent dikes or fill.

BCDC can require, as conditions of permits, shoreline public access improvements consistent with the project, as required to establish maximum feasible public access, such as, but not limited to, pathways, bicycle racks, parking, benches, or signs. Applications for permits for activities within the 100-foot "shoreline band" (outside of the boundaries of certain designated water-oriented priority land uses) may be denied only if the proposed activity or use fails to provide the maximum feasible public access, consistent with the proposed use, to the Bay and its shoreline. Some guidance regarding the suggested type of access and level of improvements is provided in a 1985 BCDC document, Public

Access Design Guidelines. The amount and design of public access areas are determined on a case-by-case basis consistent with the requirements of Section 66632.4 of the McAteer-Petris Act.

San Francisco Bay Plan

The *San Francisco Bay Plan*, adopted in 1969, as amended, is the BCDC policy document that specifies goals, objectives, and policies for waterfront land use and other BCDC jurisdictional areas defined in the McAteer-Petris Act./23/ The plan addresses public access to the Bay and the effects of filling and development on the Bay. The plan concludes that the remaining water volume and surface area of the Bay should be maintained to the greatest extent feasible for the benefit and protection of Bay fish and wildlife; filling and diking should be permitted only for purposes providing substantial public benefits, and only if there is no alternative upland location.

The *San Francisco Waterfront Special Area Plan*, an amendment of the Bay Plan, established "Port-priority" areas for San Francisco. "Port-priority" areas identify land most suitable for water-related uses, thus encouraging such activities on these designated areas instead of creating new Bay fill. Until amendments associated with the adoption of the *Waterfront Land Use Plan* are completed, the *San Francisco Waterfront Special Area Plan* will remain in place. However, the San Francisco Waterfront Special Area Plan essentially defers to the more up-to-date *San Francisco Bay Area Seaport Plan* (Seaport Plan) for areas south of China Basin./24/ Provisions for uses on waterfront property consistent with the McAteer-Petris Act for areas south of China Basin have thus been more recently addressed in the Seaport Plan.

At the time of the 1990 FEIR, the area of the Mission Bay east of Third Street was included in BCDC's "Port-priority" areas. "Port-priority" use areas are areas deemed to be essential to future port development and are thus reserved for port-related activities and other uses that would not interfere with port development. The "Port-priority" designation was deleted from most of the area east of Third Street and south of China Basin Channel pursuant to Seaport Plan amendments adopted in April 1996./25/ As a result, no part of the Project Area is within a "Port-priority" use area. BCDC's 100-foot shoreline band jurisdiction is unaffected by changes in "Port-priority" designations./26/ The portions of the Project Area within the 100-foot shoreline band, located along the Channel, are discussed below, under "Comparison with Existing Plans and Policies."

San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay Regional Water Quality Control Board (RWQCB) regulates discharges into the Bay, including discharge from the City's wastewater treatment facilities and storm water discharges. See "Regulatory Framework" in Section V.K, Hydrology and Water Quality: Setting.

The RWQCB is required to ensure adequate protection of water quality and statewide uniformity in siting, operation, and closure of waste disposal sites. In addition, the State Water Resources Control Board (SWRCB) delegates authority to the RWQCB for maintaining an inventory of underground storage tanks and for overseeing any clean-up associated with leaking tanks. More information on the RWQCB is presented in "Scope of 1997 Soil and Groundwater Investigations," and in "Regulatory Framework" in Section V.J, Contaminated Soils and Groundwater: Setting.

Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) has primary responsibility for the attainment and maintenance of air quality standards in the San Francisco Bay Area. The BAAQMD regulates stationary pollution sources, such as industrial plants. In conjunction with the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission, BAAQMD developed a *Bay Area Air Quality Plan*, adopted in 1979. The plan was revised in 1982 to include part of the State Implementation Program (SIP) for meeting ambient air quality standards and the ABAG *San Francisco Bay Area Environmental Management Plan*.

The Air Quality Plan describes air quality problems, federal air quality standards, and control programs to attain ozone and carbon monoxide standards. Currently, carbon monoxide levels exceed federal standards in the Bay Area. BAAQMD measures, monitors, and regulates organic and inorganic pollutant emissions and the criteria pollutants, which are lead, oxides of sulfur, oxides of nitrogen, carbon monoxide, particulate matter, and reactive organic gases. BAAQMD also establishes emission and performance standards or criteria for new stationary sources and hazardous air pollutants, issues permits for certain stationary source emission generators, and reviews and comments on environmental documents regarding air quality matters. The asbestos rule (Rule 2) contains requirements for building demolition and asbestos disposal which minimize the airborne release of asbestos.

STATE AGENCIES

University of California San Francisco

In January 1997, The Regents adopted the University of California San Francisco's (UCSF) *1996 Long Range Development Plan* (LRDP). The LRDP serves as a report to The Regents that describes UCSF's long-range physical plans for its maintenance and growth. In response to the needs identified in the LRDP, the plan presents UCSF's decision to pursue development of a 2.65-million-square-foot (excluding parking) major new site, which would include instruction, research, and support uses. The LRDP presented a set of goals and objectives for the major new site. The LRDP considered three potential locations in the San Francisco Bay Area for their potential to satisfy the goals for a major new site. On May 16, 1997, The Regents approved the selection of Mission Bay as the major new site.

California State Lands Commission

When California became a state in 1850, it became the owner of all lands underlying navigable waterways, including tidelands./27/ Most of those lands are still owned by the state or the legislature's public grantees under jurisdiction of the State Lands Commission (SLC). Port lands are state sovereign lands held in trust by the Port for the people of the State of California pursuant to the Burton Act and the related 1968 Transfer Agreement. The public trust doctrine of the California Constitution defines allowable uses of submerged lands and tidelands as commerce, navigation and fisheries, water-oriented recreation and preservation of those lands as ecological units. Tidelands that are filled remain subject to the public trust and the jurisdiction of the SLC.

The State, City, and Catellus, under the Agreement concerning the Public Trust, have entered into agreements regarding portions of the land within the Project Area that are subject to the common law public trust and Burton Act. In 1991, the Legislature enacted Chapter 1143 of the Statutes of 1991, as amended in 1992 by Chapter 86 and in 1997 by Chapter 203 (the "Act") which determined that certain parcels within the Project Area which were otherwise subject to the Public Trust or Burton Act could be sold, transferred or exchanged, provided certain findings were made. The proposed amendments to the land transfer agreements include a proposed amendment to the Agreement concerning the Public Trust, which will implement those sales and exchanges authorized by the Act and described in Section III.B, Project Description. In order to implement the amendments, the findings required by the Act would need to be made.

California Public Utilities Commission

The California Public Utilities Commission (CPUC) sets the rates and regulates the service of transportation and utility companies in California./28/ In the Project Area, the CPUC regulates Caltrain passenger service. Any changes in the service would require CPUC approval. Reduction in freight train service in the area or removal or relocation of freight rail trackage at the Project Area also would require CPUC approval./29/ Relocation or construction of new rail-crossings would require CPUC review.

California Department of Fish and Game

The California Department of Fish and Game's (CDFG) overall objective is "to maintain all species of fish and wildlife for their intrinsic and ecological values, as well as for their direct benefits to man" (including commercial fisheries such as the Pacific herring)./30/ CDFG does not directly regulate development, but under the National Environmental Policy Act and California Environmental Quality Act, and the Fish and Wildlife Coordination Act, CDFG reviews projects that may affect fish and wildlife resources. CDFG must determine whether projects are "likely to jeopardize the continued existence of any state-listed endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of the species."/31/ CDFG also administers the provisions of the state Endangered Species Act. CDFG would review this SEIR with concern for protection and enhancement of the quality of the fish and wildlife habitat provided in China Basin Channel, the China Basin area, and the Bay, particularly as may be affected by project-related changes in China Basin Channel water quality.

Department of Health Services

The Department of Health Services (DHS) is the primary state agency regulating public health, including the use and disposal of radioactive materials and the disposal of medical waste. Any uses that would involve radioactive materials or that would produce medical waste, such as medical or bio-technical research, would require permits from the DHS. Permitting for disposal of medical waste has been delegated by the DHS to the San Francisco Department of Public Health. The responsibilities of DHS and the San Francisco Department of Public Health are described in Table V.I.2 in Section V.I, Health and Safety, and in Appendix H, Health and Safety.

California Department of Toxic Substances Control

The California Department of Toxic Substances Control (DTSC) is the state agency responsible for the monitoring and control of hazardous wastes, other than those under the purview of the DHS. Permitting for activities that produce hazardous waste has been delegated by the Department to the San Francisco Department of Public Health. Hazardous waste materials and the responsibilities of DTSC are discussed in Table V.I.2 in Section V.I, Health and Safety, and in Appendix H, Health and Safety.

FEDERAL AGENCIES

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (Corps) is the primary federal permit authority for projects in or affecting navigable waterways of the United States. The Federal Rivers and Harbors Act of 1899 defined navigable waterways as those suitable for commercial transport. Section 404 of the Federal Clean Water Act of 1972 and other legislation widened the definition of navigable waterways to include rivers, coastal waters, adjacent wetlands, lakes, intermittent streams, and low-lying areas behind dikes along the coast. The regulatory authorities and responsibilities of the Corps are based on the following laws: Sections 9 and 10 of the Rivers and Harbors Act of 1899, which regulate diking, filling or placement of structures or work in or affecting navigable waters of the U.S.; Section 404 of the Clean Water Act of 1972, which regulates disposal of dredged or fill material into waters of the U.S.; and Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972, which regulates the transportation of dredged material for the purposes of disposing it in ocean waters. Primary objectives of these regulatory activities are to maintain navigability of waters, to protect and enhance water quality and biological resources, and to limit filling of wetlands. Project construction that would alter a streambed or banks of China Basin Channel, or include structures such as pedestrian bridges or utilities in or affecting China Basin Channel would require Corps review.

For a proposed project within its jurisdiction, the Corps conducts a "public interest review" by soliciting comments on permit applications through a public notice process. Several agencies have specific review and comment responsibility for Corps-permitted projects. Among them are BCDC, RWQCB, California Department of Fish and Game, SLC, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Coast Guard, and National Maritime Fisheries Service.

U.S. Coast Guard

● The Coast Guard's primary responsibility is to serve and enhance the navigability and safety of navigable waters of the United States./32/,/33/ Under Section 9 of the Rivers and Harbor Act of 1899, the Coast Guard has permitting jurisdiction for bridges over navigable waters, and regulates the operation of drawbridges. U.S. Coast Guard bridge permits also require the prior approval of BCDC and RWQCB.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (FWS) does not have direct permit authority, but influences decisions on fish and wildlife habitat through its role as a commenting agency to the U.S. Army Corps of Engineers permit applications. Under the Fish and Wildlife Coordination Act of 1958, FWS must be consulted on federally funded, licensed, or permitted projects. The Federal Endangered Species Act of 1973 requires federal and state agencies and private applicants to consult with FWS when a project might jeopardize the habitat of listed endangered or threatened species./34/ The FWS will comment on applications made to the RWQCB, the Corps, and, where applicable, BCDC.

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) is the primary federal agency involved in regulating hazardous materials and hazardous wastes. The responsibilities of EPA with regard to hazardous wastes are described in Table V.I.2 in Section V.I, Health and Safety, and in Appendix H, Health and Safety.

COMPARISON WITH EXISTING PLANS AND POLICIES

This section discusses the effects that the proposed project would have on existing plans and policies. It also indicates the major permits that would be required for activities that could occur as a result of development within the Project Area, and the processes of the various permitting agencies for acting on those permits. The project consists of adoption and implementation of the proposed Redevelopment Plans and the Design for Development documents pursuant to their plans for the proposed Mission Bay North and Mission Bay South Redevelopment Areas. This includes a development program proposed by Catellus and the Redevelopment Agency to implement the Redevelopment Plans. The SEIR evaluates the physical effects that could result from the Redevelopment Plans, the Catellus and the Redevelopment Agency development program, and conforming amendments to land use and other plans.

Not all agencies addressed in the Setting section appear in the comparisons section because no permits would be required by certain agencies, the requirements of these agencies are discussed elsewhere in the SEIR, or the approval action has no substantive physical environmental or planning policy consequences. Policies and permits of the Department of Health Services, the California Department of Toxic Substance Control, and the U.S. Environmental Protection Agency are discussed in "Health and Safety Laws and Regulations," and "Applicable Plans and Policies" in Section V.I, Health and Safety: Setting; "Regulatory Framework" in Section V.F, Air Quality: Setting; and "Regulatory

Framework" in Section V.J, Contaminated Soils and Groundwater: Setting. A comprehensive summary of required permits and approvals is found in Section III.C, Approvals Required.

LOCAL AGENCIES

San Francisco Redevelopment Agency

Redevelopment Plans for Mission Bay North and Mission Bay South

Development in the Project Area, except for the UCSF land use designation, would be governed by the proposed Redevelopment Plans for Mission Bay North and Mission Bay South. The Redevelopment Plans set forth the general policy objectives for development, and call for separate, associated Design for Development documents which contain more- specific design standards. The proposed Redevelopment Plans and Design for Development documents are described in "Redevelopment Plans for Mission Bay North and South" and "Design for Development Documents" under "Implementation" in Section III.B, Project Description.) The Redevelopment Plans and Design for Development documents contain a regulatory scheme governing land uses and development standards for the Mission Bay Project Area which, upon adoption would supersede the City Planning Code. Prior to adoption, the Redevelopment Plans must be found to be consistent with the General Plan by the Planning Commission and the Board of Supervisors. The General Plan would be amended as necessary to bring the two documents into agreement. Under California Redevelopment Law, the Redevelopment Plan "provides the Agency with the powers, duties, and obligations to implement and further the program generally formulated in this Plan for the redevelopment, rehabilitation, and revitalization of the Project Area."/35/ The Redevelopment Plans would require adoption by the Redevelopment Agency Commission and the Board of Supervisors. After adoption of the Redevelopment Plan, any subsequent changes to the General Plan or other local land use policy would not apply to the Redevelopment Area unless so provided in the Redevelopment Plan. All city agencies, including the Port, would be required by the Redevelopment Plans to cooperate in implementing the Redevelopment Plans and to exercise their jurisdiction in a manner consistent with the Redevelopment Plans, and related implementing documents, such as the Design for Development documents and Owner Participation Agreements (OPA).

The proposed Redevelopment Plans for Mission Bay North and South and their Design for Development documents would establish new land use development guidelines for the Project Area. Currently, land use policies and development guidelines are contained in the 1990 *Mission Bay Plan* for most of the Project Area, with the exception of the Castle Metals and Esprit sites, which are currently governed by the *Central Waterfront Plan* and are proposed to be governed by the

- *Redevelopment Plan for the Mission Bay South Redevelopment Project* as part of the project. For the Project Area, the *Mission Bay Plan* is proposed to be rescinded and replaced in the General Plan by reference to the Redevelopment Plans for Mission Bay North and Mission Bay South, to establish conformity between the General Plan and the Redevelopment Plans. Article 9 of the City Planning Code would also be amended to apply only to areas in the *Mission Bay Plan* that are not included in the Project Area. These include parcels occupied by Caltrain, the former wetlands site on Seawall Lot 337, and portions of Seawall Lots 338 and 339, which are owned by the Port. All other areas previously governed by the *Mission Bay Plan* and Article 9 are within the Mission Bay Project Area and would be subject to the Redevelopment Plans.

- Rescission of the 1990 *Mission Bay Plan* and amendment of Article 9 would need to be approved by the Planning Commission and adopted by the Board of Supervisors. The Mission Bay Plan would be re-adopted by the Planning Commission as Mission Bay Guidelines which would pertain to the parcels not covered by the Redevelopment Plans. The project also includes proposed amendments to the General Plan to reflect the project. The proposed amendments are presented in Appendix B, Plans, Policies, and Permits.

In addition to the Redevelopment Plans and Design for Development documents, the project would involve OPAs to be entered into between Catellus and the Redevelopment Agency for Mission Bay North and those areas of Mission Bay South that Catellus controls. The Redevelopment Agency could also enter into OPAs with other property owners in the Project Area for development of their properties, except for UCSF. The Catellus OPAs will each include a Scope of Development which includes more specific design guidelines that augment the Design for Development and Redevelopment Plan.

As part of the project approval process, the Planning Commission would determine whether the project, including the Redevelopment Plans, is consistent with the General Plan. The Board would then consider the Planning Commission's decision before making its final determination. Refer to "Implementation" in Section III.B, Project Description, for further discussion of the Redevelopment Plans and the process of adoption.

Land Use Designations

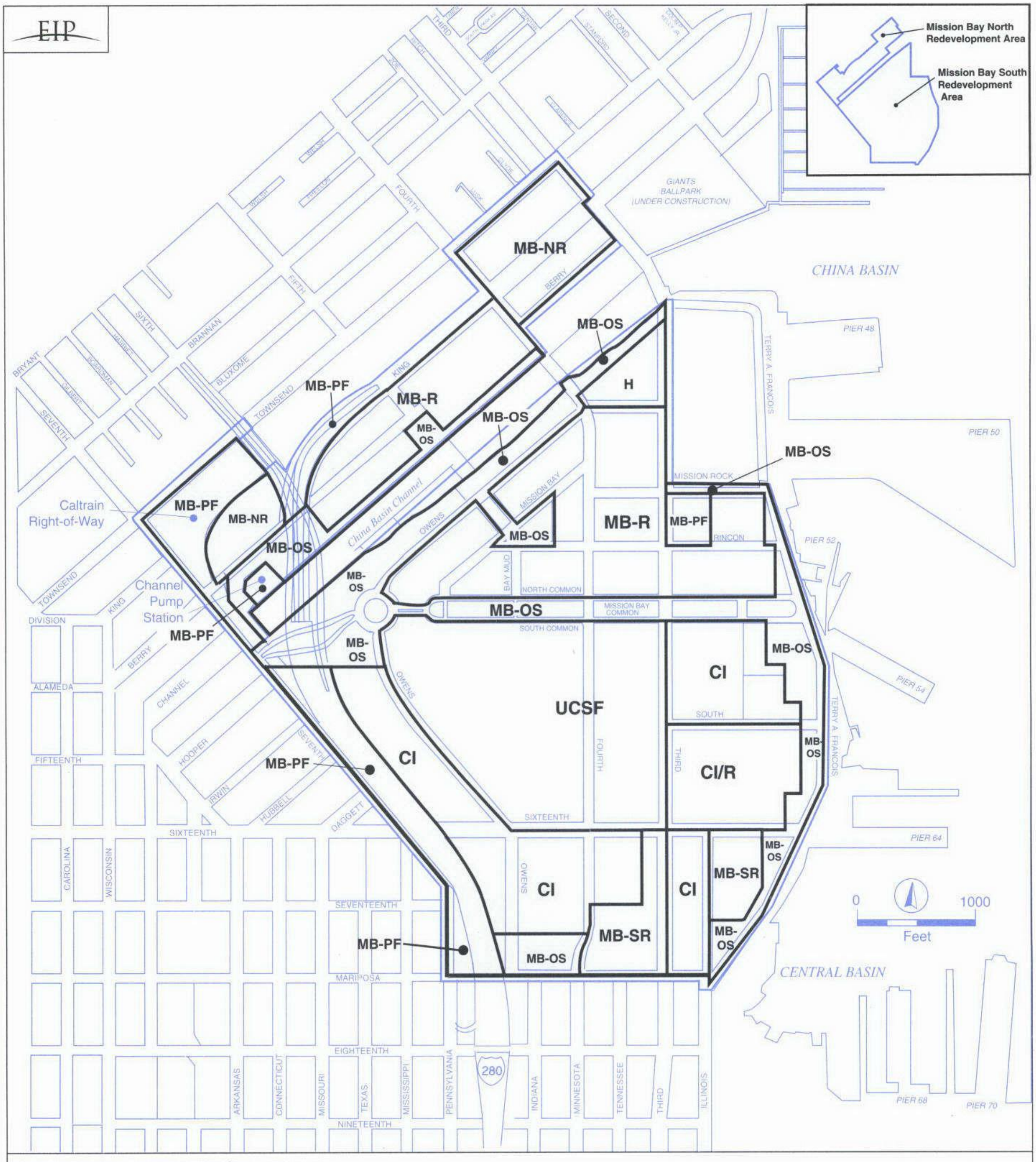
The proposed Redevelopment Plans for Mission Bay North and Mission Bay South would replace the mix of residential, office, commercial, and open space land use districts in the Project Area that are currently found in the 1990 *Mission Bay Plan* and Article 9 of the City Planning Code with new land use designations (see Figure V.A.6). In the proposed Mission Bay North Redevelopment Area, blocks designated Mission Bay North Retail (which includes housing) flank areas designated as Mission Bay Residential (which include neighborhood-serving retail). The existing pump station would be designated as Mission Bay Public Facility. Mission Bay Open Space would front both sides of the Channel.

A wider variety of land use designations are planned for the Mission Bay South Redevelopment Area. Mission Bay Hotel would be located in about the same area as in the 1990 *Mission Bay Plan*, just south of the Channel between Third and Fourth Streets. Mission Bay Residential designations would be located between the Hotel designation, the proposed Mission Bay Open Space designation on the south side of the Channel, and The Common. Mission Bay Open Space would be west of Terry A. François Boulevard, near the Bayfront. The area south of The Common and bounded by Third, 16th, and Owens Streets would be designated UCSF. Areas designated primarily as Commercial Industrial and Commercial Industrial/Retail would border the UCSF designation on the west along the freeway, on the south below 16th Street, and east of Third Street. Mission Bay South Retail would be located in areas south of 16th Street.

Permitted land uses within these designations are described in "Proposed Land Uses" under "Redevelopment Plans and Proposed Land Uses" in Section III.B, Project Description. Land uses are discussed in detail in "Land Use Changes by Subarea," under "Summary of Project Area Impacts" in Section V.B, Land Use: Impacts.

Interim Uses

The Redevelopment Plans contain provisions for interim uses. Interim uses are land uses that might not otherwise be permitted as part of the development which would result from implementation of the Redevelopment Plans, but which could be permitted for a limited period pending development under the Plans. Currently, Article 9 of the City Planning Code, Mission Bay Districts, allows uses permitted in M-1 districts as interim uses of either five or ten years, plus possible extensions. The proposed Redevelopment Plans would allow interim uses for up to 15 years, with extensions in five-year increments at the discretion of the Redevelopment Agency. Interim uses may be authorized by the Executive Director of the Redevelopment Agency upon a determination that such uses would not impede the orderly development of the Project Area. Interim uses would include temporary structures and uses incidental to the construction of a building, rental or sales offices incidental to new development, open recreation uses, truck parking, storage, and parking.



REDEVELOPMENT PLAN LAND USE DESIGNATIONS

CI	COMMERCIAL INDUSTRIAL	**MR-R**	MISSION BAY RESIDENTIAL	**MB-PF**	MISSION BAY PUBLIC FACILITIES
CI/R	COMMERCIAL INDUSTRIAL / RETAIL	**H**	HOTEL		MISSION BAY PROJECT AREA
MB-NR	MISSION BAY NORTH RETAIL	**MB-OS**	MISSION BAY OPEN SPACE		
MB-SR	MISSION BAY SOUTH RETAIL	**UCSF**	UCSF (includes City school site)		NOTE: See Table III.A.2 for types and amounts of use.

96555/3/30/98

SOURCE: San Francisco Redevelopment Agency

FIGURE V.A.6 LAND USE DESIGNATIONS IN THE PROPOSED MISSION BAY REDEVELOPMENT PLANS

Temporary Uses

Temporary uses of up to 90 days are also provided for in the Redevelopment Plans. Temporary uses could include exhibitions, festivals, convention staging, and truck parking and loading. Similar temporary uses are currently permitted under Article 9 for up to 60 days.

Height Limits

The proposed Redevelopment Plans for Mission Bay North and Mission Bay South would replace the mix of height and bulk districts set forth in the 1990 *Mission Bay Plan* and Article 9 of the City Planning Code with new designations for properties in the Project Area. The proposed Mission Bay North Redevelopment Plan would allow certain buildings north of the Channel to reach a maximum of 160 feet (Height Zones HZ-1b and HZ-1a; see Figure III.B.5). The proposed Mission Bay South Redevelopment Plan would allow certain buildings south of the Channel to reach a maximum of 160 feet (Height Zones HZ-2, HZ-3, HZ-4, HZ-5, HZ-6, and HZ-7; see Figure III.B.5). As a whole, these proposed height zones represent a substantial increase in potential allowable heights, compared to allowable heights of 45 to 110 feet in the 1990 *Mission Bay Plan* and Article 9 of the City Planning Code. The proposed height and bulk standards would limit the amount of developable area and the number of towers that could attain the maximum height within each zone. These standards would vary according to the different height zones. (See Table III.B.2 for provisions governing height zones in the proposed Redevelopment Areas.) These limits are discussed below in association with the proposed building bulk controls. The Castle Metals and Esprit sites currently have height limits of 80 feet and 40 feet, respectively. Allowable heights on these parcels would be increased to 90 feet under the proposed Mission Bay South Redevelopment Plan. See "Views" in Section V.D, Visual Quality and Urban Design: Impacts, for a discussion of the physical and visual impacts of the proposed height limits.

The proposed Redevelopment Plans would have bulk limits which set forth the maximum dimensions for potential buildings based on length and vertical and diagonal measurements (in feet). Bulk limitations would apply to buildings 90 feet or taller. Refer to Table V.A.1 for maximum building bulk. Allowable density, bulk, and coverage are discussed in detail under "Urban Form and Design," under "Redevelopment Plans and Proposed Land Uses" in Section III.B, Project Description, and the physical effects are discussed throughout Section V.D, Visual Quality and Urban Design: Impacts.

The area designated as UCSF would be within Height Zone 8 (HZ-8). Height and bulk controls established under the project would not apply to development in this area.

TABLE V.A.1
PROPOSED MISSION BAY BUILDING BULK STANDARDS

	Height Zones	
Mission Bay North	HZ-1b	HZ-1a
Bulk (above 90')	Max. residential plan diagonal 190 ft. Max. residential plan length 160 ft. Max. residential floor plate 17,000 sq. ft.	Above 120' Max. residential plan diagonal 190 ft. Max. residential plan length 165 ft. Max. residential floor plate 17,000 sq. ft.

	Height Zones	
Mission Bay South	HZ-2 HZ-3 HZ-4	HZ-5 HZ-6 HZ-7
Bulk (above 90')	Max. residential plan diagonal 190 ft. Max. residential plan length 160 ft. Max. residential floor plate 17,000 sq. ft. Max. hotel plan length 200 ft. Max. hotel floor plate 20,000 sq. ft.	Max. plan length 200 ft. Max. floor plate 20,000 sq. ft.

Source: San Francisco Redevelopment Agency, *Design Standards and Guidelines, Mission Bay,* Draft C, prepared by Catellus Development Corporation, as adopted by the Mission Bay Advisory Committee on December 11, 1997, revised March 30, 1998, p.28.

Rincon Point - South Beach Redevelopment Plan

The *Rincon Point - South Beach Redevelopment Plan* covers an area adjacent to the Project Area./36/ In accordance with that plan, several multi-unit residential buildings have been constructed, providing over 1,500 units of housing and retail space. Other residential projects, including One Embarcadero South and Oriental Warehouse Phase II, have been approved for construction. Conversion of industrial uses to office, retail, and residential activities is occurring in the area. In addition, the *Rincon Point - South Beach Redevelopment Plan* was amended in July 1997 to include the site of the San Francisco Giants Ballpark, which is under construction at King and Third Streets, adjacent to South Beach Park. Land use policies proposed for Mission Bay are intended to be compatible with the *Rincon Point - South Beach Redevelopment Plan.*

City of San Francisco

General Plan

The proposed General Plan text amendments are contained in Appendix B; these are subject to modification as part of the approval process but accurately describe the nature of the amendments necessary to accommodate the project. The majority of the amendments would consist of map changes to reflect the new land use program provided in the Redevelopment Plans. There are also proposed text changes that would generally update information regarding the Project Area or delete references to the 1990 *Mission Bay Plan*. Additional revisions may be necessary to reflect the status of the properties that were part of the 1990 *Mission Bay Plan* which are not included in the Project Area. Any further modifications or amendments beyond those described and analyzed in this SEIR would be assessed to determine whether they could lead to potential significant environmental impacts not identified in this SEIR. If so, further environmental review would be necessary. The discussion that follows addresses the broader policy implications if the Redevelopment Plans were adopted.

Commerce and Industry Element

The Commerce and Industry Element contains designations and maps that relate to *Mission Bay Plan* land use districts, land use, and density designations. Amendments are proposed that would delete existing references to Mission Bay and would cross-reference the proposed Redevelopment Plan designations.

Mission Bay Plan

The proposed Redevelopment Plans for Mission Bay North and South differ from the 1990 *Mission Bay Plan* in terms of land use, associated activities, and zoning controls. The inclusion of a new site for the University of California San Francisco further differentiates the proposed project from the existing plan (discussed later in "State Agencies"). To make the *San Francisco General Plan* and the Redevelopment Plans consistent, the *Mission Bay Plan*, i.e., Part II of the *Central Waterfront Plan*, would be rescinded and re-adopted by the Planning Commission as Mission Bay Guidelines for those parcels that were part of the 1990 Mission Bay Plan, but which are not included in the Project Area. The remainder of the *Central Waterfront Plan* would be amended (as described below), and would be the part of the General Plan most directly associated with the proposed Project Area. Other Elements of the General Plan would also remain relevant to the Project Area. As discussed below, Article 9 of the City Planning Code, which implements the existing *Mission Bay Plan*, would be amended to excise the Project Area.

Central Waterfront Plan

The *Central Waterfront Plan* would be amended to reflect the new Redevelopment Areas and associated policies. These amendments would reflect the new Project Area, which includes the Castle Metals and Espirit sites, and describe the proposed new land uses for Mission Bay. This change would be in addition to the amendment of Part II of the *Central Waterfront Plan*, the *Mission Bay Plan*.

Northeastern Waterfront Plan

The 1990 FEIR concluded that the then-proposed Mission Bay development would not support the underlying objectives of the *Northeastern Waterfront Plan* to convert waterfront property north of Market Street to non-maritime uses while preserving and expanding maritime uses along the southern waterfront./37/ That project allowed for the potential conversion of port property adjacent to Piers 48 to 64 to non-maritime uses and did not allow for the expansion of maritime uses along the southern waterfront adjacent to the Project Area. However, since the 1990 FEIR was published, the policy framework guiding development near the waterfront has changed: the 1990 *Mission Bay Plan* was adopted, the Port adopted a *Waterfront Land Use Plan*, and the *Northeastern Waterfront Plan* has been amended to achieve consistent policies regarding land use in and around the waterfront.

The Port recognizes that changes in shipping technology, along with geographical disadvantages and limited rail connections to port land, have significantly decreased shipping activities. The Port is striving to encourage the presence of other forms of maritime activities. For many areas of the waterfront, where maritime activities are not feasible, the Port deems public access and open space suitable land uses./38/ This general policy is reflected in the amended *Northeastern Waterfront Plan*. The proposed Redevelopment Plans call for public open space in areas adjacent to the waterfront, a land use consistent with the *Northeastern Waterfront Plan*.

South of Market Plan

The South of Market Area Plan calls for protecting and encouraging the character and scale of activities found in the South of Market area of San Francisco. The plan recognizes the mixed residential, light industrial, business services, and artisan uses in SOM as well as the physical scale and quality of the area. Goals and specific policies set forth in the plan are thus intended to address both land use and activities as well as issues such as in-fill development and building envelopes. For the areas of the South of Market Plan nearest the Mission Bay Project Area, bordering Townsend Street, retail, office, business service, and light industrial, and industrial land uses are encouraged.

High densities of residential uses and moderate to medium densities of industrial activities are delineated for this area. Building heights are limited to 65 and 50 feet along Townsend Street.

In general, development proposed for the Mission Bay North Redevelopment Area would be mixed-use in nature, emphasizing residential and retail/entertainment, and would be compatible with the mix of activities found in nearby South of Market neighborhoods. Development proposed for the Mission Bay North Redevelopment Area, which includes retail intended to attract a population greater than the immediate neighborhood and buildings of up to 120 feet (and towers up to 160 feet), would differ in scale from adjacent SOM neighborhoods. The relationship between existing South of Market land uses and proposed land uses is discussed in "South of Market," under "Summary of Project Area Impacts" in Section V.B, Land Use: Impacts.

Urban Design Element

This Element contains a number of maps and designations regarding urban design issues such as landscaping, light, open spaces, and building height and bulk. Although the Redevelopment Plans are not subject to height and bulk controls defined in the City Planning Code, the Planning Commission would have to determine that the Redevelopment Plans conform to the Urban Design Element, including policies regarding height and bulk of buildings. In order to make the Redevelopment Plans consistent with the Element, the maps and designations would have to be amended to cross-reference the Redevelopment Plans.

Vacation of public streets would occur as part of the project. The City Planning Commission would evaluate the proposed street vacations for consistency with the General Plan, including Urban Design policies that call for maintaining a strong presumption against giving up streets, reviewing proposals for street vacation in light of the public values that streets afford, and releasing streets in the least extensive and least permanent fashion possible. The Commission would consider these policies in assessing the proposed vacations as well as the new streets that would be provided as part of the project.

Recreation and Open Space Element

This Element contains designations and maps related to existing and proposed open space as well as policies related to improving existing open space. The project includes proposed amendments which would delete the existing Mission Bay designations and cross-reference the Redevelopment Plans, and text revisions that reflect the general nature of the open space program proposed in the Redevelopment Plans. The City Planning Commission would determine whether or not the proposed project satisfies requirements for recreation and open space (see "Recreation and Parks: Impacts" in Section V.M, Community Services and Utilities, for a discussion of proposed open space and recreation facilities). Proposed map amendments and other specific changes to the Recreation and Open Space Element are listed in Appendix B.

Arts Element

The Arts Element contains a variety of policies intended to support and encourage arts and arts-related activities in the City. The Element contains maps indicating the concentration of certain arts-related activities throughout the City. The project includes proposed amendments that would reduce the allowable concentration of these activities in the Project Area.

Residence Element

This Element contains a variety of policies regarding the provision of housing in San Francisco, including the creation of affordable housing. The Element contains maps and designations related to the density and location of residential uses. The project proposes amendments that would delete these designations for the Project Area and replace them with cross-references to the proposed Redevelopment Plans. It would also include text amendments allowing residential densities as set forth in the Redevelopment Plans and associated Design for Development documents.

The 1990 *Mission Bay Plan* included development of about 8,270 housing units. The current project would include approximately 3,000 units in Mission Bay North and 3,090 units in Mission Bay South. This would be a reduction of allowable housing in the area by approximately 2,180 units.

The Project Area is currently designated as medium density in the *Residential Density Plan*. Land use designations for housing, including density, would be established in the Redevelopment Plans. The Redevelopment Plans for Mission Bay North and South state that the number of housing units allowed would be no more than allowed for by the City's General Plan. The Residence Element would be amended to remove any designations relating to Mission Bay residential districts, and densities for the Project Area would be provided in the Redevelopment Plans.

The Redevelopment Agency must follow guidelines established by the Community Redevelopment Law with regard to amount of housing, housing mix, and income classification. In accordance with subdivision (b) of section 33413 of the Community Redevelopment Law, at least 30% of the housing developed by the Agency must be affordable to people and families with low or medium incomes; for housing developed by sponsors other than the Redevelopment Agency, the requirement is 15%. This responds to Housing Affordability Policy 3, which states: "seek inclusion of low and moderate income units in new housing developments."

The project would also include conforming amendments to the Land Use Index to reflect certain of the amendments described above.

San Francisco Planning Code

As part of the project, Article 9 of the City Planning Code would be amended. The amendment of Article 9 would require approval by the Planning Commission and adoption by the Board of Supervisors. Adoption of the Redevelopment Plans and Design for Development documents would supersede the Planning Code with respect to the Project Area. These documents would change existing zoning to new land use designations and provide new development controls for the entire Project Area.

As part of the approval process, Section 101 of the City Planning Code requires that the project, including the Redevelopment Plans, must be found consistent with the General Plan and the eight "Priority Policies" of the City. The City Planning Commission would make determinations on the issue for consideration by the Board of Supervisors. Individual development projects that may result from implementing the plan are not subject to "Priority Policy" review.

Subdivision Map Act

As part of the previously proposed Mission Bay development project, the City adopted a Development Agreement, now terminated, which included a Mission Bay Subdivision Code and Mission Bay Subdivision Regulations. The code and regulations made certain changes to the San Francisco Subdivision Code and San Francisco Subdivision Regulations applicable only to that project. Similarly, as part of the currently proposed project, changes would be made to the San Francisco Subdivision Code and San Francisco Subdivision Regulations to create conformity between those documents and the proposed redevelopment plans and related plan documents.

Sustainability Plan

The Sustainability Plan is a non-binding document and, therefore, does not govern the project or other City or private actions. In response to requests received during the public scoping process for this SEIR, a general evaluation of the project in light of Sustainability Plan principles is presented below.

The evaluation is general because the specific actions recommended in the Sustainability Plan are not intended to be used as a detailed checklist for proposed projects.

Many of the Sustainability Plan objectives do not directly relate to the project. Many others are very specific and cannot be evaluated at this time because details (of building design and landscaping, for example) have not been formulated. Major objectives that can be related to the project are discussed below.

Transportation objectives of the Plan focus on reducing vehicle miles and facilitating use of transit, bicycles, and walking. The project provides for bicycle routes connecting with existing City routes. The project would rely on recent and planned MUNI line extensions and upgrades to enable a high proportion of project trips to occur on public transit. Accessory parking for most uses would be limited compared to Planning Code requirements (for most uses, minimum parking amounts set forth in the Planning Code are proposed as maximum amounts in the Redevelopment Plans), which could discourage excessive trips by private automobile. Local-serving retail and office uses are proposed to be allowed in all project use districts, reducing the need to travel by car for basic shopping and services.

The Plan calls for expanding green space and providing recreational facilities. The project proposes about 47 acres of public parks to serve future residents and workers of the project as well as existing residents and workers. (Refer to "Open Space," under "Redevelopment Plans and Proposed Land Uses" in Section III.B, Project Description, and "Open Space Demands," under "Recreation and Parks: Impacts" in Section V.M, Community Services and Utilities, for discussion of proposed open spaces.)

Sustainability strategies for water and wastewater include maximizing reclamation and reuse of wastewater, conserving potable water, minimizing storm water flows into the city's combined sewer system, reducing system discharges to the Bay, and ensuring discharges do not impair receiving water. The project would conform with current city requirements for the installation and use of a reclaimed water system, i.e., installation of dual-piping in the non-UCSF portions of the project. The project would include 1.6-gallon flush toilets and other water-conserving devices and appliances as required by law. The project's sewerage system would include addition of combined sanitary/sewer stormwater lines in Mission Bay North and the southern portion of Mission Bay South, and a new system with separated sanitary sewer and stormwater lines in the northern portion of Mission Bay South. The system, described in "Sewer Infrastructure Improvements," in "Sewers and Wastewater Treatment: Impacts" in Section V.M, Community Services and Utilities, is intended to minimize degrading Bay water quality and minimize contribution to existing city system discharges in time of storm flows that exceed system capacity. The effects of the proposed system on the city system are described in "Sewer Infrastructure Improvements" under "Sewers and Wastewater Treatments: Impacts" in Section V.M, Community Services and Utilities, and the effects on water quality are discussed in "Evaluation of Potential Water Quality Impacts" under Section V.K, Hydrology and Water Quality: Impacts.

Goals of the Sustainability Plan include prioritizing minimization of hazardous materials use and hazardous waste generation, and focusing remediation efforts "towards those issues with the highest risk of danger to human and environmental health." This approach appears generally consistent with the project proposals described in "Larger Waste Generators" under "Potential Environment Impacts of Hazardous Waste Generation and Disposal" and "Cumulative Effects" in Section V.I, Health and Safety: Impacts, and in "Risk Management Plan for Project Area Development" under Section V.J, Contaminated Soils and Groundwater: Impacts. With remediation of hazardous wastes proposed to minimize the risk of exposure to people, the reuse of the site to create housing, commercial, and institutional development projected to generate 30,000 jobs and contain 11,000 residents generally reflects the Sustainability Plan's assertion that "cleanup and reuse" of contaminated 'brownfield' sites "will enable new economic development at the same time that exposure to hazardous materials from these sites is eliminated."

The project's residential and commercial densities are relatively high. High-density land-use concepts are generally efficient compared with those for lower densities; thus, the project's consumption of resources would be expected to be lower than accommodating the same number of residents and workers in other locations or with other land use concepts.

Port of San Francisco

Waterfront Land Use Plan

Port property adjacent to the Project Area that is covered by the *Waterfront Land Use Plan* mainly extends from Piers 38 to 64, roughly between Mission Rock Street and Mariposa Street. Land uses proposed in the Mission Bay South Redevelopment Plan and related documents include Open Space, to be located adjacent to Port property along Terry A. Francois Boulevard, and Mission Bay Residential along Mission Rock and Third Street. The Mission Bay Hotel land use designation would be located across Third Street from Seawall Lot 337 and Pier 48. Open space, which would be the predominant use proposed for the areas directly adjacent to Port property, would be considered appropriate and would support Port policies in the *Waterfront Land Use Plan*. In the long term, and by the time the Project Area would be built out, residential population and commercial industrial activities would grow in the Project Area. Resulting increased traffic congestion and population density could make piers less attractive for maritime activities and more attractive for commercial development, possibly creating pressure to transition from existing maritime uses to commercial and retail activities on nearby port property. This potential transition could also make it more difficult for the Port to attract or expand maritime activity at Piers 48 and 50, which are designated Port Priority Areas. The mix of residential, retail, commercial uses, and open space that would be developed in accordance with the Mission Bay North Redevelopment Plan and related documents would not directly conflict with Port policies regarding the use of piers and other adjacent property. The relationship between Port land uses and the proposed project are also addressed in: "Adjacent Port Property" under "Summary of Project Area Impacts" in Section V.B, Land Use: Impacts; in "Adjacent Port Property Nearby Area" under "Nearby Areas" in Section V.C, Business Activity, Employment, Housing, and Population: Setting; and "Residential Development," under "Spillover Effects: Implications for Nearby Areas" in Section V.N, Growth Inducement.

REGIONAL AGENCIES

Bay Conservation and Development Commission

The 100-foot shoreline band which delineates BCDC jurisdiction extends along the waterfront and around China Basin Channel. Proposed Channel modifications and other project construction and activities within the 100-foot band would fall under the jurisdiction of BCDC./39/

The proposed modifications along and in the Channel include a pedestrian circulation system along the top of the Channel on the north and south sides; three promontories overlooking the Channel on the north side; a potential pedestrian bridge over the Channel linking Fifth Street to the future Owens Street; stabilization of the banks of the Channel with riprap; and landscaping with salt-tolerant vegetation. See "Proposed China Basin Channel Edge and Bridge Treatments," in Section V.L, China Basin Channel Vegetation and Wildlife: Impacts, for a detailed description of the proposed channel edge treatment. The pedestrian circulation system and the promontories are designed to afford opportunities for passive recreation such as strolling, sitting, socializing, and viewing. Construction of certain sewer lines, storm drains, and new pump stations would also occur within the 100-foot band. Refer to "Construction and Phasing of Infrastructure" under "Water Supply: Impacts" and under "Sewers and Wastewater Treatment: Impacts" in Section V.M, Community Services and Utilities, for a description of these features and their locations. In addition, BCDC would determine if any other proposed development near the Channel would be located within the 100-foot band.

The pedestrian walkways and parks are open space uses intended to encourage water-oriented recreation and afford opportunities for public assembly, which are both activities favored by BCDC's San Francisco Bay Plan. Because these treatments would require fill, and the promontories and potential pedestrian bridge would cover open water, BCDC would evaluate whether or not such fill and loss of open water was consistent with the McAteer-Petris Act and policies of the Bay Plan related to use of fill for improving the shoreline and public access areas. Any sewer lines, storm drains, and pump stations within BCDC jurisdictional areas would also be subject to BCDC permitting authority.

San Francisco Bay Regional Water Quality Control Board

The RWQCB regulates surface water and groundwater quality in the San Francisco Bay Area through its *San Francisco Bay Basin Water Quality Control Plan.*/40/ As discussed in the "Storm Water Pollution Prevention Plan," under "Construction Activity Pollutants" in Section V.K, Hydrology and Water Quality: Impacts, the project would need to obtain coverage under the State's General Construction Activity Storm Water Permit for construction on areas that currently drain to the Bay. The RWQCB enforces the requirements of the federal Clean Water Act and issues permits for stormwater discharges. Furthermore, the RWQCB has a certification role regarding U.S. Army Corps of Engineers Clean Water Act, Section 404 permits (see "U.S. Army Corps of Engineers" below). Refer to "Regulatory Framework" in Section V.J, Contaminated Soils and Groundwater: Setting, for a discussion of the RWQCB's role in regulating contaminated soils and groundwater.

Bay Area Air Quality Management District

Some of the proposed development activities, including certain industrial and research and development activities, which produce criteria air pollutants and/or toxic air contaminant emissions may require permits from the BAAQMD. Obtaining air permits would be the responsibility of tenants or operators. Depending on the size and type of its proposed boilers, UCSF may be required to obtain permits for some of these boilers and other fossil-fuel burning equipment. Contractors would be required to follow BAAQMD regulations for dust suppression during construction. BAAQMD requirements are discussed in more detail in "Regulatory Framework" in Section V.F, Air Quality: Setting.

STATE AGENCIES

University of California San Francisco

The proposed project would include the construction in Mission Bay South of a 43-acre major new site by the University of California San Francisco. The UCSF *1996 Long Range Development Plan* (LRDP) principles for the major new site include the following:

- The various uses at the new site would be consistent with UCSF's major functions, primarily instruction, research, and related support activities. Major hospitals or clinics are not proposed for the new site, though a small community facility is possible.
- The site's physical development would focus on health sciences research.
- Physical development at the new site would follow established parameters of local master plans and zoning codes for the site and surrounding area to the maximum extent feasible, including guidelines related to building scale, proportion and setbacks, to promote compatibility between UCSF and neighboring uses./41/

Goals for the new site include the following:

- Establish a major new site to provide space for decompression, expansion, and consolidation of UCSF's activities which can accommodate existing programs, new programs and as yet unprogrammed growth, and which is suitable, flexible, safe and attractive for its occupants.
- Optimize the design, placement and relationship of buildings on the major new site to meet UCSF's program needs in the best way possible.
- Ensure that UCSF development is compatible with its physical surroundings in use, scale, and density./42/

The University of California is exempt under Article 9, Section 9, of the State Constitution from local planning, zoning, and redevelopment regulations whenever land under its control is used for educational purposes. That portion of the Project Area within the UCSF site to be developed as a city school site for the San Francisco Unified School District, and the dedicated public streets (e.g., Fourth Street) would be subject to the jurisdiction of the City, the Redevelopment Agency, and/or the school district and state agencies with jurisdiction over public school construction. However, the LRDP Goals and Objectives express UCSF's intention to work with local governments to satisfy the interests of local jurisdictions and UCSF. In addition, UCSF and the City and County of San Francisco entered into a Memorandum of Understanding (MOU) in 1987. The MOU calls for meetings of UCSF staff and City Planning Commission staff and states that the City will use Section 304.5, Institutional Master Plans, of the City Planning Code to evaluate UCSF projects. Section 304.5 describes the City's requirements for completion of Institutional Master Plans for medical centers and colleges. UCSF is not subject to Section 304.5 but submitted its LRDP to the Planning Commission pursuant to the MOU./43/ The proposed Mission Bay project would involve recision or amendment of the applicable Elements or Area Plans of the *San Francisco General Plan* as well as the City Planning Code; approval of these actions would ensure that development of the UCSF site would be generally consistent with local plans and policy documents. Development activities associated with the major new site would be subject to state regulations regarding demolition and construction.

California Department of Fish and Game

Under California Fish and Game Code Section 1601-03, Streambed Alteration Agreement, a project proponent must obtain an agreement from the CDFG for any alteration to a streambed channel, or to the flow of waters in a channel, if the stream or channel has significant wildlife values. CDFG has not yet determined if the proposed project would require a Streambed Alteration Agreement for alterations to China Basin Channel; it is CDFG's general policy to review a project EIR before making this determination.

Under the federal Fish and Wildlife Coordination Act of 1958, CDFG would review permit applications to the U.S. Army Corps of Engineers if any are required for the project, and participate in any review and permitting procedures required by BCDC. CDFG's review of U.S. Army Corps of Engineers (discussed below) and BCDC permits would focus on potential effects of dredging and filling of Bay waters or any alteration of the shoreline on the area's fish and wildlife habitat, such as the proposed soft-edge Channel treatments discussed in "Proposed China Basin Channel Edge and Bridge Treatments," in Section V.L, China Basin Channel Vegetation and Wildlife: Impacts. CFDG would also focus on potential project effects on Pacific herring spawning habitat (see "Turbidity and Resuspension of Contaminated Sediment," in Section V.L, China Basin Channel Vegetation and Wildlife: Impacts.)

FEDERAL AGENCIES

U.S. Army Corps of Engineers

The Corps would review any development that results from the proposed project that involves structures or fill materials, such as rip-rap, within the Channel area or the Bay. Water quality, navigation, protection of water edges, flood protection, and aquatic habitats are some of its concerns. The proposed project would include stream alterations associated with Channel improvements, the creation of public walkways along the edge of the Channel, filling associated with the construction of three promontories in Channel waters, and the possible construction of a pedestrian bridge over the Channel. Furthermore, four additional stormwater outfalls that would discharge into the Bay are proposed as part of the project. These activities would be reviewed by the Corps.

U.S. Coast Guard

● The project proposes the construction of a new pedestrian bridge over the Channel. Because the Channel is a navigable waterway, the new bridge must allow passage of vessels. The U.S. Coast Guard has permitting jurisdiction for bridges over navigable waterways and would decide whether or not to issue permits for the construction of any new bridge or alteration of either of the existing bridges over the Channel. The Coast Guard also has authority to require safety measures, such as navigation lights or channel markers, within navigable waterways. In addition, the Coast Guard reviews U.S. Army Corps of Engineers' Section 404 and Section 10 Public Notices with particular concern for marine safety.

NOTES: Plans, Policies, and Permits

1. In 1951, the Community Redevelopment Act was renamed the Community Redevelopment Law, Health and Safety Code, Sections 33000 *et seq*.

2. City and County of San Francisco, Planning Department, *Central Waterfront Plan*.*

3. City and County of San Francisco, Planning Department, *Central Waterfront Plan*, p. II.8.7.*

4. While the Esprit site was analyzed as part of the Mission Bay project area in the 1990 FEIR, the adopted Mission Bay Plan did not include that site.

5. Backland is defined as an area inland from container cranes where containers can be stored.

6. City and County of San Francisco, Planning Department, *San Francisco General Plan,* Commerce and Industry Element.*

7. City and County of San Francisco, Planning Department, *The South of Market Plan.*

8. City and County of San Francisco, Planning Department, *Northeastern Waterfront Plan*.*

9. City and County of San Francisco, Planning Department, *San Francisco General Plan*, Urban Design Element.*

10. City and County of San Francisco, Planning Department, *San Francisco General Plan,* Urban Design Element, p. I.5.ii.*

11. City and County of San Francisco, Planning Department, *San Francisco General Plan,* Urban Design Element, p. I.5.ii.*

12. City and County of San Francisco, Planning Department, *San Francisco General Plan,* Recreation and Open Space Element.*

13. City and County of San Francisco, Planning Department, *San Francisco General Plan,* Residence Element.*

14. City and County of San Francisco Planning Code, Article 9, Part I, p. PL-298.164.*

15. State law defines subdivision as "the division, by any subdivider, of any unit or units of improved or unimproved land, or any portion thereof, shown on the latest equalized county assessment roll as a unit or as contiguous units, for the purpose of sale, lease or financing, whether immediate or future except for leases of agricultural land for agricultural purposes."(Section 66424)

16. Diane Oshima, Planner, Port of San Francisco, telephone conversation with EIP Associates, October 8, 1997.

17. City and County of San Francisco, Planning Department, *Port of San Francisco Waterfront Land Use Plan Final Environmental Impact Report*, Planning Department File No. 94.155E, State Clearinghouse No. 94123007, certified January 9, 1997, p. 39.*

18. McAteer-Petris Act, California Government Code Section 6605(a).

19. Fill includes earth or any other material, including pilings; any water coverage whether on pilings or by cantilever; shoreline protection, e.g. sheet piling; bridges over constant-level canals; and floating structures moored for extended periods of time, such as houseboats and floating docks.

20. San Francisco Bay Conservation and Development Commission, San Francisco Bay Plan, as cited in City and County of San Francisco, Planning Department, *Port of San Francisco Waterfront Land Use Plan Final Environmental Impact Report*, Planning Department File No. 94.155E, State Clearinghouse No. 94123007, certified January 9, 1997, p. 96.*

21. City and County of San Francisco, Planning Department, *Port of San Francisco Waterfront Land Use Plan Final Environmental Impact Report*, Planning Department File No. 94.155E, State Clearinghouse No. 94123007, certified January 9, 1997, p. 97.*

22. Dredging includes any extraction or excavation by hydraulic or mechanical means of materials underwater, in areas subject to tidal action or in other areas of jurisdiction.

23. San Francisco Bay Conservation and Development Commission, *San Francisco Bay Plan*, adopted January 1969, amended July 1979.*

24. Linda Scourvis, Planner, San Francisco Bay Conservation and Development Commission, telephone conversation with EIP Associates, August 22, 1997.

25. Linda Scourvis, Planner, San Francisco Bay Conservation and Development Commission, telephone conversation with EIP Associates, August 22, 1997.

26. Port Priority Uses were established by the San Francisco Bay Area Seaport Plan, which was adopted in 1982 and amended in 1988 and again in April 1996. The 1996 amendments lifted the designation of "Port Priority Use" from the area containing the proposed project. As a result, the Seaport Plan no longer includes policies relevant to the proposed project.*

27. California State Lands Commission, brochure.

28. 1990 FEIR, Volume Two, pp. VI.A.30-VI.A.31.*

29. 1990 FEIR, Volume Two, p. VI.A.29.*

30. California Department of Fish and Game, *California Fish and Wildlife Plan*, January 1966 (in revision).

31. California Fish and Game Code, Section 1603.

32. City and County of San Francisco, Planning Department, *Port of San Francisco Waterfront Land Use Plan Final Environmental Impact Report*, Planning Department File No. 94.155E, State Clearinghouse No. 94123007, certified January 9, 1997, p. 105.*

33. In its *Bridge Permit Application Guide* (1985), the Coast Guard generally defines "navigable waters" as follows: "Navigable waters of the United States for bridge administration purposes are, in general, waters subject to tidal influence, waterways that have a history of substantial commercial navigation, waterways that presently have commercial navigation, and waterways that are susceptible to commercial development." The legal definition of navigable waters is found in Code of Federal Regulations, Title 33, Section 2.05-25(a).

34. City and County of San Francisco, Planning Department, *Port of San Francisco Waterfront Land Use Plan Final Environmental Impact Report*, Planning Department File No. 94.155E, State Clearinghouse No. 94123007, certified January 9, 1997, p. 106.*

35. San Francisco Redevelopment Agency, *Draft Redevelopment Plan for the Mission Bay North Redevelopment Project*, March 30, 1998, p. 1.

36. San Francisco Redevelopment Agency, *Rincon Point - South Beach Redevelopment Plan*, adopted by the Board of Supervisors Ordinance No.14-81, January 5, 1981, most recently amended July 17, 1997.*

37. 1990 FEIR, Volume Two, p. VI.A.44.*

38. Port of San Francisco, *Waterfront Land Use Plan*, 1996, p. 47.*

39. BCDC's shoreline jurisdiction includes all Bay shoreline, including piers which existed in 1969, located within 100 feet of the Bay, measured inland from the line of highest tidal action. Highest tidal action includes any area touched by tidal waters since September 17, 1965 except for areas flooded for less than a year due to the natural destruction of a dike or levee and areas that can be removed from tidal action by closing a functioning tide gate.

40. San Francisco Bay Regional Water Quality Control Board, San Francisco Bay Basin (Region 2), *Water Quality Control Plan*, June 21, 1995.

41. University of California San Francisco, *1996 Long Range Development Plan*, January 1997, pp. 167-168.

42. University of California San Francisco, *1996 Long Range Development Plan*, January 1997, pp. 172-173.

43. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, certified January 1997, Volume Two, p. 63.*

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

B. LAND USE

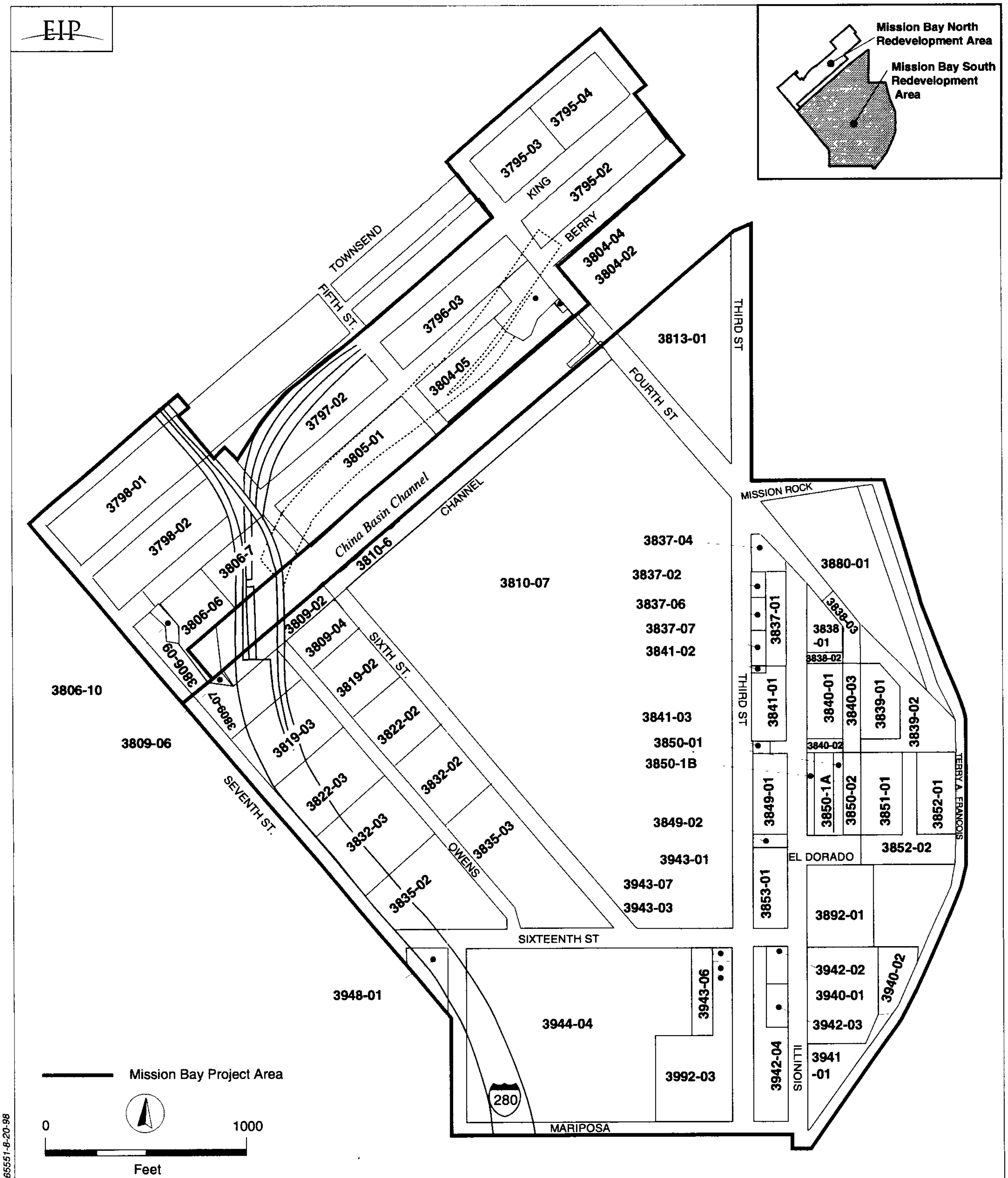
The Land Use, Business Activity, and Employment section of the 1990 FEIR/1/ describes the land uses in the Project Area at that time. In general, 1997 land uses in the Project Area are substantially the same as those described in the 1990 FEIR analysis. This section provides an updated review of land uses in the Project Area and the Nearby Areas, as defined in the 1990 FEIR, which are adjacent commercial and industrial areas or nearby residential neighborhoods./2/ Major changes in existing land uses occurring after publication of the 1990 FEIR are summarized. The primary Nearby Areas, which are discussed below, are Adjacent Port Property, South of Market, Potrero Hill, North Potrero, Showplace Square, Lower Potrero, and Central Bayfront. Further information on business activity is provided in Section V.C, Business Activity, Employment, Housing, and Population. The endnotes for this section begin on p. V.B.30.

SETTING

PROJECT AREA CHARACTERISTICS

The Project Area is a primarily industrial area occupied by block-long warehouses, concrete and gravel processing facilities, truck terminals, and surface parking with large tracts of undeveloped land that previously contained rail lines and a rail yard. Building heights generally range from one to two stories. The conveyor towers of two concrete and gravel processing facilities dominate the landscape at heights of about three stories. There are three truck terminals and about 50 warehouses, buildings, other structures, and recreational uses including a golf driving range and in-line skating facility. Buildings range from small materials sheds to large warehouses. Lot sizes in the Project Area vary from the block-size parcels north of the Channel to the large central parcel bounded by the Channel, Fourth, 16th, and Sixth Streets. Figure V.B.1 shows the Assessor's Block and Lot Numbers for the Project Area. Building uses include distribution and storage facilities for food products, clothing, rental furniture, and personal effects; light manufacturing; and some office use. Uses of undeveloped areas include maintenance yards, parking areas for container trucks and commercial buses, and storage areas for construction materials.

Catellus Development Corporation (Catellus) is the primary landowner in the 303-acre Project Area, owning approximately 167 acres. Approximately 11 acres are owned by other public and private entities. The City and County of San Francisco controls about 78 acres of land dispersed throughout the Project Area, including the Channel Pump Station, Fire Station No. 30, and street rights-of-way. The Port of San Francisco controls about 47 acres, primarily in the eastern portion of the Project Area and along the Channel, and rail rights-of-way in Seawall Lots 337, 339, 340, and 343. Certain



SOURCE EIP Associates, San Francisco Department of City Planning

MISSION BAY SUBSEQUENT EIR

FIGURE V.B.1 ASSESSOR'S BLOCKS AND LOTS COMPRISING THE PROJECT AREA

land transfer agreements would result in 43 acres donated to UCSF to develop the UCSF site. After the transfers, land ownership within the Project Area would be approximately as follows: Catellus would own about 149 acres; the City about 78 acres; the Port of San Francisco about 23 acres; UCSF about 43 acres; the State of California about an acre; and other private owners about 9 acres./3/ "Amendments to Land Transfer Agreements" under "Implementation" in Section III.B, Project Description, also describes recent Port and Board of Supervisors actions to transfer a small portion of land to UCSF in February and March 1998.

EXISTING LAND USES IN THE PROJECT AREA

Figure V.B.2 shows existing land uses within the Project Area and immediately adjacent areas./4/

The major changes in land use in the Project Area since completion of the 1990 FEIR include/5/: interim uses such as construction of the Mission Bay Golf Center driving range and installation of the temporary structures of American Storage Unlimited, and public improvements including the widening of and improvements to King Street to accommodate the MUNI E-line light rail extension and the reconfiguration of the I-280 ramps onto King Street including demolition of a portion of the I-280 stub./6/ The overall mix of land use in the Project Area has not changed markedly since 1990. The Project Area is still primarily occupied by warehouses used for light industrial, commercial, and office use, with expanses of undeveloped land. Rail tracks have been removed in some areas, particularly in the area west of the truck terminal building at Third Street between Mission Rock Street and 16th Street and along Terry A. François Boulevard between Mission Rock Street and 16th Street. The Caltrain terminal, the China Basin Landing buildings, China Basin Channel, and the Mission Creek houseboat community are outside the Project Area. The Caltrain rail rights-of-way run along the western border of the Project Area./7/ Existing land uses in the Project Area are summarized below.

North of the Channel, the area between Third and Fourth Streets includes the site of the former San Francisco Recreational Vehicle Park (which ceased operations in January 1998) north of King Street and an unattended parking lot south of King Street. The San Francisco Recreational Vehicle Park contained approximately 200 rental spaces for trailers and motor homes. The I-280 stub between Third and Fourth Streets was removed from the unattended parking lot in 1996. The parking lot has spaces for about 540 automobiles.

The northern half of the area between Fourth and Sixth Streets is a vacant lot. The southern half is occupied by construction materials, trailers, clean soil, and a one-story building underneath the remaining portions of the abandoned and elevated I-280 stub. The reconfigured I-280 King Street ramps, completed in June 1997, curve northeasterly through a portion of the area south of Sixth and King Streets, becoming a surface street on King Street midway between Fifth and Sixth Streets.

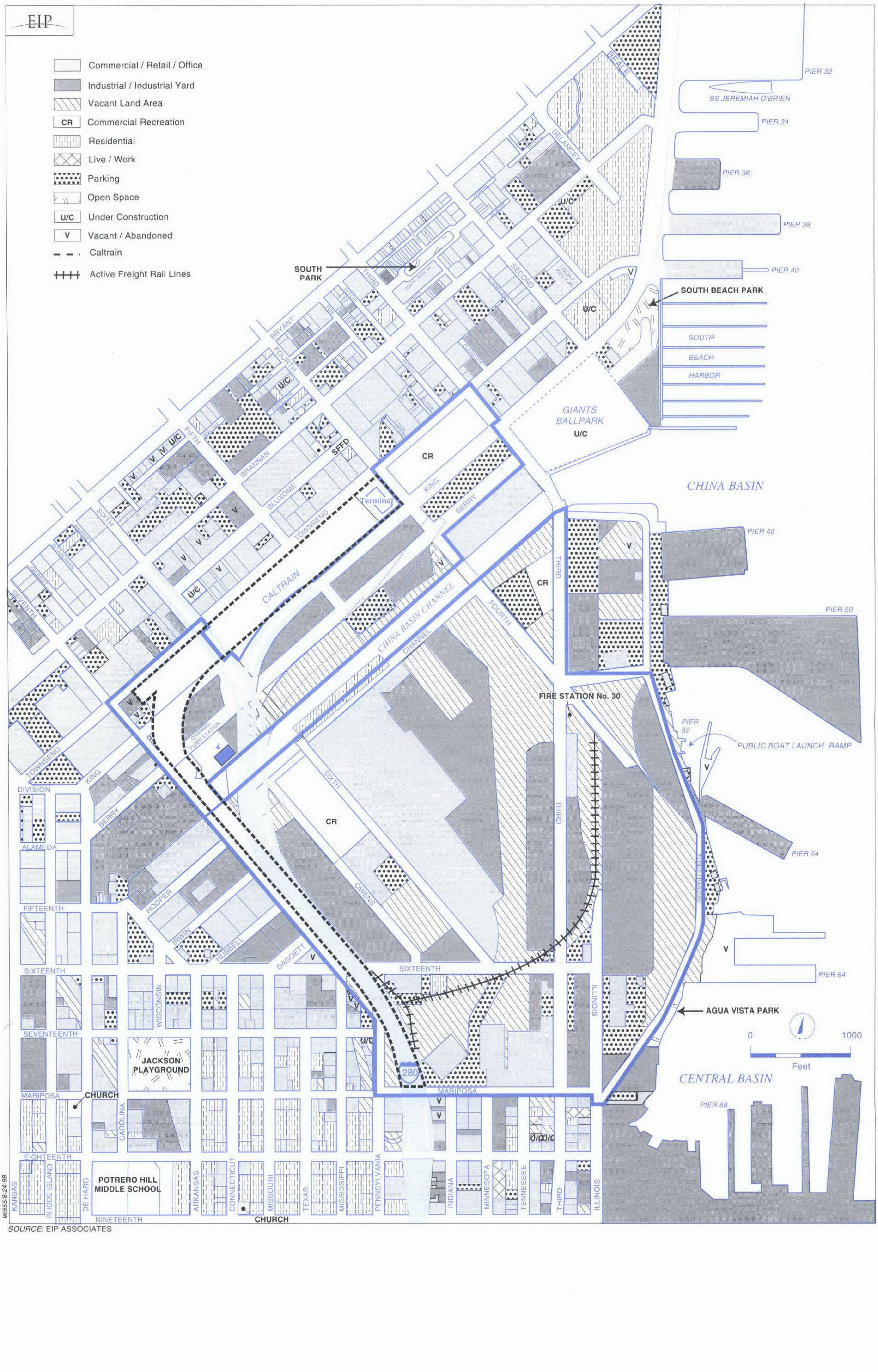
Improvements to King Street between The Embarcadero and the I-280 ramps include: widening for the MUNI Metro light rail service located in the King Street median, with stations at Second Street and Fourth Street; two travel lanes in each direction with parking permitted in the curb lane in most areas in both directions; and street trees. King Street is designated as a major arterial, a transit-important street, a neighborhood pedestrian street, and a citywide bicycle route in the City's Transportation Element of the General Plan./8/

At the northwestern corner of the Project Area, between Sixth and Seventh Streets, are a rail scrap yard, an Amtrak police station, a closed restaurant, the Channel Pump Station, and construction staging areas. Active Caltrain rail lines and other inactive rail lines occupy the westernmost portion of the area.

South of the Channel, the Project Area between Seventh Street and Third Street, and north of 16th Street, is occupied by warehouses, truck terminals, other buildings, truck yards, and vacant land. Buildings in this area are generally one-story warehouses. West of Owens Street is a truck terminal building, a warehouse, and an office building. Between Owens Street and Third Street are six warehouses, three commercial garages, two other buildings, two truck terminals, rows of storage structures, and vacant land. One of the warehouses includes surface parking for about 70 cars. Most of the warehouses front on Sixth Street. One truck terminal facility fronts on Channel Street, and the other truck terminal facility fronts on Third Street just north of 16th Street; container trucks are parked immediately west of this truck terminal facility in an open area. Building heights in this area are generally one or two stories.

Since publication of the 1990 FEIR, American Storage Unlimited has erected temporary storage structures on about 3 acres of land on Sixth Street just north of 16th Street. Two commercial recreation facilities were developed within the last five years: the Mission Bay Golf Center on Sixth Street at Channel Street, which was constructed in 1992; and the Bladium, an in-line skating facility at Third and Fourth Streets, which was developed within an existing structure. The tallest features in the Project Area are the nets of the golf driving range on Owens Street, which are about 110 to 120 feet high./9/

Fire Station No. 30 is located at Third and Mission Rock Streets. The fire station is used for a Mother Teresa soup kitchen and for storage and repair of toys for children. To the south of the fire station on Third Street is a row of two-story warehouse buildings. Farther south on Third Street,



MISSION BAY SUBSEQUENT EIR

FIGURE V.B.2 LAND USE IN THE PROJECT AREA AND VICINITY

both north and south of 16th Street, are two concrete and gravel processing facilities. The conveyor towers of the concrete and gravel processing facilities extend above the warehouses and other buildings at a height of about 40 to 60 feet (about three stories high).

East of Illinois Street are warehouses, other commercial buildings, and vacant land formerly occupied by railroad tracks. The Esprit site, containing an Esprit outlet store, is located at Illinois and 16th Street. The buildings east of Illinois Street are generally one-story buildings; there is a two-story building on Illinois Street at Mariposa Street. The land east of Illinois Street is composed of "seawall lots." Seawall lots are filled land areas under the jurisdiction of the Port of San Francisco. Seawall lots have Assessor's Parcel Number designations and also have separate seawall lot numbers.

South of 16th Street and west of Third Street are five warehouses and two other buildings. The warehouses generally are one story high; the warehouse on the Castle Metals site is about two stories high./10/

Interim Uses

Since publication of the 1990 FEIR, permanent development (except for public improvements north of the Channel) has not occurred under the approved 1990 *Mission Bay Plan* implemented by Article 9 (Mission Bay Districts) of the San Francisco City Planning Code. Rather, interim uses, as defined in Article 9, have continued or have been built in the Project Area.

EXISTING LAND USES IN THE NEARBY AREAS

Major changes and ongoing projects in the vicinity of the Project Area since publication of the 1990 FEIR include:/11/

- H&H Ship Service Company, a recycling and tank cleaning facility that handled hazardous wastes, discontinued operations in April 1997. (The facility, located on Terry A. François Boulevard just south of China Basin Channel, was the only one of its kind in the Bay Area.)
- The Giants Ballpark is under construction on 13 acres at Third Street between King Street and China Basin Channel.
- China Basin Park, which will be about 85,000 to 100,000 square feet (sq. ft.) of open space area, will be completed in connection with development of the Giants Ballpark parking along the southern shoreline of China Basin Channel on port property northeast of Third Street and Terry A. François Boulevard./12/
- The Port of San Francisco's Maintenance Operations Facilities (MOF) was relocated from Pier 46B to Pier 50 in August 1997.

- The Port is continuing public improvements to the Public Boat Launch Ramp between Pier 52 and Pier 54, which were begun in 1995. These include a double boat ramp and maneuvering area, a disability-accessible gangway, public access and landscape improvements, and a 20-vehicle/trailer-space parking lot on the west side of Terry A. François Boulevard; and moving the Pier 52 curbline back 8 feet to accommodate future bike lanes along this area of the waterfront.

Transportation changes in the Project Area, and planned transportation projects affecting the Project Area, are discussed in "Year 2015 Transportation System Assumptions" in Section V.E, Transportation: Impacts.

The general pattern of land uses in the Nearby Areas is discussed below and shown in Figure V.B.2.

Adjacent Port Property

East of the Project Area and under port jurisdiction are the waterfront piers from Pier 48 to Pier 64./13/ This waterfront area also has maritime, recreational, industrial, office, and restaurant/night club uses. Maritime-related industrial and maritime uses include mooring facilities for commercial vessels, yacht and boat clubs, and other small-boat facilities.

Also under port jurisdiction is the Mission Creek Marina, a 20-unit houseboat community with slips for 35 pleasure craft and parking for about 50 vehicles./14/ The marina, adjacent to the south side of China Basin Channel and west of the Peter Maloney Bridge, is bordered on two sides by the Project Area.

The houseboat community and pleasure craft slips are not included in the Project Area and would remain in their current location. The approved China Basin Park will be located northeast of Third Street and Terry A. François Boulevard. The port property on the block bounded by Terry A. François Boulevard, Mission Rock Street, and Third Street includes the former site of the defunct H&H Ship Service Company, a tank cleaning facility that handled hazardous wastes. The property is currently used for a recycling center, car auctions, trucking operations, and a homeless shelter. This port property was included in the 1990 *Mission Bay Plan*, but is not a part of the current Project Area./15/

Along the waterfront, some tenants of the Port of San Francisco have relocated or discontinued operations, and tenant turnover has been increasing. The Port of San Francisco's *Waterfront Land Use Plan*, which presents land use guidelines for the development of the waterfront, was adopted on June 24, 1997. The piers and seawall lots in the "China Basin Subarea" of the *Waterfront Land Use*

Plan, i.e., the area from China Basin to Mariposa Street, are dedicated to small-boat and recreational uses except for Piers 48 and 50, which are designated Port Priority Areas. Pier 48 is currently vacant./16/ The Port of San Francisco's Maintenance Operations Facilities is currently located at Pier 50. Piers 50, 54, and 54½ contain maritime support services, including tug and tow services, seasonal fishing operations, and boat storage. Piers 50½, 52, and 54 include yacht and boat clubs, an office building, and the Port of San Francisco's Public Boat Launch Ramp. Pier 64 is vacant and condemned, as is the former railroad ferry pier between Piers 52 and 54. South of Pier 64 on the waterfront is Agua Vista Park, the Mission Rock Resort (a bar and restaurant), a small boat yard, and The Ramp restaurant.

South of Market

The portion of the South of Market Nearby Area shown in Figure V.B.2 includes the area east of Seventh Street and north of Townsend Street. Land uses in the South of Market Nearby Area are primarily office, retail, residential, and live/work uses. Building heights in this area generally range between one and eight stories, with older buildings about one to four stories high and newer buildings from six to eight stories high.

Adjacent to the Project Area and north of King Street is the Caltrain terminal, which provides primarily passenger and commuter train service to the Peninsula and the South Bay. The terminal is bounded by Sixth, Townsend, Fourth, and King Streets. The rail lines extend west between Townsend and King Streets and turn south along Seventh Street, generally under the elevated I-280 structure. The train terminal contains customer services such as a newsstand and snack bar. Uses along the north side of Townsend Street, west of Fourth Street, include light manufacturing, wholesale trade, and warehousing.

Farther north, the blocks north of Brannan Street and east of Fourth Street contain a number of commercial buildings that are currently vacant, as well as industrial yard uses (undeveloped land that is used for the storage of construction materials and other industrial tools or products).

Immediately northeast of the Project Area is the South Beach subarea of the Rincon Point - South Beach Redevelopment Project which includes the site of the San Francisco Giants Ballpark, currently under construction, on Third Street between King Street and China Basin Channel. The China Basin Landing office buildings abut the Project Area on Fourth Street, south of Berry Street. Along Townsend west of Fourth Street, and along Third Street north of King Street, are one- and three-story office, retail, and light industrial buildings. The South End Historic District, characterized by industrial buildings with red brick facades, is the area generally bounded by Third Street (at King

Street), Brannan Street, Second Street, Bryant Street, Delancey Street, Townsend Street, Second Street, and King Street./17/ South Park and South Beach are two neighborhoods within the South of Market Nearby Area.

South Park

The South Park neighborhood, located between Third and Second Streets, and Bryant and Brannan Streets, is composed of older residential buildings that have been converted to commercial and live/work uses. It is a neighborhood surrounding a small grassy area called South Park, which is outfitted with play equipment and picnic tables. The South Park area is characterized by two- to three-story residential buildings with office, retail, restaurant, and residential uses. Buildings ranging from one to four stories are built in a ring around South Park. The area is also known as Multimedia Gulch for its concentration of software companies specializing in multimedia applications.

South Beach

The South Beach neighborhood/18/, developed in the last ten years, contains a mix of multi-family residential, neighborhood-serving commercial uses, and waterfront development. South Beach extends northeast along the waterfront from Third Street and China Basin Channel and is part of the Rincon Point - South Beach Redevelopment Plan Area. The area's apartment buildings range from about three to six stories high, although two of the residential towers are 13 and 14 stories high, respectively. Several of the existing and proposed apartment buildings include retail uses such as grocery stores, restaurants, and other services on the ground floor. The *Rincon Point - South Beach Redevelopment Plan* includes development of Pier 40, South Beach Harbor, and South Beach Park. Pier 40 includes surface parking and offices for six maritime-related businesses. South Beach Harbor has berths for 680 boats and related facilities. South Beach Park is a 5-acre park that may be expanded to include additional open space and additional parking for the harbor.

Potrero Hill and North Potrero

The Potrero Hill and North Potrero Nearby Areas are separated from the Project Area by the Caltrain tracks and I-280 along Seventh Street. Industrial uses occur in the area adjacent to the freeway and rail right-of-way. Commercial uses south of 16th Street form a buffer from the predominantly multi-family residential uses south of 17th Street and neighborhood-serving commercial uses concentrated along 18th and 20th Streets.

Adjacent to the western border of the Project Area, across the rail lines and freeway structure, are converted warehouses used for retail and office use, some industrial uses, storage facilities, and open areas used for parking and industrial yard areas. Building heights in this area are generally two or three stories high, with the majority of uses either vacant land used for parking or converted warehouses. Rail tracks extend from the corner of Mariposa and Carolina Streets to the northwest and diagonally cross three blocks to 15th Street.

Residential uses are concentrated south of 17th Street and west of Pennsylvania Street. The residential buildings are single-family and multi-family complexes ranging from two- to four-unit buildings to 12- to 16-unit buildings. Buildings in the Potrero Hill area are generally three to five stories high. Jackson Playground, at Mariposa and Arkansas Streets, is five blocks from the southwest corner of the Project Area. A convalescent hospital is located on Pennsylvania Street south of 18th Street. Potrero Hill Middle School is located at 19th and De Haro Streets. Two churches, one at Mariposa and De Haro Streets and one at 19th and Connecticut Streets, are also located nearby.

Showplace Square

Directly west of the Project Area is Showplace Square, a wholesale commercial area centered at Eighth and Townsend Streets. Showplace Square generally consists of former industrial buildings that have been converted to exhibition and marketing of interior design products. Items exhibited include home furnishings, fabrics, and fixtures, as well as office furniture, jewelry, gifts, and apparel. Buildings are generally converted industrial buildings with brick facades and range from three to six stories in height.

Lower Potrero and Central Bayfront

Immediately south of the Project Area, south of Mariposa Street, and east of the I-280 freeway are the Lower Potrero and Central Bayfront Nearby Areas. In addition to light industrial, office, and retail uses, Lower Potrero contains a small residential neighborhood. Along Tennessee Street, between Mariposa and 19th Streets, are residential buildings, including some Victorian-era buildings. Three live/work buildings are under construction./19/ Light industrial uses include vehicle and motorcycle repair shops, scrap yards, an iron works, and a photographic studio. Building heights in this area are generally one to three stories, but the three new live/work buildings under construction will be about four stories high. The Central Bayfront Nearby Area includes the maritime industrial uses of Piers 68 and 70 as well as the light industrial and commercial uses east of Third Street. Piers 68 and 70, at 18th to 20th Streets, are shipyards./20/

IMPACTS

This section discusses the changes in land use in the Project Area that would result from implementation of the proposed project, and compatibility of the project land uses with existing land uses in the vicinity.

STANDARDS OF SIGNIFICANCE

The City has no adopted significance standard for land use impacts, but generally considers whether a project would disrupt or divide the physical arrangement of an established community, or have any substantial adverse impact upon the existing character of the vicinity.

REDEVELOPMENT AREAS AND SEIR SUBAREAS

The Project Area is composed of two proposed Redevelopment Areas: Mission Bay North/21/ and Mission Bay South/22/. To facilitate description and analysis in certain sections of this SEIR, Project Area has been divided into five subareas for environmental review. (The subareas have no meaning with respect to the proposed Redevelopment Plans, construction phasing, or any other aspects of the project.) The subareas are described in "Perspectives for Impact Assessment" in Section IV.B, SEIR Study Approach, and shown in Figure IV.B.1. The proposed Mission Bay North Redevelopment Area is, for SEIR description and analytical purposes, the North Subarea. For SEIR description and analytical purposes, the proposed Mission Bay South Redevelopment Area is divided into the Central Subarea, West Subarea, East Subarea, and UCSF Subarea. Mission Bay North and Mission Bay South are connected across China Basin Channel by two drawbridges: the Peter Maloney Bridge at Fourth Street and the Lefty O'Doul Bridge at Third Street.

SUMMARY OF PROJECT AREA IMPACTS

The potential land use impacts of the project are summarized here and described in more detail by topic, and by subarea as appropriate, below.

Land Use Changes

The project includes Redevelopment Plans which propose land use designations intended to eliminate blight by facilitating development on primarily vacant and underutilized land. Accordingly, the project would ultimately result in virtually a complete change and intensification in land uses in the Project Area. Implementation of the proposed project would require demolition of almost all existing buildings within the Project Area and displacement of existing uses over the build-out period, which would not be complete until at least 2015. Buildings in the Project Area are primarily warehouses, one- and two-story buildings, and truck terminals. The primarily industrial, light industrial, commercial, and office uses would gradually be replaced by approximately 6,090 dwelling units, a 500-room hotel, up to 445,000 gross sq. ft. of entertainment-oriented commercial use, up to 805,000 gross sq. ft. of city-serving retail use, up to 257,000 gross sq. ft. of neighborhood-serving retail use, up to 5,557,000 gross sq. ft. of research and development/light industrial/office uses, about 47 acres of open space (including about 8 acres within the UCSF site), and associated parking consisting of about 22,000 spaces./23/ In addition, a major new site for UCSF containing up to 2,650,000 gross sq. ft. of instruction, research, and support uses with associated parking of about 5,300 spaces would be developed on about 43 acres. Land would be donated by Catellus for a San Francisco Unified School District public school and a new police and fire station. The project would include a new grid system of local streets and some new major streets; the existing street pattern would be substantially changed. The new street pattern is discussed in "Changes to Circulation Pattern in Mission Bay" in Section V.E, Transportation: Impacts. The project would also include major infrastructure improvements, such as drainage improvements, utility trenches, conduit ducts, and expansion of the sewer and water systems. Changes to existing infrastructure systems are discussed in "Water Supply: Impacts" and "Sewers and Wastewater Treatment: Impacts" in Section V.M, Community Services and Utilities.

Existing Uses and Buildings During Build-out of the Project Area

During the period that the Project Area is being developed, existing, non-conforming buildings and uses would generally be permitted to continue for up to 15 years, plus possible extensions at the discretion of the Redevelopment Agency./24/ Existing uses and buildings would also be permitted minor changes including enlargements, intensifications, extensions, or expansions to accommodate ongoing business operations while other parts of the Project Area were being developed.

Buildings to Be Demolished

Almost all of the buildings in the Project Area would be demolished over time to permit full build-out of the project, conservatively assumed for purposes of analysis to be complete by 2015. Buildings to be demolished are listed by Assessor's Block and Lot Number in Table V.B.1, which are shown in Figure V.B.1. The Channel Pump Station and the offices of the Amtrak police at 580 King Street would be retained./25/ Fire Station No. 30 could be either demolished or retained by the City. Fire Station No. 30 is discussed in "Architectural Resources" in Section V.D, Visual Quality and Urban Design: Setting and Impacts.

TABLE V.B.1
BUILDINGS TO BE DEMOLISHED

Assessor's Block, Lot	Height (Stories)	Gross Floor Area /a/ (sq. ft.)
Mission Bay North		
Block 3795, Lot 4		
250 King St.	2	10,300
Block 3804, Lot 2		
940 Fourth St.	1	1,700
Mission Bay North Subtotal		***16,100***
Mission Bay South		
Block 3809, Lot 4	1	500
Sixth & Channel	1	1,200
Sixth & Channel	1	1,900
Sixth & Channel	2	12,400
Block 3810, Lot 7		
1210 Sixth St.	W1/b/	64,800
1225 Sixth St.	W1	60,000
1301 Sixth St.	W1	116,100
1335 Sixth St.	W1	90,900
1355A Sixth St.	W1	2,500
1355 Sixth St. /c/ (2 bldgs)	W1	28,100
1788 Third St.	1	800
1730/1760/1780 Third St.	W1	106,000
1790 Third St.	1	1,000
255 Channel St.	W1	104,600
205 Channel St.	W1	34,100
Block 3813, Lot 1		
1050 Third St.	W1	27,300
Blocks 3822, Lot 3; 3832, Lot 3; and 3835, Lot 2		
700 16th St.	W1	104,400
700 16th St. (2 bldgs.)	1	6,800

(Continued)

TABLE V.B.1 (Continued)

Assessor's Block, Lot	Height (Stories)	Gross Floor Area /a/ (sq. ft.)
Block 3832, Lot 2		
1400 Sixth St.	W1	59,900
Block 3835, Lot 3		
1624 Sixth St.	2	12,600
1600 Sixth St.	1	3,700
Block 3837, Lot 2		
1401 Third St.	2	18,200
Block 3837, Lot 4		
Fire Station No. 30 /d/	2	22,600
Block 3837, Lot 6		
1455/1475 Third St.	2	21,900
Blocks 3837, Lot 7; and 3841, Lot 2		
1481/1501 Third St.	2	31,400
Blocks 3838, Lots 1, 2; and 3840, Lots 1, 2		
1420 Fourth St.	W1	37,600
Misc. Bldgs.	W1	2,500
Blocks 3838, Lots 1, 2, 3; 3840, Lots 1, 2, 3; and 3850, Lots 1, 1A, 2		
1420 Fourth St./299 Illinois St. (2 bldgs.)	W1	128,300
Misc. Bldg.	W1	1,700
Blocks 3849, Lots 1, 2; and 3853, Lot 1		
300 16th St.	2	11,200
Blocks 3852, Lot 2; and 3892, Lot 1		
375 Illinois St.	1	5,200
377 Illinois St.(2 bldgs.)	W1	1,600
Block 3880, Lot 1(SW338)		
440 T. François Blvd.	W1	10,100
74 Mission Rock St.	W1	3,500
Block 3940, Lot 1		
499 Illinois St.	1	43,800
Misc. Bldg.	1	3,500

(Continued)

TABLE V.B.1 (Continued)

Assessor's Block, Lot	Height (Stories)	Gross Floor Area /a/ (sq. ft.)
Block 3941, Lot 1(SW343)		
Illinois/Mariposa	2	14,100
Block 3942, Lots 2, 3		
420 17th St.	W1	36,400
Block 3942, Lot 4		
Third & Mariposa	2	4,500
Third & Mariposa	1	1,800
Block 3943, Lot 1		
1810 Third St.	1	2,700
Block 3943, Lot 7		
1830 Third St.	1	4,600
Block 3943, Lot 6		
Misc. bldgs.	1	600
Block 3944, Lot 4		
701 16th St.	W1	44,400
750/770 Mariposa St.	W1	70,100
800/880 Mariposa St.	W1	66,500
Block 3992, Lot 3		
1900 Third St.	W2	253,800
Mission Bay South Subtotal		***1,682,200***
PROJECT AREA TOTAL		**1,698,300**

Notes:
a. Numbers have been rounded to the nearest hundred.
b. Standard building height is about 10 ft. per floor; warehouse building heights (W) are about 25 ft. at the ground floor.
c. Does not include temporary structures.
d. Fire Station No. 30 may be demolished.

Source: EIP Associates.

Businesses to Be Relocated

There are no residential units in the Project Area that would be displaced by the proposed project. Project-related development could displace any businesses and their employees. Their relocation would be assisted to the extent required by applicable law. In brief, the goal of relocation assistance is to find a new location of comparable rent and business characteristics, so that loss from the relocation is minimized.

Existing uses would be replaced gradually as the Project Area developed in accordance with the Redevelopment Plans. It is not yet known when and where specific businesses would relocate. Most existing businesses would relocate to areas that make sense for the particular business and where permitted by zoning. Depending on the activity and where it relocates, environmental impacts could occur at the new location. If impacts could occur from any such proposal requiring a discretionary permit from any public agency, environmental review would be carried out at such time as relocations of specific uses to specific new sites were proposed. For example, in January 1998 RMC Lonestar submitted an environmental review application to the Planning Department for a proposal to relocate its existing ready-mix concrete batch plant in the Project Area at Third and Mariposa Streets to Pier 90-92 on port property as an interim land use. That environmental review will examine the potential impacts of that particular use at that proposed site.

Construction Effects of Project Area Development

Construction would occur over about 20 years alongside existing, remaining industrial, light industrial, office, retail, and commercial uses and new residential, public school, UCSF, office, industrial, and retail uses. Generally, the pace of project construction would be determined by the rate of market absorption of these uses. Construction would most likely occur at various locations in the Project Area concurrently. For example, the occupants of residential development anticipated in the blocks bounded by North Common Street, Third Street, Mission Rock Street, and Terry A. Francois Boulevard, could at various times, or consecutively, encounter construction work: construction of other dwelling units on the west could occur, followed by construction of the police/fire station immediately north, followed by construction of research and development and office use to the south, followed by construction on the UCSF site to the southwest. The UCSF site would be developed in phases to meet campus space needs as capital improvement funding is secured. In all, the new residential development could be in proximity to some construction, construction staging, environmental staging, and rental offices for over 20 years. This could be annoying to residents or workers. People choosing to live or work in the Project Area would be aware that Mission Bay is a developing area with a long-term construction program. The effects of construction on adjacent uses, both within and outside the Project Area, are addressed individually under each environmental topic in other sections of this document, including contaminated soils and groundwater, noise, air quality (dust), traffic, and health and safety.

Temporary Uses

Temporary uses such as carnivals or Christmas tree lots would be allowed in the Project Area. These uses would be limited up to 90 days in duration and are not, therefore, likely to create effects beyond temporary (short-term) noise, air quality (dust), and traffic issues discussed in the noise, air quality, and transportation sections.

Interim Uses

The Redevelopment Plans would allow the development of temporary structures and uses that are incidental to the Redevelopment Plans' development program for an initial period of up to 15 years, with five-year extensions. Sales or rental offices affiliated with specific residential developments could be constructed or could be housed within the housing development, and construction staging and environmental clean-up of contaminated soils would be allowed. Open recreation, parking, truck parking, and storage would also be acceptable interim uses. Each interim use would be subject to a finding by the Executive Director of the Redevelopment Agency that such use would "not impede the orderly development of the Project Area."/26/

Interim uses would also include parking areas. As discussed in "Proposed Interim Use - Giants Ballpark and UCSF Surface Parking" in Section III.B, Project Description, interim surface parking is proposed for Giants Ballpark use just south of the Channel and for UCSF site uses just north of 16th Street. It is anticipated that the previously approved Giants Ballpark parking would only be for the first five years of operation (until about 2005); the UCSF site parking would remain in operation until UCSF determines that development of structured parking on the UCSF site is necessary. In either event, the Project Area could contain at least 35 acres of paved parking area for an indeterminate period. Redevelopment Plans would not limit the amount of interim parking that could be developed in the Project Area pending ultimate build-out by project uses, although any interim parking would be subject to Redevelopment Agency review and the findings described above.

The parking lot areas outside the UCSF Subarea could also be used for commuter parking on an interim basis at the discretion of the Redevelopment Agency. Commuter parking lot areas are generally all-day parking lots that would experience the most disturbance during the morning and evening commute hours. The effects of potential commuter parking lot areas is discussed in "Interim

Uses and Interim Conditions" under "Transportation Issues During Build-out" in Section V.E, Transportation: Impacts. No plan has been established to provide for Giants Ballpark parking after the Catellus lease term has expired./27/

Land Use Changes by Subarea

For purposes of SEIR analysis, the project is assumed to be built out in the year 2015. In general, development would include approximately 3,000 residential units with ground-floor retail and 611,000 gross sq. ft. of retail uses in the North Subarea; approximately 3,090 residential units with ground-floor retail and a hotel with associated retail in the Central Subarea; about 5,557,000 gross sq. ft. of research and development/light industrial/office with ground floor retail and about 583,000 gross sq. ft. of city-serving retail in the combined East and West Subareas; and a UCSF site with about 2,650,000 gross sq. ft. of instruction, research, and support uses in the UCSF Subarea. (See Table III.B.1 for a summary of proposed land uses.) The project also includes a public school site in the UCSF Subarea and a police and fire station in the Central Subarea. There would be open space areas and parking uses interspersed throughout the Project Area. (See Table V.B.2 for a summary of proposed land uses by subarea and Figure III.B.3 for a map of the land use program.)

Development of the North and Central Subareas, over the 20-year build-out period, would replace vacant land and interim uses in the northern and central portions of the Project Area with residential, hotel, retail, and public facilities uses and associated parking and open space areas.

Development of the UCSF, East, and West Subareas would change the type of the industrial uses in these subareas, and replace some of the uses with instruction, research, and support uses, and research and development, light manufacturing, office, UCSF's retail, accessory parking, and open space uses. The existing industrial uses of the Project Area are primarily warehousing, truck terminals, and heavy equipment repair and storage. The proposed light industrial uses are primarily research and development (such as medical research, computer, semi-conductor, multimedia, and other R&D) and light manufacturing uses.

<u>North Subarea</u>

The North Subarea would be developed with approximately 3,000 dwelling units, up to 667,000 gross sq. ft. of retail uses, about 6 acres of open space, and associated parking for about 5,700 vehicles. The retail uses would include about 389,000 gross sq. ft. of commercial entertainment; an additional 222,000 gross sq. ft. would be city-serving retail; and about 56,000 gross sq. ft. would be neighborhood-serving retail associated with the residential development. Commercial uses would be

TABLE V.B.2
PROPOSED MISSION BAY LAND USE BY SUBAREA

Subarea	Size/a/ (acres)	Residential (dwelling units)	R&D/ Office (gsf)/b/	UCSF Site (gsf)	City-Serving Retail (gsf)	Commercial, Entertainment-Oriented (gsf)	Neighborhood-Serving Retail (gsf)	Open Space Land (acres)	Public Facilities (acres)/f/
NORTH	65	3,000	0	0	222,000	389,000	56,000	6	1.5
Subtotal for Mission Bay North Redevelopment Area	*65*	*3,000*	*0*	*0*	*222,000*	*389,000*	*56,000*	*6*	*1.5*
CENTRAL	85	3,090	0	0	0	500-room hotel 56,000	111,000 /d/	20.3	1.52
EAST	51	0	2,952,000	0	273,000 /c/	0	67,000 /d/	7.2	0
WEST	57	0	2,605,000	0	310,000	0	23,000 /d/	5.4	0
UCSF	45	0	0	2,650,000	0	0	0	8	2.2 /e/
Subtotal for Mission Bay South Redevelopment Area	*238*	*3,090*	*5,557,000*	*2,650,000*	*583,000*	*56,000*	*201,000*	*40.9*	*3.72*
GRAND TOTALS	**303**	**6,090**	**5,557,000**	**2,650,000**	**805,000**	**445,000**	**257,000**	**46.9**	**5.22**

Notes:
a. Acreage includes freeway, rail, and net streets.
b. gsf = gross sq. ft.
c. City-serving retail, 23,000, to be dispersed throughout a portion of the subarea.
d. Neighborhood-serving to be dispersed throughout subarea.
e. Exact location of school site in UCSF Subarea to be determined.
f. In addition to the acreage shown in the table, land under I-280 that is not otherwise designated Public Open Space would be designated Public Facilities.

Source: Catellus Development Corporation, KCA Engineers, July 1997.

located on the western and eastern ends of Mission Bay North with most of these uses planned for the eastern end of the subarea.

Development heights between Fourth and Seventh Streets would be allowable up to 65 feet, with 10% of the developable area allowable up to 90 feet in height, and 15% allowable up to 160 feet in height. Between Fourth and Seventh Streets, buildings would also be restricted to a maximum average of 50 feet high within 20 feet of the public open space parallel to the Channel edge, to 65 feet high within 100 feet of the north side of the Channel, and to 90 feet high south of Berry Street. Development between Third and Fourth Street would be allowable up to 80 feet high, with 50% of the developable area allowable up to 120 feet high, and 20% allowable up to 160 feet in height. The height zones for the Project Area are presented in Figure III.B.5. At about five stories (about 65 feet), the housing and retail uses would be slightly taller than existing retail uses along Townsend Street west of Fourth Street. The height and scale of the retail uses along Third Street, at an average of 120 feet high, would be similar to the height and scale of the Giants Ballpark, which is 130 feet high along King Street with light standards (i.e., posts) at 175 feet. (Visual quality and urban design are discussed further in "Proposed Redevelopment Plans: Mission Bay North Retail" under "Urban Design" in Section V.D, Visual Quality and Urban Design: Impacts.)

The western block of the North Subarea would be developed with retail and residential uses. This area is surrounded by railroad tracks on the north and freeway ramps on the south. The converted four- and five-story industrial buildings of Showplace Square border the area on Townsend and Seventh Streets. The south side of Townsend Street between Seventh and Fourth Streets is used for on-street angled parking. Access to the residential and retail development would be from Berry Street. The I-280 ramps and the Channel Pump Station are immediately to the south and east.

The area between Fourth, Sixth, and King Streets and the Channel would be developed with residential uses, with some ground-floor neighborhood-serving retail dispersed throughout. It is anticipated that these residential uses would be oriented toward Berry Street and the Channel. Public access and a pedestrian pathway would be developed along the north side of the Channel and at Fifth and Berry Streets as part of the project's open space improvements. A pedestrian bridge is proposed to be constructed at Fifth Street, subject to obtaining the required permits and approvals, and would provide access between the northern and central residential developments.

The residential and neighborhood-serving uses of the North Subarea would be within a block of existing similar neighborhood-serving retail uses that occupy Townsend Street east of Fourth Street and Third Street north of King Street. Residential uses northeast of the Project Area are three- to six-story-tall buildings with ground-floor neighborhood-serving commercial uses that were constructed within the last 10 years in the South Beach subarea of the Rincon Point - South Beach Redevelopment Area. The project's residential development would continue the trend of converting deteriorating industrial areas near the waterfront to new uses, particularly residential.

Outside the Project Area and across the Channel from these proposed residential uses is the houseboat community of Mission Creek. The community includes 20 one- and two-story houseboats and about 25 permitted pleasure craft (there are 35 berths available). The development of the project would surround the houseboat community with a larger residential community of multi-family housing complexes.

The blocks bounded by Third, Townsend, Fourth, and Berry Streets would be developed with retail uses. Various retail programs could be built under the proposed Mission Bay North Redevelopment Plan. For purposes of analysis in this SEIR, the land use program is assumed to include a theater complex with up to 25 screens, sports-oriented retail, small retail stores intended to foster a street-level experience, theme restaurants, new technology and/or game-related retail, and other eating and drinking establishments./28/ The *Giants Ballpark Final EIR* discussed the demand for pedestrian-serving retail uses in the vicinity of the ballpark./29/ The development of city-serving commercial entertainment and retail uses in the Project Area would address some of the projected demand of ballpark patrons discussed in that document.

Central Subarea

The Central Subarea would be developed with approximately 3,090 dwelling units, up to 111,000 gross sq. ft. of retail uses, a 500-room hotel with associated uses such as banquet and conference facilities, up to 56,000 gross sq. ft. of retail space, a site for police and/or fire facilities, about 20 acres of open space, and associated parking for about 3,500 vehicles. Five- and six-story residential apartment buildings would be constructed throughout the subarea on both sides of Third Street. The hotel would be located next to China Basin Channel between Third and Fourth Streets. The 1.5-acre site of the police and fire station would include the current site of the Fire Station No. 30 on Third Street at Mission Rock Street. Public open space would be developed along the perimeter of the subarea, on the south side of the Channel, along Terry A. François Boulevard, and at the southern edge of the subarea at The Common, a two-lane roadway with a 130-foot-wide median stretching from Seventh Street to Terry A. François Boulevard.

In this subarea, development would generally be allowable up to 65 feet, with some development allowable up to 90 feet high and 160 feet high, respectively, including: 10% at 90 feet in height and 15% at 160 feet high of the developable area along the Channel; 13% at 90 feet high and 7% at 160 feet high of the developable area north of The Common and, generally, west of Third Street; and 13% at 90 feet high and 7% at 160 feet high of the developable area east of Third Street. Buildings would also be restricted to a maximum average of 50 feet high within 20 feet of the Channel, and to 90 feet high fronting the linear park on Terry A. François Boulevard (see hatched area in Figure III.B.5). Access to the existing neighborhood-serving retail uses of Townsend Street and the proposed project entertainment-oriented uses on Fourth Street would be available via the existing Fourth Street Bridge and, if built, the pedestrian bridge at Fifth Street.

West of Fourth Street, the residential uses in the Central Subarea would be directly across China Basin Channel from proposed residential uses on the north side of the Channel. Immediately north would be the existing houseboat community and the existing and proposed public access and park areas adjacent to the houseboats. The central portion of the residential uses would be arranged around a triangular park area. Along the south edge of the subarea, The Common and other open space would buffer residential uses from the UCSF Subarea and the research and development, light manufacturing, and office uses in the East and West Subareas.

East of Third Street, residential buildings with ground-floor neighborhood-serving retail would be north of The Common, west of a waterfront linear park, south of Port property and adjacent to the new police and fire facilities on the Fire Station No. 30 site. South of The Common would be research and development, light manufacturing, and office uses with neighborhood-serving and city-serving retail. Some residential use would face existing and potential future maritime and industrial uses along the waterfront and to the north on port property. To the east of the Project Area, Pier 50 is designated a Port Priority Area (as is Pier 48) and currently houses the Port of San Francisco's Maintenance Operations Facilities (MOF), which supports the maritime-industrial uses of the Port. The Port's Public Boat Launch Ramp is located between Piers 52 and 54. The Port of San Francisco's long-term plans for the use of port property directly across Third and Mission Rock Streets are uncertain at this time./30/ Interim parking for the Giants Ballpark is planned for the area for about the first 10 years of ballpark operation to accommodate about 2,500 vehicles on about 14 acres, including the port property.

Disposition of the port property, outside of the Project Area (including new operations or remediation activities for petroleum free product contamination), could affect the residential uses of the Central Subarea directly facing the site on two sides. H&H Ship Service, a tank cleaning facility that handled identified hazardous wastes, discontinued operations on that site in early 1997. While there is no current proposal to expand maritime or industrial uses on the piers (Pier 48 or 50), these uses could expand in accordance with existing zoning and plans. Effects on the proposed project's residences east of Third Street could potentially include light and glare and increased noise from an expansion of maritime or industrial uses on Pier 48 and 50.

At the north end of the Central Subarea would be a 500-room hotel with associated uses such as banquet and conference facilities and up to 56,000 gross sq. ft. of associated retail uses. The hotel would be directly across the Channel from the China Basin Landing buildings, which provide patio seating and public access on the Channel, and the Giants Ballpark. The Giants Ballpark site will be developed with a Pacific Bell Learning Center and other retail uses intended to draw a regional audience. The hotel would face the existing industrial uses and proposed Giants Ballpark interim parking on the port property directly across Third Street.

East Subarea

The East Subarea would be developed with up to 2,952,000 gross sq. ft. of research and development, light manufacturing, and office use; about 340,000 gross sq. ft. of retail use; about seven acres of open space; and associated parking for about 4,600 vehicles. The retail uses would include about 273,000 gross sq. ft. of city-serving retail and about 67,000 gross sq. ft. of ground-floor neighborhood-serving retail. The neighborhood-serving retail uses would be dispersed throughout the subarea, and the city-serving retail uses primarily would be concentrated at or near the existing Esprit site, with a smaller portion dispersed throughout the center portion of the subarea. The 7 acres of open space would be developed primarily along Terry A. François Boulevard. Development in the subarea would be allowable up to 90 feet in height, with 7% of the developable area allowable up to 160 feet high (along Third Street). Buildings along the Bayside linear park would be restricted to 90 feet in height, with development adjacent to a portion of the park frontage limited to 55 feet in height. Buildings in the subarea would be about six stories high./31/

The research and development, light manufacturing, office, and retail uses of the northern portion of the East Subarea would be across The Common from residential units and across Third Street from UCSF instruction, research, and support uses. Across Terry A. François Boulevard are maritime-related industrial and commercial uses and public access to the Bay. Maritime uses include tug services, seasonal fishing operations, yacht and boat clubs, and a small-boat yard. The Port of San Francisco's Public Boat Launch Ramp is between Piers 52 and 54, and Agua Vista Park is just south of Pier 64, opposite the Esprit site. Access to existing recreational uses is discussed in "Changes to Circulation Pattern in Mission Bay" under "Year 2015 Transportation System Assumptions" in Section V.E, Transportation: Impacts; the height and scale of new development are discussed in "Views" in Section V.D, Visual Quality and Urban Design: Impacts.

The research and development, light manufacturing, office, and city-serving retail uses in the southern portion of the East Subarea would be within one block of the existing small-scale retail and light industrial uses of the Lower Potrero/Central Bayfront area. Across Terry A. François Boulevard and to the south are the maritime-industrial shipyards of Piers 68 and 70.

West Subarea

The West Subarea would be developed with up to 2,605,000 gross sq. ft. of research and development, light manufacturing, and office use; up to 343,000 gross sq. ft. of retail use; about five acres of open space; and associated parking for about 4,100 vehicles. The retail uses would include about 310,000 gross sq. ft. of city-serving retail and 23,000 gross sq. ft. of ground-floor neighborhood-serving retail. The retail uses would be interspersed throughout the subarea. The city-serving retail would be located predominantly on the Castle Metals site. The open space areas primarily would be located at the northern and southern ends of the subarea. Development in the subarea would be allowable up to 90 feet in height, with 15% of the developable area west of Owens Street allowable up to 160 feet high, and 10% of the developable area between Owens Street and Third Street allowable up to 160 feet high. Building height on the Castle Metals site would be restricted to 90 feet high. Building height would be restricted to the freeway height along a minimum of each development block of 60% of the I-280 frontage for a depth of 100 feet from the edge of the freeway. Buildings in the subarea would be about eight stories high.

The new research and development, light manufacturing, office, and retail uses in the northwestern portion of the West Subarea would be south of the Channel and the houseboats, and existing and proposed open space areas of China Basin Channel. These uses would be adjacent to the I-280 structure, which is approximately 75 feet high along the length of Seventh Street. Across I-280 and Seventh Street from the Project Area are light industrial uses including, from north to south, mini-storage facilities, a bus maintenance yard, wholesale trade warehouses, and a vacant warehouse at the intersection of Seventh Street and 16th Street.

South of 16th Street, the research and development, light manufacturing, and office uses would be adjacent to UCSF instruction, research, and support uses on the north, and other research and development, light industrial, and office uses on the west and east. Existing warehouses, auto body shops, and retail and office buildings would face the open space and retail uses of the Project Area along Mariposa Street. Existing residential uses would be within one block of the open space and retail uses. Older residential buildings and newer apartment complexes, part of the Potrero Hill neighborhood, extend to the west and south. Jackson Playground is five blocks from the Project Area, as are churches and other neighborhood-serving retail uses.

New retail and open space uses would be directly north of existing small-scale retail, residential, office, light manufacturing, and live/work uses of Lower Potrero. Residential buildings, predominantly two- to three-stories high, are clustered at the intersection of 18th Street and Tennessee Street. Retail uses include auto body shops, photography labs, graphics services, and restaurants.

UCSF Subarea

The UCSF Subarea would be developed with a major new site for UCSF, with about 160,000 gross sq. ft. of instruction space; about 1,220,000 gross sq. ft. of research space; about 265,000 gross sq. ft. of academic support space; about 475,000 gross sq. ft. of academic/campus administration space; about 160,000 gross sq. ft. of campus community space (including retail and other service uses); about 370,000 gross sq. ft. of logistics space, a central utilities plant, about 8 acres of open space, and associated parking for up to 5,300 vehicles./32/ The research space would include laboratories; there would not be any large clinical space, i.e., areas used for seeing patients. Once sufficient UCSF development occurred, a central utilities plant could be constructed to supply UCSF facilities with steam and electric power, and would also serve as the location for chillers, primary electrical service, emergency generators, and other centralized systems. The central utilities plant could also include a cogeneration unit. The UCSF site would "stand alone," i.e., the administration and support functions necessary for the site to interact as a part of the UC campus system would be available on-site. Those functions would include administrative support, logistics, food service, and retail uses. Open space areas would be dispersed throughout the subarea. Buildings within the subarea would range from about 4 to 10 stories high. UCSF classroom and research uses would require about a 15-foot floor-to-ceiling height. For purposes of SEIR analysis, buildings are conservatively assumed to be up to 160 feet high with the majority of buildings at a height of 110 feet or less. The UCSF Subarea would contain a site for a public school, most likely near The Common. The UCSF Subarea would be completely surrounded by other Mission Bay South project development.

The proposed new alignment of Fourth Street would cross the UCSF Subarea; remaining internal streets would be private and would be defined as part of UCSF's design process. UCSF uses would be bordered by South Common Street on the north, Third Street on the east, 16th Street on the south, and Owens Street on the west. No housing is proposed in the UCSF Subarea.

Immediately to the west, south, and east, research and development, light manufacturing, office, and retail uses would abut the UCSF Subarea. The proposed development west, south, and east of the UCSF Subarea would be compatible with the medical research and instructional uses of the campus. To the north would be The Common, providing a buffer for the residential development on the other side. To the south across 16th Street and southeast across Third Street are proposed city-serving retail uses. The proposed recreational areas of China Basin Channel and the existing recreational uses of the waterfront would be located a few blocks from the UCSF Subarea.

Research and adjacent light manufacturing activities could potentially be incompatible with the development of a public school or child care facilities depending on the type of proposed use and proximity to the school or child care facility, as discussed in "Toxic Air Contaminants" in Section V.F, Air Quality: Impacts. It is anticipated that the site for a public school would be located along the northern border of the UCSF Subarea. The development of the school at this location, along The Common, would reduce potential incompatibility with laboratory, research, and other similar activities. Issues associated with the location of child care facilities are addressed in "Toxic Air Contaminants" in Section V.F, Air Quality: Impacts; "Land Use and Planning Issues" under "Other Issues" in Section V.I, Health and Safety: Impacts; and "Process for Selecting and Approving a Child Care Center and/or School Location," under "Post-Development Impacts" in Section V.J, Contaminated Soils and Groundwater: Impacts.

Development of the Project Area with residential, retail, institutional medical research, research and development, light manufacturing, office, and open space uses would generally be compatible with the land uses of the adjacent properties as described above for each subarea. As described under "Existing Land Uses in the Project Area," above, an established community does not exist in the Project Area. Consequently, the project would not disrupt or divide an existing established community.

Nearby Areas

Effects on the Nearby Areas are discussed below. In general, effects on Nearby Areas related to transportation, air quality, noise, and community services are addressed in those sections of the SEIR. Development of Mission Bay would gradually but substantially change the character of this part of the City. Some of the resulting effects of the change in character and intensification of use are relatively predictable and are discussed below. Without knowing the precise location of uses, some other effects could occur, but it would be speculative to attempt to predict them at this time.

<u>Adjacent Port Property</u>

Mission Creek Houseboat Community

Development of the North and Central Subareas with residential, retail, hotel, and open space uses would create a new neighborhood adjacent to the Mission Creek houseboat community. As discussed earlier, the houseboat community would be surrounded on two sides by residential buildings. The open space amenities proposed along the Channel, including moving Channel Street away from the Channel and developing public access along most of the channel edges, would draw residents and visitors along the north, and primarily south, sides of the Channel. The houseboat community would no longer exist in relative isolation. There would be the same amount of on-street parking for residents and visitors since the houseboat community's 50 parking spaces would be retained in the project's public open space along the Channel. Project Area development of ground-floor retail within residential buildings would increase the type and amount of personal services available to the houseboat residents.

Port Priority Areas

Piers 48 and 50 are currently identified in the *San Francisco Bay Area Seaport Plan* as Port Priority Areas./33/ This designation includes the use of the piers for marine terminals and directly-related ancillary activities such as container freight stations, storage, ship repair and support transportation uses. Though there is no current proposal to expand maritime or industrial uses on Piers 48 or 50, these uses could expand in accordance with existing zoning and plans. Effects on the project's residences east of Third Street could potentially include light and glare and increased noise from an expansion of maritime or industrial uses on Piers 48 and 50.

Recreational Uses and Public Open Space Along the Waterfront

Development of the Project Area would include improvements to Terry A. François Boulevard and creation of a Bayside linear park west of Terry A. François Boulevard. Existing angle/perpendicular parking would be removed along Terry A. François Boulevard from Pier 54 south to Mariposa Street. Users of the yacht and small boat clubs, the Port of San Francisco's Public Boat Launch Ramp, Agua Vista Park, and other small boat facilities would compete for access and on-street parking to these facilities with the residents, employees, and visitors, of the Project Area. The Project Area development also would increase the amount of patrons to existing commercial uses, including waterfront restaurants. The lack of available parking would make use of existing facilities inconvenient for those arriving by private vehicles. As demand for the waterfront recreational uses grows, it would be expected that there would be a consequent demand for parking to accommodate these uses.

With the development of the Project Area, the Port may be able to reserve boat trailer parking within 600 feet of the Public Boat Launch Ramp between Piers 52 and 54. The parking, required for a minimum of 20 years under the terms of a grant from the California Department of Boating and

Waterways, had been planned directly across the street on the west side of Terry A. François Boulevard. The Port is considering a location just south of The Common. The location of the boat trailer parking is subject to change if Terry A. François Boulevard is realigned along a new route inland of the existing roadway (see Section VII.A, Variant 1, Terry A. François Boulevard)./34/

South of Market

South Beach and South Park

Development of the retail uses in Mission Bay on Third Street, in conjunction with the construction of the Giants Ballpark, would create a regional destination center in this part of the City. Unlike the Giants Ballpark, these commercial entertainment uses would create a year-round destination center. Currently, the South Beach and South Park portions of the South of Market are active, vibrant communities. In the tradition of most of San Francisco, these neighborhoods derive most of their pedestrian and auto traffic from nearby neighbors. The development of the area as a regional entertainment center would increase the use of the area by tourists visiting San Francisco as well as visitors from other parts of the City and region.

South Beach and South Park residents would likely find that their day-to-day travel patterns would be altered. For example, increased traffic would be encountered as many more people would use The Embarcadero, Third Street and the reconfigured Fourth Street as major thoroughfares. The redevelopment of South Beach, which has replaced low-density maritime and industrial use with taller, denser residential with ground-floor retail uses, would be extended west into the Project Area. That is, taller and denser residential and retail development would replace low-density uses and vacant land. Increased pedestrian and auto traffic would occur in tandem with buildout of the Project Area.

Of particular interest to harbor users is access to South Beach Harbor, which is the largest waterfront recreational use south of the Bay Bridge. Build-out of the Project Area would increase the number of residents, daytime employees, and vehicle traffic, which would increase use of the area and could spur further development. Additional recreational uses and associated parking may be developed in the future to meet the new demand. However, in the short term, existing recreational facilities may be impacted by the increased number of pedestrians, and thus pedestrian and vehicle congestion, in the area. The lack of available parking could make use of existing facilities inconvenient for those arriving by private vehicles.

Potrero Hill/North Potrero

The research and development, light manufacturing, office, and retail uses proposed for the East and West Subareas and the instruction, research, and support uses of the UCSF Subarea would represent a change in the type and intensity of industrial uses currently operating in the Project Area and Nearby Areas. It is anticipated that the UCSF site would attract research and development uses that would benefit from proximity to a medical university. The development of the East, West, and UCSF Subareas would increase the intensity of individual business operations as well as the density throughout the Project Area. The UCSF site would operate as a stand-alone site, independent of the existing UCSF Parnassus Heights site and other UCSF sites, with a population present throughout the day and evening. The business park operations of the East and West Subareas would similarly employ a worker population present throughout the day. The new workers would remain in the Project Area throughout the day, and possibly evening, and would increase demand for restaurants and personal service retail. Some of this demand would be met by the ground-floor neighborhood-serving retail developed throughout the East and West Subareas. However, the commercial areas of Potrero Hill and North Potrero would likely experience increases in demand for restaurants and personal services. Some Project Area employees might choose to park on nearby streets if they were unable to find long-term parking in the Project Area. Most of the adjoining and nearby blocks below 17th Street contain industrial and commercial uses with high daytime use. Project workers could find parking in these areas and cause spillover demand from existing industrial and commercial users who may then seek parking in adjoining and more-distant residential areas where daytime parking is more plentiful. Thus, those residential blocks south of 17th Street would likely experience increased use of existing on-street parking. However, the project's daytime worker demand likely would not coincide with the usual evening/night demand of residential areas. See additional discussion in "Parking Impacts" in Section V.E, Transportation: Impacts.

Other effects would likely be experienced by the residential neighborhoods of Potrero Hill and North Potrero. Development of the Project Area would extend dense urban development from the Downtown area toward these residential communities to the south. Thus, residents of Potrero Hill and North Potrero would have available a wider range of commercial and retail options.

Showplace Square

Unlike the close-in residential and neighborhood-serving retail neighborhoods of South Beach and South Park, the city-serving retail areas of Showplace Square and the more distant retail and commercial areas of the South of Market generally would not be affected by development of the Project Area. However, pedestrian traffic from the city-serving retail proposed on Berry Street between Seventh and Sixth Streets may increase the amount of activity at the large interior design showrooms and retail outlet stores of Showplace Square. Some Project Area employees (primarily from expected office uses) might choose to park on nearby streets if they were unable to find long-term parking in the Project Area. Most of the nearby blocks north of Channel Street contain city-serving retail and wholesale uses with available parking. Project demand for parking likely would not affect this area since parking is more plentiful and since Showplace Square is farther away from the project's potential office uses. See additional discussion in "Parking Impacts" in Section V.E, Transportation: Impacts.

Lower Potrero/Central Bayfront

As noted above for the Potrero Hill and North Potrero neighborhoods, new workers in the East, West, and UCSF Subareas would remain in the Project Area throughout the day and would increase demand for restaurants and personal service retail. Some of the Project Area employees might choose to park in the Lower Potrero area on streets where no time limits are imposed. Development of city-serving retail south of Mariposa Street on both sides of Third Street would increase the amount of retail activity in the area. The Lower Potrero area would experience an increase in commercial activity, creating pressure to convert existing light industrial uses to pedestrian-serving uses. The live/work uses currently under construction in the Lower Potrero would not be affected.

Some Project Area employees (primarily from expected office uses) might choose to park on nearby streets if they were unable to find long-term parking in the Project Area. Most of the adjoining and nearby blocks south of Mariposa Street contain industrial and commercial uses with high existing daytime use and consequent lack of available parking. However, if project workers could not find parking in these areas they may seek parking in adjoining and more-distant residential areas (for example, west of Pennsylvania Street) where daytime parking is more plentiful. Thus, the residential areas west of Pennsylvania Street could experience increased use of existing on-street parking since the project's daytime worker demand likely would not coincide with usual evening/night demand of those residential areas. See additional discussion in "Parking Impacts" in Section V.E, Transportation: Impacts.

NOTES: Land Use

1. San Francisco Planning Department, *Mission Bay Final Environmental Impact Report*, Planning Department File No. 86.505E, State Clearinghouse No. 86070113, certified August 23, 1990, Volume Two, pp. VI.B.1-VI.B.49.*

2. 1990 FEIR, Volume Two, pp. IV.4-IV.7.* The Mission Creek houseboat community was in the 1990 FEIR project area. The Project Area in this SEIR does not include the houseboat community. It is discussed in this SEIR as part of the "Adjacent Port Property."

3. Eric Harrison, Project Manager, Catellus Development Corporation, personal communication with EIP Associates, August 17, 1998.

4. A survey of existing land uses for the Project Area and for the adjoining areas was conducted in July 1997. The land use survey was conducted by EIP Associates. The survey included the area bounded by Bryant and Second Streets to the north, the waterfront piers from Pier 40 to Central Basin on the east, 19th Street to the south, and Eighth Street and Kansas Street to the west.*

5. 1990 FEIR, Volume Two, pp. VI.B.2-VI.B.6, and Table VI.B.1, p. VI.B.4.*

6. "Interim uses" in this context, as defined under Article 9 of the San Francisco Planning Code, refers to the conditional development of land uses in Mission Bay for a duration of up to 10 years; interim uses may not be consistent with existing zoning. The Redevelopment Plans permit interim uses for periods of up to 15 years, with additional extensions granted at the discretion of the Redevelopment Agency.

7. No change is proposed in this area, although the area is included in the project boundaries and Catellus holds the underlying title.

8. City and County of San Francisco, *San Francisco General Plan,* Transportation Element, Table 1: Classification of Elements in Vehicular Circulation Plan, p. I.4.35.*

9. Dennis Duden, General Manager, Mission Bay Golf Center, telephone conversation with EIP Associates, August 7, 1997.

10. The properties on the Castle Metals site, located on Third Street at Mariposa Street, are not owned by Catellus. (Note: The large warehouse on the Castle Metals site belongs to 1900 Third Street L.L.C.)

11. 1990 FEIR, Volume Two, pp. VI.B.29-VI.B.38.*

12. Port of San Francisco, Resolution No. 97-92, adopted October 14, 1997.

13. South of China Basin Channel and east of Third Street are seawall lots occupied by industrial uses such as recycling facilities; this is also the site of the former H&H Ship Service Company. Port property is primarily made up of "finger piers," pile-supported extensions into the water, and "marginal wharves," which are constructed parallel to the shoreline or seawall and are generally located between finger piers. These wharves are customarily designated with a "½," as in Pier 40½. Port of San Francisco, *Waterfront Land Use Plan*, 1996, p. 110.*

14. Currently, 20 houseboats and 25 pleasure craft have permits. There are berths for 35 pleasure craft. Paul Osmondson, Planning Director, Port of San Francisco, telephone conversation with EIP Associates, May 30, 1997.

15. Under the 1990 *Mission Bay Plan*, a 10.8-acre area (470,000 sq. ft.) was to be developed as open space/public access uses and was to be called the Mission Bay Wetlands Park. Port of San Francisco, *Waterfront Land Use Plan*, 1996, p. 144. *

16. A fire at Pier 48 in early 1996 required the evacuation of the pier sheds. Renovation work is ongoing and should be completed in 1998. Phillip J. Williamson, Commercial Property Manager, Port of San Francisco, personal communication with EIP Associates, March 2, 1998.

17. San Francisco Planning Code, Appendix I to Article 10.

18. On July 29, 1987, the State legislature adopted legislation freeing Port Seawall Lots 331, 332, and 333 from public trust use restrictions for 66 years and enabling the construction of almost 300 housing units on port property, the South Beach subarea of the Rincon Point - South Beach Redevelopment Project Area. Seawall Lots 328 and 330 are used for parking. Seawall Lot 329 is open space adjacent to the Portside apartment complex. Port of San Francisco, *Waterfront Land Use Plan*, 1996, p. 144.*

19. A Planning Department report on live/work projects within San Francisco identified over 40 such projects within the area bounded by the Bay Bridge, I-280, and Cesar Chavez Street.

20. Pier 80, at Cesar Chavez Street, and Piers 94 and 96, south of Islais Creek Channel, contain two modern, deep-water cargo terminals complete with on-dock rail facilities for intermodal cargo, the only Northern California facility of its kind. With the departure of the Port's larger shipping lines, the container terminals operate at about 2% to 5% of capacity. The Port has reserved backlands adjacent to Piers 70, 94, and 96 and some seawall lots for the future regional expansion of maritime operations, including cargo shipping, cargo support services, and ship repair; the facilities remain vacant, unimproved, or underutilized. Pacific Gas & Electric operates a power plant adjacent to port jurisdiction at Pier 72 (22nd Street). Port of San Francisco, *Waterfront Land Use Plan*, 1996, p. 153.*

21. Mission Bay North consists of Lots 2, 3, and 4 of Assessor's Block (AB) 3795; Lot 3 of AB 3796; Lot 2 of AB 3797; Lots 1 and 2 of AB 3798; Lots 2, 4, and 5 of AB 3804; Lot 1 of 3805; Lots 6, 7, 9, and 10 of AB 3806; and the I-280 right-of-way bounded by King/Third/Berry/Sixth Streets. Information obtained from the Planning Department, Planning and Zoning Information counter, July 29, 1997.

22. Mission Bay South consists of Lots 2, 4, 6, and 7 of AB 3809; Lots 6 and 7 of AB 3810; Lot 1 of AB 3813 ; Lots 2 and 3 of AB 3819; Lots 2 and 3 of AB 3822; Lots 2 and 3 of AB 3832; Lots 2 and 3 of AB 3835; Lots 1, 2, 4, 6, and 7 of AB 3837; Lots 1, 2 and 3 of AB 3838; Lots 1 and 2 of AB 3839; Lots 1, 2, and 3 of AB 3840; Lots 1, 2, and 3 of AB 3841; Lots 1 and 2 of 3849; Lots 1, 1A, 1B and 2 of AB 3850; Lot 1 of AB 3851; Lots 1 and 2 of AB 3852; Lot 1 of AB 3853; Lot 1 of AB 3892; Lot 1 and 2 of AB 3940; Lot 1 of AB 3941; Lots 2, 3, and 4 of AB 3942; Lot 1, 3, 6, and 7 of AB 3943; Lot 4 of AB 3944; and Lot 1 of AB 3948. Information obtained from the Planning Department, Planning and Zoning Information counter, July 29, 1997.

23. Eric Harrison, Project Manager, Catellus Development Corporation, memorandum to Bill Wycko, Department of Parking and Traffic, June 9, 1997.

24. Fully enclosed warehouse buildings located east of Third Street would be allowed to continue in use for a somewhat longer period, consistent with the period currently allowed under Planning Code Section 983.

25. The Caltrain rail right-of-way includes the Amtrak police station and two other structures, both abandoned, in the northwest corner of the Project Area. These buildings are owned by Caltrain. The abandoned buildings include a warehouse and a restaurant.

26. San Francisco Redevelopment Agency, "Draft Redevelopment Plan for the Mission Bay North Redevelopment Project," March 30, 1998, Section 303.3, and "Draft Redevelopment Plan for the Mission Bay South Redevelopment Project," March 30, 1998, Section 303.3.*

27. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report*, Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, Volume One, p. IV.24.* For analysis purposes, the Giants Ballpark FEIR assumes that by 2015 a parking structure or structures will have been constructed for up to 5,000 vehicles in an undetermined location south of the Channel. The Giants Ballpark FEIR also analyzed the effects of providing no parking south of the Channel in Variant B, concluding that traffic effects in the area near the ballpark would be less, because: 1) fewer vehicles would be attracted to that location, 2) a portion of the parking demand would be met in parking facilities and on streets farther than a 20-minute walk from the ballpark, and 3) there could be considerable additional demand for transit services in the Third Street light rail corridor, as patrons found parking south of the Mission Bay Project Area close to the new light rail line.

28. In order to present a conservative SEIR analysis, particularly for traffic impacts, a 25-screen cinema and other intensive land use assumptions were made.

29. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report*, Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, Volume One, p. IV.22.*

30. The *Waterfront Land Use Plan* acknowledges the planning underway for Mission Bay and states that the Port will re-evaluate long-term land uses for the area as more information becomes available.*

31. Research and development uses typically require a floor-to-floor height of 15 to 18 feet, rather than the 10 feet associated with residential or 13 feet associated with office space.

32. The UCSF LRDP assumed a parking supply of two spaces per 1,000 gross square feet for planning purposes. It is anticipated by UCSF that the total number of parking spaces at full build-out will be fewer than 5,300 and will approximate the estimated demand, owing to proposed enhanced transit service and future development of alternate forms of transportation. University of California San Francisco, *1996 Long Range Development Plan*, adopted January 1997, p. 211.

33. San Francisco Bay Conservation and Development Commission, *San Francisco Bay Area Seaport Plan, A Report to the San Francisco Bay Conservation and Development Commission and the Metropolitan Transportation Commission*, adopted April 1996, pp. 52-53.*

34. Alec Bash, Waterfront Planner, Special Projects, Port of San Francisco, memorandum to Paul Deutsch, Senior Environmental Planner, Mission Bay EIR Coordinator, San Francisco Planning Department, January 20, 1998.

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

C. BUSINESS ACTIVITY, EMPLOYMENT, HOUSING, AND POPULATION

This section describes the existing conditions relevant to the analysis of changes in business activity, employment, housing, and population, including a description of current conditions and trends that form the cumulative context through year 2015. Conditions are described for the Project Area, the citywide and regional context, and for nearby, neighborhood areas adjacent to or close to the Project Area. These Nearby Areas include Adjacent Port Property; South of Market, both east and west of Third Street; Potrero Hill, North Potrero, and Showplace Square; Lower Potrero and Central Bayfront; Inner Mission; and South Bayshore. The impact analysis addresses changes in business activity, employment, housing, and population within the Project Area and San Francisco, in San Francisco's jobs/housing balance, and in citywide housing market conditions.

Information from the 1990 FEIR that is still relevant has been summarized; that information is incorporated in the following discussion by reference. New and updated information on the Project Area and on citywide employment, population, and housing is also presented. The endnotes for this section begin on p. V.C.40.

SETTING

PROJECT AREA

This section describes existing activity (businesses, employment, trends in level of activity) in the Project Area, based on field work (including a survey of Project Area businesses) conducted in June, July, and August 1997 and lease records from Catellus and the Port of San Francisco. There are no permanent residents in the Project Area. The project area analyzed in the 1990 FEIR included China Basin Channel, the houseboat community, and the pleasure-boat marina./1/ Those port tenants located along China Basin Channel are not a part of the current Project Area. They are discussed as part of a Nearby Area for the analysis in this SEIR (see "Adjacent Port Property" later in this Setting subsection).

Existing Business Activity and Employment

There were about 95 establishments doing business in the Mission Bay Project Area in 1997. Those establishments provide jobs for about 1,670 workers (see Table V.C.1). Total employment in the Project Area represents less than 1% (about 0.3%) of total employment in San Francisco. Most of the establishments (60%) and employment (70%) are south of China Basin Channel and west of Third

TABLE V.C.1
MISSION BAY PROJECT AREA ESTABLISHMENTS AND EMPLOYMENT BY BUSINESS ACTIVITY, 1997

Business Activity	Establishments	Percent of Total	Employment	Percent of Total
Wholesale/Distribution/Warehouse	31	33%	610	37%
Transportation & Related Services	13	14%	480	29%
Office	16	17%	200	12%
Manufacturing/Construction/Repair	9	10%	174	10%
Retail/Restaurant	6	6%	122	7%
Recreation	3	3%	46	3%
Design/Multimedia	5	5%	33	2%
Vehicle/Equipment Storage	10	11%	6	0%
Community Facility	1	1%	—	0%
TOTAL	**94**	**100%**	**1,671**	**100%**

Note: Employment data are approximate.

Source: Mission Bay Project Area Business Survey, 1997.

Street. The highest levels of business activity in the Project Area are concentrated in several locations along Third Street, Sixth Street, 16th Street, and east of Third Street along Illinois and the Fourth Street extension.

There are many different types of business activities and jobs in the Project Area, although certain categories predominate. Currently, the largest numbers of both establishments and employees are in the Wholesale/Distribution/Warehouse business activity (see Table V.C.1). That group represents one-third of all Project Area establishments and almost 40% of Project Area employment. Warehouse space is also the predominant building space type in the Project Area, representing about 60% of all building space in use by businesses (see Table V.C.2). Transportation and Related Services is the next largest business activity ranked by both number of jobs and building space in use.

The types of business operations classified in these two categories are very similar in terms of the types of space used (warehouses, truck/van terminals, large open areas for vehicle parking). In the Transportation business activity particularly, a large share of the employees spend most of their day away from the base of operations in the Project Area. The two categories are distinguished by the

TABLE V.C.2
MISSION BAY PROJECT AREA - BUILDING SPACE AND LAND AREA USED BY BUSINESSES - BY BUSINESS ACTIVITY, 1997

Business Activity	Building Space (gsf)	Percent of Total	Land Area (gsf)	Percent of Total
Wholesale/Distribution/Warehouse	875,870	58%	147,800	7%
Transportation & Related Services	276,850	18%	185,300	9%
Office	71,907	5%	—	0%
Manufacturing/Construction/Repair	71,800	5%	301,662	15%
Retail/Restaurant	54,621	4%	166,996	8%
Recreation	27,400	2%	448,378	23%
Design/Multimedia	29,432	2%	—	0%
Vehicle/Equipment Storage	97,400	6%	682,412	34%
Community Facility	12,000	1%	50,000	3%
TOTAL	**1,517,280**	**100%**	**1,982,548**	**100%**

Notes: gsf = gross square feet.
Data are approximate.

Source: Mission Bay Project Area Business Survey, 1997.

fact that the Wholesale/Distribution/Warehouse establishments operate primarily for their own account, while the Transportation and Related Services establishments provide trucking and other transportation services to a variety of customers.

Office establishments are the next largest group in terms of employment, accounting for about 200 Project Area jobs. As expected, this business activity uses relatively small amounts of space and no open land area. The offices located in the Project Area range from very small (five or fewer employees) to as many as 40 employees. The smaller offices are professional service establishments, construction management offices, manufacturers' representatives, and shipping agents. The larger offices include headquarters and administrative support functions for small manufacturers and business service establishments.

Businesses engaged in Manufacturing/Construction/Repair activities are also a substantial presence in the Project Area (10% of Project Area establishments and employment). This business activity includes construction materials suppliers, special trades contractors and suppliers, and vehicle and equipment rental and repair operations. The large amount of land area used by these activities (15%

of the total land area used by businesses) includes the two ready-mix concrete plants. Many of the workers in this business activity work away from the Project Area most of the time.

Retail/Restaurant and Recreation business activities together account for about 10% of Project Area establishments and employment. The Retail/Restaurant group includes the largest single employer in the Project Area: the Esprit Outlet (retail clothing and accessories) employs about 90 people; 75% are part-time workers. These activities do not use much building space in the Project Area; they do use open land for parking. In addition, taking advantage of relatively undeveloped but close-in locations and excellent freeway access, the large recreation facilities in the Project Area use almost one-quarter of the open land area used by businesses.

The Retail/Restaurant and Recreation categories combine businesses long-established in the Project Area with relatively recent additions./2/ One small coffee shop located along the Third Street corridor has served southern waterfront customers for almost 50 years. After operating for 20 years near the Caltrain terminal north of China Basin Channel, the San Francisco Recreational Vehicle (SFRV) Park ceased doing business on the site at the beginning of 1998.

The Esprit Outlet opened about 13 years ago and was a precursor to the newer types of large-scale recreation and retail activities that have followed it to this location. The Mission Bay Golf Center opened in 1992, using almost 300,000 square feet of land area (over 6 acres) for a driving range. A restaurant and retail shop have opened as sub-tenants of the center. An in-line hockey sports facility (Bladium) opened in 1995 west of Third Street just south of the Lefty O'Doul Bridge. Similar to the Esprit Outlet and the Golf Center, Bladium also offers retail and eating and drinking operations.

Design/Multimedia is a relatively small category for the Project Area in terms of both employment and building space use. These establishments do not use traditional office space and are attracted to the Project Area by the relatively low cost and flexibility of the existing building space, availability of parking, and the location (proximity to downtown and freeways). Design/Multimedia establishments include specialized professional services and production functions in the graphics, video, and arts and entertainment sectors.

There are a relatively large number of establishments in the Vehicle and Equipment Storage category (10% of all Project Area establishments). Most of these operations are storage functions only; there are no employees on-site. They include open air construction storage and parking lots north of the Channel and a 7-acre swath of open land used for the occasional storage of containers and truck trailers in the middle of the Project Area south of the Channel west of Third Street. Open air storage accounts for over one-third of the Project Area land used by businesses. Much of this space is only in use on an interim basis, e.g., when a downtown construction project is underway or when excess containers and truck trailers need accommodation.

Finally, there is one active public facility in the Project Area. The pump station north of the Channel is operated by the City and County of San Francisco. No workers are based at this location; up to 20 may work there in an emergency.

Characteristics of Jobs in the Project Area

In general, there is a considerable mix of occupations in the Project Area. The largest single occupational category is the "operative" category. Most of those jobs are in the traditionally "industrial" business activities: transportation and related services, wholesale/distribution/ warehouse, manufacturing/construction/repair, and vehicle/equipment storage. Operatives are truck drivers and delivery workers. The next largest occupational group is the "sales" category. One large establishment (the Esprit Outlet) accounts for most of those jobs. There are about equal proportions of jobs in managerial and clerical occupations, and they are found throughout the many different types of establishments in the Project Area. The jobs in the "other" occupational category represent workers in warehouses, movers, and inventory/stock clerks. The occupational categories representing the smallest numbers of Project Area workers are: professional/technical, service, and skilled crafts. Appendix Table C.1 presents the estimates of Project Area jobs by occupation, based on detailed information collected during the project area business survey undertaken for the 1990 FEIR./3/

Rail Freight Users and Maritime-related Activity

Rail freight use and maritime-related activity in the Project Area have declined over time. See "Rail Freight Users" and "Maritime-related Activity" in Appendix C for detail on the results of the 1997 business survey and comparison to conditions described in the 1990 FEIR.

Trends in Activity in the Project Area

Types of Business Activities

Overall, the level and type of business activity in the Project Area have not changed much compared to conditions in 1985 described in the 1990 FEIR./4/ With the addition of two new categories and some modifications to the types of businesses included in other categories, the same classification of business activities used in the 1990 FEIR describes current activity in the Project Area. The two new categories are Design/Multimedia and Recreation. The Design/Multimedia category recognizes a cluster of establishments in those industries new to the Project Area since 1985. Similarly, the Recreation category acknowledges the former San Francisco Recreational Vehicle Park and two more recent additions (the Mission Bay Golf Center and Bladium).

One type of activity not observed in the Project Area in 1997 is Arts/Design. The survey conducted for the 1990 FEIR identified several small artist studios and design workshops in the Project Area. The Design/Multimedia category now includes similar types of activities (graphic design and video production studios).

Generally, the Project Area continues to function as it did in the mid-1980's: a central distribution location with good access to downtown, other parts of San Francisco, as well as East Bay and South Bay locations; a central location for construction staging and other material and equipment storage; a location offering flexible, lower-rent space suitable for a variety of functions (production, distribution, administration, and storage), in addition to ample parking.

The somewhat subtle changes to these functions have mostly to do with transportation factors; reliance on trucks for shipping and receiving is more prevalent than in the past. While the types of business activities in the Project Area have not changed much, relationships to the local and regional transportation system have evolved. Truck transport has replaced rail freight and water-borne goods movement. Virtually all businesses in the Project Area rely on some degree of regular truck access to their facility. For many establishments in the Project Area, shipping and receiving are the very nature of their business; for others, truck transport is an ancillary element of doing business.

Tenure of Businesses in the Project Area

Not only are the same types of activities in the Project Area, but many (at least 25%) are the same establishments. Some establishments have relocated within the Project Area. The responses to the 1997 business survey indicate that about half of Project Area establishments have been located there for five or more years. Although there are longer-term occupants in every business activity except Design/Multimedia, a disproportionate share of the longer-term Project Area establishments are in the Wholesale/Distribution/Warehouse and Transportation business activities. As they have for many years, these types of operations continue to take advantage of suitable space and open land area in a central and highly accessible location.

Although there continues to be evidence of businesses moving out of the Project Area and some establishments identified on lease records do not appear to be active in the Project Area, there is less turn-over of businesses than was the case in the mid-1980's. Loss of Project Area business activity attributable to the decrease in the maritime, industrial, and distribution activity in San Francisco that had supported many earlier tenants was largely complete by the late-1980's. The level of distribution, transportation, and industrial support operations in the Project area appears to have stabilized over the last 10 years. Small offices and Manufacturing/Construction/Repair operations appear to be more well-established in the Project Area, and the newer uses (Recreation and Design/Multimedia) are evidence of the Project Area's ability to capitalize on the growth of emerging sectors in the City's economy.

Lease Terms

A few tenants hold leases of 20 years or more. These are land leases negotiated in the 1970's; one dates from 1951. Most of the land leases expire in 1997, exclusive of renewal options; one extends to 2001 and another to 2013. In 1985, most of the establishments in the Project Area operated under month-to-month leases, accepting lack of long-term location security in return for below-market-rate rents (at that time in the range of $0.20 - $0.30 per square foot). Since that time, it appears that more longer-term leases have been negotiated; for example, most of the tenants in the Wholesale/ Distribution/Warehouse and Transportation categories have three- to five-year leases; some terms extend to eight or nine years. Among the other business activities, month-to-month leases are more prevalent. Many of the longer-term leases expire in the next three to five years. Many tenants whose leases have expired hold over in the Project Area on a month-to-month tenancy.

Consistent with the change in lease terms, rental rates are higher than they were in 1985. The base rent for warehouse space averages about $0.40 per square foot. The same average holds true for Retail/Restaurant, Recreation, and Design/Multimedia uses. The base rental rate for office space averages about $0.66 per square foot, and the rate for storage space is lower at about $0.20 per square foot. Many tenants cite affordable space costs as a prime reason for their choice to locate in the Project Area.

Sub-leases are not as common in the Project Area as they were in 1985. Most of the current sub-tenant arrangements are among Office activities and the cluster of Design/Multimedia establishments. There appear to be fewer instances of trucking and warehousing establishments sub-leasing space to related operations.

CITYWIDE AND REGIONAL CONTEXT

This following discussion provides information describing the cumulative context for employment, population, and commute patterns (where people live and work) in San Francisco and the rest of the

Bay Area region. The tables present the setting year and (for the rest of the region outside San Francisco) year 2015 population and employment estimates that are used in the cumulative analyses in this SEIR. The text discusses trends and patterns that the numbers illustrate. (The year 2015 cumulative context scenario for San Francisco employment and population is described later in the Impacts subsection under "Project Area and Cumulative Citywide Growth.") The citywide and regional context also includes information on housing market conditions and the factors influencing those conditions, as background to the housing market analysis.

San Francisco Business Activity and Employment

Table V.C.3 presents data from San Francisco's *1996 Commerce and Industry Inventory* describing the overall composition of employment in San Francisco. In 1995, there were 524,000 wage and salary jobs in San Francisco. Self-employed workers are estimated to represent another 10% of total employment in the City./5/ About one-third (32%) of wage and salary jobs in San Francisco are office jobs; the next largest categories are industrial business activities and cultural/institutional activities, each claiming just over 20% of total employment in the City. Retail business activities account for about 15% of total employment; government accounts for 6%; and hotels account for just over 3% of total employment.

Total employment in San Francisco peaked in 1990 at about 559,000 jobs. From this high point, San Francisco lost almost 50,000 jobs during the first years of the decade. The City has recovered from the recession; the most recent employment estimates for 1996 indicate total San Francisco wage and salary employment of 535,600./6/ This is lower than the 1985 setting estimate of San Francisco wage and salary employment presented in the 1990 FEIR (565,800 jobs)./7/

The mix of types of jobs in San Francisco has changed somewhat over the last 15 years. While office employment has held steady at about 32% of the total, industrial employment has declined from 27% to 22% of the total. The share of San Francisco employment in the cultural and institutional sectors has increased, offsetting that decline. (The cultural/ institutional land use activity includes health services, private educational services, private museums, theaters, nightclubs, and social services.) The retail and hotel sectors also have increased as a share of total jobs in San Francisco.

San Francisco is expected to continue to recover the job losses of the early 1990's and return to a period of economic expansion, provided land and facilities are available to accommodate the space demands of expected growth. Although not anticipated to be the source of substantial employment growth, corporate headquarters and state and federal government offices will maintain a presence in San Francisco. The City will continue to be a regional and national center for the finance sector,

TABLE V.C.3
SAN FRANCISCO EMPLOYMENT BY LAND USE ACTIVITY, 1995

Land Use Activity	Jobs in 1995	Percent of Total
Office	167,379	31.9%
Retail	81,878	15.6%
Industrial	114,007	21.8%
Hotel	18,287	3.5%
Cultural/Institutional	109,546	20.9%
Government	31,624	6.0%
Other	1,383	0.3%
TOTAL	**524,104**	**100.0%**

Source: California Employment Development Department, as presented in San Francisco Planning Department, *Commerce and Industry Inventory,* August 1996.

printing and publishing, advertising, design, other business and professional services, and the multimedia sector, as well as some components of the arts and entertainment sectors. The health care industry and related sectors—including, potentially, biotechnology—as well as educational services will be sources of economic expansion and job growth in San Francisco in the future. Tourism and convention activity will continue to be important elements of the City's economic base, supporting retail, restaurant, entertainment, and services sectors. Population growth in the City and the region will support expansion of city-serving and more regionally-oriented retail activity. Continuing a long-term trend, employment in general industry, warehousing and distribution, cargo shipping, and ship repair is expected to decline or remain at relatively low levels for the foreseeable future.

San Francisco Households, Population, and Employed Residents

San Francisco's population totaled 778,068 in 1997, an increase of 54,109 people—7.5% —over the count in the 1990 Census (see Table V.C.4)./8/ There are about 310,000 households in San Francisco in 1997;/9/ the average household size is estimated to be 2.44 persons/10/, and there are, on average, about 1.24 workers per household.

The 1985 population estimate used for the setting in the 1990 FEIR was 741,570. That FEIR also included an estimate of population in San Francisco for the year 2000./11/ The updated 1997 setting

TABLE V.C.4
SAN FRANCISCO POPULATION AND EMPLOYED RESIDENTS, 1980, 1990, and 1997

				1980 - 1990		1990 - 1997	
	1980	**1990**	**1997**	**Number**	**Percent**	**Number**	**Percent**
Total Population/a/	678,974	723,959	778,068	44,985	6.6%	54,109	7.5%
Household Population	654,511	699,330	755,852	44,819	6.8%	56,522	8.1%
Employed Residents/b/	342,044	386,380	384,800	44,336	13.0%	(1,580)	-0.4%
Households/c/	298,956	305,584	309,661	6,628	2.2%	4,077	1.3%
Persons-per-household/d/	2.19	2.29	2.44				
Workers-per-household/e/	1.15	1.26	1.24				

Notes:
a. Includes both household population and population living in group quarters.
b. Residents of San Francisco who are employed, regardless of place of work. 1980 and 1990 data from the Census; 1997 estimate calculated based on a straight-line interpolation between estimates for 1995 and 2000 from ABAG *Projections '96.*
c. Households are equivalent to occupied housing units.
d. Household population divided by number of households.
e. Employed residents divided by number of households.

Source: U.S. Department of Commerce, Bureau of the Census, *1980 Census of Population and Housing* and *1990 Census of Population and Housing;* California Department of Finance, *City/County Population and Housing Estimates, 1997,* May 1997; Assocation of Bay Area Governments, *Projections '96*; Hausrath Economics Group.

population estimates used in this SEIR are consistent with the 1985 through 2000 citywide scenario for population presented in the 1990 FEIR. A population estimate for 1997, based on the growth rate implicit in the 1990 FEIR (years 1985 through 2000 scenario), would be 777,000 (almost exactly the current population estimate for the City used in this SEIR). On the other hand, the 1985 setting estimate for households in San Francisco presented in the 1990 FEIR (based on a California Department of Finance estimate current at that time) was substantially higher than both the 1990 Census household count for San Francisco and the current 1997 California Department of Finance household estimates for the City used in this SEIR./12/ One implication of these differences is that average household size in San Francisco has increased more than anticipated when the 1990 FEIR analysis was completed.

Following two decades of decline in the 1960's and 1970's, San Francisco's population has increased steadily since 1980. The increase is attributable to additions to the housing stock and occupancy of vacant units, both of which accommodate more households in San Francisco, as well as to increases in household size, measured by the average number of people in a household. The 1980 Census measured persons per household at 2.19 for San Francisco. The increase to 2.44 persons per household in 1997 (according to the California Department of Finance) means that about 75,000 of the almost 100,000-person population growth from 1980 to 1997 has been accommodated in the existing housing stock by increases in household size. The increases in household size are attributable to a number of factors, including economics (especially the high cost of housing in San Francisco), as well as ethnic traditions or cultural preferences, and how those demographic characteristics are represented in the total population.

The number of employed residents of San Francisco grew through the 1970's and 1980's. The increasing labor force participation of women, the dominance of the baby-boom generation in the labor market, and steady increases in employment opportunities contributed to the increase in employed residents. There was an increase in workers per household, and the employed population grew at a faster rate than the population overall.

Between 1990 and 1997, the number of employed residents has stayed about constant or declined slightly. This reflects the effects of the recession (job loss and slower growth in job opportunities) and the leveling-off of both increases in labor force participation and increases in the percentage of the population in the prime labor force age group (those 16-64 years of age).

Employment in the Rest of the Region

There were about 2.5 million jobs in the eight Bay Area counties outside San Francisco in 1995, and 3 million jobs in the entire Bay Area including San Francisco. San Francisco employment represents about 17% of the total.

The eight Bay Area counties outside San Francisco are expected to add about 890,000 jobs from 1995 through 2015, growing at a rate of 1.5% per year over those 20 years. In *Projections '96,* the Association of Bay Area Governments' (ABAG's) expectations are that the region will continue the long-term growth pattern of the preceding 15-year period (a growth rate of 1.5% per year from 1980 through 1995, inclusive of the severe recession in the early 1990's). By comparison to the period of moderate expansion in the 1980's (a growth rate of 2.4% for the rest of the region outside San Francisco), the future long-term growth rate is expected to be slower. See Appendix Table C.2./13/

The decentralization of economic activity within the region is expected to continue as the more outlying East Bay and North Bay counties capture an increasing share of total jobs in the region. Projected to grow at a rate of almost 2% per year, the four East Bay counties combined (Alameda, Contra Costa, Napa, and Solano) claim over half of the job growth in the rest of the region. While employment growth rates among the rest-of-region counties are slowest in the South Bay (Santa Clara and San Mateo Counties), and the share of regional employment in that area is expected to decline, the job base is large, as is the absolute magnitude of job growth. The South Bay is expected to generate over one-third of all job growth in the region outside San Francisco.

Population in the Rest of the Region

About 5.7 million people lived in the Bay Area outside San Francisco in 1995. San Francisco's population represents about 12% of the nine-county regional total. Considering the rest of the region outside San Francisco, East Bay counties house about one-half of the region's residents. Forty percent of the population live in the South Bay, and 12% live in the North Bay (Marin and Sonoma Counties).

Between 1995 and 2015, the eight Bay Area counties outside San Francisco are expected to grow by almost 1.2 million residents. The growth rate (1% per year on average) is substantially slower than in the past; regional population increased at a rate of 2.4% per year between 1980 and 1995. Housing supply constraints and a leveling off of the trends that have resulted in increases in average household size are the reasons behind the slower rate of growth for the long-term future. Within the region outside San Francisco, East Bay counties are expected to capture the most population growth—60% of the increase, as the re-distribution of population to the more suburban parts of the region where most of the region's housing will be added is expected to continue. See Appendix Table C.3./14/

Jobs/Housing Relationship

This section presents information on the place of residence for people working in San Francisco and the place of work for employed residents of San Francisco. The information is useful to the analysis of the relationship between the contribution of Project Area job growth to housing demand and the contribution of Project Area housing to supply. The information is also used to understand the labor market and housing market implications of future development in the Project Area.

<u>Where People Working in San Francisco Live</u>

Regional Estimates and Projections

San Francisco is an important job center in the regional economy; job growth in the City is supplied by the labor force of the regional labor market. In 1990, considering only those San Francisco jobs held by people living in the Bay Area, San Francisco residents held 55% and people living in other parts of the Bay Area held the balance (45%). (The 1990 Census also identified about 12,000 people working in San Francisco who lived outside the nine-county region. They represented about 2% of all people working in the City.) Most commuters to San Francisco jobs lived in the East Bay (22%), 16% lived in the South Bay, and 8% lived in the North Bay./15/

While business activity in San Francisco is an important source of job opportunities for residents of the region, most of the region's employed residents work elsewhere. In 1990, about 10% of the employed residents of the Bay Area outside San Francisco worked in the City; the other 90% worked at jobs elsewhere in the Bay Area./16/

Over the decades of the 1960's and 1970's the percentage of San Francisco jobs held by people living outside San Francisco increased. That trend, a consequence of rapid job growth in the City, slower growth of population and labor force in San Francisco than in the rest of the region, and the opening of the BART system enhancing the transbay commute, is expected to stabilize at 1990 ratios. In the future, residents of the City will hold about 55% of San Francisco jobs, and residents of other Bay Area counties will hold about 45% of San Francisco jobs./17/ See Appendix Table C.4.

Survey Results

Two other sources of information describing where people working in San Francisco live are relevant to the analysis of the proposed project. The first is the Citywide Travel Behavior Survey (CTBS), conducted by the San Francisco Department of City Planning in 1992. The results of the survey indicate that 50% of those working in San Francisco also live in the City. The percentage is somewhat lower than that indicated by the results of the 1990 Census. The CTBS share of commuters from the East Bay (26%) is higher than that indicated by the Census, while the shares from the South Bay and North Bay are about the same./18/

UCSF Employees

About 56% of UCSF employees reside in San Francisco, according to information from a 1993 employee database./19/ This is about the same percentage indicated by the Census for all people working in San Francisco and somewhat higher than indicated by the CTBS.

<u>Where San Francisco Residents Work</u>

San Francisco jobs in 1990 provided employment for 81% of all residents of the City who worked in the Bay Area region. Just over 10% of San Francisco employed residents commuted to jobs in the

South Bay, 7% commuted to jobs in the East Bay, and less than 2% commuted to the North Bay. The proportion of San Francisco employed residents working in the City has declined gradually over time. Since 1960, job opportunities have increased in other parts of the region, particularly in the South Bay, increasing the probability that some San Francisco residents find jobs outside the City. ABAG and the Metropolitan Transportation Commission (MTC) project that the percentage of San Francisco employed residents working in San Francisco will stay at about the 1990 level, showing only a small decline to 79% by 2010./20/ See Appendix Table C.5.

Housing Market Context

Overview of Demand and Supply Factors

San Francisco consistently ranks as one of the most expensive housing markets in the United States. The 1990 FEIR identified the following factors contributing to strong housing demand in San Francisco:/21/

- San Francisco is the central city (and most urban place) in an attractive region known for its agreeable climate, open space and recreational opportunities, cultural amenities, strong and diverse economy, and prominent educational institutions.
- As a regional employment center, San Francisco attracts people who want to live close to where they work.

These factors continue to support strong housing demand in the City. At the same time, as described in the 1990 FEIR, new housing to relieve the market pressure created by strong demand is particularly difficult to provide in San Francisco because of high costs of production./22/ The amount of land available is limited and land and development costs are relatively high. Higher density housing construction is generally more expensive and more difficult to finance. Because the resultant prices/rents associated with new construction are beyond what many households can afford, the private development community does not produce new housing in San Francisco to satisfy the demand of large segments of the market.

Housing Market Indicators

San Francisco's housing supply totaled about 334,400 units at the end of 1995. According to City of San Francisco data, the City gained just over 4,500 units from the 1990 Census through the end of 1995. The pace of housing construction in the City in the early 1990's has lagged behind the pace set in the 1980's when annual net additions to the City's housing stock averaged about 1,300 units per year. The annual net addition since 1990 has averaged about 865 units per year./23/ Large multi-unit projects of 20 or more units account for two-thirds of total housing unit production in San Francisco over the last 10 years./24/

Affordable housing construction (units affordable to very low, low and moderate income households) accounted for about one-third of total housing production in San Francisco over this period. In contrast to housing production generally, the pace of affordable housing production was somewhat faster than it was during the 1980's./25/

While the net addition to the housing stock was relatively low in 1995, there are signs that a relatively strong pace of growth prevails. The Department of Building Inspection authorized 410 units for construction in 1995, and the Planning Department approved 31 major projects totaling about 1,200 units. In addition, the Planning Department had 11 major projects (projects with 10 or more units) under review in 1996./26/ According to more recent building permit data for San Francisco, almost 1,500 units were authorized by permits in 1996—the highest annual level of permits since 1989./27/ All of these project and unit counts include both affordable and market rate development, including development in redevelopment project areas. They also include mixed use and live-work projects.

The 1990 Census and the California Department of Finance cite residential vacancy rates of around 7% for San Francisco./28/ Recent surveys of San Francisco apartment vacancy indicate vacancy rates of 3.2%, 2.6%, and 1.8%, respectively, in 1994, 1995, and 1996./29/

NEARBY AREAS

This section describes the existing development pattern and characteristics of economic activity, employment, and population in areas near the Project Area. See Figure IV.B.2 for depiction of Nearby Area boundaries. This setting discussion provides the background for the impact analysis presented in "Spillover Effects - Implications for Nearby Areas" in Section V.N, Growth Inducement.

Adjacent Port Property Nearby Area

The Port of San Francisco owns property immediately adjacent to the Project Area, including part of the southern shoreline of China Basin Channel between Mission Bay North and Mission Bay South. Most of the immediately adjacent port property borders the Project Area to the east and includes seawall lots as well as piers and associated shoreline areas. Some of this port property (the Channel area and the land area west of Terry A. François Boulevard) was included in the project area analyzed in the 1990 FEIR.

Business Activity and Employment

The level of economic activity on port property east of the Project Area has continued to decline over the last 10 years. Maritime activity in particular is less evident. Ship repair has consolidated south of the Project Area at Pier 70. Cargo operations have all but disappeared. Some of the larger piers adjacent to the Project Area are used for lay berthing (interim berths for visiting vessels), ferry layover berthing, and tug and tow berthing and maintenance. The Port has relocated maintenance operations and storage from Pier 46B (part of the San Francisco Giants Ballpark site) to Pier 50, increasing the level of activity in the area. Much of the Port's land west of Terry A. François Boulevard is vacant or used for open air storage or materials processing (e.g., recycling). Bayfront restaurants, small boat repair yards, active boat clubs, and a small amount of office activity are responsible for most of the on-going economic vitality in the area. There are probably no more than 100 to 150 people employed in businesses located along this stretch of San Francisco's waterfront./30/

Housing and Population

China Basin Channel is home to a resident houseboat community and a pleasure-boat marina. Both houseboat and pleasure craft berths are located on the southern shore of the Channel at Wharf 60, property of the Port of San Francisco. The Mission Creek Harbor Association represents the boating community (both resident and nonresident). There are 20 houseboats ("live-aboards") berthed in the Channel and 35 pleasure boat berths./31/ The houseboat and pleasure boat communities were part of the project area analyzed in the 1990 FEIR. In 1985, there were 34 residents of the houseboat community./32/ A more current count indicates that between 45 and 50 people now live in the houseboat community./33/

South of Market Nearby Area, East of Third Street

The portion of the South of Market Nearby Area east of Third Street includes the Rincon Point - South Beach Redevelopment Area, the site of the San Francisco Giants Ballpark, Port of San Francisco property including both seawall lots and piers between the Bay Bridge and China Basin Channel, as well as South Park and the Second Street corridor of converted warehouse and industrial buildings. For the purposes of this analysis, the northern border extends to Market Street, to encompass the Rincon Hill and Transbay areas. This Nearby Area also includes the China Basin office complex adjacent to the Project Area, even though the buildings are west of Third Street.

Business Activity and Employment

In the South of Market area east of Third Street, older manufacturing and distribution activities have been replaced by a variety of new activities. Office, housing, retail, and the multimedia sector now set the prevailing tone for economic activity. Although the increase in office occupancies expected in the Second Street corridor in the 1980's did not occur, other users have filled once vacant industrial and warehouse buildings. Live-work development and expansion of the variety of enterprises engaged in the multimedia sector are particularly responsible for the demand for rehabilitated and converted existing space. Of the more traditional economic activities in the eastern South of Market area, printing and publishing and apparel manufacturing remain. The latter has become more visible with the increase in outlet stores. That type of retailing for many different types of goods has been another boon for both ground-floor and upper-floor warehouse space in the area. Downtown "Class A" and "Class B" office and ground-floor retail uses characterize the blocks immediately south of Market Street. The Transbay area includes numerous vacant sites that have the potential to accommodate large new buildings. The Transbay area has been designated a redevelopment survey area and is under study for a plan that may include office, residential, and mixed-use development.

Housing and Population

The eastern South of Market area has only in the last 10 years experienced revival as a substantial residential neighborhood. This is attributable to new construction in the Rincon Point - South Beach Redevelopment Area (where about 2,000 housing units have been built between 1989 and 1996), and new residential development and residential conversions including live-work condominium development on Rincon Hill and in the Transbay area. With the exception of some older housing in the vicinity of South Park, most housing units and residents in the eastern South of Market area are new to the area since the late 1980's. The 1990 Census counted about 2,800 residents in 1,600 households in the eastern South of Market. Many South Beach residents are not included in 1990 Census counts because the units were not occupied until the early 1990's. Indeed, the 1990 Census counts almost 500 vacant units (23% of the total) in the eastern South of Market area./34/ The Redevelopment Agency estimates a population of about 7,500 people in the Rincon Point/South Beach area after completion of all projects over the next few years./35/

South of Market Nearby Area, West of Third Street

The portion of the South of Market Nearby Area west of Third Street includes the Caltrain terminal immediately adjacent to the Project Area and the mixed commercial, industrial, and residential districts north to Market Street. The area includes the Yerba Buena Center Redevelopment Area and most of the area covered by the *South of Market Plan*.

Business Activity and Employment

The South of Market area west of Third Street has not experienced the same degree of transformation as the area east of Third Street. The western South of Market continues to be the location of choice for many smaller service, sales, and light industrial businesses. Most buildings are small and can serve the variety of activities that find the area attractive: auto repair, restaurant and food service supply, equipment and general contracting, printing, machine repair, graphic design, film and video production, restaurants and bars—all seeking a close-in, relatively low-cost location. New economic activity in the area in the last 10 years has been accommodated in new construction of large-scale retail outlets and a large number of smaller, in-fill live-work developments. Increasing retail and residential activity in the western South of Market area has focused attention on conditions that may affect the mix of uses in this area. Strong demand from higher-rent-paying uses (residential and retail) makes it harder for rent-sensitive businesses to find space, and land use conflicts make it difficult for some businesses to continue operating as they have traditionally.

Housing and Population

Much of the older housing in this area is small-scale, clustered on mid-block alleyways and above ground-floor commercial uses. Other older, higher-density housing units are found in apartments and residential hotels along Sixth Street. New high-density apartments and condominiums have been developed as part of the Yerba Buena Center Redevelopment Plan. In the last few years, conversion of industrial buildings to residential lofts and studios along South of Market alleyways has been followed by a marked increase in new construction of multi-unit live-work condominium developments in the western South of Market. According to the 1990 Census, there were about 9,000 people and about 4,370 housing units in the western South of Market in 1990./36/

Potrero Hill, North Potrero, and Showplace Square Nearby Areas

The Potrero Hill and North Potrero Nearby Areas are located south and west of the Project Area; the I-280 freeway and the Caltrain railroad tracks separate the two areas. The Potrero Hill and North Potrero Nearby Areas consist of the older industrial and commercial district between I-280 and U.S. 101 and, to the south, the residential neighborhood between the freeways, south to Caesar Chavez Street. The Showplace Square Nearby Area is located west of the Project Area and includes part of the older industrial and commercial district on both sides of the I-280 from Brannan Street south to 17th Street.

Business Activity and Employment

At the foot of Potrero Hill, the North Potrero and Showplace Square Nearby Areas were once part of a thriving heavy industrial and warehouse district. After a period of dormancy in the 1960's and 1970's, the areas have evolved and the level of activity and employment has increased. Showplace Square is a major regional center for interior design and furnishings industries, for wholesale trade generally, and for furniture and home improvements retail outlets. The level of this type of business activity has remained fairly stable over the last 10 years. Some large "mart" projects developed in the late 1980's and early 1990's have yet to be occupied. More recent interest in these large facilities has come from the office and multimedia sectors.

Since 1990, the transition from industrial and transportation-related operations has expanded to the North Potrero area. North Potrero, Potrero Hill, and Showplace Square have attracted furniture and home improvement retailers, architects, designers, artisans, artists and others involved in creative or crafts oriented sectors of San Francisco's economy, looking for low-cost, centrally located commercial space. Although it is more densely developed than the Project Area and lacks the large open land area for vehicle parking and storage, this district at the foot of Potrero Hill has many of the same space and location characteristics that are important to businesses currently located in the Project Area.

Housing and Population

The northern slope of Potrero Hill, overlooking the Project Area, consists predominantly of older, single-family houses and flats interspersed with larger, more modern apartments and condominium complexes. Two public housing projects totaling over 600 units are located on the southeastern slope of Potrero Hill. On the southern slope, single-family houses and flats are the typical housing stock. There are a total of about 4,600 housing units in the area, according to 1990 Census data. The population in 1990 totaled about 9,200./37/

Lower Potrero and Central Bayfront Nearby Areas

The Lower Potrero and Central Bayfront Nearby Areas border the Project Area south of Mariposa Street. This area includes older industrial areas on either side of Third Street south to Islais Creek and a residential area at the base of Potrero Hill east of I-280. Much of the land in the Central Bayfront is owned by the Port of San Francisco or is under Port jurisdiction.

Business Activity and Employment

Once dominated by industrial maritime and other heavy industrial activity, the bayfront district south of the Project Area on either side of Third Street has undergone changes similar to those in the North Potrero and Potrero Hill Nearby Areas. While the ship repair activity remains at Pier 70, although at lower levels of output than in the past, other older industrial and warehouse facilities now house a variety of smaller businesses. The Esprit headquarters complex brings office, design, showroom, and distribution activity to the district. Many of the businesses in the Lower Potrero and Central Bayfront Nearby Areas are similar to those currently located in the Project Area: contractors, construction suppliers, small manufacturers, storage uses, and small offices. There are also a number of production, transportation, and distribution activities, particularly towards the southern end of the district. Since the early 1990's, the Port's container facility at Pier 80 has been inoperative.

Overall trends in employment and levels of activity in Lower Potrero/Central Bayfront are similar to those in South of Market, Potrero Hill/North Potrero, and Inner Mission Nearby Areas. Employment in large manufacturing and maritime facilities has declined. The continued presence of transportation, distribution, service, and repair establishments, in addition to the growth of small manufacturers, artisans, and new business sectors (e.g., multimedia and communications) has offset some of the decline.

Housing and Population

Adjoining the Project Area to the south, this neighborhood is the smallest of the nearby residential areas. In 1990, about 470 residents lived in about 230 households./38/ After a substantial population decline in the 1970's, the population has leveled off since 1980. Residents are a mix of old-timers and newcomers. Since the late 1980's there has been substantial live-work development in the Lower Potrero area. Initially, the development activity involved conversion of large industrial and warehouse buildings to lofts and residential units. In the last couple of years, as in the western South of Market, Potrero Hill, and Inner Mission Nearby Areas, new live-work construction is much in evidence.

Inner Mission Nearby Area

The Inner Mission Nearby Area is bounded roughly by U.S. 101 on the east, Dolores Street on the west, 16th Street on the north, and Cesar Chavez Street on the south. The area includes the district sometimes referred to as the Northeast Mission Industrial Zone.

Business Activity and Employment

Most of the traditional large-scale manufacturing activities that operated in Northeast Mission Industrial Zone at the time of the 1990 FEIR are no longer in operation. These included food and beverage processing, apparel manufacturing, and building materials production. Warehousing, distribution, vehicle maintenance, and storage uses continue, and there is a substantial amount of vacant and underutilized space and land area. Expansion of Showplace Square-related businesses west of Potrero Avenue has not materialized as a major factor in Inner Mission economic activity. Nevertheless, use of space by small manufacturing, sales, and service businesses has continued to increase, and multimedia businesses and other communications activities are a sizable presence here as in the South of Market area.

Housing and Population

Inner Mission residential neighborhoods are separated from the Project Area by development patterns and physical barriers. Potrero Hill and U.S. 101 form a distinct boundary as does the industrial and commercial district in the northeast corner of the area.

The Inner Mission is the largest residential neighborhood near the Project Area. In 1990, there were about 21,300 housing units in the Inner Mission (over twice as many as in any other nearby residential area). There has been relatively little new development in the area. Recently, several new live-work projects have been constructed in the Inner Mission near Project Artaud, a pioneering conversion of an old industrial building to artist live-work space. In 1990, there were about 57,000 people living in the Inner Mission./39/

South Bayshore Nearby Area

The South Bayshore Nearby Area, about 1 mile south of the southern boundary of the Project Area, extends from Islais Creek to the county line, from U.S. 101 to the Bay. South Bayshore includes the India Basin Industrial Park, the Produce Market, Port facilities at Piers 90 - 96, the Third Street commercial area, Hunters Point Naval Shipyard, and surrounding residential areas.

Business Activity and Employment

Concentrations of San Francisco's traditional industrial, warehousing, and distribution activities remain in the South Bayshore industrial areas. This is also the district that accommodates most of the City's auto wrecking, salvage, and other open air uses, such as construction materials storage. The

Produce Market remains an active distribution center. A variety of production, distribution, showroom, and office activities occupy the relatively new space at the India Basin Industrial Park developed by the San Francisco Redevelopment Agency. Further south along Third Street and west towards Bayshore Boulevard smaller manufacturers, distributors, outlet stores, artisans, and transportation services continue to fill in existing and some new space. Much space and land area remains underutilized and deteriorated. Maritime-related activity at Port of San Francisco facilities in this area is limited. Since the mid-1990's there has been minimal container traffic through Piers 94 and 96. City of San Francisco institutional uses and vehicle repair and storage operations are important elements of economic activity.

Three distinct areas important to future economic activity in the South Bayshore are located at the southern end of the district. They include the Hunters Point Naval Shipyard and the Executive Park Office Complex, as well as 3Com Park and the site of proposed major retail development.

Housing and Population

South Bayshore residential areas are quite distant from the Project Area. Planned light rail service along Third Street will create a stronger connection between these parts of the City.

South Bayshore includes public housing projects, subsidized and market-rate residential development sponsored by the San Francisco Redevelopment Agency (about 1,700 units completed as of 1995), and extensive single-family residential neighborhoods on either side of Third Street as it nears Candlestick Point and 3Com Park. There were about 28,000 residents of the South Bayshore area in 1990. The Census counted about 9,700 housing units in the area in 1990, and a vacancy rate lower than the citywide average. The most striking characteristic of South Bayshore housing is the high proportion of owner-occupied housing. In 1990, over half of the units (52%) were owner occupied; citywide, only 35% of units were owner occupied, and the home-ownership rate is substantially lower in other residential areas near the Project Area./40/

IMPACTS

The impact analysis describes future business activity and employment and future housing and population in the Project Area, assuming build-out of the proposed project. The text describes the number and types of jobs expected in the Project Area in the future and the amount and type of housing development and associated residential population expected in the Project Area under the proposed Redevelopment Plans. Impacts discussed include those for job opportunities in San Francisco, for existing Project Area business activity and employment, for the jobs-housing balance in the City, for citywide housing market conditions, and for total employment and population growth in San Francisco. This section also presents the cumulative scenario of employment and population growth in San Francisco (including the proposed project) that is used for cumulative impact analysis in this SEIR.

STANDARDS OF SIGNIFICANCE

The City has no formally adopted significance standards for potential impacts related to employment, housing, and population. A project that induces substantial growth or concentration of population generally is not viewed as having a significant impact on the environment, per se. Rather, the effects and significance of this growth are examined under other environmental topics such as transportation, air quality, noise, community services, and growth inducement. The impacts are also considered in the context of local and regional plans and projections dealing with population and employment.

CHANGES IN THE CHARACTERISTICS OF THE PROJECT AREA

This section describes changes in business activity, employment, and population arising directly from Project Area development under the proposed Redevelopment Plans. Changes include businesses and employment that would locate in new development in the Project Area over time, construction jobs generated by that new development, likely outcomes for existing Project Area businesses, and the addition of substantial residential development and a resident population in the Project Area. (See "Land Use Changes by Subarea" under "Summary of Project Area Impacts" in Section V.B, Land Use: Impacts, for further discussion.)

Project Area Employment and Job Opportunities

Business Activity and Jobs

A substantial increase in business activity and jobs in the Project Area would accompany build-out and occupancy of the proposed project./41/ Total employment in the Project Area would increase from about 1,670 jobs in 1997 to about 30,000 jobs at build-out—an 18-fold increase (see Table V.C.5). This is about 20% more Project Area jobs than the 25,100 jobs analyzed for the Development Agreement Application variant (Variant 12) in the 1990 FEIR./42/ Commercial Industrial development in Mission Bay South, east and west of Third Street, would accommodate half of the 30,000 jobs in the Project Area at build-out (15,300 jobs). Office and research and development (R&D) business activities would be the primary occupants of this new development. Examples of the types of businesses that might locate in those subareas are: drug manufacturers,

TABLE V.C.5
MISSION BAY PROJECT AREA EMPLOYMENT BY LAND USE AND SUBAREA AT BUILD-OUT (2015)

		Mission Bay South						
Land Use/Business Activity	**Mission Bay North**	**Central Subarea**	**East Subarea**	**West Subarea**	**UCSF Subarea**	**Mission Bay South Subtotal**	**GRAND TOTAL**	**Percent of Total**
Office/a/	—	—	4,670	4,120	—	8,790	**8,790**	**29%**
Research & Development/a/	—	—	3,460	3,060	—	6,520	**6,520**	**22%**
UCSF Site/b/	—	—	—	—	9,100	9,100	**9,100**	**30%**
City-serving Retail	630	—	780	890	—	1,670	**2,300**	**8%**
Entertainment-oriented Retail	1,110	160	—	—	—	160	**1,270**	**4%**
Neighborhood-serving Retail	160	320	190	70	—	580	**740**	**2%**
Hotel	—	370	—	—	—	370	**370**	**1%**
Public Facilities/Open Space	1	102	1	—	150	253	**254**	**1%**
Building Maintenance/Security/Parking	50	10	170	150	30	360	**410**	**1%**
Housing-related	120	120	—	—	—	120	**240**	**1%**
TOTAL	**2,071**	1,082	9,271	8,290	9,280	**27,923**	**29,994**	100%
Percent of Total	7%	4%	31%	28%	31%	93%	100%	

Notes:
Employment estimates from final Project Area land use profile as presented in the table prepared by EIP Associates: *Land Use Statistics for EIR Project Description*, July 21, 1997. The estimating factors are those used in the 1990 FEIR; see 1990 FEIR, Appendix A: The EIR Alternatives, pp. XIV.A.10 - XIV.A.12. A stabilized average vacancy rate of 5% to account for on-going tenant turnover is assumed for office and research and development space.

a. Commercial Industrial space assumed to be 50% occupied by office activities and 50% occupied by research & development and light manufacturing activities.
b. University of California San Francisco *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, January 1997, Volume II, p. 516.

Source: Hausrath Economics Group.

medical equipment and supplies manufacturers, research and testing services, computer and data processing services, and engineering companies, as well as professional service, business and personal service, and equipment repair and supply operations that would support the larger companies. Biotechnology enterprises occupying this new development in the Project Area would be attracted to Mission Bay because of the UCSF site planned for the central portion of the Project Area west of Third Street. Total employment of 9,100 is expected at the UCSF site/43/, accounting for 30% of Project Area jobs. Overall, Mission Bay South would accommodate over 90% of the total future employment in the Project Area.

About 14% of total Project Area employment (4,300 jobs) would be in retail business activities. Three primary types of retail/entertainment activities are proposed: neighborhood-serving retail shops and restaurants oriented primarily to the convenience needs of Mission Bay residents, workers, and businesses; larger retail stores and restaurants serving the Project Area as well as a broader citywide market area; and entertainment-oriented retail stores, restaurants, and theaters designed to attract both city residents and visitors. Most of the retail activity and employment would be located in the North Subarea, accounting for all but a small amount of the total business activity and jobs expected in that subarea. There would also be city-serving retail development in the East and West Subareas in Mission Bay South. Neighborhood-serving retail business activity and jobs would be located throughout the Project Area and concentrated in the Central Subarea south of the Channel. Most of the retail jobs in the Project Area would be in the city-serving retail establishments; this type of development would account for 8% of total jobs in the Project Area.

The hotel proposed for the Central Subarea would be another source of jobs. That operation would account for about 1% of total Project Area jobs (about 400 jobs).

There would also be jobs in public facilities located in the Project Area (school, fire/police station). Building maintenance and security, attended parking, and maintenance, management, and security associated with Project Area residential development would support additional Project Area employment. Together, those business activities would account for about 3% of total Project Area employment at build-out (about 900 jobs).

Appendix Table C.6 presents the assumptions and factors used to estimate Project Area employment.

Types of Job Opportunities

Expanding employment opportunities in Mission Bay for San Francisco residents is among the planning objectives and policies for the proposed Redevelopment Plans. In addition to attracting new business activity to the Project Area, the Redevelopment Agency intends to both "promote the creation of jobs for a highly skilled and professional work force" and "promote efforts to attract, retain, and expand employment improvement opportunities for unskilled and semi-skilled workers."/44/

In addition to the sizable increase in the number of jobs in the Project Area, the types of jobs associated with business activity in the Project Area would change substantially under the proposed project. The mix of types of jobs would be more heavily weighted towards professional and specialized technical and production occupations. The medical research, instruction, academic support, and administrative functions at the UCSF site would employ professional, technical, managerial, and clerical workers. Those occupations, which generally require high levels of education and, in some cases, specialized skills, would also predominate in the office and R&D business activities. In addition, sales and marketing occupations are a growing component of the workforce in R&D-intensive industries./45/

Although large-scale routine production is not likely to be a significant component of the R&D activity in the Project Area, some research and development companies, office operations, and business support services that might locate in the East and West Subareas would employ relatively unskilled workers in some production occupations and entry-level operative occupations. Some R&D-intensive industries rely increasingly on workers who have no specialized skills or education but who possess an aptitude and interest in undertaking multiple and changing work tasks./46/ Given the potential magnitude of economic activity that could be accommodated in these subareas, the Project Area would offer more job opportunities in the future for relatively unskilled production workers than is currently the case with the more traditional production and distribution businesses located there.

Other types of job opportunities would be associated with the proposed hotel and retail development and with public facilities and other support activities. Service, sales, administrative, and management labor would be employed, as would, to a lesser extent, skilled and unskilled craft workers.

Construction Period Employment

Development in the Project Area would be an on-going source of construction jobs in San Francisco for many years. Over the build-out period, demolition, site preparation, and infrastructure improvements would require construction labor, as would the various types of residential and nonresidential building development. In addition, the construction process would require project management and supervisory personnel.

The various building types proposed for development would involve different levels of construction activity (see Table V.C.6). By way of example, there would be about 100 construction workers on site per day during the construction period for a prototypical five-story residential building. A concrete-frame residential tower would require more labor: about 140 workers per day, on average. Construction of a prototypical Commercial Industrial building would employ about 120 workers per day. Hotel construction would employ about 170 workers per day. Overall, the prototypical building types would **each** support from 130 to 180 person-years of construction labor./47/

Over the course of build-out of the Project Area, depending on the final design and phasing of construction, total construction labor supported would be in the range of 15,000 person-years. Assuming a build-out period of 15 years, this would mean an average of 1,000 full-time construction jobs per year./48/

Construction employment generated by development in the Project Area would offer a wide range of job opportunities for workers in various skill levels. Workers with skills in management, technical professions, personnel, and other administration would fill supervisory, support, and clerical positions in construction and related design and engineering firms that would be involved in various stages of the planning and development process. Actual construction work for the large-scale development proposed for the Project Area would span a range of activities requiring both skilled and unskilled workers. The long-term, phased nature of the construction work would provide an opportunity for apprenticeship and training programs in a variety of aspects of construction. Entry-level workers could be trained and move up within their craft while moving from one construction project to another within the Project Area.

Employment Benefits to the Labor Force

Not all Project Area employment would represent job openings initially because many businesses would move there from other locations, bringing existing employees with them. Employment opportunities would occur as Project Area businesses expand and as job turnover (the result of employees being fired, quitting their jobs for other employment, or leaving the labor force) creates openings for new workers. The employment benefits to the labor force would continue after build-out as on-going job turnover, as well as on-going maintenance and building renovation and upgrading, would introduce some openings on a continual basis.

Jobs in the Project Area would employ San Francisco residents as well as residents of other parts of the region. Assuming that the citywide average projection for the place of residence of people working in San Francisco applies to people working in Mission Bay, about 55% of Project Area jobs

TABLE V.C.6
PROJECT AREA CONSTRUCTION EMPLOYMENT BY BUILDING TYPE

	Building Type			
	Residential (5-story): metal frame with garage	**Residential tower: Concrete frame**	**Commercial-Industrial**	**Hotel**
Average Number of Workers on-site per day/a/	100	140	120	170
Average Person Years of Construction Labor/b/	130	180	160	170

Notes:
a. Average over all phases of construction including demolition, excavation, foundation, super structure, parking structure, and interior finish.
b. A person-year of construction labor is equivalent to one construction worker's labor, full-time, for one year. Construction worker-days converted to estimates of person-years of construction labor assuming 260 days of work per person-year of construction labor [52 weeks per year multiplied by 5 days per week]. The formula assumes vacation days and holidays are offset by working weekends.

Source: Charles Pankow Builders, Ltd., Projected Construction Traffic and Parking Impact tables, 4/1/97; Dean Browning, Charles Pankow Builders, Ltd., telephone conversation with Hausrath Economics Group, August 14, 1997, and Hausrath Economics Group.

would be held by San Francisco residents in 2015. Although the percentage may fluctuate in the future, this is a reasonable assumption given the large number and wide range of types of jobs in the Project Area. (See "Where People Working in San Francisco Live" in the Setting subsection.) Those 16,500 employed San Francisco residents working in the Project Area (the estimate at build-out) would represent about 4% of total employed residents of San Francisco in 2015.

Implications for Existing Project Area Business Activity

Transition of land use and business activity in the Project Area has been underway for decades. The changes in the types of operations in the Project Area have followed a long-term pattern of decline in distribution, warehousing, and associated transportation activities in and near downtown San Francisco as access has deteriorated and other locations have become more convenient to markets served. The warehousing, distribution, and repair activities that remain in the Project Area serve downtown and other close-in markets. The Mission Bay location remains convenient and accessible for this specialized group. Similarly, the Project Area has offered a convenient, close-in storage and materials-processing location for downtown construction projects.

Major new development on a scale even larger than that currently proposed for the Project Area has been publicly described and debated in San Francisco since the early 1980's. Moreover, many of the current tenants in the Project Area located there after the development agreement for the prior project analyzed in the 1990 FEIR was negotiated in 1990. Therefore, eventual relocation has been an underlying assumption of operating in the Project Area; most tenants are leasing on a month-to-month basis or have leases that expire before the year 2000. Nevertheless, the Mission Bay location has made good economic sense for most of these businesses. Most do not have substantial investments in buildings or equipment; rental rates have been favorable; and many have probably assumed that the potential development process would take a long time to complete.

Among those few establishments holding long-term leases negotiated before the onset of new development planning, all but one have leases that, exclusive of options, will expire in the near future, within the early years of potential Project Area development. Development of the Project Area would occur gradually over the build-out period as market demand warrants. There would be no need to have complete clearance of the Project Area prior to development. In fact, it is generally in the interest of landowners to maintain existing rent-paying tenants in the Project Area as long as feasible and to not have tenants leave at the first signs of eventual development. As long as existing buildings remained in the Project Area, some existing businesses or similar operations might decide to remain. At some time short of clearance and demolition of existing facilities, however, nearby construction activity would be likely to make the Project Area a less desirable business location for many of the activities currently located there.

Project-related development could displace any businesses and their employees only to the extent they are existing businesses at the time property where they are located is needed for development. Their relocation would be assisted to the extent required by applicable law. The goal of relocation assistance is to find a new location of comparable rent and required business characteristics so that loss from the relocation is minimized. (See also "Businesses to Be Relocated" under "Summary of Project Impacts" in Section V.B, Land Use: Impacts, for further discussion.)

Eventually, relatively few of the businesses currently operating in the Project Area would be likely to remain under the development program proposed in the Redevelopment Plans. Many require the large areas of open land and/or warehouse and loading dock facilities that would no longer be available in the Project Area; most would need to find lower cost space than that likely to be offered in the new development. While some existing retail and recreation activities could be accommodated in new development in the Project Area, those that required large amounts of open land area would not be easily accommodated (beyond continuing on an interim basis pending market demand for more intensive development).

A few specialized activities in the Project Area, such as the golf driving range and the ready-mix concrete plants, have unique location requirements that may be difficult to satisfy elsewhere in San Francisco, although large amounts of open land may be found in the southern parts of the City.

While a few may have difficulty finding an alternative location, most current Project Area businesses would not, although they may have to pay more for space than they do now. Many would remain in San Francisco. Businesses likely to stay in San Francisco would be those serving specialized markets (such as downtown customers) or those that have important links to other City business activity. Within San Francisco, areas west and south of the Project Area (in the Inner Mission, Potrero Hill, Lower Potrero, Central Bayfront, and South Bayshore Nearby Areas) would offer features attractive to Project Area businesses.

Other Project Area businesses not as dependent on a San Francisco market would find better opportunities outside the City. Both newer and older light industrial/distribution centers and business parks in San Mateo County and Alameda County offer space, cost, access, and other features that compare favorably to options in San Francisco.

Characteristics of Project Area Housing and Households

New residential development in the Project Area would be an important addition to the City's housing supply, providing both large numbers of new units and housing opportunities for a variety of households. There would be a mix of types and sizes of units to satisfy both the demands of the market and planning goals encouraging neighborhood diversity and development of new housing to fill the range of housing needs in San Francisco. A total of approximately 6,090 housing units are proposed to be added in the Project Area, of which approximately 1,700 units (28%) would be affordable to very low-, low-, and moderate-income households. There is no housing in the Project Area now.

In Mission Bay North, approximately 3,000 units are proposed. Of those units, 20% (600 units) would be affordable to very low-, low-, and moderate-income households. Catellus would be responsible for developing up to 255 of the affordable units. The affordable units to be developed by Catellus would likely be primarily rental units, integrated into Catellus' market-rate development within Mission Bay North. The balance of the affordable units (345 units) would be developed by non-profit housing developers sponsored by the Redevelopment Agency on land donated by Catellus./49/

In Mission Bay South, up to 3,090 units are proposed for the Central Subarea. Of the 3,000 units on Catellus-owned property, 37% (1,100 units) would be affordable to very low-, low-, and moderate-income households. Catellus would donate approximately 12.2 acres of land for the affordable units; non-profit housing developers sponsored by the Redevelopment Agency would develop the units. Catellus would develop approximately 1,900 market-rate units in the Central Subarea./50/ In addition, 90 units are proposed in that subarea on land in private ownership, but not owned by Catellus.

The new housing in the Project Area would consist of studio units, one-bedroom, two-bedroom, and three-bedroom units. Of the Catellus-developed units, smaller units are expected to predominate among the rental units—approximately 50% to 60% of the rental units would be studio and one-bedroom units. More of the market-rate units developed by Catellus would be larger units—approximately 60% of the market rate units would be two- and three-bedroom units. Catellus' current working assumption is that initially approximately 65% of the market rate units would be rental units and approximately 35% would be for-sale units./51/ All of the Catellus-developed affordable units (255 units in Mission Bay North) would likely be rental units./52/ A higher percentage of the Redevelopment Agency-sponsored affordable units (in both Mission Bay North and the Central Subarea) would be larger two-, three-, and four-bedroom units. Based on the experience of recent affordable housing development in San Francisco, as much as 70% of the Redevelopment Agency-sponsored affordable units would be larger units. Most of the rest of the affordable units would be one-bedroom units; it is unlikely that many studio units would be developed because the emphasis of the development program is expected to be housing for families./53/

Compared to the unit mix of the Mission Bay residential development analyzed in the 1990 FEIR, the current assumptions for housing in the Project Area result in a higher percentage of smaller units. Considering affordable and market rate units together, about 47% of the units would be studio and one-bedroom units. In the alternatives analyzed in the 1990 FEIR, 40% of the units were studio and one-bedroom units./54/

The 1990 FEIR described the characteristics of the households and population in the Mission Bay./55/ That characterization holds true for the current proposal and is summarized below.

- At build-out, Mission Bay would include a residential neighborhood large enough to accommodate a mix of different households and people. The housing would appeal to a range of types of households: singles, students, working couples, families, and single parents with children.

- The Mission Bay residential neighborhood would not be homogenous in terms of household income. Overall, about 25% to 30% of the households would be of low and moderate income, accommodated in the affordable units. The ranges of prices and rents for the rest of the housing would vary depending on unit size, location, and other characteristics. The households attracted to those units would span a range of income groups, depending on the number of workers in the household, the occupations of those workers, and the age of the householder, among other things.

- Because the Mission Bay residential neighborhood would consist entirely of new housing, households would be smaller than average San Francisco households. The individual housing units in new, higher-density housing development are smaller than the overall average for San Francisco's older housing stock.

- A relatively high percentage of Project Area residents would be workers. Housing in the Project Area would have a strong appeal to workers because of its proximity to job opportunities in the Project Area, South of Market area, and the rest of the downtown. There would also be relatively easy access, via reverse-commute, to employment centers in the South Bay and close-in East Bay cities.

Project Area Population and Employed Residents

Table V.C.7 presents estimates of Project Area housing units, households, population, and employed residents at build-out. The approximately 6,090 housing units proposed for the Project Area would accommodate about 5,900 households, assuming an average stabilized vacancy rate (3.5%) to account for turnover of units as households move in and out of the neighborhood. There would be about 10,850 people living in those households; most (60%) would be workers./56/ Many of the employed residents of the Project Area would work in San Francisco. Assuming the citywide average pattern for the future place of work of employed residents of San Francisco, about 79% of the employed residents of the Project Area (5,180 people) would also work in San Francisco. (See "Where San Francisco Residents Work" in the Setting subsection.) Some of these employed residents of the Project Area would also work in the Project Area.

The Mission Bay residential neighborhood would be split between Mission Bay North (3,000 housing units and 4,980 residents) and the Central Subarea in Mission Bay South (3,090 housing units and 5,880 residents). There would be more people living in the Central Subarea because the housing units and thus the household sizes are assumed to be somewhat larger, on average, than would be the case in Mission Bay North. In Mission Bay North, the average household size is estimated to be 1.72 persons per household. In the Central Subarea, the average household size is estimated to be 1.97 persons per household.

Appendix Table C.7 presents the assumptions about the demographic factors used to estimate population and employed residents for the Project Area.

TABLE V.C.7
MISSION BAY PROJECT AREA HOUSING UNITS, POPULATION, AND EMPLOYED RESIDENTS BY SUBAREA AT BUILD-OUT (2015)

		Mission Bay South					
	Mission Bay North	Central Subarea	East Subarea	West Subarea	UCSF Subarea	Mission Bay South Subtotal	GRAND TOTAL
Housing Units	3,000	3,090	—	—	—	3,090	**6,090**
Households/a/	2,895	2,982	—	—	—	2,982	**5,877**
Population/b/	4,980	5,875	—	—	—	5,875	**10,855**
Employed Residents/c/	3,010	3,550	—	—	—	3,550	**6,560**

Notes:
From final Project Area land use profile as presented in the table prepared by EIP Associates: *Land Use Statistics for EIR Project Description*, July 21, 1997. The estimating factors are those used in the 1990 FEIR; see 1990 FEIR, Appendix A: The EIR Alternatives, p. XIV.A.13.

a. A housing vacancy rate of 3.5% is assumed, resulting in an estimate of households (occupied housing units) that is less than the total number of housing units.
b. Number of people living in housing units built in the Project Area. Estimated using 1990 FEIR factors for persons-per-household by unit size, after determining potential mix of units by size based on information provided by Eric Harrison, Project Manager, Catellus Development Corporation, in a memorandum to EIP Associates, March 7, 1997; and on analysis of affordable housing produced in San Francisco.
c. Residents of the Project Area who are also employed, regardless of place of work. Estimated using 1990 FEIR factors for age distribution of population and percentage of the population in each age group that would be working. Confirmed by review of ABAG *Projections '96* population and labor force projections by age for San Francisco.

Source: Hausrath Economics Group.

RELATIONSHIP BETWEEN PROJECT AREA EMPLOYMENT GROWTH AND HOUSING DEVELOPMENT AND IMPLICATIONS FOR CITYWIDE HOUSING MARKET CONDITIONS

This section evaluates the jobs/housing balance of the proposed project. Housing demand associated with Project Area employment growth, with and without employment at the UCSF site, is compared to housing supply in the Project Area. The housing market implications of the jobs/housing balance evaluation, and of other aspects of the housing supply proposed for the Project Area, are also discussed.

Jobs/Housing Balance

Employment growth adds to housing demand, and housing development adds to housing supply. Comparing the number of jobs that could be accommodated by development in the Project Area to the housing added in the Project Area is a useful means of evaluating the consequences of different land use options for the Project Area. Ultimately, the capacity of the City's land supply to accommodate either jobs, or housing, or both has long-term consequences for the housing market, and potential environmental impacts (e.g., transportation and air quality impacts) because of effects on commute patterns. See "Relationship Between Project Area Employment Growth and Housing Development and Implications for Citywide Housing Market Conditions" under "Business Activity, Employment, Housing, and Population" for each alternative in Chapter VIII, Alternatives to the Proposed Project, for the comparative conclusions about these land use options for the Project Area.

Appendix Table C.8 presents the comparison of San Francisco housing demand and housing supply calculations for the Project Area, with and without the UCSF site. The table also shows all of the factors used in the calculation steps. The main points are summarized below. The approach and methodology represent an evolution of the jobs/housing analysis in the 1990 FEIR/57/ and are based on the recent consultant's report updating the formula for the City's Office-Affordable Housing Production Program (OAHPP)./58/

The estimate of demand begins with Project Area employment growth through build-out. According to ABAG and MTC projections of commute patterns, 55% of the people working in San Francisco are expected to live in the City in 2015. The other 45% will find housing outside of San Francisco. This is essentially the pattern in existence today, and represents a stabilization of the decrease experienced through 1980 in the percentage of San Francisco workers who live in San Francisco. (See "Where People Working in San Francisco Live" in the Setting subsection.)/59/ The estimate of workers living in San Francisco is translated to an estimate of households in San Francisco based on an assumption about the average number of workers per worker-household.

Combining these factors, Project Area employment growth (including that associated with the UCSF site) translates to about 9,700 San Francisco households. This is the estimate of housing demand in San Francisco associated with all projected Project Area employment growth through build-out. Housing supply in the Project Area consists of approximately 6,090 units of housing proposed for Mission Bay North and Mission Bay South combined. The number of housing units needed to accommodate all projected demand for housing in San Francisco associated with Project Area employment growth exceeds the housing supply that would be provided in the Project Area by about 3,700 units. In short, proposed development of the Project Area (including the UCSF site) would add more to housing demand in San Francisco than it would to supply./60/

UCSF addressed the issues of housing supply for its students, faculty, and staff in the LRDP. The LRDP Goals and Objectives provide that UCSF would work closely with the community to develop housing in the Bay Area for between 20% and 25% of UCSF's total net new employees in categories that are eligible for affordable housing. The LRDP FEIR found that housing effects of UCSF development would be less than significant and could be met by projected housing supply in the region.

If the employment associated with the UCSF site in Mission Bay South is excluded from the calculations, housing demand would be approximately equal to the housing supply proposed in the Project Area (see Appendix Table C.8). Housing demand associated with all other employment growth in the Project Area, other than UCSF, totals about 6,600 households, which would just about balance with the 6,090 units that would be supplied in the Project Area.

Implications of the Jobs/Housing Balance Conclusions

This analysis is not meant to imply that there would be a precise match between housing supply and demand for any specific project area. Any given project would normally develop residential or nonresidential space, with the resulting excess demand for housing or jobs accommodated within the City and regional labor and housing markets. Also, an imbalance of housing to jobs is not a physical environmental effect, but rather an economic and social issue that warrants attention by San Francisco policymakers and other jurisdictions in the Bay Area. Certain indirect project and cumulative effects caused by the imbalances in local employment and housing opportunities would be environmental impacts, primarily transportation and related air quality impacts, and are described in those sections of this SEIR. The geographic distribution of employment and housing is taken into account in the SEIR analysis. For example, commute patterns are considered in the trip distribution factors underlying the transportation and air quality impact analyses. The secondary physical impacts of the Project Area housing supply shortfall (i.e., significant traffic, transit, and air quality effects from both the project and project-plus-cumulative impacts), can be best mitigated through measures directly addressing those effects, such as those that encourage increases in transit use and reduce traffic congestion. The economic and social ramifications are briefly identified here and in Business Activity, Employment, Housing, and Population, under "Environmental Assessment" in Chapter VIII, Alternatives to the Proposed Project, where the jobs/housing balance outcomes for other Project Area land use options are evaluated.

San Francisco housing market conditions overall in the future are not expected to be much different from those that characterize the market today (see "Housing Market Context," above, under "Citywide and Regional Context" in the Setting subsection, as well as the 1990 FEIR/61/). A shortfall of housing supply compared to demand such as that identified above for the proposed project overall including the UCSF site would, nevertheless, result in some housing market impacts for some segments of the housing market compared to a situation in which there were no shortfall. All other things being equal, the supply shortfall would mean more demand than would otherwise be the case for other new units near downtown and the Project Area, since most people prefer housing near their jobs. There would also be greater demand for existing housing, and, generally, for market-rate housing at the lower end of the price/rent range. In the context of the citywide housing market, price impacts would probably be small, and the impacts on housing choice would also be small. Types of housing market impacts could include: more people doubling up to share housing expenses; others remaining in existing housing rather than moving up to better options; and still others choosing housing they could better afford outside San Francisco.

Offsetting these potential impacts, the proposed project would increase the supply of affordable units and market-rate housing at the lower end of the price/rent range, and this would benefit low and moderate income households. For very-low, low-, and moderate income households (typically those that have the fewest options and sacrifice the most when supply is constrained and prices and rents rise), the increased supply of affordable units would ease housing market pressures such as those described above.

It is not known exactly where in the region additional housing supply to satisfy some of the Project Area demand would be provided. Therefore, it is not possible to identify location-specific impacts. Outside of San Francisco, it is safe to conclude that the impacts would be dispersed over the regional housing market and would not be concentrated in any particular location. Moreover, a future context of citywide and regional housing supply and demand that accommodates the supply and demand associated with the proposed project is part of the SEIR cumulative future context and is analyzed in the SEIR (see "Relationship Between Employment Growth and Population" in Section V.N, Growth Inducement).

PROJECT AREA AND CUMULATIVE CITYWIDE GROWTH

This section describes the cumulative context for employment and population growth in San Francisco. After an introduction to the cumulative growth scenario of employment and population for the City through 2015, the section describes the proposed project's contributions to that growth. Growth-inducing implications of the proposed project are described in Section V.N, Growth Inducement.

San Francisco Cumulative Growth Scenario

For the purposes of this SEIR, total development proposed for the Project Area is assumed to be built and occupied by the year 2015. (As explained above, a stabilized average vacancy rate is assumed for the purposes of estimating employment and population associated with a given amount of development.) Table V.C.8 (employment) and Table V.C.9 (households, population, and employed population) present estimates and projections for the Project Area and the rest of San Francisco in 1995 and 2015. The tables indicate the relative magnitude of the growth projected for the Project Area in the context of citywide growth. The total San Francisco projections for 2015 presented in the tables are the result of adding the Project Area build-out estimates (see Table V.C.5 and Table V.C.7) to estimates of total employment, households, population, or employed residents in the rest of the City by the year 2015. The estimates for the rest of the City reflect results of the San Francisco cumulative growth study prepared to provide a common basis for cumulative impact analyses in current San Francisco environmental review documents./62/

The projections including the proposed project indicate total San Francisco employment of about 673,000 in 2015—an increase of about 138,000 over 1995 estimated employment. This represents a 25% increase in employment in the City. For comparison, the 2020 cumulative employment scenario in the 1990 FEIR projected about 795,000 jobs in San Francisco—an increase of 35% over the 1985 setting estimate used in that document./63/ (The 1990 FEIR scenario did not anticipate the depth of the economic recession in the early 1990's and its effect on employment levels in San Francisco.)

The cumulative projections of population growth for San Francisco used in this SEIR indicate population totaling about 819,000 in 2015, including the proposed project. Projected growth of 59,000 people from 1995 through 2015 represents an 8% increase for the period. Over the same period, total households in the City are projected to increase 10%, from 311,000 to 344,000. Again, for comparison, the 1990 FEIR projected total population of 830,500 for San Francisco in 2020—an increase of 12% over estimated 1985 totals. The 1990 FEIR household projection of 344,000 for 2020 is the same as the 2015 projection used for cumulative analysis in this SEIR./64/

TABLE V.C.8
MISSION BAY PROJECT AREA AND REST OF CITY EMPLOYMENT
1995 AND 2015

Year	Mission Bay Project Area/a/	Rest of City/b/	Total San Francisco/c/	Project Area as Percent of Total City
1995/d/	1,670	533,310	534,980	0.3%
2015	29,995	643,500	673,495	4.5%
Change: 1995-2015	28,325	110,190	138,515	20.4%

Notes:

a. Hausrath Economics Group. Existing conditions based on 1997 Mission Bay Project Area Survey. Estimates for 2015 based on July 21, 1997, Project Area land use statistics prepared by EIP Associates.

b. Keyser Marston Associates, Inc., *San Francisco Cumulative Growth Scenario, Final Technical Memorandum*, prepared for the San Francisco Redevelopment Agency, March 30, 1998.

c. Mission Bay Project Area estimates prepared for Subsequent EIR added to "Rest of City" estimates prepared by Keyser Marston Associates, Inc., *San Francisco Cumulative Growth Scenario, Final Technical Memorandum*, prepared for the San Francisco Redevelopment Agency, March 30, 1998.

d. 1997 estimates of existing conditions for the Project Area are presented here. Any differences between 1995 and 1997 for the Project Area are not significant when measured against citywide totals.

Source: Hausrath Economics Group.

Appendix C presents a comparison of the SEIR cumulative growth scenario to San Francisco growth through the year 2020 as recently published by ABAG in *Projections '98*. The employment projections for the cumulative growth scenario used in the SEIR are almost the same as the most recent ABAG projections (and are greater when full build-out of the proposed Mission Bay project is included). The cumulative population projections used in the SEIR are greater than ABAG's population projections for San Francisco. See Appendix Table C.9 and "SEIR Cumulative Growth Scenario Compared to *Projections '98*" in Appendix C.

Implications for Employment and Job Opportunities in San Francisco

After subtracting existing Project Area employment of 1,670 jobs, there would be about 28,300 more jobs in the Project Area at build-out of the proposed amount of nonresidential development (see Table V.C.8). That increase would represent a 5% increase over total employment in San Francisco in 1995. By the year 2015, assuming build-out and occupancy of the UCSF site and all other components of the proposed project, Project Area jobs would represent just over 4% of total

TABLE V.C.9
MISSION BAY PROJECT AREA AND REST OF CITY HOUSEHOLDS, POPULATION, AND EMPLOYED RESIDENTS: 1995 AND 2015

Year	Mission Bay Project Area/a/	Rest of City/b/	Total San Francisco/c/	Project Area as Percent of Total City
Households				
1995	0	311,430	311,430	0.0%
2015	5,877	337,862	343,739	1.7%
Change: 1995-2015	5,877	26,432	32,309	18.2%
Population				
1995	0	759,900	759,900	0.0%
2015	10,855	808,556	819,411	1.3%
Change: 1995-2015	10,855	48,656	59,511	18.2%
Employed Residents				
1995	0	376,800	376,800	0.0%
2015	6,560	420,657	427,217	1.5%
Change: 1995-2015	6,560	43,857	50,417	13.0%

Notes:

a. Hausrath Economics Group. Existing conditions based on 1997 Mission Bay Project Area Survey. Estimates for 2015 based on July 21, 1997, Project Area land use statistics prepared by EIP Associates.

b. Keyser Marston Associates, Inc., *San Francisco Cumulative Growth Scenario, Final Technical Memorandum*, prepared for the San Francisco Redevelopment Agency, March 30, 1998. The 1995 numbers reflect ABAG's *Projections '96* estimates for San Francisco. These estimates are somewhat different from the 1997 data for San Francisco presented in Table V.C.4. The 1997 data reflect more current estimates prepared by the California Department of Finance.

c. Mission Bay Project Area estimates prepared for this 1998 Subsequent EIR added to "Rest of City" estimates prepared by Keyser Marston Associates, Inc., *San Francisco Cumulative Growth Scenario, Final Technical Memorandum*, prepared for the San Francisco Redevelopment Agency, March 30, 1998.

Source: Hausrath Economics Group.

employment projected for San Francisco. The increase in employment in the Project Area would account for about 20% of total expected employment growth in San Francisco from 1995 through 2015.

Implications for Households, Population, and Employed Residents in San Francisco

Table V.C.9 presents Project Area and Rest of City estimates of households, population, and employed residents for 1995 and 2015. The increase in households, population, and employed residents in the Project Area would represent less than 2% of total households, population, and employed residents in San Francisco in 1995. By 2015, the Project Area would represent a similarly small share of citywide totals. The increase in households and population in the Project Area would be an important component of the growth of households, population, and employed residents in San Francisco, however. The growth in the Project Area would account for 18% of projected household and population growth in San Francisco and 13% of projected growth of employed residents./65/

NOTES: Business Activity, Employment, Housing, and Population

1. San Francisco Planning Department, *Mission Bay Final Environmental Impact Report*, Planning Department File No. 86.505E, State Clearinghouse No. 86070113, certified August 23, 1990, Volume Two, p. VI.B.13.*

2. The restaurant on the pier off of Fourth Street that extends into China Basin Channel is not included in the current Project Area boundary. There has been a restaurant at this location for almost 40 years.

3. The earlier project area business survey included more in-depth questions about the characteristics of project area workers than did the survey update completed in 1997. Given the limited changes in the mix of types of businesses in the Project Area, the earlier survey results provide a valid indication of the types of jobs still offered by Project Area businesses.*

4. Described in the 1990 FEIR, Volume Two, pp. VI.B.6-VI.B.12.*

5. City and County of San Francisco, Planning Department, *Commerce and Industry Inventory*, August 1996, Table 3.1.1 and p. 19. The *Commerce and Industry Inventory* presents employment data by "land use activity," matching the type of economic activity (as indicated by Standard Industrial Classification) with a corresponding type of building space and the prevailing land use pattern. See *1996 Commerce and Industry Inventory*, pp. 2-5, for more information.*

6. The most recent employment estimates from the California Employment Development Department (EDD) (benchmark March 1996) show employment at 535,600 for the City in 1996. That same series indicates 1995 wage and salary employment of 513,700. That estimate is different from the 1995 employment data published in the Planning Department's *Commerce and Industry Inventory*. At the time they were preparing the inventory, Department staff used preliminary employment data available from EDD.

7. 1990 FEIR, Volume Two, Table VI.B.11, p. VI.B.21. Other Setting tables in the 1990 FEIR include the self-employed in estimates of total San Francisco employment, for a total of 584,900 jobs. (See, for example, Table VI.B10 on p. VI.B.20 of the 1990 FEIR.) The self-employed are not included in the 1996 estimate presented in the SEIR text, so the appropriate comparison is to the 1985 estimate without the self-employed.*

8. California Department of Finance, *City/County Population and Housing Estimates, with Totals for Incorporated and Unincorporated Areas, 1997*, May 1997. (Estimates for January 1, 1997.)

9. There are more housing units than households because not all housing units are occupied. The difference between total housing units and total households represents vacant units.

10. The total population of the City consists of people living in households (the household population) and people living in group quarters, e.g., nursing homes, dormitories, rooming houses, jails, and military facilities. The group quarters population totals about 22,200 in 1997.

11. 1990 FEIR. Volume Two, Table VI.C.1 on p. VI.C.8 and Table VI.C.9 on p. VI.C.39.*

12. 1990 FEIR, Volume Two, Table VI.C.1 on p. VI.C.8.*

13. ABAG published *Projections '98* in December 1997, after the analyses and most of the writing for this SEIR were complete. A brief discussion of *Projections '98* for San Francisco appears in "SEIR Cumulative Growth Scenario Compared to *Projections '98*" in Appendix C. The overview comparison indicates that there is not much difference between the cumulative growth scenario and updated ABAG projections.

14. ABAG published *Projections '98* in December 1997, after the analyses and most of the writing for this SEIR were complete. A brief discussion of *Projections '98* for San Francisco appears in "SEIR Cumulative Growth Scenario Compared to *Projections '98*" in Appendix C. The overview comparison indicates that there is not much difference between the cumulative growth scenario and updated ABAG projections.

15. Metropolitan Transportation Commission, "County-to-County Commuters in the San Francisco Bay Area: 1960-2010." Table based on U.S. Decennial Census and ABAG's *Projections '96*. Commuter forecasts prepared by MTC.

16. Metropolitan Transportation Commission, "County-to-County Commuters in the San Francisco Bay Area: 1960-2010." Table based on U.S. Decennial Census and ABAG's *Projections '96*. Commuter forecasts prepared by MTC.

17. Metropolitan Transportation Commission, "County-to-County Commuters in the San Francisco Bay Area: 1960-2010." Table based on U.S. Decennial Census and ABAG's *Projections '96*. Commuter forecasts prepared by MTC.

    There is some uncertainty about this projection of the percentage of future San Francisco jobs held by people who are also residents of San Francisco. The percentage may fluctuate over time. Factors influencing this pattern include housing production in the City and the region, housing costs, characteristics of the work force, travel times on major freeways, and improvements proposed in regional and local transit.

18. San Francisco Planning Department, San Francisco Public Utilities Commission, and the San Francisco County Transportation Authority, *Citywide Travel Behavior Survey: Employees and Employers*, May 1993, Table IIA1, p. 11.*

19. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, certified January 1997, Volume II, pp. 147-148.*

20. Metropolitan Transportation Commission (MTC), "County-to-County Commuters in the San Francisco Bay Area: 1960–2010." Table based on U.S. Decennial Census and ABAG's *Projections '96*. Commuter forecasts prepared by MTC.

21. 1990 FEIR, Volume Two, pp. VI.C.1–VI.C.6.*

22. 1990 FEIR, Volume Two, especially p. VI.C.4.*

23. City and County of San Francisco, Planning Department, *Housing Information Series: Changes in the Housing Inventory for 1995*, May 1996, p. 6.*

24. City and County of San Francisco, Planning Department, *Housing Information Series: Changes in the Housing Inventory for 1995*, May 1996, p. 12.*

25. City and County of San Francisco, Planning Department, *Housing Information Series: Changes in the Housing Inventory for 1995*, May 1996, p.28.*

26. City and County of San Francisco, Planning Department, *Housing Information Series: Changes in the Housing Inventory for 1995*, May 1996, List 2A, List 3A, and List 3B, pp. 52-56.*

27. Real Estate Research Council of Northern California, *Northern California Real Estate Report*, First Quarter 1997, p. 40. Permit data provided by the Construction Industry Research Board.

28. U.S. Department of Commerce, *1990 Census of Population and Housing*, and California Department of Finance, *City/County Population and Housing Estimates, 1997*, May 1997.

29. Real Estate Research Council of Northern California, *Northern California Real Estate Report*, First Quarter 1997, p. 65. Survey data on apartment vacancy rates provided by RealFacts.

30. Estimate based on responses to business survey conducted by EIP Associates, Inc., July 1997.

31. Paul Osmundson, Planning Director, Port of San Francisco, telephone conversation with EIP Associates, May 30, 1997.

32. 1990 FEIR, Volume Two, p. VI.B.13.*

33. Betty Boatwright, past president, Mission Creek Harbor Association, personal communication with Hausrath Economics Group, February 24, 1998.

34. U.S. Department of Commerce, *1990 Census of Population and Housing*, Summary Tape File 1A.

35. San Francisco Redevelopment Agency, *San Francisco Redevelopment Program: 1995-1996 Summary of Project Data and Key Elements*, pp. 93-97 and p. 143.

36. U.S. Department of Commerce, *1990 Census of Population and Housing*, Summary Tape File 1A.

37. U.S. Department of Commerce, *1990 Census of Population and Housing*, Summary Tape File 1A.

38. U.S. Department of Commerce, *1990 Census of Population and Housing*, Summary Tape File 1A.

39. U.S. Department of Commerce, *1990 Census of Population of Housing*, Summary Tape File 1A.

40. U.S. Department of Commerce, *1990 Census of Population and Housing*, Summary Tape File 1A.

41. The Project Area employment estimates are calculated assuming an average, stabilized vacancy rate of 5% for office, research and development, and light industrial space, to account for on-going tenant turnover.

42. 1990 FEIR, Volume Two, p. VII.89.*

43. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, certified January 1997, Volume II, p. 516.*

44. San Francisco Redevelopment Agency, "Draft Redevelopment Plan for the Mission Bay North Redevelopment Project," March 30, 1998, pp. 6-7, and "Draft Redevelopment Plan for the Mission Bay South Redevelopment Project," March 30, 1998, pp. 6-7.*

45. William Luker, Jr., and Donald Lyons, "Employment shifts in high-technology industries, 1988-96," *Monthly Labor Review*, June 1997, p. 22.

46. William Luker, Jr., and Donald Lyons, "Employment shifts in high-technology industries, 1988-96," *Monthly Labor Review*, June 1997, p. 22.

47. Construction employment is also measured in terms of person-years of construction labor. A person-year is equivalent to one construction worker's labor, full-time, for one year.

48. The estimate accounts for all on-site construction labor, including workers to complete infrastructure development projects. On-site project management and supervisory personnel are included in the labor estimate. Off-site management, design, engineering, sales, and administrative jobs are not included.

49. Catellus Development Corporation, *Conceptual Framework for a Proposal for the North of Channel Redevelopment Plan Area*, September 26, 1996.

50. Catellus Development Corporation, *Conceptual Framework for a Proposal for the Catellus Development Portion of the South of Channel Redevelopment Plan Area*, July 2, 1997.

51. Eric Harrison, Project Manager, Catellus Development Corporation, memorandum to EIP Associates, March 7, 1997. The mix of units by size reflects current working assumptions for purposes of analysis; the mix may change due to variations in building design, changes in the market and other factors.

52. Andrea Jones, Catellus Development Corporation, telephone conversation with Hausrath Economics Group, July 21, 1997.

53. The mix of sizes of units for the Redevelopment Agency-sponsored affordable units reflects the record of affordable housing development in San Francisco from 1990 through 1995. The source of the data describing major new affordable housing construction in the City is: City and County of San Francisco, Planning Department, *Housing Information Series: Changes in the Housing Inventory for 1995*, May 1996, List 1B, pp. 49-51. To develop a distribution of unit sizes representative of the types of affordable housing envisioned for the Project Area, live/work projects, single-room occupancy projects, elderly-only projects, and projects for special populations were excluded from the sample. Family projects and some mixed family/elderly projects were included in the sample.

54. 1990 FEIR, Volume Two, p. V.5.*

55. 1990 FEIR, Volume Two, pp. VI.C.64-VI.C.67.*

56. Based on factors originally developed for the 1990 FEIR describing the age distribution of the population and the percentage of the population in various age categories that would be working. (See the 1990 FEIR, Volume Three, p. XIV.A.13.) Review of those factors in light of ABAG's updated projections of population and labor force by age for San Francisco through 2015 indicated that the original factors remained valid.

Compared to the population of the City overall, a higher percentage of the Project Area population is expected to be in their prime working years (ages 15–64). Sixty-nine percent of the Project Area population would be in this age group, compared to 65% for the citywide average projected by ABAG. Among the population in the Project Area, 71.8% of the population 15 years of age and older would be employed. According to ABAG's projections, in 2015, employed residents are expected to represent 62.5% of the citywide population 15 years of age and older.

57. 1990 FEIR, Volume Two, pp. VI.C.67-VI.C.77, and Volume Three, Appendix C, pp. XIV.C.29-XIV.C.36.*

58. Office development projects located on property under the jurisdiction of the San Francisco Redevelopment Agency and property owned by the State of California (e.g., the UCSF site, eventually) are exempt from the current Office Affordable Housing Production Program (OAHPP Planning Code Section 313.3). The OAHPP approach is used here only as an evaluation tool; a similar approach was used in the 1990 FEIR. See "Background on the Jobs/Housing Analysis" in Appendix C for more discussion. The OAHPP update analysis is evaluating continued exemption of office development on property under the jurisdiction of the Redevelopment Agency and the Port of San Francisco as well as expansion of the OAHPP ordinance to apply to other nonresidential land uses. Retail and entertainment, hotel, medical-related, cultural and institutional, and research and development are the additional building types or land use activities under study. See Keyser Marston Associates, Inc. and Gabriel Roche, Inc., *Jobs Housing Nexus Analysis, City of San Francisco*, July 1997.*

59. The 1990 FEIR provides extensive discussion of the rationale behind this factor in the jobs/housing calculation. See the 1990 FEIR, Volume Four, pp. XV.C.6–XV.C.7.*

60. The jobs/housing analysis in the 1990 FEIR included another factor that is not included in the updated jobs/housing calculations used here. The 1990 FEIR and the original OAHPP analysis on which it was based included a factor that discounted demand for additional housing units in San Francisco associated with employment growth because the number of workers-per-household was expected to continue to increase. That increase meant that some of the additional employment growth would be accommodated by changes in the characteristics of households living in existing housing. Those changes have already happened: workers-per-household increased from 1.14 in 1980 to 1.26 in 1990. After a recession-induced decline to 1.21 in 1995, ABAG projects the ratio will stabilize through the forecast period at about 1.25. (This is essentially the same scenario behind the 1990 FEIR factors. Workers-per-household was estimated at 1.20 for 1985 and forecast to increase to 1.25 by 2000 and be stable after that.) Looking at a jobs/housing analysis from this point forward, i.e., almost at the year 2000, the scenario does not indicate much room for accommodating housing demand through changes in the characteristics of the households in the existing housing stock. This is the scenario incorporated in the July 1997 update to the OAHPP (see Keyser Marston Associates, Inc., and Gabriel Roche, Inc., *Jobs Housing Nexus Analysis*, *City of San Francisco,* July 1997).*

61. 1990 FEIR, Volume Two, pp. VI.C.83-VI.C.84.*

62. Concurrent environmental review of several major planning and transportation projects in San Francisco (Mission Bay North and South Redevelopment Plans, Bayview/Hunters Point Redevelopment Plan Amendment, MUNI Third Street Light Rail Project, and the Candlestick Point Stadium-Mall) required a consistent forecast of population and employment growth in San Francisco reflecting the development that could be accommodated in the various project areas. As a result of efforts of the Redevelopment Agency, the San Francisco Planning Department, and various consultants, all of these environmental analyses use the same cumulative growth forecast of San Francisco population and employment in 2015 as the basis for cumulative transportation analysis, as well as for growth inducement and related analyses of housing, business activity, and land use impacts.

Not all of the major planning and redevelopment project areas assumed for cumulative analysis purposes may actually be adopted or built out to the extent assumed. The assumptions are conservatively high for CEQA analysis purposes, and to the extent actual development falls short of projections, cumulative impacts proportional to population and employment (e.g., transportation, air quality, traffic noise) would be overstated.

Keyser Marston Associates (KMA) completed the *San Francisco Cumulative Growth Scenario, Draft Technical Memorandum* in August 1997. The KMA 2015 cumulative growth scenario includes household, population, employed residents, and employment estimates for the total City and for the various project areas as well. The KMA projection assumes substantial development by 2015 largely as proposed for several areas under consideration as redevelopment project areas and for the Presidio. Overall, the cumulative growth scenario projects more employment and population growth for San Francisco by 2015 than does ABAG's *Projections '96*. Compared to the ABAG projections for 2015, the cumulative growth scenario assumes that more aggressive development efforts on the part of the City, including redevelopment planning, capital improvement funding, housing and business assistance, and catalyst projects result in more demand for new development and re-use of existing space than would otherwise be the case. See Keyser Marston Associates, Inc., *San Francisco Cumulative Growth Scenario, Final Technical Memorandum*, prepared for the San Francisco Redevelopment Agency, March 30, 1998.

The KMA *Cumulative Growth Scenario* includes estimated projections for the Mission Bay North and South Redevelopment Plan Areas. Those estimates did not, in fact, assume full build-out by 2015 of all of the R&D/office development proposed for Mission Bay South. (For analysis in this SEIR, more detailed Project Area projections of employment and population were developed, as described in "Project Area Employment and Job Opportunities" and "Project Area Population and Employed Residents" earlier in this Impacts subsection.) The "Rest of the City" estimates used in this SEIR from the KMA *San Francisco Cumulative Growth Scenario* reflect the totals for all other parts of the City after subtracting the KMA estimates for Mission Bay North and Mission Bay South.

See "SEIR Cumulative Growth Scenario Compared to *Projections '98*" in Appendix C for a brief discussion of ABAG's new projections series, published in December 1997, after the analyses for this SEIR were complete. The overview comparison indicates no substantial difference between the population and employment projections in the cumulative growth scenario and ABAG's updated projection.

63. 1990 FEIR, Volume Two, Table VI.B.27 on p. VI.B.77.*

64. 1990 FEIR, Volume Two, Table VI.C.11 on p. VI.C.47.*

65. The Project Area represents a smaller share of the growth of employed residents than it does of households or population because of the smaller average household size assumed for the Project Area, compared to the average for the rest of the City. As a result, there are fewer workers per household, on average, in the Project Area than expected in the larger households in the rest of the City. The percentage of the total population that is also employed remains higher for the Project Area (at 60%) than projected for the rest of the City (52%). Generally, the rest of the City would include a more diverse group of households than expected for the new housing in the Project Area. Compared to areas of predominantly new multi-family housing such as that proposed for the Mission Bay Project Area, the rest of the City, in generally larger housing units, would house a larger share of family households, including younger children; a larger share of households with elderly, non-working members; and a larger share of two-worker households.

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

D. VISUAL QUALITY AND URBAN DESIGN

This section addresses the Mission Bay project's effects relative to the built environment and its urban visual quality. The visual quality of an area is based on its aesthetic character, defined by the physical character (i.e., landform, vegetation, water, color, and diversity) and perceptual quality (i.e., harmony, vividness, adjacent scenery, urban design, and cultural modifications). Architectural resources within the Project Area are also considered. The following analysis is based on field visits, photographs, aerial photo interpretation, and review of visual simulations developed for the proposed redevelopment of the Project Area. This section also provides a comparison of the proposed urban design features with those in the adopted 1990 *Mission Bay Plan*, as well as a description of the street-level experience expected to occur at build-out for the proposed Mission Bay project, compared with current conditions. The endnotes for this section begin on p. V.D.46.

Potential shadow and wind effects created by the redevelopment of the Mission Bay Project Area are discussed under "Air Quality/Climate" in Section IV.B, Environmental Evaluation Checklist, in the Initial Study (Appendix A).

SETTING

The Visual Quality section of the 1990 FEIR/1/ describes the visual setting of the Project Area as of 1987-1990. However, since the 1990 analysis was conducted, some of the visual characteristics of the Project Area and surroundings have changed. This section provides an updated description of the existing physical appearance of the Mission Bay Project Area and its environs in relation to views of, and views from, the existing Project Area setting.

EXISTING VISUAL CHARACTER

Regional Setting

The Mission Bay Project Area lies near the eastern shoreline of the City and County of San Francisco, at the north end of the San Francisco Peninsula. The peninsula faces the Pacific Ocean to the west and defines the western edge of San Francisco Bay to the east. The cities of Oakland and Alameda are located about 4 miles east of and opposite San Francisco and, along with other municipalities, form the eastern edge of San Francisco Bay. The San Francisco-Oakland Bay Bridge is a prominent man-made feature in this regional setting, connecting the west and east sides of the Bay. The San Francisco anchorage of the Bay Bridge is located approximately 1 mile north of the Mission Bay Project Area on the waterfront.

The most intensely developed portion of San Francisco, including the downtown area and Financial District, is located within the flatter portions of the City about 1.5 miles north of the Mission Bay Project Area. San Francisco's Financial District is about 1 mile north of the Project Area and consists of high-rise buildings, with heights of up to approximately 50 stories. Financial District buildings visible in a longer-range skyline include office towers developed in the 1920's and 1930's, and more recent and generally larger and taller structures developed from the 1960's to the 1980's.

The San Francisco waterfront defines the urban edge of the eastern and northern portions of the City. The overall character of the waterfront varies by land uses and geographic location.

The future San Francisco Giants Ballpark site (Giants Ballpark), immediately adjacent to the Mission Bay Project Area to the northeast, is located at the southernmost portion of The Embarcadero where it terminates at King Street.

Nearby Areas

As discussed in "Perspectives for Impact Assessment," under Section IV.B, SEIR Study Approach, portions of the City that could be affected by the project were grouped and defined as nine Nearby Areas to provide a background and setting context for the Mission Bay Project Area. Locations of the Nearby Areas are shown in Figure IV.C.2. For purposes of this visual quality analysis, only seven of the nine Nearby Areas are discussed below since these are necessary to describe the visual setting. Land uses in all Nearby Areas (including Inner Mission and South Bayshore) are described in "Existing Land Uses in the Nearby Areas" in Section V.B, Land Use: Setting.

<u>Adjacent Port Property</u>

The area immediately adjacent to the Project Area to the east is mostly Port of San Francisco property. Port property also includes the China Basin Channel and part of the southern shoreline of the Channel. The Mission Creek Marina houseboat community is located near the west end of the Channel. A variety of architectural styles and sizes are exhibited by the approximately 20 resident houseboats in the Channel./2/

Port property also includes certain seawall (landside) lots, as well as Piers 40 through 68 and associated shoreline areas, east of Terry A. François Boulevard and south to 19th Street. As discussed in "Adjacent Port Property" under "Existing Land Uses in the Nearby Areas" in Section V.B, Land Use: Setting, the shoreline area contains maritime, recreational, industrial, office, restaurant, and night club uses. There are yacht and boat clubs and larger mooring facilities for commercial vessels near the shoreline area. Piers 48 and 64 are currently vacant and appear dilapidated. Much of the port property west of Terry A. François Boulevard is vacant or used for open air storage or materials processing. A fence separates the open storage areas from Terry A. François Boulevard.

Potrero Hill, North Potrero, and Showplace Square

The Potrero Hill Nearby Area is located immediately to the south and west of the Mission Bay Project Area and is separated from the Project Area by the Caltrain terminal tracks and the elevated I-280 freeway along Seventh Street. Industrial uses such as service shops and manufacturing warehouses occur in the freeway area and rail right-of-way. The North Potrero Nearby Area includes the commercial district between I-280 and U.S. 101 and consists of some commercial/retail, older light industrial land uses, and Showplace Square area. Showplace Square includes industrial buildings with brick facades ranging from three to six stories in height that have also been converted to wholesale and retail interior design showrooms and related uses. These uses provide a buffer for the predominantly multi-family residential uses located adjacent to the south of 17th Street and neighborhood-serving commercial uses concentrated along 18th and 20th Streets.

The Potrero Hill area rises in a southerly direction from about Mariposa Street, reaching a maximum elevation of about 200 feet above mean sea level (MSL). The upper portion of the Potrero Hill area is predominantly residential, including multi-family uses ranging from 2- to 4-unit buildings to 12- to 16-unit buildings. Residential buildings in this area are generally two to five stories high.

Lower Potrero/Central Bayfront

The Lower Potrero/Central Bayfront area borders the Project Area south of Mariposa Street. This area includes older industrial areas on either side of Third Street south to Islais Creek and a residential area at the base of Potrero Hill east of I-280. The residential units in this area, primarily clustered on Tennessee Street, include older Victorian buildings and are generally two to three stories in height. Some of the older large industrial warehouse buildings located in the Lower Potrero area have been converted to lofts and residential units. New live/work buildings have also been constructed in the area.

South of Market

The northern border of the South of Market Nearby Area extends to Market Street, San Francisco's main street, about a mile north of the Project Area. Much of the South of Market area is differentiated from the downtown area and Financial District north of Market Street by virtue of the scale, age, architectural style, and uses of the buildings.

The South of Market area near Mission Bay includes the China Basin Landing Buildings (an office complex adjacent to the Project Area), The Embarcadero, the Rincon Point-South Beach Redevelopment Area which includes the San Francisco Giants Ballpark site, the Yerba Buena Redevelopment Area, the Caltrain terminal, the China Basin area, the South End Historic District, and the port property between the Bay Bridge and China Basin Channel.

New buildings have been constructed in recent years, particularly the Moscone Convention Center, the Yerba Buena Center area, and new live/work residential units, but much of the South of Market area retains its predominantly manufacturing, light-industrial, and warehousing appearance. Most building heights range from about one to eight stories, especially south of Folsom Street. Although various portions of the South of Market area have undergone redevelopment, the overall appearance of the area remains utilitarian.

Along the waterfront, The Embarcadero extends from Fisherman's Wharf on the north until it reaches King Street on the south, a distance of 3.5 miles. The Embarcadero contains pedestrian pathways and a MUNI Metro right-of-way in the median. Existing streetscape features along The Embarcadero include specialty lamp posts, bollards/3/, benches, tree planters, railings, decorative cobblestone pavers, and concrete sidewalks with colorful signage. Along the length of The Embarcadero, street trees consisting of sycamores and palms, together with the pedestrian amenities, are intended to create a sense of visual continuity. These design features generally carry through along King Street into the Mission Bay Project Area. The future Giants Ballpark site, immediately adjacent to the Mission Bay Project Area, is located at the southernmost portion of The Embarcadero, at King Street, between Second and Third Streets.

The South Beach subarea of the Rincon Point-South Beach Redevelopment Area, which includes the future Giants Ballpark, is to the northeast of the Project Area. The character of this redevelopment area contrasts in architectural form and style with the mix of pier structures and accessory buildings along the east side of The Embarcadero, and the north side of King Street. Several 4-story to 12-story residential buildings are located along the west side of The Embarcadero. The bulk of these buildings appears to fill their roughly triangular-shaped lots, and provide visual continuity along the west side of The Embarcadero through common design themes and similar height and bulk.

The China Basin area currently consists of low-rise structures that tend to contrast visually with surrounding elements in the vicinity, such as Potrero Hill, the elevated structure of I-280 and I-80 to the southwest and north, the Mission Bay Golf Center and other industrial buildings in the Mission Bay Project Area, and the more distant high-rise buildings in the Financial District and the San Francisco Bay Bridge towers.

The South End Historic District, located north and northwest of the Project Area at King Street, is bounded by Brannan Street, Second Street, Bryant Street, Delancey Street, Townsend Street, and King Street. This historic district is a visual landmark, representative of the development of warehouses and industrial buildings over a 120-year period. The buildings in the district are of typical warehouse design, large in bulk, often with large arches and openings originally designed for easy rail or truck access. Most of the buildings have brick facades.

At Townsend Street and immediately adjacent to and north of the Project Area is the Caltrain terminal, which provides train service to the Peninsula and the South Bay. The rail lines extend west from the terminal to between Townsend and King Streets and then turn south along Seventh Street, generally under the elevated I-280 structure.

The two China Basin Buildings (bounded by Berry Street to the north, Third Street to the east, Fourth Street to the west, and China Basin Channel to the south) are rectangular and together occupy the entire block between Third and Fourth Streets. The China Basin Building is a six-story (approximately 90-foot-high) former warehouse fronting China Basin Channel from Third Street to Fourth Street. Originally constructed in 1921, this building was recently renovated. The three-story (about 50-foot-high) China Basin Landing Building adjacent to the China Basin Building (fronting Berry Street) was constructed within the last five years.

Mission Bay Project Area

The 303-acre proposed Mission Bay Project Area includes 65 acres located north of China Basin Channel and 238 acres located south of the Channel. Visually, the Project Area contrasts with surrounding areas that contain taller elements, such as Potrero Hill, high-rises in the Financial District and downtown, the China Basin Buildings and the I-280 structure, because existing buildings in the Project Area are lower and much of the land area is vacant. The Project Area is a relatively flat area and is industrial in appearance, containing a mixture of industrial and light industrial buildings, block-long warehousing/storage structures (i.e., truck terminals and shipping and distribution facilities) and warehouses, converted office buildings ranging in height from one to two stories, and vacant land. Pedestrian-oriented areas in the Project Area are limited to the area around the Channel, with its floating pier, docked houseboats and public access pier of the China Basin Building, and a portion of the western side of Third Street, which includes a sidewalk or walkway. Most of the buildings are similar in architectural details, size, scale and age. Large tracts of open area that were used in the past for rail lines are also located in the north and eastern/central portions of the Project Area. There are no major trees or landscape features within the Project Area. Prominent features in the Project Area include the 110-foot-high netted fence of the Mission Bay Golf Center, in the western portion of the Project Area; the conveyor towers of two concrete and gravel processing facilities on the eastern side of the Project Area, which reach a height of about three stories; and the five-peaked, low-rise roof of the Castle Metals building located on Mariposa Street at Third Street.

China Basin Channel, located between Channel Street to the south and King Street to the north, is a semi-natural aesthetic feature within the Project Area. It also serves as a physical divider between the north and south areas of the overall Project Area. The Channel varies in width from about 180 to 280 feet over its 4,000-foot length./4/ It contains 20 houseboats and 25 pleasure craft in the Mission Creek Marina.

The I-280 freeway structure visually defines the southwesterly boundary of the Project Area. Currently, there are two ramp structures of I-280 that are adjacent to the Project Area on the north side. The recently completed I-280 ramp structure leading to King Street is approximately 70 feet high. The other abandoned I-280 structure is about 100 feet high and parallels the north side of the Channel, terminating as a "stub" before Fifth Street. This I-280 stub is currently being demolished and will be completely removed by the year 2000.

Land uses in the Project Area are discussed in Section V.B, Land Use: Setting.

ARCHITECTURAL RESOURCES

The 1990 FEIR identified three existing structures within or adjacent to the Project Area that have been noted by historic or architectural surveys as important architectural resources. These structures are Fire Station No. 30, which is no longer in use, and the Lefty O'Doul Bridge and the Peter Maloney Bridge, both of which cross China Basin Channel. Fire Station No. 30, while not listed on either the 1974-1976 citywide Planning Department Architectural Inventory or the Foundation for San Francisco's Architectural Heritage survey, has been identified as potentially eligible for the National Register./5/ The station, located at Third, Fourth, and Mission Rock Streets, is constructed of red brick masonry in the Mission style. The building is two stories, with a Spanish tile roof surmounted by a low tower. The brick and masonry materials are sensitively designed and detailed. The building has a rear yard with an intricately detailed metal entrance gate flanked by two brick piers./6/

The two China Basin Channel bridges, the Lefty O'Doul drawbridge at Third Street and the Peter J. Maloney drawbridge at Fourth Street, located adjacent to the Project Area, are unique engineering structures. Both bridges have steel truss work and counterbalance structures. The Lefty O'Doul Bridge is a heel-trunnion bascule iron drawbridge and was built in 1933 by the Straus Engineering Company. The Peter Maloney Bridge was also built in the 1930's. Evaluations of the historic significance of the bridges have concluded that both are eligible for listing on the National Register of Historic Places./7/ The Lefty O'Doul Bridge is a designated City Landmark (No. 194).

URBAN DESIGN

The 1990 FEIR/8/ provides a description of the urban design features within the Mission Bay Project Area at that time. This description still applies to the Mission Bay Project Area today. The existing urban design characteristics of the Project Area reflect the railroading, shipping, and warehousing industries that developed in the 19th century and early 20th century. Street patterns, waterways, and building forms are indicative of the utilitarian nature of those industrial land uses. Large blocks and, therefore, fewer streets were developed to allow room for large one- and two-story warehousing and manufacturing buildings. The buildings in the area have no particular style of architecture and do not include special window, facade, or other decorative elements. No large trees or landscape features are present. As with most industrial areas, very little exists in the Project Area that would attract or encourage pedestrian use. The area around the Channel, with its floating pier, docked houseboats, and the public access pier of the China Basin Building (adjacent to the Project Area), offers some visual interest at the pedestrian level. Other areas, such as Berry Street, which is partially paved with no sidewalks, and Third and Fourth Streets with numerous warehouses and parking lots, the cement plant, and drawbridges, are not designed to promote pedestrian movement, but to facilitate the current industrial uses on site.

Although many on-site views are limited to buildings and structures associated with the industrial use of the area, it is because of these low-scale buildings and largely undeveloped land that long distance and panoramic views from many portions of the site are available of the downtown, Bay, Bay Bridge, and East Bay hills, as discussed in detail in the following subsection, "Existing Views."

EXISTING VIEWS

View corridors are defined by physical elements such as buildings and structures that guide lines of sight and control view directions available to pedestrians and motorists. Visual quality is also assessed through the consideration of: 1) building height, bulk, and architectural style as urban design elements; 2) pedestrian areas and amenities; and 3) open spaces and view corridors.

In general, because of the low elevation and relatively flat terrain, most of the Project Area is visible from surrounding areas. Similarly, existing views from the Project Area are primarily open and unobstructed, offering panoramic views of the Financial District and Potrero Hill because of the low-scale buildings and largely undeveloped land within the Project Area. The Project Area has few public open spaces and is not known as a place from which to enjoy views.

Thirteen viewpoints were selected for use in this analysis to provide a representative range of viewsheds of the Project Area, from the Project Area, and of the Project Area and the surrounding environment. Figure V.D.1 identifies the 13 viewpoint locations for existing conditions. (The rest of the figures referenced in this Setting section are located under "Views" in the Impacts subsection for easier comparison of existing conditions with potential project effects. For that reason, some of the figures referenced in the Setting subsection are not sequential.)

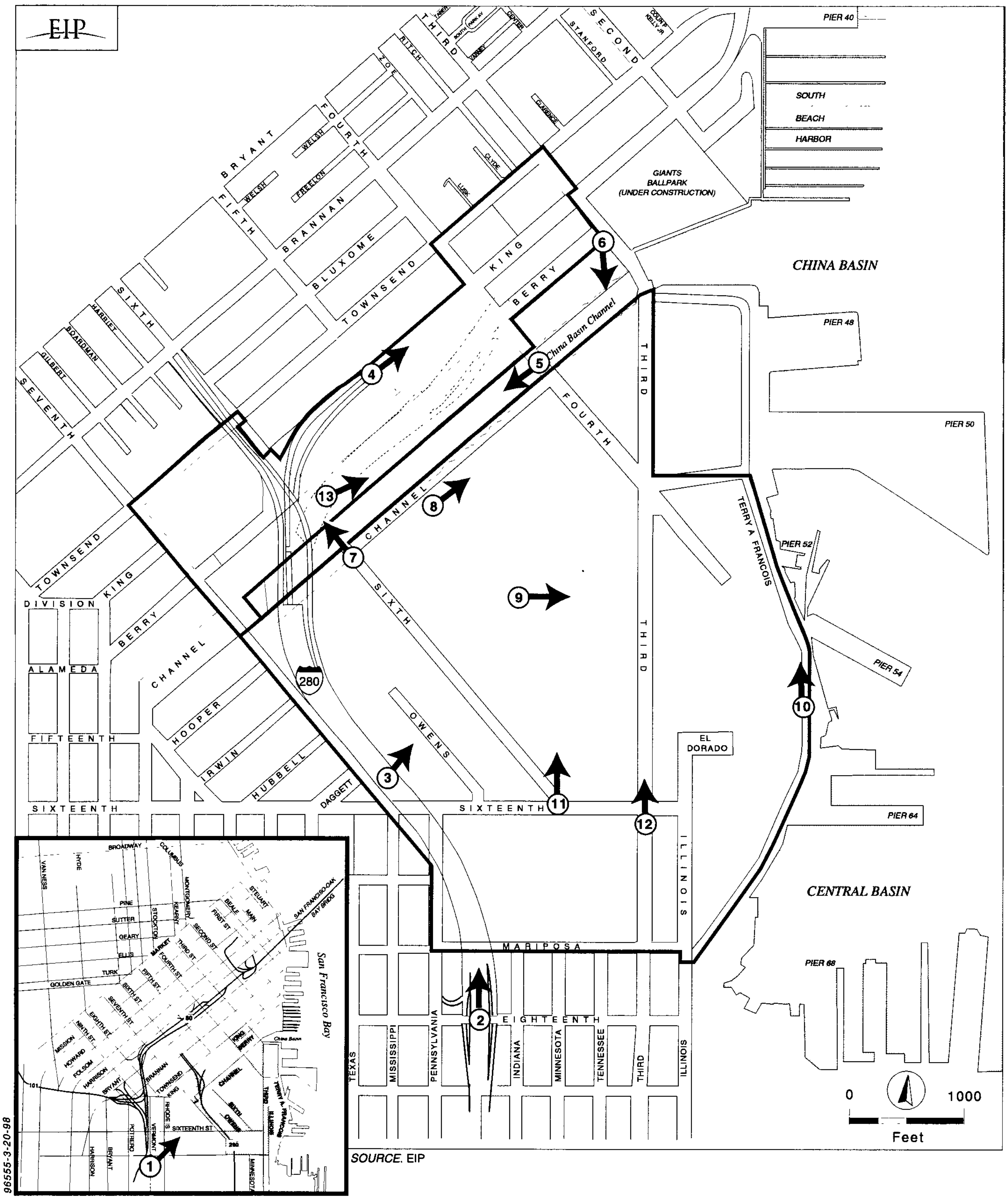
Views of the Project Area

Panoramic View From Potrero Hill: Viewpoint 1

Figure V.D.3 shows a panoramic view of the Project Area from Vermont Street between 18th and 19th Streets on Potrero Hill from the roof of the International Studies Academy (formally Patrick Henry School). This viewshed was selected in order to provide an unobstructed, panoramic view of the Project Area. Prominent features in the panoramic view include the downtown skyline, the I-280 freeway ramps, the Mission Bay Golf Center, the China Basin Buildings, and the more distant Bay Bridge. Farther away, Yerba Buena Island can be seen to the northeast. Beyond it, the East Bay hills can be seen. Short-range views include some residential units on Potrero Hill. These homes are in typical ranges of residential architectural styles found in San Francisco. Electrical and phone utility lines servicing the residential area are also visible.

View From I-280 Overcrossing at 18th Street: Viewpoint 2

Motorists traveling on I-280 in the northerly direction have direct views of the Project Area. Figure V.D.5(a) presents an existing view taken from the 18th Street overcrossing of I-280 looking north. As can be seen in the figure, this portion of the I-280 structure contains four lanes in each direction and has a width of approximately 200 feet. From this portion of I-280, motorists have a gateway view of the more distant, yet dominant, features of the area including the downtown high-rise structures to the north; the China Basin Buildings to the northeast; the Bay Bridge; the East Bay hills; the Bay; and Yerba Buena Island. Short-range views include the overall Project Area to the east, particularly the five-peaked (only four peaks shown in Figure V.D.5[a]) Castle Metals Building on Mariposa Street



MISSION BAY SUBSEQUENT EIR

FIGURE V.D.1 VIEWPOINT LOCATIONS-EXISTING CONDITIONS

just west of Third Street and the cement plant east of Third Street. An area containing trees and vegetation can also be seen adjacent and to the west of the I-280 freeway.

View From I-280 North of 16th Street: Viewpoint 3

Figure V.D.6(a) illustrates the view from I-280 just north of 16th Street, looking northeast. As with Viewpoint 2 at I-280 and 18th Street, motorists traveling north on I-280 also have direct views to the east of the Project Area. In this view, short-range features that can be seen include various warehouses throughout the Project Area, the truck terminal facility at Owens Street, and the Mission Bay Golf Center along Sixth Street. More distant features of downtown high-rises, the China Basin Buildings, Peter Maloney Bridge, and the Giants Ballpark site can also be viewed. The Bay Bridge and Yerba Buena Island are prominent in the background.

Views From or Near the Project Area

Northeast View Along King Street Near Fifth Street: Viewpoint 4

Figure V.D.7(a) illustrates the northeasterly view along King Street near the intersection of Fifth Street. Views along King Street show the recently completed King Street improvements, which included a wider four-lane street plus a center median (approximately 200 feet wide). The improvements include a wider sidewalk system on both sides of King Street, trees and other landscaping, ornamental street lighting, and MUNI E-line light rail vehicle tracks in the median. There are partial views of the I-280 stub to the south. Beyond the fence along the north side of King Street, there are partial views of the Caltrain terminal and Caltrain tracks. More distant features include the western end of the upper portions of the China Basin Building and partial views of the upper portions of the Bay Bridge.

Southwest View Across China Basin Channel: Viewpoint 5

As illustrated in Figure V.D.8(a) (at Fourth Street), the existing southwesterly view along China Basin Channel from the Peter Maloney Bridge includes both the recently reinforced I-280 structure to the west and the abandoned I-280 stub to the north. The I-280 structure is approximately 80 feet above the water line. Beneath the I-280 stub, there is unimproved land currently occupied by large trucks, soil stockpiles, and construction equipment.

Towards the south side of the Channel, Blanche's Pier is directly visible from the Peter Maloney Bridge. Blanche's Pier is just south of the bridge at Fourth Street and includes a restaurant and a public garden area. The south side of the Channel currently contains a small open space area at the westerly end, containing benches and trees. Although not visible in Figure V.D.8(a), Channel Street runs parallel to China Basin Channel. Parked trucks and cars can be seen along Channel Street. An office building is at Channel and Sixth Streets, as shown in the view in Figure V.D.8(a).

The northern and southern shorelines of the Channel are visible and are currently overlain with rubble, rocks, and sparse vegetation, as described in Section V.L, China Basin Channel Vegetation and Wildlife: Setting. At the westerly end of the Channel, houseboats and other water- craft are visible. There are partial views of the 110-foot-high netted fence of the Mission Bay Golf Center toward the southwest (on the left in this figure). Just beyond the fence are views of residential buildings on Potrero Hill. In the distance toward the west, there are partial views of Mt. Davidson (on the right in this figure).

South View From Lefty O'Doul Bridge: Viewpoint 6

From the western walkway of the Lefty O'Doul Bridge, there are direct views of the south bank of China Basin Channel. At the intersection of Third and Channel Streets, there are a few trees and shrubs. Figure V.D.9(a) shows the direct view from the bridge to Third Street. In the foreground, nearby warehouse structures can be seen to the south and various utility and light posts can be seen along Third Street, but the view from this point is primarily of vacant land south of the Channel. Potrero Hill and the Mission Bay Golf Center are also visible in the distance toward the southwest.

Northerly View of China Basin Channel: Viewpoint 7

Figure V.D.10(a) illustrates the view looking north over China Basin Channel from the western end of the Channel near Sixth Street. This view includes portions of the Mission Creek Marina, including the floating pier, houseboats, and other craft. The Channel's unimproved north shoreline is directly visible and contains rubble, rocks, and scattered vegetation. An overflow structure associated with the City's combined sewer system is directly visible on the north bank of the Channel. The I-280 Sixth Street off-ramp, the abandoned I-280 stub, which currently stands approximately 80 feet above the waterline, and the new King Street off-ramp are visible from this viewpoint.

More distant views across the Channel to the north include the South of Market area and downtown high-rises. The tower of the San Francisco Hilton Hotel and the Hyatt Union Square Hotel are both directly visible in this view. There are partial views of the Bank of America headquarters building above the I-280 stub.

Northeast View From Channel Street Area: Viewpoint 8

Figure V.D.11(a) shows the paved area immediately adjacent to the south side of Channel Street that is used for truck parking and loading/unloading. A truck terminal warehouse building is adjacent to the south side of the street (to the right in the figure). The China Basin Building is visible north of the Channel. The Peter Maloney Bridge and Lefty O'Doul Bridge are partially visible. Channel Street lacks sidewalks, and the sides of the roadway are currently used for parking. Further east along Channel Street is a fenced, vacant area containing stockpiled soils. There are a few trees along Channel Street; however, most of the area around the Channel lacks vegetation and is covered mostly with rubble and rocks. Channel Street contains uneven, cracked asphalt along the entire length of the roadway.

Views of the East Bay hills are partially visible to the east.

East View of Central Subarea: Viewpoint 9

Figure V.D.12(a) shows the undeveloped, dirt-paved truck parking/storage area looking east, just south of Channel Street. The parked truck trailers obstruct all direct easterly views, including views of the Bay and of buildings along Third Street. Overhead utility lines and lights can be seen traversing this view.

View From Terry A. François Boulevard Near Pier 54: Viewpoint 10

Figure V.D.13(a) illustrates the northwest view along Terry A. François Boulevard near Pier 54. Northwesterly views along the west side of Terry A. François Boulevard include one-story warehouses and vacant land with scattered vegetation formerly occupied by railroad tracks. On the west side of Terry A. François Boulevard (the left side of the figure) there is a chain-link fence. Along the eastern side of Terry A. François Boulevard (the right side of the figure), a fenced utility-storage area and warehouse on port property can be seen. There are no defined sidewalks on this portion of Terry A. François Boulevard. The China Basin Building and Peter Maloney Bridge are visible further north. The downtown high-rises and more distant Bay Bridge are also visible. Although not shown in the figure, visible from this location are views of maritime activities, such as tug-and-tow services, public boat launching facilities, and boat storage areas to the east of Terry A. François Boulevard.

View North From 16th Street Near Sixth Street: Viewpoint 11

Figure V.D.14(a) shows the view to the north near the intersection of 16th and Sixth Streets. The high-rises in the Financial District can be seen in the background. Near the corner of Sixth Street, the upper levels of the China Basin Building and warehouses that are located beyond the fence and along the roadway are partially visible (on the right in the figure). Overhead utility lines and street light posts are also visible.

Northerly View From Third Street Near 16th Street: Viewpoint 12

Views along Third Street are generally representative of the full range of land uses within the Project Area. As shown in Figure V.D.15(a), the northerly view along Third Street near 16th Street includes the Bode Gravel plant on the east side of Third street (to the right in the figure). The plant is currently in use and has an industrial appearance; it covers much of the area from 16th Street to Mission Rock Street. An old railway crossing system, a feature illustrating the past use of the Project Area, is directly visible. The row of light and utility poles that align the center median and western side of Third Street are within the view. Other utility lines are also seen crossing the area.

As shown in Figure V.D.15(a), the most prominent feature on the western side of Third Street is the large billboard situated above the existing structures (on the left side of the figure). The Triangle Sandwich Cafe is situated on the western corner of Third and 16th Streets. Further north along Third Street, there are views of various other light industries, such as a U-Haul Truck Rental Company.

More distant views include the China Basin Building and the high-rises in the Financial District to the northwest. The Bay Bridge can be seen to the northeast.

View of North Side of China Basin Channel Near Sixth Street: Viewpoint 13

Figure V.D.16(a), a northeasterly view from the north side of China Basin Channel, shows the I-280 elevated freeway stub, under demolition, the open area north of the Channel, the Channel, and the houseboat community. Portions of the China Basin Building and the Peter Maloney and Lefty O'Doul Bridges are visible east of Fourth Street; the East Bay Hills appear in the background.

Buildings north of the Caltrain tracks and Townsend Street are partially visible beneath the I-280 structure.

IMPACTS

This section discusses the potential effects of the project on the scale and intensity of development of the site, and on light and glare. The section also reviews proposed urban design standards and guidelines, and project effects on architectural resources. Changes in visual quality and lighting would result from three aspects of the Mission Bay project: 1) demolition of the existing buildings in the Project Area; 2) construction and build-out of the Project Area; and 3) lighting changes associated with the new development in the Project Area.

The degree of viewer sensitivity often depends on the length and frequency of the exposure to a view. Residents and recreational users are considered to have a higher concern over the visual quality of an area than shoppers and motorists who are transient users. Transient users are considered to have a medium to low concern over the visual quality of an area since they experience views for a shorter duration of time.

For purposes of this analysis, viewer groups who would have views of the Project Area include residents within Potrero Hill and the Project Area, recreational users, motorists traveling on elevated I-280 and surrounding roadways, employees and customers of surrounding retail businesses, employees of Project Area businesses, persons associated with UCSF, patrons of the Giants Ballpark, and MUNI patrons.

Also, for the purposes of this analysis, public views are scenic views from existing parks, plazas, major roadway or other public areas, and gateway and panoramic views from areas generally available to the public. Views from private property, such as residences, are not considered public views since they are not available to the general public.

STANDARDS OF SIGNIFICANCE

The existing visual character of the site is determined by the attributes of specific site features and by patterns that the features have assumed as a result of natural and/or cultural processes. Evaluation of potential project impacts on the existing visual character of the site requires analysis of each element of the project that would be introduced and how these changes (separately or collectively) would affect the character of the site and views of it from off-site locations. Significant impacts to the visual quality or character of a site may occur as a result of substantial, demonstrable, negative aesthetic effects; substantially degraded or obstructed important scenic views from public areas; or the production of new substantial light or glare.

DEMOLITION OF EXISTING PROJECT AREA BUILDINGS

Most of the buildings within the Project Area would be removed over time as construction occurs. There would be construction staging areas at various locations throughout the Project Area. Construction activities would occur at various locations within the Project Area through build-out, assumed for purposes of this SEIR to be through 2015. The demolished buildings would be replaced with the land uses and infrastructure proposed as part of the Redevelopment Plans (discussed in "Buildings to Be Demolished" in Section V.B, Land Use: Impacts). Additionally, demolition would remove stored materials, machinery, and equipment related to existing industrial, recreational, and maritime activities in the Project Area. The only existing structures that would remain within the Project Area at build-out would be the Channel Pump Station, the Peter Maloney and Lefty O'Doul Bridges, the I-280 structure and recently constructed ramps onto King Street, and possibly Fire Station No. 30.

INTERIM USES

During the build-out period, potential interim uses, including surface parking lots proposed at the north and south ends of the Mission Bay Project Area, would be visible, in part, from surrounding areas, including residential areas on Potrero Hill (see Figure III.B.4). While the interim surface lots could include some landscaping, interim parking lots would be visible from large areas within Mission Bay, if buffer features were not provided.

Lighting associated with the interim surface parking lots could potentially cause obtrusive glare when viewed from residential areas on the northern and eastern slopes of Potrero Hill. This would be a significant effect. The project would include a mitigation measure (Mitigation Measure D.1 in Section VI.D, Mitigation Measures: Visual Quality and Urban Design) to minimize spill lighting or glare in off-site areas while providing adequate lighting in the parking areas for patron visibility and safety.

As development of Mission Bay proceeds, views would change from an older industrial area to construction staging area, including interim structures, surface parking lots, increased vehicle traffic (associated with the parking lots and with construction activities), construction equipment, and a mix of old and new development. The visual contrast of new and old development would extend through the build-out period of Mission Bay.

URBAN DESIGN

This subsection presents a brief comparison between the currently proposed urban design features of the Redevelopment Plans (North and South) with the urban design features of the adopted 1990 *Mission Bay Plan*. Some of these features will be incorporated into the Design for Development documents; others will be included in Owner Participation Agreements (referred to collectively in this discussion as Redevelopment Plan documents). In addition, this subsection describes the proposed conceptual urban design features of the proposed redevelopment plan documents and how the existing character of the Mission Bay Area would be expected to change from a low-scale industrial area to a more intensely developed area with a greater scale, height, and bulk, and a variety of building types.

Adopted 1990 Mission Bay Plan

The 1990 FEIR discusses the Urban Design Element of the *San Francisco Master Plan*./9/ At that time, general urban design goals and policies that were part of the Element applied to the Mission Bay Area. However, upon adoption of the *Mission Bay Plan* (1990), the City's Urban Design Element was amended to be consistent with the adopted Plan. The amended Urban Design Element currently applies to the Mission Bay Area and thus provides specific design guidelines for building height, bulk, plan dimension, and diagonal dimension.

The 1990 *Mission Bay Plan* contains a number of objectives and policies that serve as design guidelines for future development. These guidelines address the creation of an urban pattern of streets, parks, and buildings that blend into the surrounding urban context, which aim to preserve and maximize views to and from the area. "Mission Bay Plan," in Section V.A, Plans, Policies, and Permits: Setting, lists the Plan's objectives. In general, the 1990 *Mission Bay Plan* intended for new development to recognize the physical transition from the higher elevations of Potrero Hill to the lower elevations of the shoreline. The 1990 plan calls for the taller buildings (typically, 85 to 95 feet, up to 110 feet north of Berry Street) nearer to Potrero Hill, stepping down to lower buildings (45 to 55 feet) closer to the shoreline, and thus providing for a planned general transition from higher to lower building heights from the north and west toward the east across the flat Mission Bay Project Area.

As part of the project, the 1990 *Mission Bay Plan* would be amended. The primary difference between the 1990 *Mission Bay Plan* and the proposed Redevelopment Plan documents is the higher height limits, up to 160 feet, compared to the 1990 Plan maximum height limit of 110 feet. The proposed Redevelopment Plan documents for Mission Bay North would allow certain buildings north of the Channel to reach a maximum of 160 feet (Height Zones HZ-1b and HZ-1a; see Figure III.B.5

and Table III.B.2, illustrating proposed height zones in Mission Bay). Additionally, the proposed Redevelopment Plan documents for Mission Bay South would allow certain buildings south of the Channel to reach a maximum height of 160 feet (Height Zones HZ-2, HZ-3, HZ-4, HZ-5, HZ-6, and HZ-7; see Figure III.B.5). As with the 1990 *Mission Bay Plan*, the proposed *Redevelopment Plan for Mission Bay South* would have lower height limits toward the Bay. The Redevelopment Plan would limit building heights to 65 feet and 90 feet near Terry A. François Boulevard (refer to Figure III.B.5). The proposed height and bulk standards of the Redevelopment Plans would limit the overall amount of developable area, other building dimensions such as maximum plan length and diagonal length, and the number of towers that could be at the maximum height limit of 160 feet (see Table V.A.1).

Overall, the 1990 *Mission Bay Plan* calls for about 8,270 new housing units concentrated in the central portion of the Project Area, while the proposed Redevelopment Plans call for approximately 6,090 new housing units primarily in the northern portion of the Project Area. The 1990 *Mission Bay Plan* calls for moderate density, as typical San Francisco three-story units over a garage, while the proposed Mission Bay Redevelopment Plan documents envision a smaller but more dense residential area, generally consisting of five- and six-story buildings, and residential towers up to 16 stories (160 feet), as shown in Figure III.B.5.

Other types of land uses as part of the 1990 *Mission Bay Plan* are similar to the proposed land uses within the proposed Redevelopment Plans. (Refer to "Land Use Designations" in Section V.A, Plans, Policies, and Permits: Comparison with Existing Plans and Policies.)

The UCSF site proposed within the Project Area would be a new feature not considered in the 1990 *Mission Bay Plan*. While the University of California is generally exempt from local planning, zoning, and redevelopment regulations when using its property for educational purposes, UCSF site design concepts are assumed in the analysis in this section.

Proposed Redevelopment Plans

Overall, the proposed Redevelopment Plans for Mission Bay North and Mission Bay South would establish major public open space corridors along China Basin Channel, the waterfront, and a new east-west corridor park (The Common); establish a continuous building edge along the residential part of the Fourth Street Corridor; limit building heights adjacent to open space areas and near the Bay; limit heights at the edge of the Project Area in the areas flanking the Channel to blend with the smaller scale adjacent areas; have higher height limits near the Giants Ballpark; and allow for a group of taller buildings along Third Street. This overall design approach would yield a high-density, urban streetscape.

In order to assess the changes in visual quality that would result from the construction of the proposed project, it is necessary to describe the physical components and appearance of the project. The proposed Redevelopment Plan documents/10/ set forth specific standards, which are design requirements that would govern the development and build-out of the Mission Bay project. They serve to regulate land use, height, bulk, density, maximum development, setbacks, coverage, streetwalls, view corridors, open areas, and parking/loading access. Those design standards are discussed in "Proposed Land Uses" in Section III.B, Project Description. Based upon the design standards, future development can be conceptually described. In addition, the Redevelopment Plan documents include guidelines, recommendations intended to be applied in project review of individual redevelopment proposals in a manner that is consistent with the densities, intensities, land uses and infrastructure standards of the Redevelopment Plans. In contrast to the standards, the guidelines would not be absolute requirements. The discussion below summarizes the key design standards and guidelines proposed for the Project Area. The Redevelopment Plans for Mission Bay North and Mission Bay South set forth the allowable land uses for: Mission Bay Residential, Mission Bay North Retail, Hotel, Commercial Industrial, Commercial Industrial/Retail, Mission Bay South Retail, and Mission Bay Open Space. The Redevelopment Plan documents provide general design criteria as well as criteria specific to those use designations.

Mission Bay Residential

The Redevelopment Plan design standards would have a dominant height for the Mission Bay Residential areas of 65 feet (about four to five stories high; approximately 75% to 80% of the developable area for Height Zones HZ-2, HZ-3, and HZ-4 could be constructed up to this height). Mid-rise buildings up to 90 feet high and towers up to 160 feet high may be constructed within a percentage of the developable area of each height zone for the residential areas. Towers would not be permitted within 100 feet of the north side of the Channel (within HZ-1b), and on the areas fronting Terry François Boulevard within Height Zone 4 (HZ-4).

This proposed residential land use is intended to create a pedestrian-oriented environment with continuous street frontages, frequent entrances, ground floor, neighborhood-serving retail uses, mid-block and other walkways, and a network of private and public open space areas.

Mission Bay North Retail

The Mission Bay North Retail land use designation includes entertainment-oriented commercial uses across Third Street from the under-construction San Francisco Giants Ballpark (refer to Figure III.B.5). These retail/entertainment uses are intended to complement the ballpark activities. The design standards would allow mid-rise buildings up to 120 feet high and towers up to 160 feet within a percentage of the developable area of Height Zone 1a (HZ-1a). The guidelines call for tower locations at major intersection and transit stops along King and Third Streets in a manner that would preserve designated view corridors. Guidelines would also encourage continuous street-level uses, and open space for pedestrian scale.

Mission Bay Hotel

The Mission Bay Hotel use is designated in Mission Bay South, at Third Street and the extended Owens Street. The design guidelines for this use would encourage public functions, such as restaurants, retail and lobby areas, to be oriented towards Owens and Third Streets and for hotel development to relate to proposed open space and the nearby Channel. Portions of the hotel could be up to 160 feet.

Commercial Industrial

The Commercial Industrial uses would be within the Mission Bay South Redevelopment Plan. The primary land uses within this land use designation would include light manufacturing, research laboratories, wholesale, including warehousing, and office. These uses are within Height Zones HZ-5, HZ-6 and HZ-7 (refer to Figure III.B.5). The base height in these zones would be generally 90 feet. Tower structures up to 160 feet would be allowed in each of these height zones. To help preserve views from I-280, only 60% of the buildings within 100 feet from the I-280 freeway within HZ-7 would be permitted above the height of the freeway. Guidelines would encourage tower structures within HZ-7 to be separated by a minimum distance of 100 feet when located on the same block and to be separated by 200 feet near the I-280 freeway. The guidelines also would encourage a variety of building heights with buildings at the property line and a continuous streetwall along major streets.

Mission Bay South Retail

The Mission Bay South Retail designation would include a broad range of neighborhood-serving and city-serving retail, as shown in Figure III.B.3. Height and bulk limits would be governed by design standards in their respective height zones, with heights ranging up to 90 feet.

Guidelines for retail developments would encourage active street-level frontages, appropriate design treatments for windowless walls, and orienting parking areas away from Third and Mariposa Streets.

Mission Bay Open Space

The Mission Bay Open Space system is intended to create a variety of public amenities and spaces for passive and active recreation. About 47 total acres of public open space would be provided as part of the proposed Redevelopment Plans, including 8 acres within the UCSF site. (Figure V.M.3 shows the main locations for the proposed open space system.) Parks would be located along the northern and southern edges of China Basin Channel, along Terry A. François Boulevard near the Bay shore; and as part of The Common, which would run east-west.

Design guidelines would encourage continuous bicycle and pedestrian pathways, active uses in open space areas (athletic playing fields, court games, children's play areas, informal lawn recreation and paths for skating, walking, jogging, and bicycling), and passive recreation (strolling and walking, and places for sitting and viewing).

ARCHITECTURAL RESOURCES

The Cultural Resources Evaluation prepared for the 1990 FEIR concluded that Fire Station No. 30, located at the southeast corner of the intersection of Third and Mission Rock Streets, is considered potentially eligible for the National Register based on criterion "c" described below. Department of Interior regulations describe National Register criteria for listing as follows:

> The quality of significance in American History, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (a) are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction; or (d) that have yielded or may be likely to yield information important in history or prehistory./11/,/12/

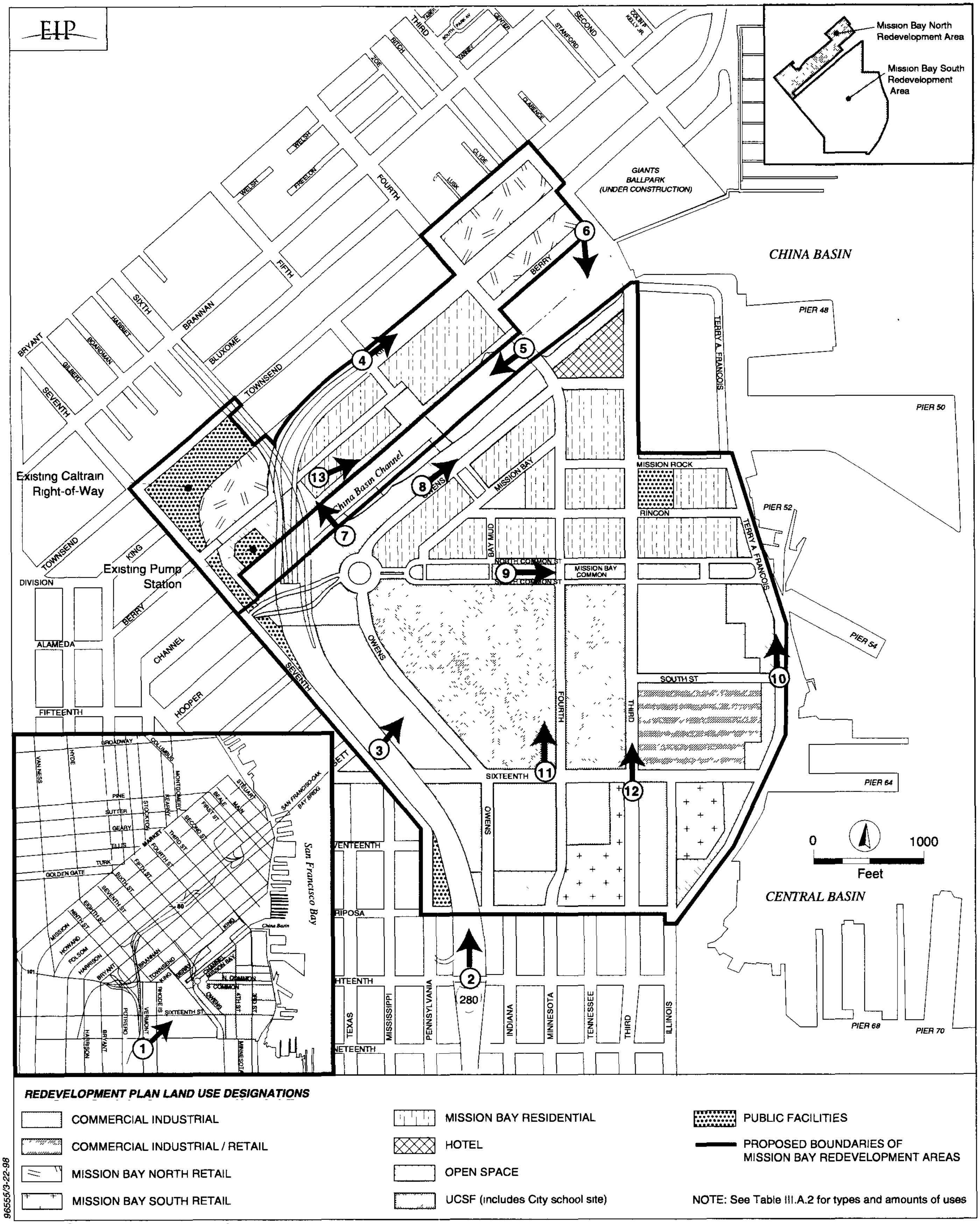
The closed fire station is located on a 0.26-acre parcel of city-owned land. The surrounding 1.26 acres of land is owned by Catellus. Under the proposed Mission Bay South Redevelopment Plan, Catellus would transfer that surrounding 1.26 acres to the City for the purpose of building new police and fire stations. No decision has been made regarding the existing building. The City might retain and rehabilitate Fire Station No. 30, or it could choose to demolish the building. Retention of the building to incorporate it into new fire or police facilities might destroy architectural characteristics contributing to the building's eligibility for the National Register. Because Fire Station No. 30 is considered potentially eligible for the National Register, and therefore a significant cultural resource, demolition of the building or alterations that would preclude its eligibility would constitute a significant impact. This potentially significant impact would be mitigated by Measures D2.a and D2.b in Section VI.D, Mitigation Measures: Visual Quality and Urban Design.

The Lefty O'Doul Bridge and the Peter Maloney Bridge are outside the Project Area and are not proposed to be modified as part of the project. The project would not significantly affect the setting or function of the bridges. Although not part of this project, the Department of Public Works has undertaken planning and design for seismic upgrade of both bridges. The visual quality of the bridges will be unaffected by the seismic upgrade projects.

VIEWS

A three-dimensional model was prepared by Johnson Fain Partners, architects for Catellus, to represent the conceptual massing, lot coverage, heights, and vertical setbacks associated with the proposed project. Square One Productions, under the supervision of EIP Associates, developed visual simulations from 13 selected viewpoints based upon this three-dimensional model. At this time, specific building locations, size, and design are unknown. Therefore, the simulations depict basic sizes and massings based on proposed redevelopment plan documents height and bulk limits and are not intended to represent specific uses or architectural design for buildings that will ultimately be proposed if the project is approved. There are numerous building configurations that could ultimately occur at the project site under the proposed redevelopment plan documents. The simulations depict representative height and massing within each height zone and include structures at maximum proposed height limits. The simulations also lack streetscape furniture and amenities and detailed architectural treatments, such as windows, entries, cornices or canopies, and other features and thus tend to appear more stark and box-like than the likely actual buildings. Some of the simulations include limited landscaping and street lighting features; those features are intended to help illustrate the size and scale of buildings in the views. However, actual landscaping and streetscape features would be designed as part of implementation of the Redevelopment Plan documents.

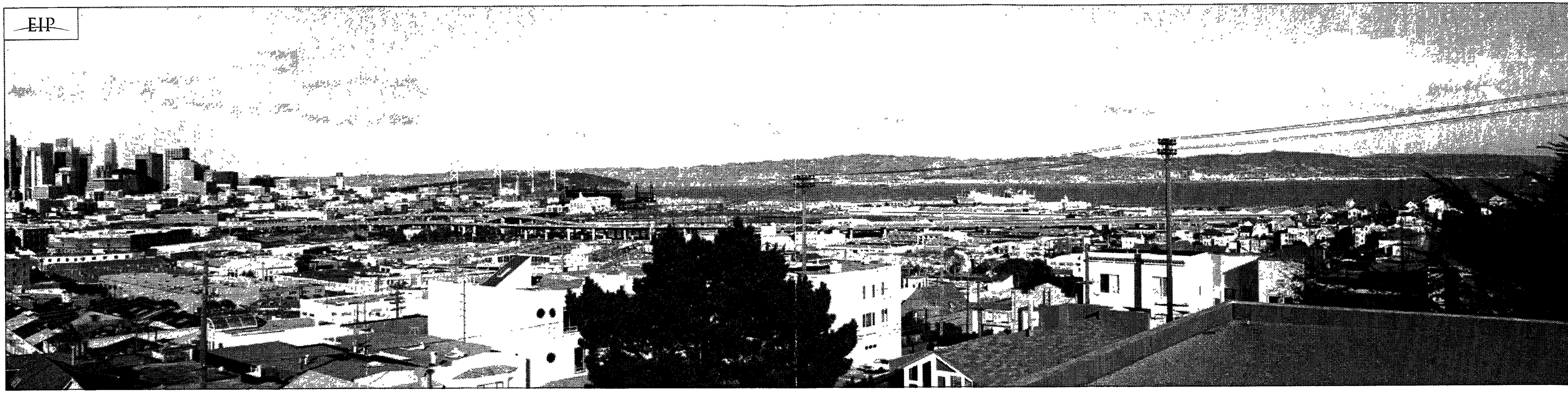
Figure V.D.2 shows locations of the viewpoints of the simulations on a map of the proposed Project Area land uses.

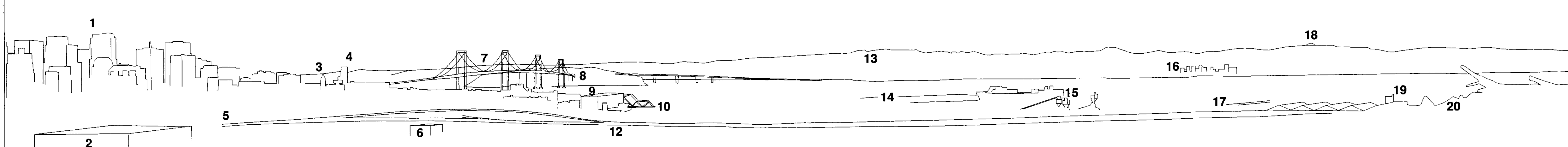


SOURCE: San Francisco Redevelopment Agency

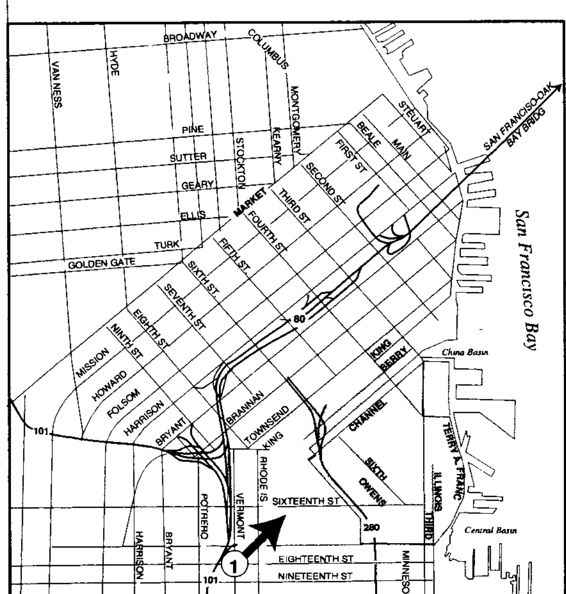
MISSION BAY SUBSEQUENT EIR

FIGURE V.D.2 VIEWPOINT LOCATIONS– PROPOSED PROJECT





1. DOWNTOWN SAN FRANCISCO
2. BAKER-HAMILTON DESIGN CENTER
3. CLOCKTOWER-SECOND STREET AT BRYANT
4. BANK OF AMERICA SIGN-FIRST STREET AT HARRISON
5. SIXTH STREET ON/OFF-RAMPS TO/FROM I-280
6. CHANNEL PUMP STATION
7. SAN FRANCISCO-OAKLAND BAY BRIDGE
8. YERBA BUENA ISLAND
9. CHINA BASIN BUILDING
10. LEFTY O'DOUL BRIDGE AT THIRD STREET
11. CHINA BASIN CHANNEL
12. I-280
13. OAKLAND HILLS
14. PIER 50
15. KAISER SAND AND GRAVEL
16. DOWNTOWN OAKLAND
17. PIER 64
18. MT. DIABLO
19. SAND AND GRAVEL CONVEYOR
20. POTRERO HILL

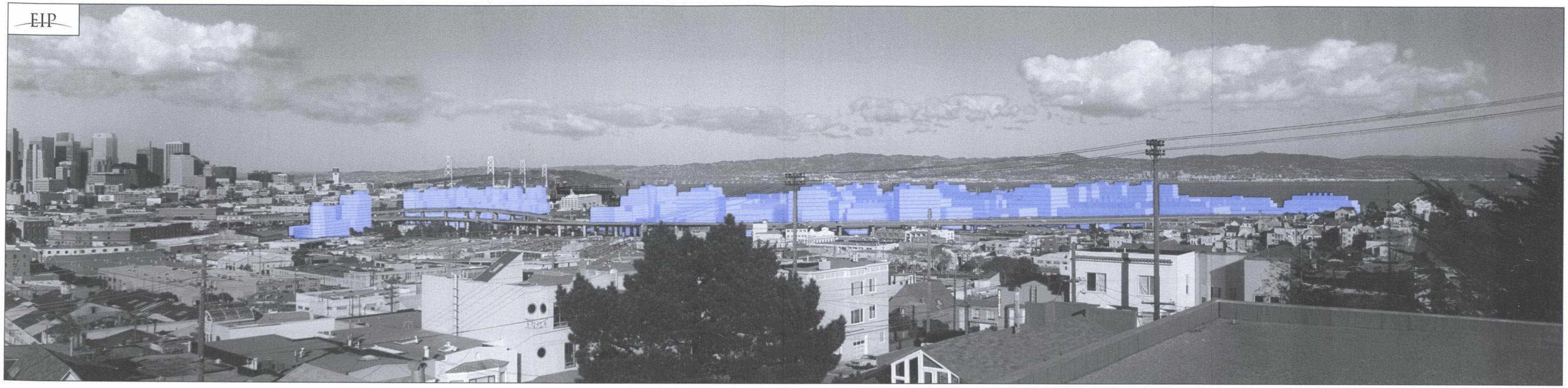


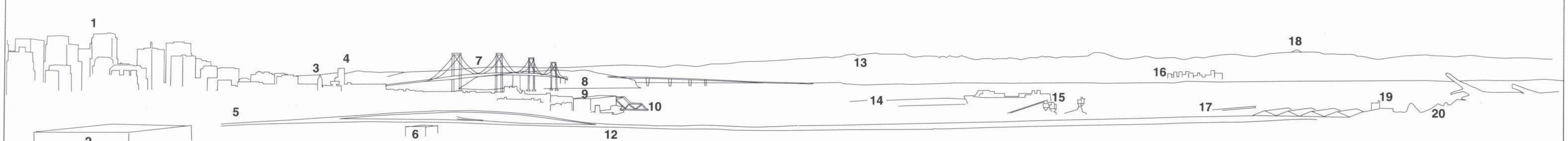
SOURCE: Square One Productions

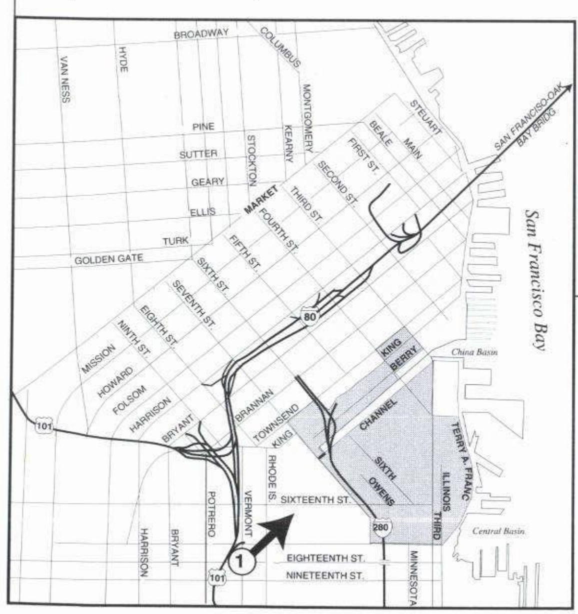
NOTE: The photograph was taken from the roof of The International Studies Academy, 639 Vermont Street near 18th Street, to provide an unobstructed view of the Project Area. Although the viewpoint is not publicly accessible, it is similar to views partially available from streets and residences on Potrero Hill

MISSION BAY SUBSEQUENT EIR

FIGURE V.D.3 EXISTING PANORAMIC VIEW FROM POTRERO HILL







1. DOWNTOWN SAN FRANCISCO
2. BAKER-HAMILTON DESIGN CENTER
3. CLOCKTOWER-SECOND STREET AT BRYANT
4. BANK OF AMERICA SIGN-FIRST STREET AT HARRISON
5. SIXTH STREET ON/OFF-RAMPS TO/FROM I-280
6. CHANNEL PUMP STATION
7. SAN FRANCISCO-OAKLAND BAY BRIDGE
8. YERBA BUENA ISLAND
9. CHINA BASIN BUILDING
10. LEFTY O'DOUL BRIDGE AT THIRD STREET
11. CHINA BASIN CHANNEL
12. 1-280
13. OAKLAND HILLS
14. PIER 50
15. KAISER SAND AND GRAVEL
16. DOWNTOWN OAKLAND
17. PIER 64
18. MT. DIABLO
19. SAND AND GRAVEL CONVEYOR
20. POTRERO HILL

SOURCE: Square One Productions

NOTE: The photograph was taken from the roof of The International Studies Academy, 639 Vermont Street near 18th Street, to provide an unobstructed view of the Project Area. Although the viewpoint is not publicly accessible, it is similar to views partially available from streets and residences on Potrero Hill.

The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design.

MISSION BAY SUBSEQUENT EIR

FIGURE V.D.4 POTENTIAL PANORAMIC VIEW FROM POTRERO HILL

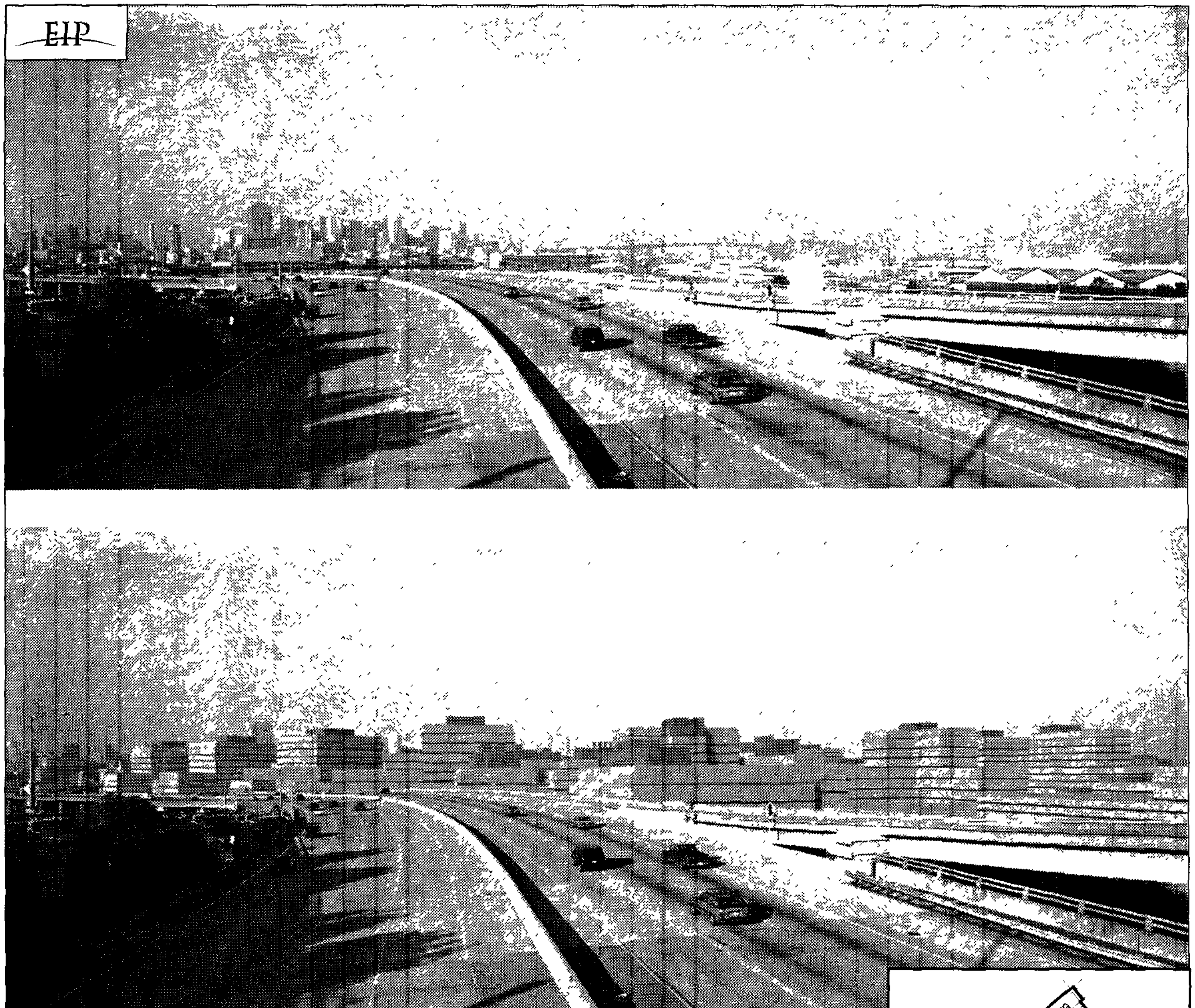
Views of the Project Area

Panoramic View on Potrero Hill: Viewpoint 1

As illustrated in Figures V.D.3 and V.D.4, panoramic views of the Project Area as seen from Potrero Hill would change from a largely undeveloped and low-scale industrial area to a densely built urban environment with building heights ranging from below 65 feet up to 160 feet. The project would result in a change in the overall visual character and scale of the Project Area. Development in the Project Area would create a visual environment more consistent with existing urbanized environment that surrounds the Project Area, such as the South of Market and downtown areas to the north; it would be more intensive than industrial and residential uses to the west and the residential areas to the south. The project would include towers at certain locations that could reach as high as 160 feet, as shown in Figure V.D.4; proposed design standards would limit the numbers and locations of these towers. Views of existing features from certain locations on Potrero Hill, such as from area roadways or Jackson Playground, would be reduced, but not eliminated. Building massing would obscure views of lower buildings and structures beyond Mission Bay, but views of the downtown skyline from most of Potrero Hill would remain. Views of the Bay Bridge, Bay, and East Bay hills from streets and private residences on the lower portions of Potrero Hill would be partially or fully obstructed. These visual changes would not be significant because important scenic views from public areas would not be substantially degraded or obstructed. However, views of the Project Area and beyond from lower portions of the hill are more likely to be already obstructed by existing buildings.

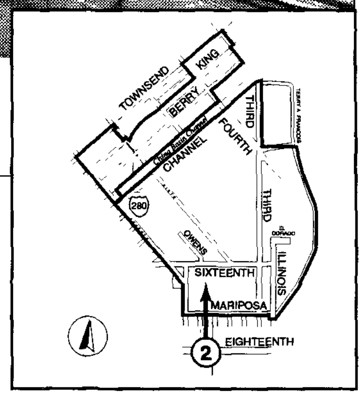
View From I-280 Overcrossing at 18th Street: Viewpoint 2

As shown in Figure V.D.5(b), from I-280 at 18th Street, development within the Project Area would be highly visible. Motorists traveling along this portion of I-280 would have views of numerous mid-rise and high-rise structures (up to 160 feet) throughout the Project Area. Short-range views of development within Mission Bay would be primarily of commercial industrial uses located immediately east of the freeway. At least 60% of the commercial industrial development near the freeway would be set back a minimum of 100 feet from the freeway. Height Zone 7 within the Project Area runs adjacent to I-280 (see Figure III.B.5). Allowable building heights within Height Zone 7 would exceed the height of the freeway in limited locations. Four towers (160 feet high) would be allowed in Height Zone 7 with a minimum separation of 200 feet. A majority (85%) of the commercial industrial buildings near the freeway would be allowed up to 90 feet high. Long-range views to the north would include residential development, and to the east, the UCSF site. While



Top: I-280 view at 18th Street

Bottom: Potential I-280 view at 18th Street



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SOURCE: Square One Productions

NOTE. The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design

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FIGURE V.D.5 EXISTING AND POTENTIAL VIEWS FROM I-280 OVERCROSSING AT 18TH STREET

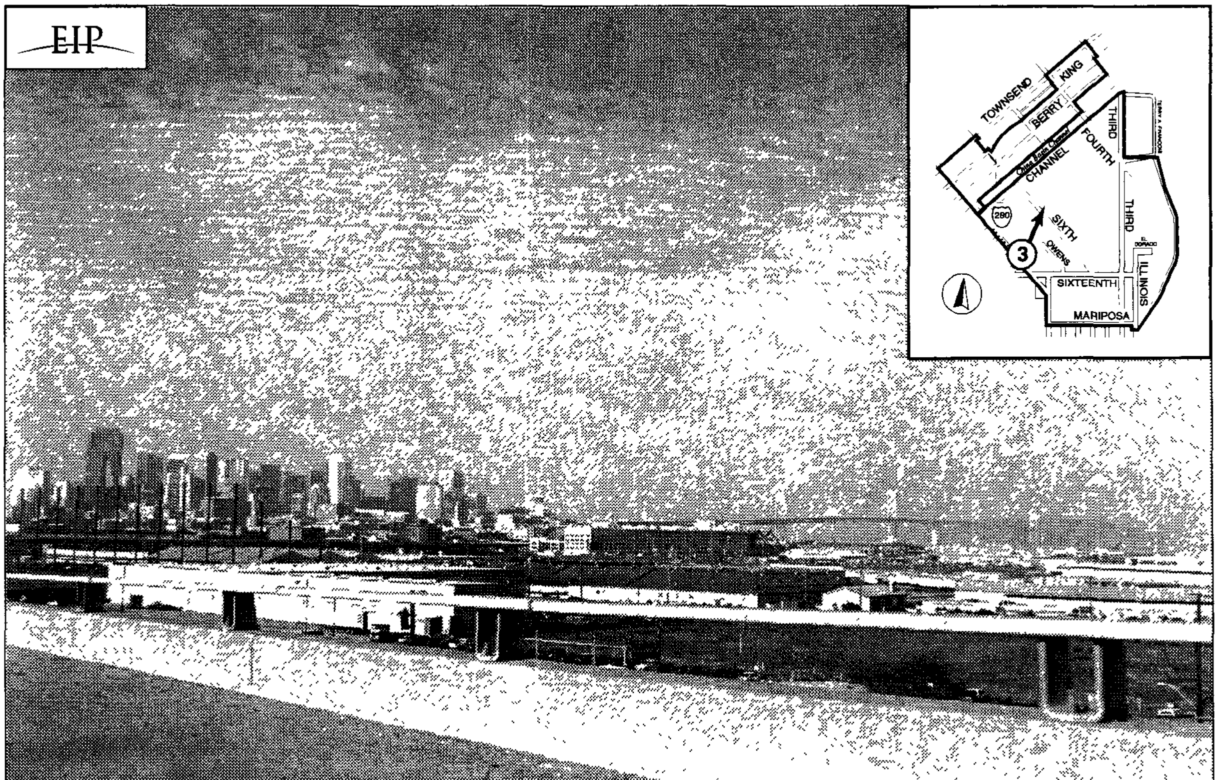
motorists traveling along I-280 would have a relatively short period to view the Mission Bay area, those changes would be noticeable.

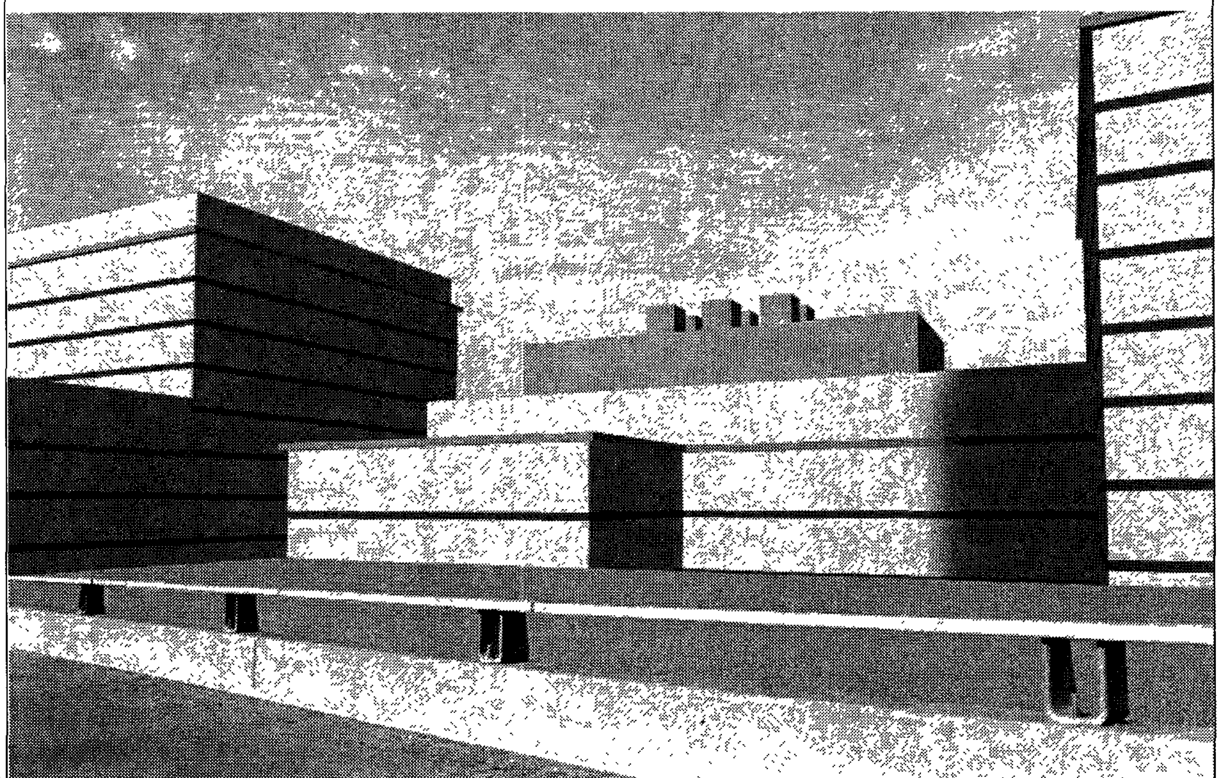
More distant views of downtown from I-280 at this location would be partially changed. Long-range views north and northeast toward the Bay Bridge and the East Bay hills would also be limited by new development, intermittently blocked by the taller buildings and towers in the Project Area. The Bay Bridge would be minimally visible, and the Bay edge of the East Bay would be completely obstructed. Views of Treasure Island would likely be eliminated. Views toward the Bay edge would not be substantially altered since existing development currently hinders visual access from this location to the shoreline area; however, distant views of Bay waters would be diminished.

Overall, views of the Project Area would substantially change from a largely undeveloped but industrial visual environment to a highly urbanized visual environment, with up to 160-foot-high tower structures providing the dominant visual features of the Project Area. Long-distance, gateway views of certain regional visual resources from I-280 at this location would be substantially reduced or removed. However, the intermittent blocking of these long-range views of certain features from an urban freeway is not considered to be a significant effect.

View From I-280 North of 16th Street: Viewpoint 3

As illustrated in Figure V.D.6(b), the view from I-280 just north of 16th Street and toward the northeast would be substantially affected by the proposed project. From this viewpoint, views of new commercial/industrial development and the UCSF site would replace panoramic views of the China Basin and downtown areas. At least 60% of the commercial/industrial buildings would be set back a minimum of 100 feet from the I-280 structure, and new development would range in height from 90 to 160 feet. Up to four towers at the maximum height level could be constructed near the freeway (within Height Zone 7). There would be intermittent views of the new UCSF site, which would contain structures ranging in height from approximately 30 feet up to 160 feet high at selected locations. As shown in Figure V.D.6(b), mechanical stacks on top of the lab buildings within the UCSF site could add up to 30% additional height and would be visible from I-280. Motorists traveling on I-280 would no longer have any views at this particular point of the Bay Bridge, China Basin Building, Treasure Island, the Lefty O'Doul Bridge, and the Giants Ballpark since new development would completely obstruct these features. However, at some points along this freeway section, and on the freeway north and south of this section, such views would be intermittently observable. The Redevelopment Plan design standards would limit building heights on Block 43 east of I-280 near the Sixth Street off-ramp. Motorists near this location would continue to have views towards downtown, the Bay Bridge, and the East Bay.





Top: Existing view from I-280 north of 16th Street
Bottom: Potential view from I-280 north of 16th Street

96555/3-20-98

SOURCE Square One Productions
NOTE: The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design.

MISSION BAY SUBSEQUENT EIR

FIGURE V.D.6 EXISTING AND POTENTIAL VIEWS FROM I-280 NORTH OF 16TH STREET

Overall, views of the Project Area would change from a largely underdeveloped industrial area to a highly urbanized, mixed-use environment, with 16-story structures providing the predominant visual features of the Project Area. These changes and intermittent loss of panoramic views from the I-280 freeway would be seen by motorists and would form part of the future urban landscape. While motorists traveling along I-280 would have a relatively short period to view the Mission Bay area, those changes would be noticeable. Intermittent blocking of these long-range views of certain features from an urban freeway is not considered to be a significant effect.

Views From or Near the Project Area

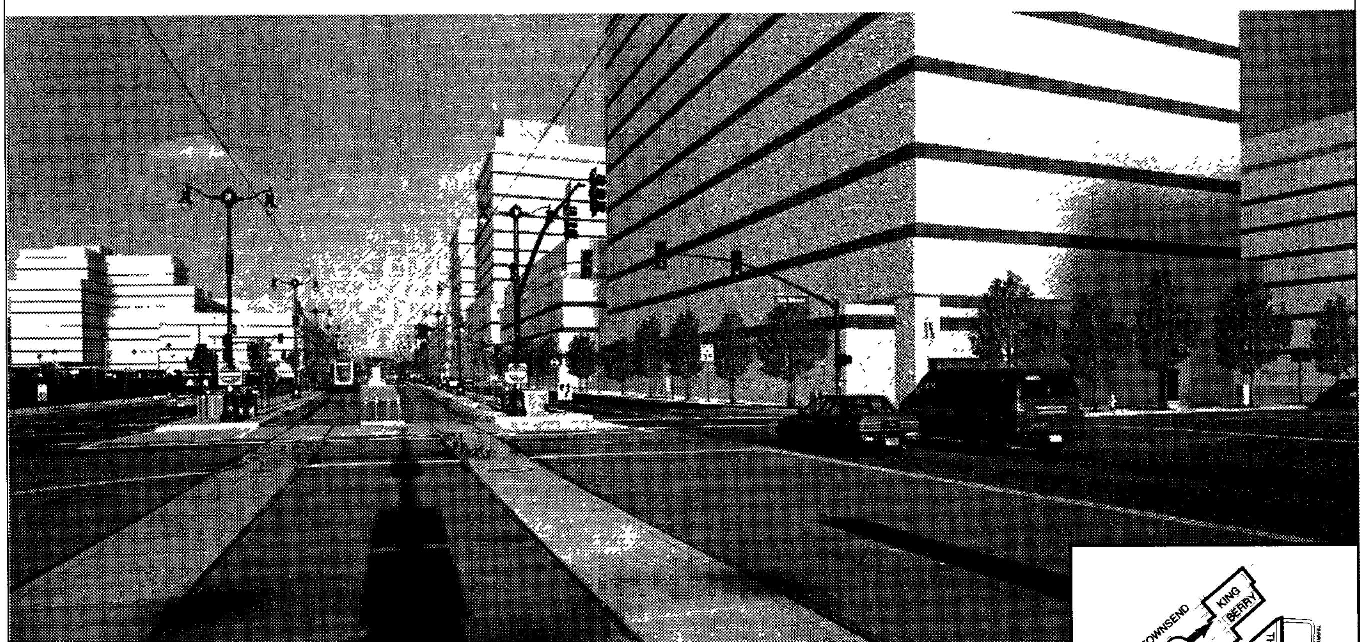
Northeast View Along King Street Near Fifth Street: Viewpoint 4

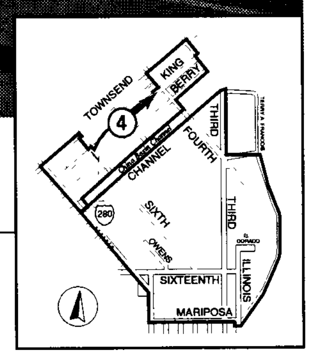
As shown in Figure V.D.7(b), northeasterly views along King Street would include direct views of approximately 65- to 160-foot-high residential structures to the south. A maximum of six towers within Height Zone 1b (see Figure III.B.5) could reach a height of 160 feet. More distant views to the north along King Street on the north side would include retail/entertainment structures and residential development, with up to six tower structures reaching up to 160 feet. Although not visible in Figure V.D.5(b), the Giants Ballpark, south of King Street at Third, would be beyond these structures, at a height of about 130 feet with light towers up to about 175 feet. The Caltrain tracks and adjacent terminal to the north beyond the fence along the north side of King Street would be unchanged.

Views of the China Basin Building to the southeast would be obstructed by intervening residential structures. The approximately 45- to 75-foot-high I-280 stub would be demolished and replaced with new residential development. Overall, northerly views along King Street would be of a more intensely developed residential and retail/commercial area.

Southwest View Across China Basin Channel: Viewpoint 5

As shown in Figure V.D.8(b), a feature in this viewshed would be the proposed Fifth Street pedestrian bridge that would extend across the Channel, connecting the open space areas on both sides (north and south) of the Channel. The bridge would provide pedestrian access from north of the Channel to the Mission Creek park on the south side of the Channel. Southwesterly views from the Peter Maloney Bridge would include rip-rap and vegetation on both sides of the Channel. Views of the north side of the Channel would include vegetation along the banks of the Channel, and open spaces areas including features such as a paved pedestrian pathway. Although not shown in Figure V.D.6(b), two larger recreational open space areas are proposed to link with the linear open space



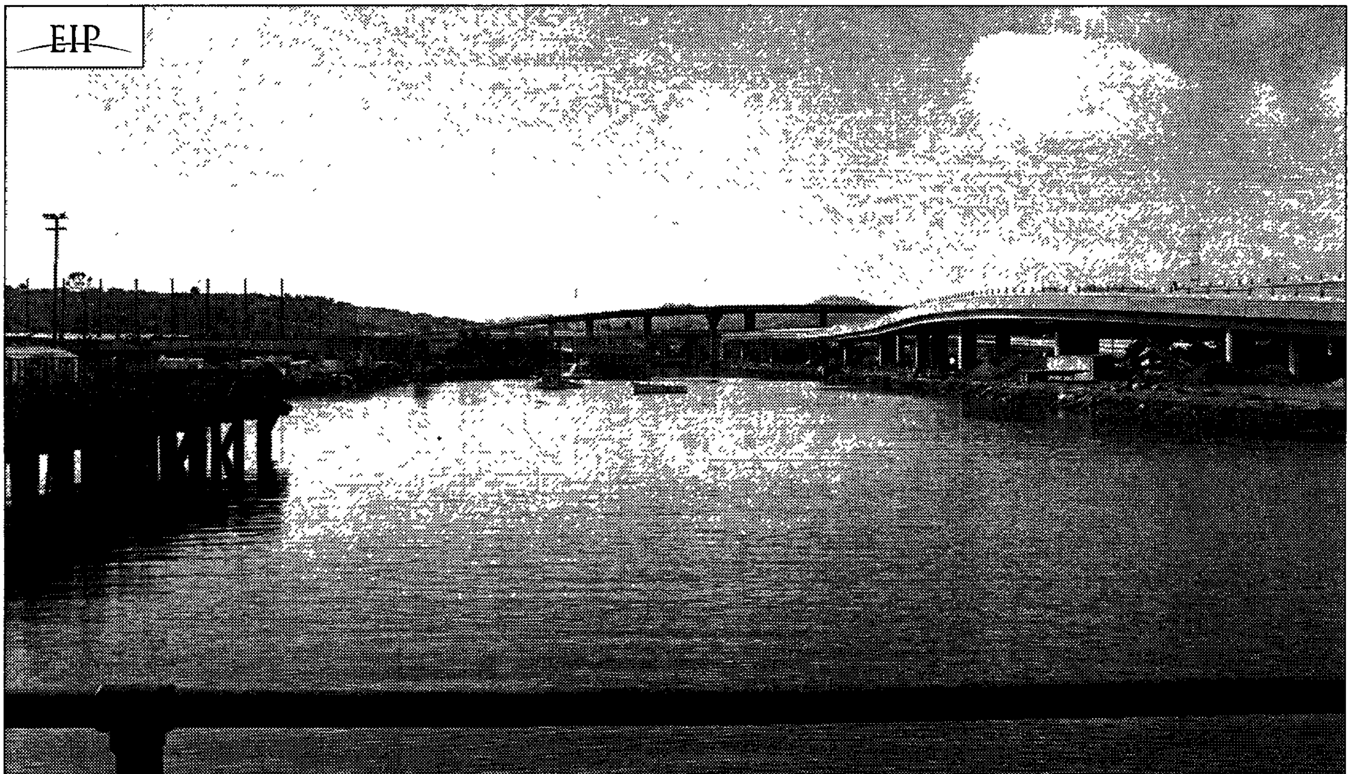


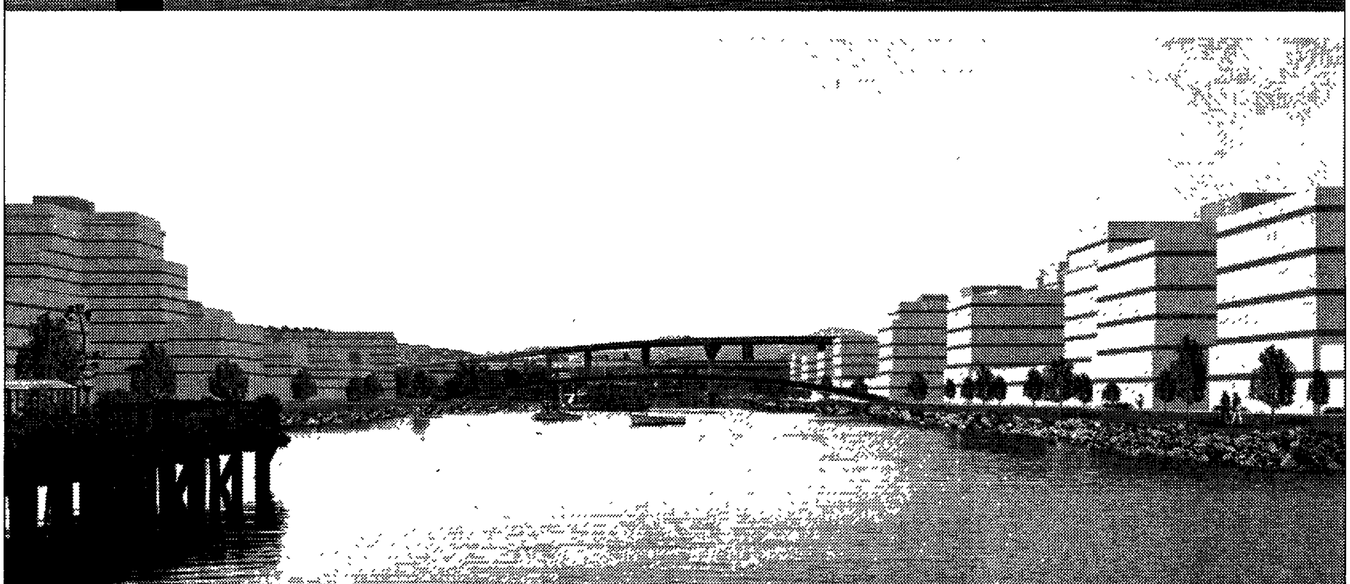
Top: Northeast view along King Street near Fifth Street
Bottom: Potential northeast view along King Street near Fifth Street

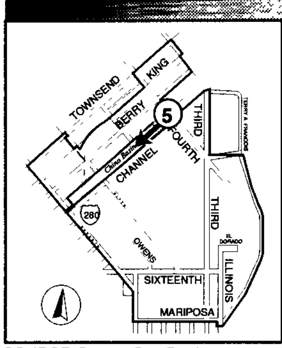
96555/3-20-98

SOURCE Square One Productions
NOTE The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design.

FIGURE V.D.7 EXISTING AND POTENTIAL NORTHEAST VIEW ALONG KING STREET NEAR FIFTH STREET







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Top: Southwest view across China Basin Channel
Bottom: Potential southwest view across China Basin Channel

SOURCE: Square One Productions
NOTE. The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design

MISSION BAY SUBSEQUENT EIR

FIGURE V.D.8 EXISTING AND POTENTIAL SOUTHWEST VIEWS ACROSS CHINA BASIN CHANNEL

along the north side of the Channel, Fifth Street Square and open space areas under and adjacent to I-280 (refer to Figure V.M.3). Landscaped edges along the north side of the Channel would contain three cantilever structures providing viewing points along the Channel.

Linear open space would extend along the entire length of the south side of the Channel. Although not entirely visible in Figure V.D.8(b), proposed open space would be visible from this viewpoint, and would connect to a larger open space area at the far western end of the Channel. Those open space areas would replace the views of the parked cars along Channel Street and of the netted fence surrounding the Mission Bay Golf Center.

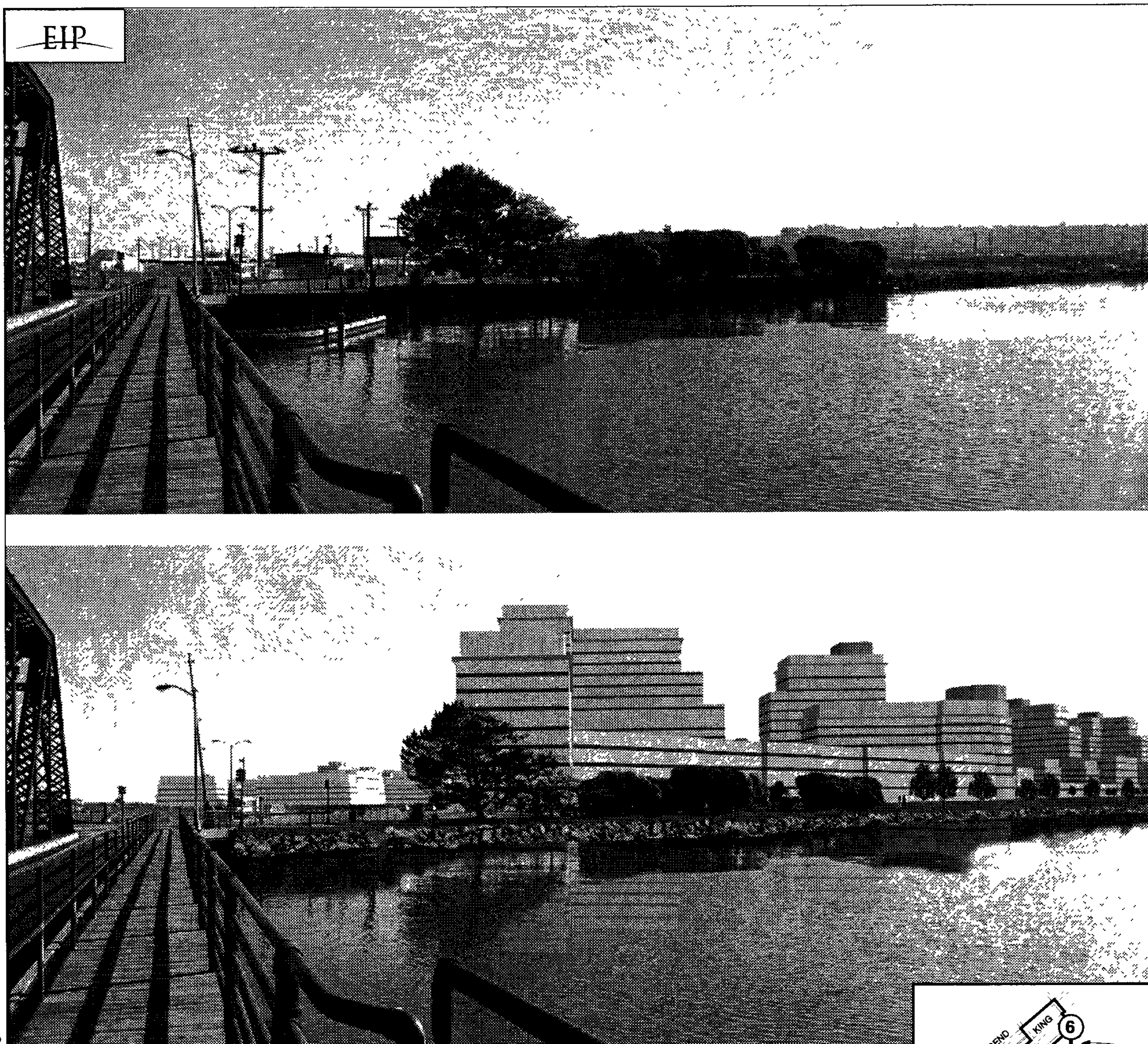
Beyond the open space areas along both sides of the Channel, multi-unit residential buildings fronting the channel would be directly visible. Residential buildings farther away from the Channel would be partially visible, due to the intervening homes fronting the Channel. On the north side of the Channel, residential structures ranging from approximately 65 feet to 160 feet high would replace the I-280 stub and the unimproved open space beneath it. Buildings within 100 feet of the north edge of the Channel would not exceed 65 feet in height. Seventy-five percent of the developable residential land in the area north of the Channel (within Height Zone 1b; see Figure III.B.5) would be at a base height of 65 feet.

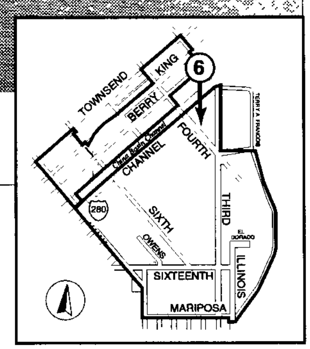
Residential buildings visible on the south side of the Channel would also range in height from 65 feet to 160 feet. As with the North of Channel area, up to 75% of the area south of the Channel (within Height Zone 2) available for residential use would be developed with heights of up to 65 feet. Only 15% of the area could be developed at building heights up to 160 feet.

At the west end of the Channel, views would include the I-280 structure and the Mission Creek houseboat community. Views of Blanche's Pier would remain unchanged. More distant partial views of Potrero Hill to the southwest and Mt. Davidson to the west would be substantially reduced by residential development north of the Channel, but would remain partially visible from the Channel corridor area.

South View From Lefty O'Doul Bridge: Viewpoint 6

Views of the proposed project from the western walkway of the Lefty O'Doul Bridge, shown in Figure V.D.9(b), would include the hotel, the eastern portion of China Basin Channel, and residential/neighborhood-serving uses to the southwest. The hotel, containing approximately 500 rooms and related facilities, on the southwestern corner of Channel and Third Streets, would be visible from this viewpoint. The hotel could be up to 160 feet high, based on the maximum allowable





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Top: South view from Lefty O'Doul Bridge
Bottom: Potential south view from Lefty O'Doul Bridge

SOURCE: Square One Productions

NOTE: The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design.

MISSION BAY SUBSEQUENT EIR

FIGURE V.D.9 EXISTING AND POTENTIAL SOUTH VIEWS FROM LEFTY O'DOUL BRIDGE

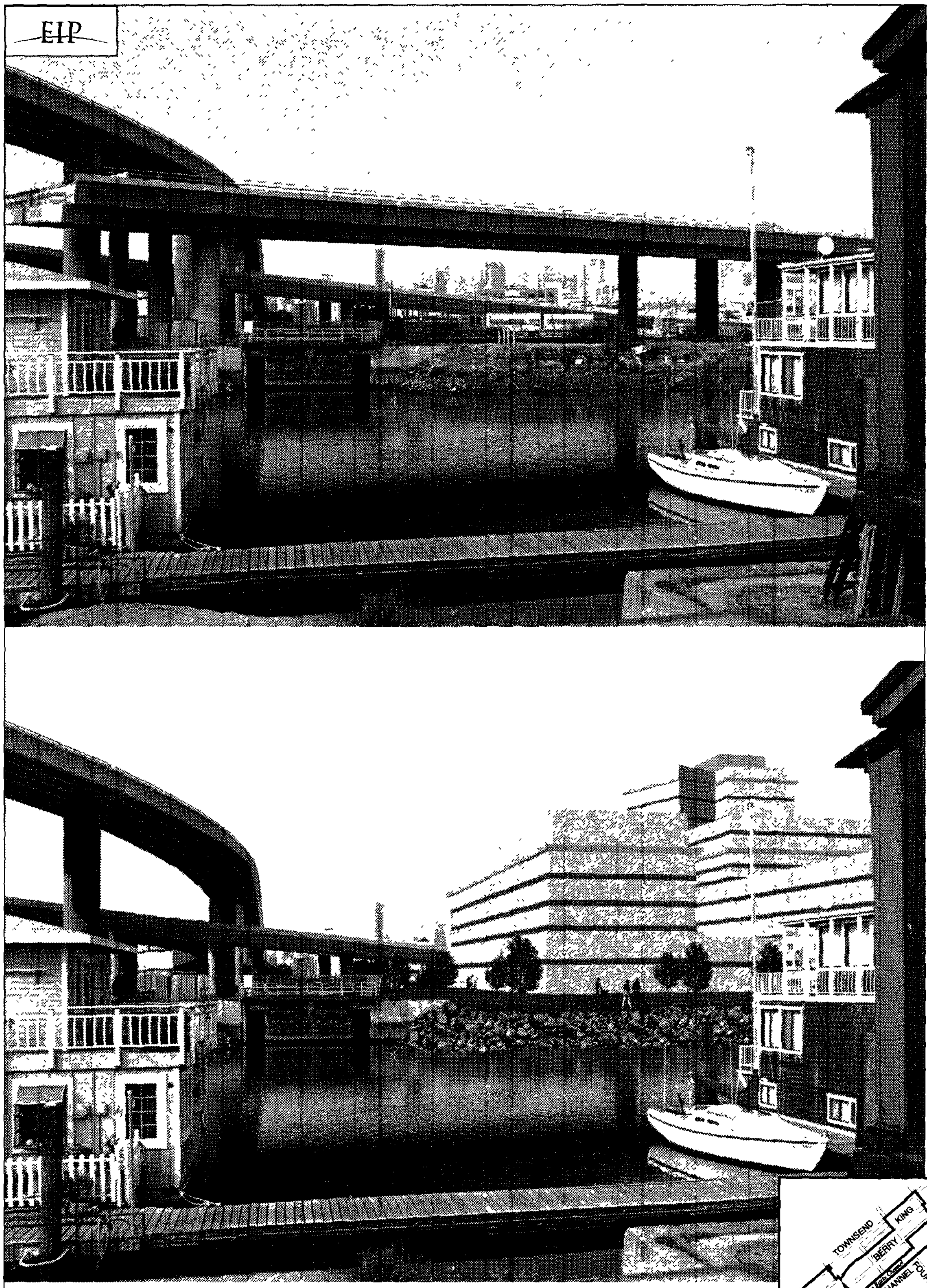
heights in Height Zone 2. Views of the existing warehouse structure, utility and light posts to the south and southwest would be eliminated. The existing trees on the southeastern corner of Third Street could remain and would be incorporated at the Mission Creek park. Although not shown in Figure V.D.9(b), views to the northeast would be of the future Giants Ballpark. Views to Potrero Hill would be completely obstructed, and there would be no remaining panoramic views of the southwest area available from the Lefty O'Doul Bridge. Other distant views would remain. The visual changes would not be significant because important scenic views from public areas would not be substantially degraded or obstructed.

Northerly View of China Basin Channel: Viewpoint 7

Potential views to the north from the south bank of China Basin Channel would include residential buildings, with neighborhood-serving retail uses, ranging in height from up to 65 feet to up to 160 feet. Residential development within 100 feet of the north Channel edge would not exceed 65 feet in height. Up to six tower structures could be built in the area directly north of the Channel within Height Zone 1b, some of which would be prominently visible from this viewpoint. The new residential and neighborhood-serving retail buildings would replace the abandoned I-280 stub, just north of the Channel. The linear open space area would be visible along the north side of the Channel. The open area would vary in width because of the configuration of the Channel bank, but buildings would be set back 60 feet from the Channel right-of-way. The linear open space area would include a pedestrian pathway that would parallel the Channel. Although not visible in Figure V.D.10(b), a pedestrian bridge across the Channel would be located to the east at Fifth Street. The northern Channel edge would be treated with intermittent cantilever structures providing vista points along the Channel. The existing, unmaintained edges of the Channel would be covered with rip-rap for slope stability and planted with salt-tolerant vegetation. The Mission Creek Marina and the I-280 King Street off-ramp would remain visible towards the western end of the Channel. More distant partial views of the high-rise structures located in the Financial District and the South of Market area would be substantially reduced by intervening residential structures with ground floor neighborhood-serving retail. Overall, distant views beyond the new residential structures would be reduced due to the size, height, and bulk of the buildings north of the Channel. The visual changes would not be significant because important scenic views from public areas would not be substantially degraded or obstructed.

Northeast View From Channel Street Area: Viewpoint 8

The existing China Basin alignment of Channel Street would be relocated to the south, farther away from the Channel, as an extension of Owens Street. The area that is now Channel Street would

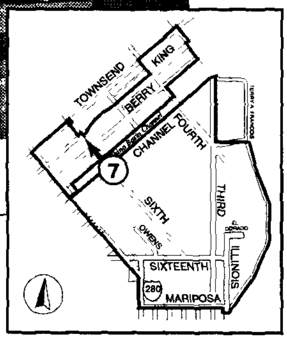


Top: *Northerly view of China Basin Channel*
Bottom: *Potential northerly view of China Basin Channel*

96555/3-20-98

SOURCE: Square One Productions

NOTE The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design



MISSION BAY SUBSEQUENT EIR

FIGURE V.D.10 EXISTING AND POTENTIAL NORTHERLY VIEWS OF CHINA BASIN CHANNEL

become a linear open space area, as shown in Figure V.D.11(b). Direct views to the northeast from along the new Owens Street extension would include the linear open space, residential and neighborhood-serving retail buildings along Owens Street and the hotel at the corner of Third Street and Owens Street.

The linear open space (approximately 140 feet at a minimum, and 200 feet wide on average) would extend along the south side of the Channel. A pedestrian bridge at Fifth Street would be visible and would connect the open space areas on both sides of the channel. A paved pedestrian walkway would connect with the bridge within the open space area, as shown in Figure V.D.11(b).

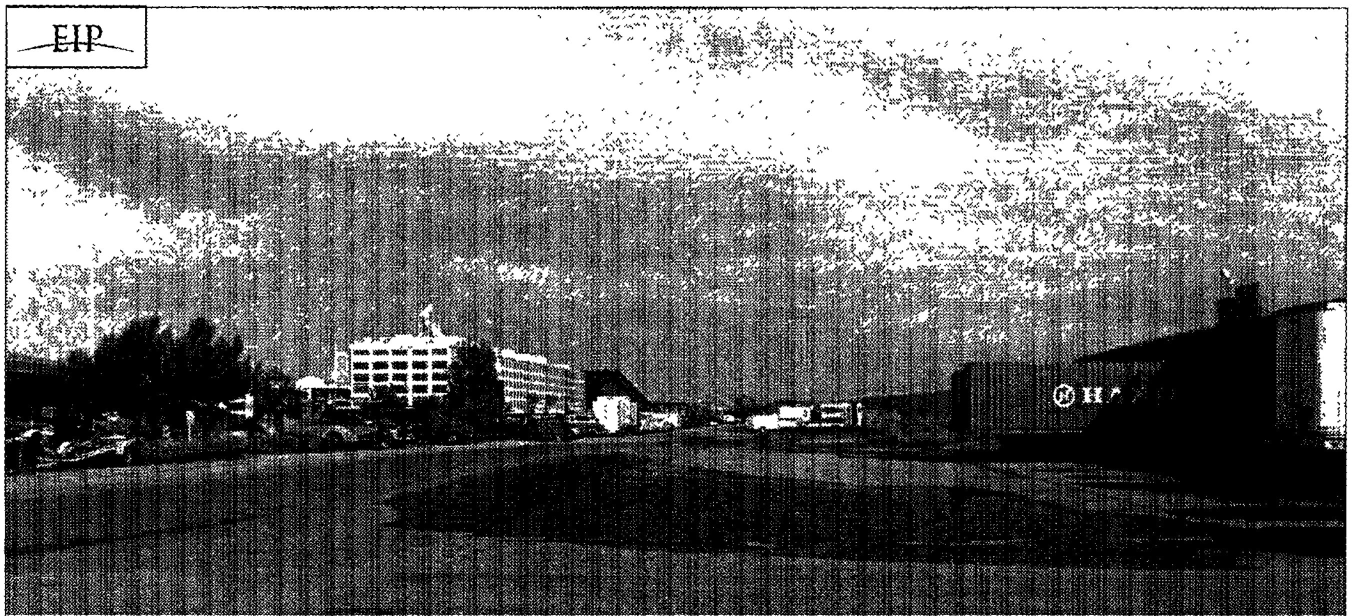
The south Channel edge would be planted with salt-tolerant vegetation and would contain rip rap at various locations. The existing truck terminal warehouse and loading area along Channel Street would be replaced with new residential and neighborhood-serving retail development. Most of the residential development would be up to approximately 65 feet high (six stories); however, buildings (about 15% of the developable area within Height Zone 2) along Owens Street could reach a maximum height of 160 feet (see Figure III.B.5).

Residential development fronting the north side of the Channel would be directly visible. Buildings fronting the Channel would not exceed 65 feet in height. Residential buildings with up to 160-foot towers north of Berry Street would also be partially visible from this viewpoint. Views to the north would include the open space areas near the Channel.

Views of the China Basin Building and the Lefty O'Doul Bridge would remain unchanged. As shown in Figure V.D.11(b), the Giants Ballpark, which is currently under construction, would also be partially visible from this viewpoint. More distant views of the East Bay would be partially obstructed by new development, but would not be eliminated.

East View of Central Subarea: Viewpoint 9

Views from within the central portion of the Project Area to the Bay would replace truck terminals and truck parking. Figure V.D.12(b) shows a view from The Common linear open space area, looking east toward San Francisco Bay. The Common would extend through the central portion of the Project Area from the Owens Street circle to Terry A. François Boulevard (see Figure V.M.3). The Common would be about 130 feet wide throughout its entire length and would have outdoor furniture and decorative landscaping. Buildings along the edges of The Common would be set back 30 feet at the 55-foot height level, or a similar design approach to reduce shadow effects on public open space would be incorporated.



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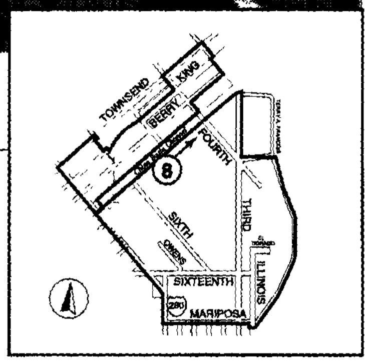
Top: View from Channel Street looking northeast
Bottom: Potential view from Channel Street looking northeast

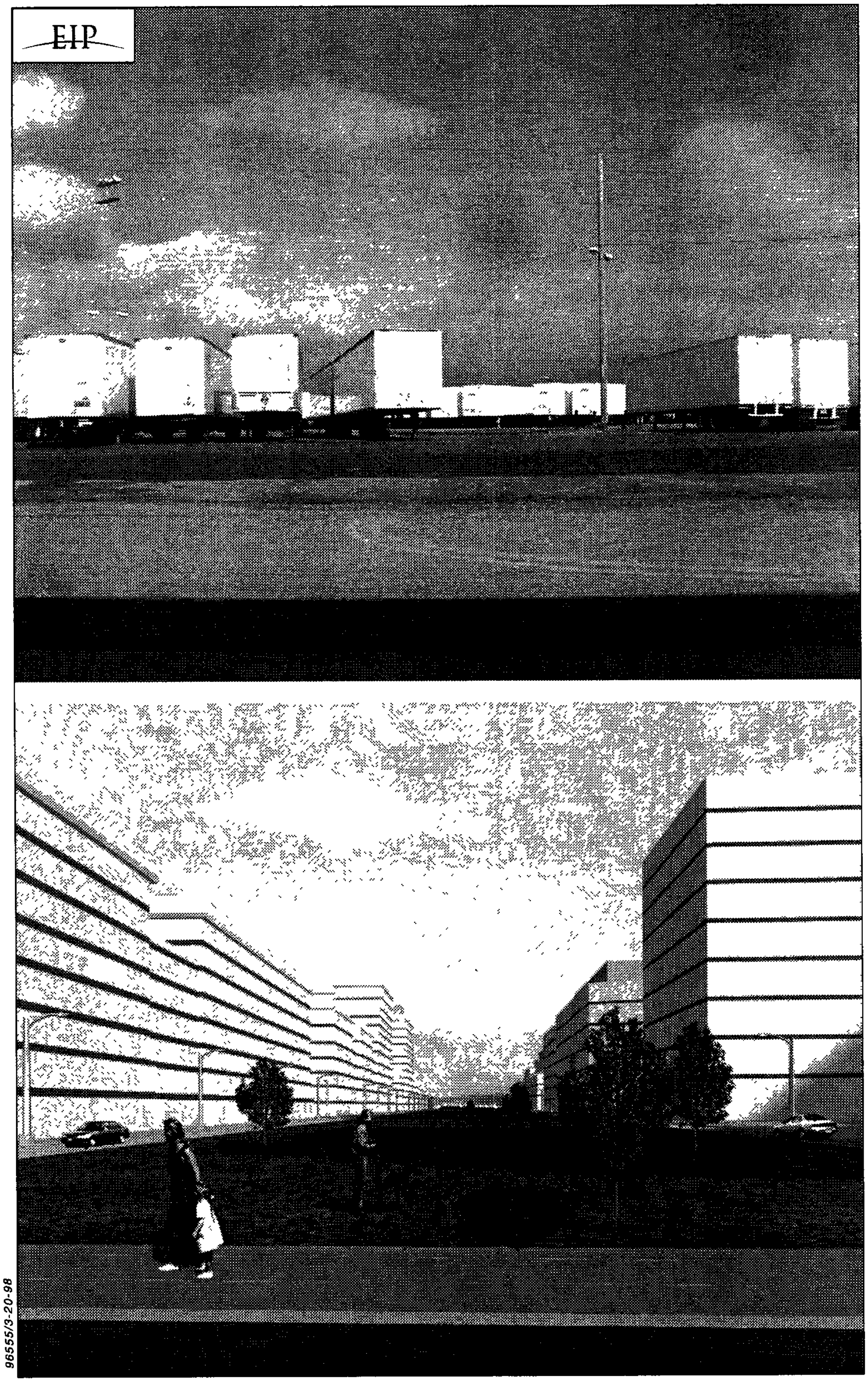


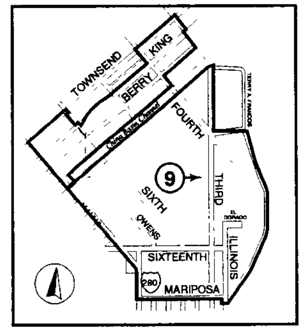
SOURCE Square One Productions

NOTE The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design

MISSION BAY SUBSEQUENT EIR

FIGURE V.D.11 EXISTING AND POTENTIAL NORTHEAST VIEWS FROM CHANNEL STREET AREA





Top: View east from vacant land south of Channel

Bottom: Future location of The Common looking east

96555/3-20-98

SOURCE: Square One Productions

NOTE: The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design.

MISSION BAY SUBSEQUENT EIR

FIGURE V.D.12 EXISTING AND POTENTIAL EAST VIEWS OF CENTRAL SUBAREA

Other views from The Common, not shown in Figure V.D.12(b), would include residential and neighborhood-serving retail development to the north, the UCSF site to the south, a circular open space area to the west, and the San Francisco Bay and East Bay to the far east. Most (80%) of the residential and neighborhood-serving buildings to the north of The Common would be up to 65 feet in height; however, certain buildings could reach maximum heights of 160 feet. The UCSF site adjacent to the south side of The Common edge would likely range from about 30 feet to 110 feet in height. As shown in Figure V.D.12(b), neighborhood streets would extend along both sides of The Common. Pedestrian walkways would also be located at various points within The Common.

Views from The Common would be an east-west corridor with defined edges the length of The Common in the east and west directions. The corridor would have distant views of the East Bay.

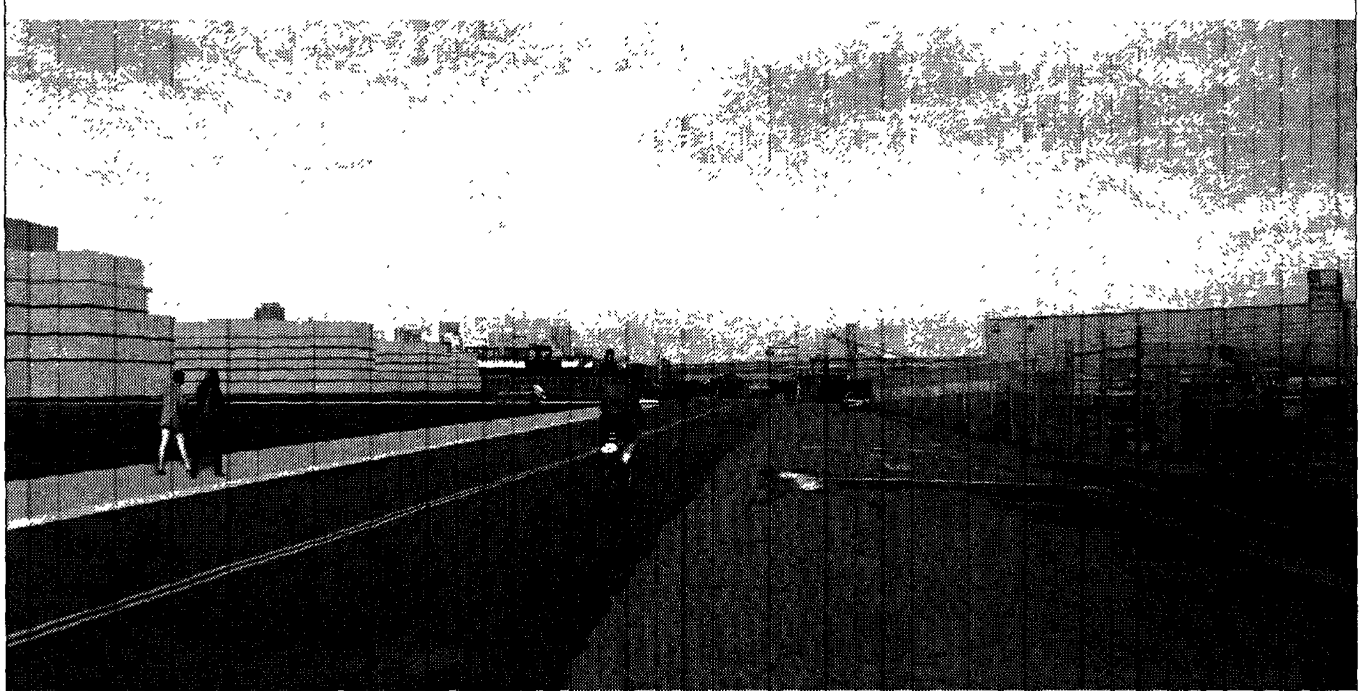
View From Terry A. François Boulevard Near Pier 54: Viewpoint 10

Proposed land uses along the western side of Terry A. François Boulevard would be open space, retail, and commercial industrial. Existing land uses along the waterfront and eastern side of Terry A. François Boulevard would not be changed; thus views of the port property and maritime activities associated with the waterfront area are assumed to remain. As shown in Figure V.D.13(b), the commercial industrial buildings proposed to the west would be visible beyond the proposed open space area on the western side of Terry A. François Boulevard. The open space area would extend along a major portion of Terry A. François Boulevard. Some of the commercial industrial buildings fronting the open space would be limited to a height of about 55 feet. Directly west of those buildings, other commercial industrial buildings would have heights no higher than 90 feet. Other areas (7%) farther to the west of Terry A. François Boulevard, primarily near Third Street, would potentially have maximum heights of up to 160 feet. Views of new commercial industrial buildings to the west would replace the views of the one-story warehouses and vacant land. The utility lines would be placed underground and would no longer be visible.

More distant views of the downtown high-rises would be partially obstructed; however, views of the Bay Bridge would remain. Overall, northwest views along Terry A. François Boulevard would consist of a more intensely developed area and more limited views of downtown structures.

View North From 16th Street Near Sixth Street: Viewpoint 11

Viewpoint 11 schematically illustrates Project Area development down the new Fourth Street corridor. As shown in Figure V.D.14(b), foreground street-level views would be dominated by mid- to high-rise buildings (generally from 90 feet to 160 feet) associated with the UCSF site. The buildings



Top: View from Terry A. Francois Boulevard near Pier 54
Bottom: Potential view from Terry A. Francois Boulevard near Pier 54

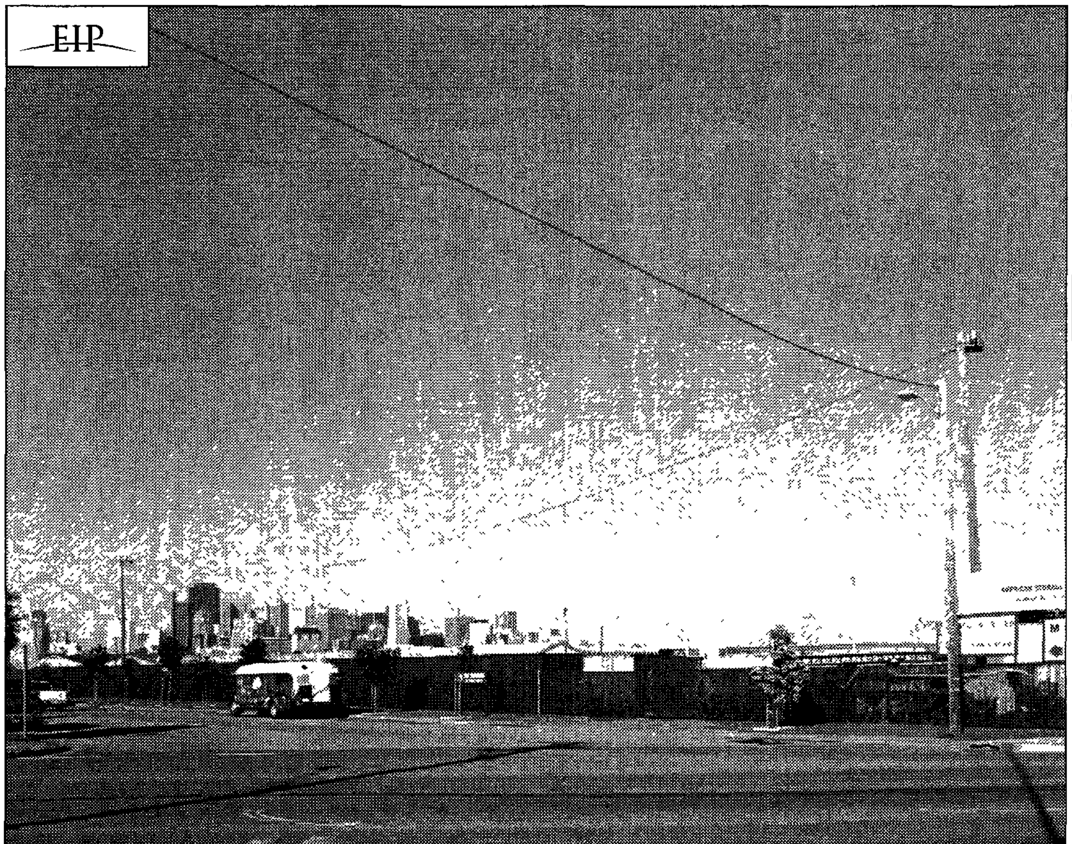
96555/3-3-98

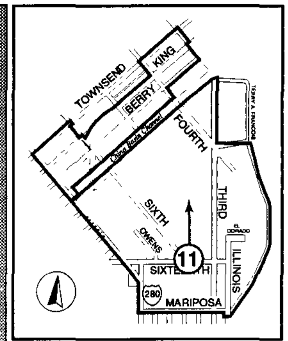
SOURCE Square One Productions

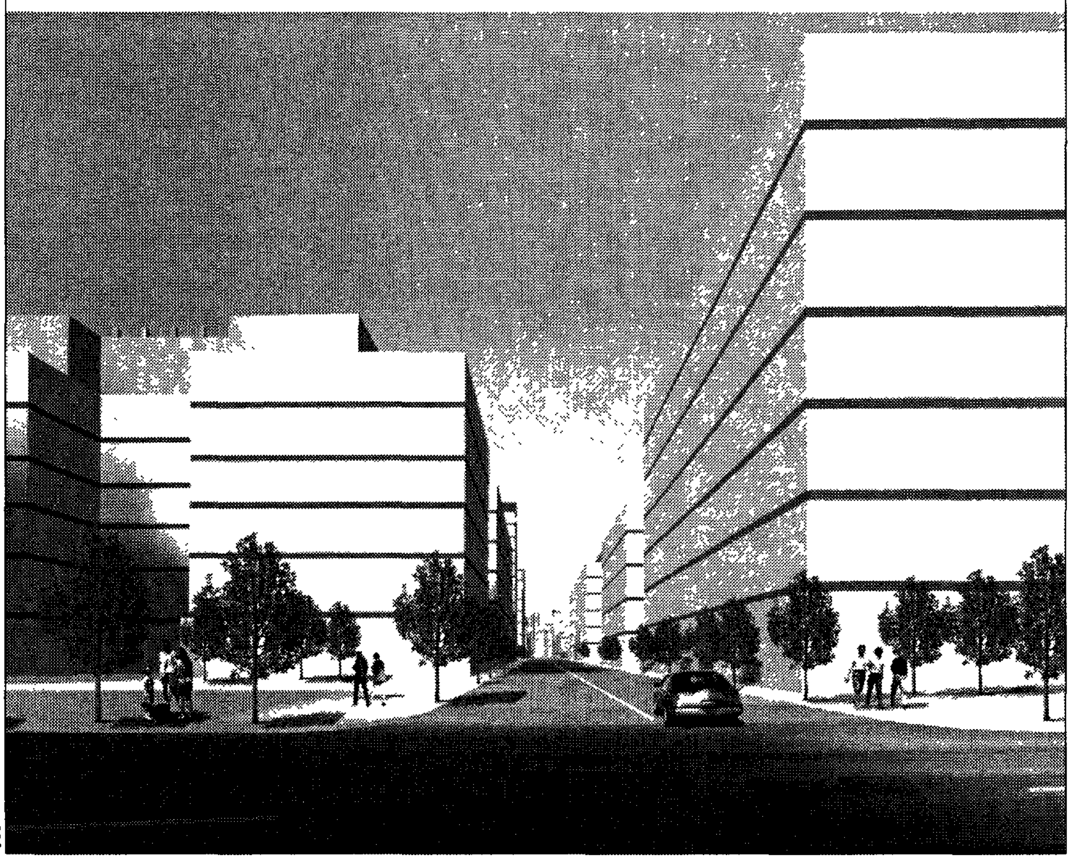
NOTE The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design.

MISSION BAY SUBSEQUENT EIR

FIGURE V.D.13 EXISTING AND POTENTIAL VIEWS FROM TERRY A. FRANCOIS BOULEVARD NEAR PIER 54







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Top: View north from 16th Street near Sixth Street

Bottom: Potential view north from 16th Street near Sixth Street

SOURCE: Square One Productions

NOTE: The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design.

FIGURE V.D.14 EXISTING AND POTENTIAL VIEWS NORTH FROM 16TH STREET NEAR SIXTH STREET

would visually enclose the realigned Fourth Street. It should be noted, however, the images in the figure do not assume any additional setbacks, variations in height or architecture, street-side features, or landscaping that would be incorporated into the final design, which would diminish the wall effect. Although the view of the downtown skyline would be obstructed by new development, 16th Street is not a public open space.

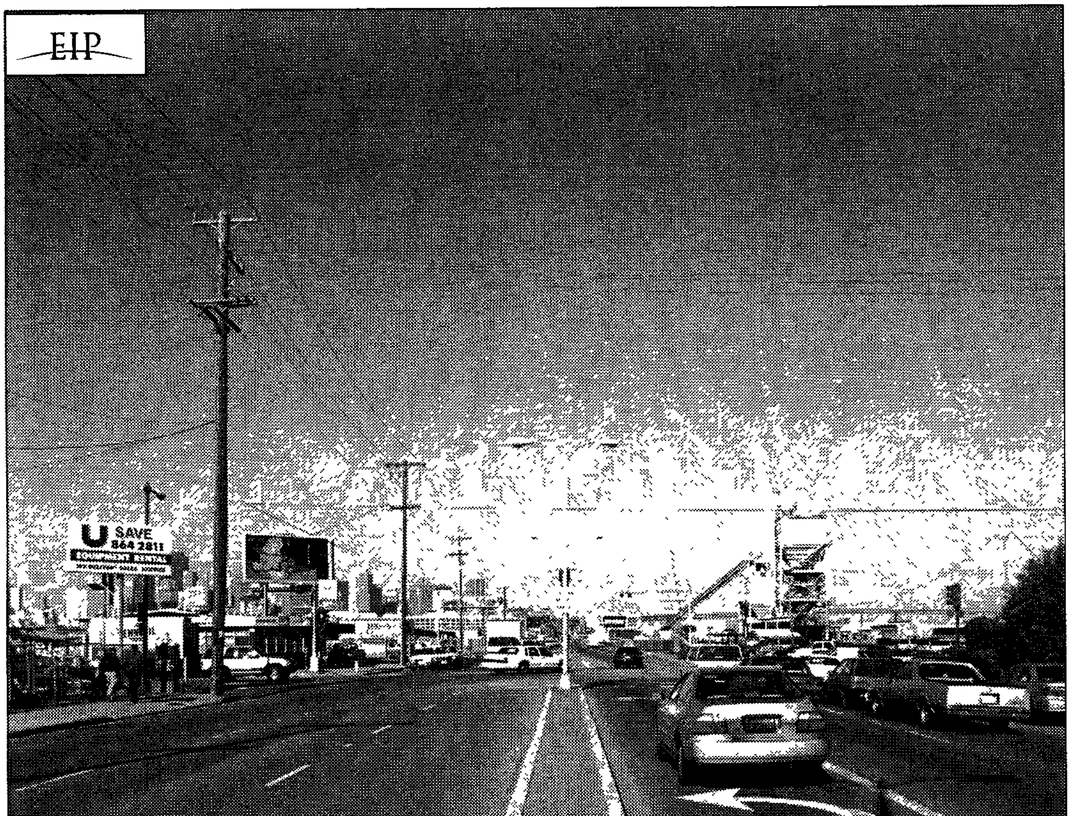
Northerly View From Third Street Near 16th Street: Viewpoint 12

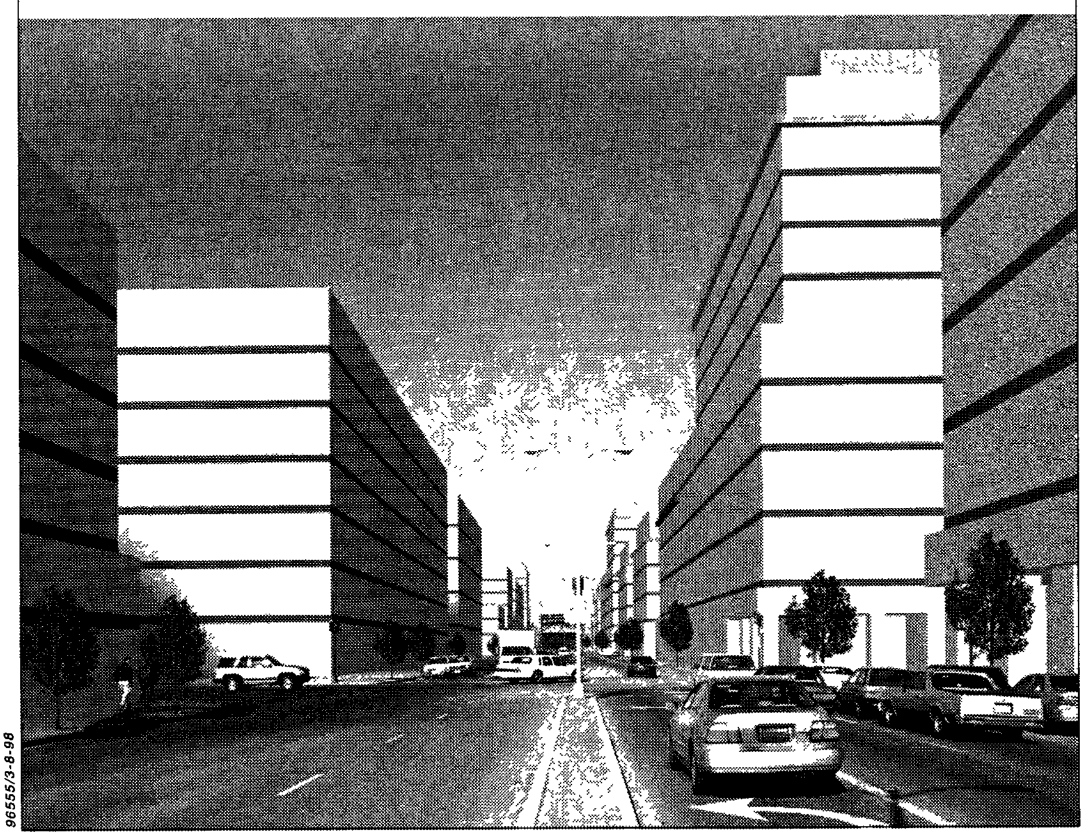
Viewpoint 12 schematically illustrates Project Area development northerly along the Third Street corridor from the perspective of a motorist or pedestrian. Pedestrian walkways would be available along both sides of Third Street. As shown in Figure V.D.15(b), foreground and street-level views would be dominated by mid- to high-rise buildings (generally up to 160 feet) associated with the UCSF site to the west and commercial industrial uses to the east. A maximum of three towers up to 160 feet high could be built on 7% east of Third Street (refer to Figure III.B.5). Directly to the north, partial views of the Giants Ballpark would be available. The most affected view from this viewpoint would be of the downtown area. Currently, views of the downtown are available, but are partially obstructed by overhead lines and billboards. New development would block views of the downtown because of the visually continuous massing of buildings. This would create a sense of enclosure at the street level. It should be noted, however, the images in the figure do not assume any additional setbacks, variations in height or architecture, street-side features, or landscaping that would be incorporated into the final design, which would diminish the wall effect.

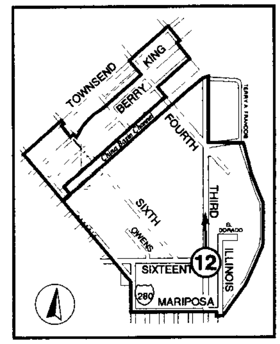
The view also does not illustrate the proposed extension of MUNI Metro light rail vehicle service in the median of Third Street. The existing visual environment includes many vertical elements in this view corridor, such as telephone poles, billboards, and the cement plant, that block clear views of the downtown. Although new development would alter the scale and character of the area, a significant viewshed would not be affected.

View From North Side of China Basin Channel Near Sixth Street: Viewpoint 13

From the north side of China Basin Channel near Sixth Street, views of the I-280 structure (and buildings to the north) and open area would be replaced by those of residential and neighborhood-serving retail buildings, and linear open space, as shown in Figure V.D.16(b). Buildings fronting the Channel would not exceed 65 feet in height. The approximately 50-foot-wide linear open space would extend along the north side of the Channel; a pedestrian bridge at Fifth Street would be visible and would connect the open space areas on both sides of the channel. A paved pedestrian walkway would connect with the bridge within the open space area.







Top: Northerly view from Third Street near 16th Street

Bottom: Potential northerly view from Third Street near 16th Street

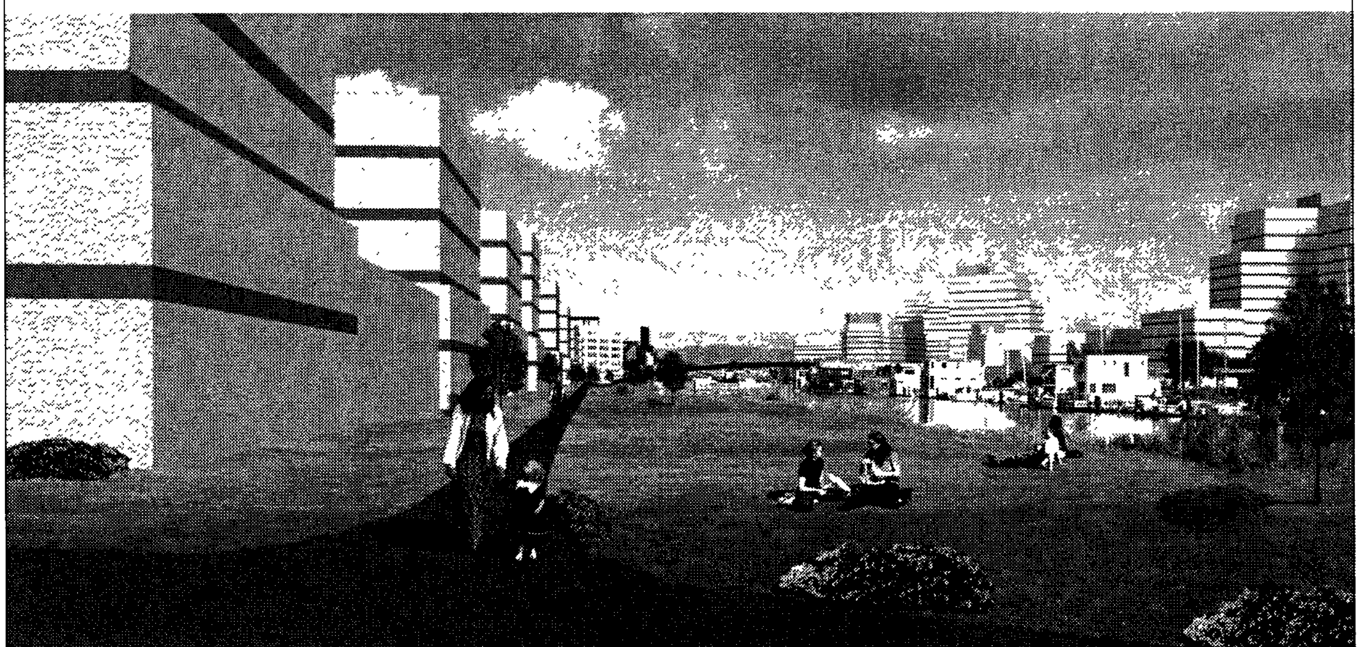
96555/3-8-98

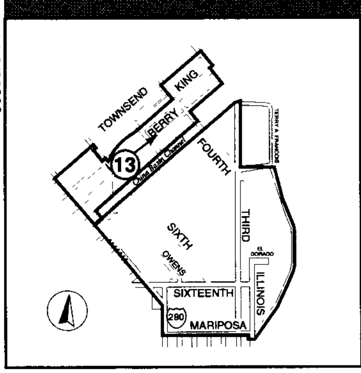
SOURCE: Square One Productions

NOTE: The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design

MISSION BAY SUBSEQUENT EIR

FIGURE V.D.15 EXISTING AND POTENTIAL NORTHERLY VIEWS FROM THIRD STREET NEAR 16TH STREET





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Top: Existing view of north side of China Basin Channel
Bottom: Potential view of north side of China Basin Channel

NOTE. The visual simulation illustrates general height and massing permitted under the proposed redevelopment plan documents, but does not necessarily represent maximum development at any particular location nor specific architecture or urban design.

MISSION BAY SUBSEQUENT EIR

FIGURE V.D.16 EXISTING AND POTENTIAL VIEWS OF NORTH SIDE OF CHINA BASIN CHANNEL

Views of the China Basin Building and the Lefty O'Doul Bridge would remain unchanged. As shown in Figure V.D.16(b), the Giants Ballpark, which is currently under construction, would also be partially visible from this viewpoint.

Views to the south of Channel would include the existing houseboats, linear open space, residential and neighborhood-serving retail buildings along Owens Street and a hotel at the corner of Third Street and Owens Street. Most of the residential development would be up to approximately 65 feet high (six stories); however, buildings (about 15% of the developable area within Height Zone 2) along Owens Street could reach a maximum height of 160 feet (see Figure III.B.5). More distant views of the East Bay would be partially obstructed by new development.

Conclusion

The viewpoint locations in the Project Area considered above illustrate the range of visual conditions that would be affected by the project. Overall, the project would alter certain views and certain features now visible would be partially or wholly blocked from various locations. However those effects would not be considered significant as the changes would not substantially degrade or obstruct important scenic views from public areas.

LIGHTING

Development of the Mission Bay Project Area could increase the amount of light and glare in the surrounding area. Glare can be caused by reflections from pavement, vehicles and reflective building materials. Since specific features of the new buildings are unknown at this time, it is assumed for purposes of this SEIR that buildings within Mission Bay could contain reflective surfaces, such as metal and glass. The resultant glare could affect nearby residential areas, pedestrians, and motorists. Additionally, new buildings, parking structures, and walkways would introduce new light sources in the Mission Bay Project Area. Increased lighting and glare would be visible but not substantial and would not be expected to create adverse effects, such as impairment of drivers. Glare effects could be reduced through building orientation, building material selection, and landscaping.

Lighting associated with uses such as parking structures in the Project Area, including roofs of parking structures, if proposed, could potentially cause obtrusive glare when viewed from residential areas on the north and east slopes of Potrero Hill. This would be a significant effect. Mitigation Measure D.1, in Section VI.D, Mitigation Measures: Visual Quality and Urban Design, would minimize spill lighting or glare in off-site areas, while providing adequate lighting in the parking areas for patron visibility and safety.

NOTES: Visual Quality and Urban Design

1. San Francisco Planning Department, *Mission Bay Final Environmental Impact Report*, Planning Department File No. 86.505E, State Clearinghouse No. 86070113, certified August 23, 1990, Volume Two, Section VI.I.*

2. EIP Associates Land Use Survey, 1997.*

3. Approximately 3.5-foot-high posts that are typically used as a vehicle barrier onto walkways/internal roadways, etc.

4. 1990 FEIR, Volume Two, p. VI.I.4.*

5. As concluded by David Chavez Associates in its report, "Cultural Resources Evaluation for the Mission Bay Project, San Francisco, California," December 1987.

6. 36 CFR Section 60.4. cited in Advisory Council on Historic Preservation. Section 106, Step by Step, issued October 1986. Publication available from the State Historic Preservation Office, Sacramento.

7. 1990 FEIR, Volume Two, p. VI.I.4.*

8. 1990 FEIR, Volume Two, pp. VI.I.6-VI.I.17.*

9. 1990 FEIR, Volume Two, pp. VI.I.18-VI.I.23.*

10. These include the Redevelopment Plans, and associated Design for Development documents; and the Owner Participation Agreements, and their associated Scope of Development documents. The draft design standards that will form the basis for the Design for Development documents are contained in San Francisco Redevelopment Agency, *Design Standards and Guidelines*, *Mission Bay*, Draft C, prepared by Catellus Development Corporation, as adopted by the Mission Bay Citizen Advisory Committee on December 11, 1997, revised March 30, 1998.

11. 1990 FEIR, Volume Two, pp. VI.I.18-VI.I.23.*

12. David Chavez and Associates, "Cultural Resources Evaluation for the Mission Bay Project, San Francisco, California," prepared for the 1990 FEIR.

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

E. TRANSPORTATION

The endnotes for this section begin on p. V.E.120.

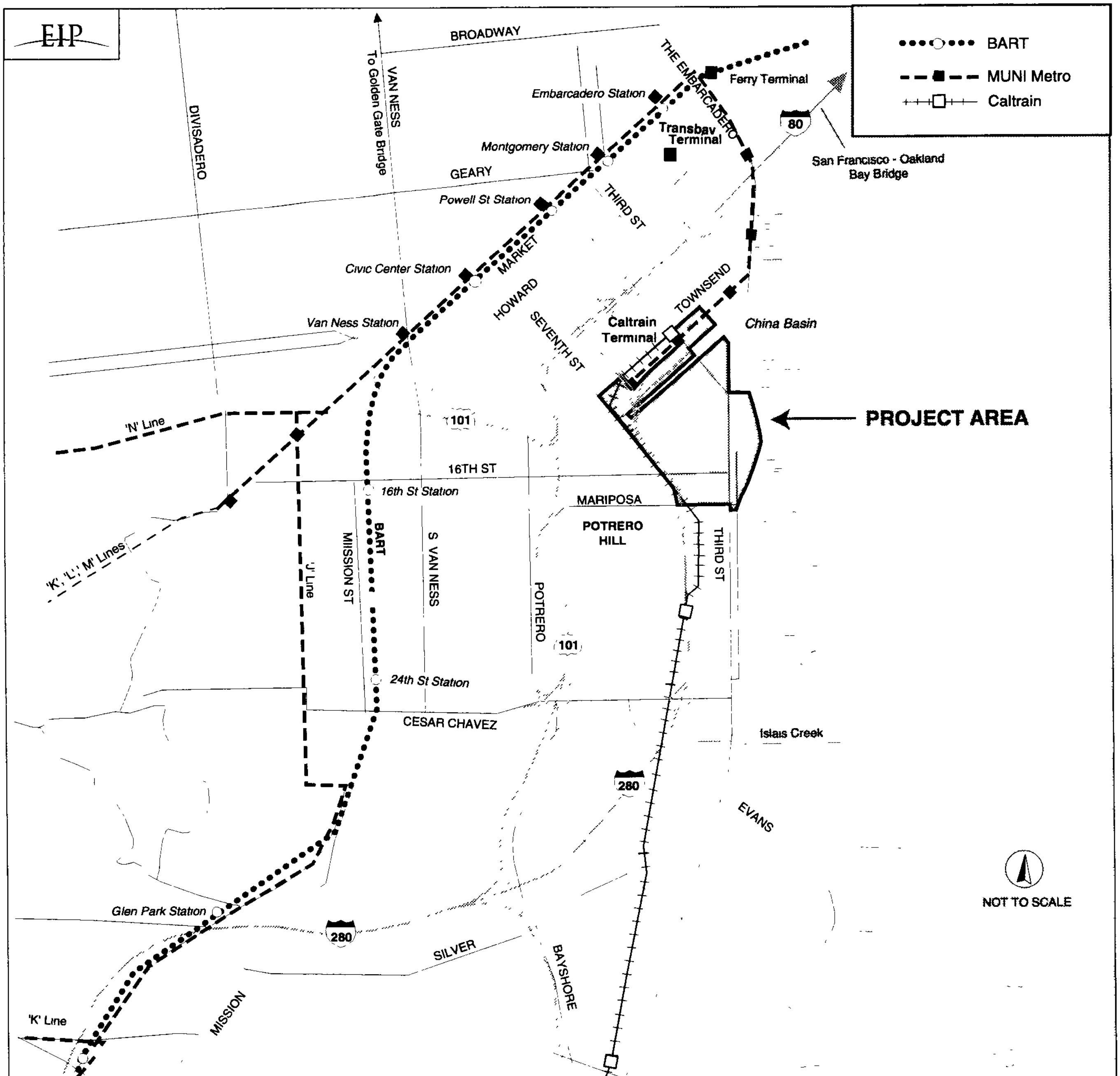
SETTING

This section describes the facilities and systems that currently comprise the local and regional transportation network serving the proposed Mission Bay Project Area. The network is a system of local streets, ramps and freeways; local and regional bus and rail transit lines; ferry service; parking areas; bicycle and pedestrian facilities; and truck loading areas. Figure V.E.1 shows the regional transportation facilities in relation to the Project Area. This Setting section describes: 1) the transportation study areas; 2) the existing regional and local transportation facilities and services that directly serve the Project Area; and 3) the existing transportation conditions.

The transportation setting has changed considerably since 1987, when data was gathered for the 1990 FEIR's transportation setting section. Circulation patterns have changed because freeways have changed due to the 1989 Loma Prieta earthquake. For example, two options noted in the 1990 FEIR for the Embarcadero Freeway after the earthquake were to demolish it or to retain it with seismic upgrade/1/, as a decision about the fate of the freeway had not been made at the time the 1990 FEIR was completed. The freeway was demolished in 1991, and traffic at approaches to Interstate 80, the Bay Bridge, and U.S. 101 has changed as a result. In addition, the 1996-97 traffic volumes obtained at local intersections in and near the Project Area are different from those obtained 10 years ago and reported in the 1990 FEIR. Therefore, little of the setting data from the 1990 FEIR has been summarized below, in favor of presenting current information.

TRANSPORTATION STUDY AREA

The transportation study area and intersections at relevant freeway ramps shown in Figure V.E.2 were established in order to determine the extent of the San Francisco transportation network that may be measurably affected by project traffic. The transportation study area is defined by travel corridors as well as by facilities such as transit stations or parking areas. The area includes freeway segments, freeway ramps, street segments, and street intersections that would be on the routes that project traffic would use. In addition, the area encompasses the various public transit modes—rail, light rail, and bus services—that would potentially serve Mission Bay, bicycle routes to and through the Project Area, and crosswalks in the Project Area serving large numbers of pedestrians.



SOURCE: Wilbur Smith Associates

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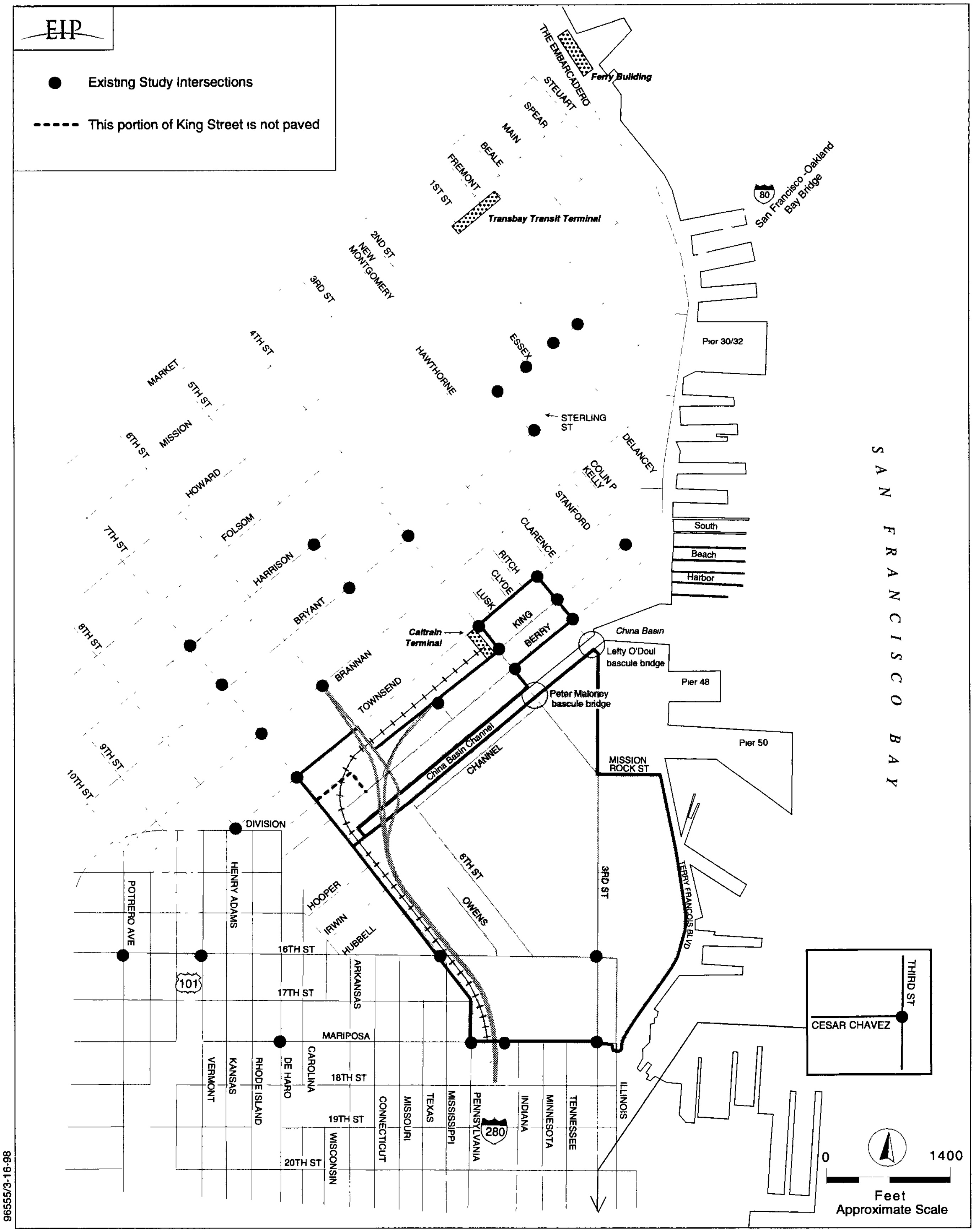
FIGURE V.E.1 REGIONAL TRANSPORTATION SETTING



SOURCE Wilbur Smith Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.E.2 TRANSPORTATION STUDY AREA: EXISTING

Traffic Study Area

Figure V.E.2 shows the Project Area and indicates the existing intersections that have been included in the traffic study. The selected intersections are parts of the primary and the secondary access routes to and from the Mission Bay Project Area.

Transit Study Area

All regional and local transit services that have stops or stations in or near the local study area were evaluated. These include rail services such as BART, Caltrain, and MUNI Metro; bus services such as MUNI, AC Transit, SamTrans, and Golden Gate Transit; and ferry services provided by Golden Gate Ferry, Blue & Gold Fleet, and Red & White Fleet.

Parking Study Area

Existing parking conditions were qualitatively reviewed in and near the Project Area, including the adjacent Nearby Areas of Lower Potrero, Potrero Hill, and portions of South of Market including South Beach. Parking supply and demand were calculated for the Project Area in the Impacts section. Possible parking impacts on areas outside the study area are discussed qualitatively.

Pedestrian and Bicycle Study Area

The pedestrian study area north of China Basin Channel concentrates on the intersection crosswalks of King Street at Third, Fourth, and Fifth Streets, in addition to Berry Street. South of the Channel, the pedestrian analysis includes existing and potential pedestrian routes leading from the Project Area toward the nearby transit stations and the San Francisco downtown area. Bicycle travel conditions were also evaluated within the Project Area.

EXISTING REGIONAL TRANSPORTATION FACILITIES

Travel to and from the Project Area involves the use of regional transportation facilities, highways, and transit systems that connect the San Francisco neighborhoods to each other, and with other parts of the Bay Area and northern California.

Regional Freeways

As shown in Figure V.E.2, the transportation study area is served by three freeways: 1) U.S. Highway 101 (U.S. 101) to and from the Peninsula and South Bay, and the North Bay via the Golden

Gate Bridge, 2) Interstate 80 (I-80) to and from the East Bay via the Bay Bridge, and 3) Interstate 280 (I-280) to and from the Peninsula and South Bay areas ending at Sixth and Brannan Streets and at Fifth and King Streets. Regional access to the transportation study area from each travel direction via the freeway network is summarized below. Freeway operating conditions are described in terms of speed and level of service. Level of service (LOS) is ranked from A to F, with A representing very good conditions, and F representing the worst, or most congested, conditions. A detailed definition of the freeway level of service is included in Appendix Table D.11.

U.S. Highway 101

U.S. Highway 101 (U.S. 101) north of the transportation study area serves travelers to/from North Bay areas via the Golden Gate Bridge. There is no direct freeway connection to the Golden Gate Bridge; therefore regional access is provided by surface streets (Van Ness Avenue, Gough, and Franklin Streets to either Lombard Street or Bay Street and Marina Boulevard) in the northern part of San Francisco.

U.S. 101 south of the transportation study area provides access to/from the San Francisco Peninsula and the South Bay areas. Access to and from U.S. 101 south of the transportation study area is provided at Third Street, Silver Avenue, I-280, César Chavez Street, and Vermont/Mariposa Streets (northbound off-ramp only), as well as from I-80. The number of through lanes on U.S. 101 north of the I-280 interchange is primarily four lanes in each direction, but varies from two (near the I-80 interchange) to five (between César Chavez Street and I-280.) The primary bottleneck on northbound U.S. 101 is at the César Chavez Street interchange where the number of freeway lanes is reduced by one at the off-ramp. This occurs just north of the merge of traffic from northbound I-280 into northbound U.S. 101, causing traffic congestion south of the I-280 interchange. The U.S. 101/I-80 interchange is also a bottleneck in both directions.

During the peak hour of the evening commute period (4:00 p.m. to 6:00 p.m.), northbound U.S. 101 typically operates at 30 to 35 miles per hour (mph) (LOS E) south of Third Street, improving to 50 mph (LOS C)/2/ from Third Street to César Chavez Street, then worsening to 20 mph (LOS F)/3/ from there to the I-80 interchange. During the same period, southbound U.S. 101 typically operates at 35 mph (LOS E)/4/ from the I-80 split to the San Francisco County line at the Harney Way/3Com Park freeway ramps. (Freeway ramp locations are generally described by the nearest streets or features, such as the Harney Way/3Com Park ramps or the Fifth/King ramps to and from I-280.) The on-ramps for this section of U.S. 101 currently experience traffic back-ups at times due to mainline congestion. This effect is more pronounced in the northbound direction due to traffic congestion on the Bay Bridge.

Interstate 280

Located south of I-80 and east of U.S. 101, Interstate 280 provides access from the South Beach and China Basin areas and the transportation study area to locations south of San Francisco, and is closer to these areas than U.S. 101 and I-80. I-280 runs parallel to U.S. 101 for approximately 3 miles until crossing it, after which I-280 follows a southwest direction through the City to points south on the Peninsula.

On- and off-ramps to I-280 from the transportation study area include Sixth/Brannan Streets, Fifth/King Streets, Mariposa Street, and César Chavez Street. The basic number of through lanes on I-280 varies from two lanes on the ramps near the transportation study area to three and four lanes south toward U.S. 101.

Both directions of I-280, south of the King Street/Sixth Street split, operate at 50 mph (LOS D)/5/ or better during the 4:00 to 6:00 p.m. period. The on- and off-ramps for this section of I-280 currently operate below their maximum capacity. However, queuing sometimes occurs on the off-ramp at King Street and the on- and off-ramps at Sixth Street due to congestion at the intersections of the ramps with the local streets.

Interstate 80

Interstate 80 provides access to the transportation study area from the East Bay via the Bay Bridge. While I-80 technically ends at the Central Freeway and becomes U.S. Highway 101, the motorist perceives this as one continuous route. The basic number of through lanes on I-80 is five lanes on the Bay Bridge and three lanes between the west side of the Bay Bridge and the U.S. 101 junction. Auxiliary merge lanes are provided at some critical sections of I-80 west of the Bay Bridge.

Two off-ramps would serve westbound project traffic from the I-80/Bay Bridge into San Francisco: Fremont/Harrison Streets, and Fifth/Harrison Streets. A westbound on-ramp that would serve project traffic is located at Seventh/Harrison Streets.

The I-80/Bay Bridge eastbound on-ramps that would serve project traffic are located at Fifth/Bryant Streets, Sterling Street near Second Street, Essex/Harrison Streets, and First/Harrison Streets. Use of the Sterling Street on-ramp is restricted to trucks and vehicles with three or more occupants between the hours of 3:30 p.m. and 7:00 p.m. on weekdays. Eastbound off-ramps serving project traffic are located at Seventh/Bryant Streets and Fourth/Bryant Streets.

Eastbound I-80 during the evening commute period (4 p.m. to 6 p.m.) typically operates at 30 to 35 mph (LOS E)/6/ between the U.S. 101 merge and Treasure Island. The State of California Department of Transportation (Caltrans) reports that average travel speeds in this section of eastbound I-80 during the evening commute period drop under 35 mph. At the 5:30 peak, speeds drop to 10 mph (LOS F)/7/ in the eastbound direction up to Sterling Street, gradually increasing to 25 mph on the Bay Bridge. Westbound I-80 during the evening commute period typically operates at 45 mph (LOS D)/8/ from Treasure Island to Fifth Street, worsening to 20 mph (LOS F)/9/ from Fifth Street to the U.S. 101 split./10/ For the section of westbound I-80 from Fifth Street to U.S. 101, average speeds during the evening commute period remain below 35 mph (LOS E)./11/

The I-80 ramps that are typically congested during the 3:00 p.m. to 7:00 p.m. time period are those connecting downtown San Francisco with eastbound I-80/Bay Bridge. Shorter periods of congestion are experienced at ramps connecting downtown with westbound I-80 and southbound I-280. While traffic on the Sterling Street high occupancy vehicle (HOV) ramp is slow due to congestion on the Bay Bridge, the ramp is lightly used and has capacity for more high occupancy vehicles (i.e., carpools and vanpools with three or more persons per vehicle).

Regional Transit Systems

San Francisco is served by a variety of regional transit systems and operators including bus, rail, and light rail. Figure V.E.3 shows the services provided by regional transit operators to the transportation study area. Following is a discussion of the transit operators and the services that are currently provided.

<u>Caltrain</u>

Passenger rail service between San Francisco and the Peninsula is provided by Caltrain, operated by the Peninsula Corridor Joint Powers Board. The Caltrain terminal is outside the Project Area immediately to the north, at the southwest corner of Fourth and Townsend Streets. Weekday operating hours at the Caltrain terminal are from 5:00 a.m. to 10:00 p.m. The last train leaves the terminal at 10:00 p.m. on weekdays, with an additional train leaving San Francisco at midnight on Fridays. Caltrain currently operates 66 trains each weekday between San Jose and San Francisco; of these, four trains in the morning and four trains in the evening provide peak hour peak direction service to and from Gilroy./12/ Frequencies in the weekday peak periods vary between 5 and 30 minutes; in the off-peak, trains operate every 30 to 60 minutes. Peak period trains generally consist of four to five 140-seat cars; in the off-peak, trains generally consist of four 140-seat cars.

Ridership was most recently estimated to be nearly 24,800 passengers per day./13/ Caltrain has registered at least 6% increases in annual ridership in recent years, and a total increase of 8% in the fiscal year 1995/96 to fiscal year 1996/97 period.

SamTrans

Bus transit service between San Francisco and San Mateo County is provided by the San Mateo County Transit District (SamTrans). SamTrans operates the trunk of its basic San Francisco service along Mission Street from Ninth Street to Spear Street. At present, uncongested operation of Mission Street and the Ninth/Tenth Streets one-way couplet/14/ are critical to SamTrans' San Francisco operation. The stops nearest Mission Bay are on Mission Street, about six blocks from the northernmost parts of the Project Area, approximately 1 mile, or about a 20-minute walk.

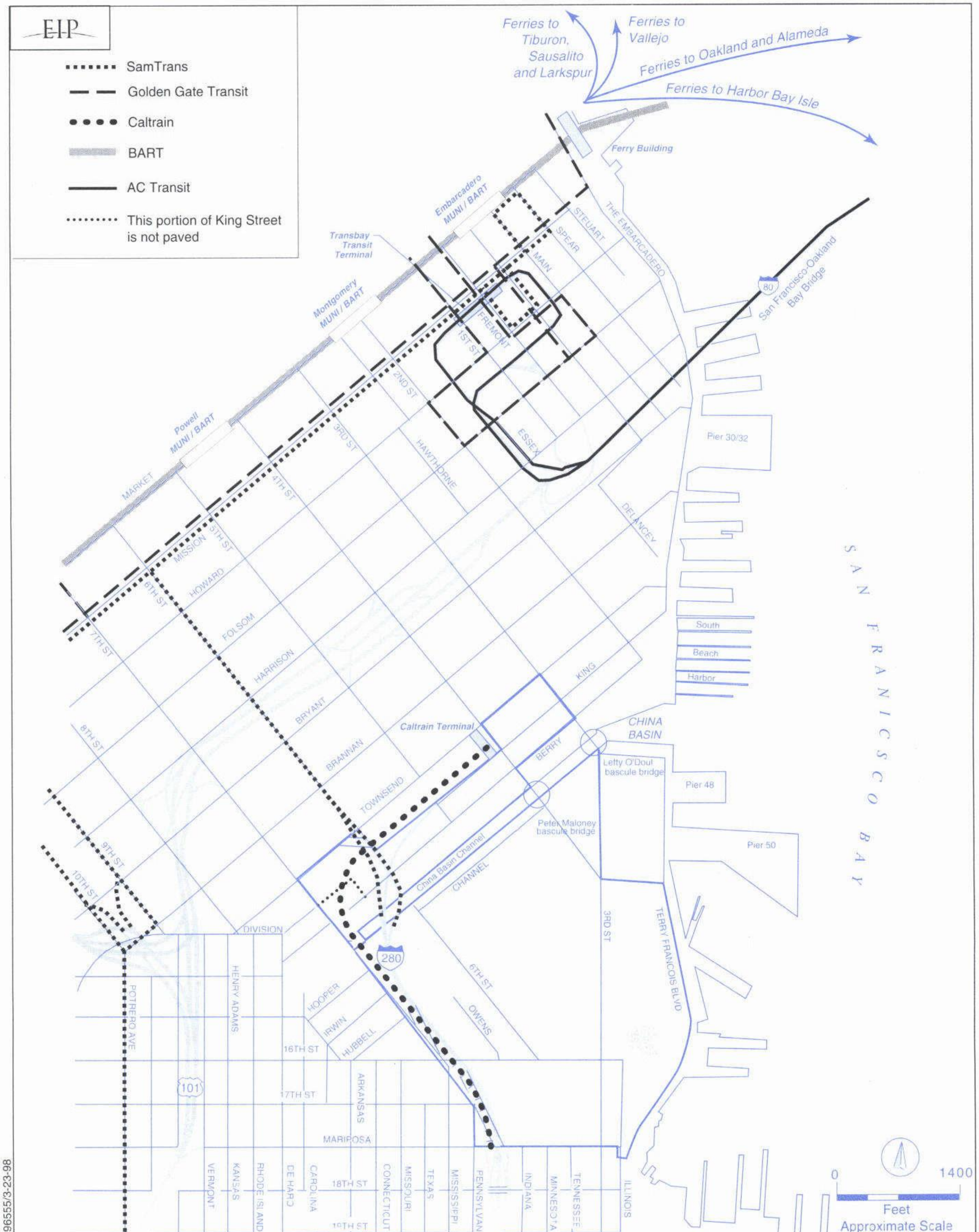
Twelve routes serve San Francisco, including nine commute express routes (1F, 16F, 17F, 18F, 19F, 41F, 47F, 48F, and 49F), two local routes (5M and 7B), and one express route (7F). The commute express routes offer limited commute service to and from various cities on the Peninsula during morning and afternoon peak periods only./15/ Commute express routes 1F, 47F, 48F, and 49F operate on Sixth Street to I-280. The remainder of the commute express routes, the local routes, and the express route use Ninth and Tenth Streets as a corridor to U.S. 101. Route 1F offers service to Pacifica, while routes 47F, 48F, and 49F provide service to San Mateo and Foster City.

Routes 5M, 7B, and 7F offer 20- to 30-minute headways/16/ during the p.m. peak, 10- to 30-minute headways during the a.m. peak, and 20- to 30-minute midday headways. The commute express routes provide service at various frequencies to and from San Francisco, with many route alignments overlapping near the City. Appendix Table D.15 describes the headways of all SamTrans lines serving San Francisco.

Total average weekday ridership of the routes to and from downtown San Francisco is about 11,300./17/ The portion of this ridership that is shared by each individual line is also presented in Appendix Table D.15. The average ridership is 35 passengers per bus.

BART

The Bay Area Rapid Transit District (BART) operates heavy rail passenger service between the East Bay (from Pittsburg/Bay Point, Richmond, Dublin/Pleasanton, and Fremont) and San Francisco, and between northern San Mateo County (Daly City and Colma) and San Francisco. In downtown San Francisco and the Mission District, trains run in tunnels under Market and Mission Streets.



SOURCE: Wilbur Smith Associates

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FIGURE V.E.3 EXISTING REGIONAL TRANSIT SERVICE

BART's Montgomery and Embarcadero Stations on Market Street are located within about 1 mile of the northernmost boundary of the Project Area (about a 20-minute walk). The BART station nearest to the portion of Mission Bay south of the Channel is the 16th Street/Mission Street station, which is located approximately 1.25 miles (about a 25-minute walk) west of Seventh Street. The Market Street stations can be reached from Mission Bay on foot, by various MUNI bus lines, and, since January 1998, by the MUNI Metro Extension, called the "E" line.

The MUNI Metro E-line connection from the Project Area to BART at the Civic Center, Powell, Montgomery, and Embarcadero Stations involves a station platform level change for connecting patrons. Passengers transferring between MUNI Metro and BART go up a level to the mezzanine and then go down two levels to the BART platform, since no direct connection exists between the MUNI and BART platforms. Passengers can also access BART at the 16th Street/Mission Street Station from MUNI line 22-Fillmore, which travels along 18th Street.

BART operates service from about 4:00 a.m. until past midnight on weekdays. During weekday peak periods, service between San Francisco and the East Bay origins/destinations varies between 5 minutes and 15 minutes, depending on the origin/destination./18/ These transbay lines combine to provide 2.5-minute headways for service between San Francisco and downtown Oakland, and between San Francisco and Daly City.

BART reported an average weekday ridership of approximately 248,700 trips for fiscal year 1996. The existing p.m. peak hour peak direction load factors (number of passengers per seat) for BART at the Transbay tunnel and south of the Civic Center Station are 1.23 (eastbound) and 0.88 (westbound), respectively./19/ BART's existing load factor during the three-hour peak commute period (approximately 3:30 to 6:30 p.m.) at the same two locations are 1.12 and 0.67, respectively. BART's performance standard is to carry no more than 1.15 passengers per seat during the three-hour morning and afternoon peak commute periods./20/

<u>AC Transit</u>

The Alameda-Contra Costa Transit District (AC Transit) provides direct bus service to the East Bay from San Francisco's Transbay Transit Terminal, which is located about 1 mile (about a 20-minute walk) from the northernmost boundary of the Project Area. Direct access is provided to the Bay Bridge from the Transbay Terminal, and AC Transit buses do not use local city streets in San Francisco. Transbay service provides transit to various parts of western Alameda and western Contra Costa counties.

Most transbay service is commute-period and commute-direction oriented with only four routes providing midday/evening/weekend services (Routes F, NL, N, and O). Weekday afternoon commute services generally operate from 4:00 p.m. to 7:00 p.m. AC Transit headways during commute hours are 15 to 30 minutes on almost all routes, with two (SW and U) operating on 30- to 60-minute headways. Midday headways on routes providing midday services are 30 to 45 minutes./21/

AC Transit's total average daily transbay ridership is approximately 13,000 passengers Average ridership during the p.m. peak period (4:00 p.m. to 6:00 p.m.) is about 5,080 passengers, which represents approximately 32 passengers per bus./22/

Golden Gate Transit

Golden Gate Transit (GGT), operated by the Golden Gate Bridge, Highway, and Transportation District (GGBHTD), provides transit service between Marin and Sonoma Counties and San Francisco. GGT service closest to the Project Area includes regularly scheduled bus services which are based at the Transbay Transit Terminal and the regular ferry services based at the Ferry Building, both of which are approximately 1 mile (about a 20-minute walk) from the northernmost boundary of the Project Area.

GGT operates three basic bus services to San Francisco: Civic Center routes, Financial District routes, and Ferry Building feeder routes. The Financial District routes travel eastward along Lombard Street, Northpoint Street, and Beach Street, and then south along Battery Street to the Transbay Transit Terminal. Civic Center routes provide service along Van Ness Avenue to the Civic Center area before traveling east along Mission Street to the Transbay Transit Terminal./23/ GGBHTD also operates a Club Bus service between the University of California San Francisco's (UCSF) Parnassus Heights site and Marin County, between Sonoma County and downtown San Francisco, and between Napa Valley and downtown San Francisco. GGT operates a layover yard for its commute period buses in San Francisco, located at Folsom and Main Streets. The lot is leased month-to-month from Caltrans.

Commute hour GGT routes to and from downtown San Francisco operate on 30-minute or less headways in the primary commute direction. GGT buses that travel north during the a.m. peak and south during the p.m. peak have either 30-minute or 60-minute headways./24/ Midday service headways are 30 minutes on all lines between Marin and Sonoma Counties and San Francisco. The UCSF Club Bus service includes six routes, each with one daily round trip, originating in Ignacio, Santa Rosa, San Rafael, Fairfax, Tiburon, and Rohnert Park. The Valley of the Moon commute service for Sonoma County includes three routes, each with one daily round trip. The Napa Valley Commute Club operates two routes, each with one daily round trip.

- The total average weekday ridership on GGT bus service to and from San Francisco (excluding Club Bus service) is approximately 21,000 passengers per day, with about 6,705 of those trips being made during the p.m. peak hour./25/ Currently, 113 outbound and 18 inbound buses serve the Transbay Transit Terminal during the p.m. peak hour, with an average ridership of 30 passengers per bus (70% of capacity).

The UCSF Club Bus service has a total average daily p.m. peak ridership of 160 passengers, with the least average share of riders, 11, going to San Rafael, and the largest average portion, 39, going to Rohnert Park. Total average daily p.m. peak riderships for the Valley of the Moon Commute Bus and Napa Valley Commute Club are 99 passengers and 61 passengers, respectively.

GGT operates ferry service during peak periods between Larkspur and San Francisco and Sausalito and San Francisco. The Larkspur Ferry currently provides three ferry arrivals to San Francisco and four ferry departures from San Francisco during the p.m. peak period. The ferry ridership to San Francisco during the p.m. peak hour averages about 61 passengers per boat, while ferries traveling in the commute (outbound) direction have an average ridership of 360 passengers per boat. Each ferry boat serving Larkspur has a capacity of 725 passengers, yielding average riderships to and from San Francisco during the p.m. peak period that are 8% and 50% of capacity, respectively.

The Sausalito Ferry provides two arrivals and two departures to San Francisco during the p.m. peak period. The average p.m. peak hour ridership from Sausalito to San Francisco is about 100 passengers per boat, and the average ridership in the commute direction is approximately 170 passengers per boat. The capacity of the Sausalito vessels is 575 passengers, yielding average p.m. peak period load factors of 17% to San Francisco and 29% to Sausalito.

- <u>Other Ferry Services</u>

- The Blue & Gold fleet, Vallejo Baylink, Oakland/Alameda and Harbor Bay ferries operate ferry service between San Francisco and Alameda/Oakland, Vallejo, Sausalito, Tiburon, and Angel Island. They supplement Golden Gate Transit ferry service to and from the North Bay, as well as BART and AC Transit service to and from the East Bay. Service to and from Vallejo includes ten round trips each weekday to and from the Ferry Building, and three daily round trips to and from Fisherman's Wharf at Pier 39. Weekday service from Oakland/Alameda includes ten trips to the Ferry Building and seven trips to Fisherman's Wharf, while service to Oakland includes eleven departures from the Ferry Building and six departures from Pier 39. Service between Sausalito and Fisherman's Wharf is provided by six daily trips, and there are seven daily trips between Fisherman's Wharf and Tiburon.

Tiburon commute ferry service operates seven daily trips to the Ferry Building and six daily trips in the reverse direction to Tiburon. All Blue & Gold, Vallejo Baylink, Oakland/Alameda, and Harbor Bay ferry services have adequate capacity to accommodate their current passengers during the p.m. peak hour./26/

EXISTING PROJECT AREA TRANSPORTATION FACILITIES

Local Streets and Intersections

Although the street grid between Market Street and the Project Area does not follow an exact north-south or east-west orientation, conventional use in San Francisco is to refer to local roadways that are parallel to Market Street as east-west and the numbered streets perpendicular to Market Street as north-south, a convention that is used in this report. The transportation study area is served by a grid street network with most major arterials spaced approximately 700 to 900 feet apart. Designated major arterials/27/ serving east-west traffic in and near the transportation study area include King, Townsend, Bryant, and Harrison Streets. Designated major arterials serving north-south traffic include The Embarcadero, Third, and Fourth Streets. Seventh and 16th Streets are designated as secondary arterials./28/ The key physical characteristics for the local roadways, such as number of lanes and accessibility to pedestrians, bicycles, and transit users, are summarized in Table V.E.1, and described in detail in the "Roadway System" section of Appendix D, Transportation.

Intersection Analysis Methodology

Existing traffic conditions were determined for the key local intersections in the transportation study area and at freeway ramps. Traffic operations were analyzed in terms of the quality of traffic movement at intersections, which are usually the controlling factors in traffic flow. Average stopped delays and associated levels of service (LOS) are computed by assigning traffic volumes on each intersection approach to available travel lanes to determine the average stopped delay per vehicle. Delay is in turn a measure of driver discomfort, fuel consumption, and lost travel time.

Traffic operations at the signalized study intersections were evaluated using the *1985 Highway Capacity Manual* operations methodology updated in 1994 by the Transportation Research Board (TRB). Intersection Levels of Service range from LOS A (very low delay, i.e., up to five seconds per vehicle) to LOS F (poor progression, i.e., delays in excess of 60 seconds per vehicle). An LOS of D (with delay in the range of 25 to 40 seconds per vehicle) is the minimum acceptable operating condition for most urban San Francisco streets./29/ Appendix Table D.12 provides more detailed descriptions of the six levels of service, A through F, for signalized intersections.

TABLE V.E.1
FUNCTIONAL STREET CLASSIFICATION/a/

Street	Transit/b/	Vehicular/c/	No. of Lanes	Pedestrian/d/	Bicycle/e/	Freight /f/	CMP/g/	MTS/h/
Harrison	Transit Important: 4th St. to 7th St. Secondary Transit: 7th St. to 11th St.	Major Arterial	Four: primarily one-way	Neighborhood Commercial: 4th St. to Division	---	---	Yes	Yes
Bryant	Transit Important: 3rd St. to 7th St. Secondary Transit: 7th St. to 11th St.	Major Arterial	Five: primarily one-way	Neighborhood Commercial: 4th St. to 11th St.	---	---	Yes	Yes
Brannan	---	Major Arterial: 5th St. to 6th St.	Two to Four: two-way	---	---	---	No	No
Townsend	Transit Oriented: 3rd St. to 4th St.	---	Two: two-way	Neighborhood Network Connection Street	Citywide Bicycle Route: West of 3rd St.	---	No	No
King	Transit Important East of 6th St.	Major Arterial: 4th St. to Embarcadero	Four: two-way	Neighborhood Commercial Bay Trail: 4th St. to Embarcadero	Citywide Bicycle Route: East of 3rd St.	Substantial truck traffic east of 4th St.	Yes 4th St. to The Embarcadero	Yes East of Fourth St.
Sixteenth	Transit Oriented: West of Kansas	Secondary Arterial: West of 3rd St.	Two to Four: two-way	Neighborhood Commercial: West of Harrison	Citywide Bicycle Route: East of Kansas	---	No	Yes
Mariposa	---	---	Two to Four: two-way	---	Citywide Bicycle Route: East of Mississippi	---	No	No
Embarcadero	Primary Transit: Transit Important	Major Arterial	Four to Six: two-way	Neighborhood Commercial: Bay Trail	Citywide Bicycle Route	Substantial truck traffic	Yes King to N. Point	

(Continued)

TABLE V.E.1 /a/ (Continued)

Street	Transit/b/	Vehicular/c/	No. of Lanes	Pedestrian/d/	Bicycle/e/	Freight /f/	CMP/g/	MTS/h/
Second St.	Secondary Transit: Howard to Harrison	---	Four: two-way	Neighborhood Commercial	Citywide Bicycle Route	---	No	
Third St.	Primary Transit: Transit Important North of King & South of Mission Rock	Major Arterial	Four to Five: one-way north of King	Citywide Pedestrian Network: North of Folsom Neighborhood Commercial	Citywide Bicycle Route: South of Townsend	Substantial truck traffic south of Mission Rock	Yes	Yes
Fourth St.	Primary Transit: Transit Important	Major Arterial	Four: one-way	Bay Trail: South of King Citywide Pedestrian Network: North of Folsom Neighborhood Commercial	Citywide Bicycle Route: Townsend St. to Third St.	Substantial truck traffic south of King	Yes	Yes
Fifth St.	---	Major Arterial: Market to Brannan	Four: two-way	Neighborhood Commercial: Market to Mission	Citywide Bicycle Route: North of Townsend	---	Yes Market to Bluxome	Yes Howard to Brannan
Seventh St.	---	Major Arterial: Market to Bryant Secondary Arterial: Bryant to 16th	Six: two-way	Neighborhood Commercial 24th St. to 25th St.	Citywide Bicycle Route North of Pennsylvania Ave.	---	Yes Market to Bryant	Yes Market to 16th St.

Notes:
a. See Appendix Table D.1 for a definition of the functional street classification categories.
b. City and County of San Francisco *General Plan*, Transportation Element (Transportation Element), July 1995, Map 9, p. I.4.42
c. Transportation Element, Map 6, p. I.4.32
d. Transportation Element, Map 11, p. I.4.55
e. Transportation Element, Map 13 p. I.4.59
f. Transportation Element, Map 15 p. I.4.75
g. Transportation Element, Map 7, p. I.4.33 [**CMP** = Congestion Management Network]
h. Transportation Element, Map 8, p. I.4.34 [**MTS** = Metropolitan Transportation System]

A different methodology is used to analyze operations at unsignalized intersections with minor street control (two-way stop). For two-way stop controlled intersections, stop signs are designed to assign the right-of-way to the major street traffic. Drivers on the minor street and those making left turns from the major street use judgment when selecting gaps in the major street traffic flow in order to cross or execute their turning movements. Therefore, the minor street traffic and left turns from the major street may be subjected to delays, while no delay is experienced by the through traffic on the major street.

Traffic operations at unsignalized study intersections with some (but not all) stop controlled approaches were evaluated using the *1985 Highway Capacity Manual* operations methodology for two-way stop controlled intersections, as outlined in *1985 Highway Capacity Manual* Chapter 10 (Unsignalized Intersections). This method determines the capacity of the stop controlled (minor street) intersection approaches by estimating the availability and usefulness of gaps in the uncontrolled traffic on the major street (so that vehicles on the minor street can cross or cross/merge with traffic on the major street). Intersection LOS is then based on average total delay per vehicle (in seconds per vehicle) at the intersection. LOS ranges from A (with generally free flow conditions and easily made turns and crossing maneuvers by the minor street traffic) to F (with very long delays for minor street traffic and major street left turns across the opposing direction traffic stream). Appendix Table D.12 provides more detailed descriptions of the six levels of service, A through F, for two-way stop controlled intersections.

Another type of unsignalized intersection is an all-way stop controlled intersection, in which stop signs are installed on all approaches to the intersection. Traffic operations at unsignalized study intersections with all-way stop controlled approaches were evaluated using the operations methodology for all-way stop controlled intersections, as outlined in the *1985 Highway Capacity Manual*, Chapter 10 (Unsignalized Intersections). This method determines the intersection capacity by estimating, for the approach, the traffic distribution on all other approaches. Intersection LOS is then based on the average total delay per vehicle (in seconds per vehicle) at the intersection.

Intersection Operating Conditions

To analyze existing intersection levels of service, turning movement volumes were collected at 31 existing study intersections on a typical weekday from 4:00 p.m. to 6:00 p.m. Intersections deemed critical or representative of traffic volumes and congestion were selected by the San Francisco Planning Department staff. This information was used to determine average traffic conditions for the weekday p.m. peak hour of the evening commute period (4:00 p.m. to 6:00 p.m.).

Table V.E.2 and Figure V.E.4 summarize the resulting average vehicle delays and levels of service for each study intersection during the p.m. peak hour. The most congested locations are near the I-80 ramps. Eight of the 31 existing study intersections currently operate at LOS F, and one intersection is currently operating at LOS E. Two of the intersections operating at LOS F (Mariposa St./I-280 southbound on-ramp, and 16th and Vermont Streets) are unsignalized. The existing LOS at the intersections of Mariposa Street at the I-280 on-ramp and Brannan Street at Sixth Street are based on traffic counts taken in 1996; the LOS has improved somewhat since the new I-280 southbound on-ramp at King Street opened in November 1997. Because new counts have not been taken since the November opening, "existing" LOS at these locations is based on the earlier data. As described below under "Local Streets" in "Traffic Impacts" under the Impacts subsection, the impacts analysis for "existing-plus-project" conditions reassigns travel from existing traffic counts to account for new freeway ramps.

China Basin Channel Bascule Bridge Operations

The Lefty O'Doul (Third Street) and Peter Maloney (Fourth Street) Bridges over China Basin Channel are bascule, or lift, type bridges operated by the San Francisco Department of Public Works. The bridges are raised to permit boats to pass from boat docks located west of the Peter Maloney Bridge out to the San Francisco Bay./30/ The frequency of bridge openings averages 40 to 75 per month during the winter and increases in the spring and summer months./31/ The highest observed number of openings was 180 in April 1994. The average number of openings per month in 1993 was 130.

Effects of Train Movement on Intersection Level of Service

The Project Area is located immediately east of Caltrain's rail corridor. Caltrain currently operates 66 passenger trains per day through this corridor. Rail service in the vicinity of the Project Area is discussed further in "Regional Transit Systems" under "Existing Regional Transportation Systems" in "Setting," above. The intersection average delays and associated LOS presented in Table V.E.2 consider the additional delay to vehicles due to train movements through immediately adjacent rail crossings. Of the 31 existing study intersections, the intersection of 16th Street at Seventh/Mississippi Streets has certain through and turning movements blocked when a train passes through (a railroad preemption). Typically, during the p.m. peak commute period, Caltrain trains block specific traffic movements at that intersection for a duration of 80 to 120 seconds. Approximately eight to nine trains operate through the intersection crossing during the peak hour. Appendix Table D.14 provides detailed information on the p.m. peak commute period railroad crossing data collected at the intersection of 16th and Seventh/Mississippi Streets. There is no at-grade railroad crossing at the

TABLE V.E.2
EXISTING CONDITIONS AT PROJECT STUDY AREA INTERSECTIONS
Levels of Service, Weekday PM Peak Hour

Study Intersection	Traffic Control Device	Average Delay (sec/veh)	Level of Service
Berry Street at:			
Third Street	Traffic Signal	7.7	B
Fourth Street	Traffic Signal	5.2	B
Brannan Street at:			
Sixth Street/I-280 ramps	Traffic Signal	49.9	E
Seventh Street	Traffic Signal	11.4	B
Bryant Street at:			
Second Street	Traffic Signal	153.1	F
Fourth/EB I-80 Off-Ramp	Traffic Signal	16.4	C
Fifth Street	Traffic Signal	77.2	F
Seventh/EB I-80 Off-Ramp	Traffic Signal	14.0	B
Harrison Street at:			
First Street	Traffic Signal	161.7	F
Second Street	Traffic Signal	185.7	F
Fifth Street	Traffic Signal	8.9	B
Seventh Street	Traffic Signal	14.8	B
Fremont/WB Off-Ramp	Traffic Signal	71.3	F
Essex Street	Traffic Signal	67.7	F
King Street at:			
Second Street	Traffic Signal	33.3	D
Third Street	Traffic Signal	20.9	C
Fourth Street	Traffic Signal	16.6	C
Fifth Street/I-280	Traffic Signal	N.A. /a/	N.A. /a/
Mariposa Street at:			
Third Street	Traffic Signal	8.4	B
De Haro Street	All-way Stop	2.5	A
SB I-280 On-Ramp	Unsignalized	30.3	F
NB I-280 Off-Ramp	Traffic Signal	19.7	C

(Continued)

TABLE V.E.2 (Continued)

Study Intersection	Traffic Control Device	Average Delay (sec/veh)	Level of Service
Townsend Street at:			
Third Street	Traffic Signal	20.9	C
Fourth Street	Traffic Signal	6.4	B
Seventh Street	Traffic Signal	10.4	B
Eighth Street	All-way Stop	5.9	B
Third Street at:			
César Chavez	Traffic Signal	21.3	C
16th Street	Traffic Signal	9.9	B
Fourth/Mission Rock Streets	Traffic Signal	9.6	B
Sixteenth Street at:			
Seventh/Mississippi Streets	All-way Stop	16.6	C
Potrero Avenue	Traffic Signal	23.1	C
Vermont Street	All-way Stop	77.9	F

Notes:
SB=southbound; NB=northbound; EB=eastbound; WB=westbound
a. Intersection at Fifth and King Streets was under construction at the time traffic counts were taken.

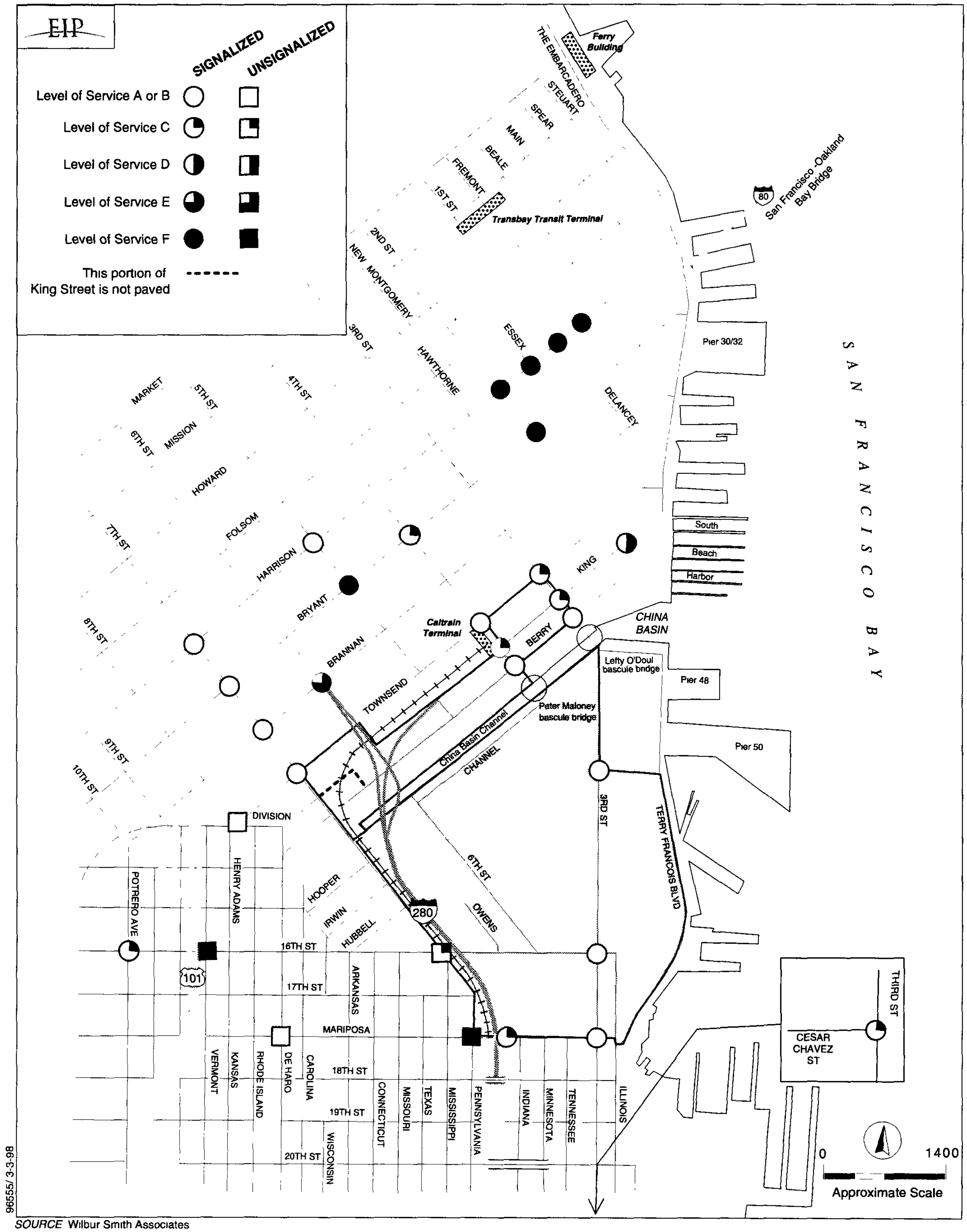
Source: Wilbur Smith Associates.

intersection of Mariposa and Mississippi Streets, and the crossing at Berry Street is not currently used. The existing crossing at King Street is currently open and passable, but not reflective of typical improvements for traffic use.

Local Transit Facilities and Services

San Francisco Municipal Railway (MUNI)

San Francisco MUNI provides local transit service within the City and County of San Francisco. MUNI operates two types of transit service in and near the Mission Bay Project Area: diesel bus and electric trolley bus. Starting in January 1998, MUNI also began light rail service to the Mission Bay



SOURCE Wilbur Smith Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.E.4 WEEKDAY P.M. PEAK HOUR LEVELS OF SERVICE: EXISTING

Project Area with the MUNI Metro E-line along The Embarcadero and King Street. Figure V.E.5 shows the locations of existing MUNI service near the Project Area.

The Project Area is served by three cross-town routes, six radial routes, and one secondary route. Most of the routes that serve the Project Area directly (15, 30, 32, 42, 45, and the Caltrain express routes) converge at the Fourth and Townsend Caltrain terminal which serves as a hub for these routes./32/

Route 15-Third, a radial diesel bus route, is the only regular transit service that crosses China Basin Channel to directly serve the Mission Bay Project Area south of the Channel. It operates at a target frequency of six minutes between 4:00 p.m. and 6:00 p.m.

Route 22-Fillmore, a cross-town electric trolleybus route, travels along 18th Street, one block south of the southern boundary of the Mission Bay Project Area, and extends west using 17th and 16th Streets. It operates at target seven-minute headways in the afternoon peak period.

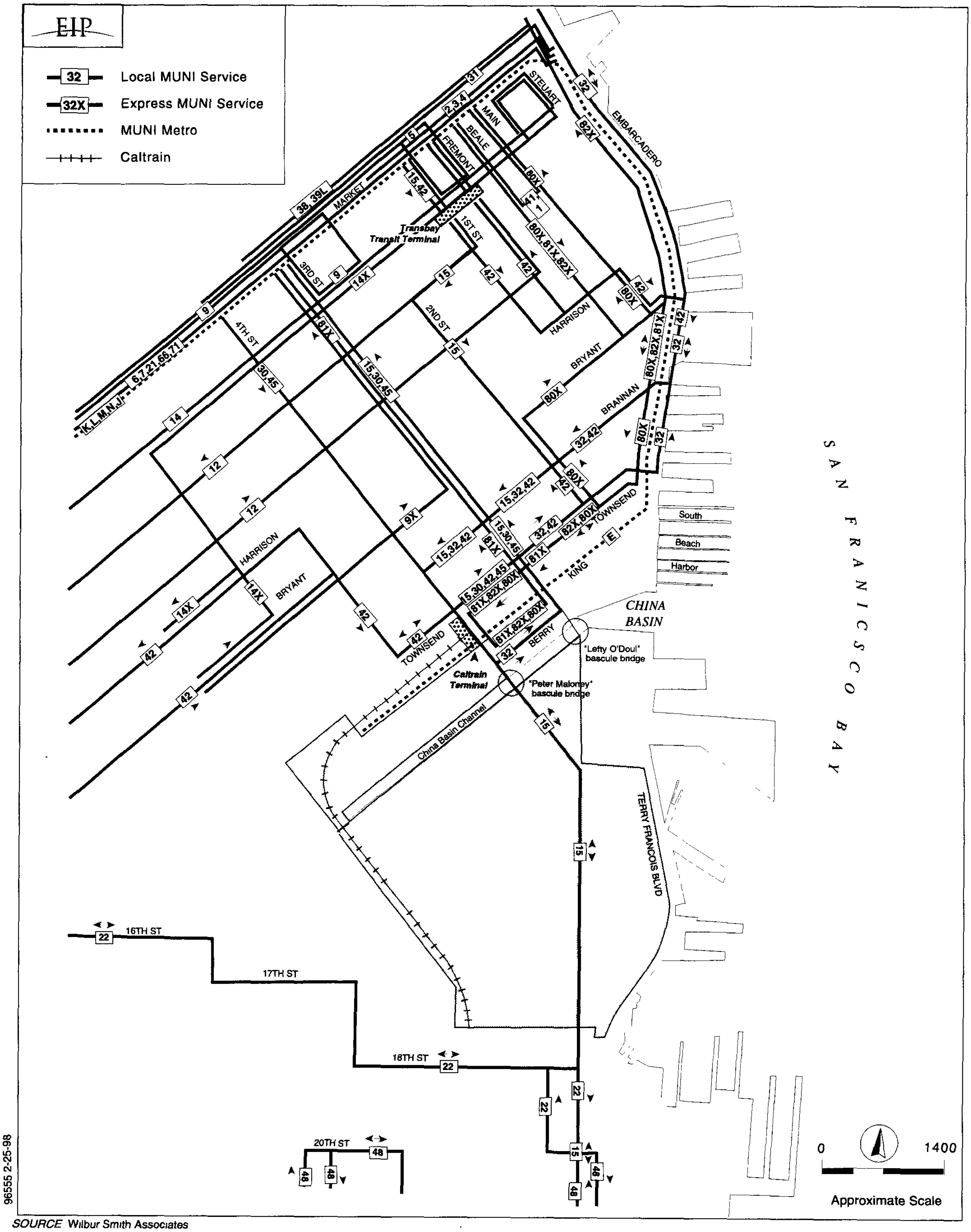
Routes 30-Stockton and 45-Union-Stockton are both radial electric trolley bus routes and have the same alignment near the Project Area. They both travel south on Fourth Street from Market Street, travel east for one block on Townsend, and continue back to Market Street, traveling north on Third Street. Route 30 operates at a target of four-minute headways during the afternoon peak, and route 45 operates at a target eight-minute headways during this time.

Route 32-Embarcadero is a secondary diesel bus route that serves the Project Area north of the Channel, traveling one block on Fourth, Berry, and Third Streets, as well as two blocks on Townsend Street. It operates at a target of 12-minute headways in the afternoon peak period.

Route 42-Downtown Loop is a cross-town diesel bus route operating at a target frequency of ten minutes in the afternoon peak period. It travels on Townsend Street for three blocks and extends north to the Transbay Transit Terminal and west along Harrison and Bryant Streets.

Route 48-Quintara-24th is a cross-town diesel bus route that travels along 22nd Street, five blocks south of the Mission Bay boundary. It operates at a target frequency of 12 minutes during the evening peak period.

The 80X-Gateway Express, 81X-Caltrain Express, and 82X-Levi Plaza Express have coverage in the Mission Bay Project Area similar to that of Route 32. These three radial diesel bus routes provide service in the a.m. and p.m. weekday peak commute times, approximately 7:00 a.m. to 9:00 a.m.,



SOURCE Wilbur Smith Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.E.5 EXISTING MUNI TRANSIT SERVICE

and 4:00 p.m. to 6:00 p.m. The 80X and 81X each operate at a frequency of 10 minutes, and the 82X operates at a 20-minute frequency. Route 80X travels south on Beale Street and The Embarcadero, west on Townsend Street to the Caltrain terminal, and returns north via Townsend Street, Second Street, Bryant Street, and finally Main Street. Route 81X buses travel south by the same path as route 80X to the Caltrain terminal, and then travel north on Third Street. Route 82X buses travel from downtown to the Caltrain terminal in a similar manner, but uses The Embarcadero to travel north again.

MUNI Metro light rail service operates in tunnels underneath Market Street. Five routes (J-Church, K-Ingleside, L-Taraval, M-Ocean View, and N-Judah) operate through these tunnels before diverging west of Church Street to various parts of the City. E-line light rail service began in January 1998 along the southern portion of The Embarcadero and King Street. It operates on a semi-exclusive right-of-way in the median of The Embarcadero and King Street, as a shuttle between Embarcadero Station and the Caltrain terminal, at a frequency of six minutes in the afternoon peak period. When the Advanced Train Control System is implemented, the E-line shuttle will be replaced by an extension of the J-Church light rail line. Eventually, this service is proposed to operate as a continuous extension of the L-Taraval line instead of the J-Church, when the J-Church line is extended as part of the new Third Street light rail service. Therefore, the Metro extension to the Caltrain terminal is called the "L-line" in the Impacts discussion, as the impacts are analyzed for the year 2015. The possibility of also extending the M-Ocean View line to the Caltrain terminal during the peak periods to provide additional capacity is currently being evaluated by MUNI staff./33/ Center platform stations for the E-line are located on The Embarcadero at Folsom Street, and at Brannan Street, as well as on King Street between Second and Third Streets, and between Fourth and Fifth Streets, next to the Caltrain terminal.

Table V.E.3 shows the combined average hourly capacities and loads at the peak load points in the p.m. peak hour of MUNI transit routes crossing one of four screenlines/34/, shown in Figure V.E.6. MUNI screenlines are hypothetical lines delineating corridors in order to measure, for impact analysis and planning purposes, conditions on combined MUNI transit lines from the greater downtown (including the Project Area) to other parts of San Francisco. These screenlines consist of aggregates of individual MUNI lines, as shown in Table V.E.3. It should be noted that the points of measurement for the screenlines do not actually follow the alignments shown schematically on Figure V.E.6, but instead are measured at the actual maximum load point for each MUNI line crossing a screenline. The greatest utilization now occurs on the lines crossing the northwest and southwest screenlines, where 73% of the available capacity is now used during the p.m. peak hour. Appendix Table D.16 describes the headways (frequency of service) and average daily ridership of the specific MUNI routes serving the Project Area.

TABLE V.E.3
EXISTING MUNI RIDERSHIP SUMMARY BY SCREENLINE
P.M. Peak Hour - Peak Direction

Screenline/a/	MUNI Routes	Hourly Capacity/b/	Average Hourly Load/c/	Percent Capacity Used
Northeast	15, 30, 30X, 45	3,400	2,250	66%
	32, 41, 42, 82X	1,950	1,050	54%
	Subtotal	*5,150*	*3,300*	*64%*
Northwest	38, 38L, 38AX, 38BX	2,800	2,000	71%
	1, 1AX, 1BX, 2, 3, 4, 5, 21, 22, 31, 31AX, 31BX	6,200	4,600	74%
	Subtotal	*9,000*	*6,600*	*73%*
Southwest	K, L, M, N	6,800	4,900	72%
	6, 7, 71, F	1,400	1,100	79%
	Subtotal	*8,200*	*6,000*	*73%*
Southeast	J, 9	1,700	1,250	74%
	15	850	350	41%
	14, 14X	1,500	950	63%
	Subtotal	*4,050*	*2,550*	*63%*

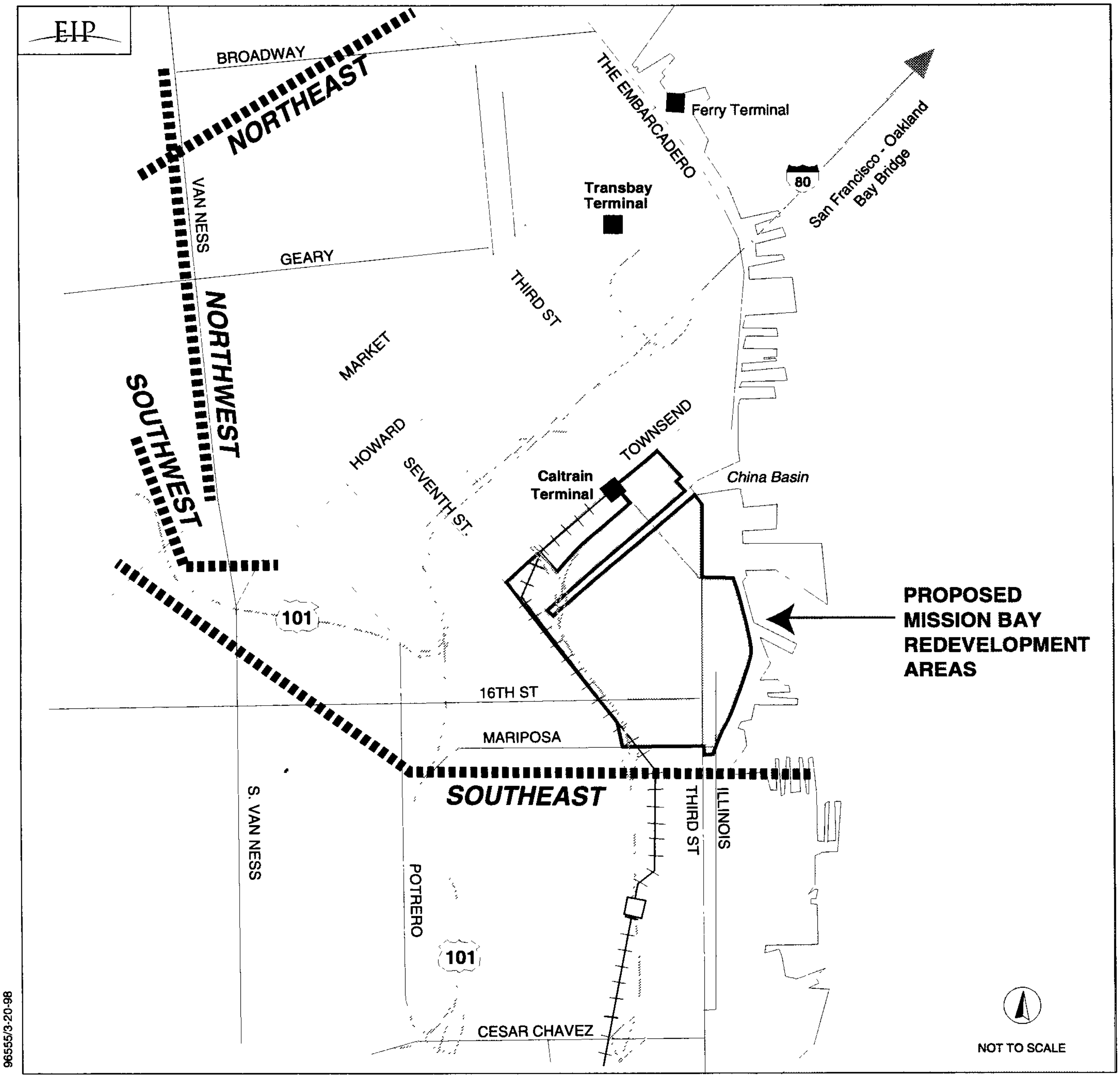
Notes:
a. See Figure V.E.6 for screenline locations.
b. Capacity based on "San Francisco Municipal Railway, Ridership Projections to the Year 2015," April 25, 1997; revised May 5, 1997. It assumes an appreciable number of standees per vehicle (somewhere between 60% and 80% of the number of seated passengers, depending on the specific transit vehicle configuration) and may not include the effects of missed or late runs.
c. Average load at maximum load point, based on MUNI's passenger monitoring data for the FY 1995-96, November 4, 1995.

Source: Wilbur Smith Associates.

MUNI's ability to provide transit is directly related to the availability of vehicles. On weekdays, MUNI is unable with its present fleet to meet its scheduled service needs during peak periods. MUNI's peak fleet deployment begins to build at about 3:30 p.m. and relaxes after 6:00 p.m.

Parking Characteristics

Several parking surveys have been performed that inventoried the parking supply and occupancy in the area north of the Project Area. These studies were reviewed and confirmed through further field



SOURCE San Francisco Municipal Railway, San Francisco Planning Department

FIGURE V.E.6 MUNI TRANSIT SCREENLINES (SCHEMATIC)

inventories conducted in 1996 for the *San Francisco Giants Ballpark at China Basin EIR* (Giants Ballpark EIR)./35/

In the Project Area north of China Basin Channel, there are approximately 12,800 spaces, of which 3,550 spaces are on-street parking and 9,240 are off-street. Off-street parking includes approximately 6,200 spaces that are available to the general public, and about 3,050 private spaces that are restricted to customers and employees of private businesses, companies, or public agencies. Informal Caltrain commuter parking occurs in the vicinity of the terminal, on Townsend, Seventh, and Berry Streets, where parking is not restricted to time limits.

In the Project Area south of China Basin Channel, on-street parking is permitted at practically all curbs. There is limited off-street parking. Most of the on-street parking spaces are restricted between 2:00 a.m. and 6:00 a.m. to deter overnight parking. Parking on Seventh Street is restricted between 12:00 a.m. and 6:00 a.m., on Monday, Wednesday, and Friday on the east side, and on Tuesday and Thursday on the west side. Parking on 16th Street is similarly restricted between 12:00 a.m. and 6:00 a.m. on Monday, Wednesday, and Friday on the north side, and on Tuesday and Thursday on the south side. The spaces on the north side of Channel Street, which are owned by the Port of San Francisco, have a two-hour parking limit to discourage commuter parking; no other on-street parking in the parking study area south of the Channel is subject to time limits.

South of the Project Area on-street parking serves mainly commercial and industrial uses. There are no parking restrictions on commercial or residential streets for several blocks south of Mariposa Street. Illinois, Minnesota, and similar industrial streets are heavily used by trucks loading and unloading; trucks occasionally double park awaiting loading docks. Parking on Third Street in this area is currently allowed but is proposed to be prohibited after construction of the Third Street light rail project.

West of the Project Area, the area on and north of 16th Street is primarily industrial, with truck loading and employee parking similar to the area south of Mariposa Street. South of 16th Street, Potrero Hill is primarily residential with no controls on on-street parking.

Pedestrian and Bicycle Access

<u>Existing Pedestrian System Characteristics</u>

North of the Channel, King Street, Third Street, and Fourth Street are important pedestrian streets and are designated neighborhood commercial streets in the citywide pedestrian network of the

Transportation Element of the *San Francisco General Plan*. In addition, parts of King Street (east of Fourth Street) and Fourth Street (south of King Street) are designated as part of the Bay Trail. Pedestrian facilities in the Project Area north of the Channel are generally adequate. The streets have sidewalks (usually 9 to 12 feet wide) on both sides, with crosswalks on all approaches. Sidewalks are generally lacking on both sides of Townsend Street between Fourth and Seventh Streets.

Pedestrian access to the northern part of Mission Bay from the east and north is generally convenient, as there are sidewalks on one or both sides of most South of Market streets. Access from the west north of the Channel is less convenient, as there is no pedestrian-oriented gate or crossing at the Caltrain tracks parallel to Seventh Street, and sidewalks on Seventh Street are lacking or inadequate.

South of the Channel, pedestrian facilities are sufficient for the existing conditions, but not adequate to support increases in land use intensity; there are sidewalks on many streets, but because of the industrial character of the area, sidewalks are discontinuous or non-existent in many places in order to accommodate entrances and exits to loading areas. Terry A. François Boulevard and Third Street each have a sidewalk on the east side only; Sixth Street has a sidewalk on the west side and for part of the eastern length. Mariposa Street has a sidewalk on both sides, except in the vicinity of the I-280 on- and off-ramps, where a sidewalk exists on the north side only. There are no sidewalks on Pennsylvania Avenue or on 17th Street within the Project Area.

Pedestrian access from south of Mariposa to the Project Area is adequate, as there are sidewalks on both sides of Third Street and on Illinois, Minnesota and most other north-south streets nearby. Access from the west, including Potrero Hill, requires crossing under the I-280 freeway structure and crossing over the Caltrain tracks. Appropriate pedestrian safety features for crossing the tracks are available to access the Project Area south of the Channel only at 16th Street, where there is a gated crossing, and at Mariposa Street, where the street and sidewalk cross the tracks on an overpass that is under the freeway structure.

Based on field observations, pedestrian activity in the immediate vicinity of the Project Area is relatively light during the evening commute peak period. However, the number of pedestrians is very high near the Caltrain terminal during weekday afternoon commute periods, especially on Townsend Street.

Pedestrian capacity analyses for existing conditions were conducted for all crosswalks at two intersections: King and Third Streets, and King and Fourth Streets. Pedestrian counts were taken on June 25, 1997, at the four crosswalks at each intersection. Each crosswalk is 20 feet wide except for the westside crosswalk at King and Fourth Streets (closest to the Caltrain terminal), which is 30 feet wide.

Pedestrian Analysis Methodology

Levels of service for walkways and crosswalks, as defined in Appendix Table D.17, provide a pedestrian measurement of 1) the amount of space for each pedestrian (more space results generally in more comfort) and 2) convenience (in that crowded walkways result in delay for some pedestrians). The method used to determine pedestrian level of service is described in *Urban Space for Pedestrians*./36/ At crosswalk locations, the signal timing affects the flow rate calculation as do the pedestrian volume and crosswalk width. The walk time available varies depending on the time of day. Thus, a lower volume in a particular crosswalk could have a worse level of service if it also has less green signal time available.

As shown in Table V.E.4, seven of the eight crosswalks at the two pedestrian study intersections are operating under a flow regime of *Open*, the least congested condition. The eastside crosswalk at Third and King Streets is operating at a flow regime of *Unimpeded*, the second best condition. Both are considered very acceptable pedestrian levels of service.

Bicycle Access System Characteristics

The level of bicycle activity varies widely in and near the Project Area, as do the types of facilities available. On-street bike lanes are currently provided on King Street east of Third Street, and on 16th Street from Third Street to Henry Adams Street crossing the Caltrain tracks at Seventh Street. The San Francisco Bicycle Plan, recently adopted by the San Francisco Parking and Traffic Commission and Board of Supervisors/37/ proposes bike lanes (Class II) on Townsend Street (between Fourth and Eighth Streets), Third Street (between Channel Street and Le Conte Avenue near Bayview Hill), and Fifth Street (between Market and Townsend Streets). Mariposa Street is designated as a Class III "bicycle route" (signs but no bike lanes), as is Seventh Street between Market and Mariposa Streets, Third Street from Townsend Street to Channel Street, and Indiana Street south of Mariposa Street to César Chavez Street.

Goods Movement

Freight Loading and Service

Roadways in and near the Project Area that carry substantial truck traffic include all freeways, Townsend Street, and Third Street. The movement of trucks is directed by specific signs to and from the Bay Bridge (I-80), I-280, and U.S. 101. Signed freeway access routes include Third, Townsend, Bryant, Harrison, Folsom, and Fremont Streets. Third Street has through-truck restrictions south of

TABLE V.E.4
CROSSWALK OPERATIONS ANALYSIS - EXISTING VOLUMES

Crosswalk Location	Time Period	Width (feet)	Walk Time/a/	Volume (pph)/b/	Flow Rate (ppmpf)/c/	Flow Regime
Third St./ King St.						
Northside	4:30 - 5:30 p.m.	20	20.5%	45	0.18	Open
Southside	4:30 - 5:30 p.m.	20	20.5%	4	0.02	Open
Eastside	4:30 - 5:30 p.m.	20	14.5%	127	0.73	Unimpeded
Westside	4:30 - 5:30 p.m.	20	14.5%	47	0.27	Open
Fourth St./King St.						
Northside	4:30 - 5:30 p.m.	20	45.5%	20	0.04	Open
Southside	4:30 - 5:30 p.m.	20	45.5%	20	0.04	Open
Eastside	4:30 - 5:30 p.m.	20	15.0%	72	0.40	Open
Westside	4:30 - 5:30 p.m.	30	15.0%	97	0.36	Open

Notes:
Counts taken June 25, 1997.
a. Walk time for eastside and westside crosswalks assumed to be 50% of green time.
b. pph = Pedestrians per hour.
c. ppmpf = Pedestrians per minute per foot of width.

Source: Wilbur Smith Associates.

Jerrold Avenue in the South Bayshore neighborhood, requiring most through trucks to use César Chavez Street for freeway access. In addition to Third Street, Mariposa, 16th, and Illinois Streets provide access to the waterfront and also experience heavy truck traffic. South of Mission Bay, trucks typically use César Chavez Street from U.S. 101 and I-280 to access industrial areas and the container shipping terminals at Piers 80 - 96.

Streets located in the vicinity of I-80 (Howard, Harrison, Bryant, First, Second, Third, Fourth, and Sixth Streets) present substantial congestion problems for goods and service movements during the weekday p.m. peak period, due to congestion on I-80 and U.S. 101. Those streets and the on- and off-ramps represent constraints, particularly for truck movements to and from the East Bay. Although trucks bound for the East Bay can use the high occupancy vehicle lanes on Bryant and Sterling Streets to bypass some of the traffic congestion, they often have difficulty accessing those lanes due to congested traffic conditions in the adjacent streets.

The north side of King Street between Second and Third Streets serves numerous truck bays. Commercial businesses along both sides of Third and Fourth Streets between King and Bryant Streets require periodic truck unloading activities. Alleys connecting Townsend Street with Brannan Street provide some off-street truck unloading/pickup facilities.

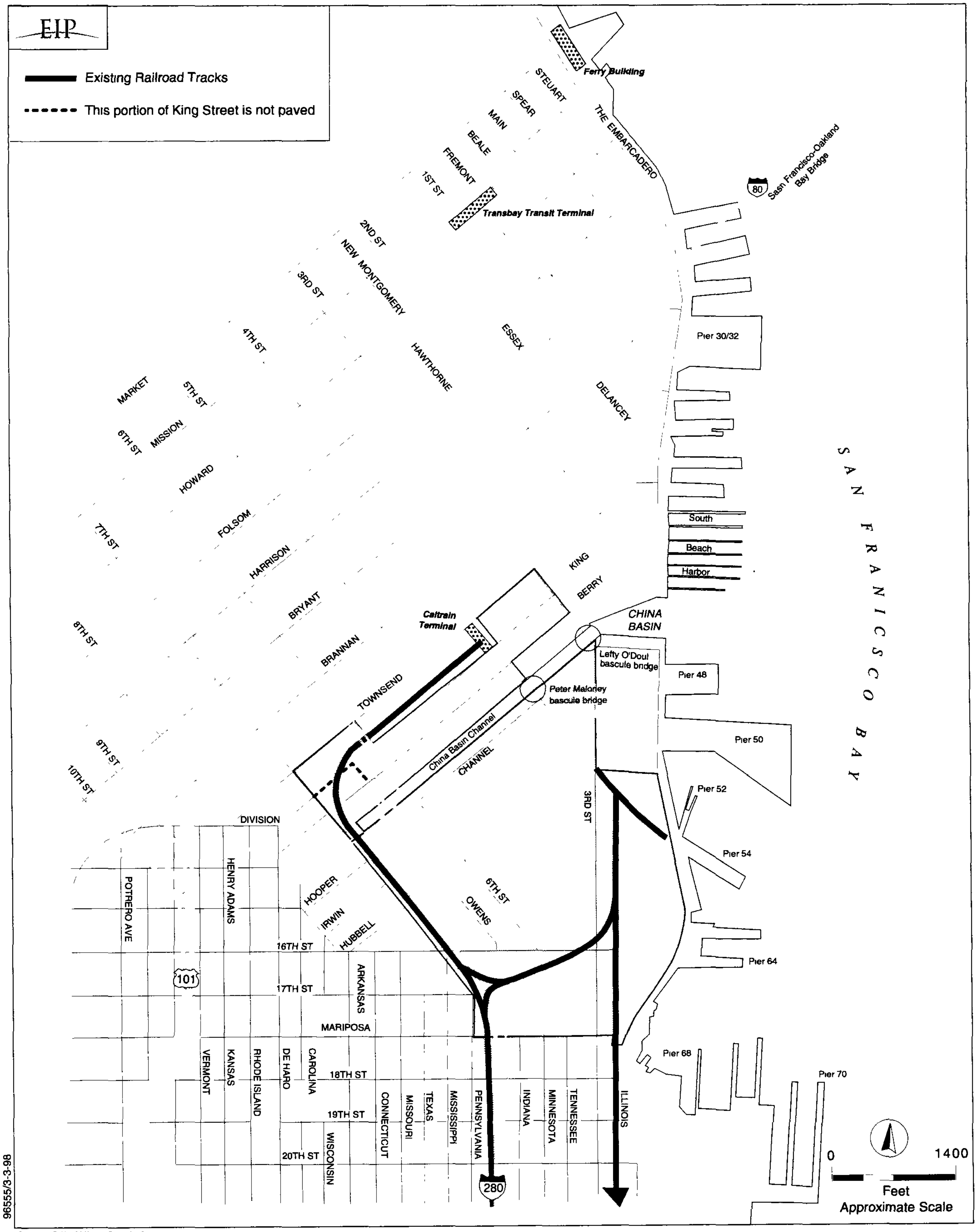
Numerous loading zones and roll-up doors are also located on the north side of Townsend Street, between Third and Seventh Streets, where extensive truck activity occurs. In many instances, delivery trucks block the sidewalk area and in some cases may partially block the westbound curb travel lane.

The south side of Channel Street offers commercial parking and loading bays for warehouses on Channel Street east of Sixth Street. On the east side of Sixth Street there is 90-degree commercial parking and several large loading docks occupying the majority of the space, and some parallel on-street parking is available on the southern portion of the street. On the west side of Sixth Street, approximately 50% of the street's length is allotted to commercial parking and loading areas. Illinois Street serves existing warehouses, and there are typically considerable numbers of trucks parked on both sides of Illinois Street from Mission Rock Street (near the intersection of Third and Fourth Streets) to south of Mariposa Street. The northern portion of Terry A. François Boulevard also has commercial parking and loading areas.

Rail Freight

Existing rail access to Mission Bay and adjacent areas is presented in Figure V.E.7. It includes a "Y" connection to the east, off the north-south Caltrain passenger line near 16th Street. The rail line crosses 16th Street diagonally, to a point north of it, where it connects to track that runs north-south on Illinois Street. Portions of rail track extending beyond Illinois Street to Terry A. François Boulevard were recently removed. Freight train operations on the rail connections in Mission Bay are generally restricted to those times when passenger service is not occurring on the Caltrain tracks, approximately 1 a.m. to 4 a.m. This restriction is part of the Shippers Agreement established between Catellus and Union Pacific Railroad/Caltrain./38/ The crossing at Third Street is protected by an automatic gate and flashing signal devices.

The existing usage data received from Union Pacific Railroad shows one train delivery to Pier 54 two years ago; however, the tracks have been removed since, and there is no track connection for this movement at this time./39/ The only other reported usage is about 15 cars per year to Pier 80, using the "Y" connection to Illinois Street, and thence southerly on Illinois to Pier 80, to deliver materials for assembling new MUNI Metro light rail vehicles (Breda cars) and occasional oversized cargo that



SOURCE: Wilbur Smith Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.E.7 EXISTING RAILROAD TRACK LOCATIONS

cannot be carried to the Pier on trucks./40/ In January 1998, the Port reopened Pier 80 for container shipping (closing the Pier 94 container facilities); it is expected that rail freight traffic will increase as a result of this change./41/

EXISTING TRANSPORTATION PLANS, POLICIES, AND PROGRAMS

Regional Transportation Plan

Since certification of the 1990 FEIR, the Regional Transportation Plan for the San Francisco Bay Area (RTP) prepared and adopted by the Metropolitan Transportation Commission (MTC) has changed considerably. The 1994 RTP approaches regional transportation planning based on the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Clean Air Act amendments of 1990. These federal laws require that transportation plans demonstrate how projects included in the plan can be constructed during the 20-year timeframe of the plan, and demonstrate that all projects included will help attain and maintain federal air quality standards in the region. A separate long-range transportation planning document is being developed by MTC that will advocate for new funding and new transportation strategies beyond projects that can be implemented in the RTP planning timeframe.

The basic regional goals that govern the RTP include: improve mobility for people and freight; make the regional transportation systems accessible to all; enhance sensitivity to the environment; and support economic and community vitality in the region. To implement these goals, the RTP uses three investment strategies in establishing the list of transportation projects to be funded over the 20-year planning period. They are: to expand transportation facilities using existing regional and local transportation plans; to maintain the region's existing facilities and services before funding major expansions in the system; and to establish a stronger connection between transportation and land-use decisions in the region. A basic assumption in this program is that no new additional revenue sources will become available during the 20-year planning period. The ISTEA (Intermodal Surface Transportation Efficiency Act) legislation adopted in 1991 also redirected federal funding policies away from building more freeways and toward a focus on transportation systems users and more local control that will reduce congestion and provide an integrated regional transportation system.

Based on these goals, strategies, and policies, the majority of the funding allocated by MTC in the RTP supports maintenance of existing transit systems, state highways, local streets and roads and eight major bridges. The funding provides for ongoing operation and maintenance of these systems, and provides for enhanced transit access through rail extensions and paratransit for elderly and disabled riders, expansion of bicycle access, and additional high occupancy vehicle (HOV) lanes on regional freeways. Therefore, relatively little of the region's estimated $74 billion in transportation funding over the next 20 years is available for major new programs. The 1994 RTP acknowledges that sufficient funding will not be available to cover all transit operating shortfalls in the region and that only those portions of streets and roads falling within the Metropolitan Transportation System/42/ can be funded for pavement maintenance. About one-third of the regional "discretionary" funding is allocated to reducing part of these shortfalls; about one-third is allocated to transit system expansions and upgrades; and the remainder is allocated to highway improvements such as new HOV lanes, to operational improvements such as traffic management tools to smooth traffic flows, and to improvement of bicycle and pedestrian facilities in the region.

In San Francisco, RTP investments include maintenance and operating funds for MUNI, rehabilitation and signal timing improvements of Metropolitan Transportation System streets, additional MUNI maintenance facilities and new trolleybuses, partial funding of bicycle and pedestrian improvements, and partial funding of the Caltrain extension to downtown./43/

The 1996 update of the RTP proposed only minor changes in the funding program established in the 1994 RTP. Most of these changes were the result of the recent court invalidation of Santa Clara County's sales tax measure, which calls into question the availability of funding for many transportation projects in that county, as well as some projects listed in the 1994 RTP for other counties that are coordinated with Santa Clara County. For San Francisco, electrification of the Caltrain extension to downtown was deleted as a result of the loss of this sales tax funding in Santa Clara County. Other revisions update projects based on more detailed information, such as adjusting the definition of the BART extension to San Francisco Airport to reflect the approved route alignment, or changing the designation of projects that are under construction or completed and therefore need no further funding.

County Congestion Management Plan

State legislation adopted in 1988 requires each county to adopt a county-wide congestion management plan containing levels of service standards for major arterials, establish transit service standards, develop trip-reduction and travel demand programs if they do not already exist, and formulate capital improvement programs. The San Francisco Board of Supervisors has designated the San Francisco Transportation Authority as the San Francisco Congestion Management Agency. The Congestion Management Agency adopts and updates the San Francisco Congestion Management Plan (CMP). The CMP designates a network of all freeways, state highways and the principal arterials within the City. Level of Service E has been established as an acceptable LOS for all designated arterials and highways in this network in San Francisco for purposes of congestion management planning, based in part on existing conditions when the CMP was adopted. Note that levels of service for arterials are analyzed somewhat differently from those at intersections; various City agencies have agreed that for local intersections, LOS D is the lowest acceptable service level and degradation from LOS D or better to LOS E is considered to be a significant environmental impact for CEQA analysis purposes. This SEIR provides analysis of local intersections and intersections at freeway ramps, consistent with the analysis in the 1990 FEIR.

Regional Transit Plans

Regional transit carriers prepare Short Range Transit Plans detailing proposals for changes in and expansion of transit service in their service areas. These plans are updated regularly. Provisions in these plans relevant to future service capacities are described for the various carriers in "Regional Carriers, 2015 Scenario," in the "Transit Impacts" discussion below.

Bay Conservation and Development Commission Policies

The *San Francisco Bay Plan*, adopted by the San Francisco Bay Conservation and Development Commission (BCDC), includes policies for water transportation in the region. The Bay Plan discourages additional freeways and bridges across the Bay and encourages use of ferries for regional transit./44/ As part of the *San Francisco Bay Plan*, BCDC and MTC jointly prepare and adopt the *San Francisco Bay Area Seaport Plan*. In the past, both the Bay Plan and the Seaport Plan called for continued shipping activities along the waterfront adjacent to Mission Bay, at Piers 48 through 64, including a new container terminal; these policies were described in the 1990 FEIR./45/ In 1996 BCDC and MTC amended the Bay Plan and the Seaport Plan to remove the "port priority" designations for much of this area adjacent to the Project Area, retaining only Piers 48 and 50 and the land immediately west of those piers as a priority area to be retained for major shipping activity adjacent to Mission Bay./46/ This port priority area west of Piers 48 and 50 is no longer part of the Project Area.

● **San Francisco Bay Trail Plan**

● The San Francisco Bay Trail is a 400-mile regional hiking and bicycling trail that is intended to permit users to circle San Francisco and San Pablo Bays. The San Francisco Bay Trail Plan was adopted by the Association of Bay Area Governments in 1989. The Plan is one component of the region's transportation and recreational facilities.

About one-half of the planned 400 miles has been developed. The San Francisco Planning Commission adopted a proposed route for the Bay Trail in 1992. The route of the Bay Trail in the Mission Bay Project Area is along Third Street from King Street to Mission Rock Street, and along Terry A. François Boulevard from Mission Rock Street to Mariposa Street.

Local Plans and Policies

A number of objectives and policies in the *San Francisco General Plan's* Transportation Element/47/ are relevant to the proposed project. They are provided in detail in Appendix B and are summarized here. The Transportation Element was substantially revised and reorganized in 1995, after completion of the 1990 FEIR. However, the "transit first" approach to transportation management remains a guiding principle; revisions primarily relate to changes in the transit and traffic facilities that had occurred over the years since the Element was prepared, such as removal of the Embarcadero Freeway after the 1989 earthquake, extension of the MUNI Metro light rail system and the BART system, and initiation of construction for King Street on- and off-ramps to I-280.

The main emphasis in the City's Transportation Element is to support use of transit rather than the automobile as a means of travel within the City and as a means of commuting between San Francisco and other Bay Area locations. Therefore, objectives in the General Plan call for maintaining San Francisco as a hub of a regional, city-centered transit system with no increases in the capacity of major highways and bridges except for high-occupancy vehicles, and maintaining transit as the primary means of travel within the City. Transportation brokerage programs and parking supply management are encouraged, among other means to manage congestion and reduce air emissions from automobiles. As noted in the 1990 FEIR, the Transportation Element supports extension of Caltrain to a downtown terminal at or near Market Street./48/ The 1995 revisions to the Element continue to support such an extension, although current support for the extension is limited, as noted below under the discussion of Caltrain in the Impacts subsection "Changes to Regional Transit System" under "Year 2015 Transportation System Assumptions."

Objectives and policies in the Transportation Element call for improving pedestrian and bicycle circulation within the City to further discourage automobile use, and call for implementing the regional Bay Trail. The Bay Trail route in the Recreation and Open Space Element of the *General Plan* would need to be amended to reflect the new proposed route in and near the Mission Bay Project Area. A *San Francisco Bicycle Plan* has been adopted since certification of the 1990 FEIR; relevant provisions are summarized in "Bicycle Access System Characteristics," above, and in the Impacts subsection "Bicycle Circulation" under "Year 2015 Transportation System Assumptions."/49/

Specific designations from the Transportation Element for streets as transit preferential, major thoroughfares, and transit conflict streets in and near the Project Area are provided in Table V.E.1, above. This table and the description of existing streets in the Project Area in Appendix D also note streets that are part of the Citywide Pedestrian Network, are Neighborhood Pedestrian Streets, or are part of freight traffic routes, as provided in the Transportation Element. Existing or proposed bicycle routes based on the *San Francisco Bicycle Plan* are noted in Appendix D under "Roadway System" and are discussed in "Impacts" under "Bike Routes in the Street Network" in "Bicycle Impacts."

Convenient and accessible off-street freight loading is encouraged in the Transportation Element to reduce congestion on streets while meeting the demand for loading space in new buildings. The *Waterfront Land Use Plan*, adopted by the San Francisco Port Commission in 1997, calls for protecting vital truck routes and freeway and freight rail access necessary to serve the Port's cargo shipping industry, located to the south of Mission Bay at Piers 80 and 92-96. The *Waterfront Land*

Use Plan suggests that major developments encourage ticket sales for transit services and provide inviting passenger waiting areas./50/

Maps 6, 7, 8, and 9 in the Transportation Element, related to vehicle circulation, and Map 12, showing Neighborhood Pedestrian Streets, show Fourth Street in its existing configuration. The project's circulation plan, described in "Year 2015 Transportation Systems Assumptions" under "Impacts," below, and shown in Figure III.B.3, would reroute Fourth Street from its current orientation, from south of the Channel to 16th Street. These maps in the Transportation Element would need to be revised. Map 13, showing bicycle routes, could be amended to show bicycle routes planned in the Mission Bay Project Area.

IMPACTS

This section describes the methods used to evaluate project and cumulative transportation impacts of the proposed Mission Bay development and presents the results of the analyses. Analysis of the transportation impacts of Mission Bay development includes consideration of vehicular traffic on freeways and local intersections; transit facilities, both local and regional; project-related parking issues; local pedestrian and bicycle systems; goods movement, including freight loading and rail freight; and project construction.

The transportation analysis approach and results from the 1990 FEIR have not been summarized and incorporated by reference because basic assumptions and approach have changed; because the Project Area circulation pattern now proposed is different from those of the alternatives analyzed in the 1990 FEIR; and because some future conditions assumed in that EIR are now expected to be different. Examples include: substantial changes in assumptions about downtown, citywide, and regional growth in building space, employment and population, due to the recession of the early 1990's that was not anticipated in the 1990 FEIR; and the completion of several new BART stations in the East Bay that have expanded the capacity of the regional transit system. Despite all the differences in assumptions and methodology that produce different results in the transportation impacts analysis, some of the basic conclusions from the 1990 FEIR remain: cumulative employment and population growth, including that from the Mission Bay project, would cause the afternoon peak commute traffic period to expand on regional freeways and bridges leading into and out of San Francisco; the Mission Bay project would contribute measurably to the expansion of the peak traffic period; regional transit facilities would need to expand service beyond that already planned if it is desired to limit the expansion of the p.m. peak traffic period; and that Project Area travel during the p.m. peak would contribute to cumulative overcrowding in some MUNI corridors.

STANDARDS OF SIGNIFICANCE

Freeways and Ramps

The City has no adopted significance criteria for potential traffic impacts along freeways and on- and off-ramps. Generally, a volume-to-capacity ratio greater than 0.9 along freeway mainlines means that freeways are at or near capacity. The project would be considered to have a significant effect on the environment if it would cause intersections at freeway ramps to deteriorate to unacceptable levels (i.e., deteriorate from LOS D or better to LOS E or LOS F). The project would also have a significant effect on the environment if, when considering the proposed project together with other closely related past, present, and reasonably foreseeable probable future development in the area, it would contribute substantially to cumulative traffic increases along freeways, or along ramps, that would otherwise operate at acceptable levels. Finally, a project would have a significant effect if it would contribute substantially to ramp congestion already at unacceptable levels such that the period of peak congestion would be substantially lengthened.

Local Intersections

In San Francisco, a project is typically considered to have a significant effect on the environment if it would cause an intersection to deteriorate to an unacceptable level (from LOS D or better to LOS E or LOS F); interfere with existing transportation systems causing substantial alteration to circulation patterns or causing major traffic hazards; or contribute substantially to cumulative traffic increases at intersections that would result in deterioration of traffic conditions to unacceptable levels.

Transit

The City has no formally adopted significance criteria for potential impacts related to transit. In San Francisco, a project is typically considered to have a significant effect on the environment if it would cause a substantial increase in transit demand which cannot be accommodated by existing or proposed transit capacity, resulting in unacceptable levels of transit service; or cause a substantial increase in operating costs such that significant adverse impacts in transit service levels could result. The project would also have a significant effect on the environment if, when considering cumulative development in the area, it would contribute substantially to the deterioration of transit service to unacceptable levels.

Parking

San Francisco's General Plan policies emphasize the importance of public transit use and discourage the provision of facilities which encourage automobile use. Therefore, the creation of parking demand which cannot be met by existing or proposed parking facilities would not be considered a significant environmental effect. However, the City would generally consider whether the unmet parking demand would result in other significant physical effects or creation of hazardous conditions caused by substantial numbers of illegally parked automobiles.

Pedestrian/Bicycle

The City has no adopted significance criteria or policy for impacts related to pedestrian or bicycle access and safety. For purposes of this analysis, the project would be considered to have a significant effect on the environment if it were to result in substantial pedestrian overcrowding on public sidewalks; create particularly hazardous conditions for pedestrians or bicyclists; or otherwise substantially interfere with pedestrian and bicycle accessibility to the site and to adjoining areas.

ANALYSIS APPROACH

To establish the transportation impacts of project-related traffic on the regional and local street system, it is first necessary to establish the background transportation conditions for the horizon year. The development of future year (2015) background conditions for this project was based on the Metropolitan Transportation Commission (MTC) regional travel demand model.

The MTC regional travel demand model is typically used to obtain estimates of future growth in San Francisco and the nine-county Bay Area and prepare future cumulative transportation impacts on regional traffic and transit facilities. The most recent MTC travel demand estimates, prepared in early 1996, incorporate the Association of Bay Area Governments (ABAG) land use and socio-economic database and growth forecasts for the years 1995, 2000, 2010 and 2015 (ABAG's *Projections '96*). *Projections '96* provides forecasts of economic and population growth for the nine-county Bay Area region in the context of national and international economic trends. *Projections '96* estimates that population in San Francisco would increase from approximately 760,000 residents in 1995 to about 796,000 residents in the year 2015 (a 4.7% increase). Similarly, San Francisco employment would grow from about 534,600 to approximately 638,700 jobs (a 19.5% increase). These projections, however, do not specifically include the most recent proposed development plans for a number of areas within the City and County of San Francisco, such as Hunters Point Shipyard Reuse Plan, Mid-Market Redevelopment Plan, Presidio Reuse Plan, Transbay Redevelopment Plan, Bayview Hunters Point Redevelopment Plan, the Treasure Island Naval Station Reuse Plan, the voter-approved Candlestick Point football stadium and retail/entertainment mall, and the Mission Bay North and Mission Bay South Redevelopment Plans (the project).

In September 1996, the San Francisco Redevelopment Agency, in coordination with the San Francisco Planning Department, initiated a process to prepare updated future year 2015 cumulative employment and housing growth estimates and travel demand estimates for San Francisco, incorporating the most recent development plans for those major planning areas. The updated travel demand forecasts are intended to be used in transportation analyses for EIRs on some of the proposed plans./51/ These revisions to ABAG's *Projections '96* data were discussed with ABAG and MTC staff by the Redevelopment Agency and its consultant staff./52/ Appendix D presents a more detailed description of the steps followed to develop future year (2015) background transportation conditions for this project in its "Methodology" section.

The year 2015 cumulative projections prepared for the Redevelopment Agency and the Planning Department assume that about 70% of the total Commercial Industrial component of the Mission Bay project would be built and occupied by the year 2015 and that housing on sites not owned by Catellus will not have been developed. Since the analysis for this Mission Bay SEIR conservatively assumes that the Mission Bay project would be fully built and occupied by the year 2015 and includes a more detailed analysis of likely employment and population in the Project Area appropriate to the SEIR for the project, the land use/socio-economic data for the project were accordingly revised and analyzed in the MTC model runs for the Mission Bay project./53/

The transportation analysis uses assumptions of specific amounts and types of land uses in the Mission Bay Project Area in order to calculate numbers of person trips on various transit systems and numbers of vehicle trips that could result from buildout of the Project Area. These land use assumptions are based on likely development in the Project Area as currently envisioned in the Mission Bay North and Mission Bay South Redevelopment Plans, including development projected for UCSF at this location in the UCSF Long Range Development Plan. The Redevelopment Plans permit a variety of uses within each land use designation. The transportation analysis has generally assumed more intense uses permitted in the Redevelopment Plans rather than less intense uses under each land use designation in order to provide a conservative analysis for this SEIR. For example, the analysis assumes 50% of the space in the Mission Bay Commercial Industrial areas would be developed as office space rather than research and development space because office uses generate a greater amount of travel during the p.m. peak hour than do most other commercial and industrial uses; the particular development program currently proposed by Catellus and the Redevelopment Agency anticipates less office and more research and development use in these areas. As another example, the analysis assumes a 25-screen multiplex cinema in the retail/entertainment area in Mission Bay North to provide analysis of a major land use permitted in the Redevelopment Plan that generates relatively large numbers of person trips.

The analysis includes uses of standard trip generation factors from all proposed land uses in the Project Area, including residential uses, and distributes that travel to four quadrants of the City and to the rest of the region based on the MTC regional model (see "Methodology" in Appendix D for a more detailed explanation of trip generation and distribution, and a summary of that information in "Project Analysis Methodology," below.) Therefore, the transportation analysis accounts for Project Area employees commuting within the northeast quadrant, where the Project Area is located, and for employees commuting to other areas in the City and region. It is assumed that most employed residents living in Mission Bay would work outside of the Project Area, although many would be likely to work in downtown San Francisco, also located in the northeast quadrant.

YEAR 2015 TRANSPORTATION SYSTEM ASSUMPTIONS

The travel demand forecasts used in the analysis are based in part on assumptions regarding planned transportation facilities and services that will affect the Project Area's transportation system by year 2015, as well as on the revised population and employment growth estimates described in "Analysis Approach," above. This section outlines the future (year 2015) improvements to the roadway system and transit services that would affect analyses of the proposed Mission Bay project.

The first two subsections describe changes to the local street and regional freeway networks, while the following subsections list planned transit projects and services.

Changes to Circulation Pattern in Mission Bay

Plans for Mission Bay North and Mission Bay South propose to change the street circulation pattern and add pedestrian paths and bicycle paths and lanes. These changes to the circulation system are described below. The precise dimensions of components of the transportation network, such as travel and bicycle lane widths and presence or absence of turn lanes, are subject to change during the on-going project planning process, including after action on the Redevelopment Plans.

Traffic Circulation

The proposed circulation plan for Mission Bay is shown in Figure V.E.8, which indicates the location and characteristics of existing and proposed streets in the Mission Bay Project Area. Basic characteristics of street rights-of-way, such as number and direction of lanes, and turning movements are shown. The proposed project includes a grid system of local neighborhood and collector streets, new major streets, plus improvement to existing major streets. The roadway improvements proposed as part of the Mission Bay project are described in detail in "Proposed Streets in Project Area,"

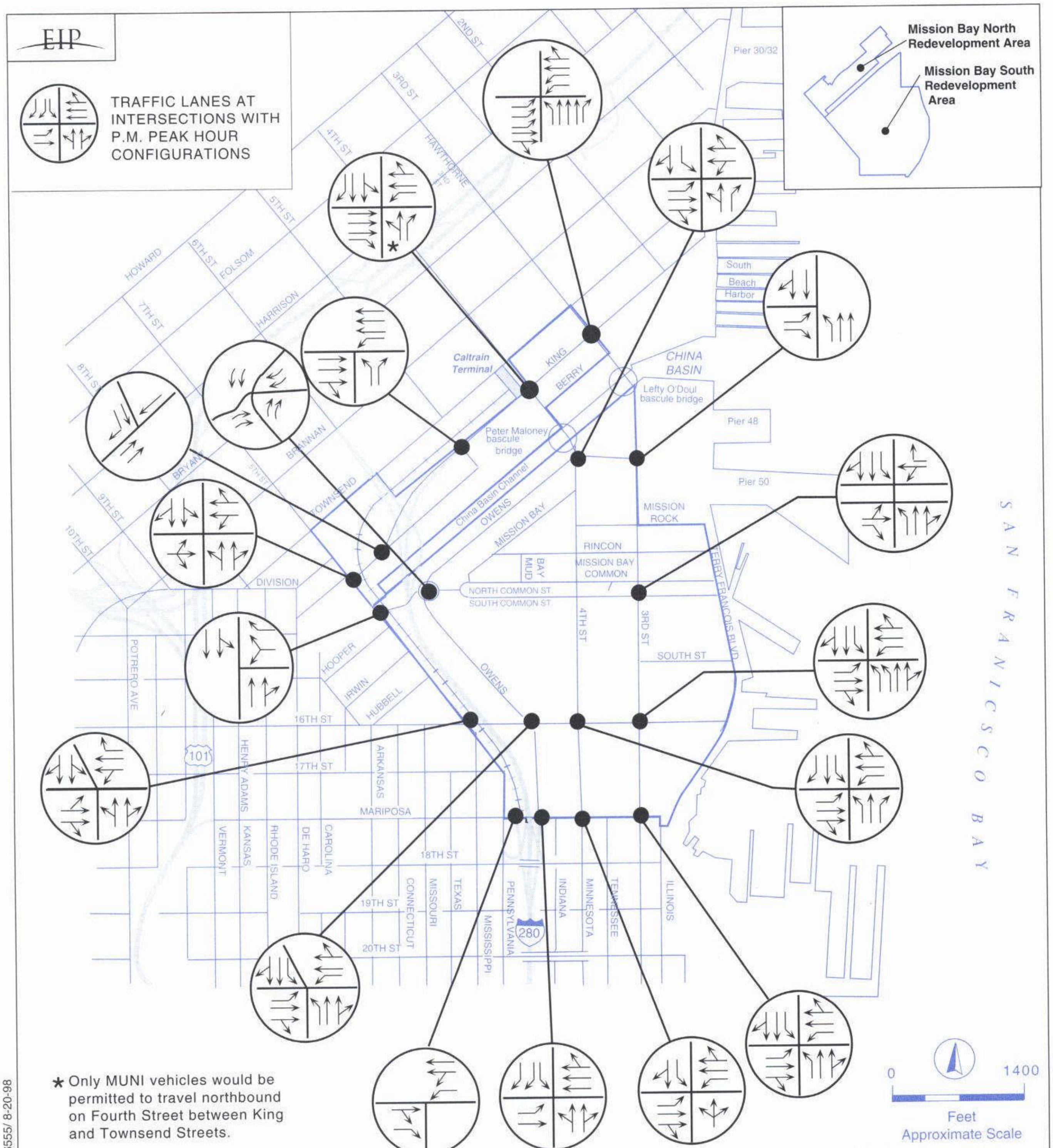
Appendix D; the proposed street cross sections are included. (Street names shown in Figure V.E.8 and other transportation figures are for reference only, and are not intended to reflect future street names, which are unknown at this time.) They are also listed as project features in Measures E.1 through E.26 in Section VI.E, Mitigation Measures: Transportation.

The existing street pattern would be substantially changed. In Mission Bay North, Berry Street would be closed between Fourth and Fifth Streets, except for driveway access to residential buildings. Berry Street would be developed as a linkage between Seventh Street and King Street by reconstructing the at-grade crossing of the Caltrain tracks. It [Berry Street] would also connect with the planned westbound King Street frontage road to be built by Catellus on the north side of the I-280 ramps structure. The I-280 off-ramp touch-down at King Street would be restriped to accommodate an additional eastbound through lane without modifications to the ramps structure. A new westbound left-turn only lane would be provided at the intersection of King and Fifth Streets. An additional northbound lane would be provided at the intersection of King and Third Streets, and Fourth Street would be widened between King and Berry Streets.

In Mission Bay South, Third Street, 16th Street, Mariposa Street, and Owens Street would remain in substantially the same alignment as today. Exclusive left-turn lanes would be provided at intersections on 16th Street within the existing right-of-way. Mariposa Street would be widened on the north side within the Project Area to provide two lanes in each direction with left-turn lanes at major intersections, and the existing on-street parking would be eliminated. Owens Street would be extended to a roundabout and then east along the southern Channel edge to Third Street, replacing Channel Street.

Fourth Street would be realigned. Fourth Street would no longer intersect with Third Street, but would run south parallel to Third Street, ending at Mariposa Street opposite Minnesota Street. Fourth Street between the Channel and Mariposa Streets would be configured along most of its length as a two-way street with parking on each side and one wide (17-foot) lane in each direction, able to accommodate automobiles and bicycles. During the morning and afternoon peak commute periods, parking on Fourth Street would be prohibited on one side of the street to accommodate one additional 15-foot-wide travel lane on the side of the street where parking is removed. Exclusive left-turn lanes would be provided on Fourth Street at major intersections.

A series of new east-west streets would also be created or extended into Mission Bay South. These would include local residential streets such as South, Rincon, and Mission Rock Streets, and a major multi-purpose one-way couplet, North Common Street and South Common Street, connecting the Owens Street roundabout with the waterfront. The Common would be about 200 feet wide to accommodate one wide (15-foot) traffic lane (able to accommodate automobiles and bicycles), parking, and a sidewalk in each direction, and a 130-foot-wide open space median. The project proposes an at-grade automatic-gated crossing of the Caltrain tracks to connect North Common and South Common Streets and Owens Street with Seventh Street west of the roundabout./54/



SOURCE: Wilbur Smith Associates

FIGURE V.E.8 PROPOSED NEW TRAFFIC CIRCULATION SYSTEM AND INTERSECTION LANE CONFIGURATION

Catellus and the City would exchange various properties to create the new public street pattern. Portions of certain existing public streets would be abandoned, and this land would be transferred to Catellus. Catellus would build and dedicate new public streets on portions of its private property.

Within the UCSF site, it is anticipated that there would be local private streets. Most of these streets would be accessible to and usable by the public. Within certain other large areas, including the housing area east of Third Street and the R&D/office area east of Third Street south of Mission Rock Street, there would also be local private streets and rights-of-way, most of which would be accessible to and usable by the public. In these areas, land would be set aside for three principal purposes: local vehicular and/or pedestrian access, utility corridors, and/or view corridors.

Third Street would be reconfigured consistent with the MUNI Third Street Light Rail Project, within the existing street right-of-way, to accommodate two traffic lanes each way and a median, with exclusive left-turn lanes at major intersections such as at the extension of Owens Street, North Common and South Common Streets, 16th Street, and Mariposa Street. The typical median width would be about 24 feet, necessary to accommodate a double track for the MUNI Metro Third Street light rail extension. A wider median (approximately 30 feet) would be provided on both sides of Mission Rock, South, and Mariposa Streets, where light rail station platforms would be located. The existing street right-of-way would be widened on the east side of Third Street, south of 16th Street, for approximately 200 feet, in order to provide a second northbound exclusive left-turn lane from Third Street onto 16th Street. The existing on-street parking on Third Street between the Channel and Mariposa Street would be eliminated.

Bicycle Circulation

The *San Francisco Bicycle Plan*, recently adopted by the Parking and Traffic Commission and the Board of Supervisors/55/, includes bicycle routes on several streets in or near the Project Area. Routes included in this network are designed to accommodate hierarchical levels of bicycle traffic, similar to a network designed for vehicular traffic. Mission Bay and locations nearby have two types of bicycle routes recommended by the *San Francisco Bicycle Plan*: Class II and Class III. Class II bike lanes are defined by striped lanes 4 feet in width for streets with vehicular flow of less than 500 vehicles per hour per lane (5 feet for streets with parking), and striped lanes 6 to 8 feet wide for vehicular flow greater than 500 vehicles per hour per lane or with vehicular speeds greater than 35 mph. On Class III routes, bicycles and vehicles share the curb lane. Signs and pavement markings are proposed to inform drivers of the policy. Table V.E.5 describes the hierarchical status of portions of roadway in or near the Mission Bay Project Area.

TABLE V.E.5
MISSION BAY AREA BICYCLE ROUTES
IN SAN FRANCISCO BICYCLE PLAN

Street Description	Hierarchical Status
Third Street, south of Channel Street	Class II
Sixteenth Street, between Third and Kansas Street	Class II
Townsend Street, between Fourth and Eighth Streets	Class II
Third Street between Channel and Townsend Streets	Class III
Fourth Street, between Townsend and Third Streets	Class III
Seventh Street, north of Mariposa Street	Class III
Mariposa Street, between Third and Seventh Streets	Class III
Townsend Street, between Fourth and Second Streets	Class III

Notes:

Class II bicycle lane: a striped lane adjacent to vehicle travel lanes in the street right-of-way, 4 to 5 feet wide for streets with 500 vehicles per hour, and 6 to 8 feet wide for streets with more than 500 vehicles per hour.

Class III bicycle lane: a signed bicycle route with no separately striped lane, where vehicles and bicycles share the curb lane.

Source: San Francisco Bicycle Plan, March 10, 1997.

Some portions of streets in the vicinity of the Mission Bay Project Area are designated as Scenic Bike Routes. These routes include Townsend Street between Kansas and Third Street, and King Street between Third Street and The Embarcadero. The *San Francisco Bicycle Plan* also includes a route for the San Francisco Bay Trail. This trail runs through the Mission Bay Project Area from The Embarcadero to Berry Street to Third Street; it continues from Third Street to Mission Rock Street to Terry A. François Boulevard and then to Illinois Street. The San Francisco Bay Conservation and Development Commission (BCDC), requires that by the year 1998 the section of the Bay Trail on Terry François Boulevard between the Lefty O'Doul Bridge and Mission Rock Street be implemented by the Port of San Francisco as a Class II bicycle facility, and that the section on Terry A. François between Mission Rock and Illinois Streets be implemented as a Class III bicycle facility. By the year

2000, the BCDC requires that the entire length of Terry A. François become a Class II bicycle facility./56/

The bicycle routes proposed for the Mission Bay project are intended to complement and extend the established bicycle routes in San Francisco. These include Class I, Class II, and Class III bicycle routes. Class I bicycle facilities provide a completely separated right-of-way for the exclusive use of bicycles, with the number of crossings minimized. Minimum recommended widths in the San Francisco Bicycle Plan are 8 feet where no pedestrian use exists, to between 12 and 16 feet where moderate pedestrian volumes are expected. Where heavy pedestrian volumes are expected (more than 400 per peak hour), two separate parallel facilities are recommended. The proposed bicycle routes and their classifications are shown in Figure V.E.9. The Bay Trail alignment shown in Figure V.E.9 between the Lefty O'Doul Bridge and Mission Rock Street does not reflect the alignment currently approved by the Board of Directors of the Bay Trail Project. However, because the San Francisco BCDC requires that a Class II bicycle facility be implemented by the Port of San Francisco in this section of Terry A. François Boulevard by the year 1998, it is possible that the Bay Trail will be realigned to this route shortly thereafter. This route would be closer to the waterfront and Mission Bay waterfront open space than the current adopted route.

Two major routes would cross the Project Area in the east-west direction, one on North Common and South Common Streets and one on 16th Street. The proposed bicycle route for North Common and South Common Streets would extend from the waterfront to Seventh Street. It would accommodate bicycles in traffic lanes (Class III) between Terry A. François Boulevard and Seventh Street. Fifteen-foot lanes (wider than standard) would be provided between the boulevard and Mission Bay Street, just east of the new roundabout, to better accommodate bicycle and automobile traffic. The bicycle route proposed for 16th Street would be an extension of the existing route on 16th Street. To improve bicycle safety, rubberized surfaces are proposed to be installed as part of the project improvements at all existing and new rail crossings in the Project Area, including 16th Street at Seventh Street, North Common and South Common Streets at Seventh Street, and Berry Street at Seventh Street. These rubberized surfaces around the tracks help to prevent bicycle wheels from falling into the narrow gap between tracks and the road surface.

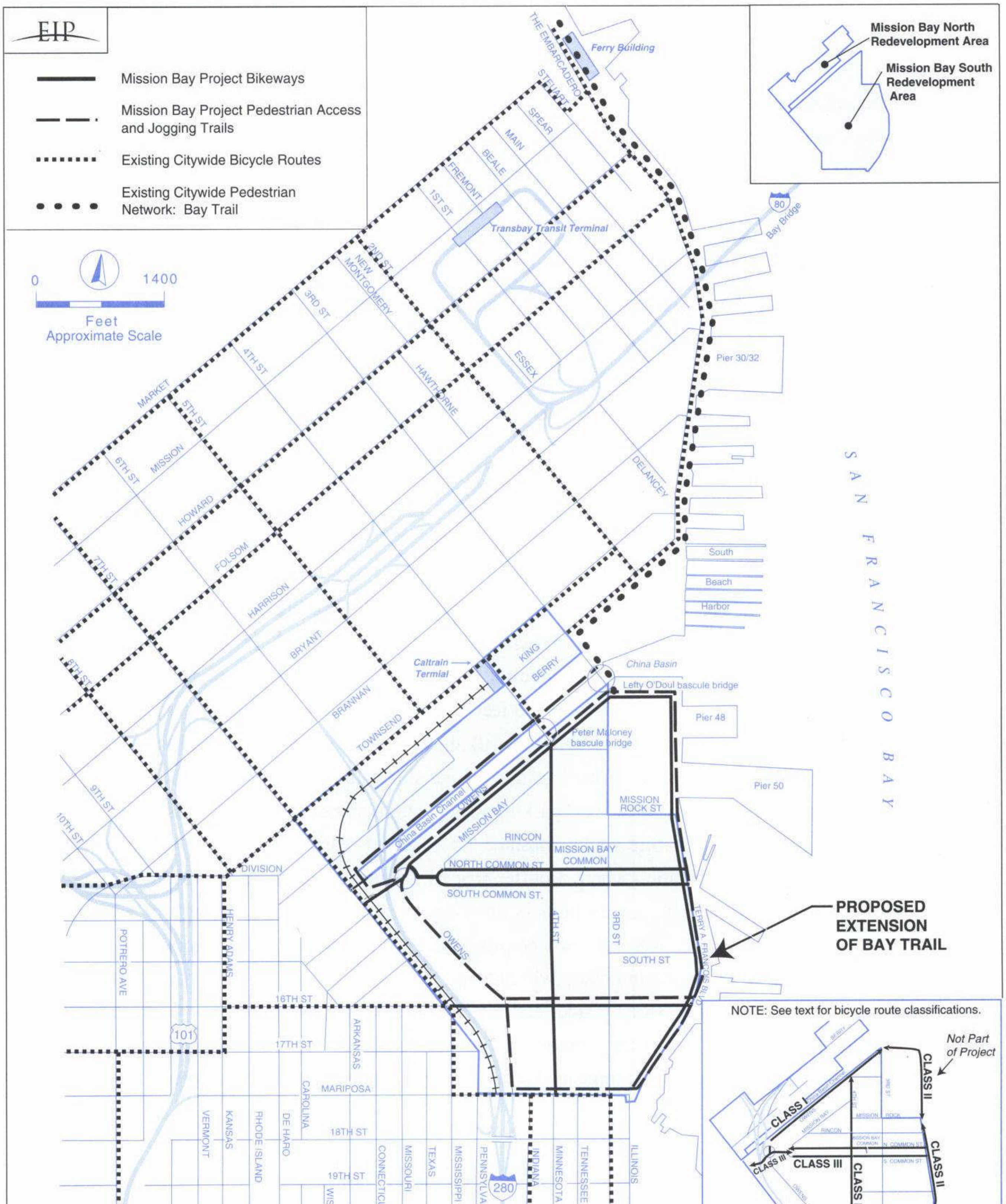
The proposed Fourth Street route would extend from the Peter Maloney Bridge in the north to Mariposa Street in the south. This route would connect the existing Fourth Street route in the South of Market area to the existing Indiana Street route at the southern boundary of the Project Area. South of China Basin Channel, Fourth Street would have 8-foot-wide on-street parking lanes plus a traffic lane 17 feet in width in each direction, which would accommodate a 6-foot bicycle lane during off-peak periods (Class III). During the peak commute periods, parking would be prohibited on one side of Fourth Street, and a 15-foot-wide curb lane would act as a shared lane for automobiles and bicycles (Class III). North of China Basin Channel, bicycles would share the 11-foot-wide travel lanes with automobiles at all times (Class III). Light rail operation planned to be in the center lanes of Fourth Street between Owens and King Streets prevents wider lanes in that section of Fourth Street.

In addition, an east-west recreational bicycle route in the planned public open space along the south edge of the Channel would likely be combined with a meandering pedestrian pathway. The paths themselves would not be shared; rather, pedestrians and bicycle movements would be separated and delineated. This Class I route primarily would serve recreational bicycling, starting at the Lefty O'Doul Bridge and extending west to Seventh Street. A second recreational route would extend from the Lefty O'Doul Bridge at Third Street along Terry A. François Boulevard to Mariposa and Third Streets; the portion south of Mission Rock Street would be part of the Mission Bay project. It would provide 6-foot-wide dedicated bicycle lanes (Class II) and would serve as part of the San Francisco Bay Trail. This bicycle facility would be in compliance with the requirements of BCDC discussed above. These recreational routes would connect to the existing routes at Third Street (north and south), at Fourth Street, at Seventh Street, at 16th Street, and at Mariposa Street and to the other routes proposed as part of the project.

Pedestrian Circulation

The proposed pedestrian access routes are shown in Figure V.E.9. Preliminary plans showing cross-sections of Project Area streets indicate typical sidewalk widths of 10 to 12 feet on both sides of the roads (see Appendix Figures D.2-D.8). A sidewalk width of 10 feet between curb and building results in an "effective sidewalk width" of 5 to 6 feet. (Effective width is the term used for the portion of the sidewalk that is actually usable for walking.) If a sidewalk abuts a building, there is a "shy" distance of 1 to 1.5 feet next to the building. If the sidewalk is directly adjacent to the curb, the street side of the sidewalk is filled with parking meters, light standards, street trees, litter containers, and other street furniture which consume 1.5 to 2 feet, sometimes more, further reducing the effective width. In the situation where a buffer strip is not provided and the sidewalk extends to the curb, the sidewalk width will also encompass driveway aprons, which are difficult for wheelchairs to negotiate. Thus a minimum of 8 feet must be provided in order to maintain a minimum of 5 feet of effective sidewalk width to accommodate wheelchairs. Five feet is also the minimum width for two people to comfortably walk side by side, and 7 feet is needed for one person to pass two persons walking together. Thus, 10 feet is the minimum width recommended for a sidewalk between the curb and building face, and 12 feet is recommended where large amounts of street furniture or bus shelters are proposed to be provided.

A pedestrian bridge over the China Basin Channel is proposed to be constructed along the hypothetical extension of Fifth Street, subject to obtaining the required approvals. The pedestrian bridge would be a "swing" bridge to accommodate the maritime use of the Channel, to be operated by the Department of Public Works at existing facilities that control the two automobile bridges over the Channel. This bridge would provide a convenient and more pedestrian-oriented alternative to the



SOURCE: Wilbur Smith Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.E.9 PROPOSED PEDESTRIAN AND BICYCLE CIRCULATION

Lefty O'Doul and Peter Maloney Bridges, which have narrow 6- and 7- foot-wide sidewalks, respectively, and short sections of even less width. Pedestrian circulation between the residential areas north of the Channel and the employment centers, neighborhood-serving retail, and open space uses located in Mission Bay South would be enhanced by the pedestrian bridge. If built, the bridge would provide convenient access for residents and workers south of the Channel, thereby encouraging more residents and workers in the western part of the Project Area to walk to Caltrain, the MMX light rail line, and for some, to downtown San Francisco. Because this bridge is a possible project component, the pedestrian analysis discusses effects both with and without it.

<u>Freight Rail Operation Changes</u>

The proposed Mission Bay project would relocate the existing freight railroad tracks located in the vicinity of 16th and Mariposa Streets that provide access to Pier 80. The existing railroad alignment, which currently crosses 16th and Third Streets at a 45-degree angle (see Figure V.E.7) would be relocated to coincide with the 16th Street alignment. The new trackage on 16th Street would be flush with the pavement, similar to the track configuration used by streetcars, and would be located in one of the center lanes, separated from the bicycle lanes by an automobile travel lane.

After leaving the mainline tracks immediately north of 16th Street, trains heading for Pier 80 would travel east along 16th Street to reach Terry A. François Boulevard. Trains would then turn north on Terry A. François Boulevard for approximately 300 yards, also traveling on the street's right-of-way. After the last car of the train had cleared 16th Street, the train would then reverse direction traveling south on Terry A. François Boulevard to reach Illinois Street, and then continue south on Illinois Street toward Pier 80 using the existing trackage.

If freight railroad access is required to be provided to Piers 48 and 50 (Mission Rock Terminal) at some point in the future, the railroad tracks located on Terry A. François Boulevard could be extended north, toward Piers 48 and 50, beyond the minimum track length requirements necessary to perform the turn onto Illinois Street. Trains would then travel north in a center lane within the Terry A. François Boulevard right-of-way to reach Piers 48 and 50.

Changes to Regional Freeway System

<u>I-280 Ramps at King Street</u>

The new I-280 southbound two-lane on- and off-ramps at the intersection of King and Fifth Streets were fully completed and opened for service in November 1997. The previous I-280 "touch-down" off-ramp was relocated at the end of June 1997 from the intersection of Fourth and Berry Streets to the intersection of King and Fifth Streets, and the old off-ramp which is currently out of service is scheduled to be removed at the beginning of 1998./57/

U.S. 101 (Central Freeway)

The Central Freeway is an elevated viaduct that runs parallel to 13th Street between I-80 and Mission Street and, until recently, provided a double-deck structure between Mission Street and the U.S. 101 freeway terminus at Oak and Fell Streets. The double-deck structure was removed in 1996. A number of Central Freeway replacement alternatives have been developed and promoted by citizen groups, consultants, and Caltrans. Caltrans is currently conducting an Environmental Assessment of a possible replacement alternative./58/ The following alternative was recommended in a public vote in November 1997, and is proposed by Caltrans as a possible solution to the replacement of the freeway:

> **Alternative 1A/B**: This alternative would construct a new single-deck, four-lane structure from Mission Street to Oak and Fell Streets. The four-lane deck would be 80 feet wide and would include new on- and off-ramps at Oak and Fell Streets. The proposed freeway would follow the existing right-of-way and be expected to carry 100% of the daily traffic handled by the Central Freeway prior to closure in August 1996.

The following alternative was recently dismissed as a viable option, and is no longer being considered by Caltrans.

> **Alternative 8B**: This alternative would consist of a single-deck, four-lane facility from Mission Street over Duboce and Valencia Streets to the south side of Market Street, near the intersection of McCoppin Street and Elgin Park. The freeway would come to grade at a signalized intersection on Market Street, serving as the northernmost entrance and exit to the Central Freeway.

The traffic analysis for the Mission Bay project assumes that one of the two alternatives discussed above would be built by the year 2015. Although there could be changes in the area directly served by the Central Freeway (Van Ness Avenue, Ninth Street north of Bryant, and Oak and Fell Streets, for example) depending on which alternative is ultimately chosen, this analysis assumes that there would be no differences in traffic conditions in the year 2015 between the two alternatives in the Mission Bay project transportation study area./59/

Embarcadero Freeway/Terminal Separator Structure Replacement

The Embarcadero Freeway and Terminal Separator Structure connecting the freeway to I-80 and the Bay Bridge were demolished after the 1989 Loma Prieta earthquake. Replacement plans for those facilities were studied, and in 1996 a preferred alternative was chosen. The following roadway improvements are expected to be in place by the year 2015 in downtown San Francisco, called for in the "Department of Parking and Traffic (DPT) Variant" alternative, selected by the San Francisco Board of Supervisors as the Locally Preferred Alternative for the replacement of the Embarcadero Freeway and the Terminal Separator Structure:

> The existing I-80 Fremont Street off-ramp would be modified so that a portion of the ramp would touch down at the intersection of Fremont and Folsom Streets. There would be four lanes on the off-ramp approach; two lanes would direct traffic toward the waterfront via Folsom Street, and two other lanes would direct traffic toward downtown via Fremont Street.
>
> Folsom, Fremont, and First Streets would be re-striped to provide additional lanes in the vicinity of the I-80 on- and off-ramps.
>
> When warranted by congestion levels in the future (expected to be sometime before the year 2015), the existing p.m. peak period car pool operation on the Bryant Street approaches to the Sterling Street on-ramp may be changed to mixed-flow operation, and the current mixed-flow operation on the Essex Street approach to the Bay Bridge may be restricted to car pool (HOV) operation during the p.m. peak period.

Changes to San Francisco Municipal Railway (MUNI) System

Light Rail Extensions

MUNI recently completed a 2-mile extension of its Metro Light Rail track system to the Project Area (MUNI Metro Extension or MMX) along The Embarcadero and King Street, terminating at King and Berry Streets beyond the Caltrain terminal. Two stations are located on King Street in the vicinity of the project, one between Second and Third Streets opposite the Giants Ballpark, and the other between Fourth and Fifth Streets opposite the Caltrain terminal. Service on the MMX began in January 1998, as the E-line shuttle, operating between Embarcadero Station and the Caltrain terminal. One-car trains operate at six-minute headways during the p.m. peak period and at ten-minute headways midday. When the Advanced Train Control System (ATCS) is implemented, service will be provided as an extension of the J-Church line and will no longer be the E-line shuttle. MUNI is evaluating the possibility of also extending the M-Ocean View line to the Caltrain terminal during the peak periods.

MUNI is in the process of completing an environmental impact report/environmental impact statement (EIR/EIS) for the MUNI Third Street Light Rail Project. This project, as defined for the DEIR/EIS, calls for light rail to be extended south from downtown to Caltrain's Bayshore station near the San Francisco/San Mateo County line, replacing the 15-Third bus line. Three alternatives for the Third

Street corridor are under environmental review at this time: the No Project Alternative, the No Build/Transportation Systems Management (TSM) Alternative, and the Light Rail Build Alternative. The first alternative would provide current service with no increase to meet future demand. The TSM Alternative is defined to include an increase to the existing transit service operated by MUNI that meets 2015 travel demand, namely the 15-Third and the 9X/9AX/9BX San Bruno Express diesel buses. The Light Rail Build Alternative assumes the construction of a 7-mile light rail line along Third Street linking Chinatown with the Caltrain Bayshore Station, near the San Francisco/San Mateo County line.

The Light Rail Build Alternative would be built in two phases: an Initial Operating Segment (IOS) in the first phase of the light rail project, and a Central Subway as the "ultimate project" (second phase). Both phases have a common route between King Street near the Caltrain terminal, and the Bayshore station southern terminus. Both phases also consider two track alignment options across the China Basin Channel: the Peter Maloney Bridge bi-directional option and the Third/Fourth Streets one-way couplet option.

North of King Street, the Initial Operating Segment phase would involve light rail vehicles (LRVs) operating on the existing MMX tracks, via King Street, The Embarcadero, and the Market Street Subway, while the Central Subway phase proposes that LRVs travel along Third (northbound) and Fourth (southbound) Streets, entering into a tunnel between Brannan and Bryant Streets, and continuing underground to a northern terminus in Chinatown under Stockton and Clay Streets.

Under the IOS phase, planned to begin operation in 2003, service on Third Street would be provided by extending the J-Church line one-car trains from the Caltrain terminal to the southern terminus at the Caltrain Bayshore station, operating on six-minute peak period and ten-minute midday headways. The service to the Caltrain terminal that was being provided by the J-Church line would be replaced by extending the L-Taraval line from the Embarcadero station at six-minute headways during the p.m peak period and ten-minute headways midday. For the Central Subway phase, one-car trains would operate as an independent line between Caltrain Bayshore southern terminus and the northern terminus in Chinatown, at six-minute headways in the peak period, and ten-minute headways during the midday.

Although the Central Subway is MUNI's desired "ultimate project" and might be built before the year 2015, it would require a substantial amount of federal funds that the City does not yet have. Therefore, in consultation with MUNI staff, the IOS light rail operating plan (Peter Maloney Bridge bi-directional track alignment option) has been assumed to represent the future 2015 transit system along the Third Street corridor for the purposes of the Mission Bay project analysis. Therefore, in the IOS phase, LRVs would operate along The Embarcadero, King Street, Fourth Street, the new extension of Owens Street, Third Street and Bayshore Boulevard on a semi-exclusive alignment (except on the Peter Maloney Bridge) as an extension of the J-Church line via the MMX track from King Street north, providing a base service of a one-car train every ten minutes each way, to be increased to one train every six minutes during the p.m. peak period./60/

Bus Service

MUNI is planning to implement service changes for other lines as a result of the recent implementation of Metro E-line service on the MMX in January 1998. MUNI will first modify the route of the 32-Embarcadero bus line to terminate near Folsom Street. When Metro service begins operating as an extension of the existing J-line rather than the current E-line shuttle operation, MUNI plans to consolidate three express bus lines that now carry passengers to/from the Caltrain terminal—the 80X, 81X, and 82X lines—into two lines. The 81X would be eliminated, and the routes and schedules of the 80X and 82X would be restructured to provide approximately half of the combined service currently provided by all three lines. Finally, when the J-Church line evening service becomes equivalent to the evening service provided on the 42-Downtown Loop line, the 42 line would be rerouted to serve Second Street betweeen Howard and Brannan Streets, while still ending at the Caltrain terminal./61/

After service to the Third Street light rail corridor is implemented, further extending the J-Church line, sometime in the year 2003, MUNI plans to eliminate the 15-Third bus route and modify the 9X, 9AX, and 9BX San Bruno express bus routes. Service changes would also be made on the 9-San Bruno Local and 43-Masonic lines. The L-Taraval Metro line would be extended to the Caltrain terminal to replace the extended J-Church Metro line./62/

In response to expected increases in Mission Bay transit demand and in accordance with the prior Mission Bay development plan, MUNI would extend either the 30-Stockton or 45-Union/Stockton trolley coach route south from its current terminus at the Caltrain terminal, via Fourth Street, and Mission Bay Street in Mission Bay South, continuing on Hooper/Irwin, 16th, Connecticut, and 18th Streets, and ending somewhere in the vicinity of Third and 19th or 20th Streets (see Figure V.E.10). A second option, not preferred by MUNI, calls for buses to travel along Townsend and Seventh Streets instead of Fourth and Mission Bay Streets. The 30-Stockton or 45-Union/Stockton service is proposed to replace a portion of the 22-Fillmore route on Potrero Hill, joining with the current route at or near 17th and Connecticut Streets. MUNI anticipates extending only about 50% of the present 30-Stockton or 45-Union/Stockton peak service, approximately matching the current 22-Fillmore service to Potrero Hill.

The 22-Fillmore would be re-routed to access the Mission Bay South area via 16th and Third Streets, to terminate at The Common near the intersection of Third Street. (Parking on South Common Street would be precluded east of Third Street in order to provide curb space for trolley bus layover.)/63/ If the 22-Fillmore were rerouted to Mission Bay substantially before the 30 or 45-line was extended, the area east of Connecticut Street between 16th and about 18th Streets would be temporarily underserviced. MUNI estimates the total cost of these trolley bus route modifications to be approximately $30 million, but the program is currently not funded through 2005. Applications are being made to MTC by the San Francisco Transportation Authority to fund replacement trolley buses and to expand the trolley bus fleet in part to meet the Mission Bay demand./64/ These MUNI service changes are consistent with the assumptions contained in the *Third Street Light Rail Project DEIS/DEIR*./64a/

Figure V.E.10 shows the MUNI service changes assumed to be implemented by the year 2015, as described above. See also Measure E.27 and E.28 in Section VI.E, Mitigation Measures: Transportation.

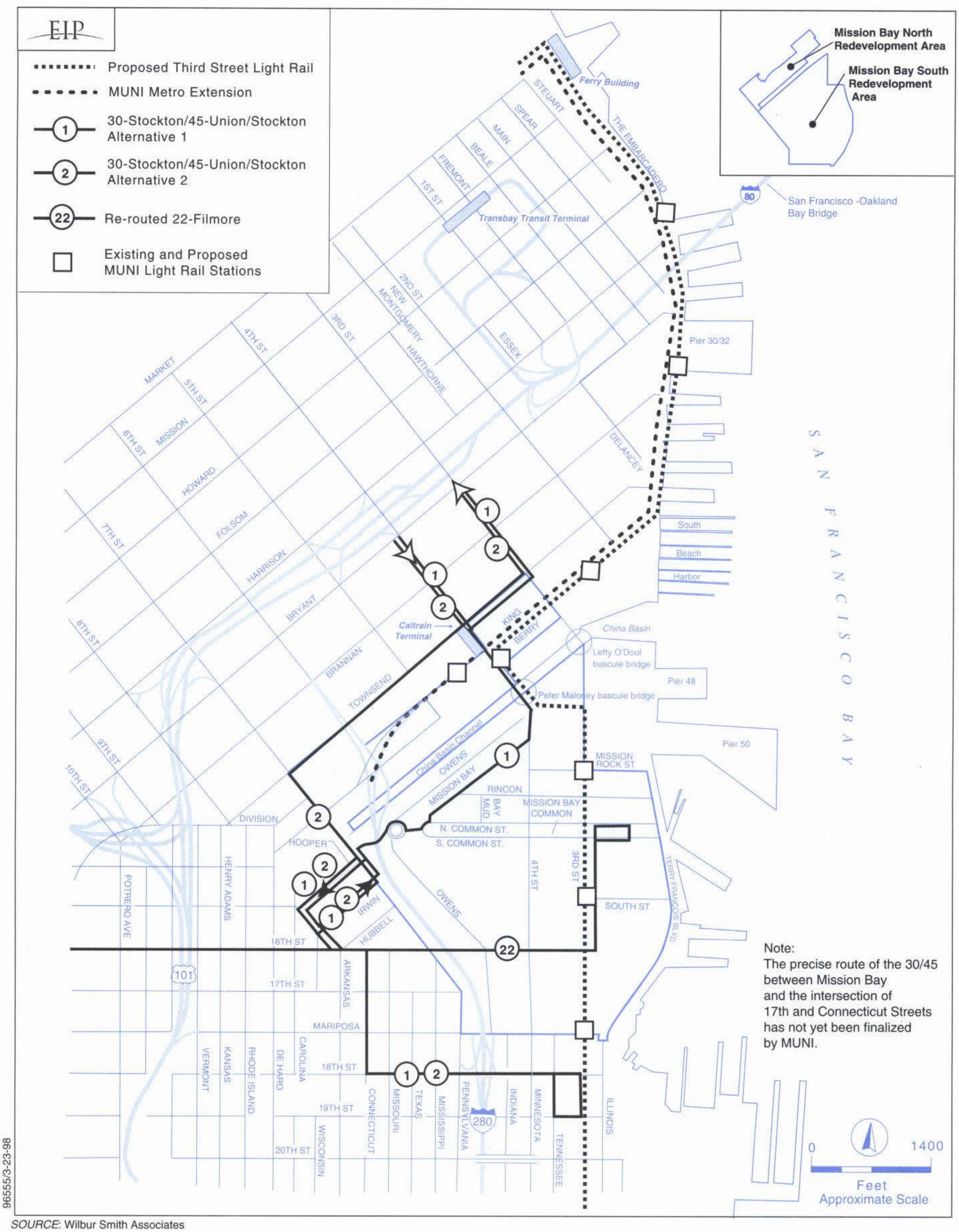
Changes to Regional Transit System

Caltrain San Francisco Downtown Extension Project

Caltrain has considered a 1.5-mile extension from its terminus at Fourth and Townsend Streets to downtown San Francisco, at Mission Street. A Draft EIS/EIR was completed in March 1997; the public review period on this EIS/EIR ended in 1997. The study assumed that the extension would be built and operational by the year 2010, with weekday service being increased to 86 daily trains, compared to 66 daily trains currently. However, recent developments in the project's review process, coupled with the relatively high cost of the project and lack of funding, indicate that it is highly unlikely that the downtown extension project would be built before the year 2015./65/ Therefore, the future (year 2015) analysis conducted for the Mission Bay project assumes that the terminus for Caltrain service will remain at its current location, at Fourth and Townsend Streets. This assumption is consistent with the transit system assumed by MTC in developing their regional travel demand forecasting model.

BART San Francisco Airport Extension

In June 1996, BART and SamTrans adopted a project to extend BART from the existing end of the line at the Colma Station, through the cities of South San Francisco and San Bruno, to the City of Millbrae and the San Francisco International Airport (SFIA). Stations are proposed to be constructed in each of those cities and the airport. The adopted BART-to-SFIA project is known as the "Aerial-Y Stub." The project will extend BART to both SFIA and Millbrae. Airport access would be achieved



SOURCE: Wilbur Smith Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.E.10 YEAR 2015 ASSUMED CHANGES TO MUNI'S EXISTING SERVICE IN THE VICINITY OF MISSION BAY

using a narrow "Y" configuration that would operate as two branches of the BART line. One BART line would run from the proposed Tanforan station directly to SFIA, the end of the line, while another line would serve the Millbrae station, bypassing SFIA. There would also be a third BART line operating as a shuttle between the Millbrae station and SFIA. The BART extension to the Airport is scheduled to open in 2000./66/

The extension of BART to SFIA would increase the BART ridership to and from San Francisco, including Mission Bay. Changes to the regional transit system that are associated with the BART extension, such as SamTrans provision of a feeder bus service, may also prompt changes in the local transit system serving the Project Area.

San Mateo County Transit District (SamTrans)

SamTrans' *FY 1995/96-FY 2004/05 Short Range Transit Plan/67/* indicates that with the planned BART-to-SFIA extension, SamTrans plans to revise its bus route system to provide new feeder bus routes to serve the new BART stations at South San Francisco, San Bruno, and Millbrae, with a corresponding reduction in express bus service from San Mateo County to San Francisco. The specific changes to the existing bus service have not been identified at this time. It is expected that these bus service changes would affect existing Samtrans riders' travel patterns between the Peninsula and the Mission Bay Project Area.

Transbay Transit Terminal Replacement and Possible Relocation

Upon establishing the need for substantial seismic upgrading of the Transbay Transit Terminal currently located on the block bounded by First and Fremont Streets, and Mission and Natoma Streets, the San Francisco Planning Department and the Redevelopment Agency have evaluated several replacement options during the past few years. Funding sources for construction of a new Transbay Transit Terminal have not been identified, and no time line has been established.

Construction of a new Transbay Transit Terminal facility could influence the service provided by various regional transit agencies, and consequently affect transit travel to and from Mission Bay. However, the relative distance between the Mission Bay Project Area and the existing terminal site is nearly the same distance to the potential sites for a relocated terminal. The transportation analysis assumed that replacement and/or relocation of the Transbay Transit Terminal would not change existing transit travel characteristics.

UCSF Transportation Services

UCSF has a Transportation Demand Management program in place at its existing sites, and would continue to expand the program to include the new UCSF site. Existing club bus service between Marin County and UCSF Parnassus Heights is expected to be modified to travel to the new UCSF site in Mission Bay if demand warrants. In addition to the club buses, UCSF facilitates an in-house carpool rider-matching service, and operates about 30 vanpools with 10 to 14 commuters per van. Monthly transit passes are sold at a variety of UCSF locations, and during peak hours, shuttle vans run to major MUNI lines and/or BART stations from all major UCSF sites, except Parnassus Heights (which is served by MUNI's N-Judah line).

UCSF also operates a shuttle service between Parnassus Heights and UCSF satellite sites via the San Francisco General—Mount Zion Shuttle. Jitney services are provided from Parnassus Heights to the Veterans Affairs Medical Center, as well as from Parnassus Heights to U.C. Berkeley. The shuttle system is designed to accommodate work-related travel during the day to reduce private vehicle trips between sites, and is not intended to be used as commuter transportation.

Pacific Bell Park

A new ballpark for the San Francisco Giants baseball team has been approved for and is under construction at a site at King and Third Streets, directly adjacent to the Project Area. The ballpark will host baseball games, concerts, and other activities. The ballpark and its environmental impacts are described in the *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report./68/*

The traffic analysis in the Giants Ballpark EIR assumed the impacts of sellout games or events at the ballpark, when all 42,000 seats are sold. Forecasts of attendance prepared for the Giants estimate approximately 37% of the games would be sellouts. A 6% "no-show" factor was also assumed in the impact analysis, resulting in an actual attendance of 39,500 for a sellout game. The Ballpark EIR analyzed the traffic impact for the hour prior to and following a game. The analysis assumed that most of the weekday afternoon games would end at about 3:30 p.m. and would not coincide with the afternoon commute period. Using this assumption, there would be approximately four games in an average season when a weekday afternoon game would end during the commute peak period and impact the already congested intersections. Other events at the ballpark are proposed to be programmed to end before or after the afternoon peak commute.

Because ballpark ballgame and special event travel would not normally contribute to the daily p.m. peak hour commute analyzed for the Mission Bay project, it has not been included in the overall quantified cumulative transportation impact analysis for this Mission Bay Project SEIR. Ballpark event traffic is discussed generally below, and its relationship to p.m. peak travel is noted, particularly the potential for overlap of traffic after weekday afternoon events with afternoon commute traffic. Regular daily employment at the ballpark has been accounted for in the future cumulative travel assumptions for this SEIR.

PROJECT ANALYSIS METHODOLOGY

The Project Area has been divided into subareas to facilitate some analysis of transportation and other issues. These subareas are shown in Figure V.E.11, along with the transportation study area and intersections evaluated in the impacts analysis. The Mission Bay North Redevelopment Area is a single subarea. The Mission Bay South Redevelopment Area has been further divided into four subareas: "Central" for the residential/mixed use area immediately south of China Basin Channel bounded by North Common and South Common Streets (a proposed new east-west street with travel lanes separated by a 130-foot wide open space) and Terry A. François Boulevard; "East" for the research and development/office area east of Third Street and south of South Common Street; "UCSF" for the area bounded by South Common Street, Third Street, 16th Street, and Owens Street, and including the proposed public school site; and "West" for the research and development/office area located west of the UCSF site and south of 16th Street. Land use totals described in Chapter III, Project Description, have been divided by subarea for purposes of transportation calculations.

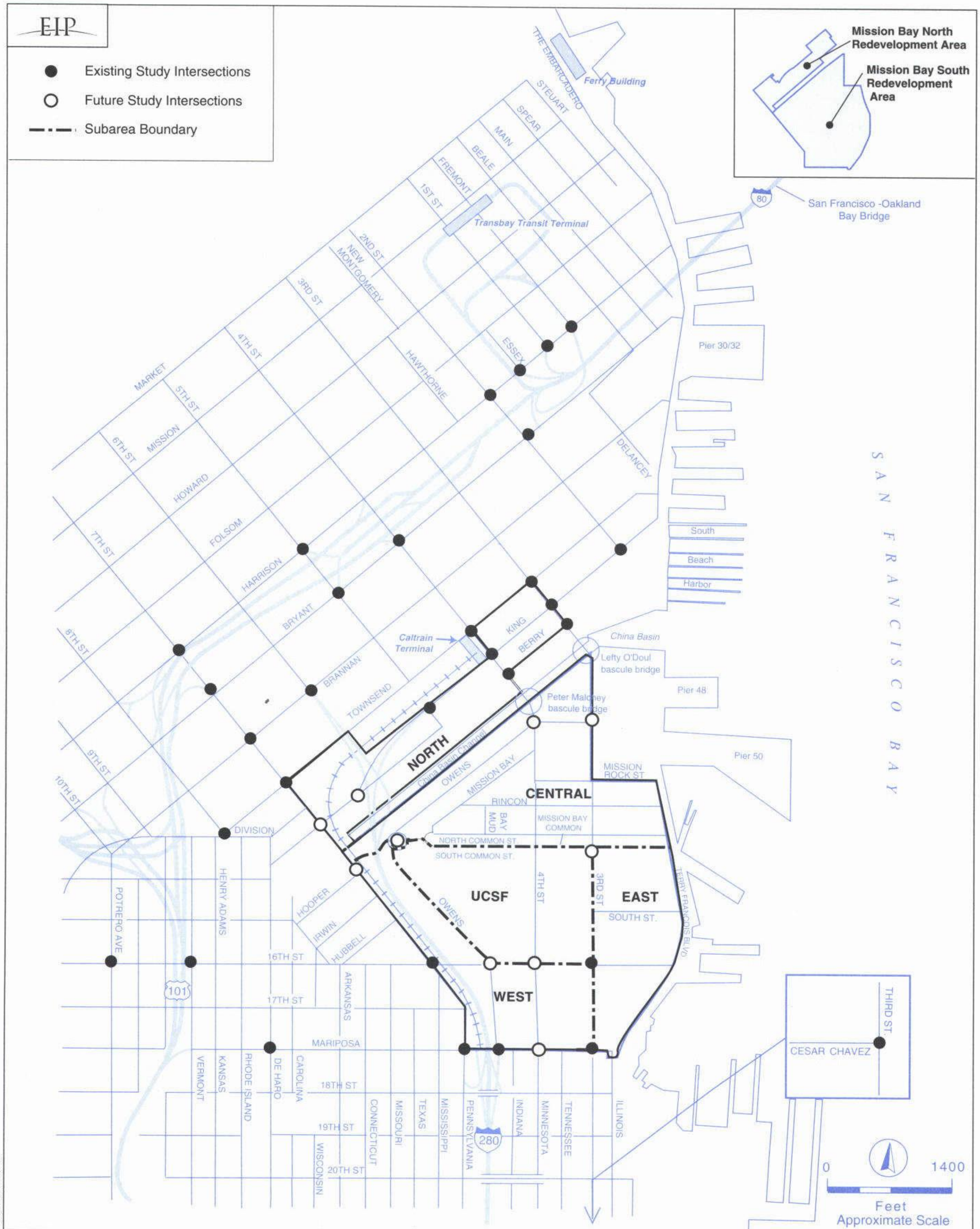
The transportation effects of the Mission Bay development were determined by calculating the daily person trips generated by different types of land uses in the Project Area, and the portion of those daily trips that would occur during the peak hour of the p.m. commute period. After determining the number of person trips generated by the project, the trips were distributed to eight different geographical origin/destination areas, including four San Francisco areas, three other regions in the Bay Area, and one area to include all locations outside the Bay Area. The mode split analysis then determined the portion of these trips made via automobile, transit, or any other mode of transportation, based upon the origin/destination of the trips, the purpose of the trips, and the availability of various modes. Finally, automobile occupancy rates were determined, to yield the average number of individuals in a vehicle and, thus, determine the number of vehicles that would be traveling to and from Mission Bay. The specific trip generation rates, p.m. peak hour proportions, trip distribution, mode split, and vehicle occupancy rates are presented in the "Methodology" section of Appendix D, Transportation.

Table V.E.6 summarizes the daily and p.m. peak hour person trips for each subarea and for the Project Area based on the assumptions described above.

TABLE V.E.6
DAILY AND P.M. PEAK HOUR PERSON TRIPS BY LAND USE TYPE

Project Areas	Land Use Type	Land Use Intensity	Land Use Unit /a/	Daily Trips	P.M. Peak Hour Trips
Mission Bay North	Retail	423	ksq. ft.	60,112	2,404
	Restaurant	100	ksq. ft.	19,272	2,602
	Residential	3,000	d.u.	25,200	4,360
	Movie Theater	25	screens	22,089	1,664
	Subtotal			*126,673*	*11,029*
Mission Bay South					
Central Subarea	Retail	167	ksq. ft.	21,787	871
	Hotel	500	rooms	3,325	316
	Residential	3,090	d.u.	26,141	4,522
	Subtotal			*51,253*	*5,710*
East Subarea	Office	1,476	ksq. ft.	24,868	2,760
	Retail	67	ksq. ft.	8,741	350
	R & D	1,476	ksq. ft.	10,776	1,724
	Large Retail	273	ksq. ft.	26,118	2,351
	Subtotal			*70,503*	*7,185*
West Subarea	Office	1,302	ksq. ft.	21,945	2,436
	Retail	23	ksq. ft.	3,001	120
	R & D	1,305	ksq. ft.	9,509	1,521
	Large Retail	310	ksq. ft.	29,658	2,669
	Subtotal			*64,112*	*6,747*
UCSF Subarea	UCSF	2,650	ksq. ft.	20,180/b/	2,754
	School	500	students	1,484	74
	Subtotal			*21,664*	*2,828*
Total Mission Bay North				126,673	11,029
Total Mission Bay South				207,533	22,469
TOTAL PROJECT				334,205	33,499

Notes:
a. ksq. ft. = thousand square feet; d.u. = dwelling units; rooms = hotel guest rooms
b. As noted in the *UCSF Long Range Development Plan FEIR*, about 10% of these trips would be internal trips (see Table 12-1, p. 306). This correlates with the overall assumption that about 10% of the total person trips would be internal trips as explained in "Multi-Use Development Capture Rates" under "Methodology," in Appendix D.
Source: Wilbur Smith Associates.



SOURCE: Wilbur Smith Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.E.11 TRANSPORTATION STUDY AREA WITH PROJECT

Table V.E.7 summarizes the p.m. peak hour person trips and daily person trips made by automobile, transit, and any other mode of transportation to or from specific land use type areas. "Other" modes include taxi, limousine, tour bus, motorcycle, and bicycle. As seen in Table V.E.7, each land use type has a unique percentage of daily trips concentrated in the p.m. peak hour.

Table V.E.8 presents the p.m. peak hour vehicle trips inbound and outbound to/from the proposed project, by land use and subarea. A total of approximately 14,160 p.m. peak hour vehicle trips would be generated by the project, 60% outbound and 40% inbound. Mission Bay North would generate approximately 25% of the total p.m. peak hour vehicle trips and Mission Bay South about 75%. The East and West Subareas in Mission Bay South would generate 22% and 23% of the total vehicle trips, respectively, while the Central Subarea would generate 19% of the trips. The UCSF Subarea would generate the remaining 11% of the vehicle trips.

TRAFFIC IMPACTS

Traffic impacts are discussed below, first for regional roadways such as freeways and bridges, and second for local streets in and around the Project Area.

Regional Roadways

Vehicles traveling to and from the Project Area use regional highway facilities such as I-80, U.S. 101, and I-280. Thus, these vehicles are part of the cumulative traffic traveling through San Francisco, and between San Francisco and other counties in the Bay Area. The impact of project-generated traffic on the regional highway system in San Francisco County is typically described using the concept of screenlines. Screenlines are hypothetical lines that would be crossed by vehicles traveling in and out of San Francisco.

There are three regional highway inter-county screenlines surrounding San Francisco County, which are used to characterize travel between San Francisco and the North Bay, the East Bay, and the South Bay. These are, respectively:

- San Francisco-Marin County Border - Golden Gate Bridge
- San Francisco-Alameda County Border - San Francisco-Oakland Bay Bridge
- San Francisco-San Mateo County Border - U.S. 101, I-280, and Highway 1

The Metropolitan Transportation Commission (MTC) staff uses these same screenlines as part of their regional transportation planning process.

TABLE V.E.7
PERSON TRIPS BY LAND USE TYPE AND BY MODE

		Daily Person Trips				P.M. Peak Hour Person Trips			
		Mode of Travel				Mode of Travel			
Project Areas	**Land Use Type**	**Auto**	**Transit**	**Walk/Other**	**Total**	**Auto**	**Transit**	**Walk\Other**	**Total**
Mission Bay North	Retail	35,631	13,873	10,608	60,112	1,425	555	424	2,404
	Restaurant	13,052	4,376	1,843	19,271	1,762	591	249	2,602
	Residential	12,948	5,682	6,570	25,200	2,240	983	1,137	4,360
	Movie Theater	12,079	6,955	3,054	22,088	910	524	230	1,664
	Subtotal	*73,710*	*30,886*	*22,075*	*126,671*	*6,337*	*2,653*	*2,040*	*11,030*
Mission Bay South									
Central Subarea	Retail	14,425	2,888	4,474	21,787	577	116	179	872
	Hotel	2,661	424	239	3,324	253	40	23	316
	Residential	14,535	5,661	5,945	26,141	2,515	979	1,029	4,523
	Subtotal	*31,621*	*8,973*	*10,658*	*51,252*	*3,345*	*1,135*	*1,230*	*5,711*
East Subarea	Office	15,797	5,568	3,503	24,868	1,753	618	389	2,760
	Retail	5,787	1,159	1,795	8,741	231	46	72	349
	R & D	6,845	2,413	1,518	10,776	1,095	386	243	1,724
	Large Retail	23,127	2,991	0	26,118	2,081	269	0	2,350
	Subtotal	*51,556*	*12,131*	*6,816*	*70,503*	*5,160*	*1,319*	*704*	*7,183*
West Subarea	Office	13,940	4,914	3,091	21,945	1,547	545	343	2,435
	Retail	1,987	398	616	3,001	79	16	25	120
	R & D	6,041	2,129	1,340	9,510	966	341	214	1,521
	Large Retail	26,262	3,396	0	29,658	2,364	306	0	2,670
	Subtotal	*48,230*	*10,837*	*5,047*	*64,114*	*4,956*	*1,208*	*582*	*6,746*
UCSF Subarea	UCSF	12,464	4,322	3,394	20,180/a/	1,870	648	236	2,754
	School	968	287	229	1,484	48	14	11	73
	Subtotal	*13,432*	*4,609*	*3,623*	*21,664*	*1,918*	*662*	*247*	*2,827*
Total Mission Bay North		73,710	30,886	22,075	126,671	6,337	2,653	2,040	11,030
Total Mission Bay South		144,839	36,550	26,144	207,533	15,379	4,325	2,764	22,467
TOTAL PROJECT		218,549	67,436	48,219	334,204	21,716	6,977	4,804	33,497

Notes:

a. As noted in the *UCSF Long Range Development Plan FEIR*, about 10% of these trips would be internal trips (see Table 12-1, p. 306). This correlates with the overall assumption that about 10% of the total person trips would be internal trips as explained in "Multi-Use Development Capture Rates" under "Methodology," in Appendix D.

Source: Wilbur Smith Associates.

TABLE V.E.8
P.M. PEAK HOUR VEHICLE TRIPS BY LAND USE TYPE

				P.M. Peak Hour Vehicle Trips		
Project Areas	**Land Use Type**	**Land Use Intensity**	**Land Use Units /a/**	**In**	**Out**	**Total**
Mission Bay North	Retail	423	ksq. ft.	257	302	559
	Restaurant	100	ksq. ft.	273	320	593
	Residential	3,000	d.u.	1,277	643	1,920
	Movie Theater	25	screens	300	97	397
	Subtotal			*2,107*	*1,362*	*3,469*
Mission Bay South CentralSubarea	Retail	167	ksq. ft.	136	160	296
	Hotel	500	rooms	36	95	131
	Residential	3,090	d.u.	1,436	724	2,160
	Subtotal			*1,608*	*979*	*2,587*
East Subarea	Office	1,476	ksq. ft.	113	1,219	1,332
	Retail	90	ksq. ft.	55	64	119
	R & D	1,476	ksq. ft.	71	761	832
	Large Retail	250	ksq. ft.	489	574	1,063
	Subtotal			*728*	*2,618*	*3,346*
West Subarea	Office	1,302	ksq. ft.	100	1,075	1,175
	Retail	23	ksq. ft.	19	22	41
	R & D	1,305	ksq. ft.	62	672	734
	Large Retail	310	ksq. ft.	555	652	1,207
	Subtotal			*736*	*2,421*	*3,157*
UCSF Subarea	UCSF	2,650	ksq. ft.	243	1,379	1,622
	School	500	students	8	18	26
	Subtotal			*251*	*1,397*	*1,648*
Total Mission Bay North				2,107	1,362	3,469
Total Mission Bay South				3,323	7,415	10,738
TOTAL PROJECT				5,430	8,777	14,207

Notes:
a. ksq. ft. = thousand square feet; d.u. = dwelling units; rooms = hotel guest rooms

Source: Wilbur Smith Associates.

Table V.E.9 presents the 1995 traffic volumes and volume-to-capacity (V/C) ratios at those screenline locations. Volume and capacity are used by traffic engineers to describe operational characteristics of a transportation facility. For this analysis, the volume-to- capacity ratio indicates how much of the capacity of the freeway is being used by the traffic volume. Values approaching 1.0 indicate near saturation conditions where the volume is near the theoretical capacity. It should be noted that capacity values used are "theoretical," as actual capacity can be affected by speed, lane widths, weaves and interchanges, and other features of the facility.

Thus, when an incident occurs, such as a stall or accident, on a facility that is carrying a volume of traffic that is near its capacity, the capacity may be lessened momentarily, creating traffic conditions that are much worse, but as soon as the incident is eliminated, the theoretical capacity returns to the previous value, and consequently, the V/C ratio returns to the previous value near (but less than) 1.0. However, the actual traffic conditions do not recover from an incident as quickly; the recovery period may last much longer than the duration of the incident. An operational V/C ratio that is near 1.0 presents the potential for a prolonged V/C ratio of 1.0 when an incident occurs.

Table V.E.9 indicates that all screenline locations are currently operating at 90% or less of their maximum theoretical capacity. The most congested location is the San Francisco/Oakland Bay Bridge, in the eastbound direction, which is operating at 90% of its capacity.

Existing-Plus-Project Conditions

The project would generate approximately 1,640 auto trips to and from the East Bay (35% inbound/65% outbound), 730 auto trips to and from the North Bay (35% inbound/65% outbound) and 3,860 auto trips to and from the South Bay (29% inbound/71% outbound) in the p.m. peak hour. Table V.E.9 shows the traffic volumes at the screenlines as a result of the proposed project. As shown in the table, none of the screenline locations would be over capacity; however, three would be operating above 95% of their theoretical capacity, particularly the San Francisco/Oakland Bay Bridge in the eastbound direction, at 99% capacity. This indicates the potential for jammed conditions (stop and go with very slow speeds) for prolonged periods of time if an incident were to occur.

Year 2015 Cumulative Conditions

Table V.E.9 shows V/C ratios at the screenlines under future year 2015 conditions based on the growth assumptions described in "Analysis Approach," above. Project Area traffic is included in these 2015 traffic volumes. As shown in the table, none of the screenline locations would be over capacity, except for the eastbound direction of the San Francisco/Oakland Bay Bridge, which would

TABLE V.E.9
REGIONAL TRAFFIC SCREENLINE VOLUME-TO-CAPACITY RATIOS
P.M. PEAK HOUR

		Year 1995, Existing Conditions		Year 1995, Existing Plus Project		Year 2015, Cumulative Conditions	
Screenline Locations	Direction	Volume	V/C Ratio/a/	Volume	V/C Ratio	Volume	V/C Ratio
U.S. 101, at San Francisco/ San Mateo County Line	Northbound	6,900	0.76	7,620	0.84	8,870	0.97
	Southbound	6,800	0.75	8,720	0.96	8,900	0.98
I-280, at San Francisco/ San Mateo County Line	Northbound	3,700	0.56	4,100	0.62	4,350	0.66
	Southbound	7,700	0.88	8,530	0.97	8,550	0.97
Hwy. 1, at San Francisco/ San Mateo County Line	Northbound	4,700	0.87	4,700	0.87	4,820	0.89
	Southbound	3,900	0.72	3,900	0.72	3,900	0.72
S.F. Oakland Bay Bridge	Eastbound	10,300	0.90	11,350	0.99	11,450	1.00
	Westbound	9,400	0.82	9,980	0.87	10,380	0.90
Golden Gate Bridge	Northbound	6,800	0.85	7,280	0.91	7,610	0.95
	Southbound	3,300	0.83	3,550	0.89	3,790	0.95

Note:
a. V/C Ratio means the ratio of the numbers of vehicles to the capacity of the roadway.

Source: Wilbur Smith Associates, based on Caltrans traffic volumes for 1995, and MTC's regional travel demand forecasting model, as updated with San Francisco growth forecast where appropriate.

be operating at the limit of its theoretical capacity. Furthermore, five of the remaining nine screenline locations would be operating at or above 95% capacity.

While the employment/population forecast for year 2015 shows substantial growth in population and employment in San Francisco and the region as a whole, the net increase in traffic on the Bay Bridge and other major freeways would not be proportional to this growth. First, the increase in population and employment growth in San Francisco would not necessarily translate to proportional intercity/intercounty traffic growth, as many persons both live and work in San Francisco. Further, people's travel behavior has been observed to change in the long term according to traffic conditions (e.g., they might change their work hours to avoid rush hour traffic or they would change their mode of travel if necessary). Identifying trends in such types of travel behavior changes is difficult. Although the model accounts for changes in travel mode, it does not consider shifts in times of travel (i.e., workers leaving earlier or later to avoid the peak commute period).

For example, traffic flows on the Bay Bridge began to approach the absolute capacity of the bridge during the peak hours in the early 1980's. With the exception of a brief period after the 1989 Loma Prieta earthquake, the bridge has been at capacity during the a.m. and p.m. peak hours for over ten years. Total daily traffic on the bridge continues to increase each year, however, with the growth occurring in the hours before and after the peak hours and in the reverse direction of the peak flows. While the number of vehicles crossing the bridge during the peak hour is at capacity, the number of persons per vehicle—the average vehicle occupancy—has varied over time, as has the number of people using BART, AC Transit, and ferry service across the Bay. For example, the total number of peak period commuters in cars and on transit crossing from the East Bay to San Francisco declined from 1991 to 1994, as substantial job-loss occurred during the recession; travel has increased again between 1994 and 1996 as the number of jobs in the City has grown./69/ The number of vehicles crossing the Bay Bridge during the peak *hour* has not changed substantially over the same time, remaining at around 10,300, but the number of vehicles crossing during the peak *period* has fluctuated based in part on employment in San Francisco. Thus, regional employment and population growth causes traffic growth on the Bay Bridge even though the peak hour traffic flow leading to the East Bay remains relatively constant. The other regional travel gateways to San Francisco—the Golden Gate Bridge to the North Bay, and U.S. 101/I-280/Highway 1 leading to the South Bay—also have similar capacity constraints that limit peak hour flows.

When the MTC travel demand forecasting model is used to assign all future traffic, it employs a more practical and realistic approach by taking into account the capacity that is available on the roadway. As a result, the amount of additional traffic assigned to the freeways by the model on the regional network is constrained by the capacity available during the p.m. peak hour (i.e., a volume-to-capacity ratio no greater than 1.0), which is very limited on some roadways like the Bay Bridge.

The result of these capacity constraints at the regional gateways to and from San Francisco is that the demand to travel by auto during the peak commute hour greatly exceeds the peak hour capacity of these regional facilities. The impact of new development generally is not to worsen peak hour conditions, but to cause a spreading or extension of the maximum capacity flow conditions over a longer time period. For example, currently, the Bay Bridge during the p.m. peak commute period experiences capacity flow conditions from approximately 4:00 p.m. to 6:30 p.m., or 2.5 hours. The impact of the Mission Bay project alone would be to lengthen this period by approximately 20 minutes, extending the peak commute period to almost 3 hours. Cumulative development to the year 2015 would cause a substantially greater lengthening of the p.m. peak commute period. With lengthening of the peak commute period, freeway on-ramps become congested and traffic backs up on streets leading to the on-ramps over an extended period of time. As described below under "Impact of the New Giants Ballpark at China Basin," on days when sold-out events end at or after 3:30 p.m., traffic from the ballpark would further extend the p.m. peak commute.

In addition to (and in part because of) the spreading of the peak commute period, many drivers would choose to take transit or to join carpools during the peak period. This would create a spreading of the peak commute period on the transit system. Until recent capacity increases, BART was experiencing near capacity loading conditions to the East Bay from 4:30 to 6:00 p.m. on weekdays. Most peak period trains now have additional capacity, but only for patrons who are willing to stand. As a result of this type of congestion (which also would occur on other transit systems), many riders shift their time of travel earlier or later, spreading the transit peak commute period.

In simple conceptual terms, these travel characteristics result in a phenomenon where a project that generates a demand for 1,000 peak hour trips (as a hypothetical example) may actually result only in 300 to 500 of these trips appearing on the regional network during the peak hour. The remaining trips would occur before or after the peak hour or on another travel mode. Alternatively, commuters may seek other routes to avoid the most congested areas, if feasible, to reach their destination. However, this would not be possible for destinations in the East Bay or North Bay because of the access capacity limitations imposed by the Bay Bridge and the Golden Gate Bridge.

To be conservative, the transportation analysis for Mission Bay assumes that, at the <u>local</u> street network and transit level, the total project peak hour travel demand would actually all travel, using local streets and local transit services during the peak hour, and that no commuters would shift travel time or travel mode. This is why projected conditions at intersections and transit screenlines are often shown as exceeding capacity. In reality, delays would occur at such locations, and these delays would result in a spreading of the peak commute period on the regional network. For example, a vehicle bound for the East Bay leaves Mission Bay at 5:15 p.m., crossing local intersections during the 4:30 to 5:30 p.m. peak traffic hour but, due to delay, does not actually cross the regional traffic screenline on the Bay Bridge until after 5:30 p.m. As a result, that trip on the Bay Bridge occurs after the 4:30 to 5:30 p.m. peak traffic hour, although it is forecast to occur during the peak hour.

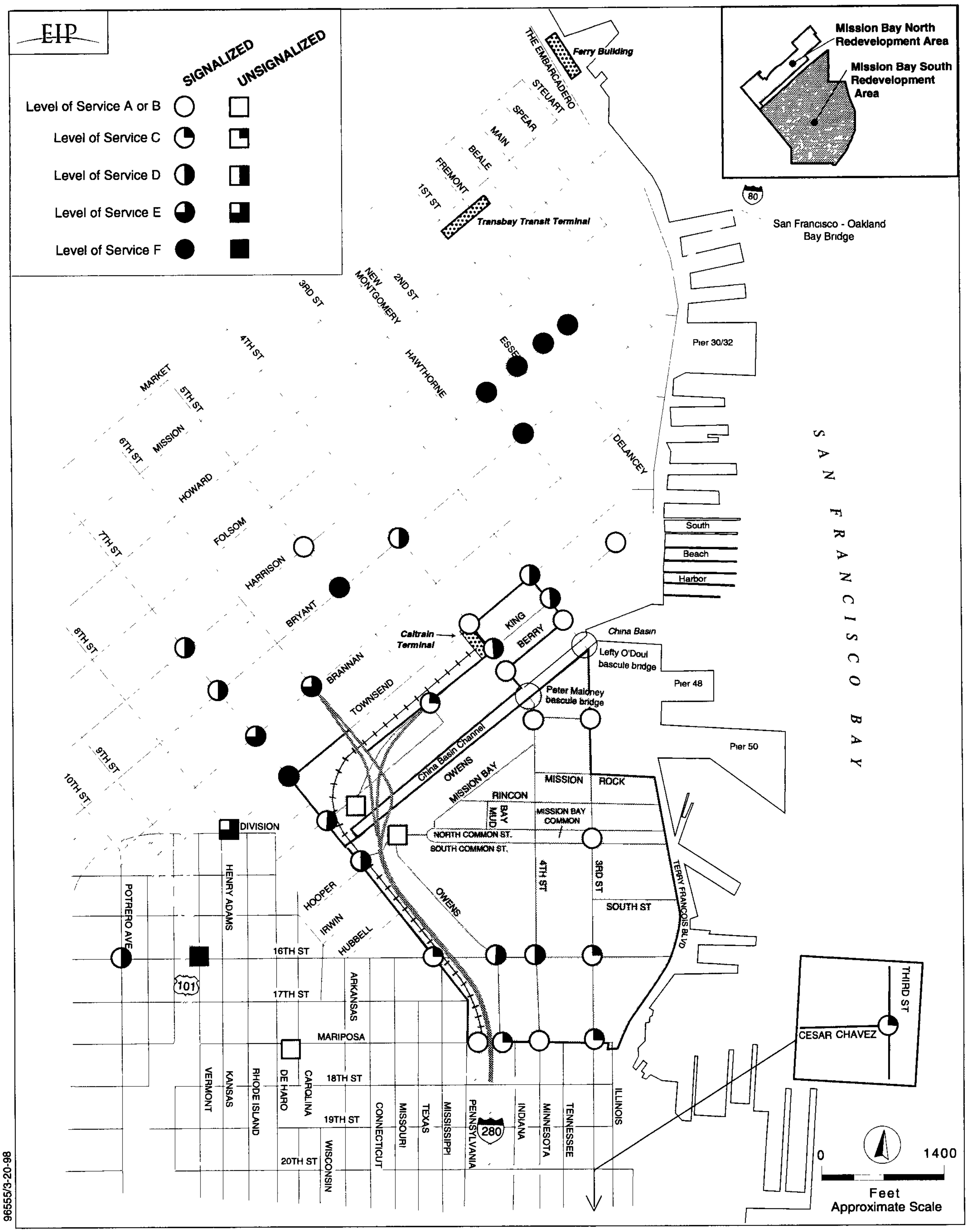
This conservative approach is used for the intersection and transit analysis because it is difficult to model the complex interactions and human behavioral patterns that occur when the regional transportation system becomes congested for an extended period. In actual experience such interactions are very dynamic and can vary greatly from one day to the next and one season to another.

Cumulative travel demand, including that from the Mission Bay project, would add to traffic and transit congestion during the afternoon peak period and would cause significant expansions of the peak commute travel period on major local streets, on freeways and freeway on-ramps, and on transit systems serving San Francisco. The project alone would contribute substantially to cumulative traffic increases along freeways and freeway ramps, thereby causing measurable expansion of the p.m. peak commute period, a significant effect on the regional transportation systems near downtown San Francisco.

Local Streets

Existing-plus-Project Conditions

Project impacts at the study intersections are presented in terms of levels of service (LOS) in Figure V.E.12 and Table V.E.10. Project vehicle trips were assigned to the study roadway network based on their origins/destinations and the most likely routes that motorists would take. Under the existing-plus-project condition, the level of service analysis assumed a modified existing street network to account for the new freeway ramps, roadways, and intersections that are either planned or under construction, or that would be developed as a result of the proposed project. These improvements include the opening of a new I-280 southbound on-ramp at King and Fifth Streets and the completion of the seismic retrofit work at the I-280 ramps at Mariposa Street. The intersection level of service analysis for existing-plus-project conditions also considered the effects of the Caltrain at-grade crossings at 16th Street, at the Seventh Street Connector (North Common and South Common Streets) and at Berry Street. It was assumed that the MUNI Metro extension (MMX) would be operational along The Embarcadero and King Street medians, on a semi-exclusive right of way, between Folsom



SOURCE Wilbur Smith Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.E.12 WEEKDAY P.M. PEAK HOUR LEVELS OF SERVICE: EXISTING WITH PROJECT

**TABLE V.E.10
SUMMARY OF PROJECT INTERSECTION LEVELS OF SERVICE
P.M. PEAK HOUR**

Study Intersection	Traffic Control Device	Existing Conditions Avg. Delay (sec/veh)	Existing Conditions LOS	Existing Plus Project Avg. Delay (sec/veh)	Existing Plus Project LOS	2015 Cumulative Avg. Delay (sec/veh)	2015 Cumulative LOS	Project Traffic Contribution (% of Total Traffic) 2015 Cumulative
Berry Street at:								
Third Street	Traffic Signal	7.7	B	5.4	B	11.7	B	50%
Fourth Street	Traffic Signal	5.2	B	11.5	B	12.4	B	61%
Seventh Street/a/	Traffic Signal	N.A.	N.A.	28.6	D	124.4	F	72%
King Street/a/	Unsignalized	N.A.	N.A.	0.5	B	0.5	B	95%
Brannan Street at:								
Sixth Street/I-280 ramps	Traffic Signal	49.9	E	54.9	E	57.9	E	3%
Seventh Street	Traffic Signal	11.4	B	54.0	E	64.1	F	30%
Bryant Street at:								
Second Street	Traffic Signal	153.1	F	215.4	F	309.2	F	33%
Fourth Street/EB I-80 Off-Ramp	Traffic Signal	16.4	C	30.6	D	32.2	D	20%
Fifth Street/EB I-80 On-Ramp	Traffic Signal	77.2	F	144.3	F	273.2	F	18%
Seventh Street/Off- Ramp EB I-80	Traffic Signal	14.0	B	27.2	D	39.6	D	30%
Harrison Street at:								
First Street	Traffic Signal	161.7	F	185.8	F	187.9	F	10%
Second Street	Traffic Signal	185.7	F	252.5	F	334.8	F	27%
Fifth Street	Traffic Signal	8.9	B	9.3	B	23.2	C	11%
Seventh Street	Traffic Signal	14.8	B	28.3	D	28.3	D	21%
Fremont/WB I-80 Off-Ramp	Traffic Signal	71.3	F	153.4	F	199.2	F	13%
Essex Street	Traffic Signal	67.7	F	120.0	F	219.8	F	26%

(Continued)

TABLE V.E.10 (Continued)

Study Intersection	Traffic Control Device	Existing Conditions		Existing Plus Project		2015 Cumulative		Project Traffic Contribution (% of Total Traffic) 2015 Cumulative
		Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	
King Street at:								
Second Street	Traffic Signal	33.3	D	13.9	B	34.3	D	21%
Third Street	Traffic Signal	20.9	C	34.8	D	99.1	F	32%
Fourth Street	Traffic Signal	16.6	C	29.1	D	52.1	E	33%
Fifth Street/I-280 ramps	Traffic Signal	N.A.	N.A. /b/	23.4	C	28.4	D	31%
Mariposa Street at:								
Third Street	Traffic Signal	8.4	B	21.3	C	23.7	C	46%
Fourth Street	Traffic Signal	N.A.	N.A.	13.4	B	13.6	B	78%
De Haro Street	All-way Stop	2.5	A	3.1	A	3.4	A	22%
SB I-280 On-Ramp	Unsignalized	30.3	F	12.5	B /c/	16.6	C /c/	49%
NB I-280 Off-Ramp/Owens Street	Traffic Signal	19.7	C	23.9	C	35.9	D	68%
Townsend Street at:								
Third Street	Traffic Signal	20.9	C	29.8	D	79.7	F	30%
Fourth Street	Traffic Signal	6.4	B	8.0	B	14.4	B	32%
Seventh Street	Traffic Signal	10.4	B	161.9	F	195.3	F	34%
Eighth Street	All-way Stop	5.9	B	37.8	E	47.4	F	47%
Owens Street at:								
Third Street/a/	Traffic Signal	N.A.	N.A.	10.3	B	14.6	B	54%
Fourth Street/a/	Traffic Signal	N.A.	N.A.	7.9	B	11.7	B	69%
Common Streets/a/	Unsignalized	N.A.	N.A.	8.3	B	8.3	B	96%
16th Street/a/	Traffic Signal	N.A.	N.A.	38.2	D	37.9	D	78%

(Continued)

TABLE V.E.10 (Continued)

Study Intersection	Traffic Control Device	Existing Conditions		Existing Plus Project		2015 Cumulative		Project Traffic Contribution (% of Total Traffic) 2015 Cumulative
		Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	
Common Streets at:								
Third Street/a/	Traffic Signal	N.A.	N.A.	8.5	B	15.3	C	43%
Seventh Street/a/	Traffic Signal	N.A.	N.A.	29.0	D	42.3	E	65%
Third Street at:								
César Chavez	Traffic Signal	21.3	C	22.3	C	37.0	D	30%
Sixteenth Street	Traffic Signal	9.9	B	17.6	C	25.2	D	47%
Fourth/Mission Rock Street	Traffic Signal	9.6	B	N.A. /b/	N.A. /b/	N.A. /b/	N.A. /b/	N.A. /b/
Sixteenth Street at:								
Fourth Street/a/	Traffic Signal	N.A.	N.A.	26.5	D	29.2	D	71%
Seventh Street/Mississippi Street	All-way Stop	16.6	C	24.4	C /c/	32.2	D /c/	61%
Potrero Avenue	Traffic Signal	23.1	C	38.8	D	162.7	F	26%
Vermont Street	All-way Stop	77.9	F	193.3	F	200.4	F	51%

Notes:
a. This intersection exists only in "With Project" networks.
b. This intersection does not exist under this scenario.
c. This intersection will be signalized under this scenario.

Source: Wilbur Smith Associates.

Street and the I-280 ramps, near the Caltrain terminal. The existing (base) traffic volumes at the study intersections were re-distributed to simulate the anticipated traffic pattern in and near the transportation study area upon opening of these new roadways and transit facilities. As explained in "Intersection Analysis Methodology" in the Setting subsection above, an LOS D is the minimum acceptable level of service for most city streets. Therefore, causing LOS to degrade to E or F would be considered a significant impact.

Occasionally, some minor traffic delays will occur due to periodic lifting of the Peter Maloney (Fourth Street) and Lefty O'Doul (Third Street) Bridges. As mentioned in the Transportation Setting section under "China Basin Bascule Bridge Operations," these bridges must be lifted to allow boats to enter and exit the Mission Creek Marina approximately two to six times per day, depending on the season. This number of typical daily lifts is not expected to measurably affect the transportation circulation patterns in and near the Mission Bay Project Area, although some vehicles would be delayed while the bridges operate the lifts.

A total of 41 intersections were analyzed under the existing-plus-project conditions. As Table V.E.10 indicates, three intersections would operate at LOS E and eight intersections at LOS F. Three of the existing intersections would decline from an LOS D or better to LOS E or F as a result of the proposed project, a potential significant impact. These intersections are: Brannan Street at Seventh Street (LOS B to E), Townsend Street at Seventh Street (LOS B to F) and Townsend Street at Eighth Street (LOS B to E). All three of these intersections could be mitigated to LOS D or better with Mitigation Measures E.29, E.30, E.35, and E.42 described in Section VI.E, Mitigation Measures: Transportation. The remainder of the intersections operating at unacceptable levels of service in 2015 with the assumed full build-out of the project currently operate at unacceptable LOS E or F. For the eight intersections currently operating at LOS F, the effect of the project would be to extend the length of time during which they would operate at an unacceptable level of service. The poor operation of these intersections is a direct effect of the congestion on the freeway. As volumes on the freeway reach capacity, traffic on on-ramps cannot be accommodated, and congestion backs up onto the city streets. Mitigation measures would not be expected to improve these intersections near freeway ramps to acceptable LOS D or better, as they are already operating at unacceptable levels during the p.m. peak commute period, and mitigation measures on city streets would not change the freeway backup onto those streets.

Although most intersections would deteriorate with the addition of project traffic, some would improve as a result of modifications proposed as part of the project. The level of service at the intersections of Mariposa Street at the I-280 southbound on-ramp and 16th Street at Seventh/Mississippi Streets would improve because additional travel lanes and new traffic signals would be provided at those two intersections. The intersection of Mariposa Street at the I-280 southbound on-ramp would improve from LOS F under existing conditions to LOS B under existing-plus-project conditions. Sixteenth Street at Seventh/Mississippi Streets would remain at LOS C, with a new signal, rather than deteriorating with project traffic.

Cumulative Year (2015) Scenario

The MTC regional travel demand model was used to develop the traffic forecasts for cumulative development and growth through the year 2015. The MTC model provides forecasts of traffic on regional freeways and on major streets in the study area for the year 2015 based upon assumptions of future growth in housing units and employment. As indicated in the Analysis Approach in the beginning of this Impacts subsection, the future cumulative baseline used in this project is based on a combination of revised year 2015 land use and employment estimates developed by the San Francisco Redevelopment Agency and the Planning Department for San Francisco County, plus population and employment estimates prepared by the Association of Bay Area Governments (ABAG) in *Projections '96* for the rest of the nine-county San Francisco Bay Area. This model is the best available source of estimates of future traffic under year 2015 cumulative conditions because it considers not just the growth in the Project Area, but the cumulative growth in all of San Francisco, and cumulative growth in the San Francisco Bay Area region as a whole.

The MTC model is intended to be a tool to forecast future traffic volumes on major regional traffic facilities such as I-80 (Bay Bridge), U.S. 101, and I-280, and on major local streets. It is not designed to provide accurate traffic forecasts on local streets at the block-by-block level, nor to forecast turning movements at intersections which are necessary to determine future intersection traffic conditions. Therefore, the future intersection turning movements were derived by comparing the existing roadway volumes with those forecast by the MTC model and were also based on the existing turning movement patterns at the study intersections, which were adjusted to reflect the changes in the local street system.

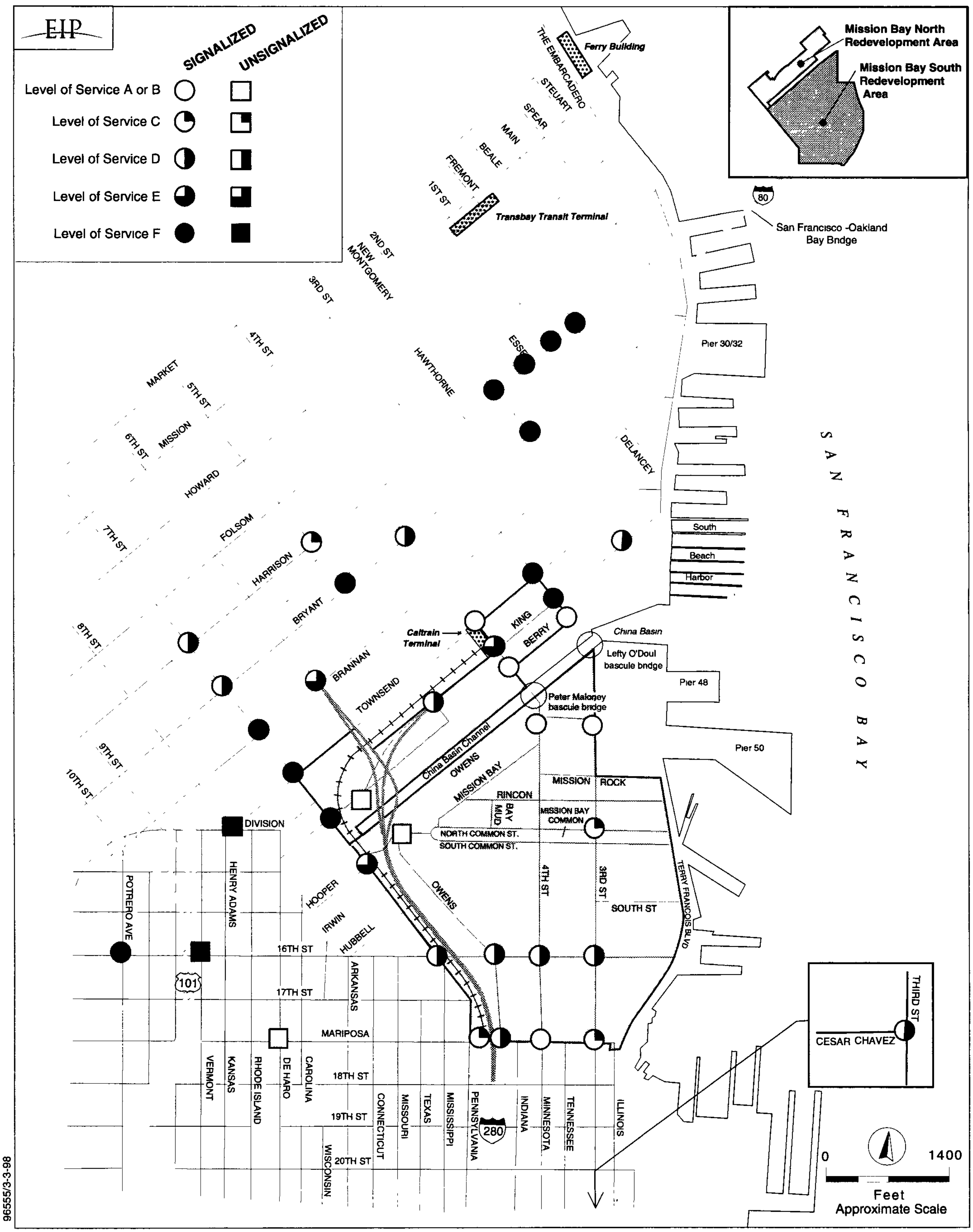
Year 2015 Cumulative Conditions

In order to forecast year 2015 traffic volumes and ensure a conservative approach for the cumulative analysis, the MTC model was adjusted to reflect land use data under full build-out conditions of the project. Under the year 2015 cumulative scenario, the Project Area roadway network was assumed to be similar to the one described under the existing-plus-project scenario. Both the Third Street Light Rail Extension and the MMX extension were assumed to be in operation under this study scenario. (See "Changes to San Francisco Municipal Railway [MUNI] System" under "Year 2015 Transportation System Assumptions," above, for a more complete description of the proposed service alignment.) The cumulative intersection level of service analysis also considered the effects of the existing and proposed Caltrain at-grade crossings at Berry Street, the Seventh Street Connector (from North Common and South Common Streets) and 16th Street.

As shown in Figure V.E.13 and Table V.E.10, 3 of the 41 study intersections would operate at LOS E and 14 intersections would operate at LOS F. Comparing the levels of service under the existing-plus-project and year 2015 cumulative conditions, including project-related traffic, six intersections would further deteriorate from LOS D or better to LOS E or F by year 2015, in addition to the three intersections (Brannan/Seventh, Townsend/Seventh, Townsend/Eighth) that would deteriorate from LOS D or better to LOS E or F with the addition of project traffic alone. The additional intersections are: Berry Street at Seventh Street (D to F), King Street at Third Street (D to F), King Street at Fourth Street (C to E), Townsend Street at Third Street (D to F), North Common and South Common Streets at Seventh Street (D to E), and Potrero Avenue at 16th Street (D to F). Two intersections (Townsend Street at Eighth Street and Brannan Street at Seventh Street), which would deteriorate from LOS B to LOS E with the addition of project traffic alone, would further deteriorate to LOS F under year 2015 cumulative conditions.

Table V.E.10 also shows the percent contribution of project traffic to each study intersection. These percentages reflect the relative degree of significance of project traffic to the overall projected delay and levels of service of the intersections. As shown in Table V.E.10, the percentages range from 3% to 96%, with the highest percentages found mostly at intersections near the Project Area. The percentages gradually decrease with distance from the Project Area. For example, while project traffic would contribute to at least half of the total traffic volume at intersections on Mariposa Street between Third Street and the I-280 ramps, approximately 10 to 20% of the total traffic volume at the intersections on Harrison Street would be attributable to the project. The relatively high contribution of project traffic to cumulative traffic increases at intersections that currently operate at unacceptable LOS E or F would be a significant environmental effect of the project. Mitigation Measures E.30 through E.42 described in Section VI.E, Mitigation Measures: Transportation, may reduce but would not eliminate this significant effect. All six of the intersections that would operate at LOS D or better with the project but would decline with cumulative traffic could be mitigated to avoid deterioration to a worse LOS, although the intersection of King Street and Third Street would require widening on two approaches to accomplish this improvement. The three intersections that would deteriorate to LOS E or F from project traffic alone could also be mitigated to an acceptable LOS under cumulative conditions. The intersections that could not be mitigated are those leading to freeway ramps.

As shown in Table V.E.10, there would be substantial increases in traffic on 16th Street in the North Potrero and Showplace Square areas. The p.m. peak hour level of service at Potrero Avenue and



SOURCE: Wilbur Smith Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.E.13 WEEKDAY P.M. PEAK HOUR LEVELS OF SERVICE: YEAR 2015 CUMULATIVE

16th Street would deteriorate from the existing LOS C to LOS F under cumulative conditions with Mission Bay traffic. Mitigation Measure E.33 in Section VI.E, Mitigation Measures: Transportation, is projected to improve the LOS to C at that intersection.

In the Potrero Hill residential area, traffic volumes would not change as substantially as they would in the North Potrero commercial/industrial area. For example, at Mariposa and De Haro Streets in 2015 the p.m. peak hour LOS would remain A and the average delay would change by 0.3 second per vehicle. Thus, traffic increases from cumulative growth including the project would not be expected to cause significant impacts in the Potrero Hill residential areas. Some new employees in Mission Bay would be expected to use commercial facilities like restaurants in the neighborhood commercial areas of Potrero Hill and along 16th Street in North Potrero, adding to lunch-time traffic in these areas.

During the peak period, general increases in traffic would occur in and around the Project Area, affecting streets and intersections that have not been studied in this analysis. The key study intersections were chosen to represent locations already operating at unacceptable levels of service or those that would be most affected by project-generated traffic during the p.m. peak hour in or near the Project Area. The operation of each study intersection is representative of the general traffic conditions that would be experienced at other nearby intersections along the streets studied, but demonstrates the most congested conditions in the local area. It should also be noted that the traffic analysis conducted for this project distributes project-generated traffic to the most probable routes to and from each land use in the Project Area. However, drivers experiencing recurrent congestion in particular areas may, where feasible and over time, seek alternate routes to their destinations. As the multiple routes possible cannot be accurately predicted at this time, it is not possible to analyze the effects of congestion-induced route changes.

Intersections along Terry A. François Boulevard were not analyzed for p.m. peak hour congestion because it is not expected that large volumes of traffic would use this street for commuting. It would have a bayfront linear park adjacent on the west side beginning at Mission Rock Street and extending the entire length south to Mariposa Street. Thus, the street would lead motorists to recreational activities in the park and on the Bay shore, rather than to residential or business uses. It would be further from freeway access points than Third, Fourth, or Owens Streets in the Project Area, and so would be less attractive to commuters than these main streets. Therefore, weekday p.m. peak hour traffic is not expected to interfere with existing recreational uses along Terry A. François Boulevard such as the proposed boat launch ramp at Pier 52. Before and after high-attendance events at the ballpark, when patrons were accessing or leaving the parking lots assumed to be south of the Channel, motorists would use this street and would cause congestion, making recreational access temporarily more difficult.

Concern has been expressed in response to the Notice That an EIR is Required and Initial Study for the SEIR that the proposed connection of Fourth Street to Minnesota Street would bring substantial increases in traffic to Minnesota Street, which would affect residential uses along Minnesota Street south of 20th Street, about three and one-half blocks south of the southern border of the Project Area, and other portions of the Lower Potrero area. Various configurations for this intersection were considered by the project sponsors before arriving at a configuration that aligns Fourth and Minnesota Streets. The alignments considered and their relative advantages and disadvantages are described in "Proposed Streets in the Project Area" in Appendix D.

The traffic analysis indicates that the potential for traffic intrusion into this area would be limited, for the following reasons: Fourth Street southbound would be designed to encourage turning movements onto the major east-west streets (16th Street and Mariposa Street) with only one through lane southbound into Minnesota Street; access to I-280 from Mariposa Street and Third Street and Third Street south to Cesar Chavez Street is predicted to operate at an acceptable level of service in the project-plus-cumulative condition, so that northbound and southbound drivers would not be induced to use Minnesota Street as an alternative to bypass congestion (the I-280 on-ramp at Mariposa that currently operates at LOS F would be signalized as part of the project and is projected to operate at LOS C with project and cumulative traffic added); and Minnesota Street dead-ends near 22nd Street about four blocks south of Mariposa Street and therefore does not provide a convenient north-south route, nor does it link to a more convenient freeway access or east-west route than streets more easily accessed from the Project Area. Therefore, while an increase in traffic on Minnesota Street would occur, it would be relatively small.

The traffic analysis in this SEIR assumes no traffic uses Minnesota Street in order to provide a worst-case scenario for Third Street, a more critical and heavily traveled thoroughfare. Under this assumption, the intersection of Fourth Street and Minnesota is projected to operate at LOS B in 2015 conditions with project-plus-cumulative p.m. peak hour traffic. The intersection was also analyzed with the assumption that approximately 650 project-generated vehicles would use Minnesota Street during the p.m. peak hour, in order to reflect a worst-case scenario for the intersection./70/ The analysis indicated that the intersection would operate at LOS C under this assumption. The number of vehicles that may travel to/from the project on Minnesota Street is unlikely to exceed 650 vehicles per hour. Assigning any additional traffic to this street would cause the Third Street corridor and the I-280 ramps at Mariposa Street to carry volumes that would be unreasonably below capacity. In reality, the number of project-generated vehicles that would use Minnesota Street would likely be less than 650, but more than the zero assumed for the main traffic analysis, indicating that the LOS would never be worse than LOS C and may be better. LOS C is an acceptable service level but the increase in traffic if realized, would be noticeable to existing residents and businesses. If this number of vehicles were to use Minnesota Street on a regular basis, many would return to Third Street using 18th or 19th Streets, because Minnesota Street changes from residential uses with more trucks and loading docks to become a tree-lined street with residential driveways and parked cars south of 19th Street, and because there is no cross street between 19th Street and 22nd Street at the south end of Minnesota Street.

The proposed connection of Fourth Street to Minnesota Street, across from Mariposa Street, could be designed such that any through traffic intrusion onto the Lower Potrero neighborhood that may occur occasionally if Third Street were unusually congested and that may be annoying to residents and businesses is minimized or eliminated. Specific designs have not been developed. Possible solutions could include prohibiting southbound traffic on Fourth Street from entering Minnesota Street by forcing left or right turns at Mariposa Street, converting one or more of the northernmost blocks on Minnesota Street from two-way traffic operation to one-way northbound; widening the sidewalks along Minnesota Street, particularly at Mariposa Street or 18th Street, either at the crosswalks or for the entire length of the block to provide a more residential, pedestrian-oriented character to the street; and installing additional landscaping at the edges of the roadway, or similar designs, to discourage through traffic. Although not needed to reduce possible significant impacts, any of these measures, or others, could be implemented as part of a traffic calming and intrusion prevention plan, to accommodate the needs and desires of both residential and commercial owners on Minnesota Street.

TRANSIT IMPACTS

The analysis period chosen for evaluation of the effects of Mission Bay development on transit systems in the area is the 4:00 p.m. to 6:00 p.m. afternoon peak period, the same as that for the analysis of traffic impacts. The p.m. peak hour falls within this two-hour period, but may vary slightly between different transit agencies. Therefore, this approach does not reflect a unique hour of analysis, but reflects a conservative scenario by combining the individual p.m. peak hour characteristics of each transit system.

Project Impacts on Regional Carriers

Table V.E.11 presents estimates of the additional p.m. peak hour patronage on regional transit carriers generated by development of the Mission Bay Project Area. The resulting impacts on each of these carriers are discussed below and their effects summarized in Table V.E.12. It should be noted that the transportation impact analysis presented in this section identifies the effects of the entire Mission Bay project on the regional transit carriers in isolation, as if the project were to occur all at once within a very short time frame. Since the project would likely develop over an extended period

TABLE V.E.11 ●
P.M. PEAK HOUR PROJECT PERSON TRIPS DISTRIBUTION BY TRANSIT CARRIER IN THE VICINITY OF MISSION BAY

Project Area	BART		AC Transit		Charter or Subscription Bus		Golden Gate Transit Buses		Golden Gate Transit Ferry		SamTrans		Caltrain		MUNI Bus/a/		MUNI Metro/a/		Total /b/
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	
Mission Bay North	285	235	83	68	25	22	83	87	18	19	20	17	50	42	558	326	893	643	3,474
Mission Bay South																			
Central Subarea	109	66	33	19	7	5	2	3	0	1	6	5	16	13	170	98	521	306	1,380
East Subarea	30	198	11	98	4	32	7	44	1	10	6	43	14	92	54	202	166	806	1,818
West Subarea	27	170	10	82	4	28	7	40	1	9	5	38	12	81	53	185	158	717	1,627
UCSF Subarea	10	57	5	27	5	28	9	54	2	11	7	41	14	78	21	120	68	387	944
Total Mission Bay North	285	235	83	68	25	22	83	87	18	19	20	17	50	42	558	326	893	643	3,474
Total Mission Bay South	176	491	59	226	20	93	25	141	4	31	24	127	56	264	298	605	913	2,216	5,769
TOTAL PROJECT	**461**	**726**	**142**	**294**	**45**	**115**	**108**	**228**	**22**	**50**	**44**	**144**	**106**	**306**	**856**	**931**	**1,806**	**2,859**	**9,243**

Note:

a. Ridership levels represent persons using MUNI as their only transit mode, as well as those using MUNI to access regional transit carriers, such as BART, AC Transit, Golden Gate Transit, ferries, SamTrans, and Caltrain. Approximately 90% of the regional transit riders generated by Mission Bay except Caltrain riders in Mission Bay North and charter bus riders in Mission Bay North and South are also expected to use MUNI. Approximately 33% of Mission Bay South MUNI bus riders are assumed to ride MUNI Metro between the downtown area and Mission Bay, but ride a MUNI bus between the downtown area and his/her origin/destination.

b. Total ridership shown in this column is higher than p.m. peak hour transit trips shown in Table V.E.7 because it includes MUNI-only and MUNI-plus-a-regional-transit-carrier MUNI trips.

Source: Wilbur Smith Associates.

TABLE V.E.12
EXISTING AND EXISTING-PLUS-PROJECT REGIONAL TRANSIT SUMMARY
PEAK HOUR OF P.M. PEAK PERIOD/PEAK DIRECTION

	Existing Conditions			Existing-Plus-Project Conditions		
Regional Transit Provider	**Hourly Capacity**	**Average Hourly Load**	**Percent Capacity Utilized**	**Project Trips**	**Average Hourly Load**	**Percent Capacity Utilized**
Caltrain	3,080 /a/	2,190 /b/	71%	304	2,490	81%
BART (Transbay)	12,820 /c/	15,760 /c/	123% /d/	570	16,330	127%
BART (to Peninsula)	8,740 /c/	7,680 /c/	88%	160	7,840	90%
AC Transit	3,915 /e/	3,254 /e/	83%	293	3,550	91%
GGT buses	4,590 /f/	3,210 /f/	70%	228	3,440	75%
GGT ferries	2,020 /g/	890 /f/	44%	49	940	47%

Notes:
a. Caltrain Timetable, effective July 6, 1997, through January 3, 1998 (assumes 25-car trains, and 34-car trains in p.m. peak hour, with 140 seats per car).
b. February 1996 data, *Giants Ballpark EIR,* p. IV.197.
c. BART *Short Range Transit Plan, FY 1995-2005.*
d. BART has established a performance standards for the three-hour peak period as 115%, but has no performance standards for the peak hour. The existing three-hour load factor is 112%.
e. Paul Bignardi, Associate Planner, AC Transit, telephone conversation with WSA, December 5, 1997.
f. Fax to Jose Farran, WSA, from Maurice Palumbo, Sr. Planner, GGBHTD, June 24, 1997.
g. Maurice Palumbo, Sr. Planner, GGBHTD, telephone conversation with WSA, October 7, 1997.

Source: Wilbur Smith Associates

of time, assumed in this SEIR to be about 20 years, its effects would not occur for many years, by which time planned increases in transit service would have occurred. In this regard, the year 2015 cumulative scenario analysis presented later in this section is more meaningful for a project of this magnitude.

Caltrain

The proximity of the Caltrain terminal to the Project Area is estimated to yield an increase in ridership aboard trains to and from the Peninsula and South Bay. Caltrain is expected to provide approximately 45% of the total Peninsula/South Bay transit patronage to the Mission Bay Project Area./71/ This would result in approximately 410 additional passengers during the weekday p.m. peak hour. Approximately 75% of these estimated trips would be to/from Mission Bay South.

Currently, there are five southbound trains departing the Caltrain terminal during the p.m. peak hour to serve the commute period. The largest passenger load on trains serving San Francisco during this period is approximately 70%./72/ If the total outbound demand were distributed equally among the five trains departing the terminal during the p.m. peak hour, the average additional load per train would be approximately 60 passengers. As Caltrain provides four to five 140-seat cars per train in the p.m. peak hour, 60 additional passengers would increase passenger loads to about 80% or less. Thus, these five trains would be sufficient to accommodate the additional 300 outbound passenger trips generated in the Mission Bay Project Area. There are two northbound trains arriving at the Caltrain terminal during the p.m. peak hour, sufficient to serve the additional 105 p.m. peak passenger inbound trips that would be generated by the Mission Bay project.

RT

The northern and western boundaries of Mission Bay are located approximately 1.0 to 1.25 miles from the nearest BART stations, which are estimated to serve the approximately 960 trips that would be generated by the Mission Bay project to and from the East Bay.

About 390 of these transbay passenger trips are anticipated to be inbound (westbound from the East Bay), while about 570 transbay trips are estimated to be outbound (eastbound) during the p.m. peak hour. The current eastbound transbay load factor (persons per seat) during the peak hour of the p.m. peak period is 1.23, which would increase to 1.27 as a result of the project (a load factor over 1.0 assumes some passengers stand). The three-hour peak period load factor would increase from the existing 1.12 to about 1.16, above BART's performance standard of 1.15 persons per seat./73/ To maintain BART's target, if the project passenger increase were to occur all at once rather than over a period of 20 years or more, it would be necessary for BART to add at least four additional cars during the three-hour p.m. peak period to accommodate additional demand from the Mission Bay project. These additional cars would be added as part of BART's planned increase in transbay service capacity, expected to occur by the year 2006, 10 to 15 years ahead of the time that the maximum estimated project demand would materialize. By the time the total project demand occurs, BART's system capacity would more than meet the estimated demand. (A more complete description of BART's planned future service is provided in "Regional Carriers, 2015 Cumulative Scenario," below.)

Approximately 650 passengers are expected to take MUNI Metro from Mission Bay to the BART stations during the p.m. peak hour. Many of these individuals would travel the shortest distance possible on MUNI Metro and transfer from MUNI to BART at the Embarcadero station, adding to existing congestion at the fare gates there. If these passengers sense that platform and fare gate conditions are too congested at the Embarcadero station, they could continue on MUNI to the Montgomery Street station or Powell Street station to avoid the congestion. Those individuals traveling to the Peninsula on BART would find this option considerably more convenient, because no unnecessary distance would be traveled. Passengers traveling to the East Bay on BART may choose to continue on MUNI to the Montgomery or Powell Street stations in order to transfer to an eastbound train before the maximum load point, as is now commonly done to increase the chance of getting a seat.

BART would also provide service to individuals traveling to Daly City and Colma and, in the future, to the airport and Millbrae, carrying an additional 225 p.m. peak hour passengers. Nearly 70% of these trips, or 155 passengers, are expected to be leaving the Mission Bay Project Area during the p.m. peak hour, while about 70 would be arriving in Mission Bay during this time. The existing southbound load factor during the p.m. peak hour is 0.88, which would increase to 0.90 as a result of the project. Similarly, the three-hour p.m. peak period load factor would increase from 0.67 to 0.68, well below BART's maximum performance standard of 1.15.

AC Transit

The additional p.m. peak hour ridership on AC Transit is projected to be 435 passengers to and from the Mission Bay Project Area. About 140 of these passenger trips would be westbound, inbound to Mission Bay, while 295 p.m. peak trips would be outbound to the East Bay. AC Transit's schedule indicates 87 eastbound bus trips during the p.m. peak hour The current p.m. peak hour transbay ridership is approximately 3,255, yielding an average of about 35 passengers per trip./74/ With each bus having approximately 45 seats, AC Transit's eastbound transbay ridership is projected to be increased from 83% to 91% of capacity with the additional passengers generated by the Mission Bay project. AC Transit also operates approximately 11 westbound transbay bus trips during the p.m. peak hour. The additional 140 westbound transbay passengers would not require any expansion of service in this direction.

SamTrans

SamTrans is projected to carry 190 trips of the p.m. peak hour transit demand produced by Mission Bay development. Approximately 145 of these trips would originate in Mission Bay, while an estimated 45 passengers would ride SamTrans to Mission Bay from the Peninsula during the p.m. peak hour. SamTrans currently operates approximately 29 buses to and from San Francisco during the p.m. peak hour./75/ The additional patronage from the project, about five passengers per outbound trip, would be minor.

Golden Gate Transit

Golden Gate Transit buses are anticipated to carry over 70% of all project North Bay transit trips, resulting in an evening peak hour patronage of 335 passengers from Mission Bay area development. About 105 riders are expected to be traveling to Mission Bay, while 230 riders would be leaving the area. During the p.m. peak hour, 113 outbound buses and 18 inbound buses serve the San Francisco downtown area. Although not all GGT bus routes have the same passenger loads during the p.m. peak hour, on average only 70% of the capacity is currently used; thus, the impact of these additional passengers would be minimal./76/

Golden Gate Transit also operates ferry service from the San Francisco Ferry Building to Sausalito and Larkspur. Ferries are expected to carry approximately 16% of the Mission Bay development North Bay transit trips, making up approximately 1% of the total Mission Bay transit patronage. The approximately 25 persons traveling to Mission Bay and 50 persons leaving Mission Bay to/from the Ferry Building are not expected to affect the level of service offered by ferries. These vessels have a maximum capacity between 575 and 725 passengers, and their existing load factors are 38% or less.

Charter/Subscription Bus

Charter and subscription buses are anticipated to be used primarily by employees traveling to/from the office space and research and development facilities in Mission Bay South. Charter and subscription buses would provide service to the South Bay, East Bay, and North Bay, combining to comprise approximately 160 transit trips of the Mission Bay project p.m. peak hour transit demand. The Golden Gate Transit "club" buses discussed under "Existing Regional Transportation Facilities" in the Setting subsection, under "Golden Gate Transit," are examples of subscription buses. Approximately 28%, or 45 passenger trips, would be inbound to Mission Bay, and 115 trips would be outbound. Assuming a bus with approximately 40 seats, the Mission Bay demand would require about one inbound bus, and approximately three outbound buses.

Regional Carriers, 2015 Cumulative Scenario

A number of sources were used to develop the transit forecasts for cumulative development and growth through the year 2015. The MTC regional travel demand model was used to develop travel forecasts for cumulative development and growth through the year 2015. The travel forecasts were based upon employment and population estimates developed by the San Francisco Redevelopment Agency and the Planning Department for San Francisco, and the Association of Bay Area Governments' *Projections '96* estimates of population and employment for the rest of the nine-county San Francisco Bay Area. The population and employment growth rates assumed in the MTC model for the transit analysis are consistent with those estimates used in the traffic analysis for 2015 conditions. The projections made by the MTC model were compared with projected transit patronage growth values from the *AC Transit Draft Transbay Comprehensive Service Plan*, published in February 1997, as well as cumulative projected ridership estimates made by various regional transit agencies as presented in their Short Range Transit Plans. In comparison, possible substantial increases (or decreases) in transit ridership were considered, due to major changes anticipated in future service. For each particular transit agency, the most reasonable compromise among the various available cumulative growth estimates was chosen in order to reflect the most appropriate estimate of the transit environment in the year 2015, as described below under the individual transit agency discussions.

The MTC model forecasts for transit cannot be used alone to analyze effects of cumulative growth on individual transit agency services because the model does not provide accurate allocations of transit demand to individual transit modes. For example, the model does not accurately allocate transbay transit travel demand between BART and AC Transit. For that reason, the improvement plans of each transit operator were taken into account when assigning the future demand to individual transit modes. For each of the major regional travel corridors, East Bay, North Bay, and South Bay, the total transit growth rate used to project the transit growth for each operator equaled or exceeded the travel demand growth rate from the travel forecasts. Table V.E.13 summarizes the resulting effects of cumulative transit use on the regional carriers.

<u>Caltrain</u>

Caltrain ridership is expected to grow in the future based on demographic trends in the Bay Area. The MTC model estimates an annual growth in San Francisco/Peninsula travel of 1.75% between 1995 and 2015; the *Caltrain San Francisco Downtown Extension Project Draft EIS/EIR*/77/ estimates an annual growth in Caltrain ridership of 2.7% between 1996 and 2010; and the Caltrain *20-Year Strategic Plan, FY 1997/98 to FY 2016/17,* suggests an annual growth rate of 4.0%/78/ In order to conservatively estimate cumulative impacts of Mission Bay development, an annual growth of 4.0% was assumed, consistent with Caltrain 20-year plan projections.

Considering the current maximum load factor of 71% and p.m. peak period operation of five trains of 560 to 700 seats each, the cumulative growth of Caltrain ridership is not expected to reach capacity with the addition of trips generated by Mission Bay. Although a downtown extension of Caltrain was not assumed by 2015 (see "Caltrain San Francisco Downtown Extension Project," under "Changes to Regional Transit System" above), an increase in daily trains from the current 66 trains per day to 86 trains per day was assumed to have been implemented by 2015, as presented in the *Caltrain's 20-Year*

TABLE V.E.13
CUMULATIVE REGIONAL TRANSIT SUMMARY
PEAK HOUR OF P.M. PERIOD/PEAK DIRECTION

	Existing Conditions			Year 2015 Conditions				
Regional Transit Provider	Hourly Capacity	Average Hourly Load	Percent Capacity Used	Hourly Capacity	Cumulative Trips Without Project	Project Trips	Average Hourly Load	Percent Capacity Used
Caltrain	3,080 /a/	2,190 /b/	71%	5,320 /c/	4,790 /d/	304	5,090	96%
BART (Transbay)	12,820 /e/	15,760 /e/	123% /f/	19,230 /g/	23,420 /h/	570	23,990	125%
BART (To Peninsula)	8,740 /e/	7,680 /e/	88%	13,110 /g/	10,870 /i/	160	11,030	84%
AC Transit	3,915 /j/	3,254 /j/	83%	3,915 /k/	5,857 /l/	293	6,150	157%
GGT buses	4,590 /m/	3,210 /m/	70%	4,590 /k/	3,680 /n/	228	3,910	85%
GGT ferries	2,020 /o/	890 /m/	44%	2,350 /p/	1,340 /q/	49	1,390	59%

Notes:

a. Caltrain Timetable, effective July 6, 1997 through January 3, 1998 (assumes 2 5-car trains, and 3 4-car trains in p.m. peak hour, with 140 seats per car).
b. February 1996 data, *Giants Ballpark EIR*, p. IV.197.
c. Increase from existing 66 daily trains to 86 daily trains corresponds to increase from five to eight trains during the p.m. peak hour, of which two were assumed to be 4-car trains, and 6 were assumed to be 5-car trains. Preliminary Caltrain Schedules, October 15, 1997.
d. Reflects annual ridership growth of 4.0%, Caltrain *20-Year Strategic Plan, FY 1997/98 to 2016/17.*
e. BART *Short Range Transit Plan, FY 1995-2005.*
f. BART has established a performance standard for the three-hour peak period as 115%, but has no performance standards for the peak hour. The existing three-hour load factor is 112%.
g. BART *Short Range Transit Plan, FY 1996-2006.* Increase from 18 to 27 transbay trains per hour.
h. Reflects annual ridership growth of 2.0%, Wilbur Smith Associates. Growth rate is compromise of those suggested by the MTC model, BART, and AC Transit.
i. Reflects annual ridership growth of 1.75%, MTC Model.
j. Paul Bignardi, Associate Planner, AC Transit, telephone conversation with WSA, December 5, 1997.
k. Assumed no increase in capacity. AC Transit has not yet reassessed the need for additional capacity since the BART strike of September 1997.
l. Reflects ridership growth of 80% between 1997 and 2015.
m. Fax to Jose Farran, WSA, from Maurice Palumbo, SR. Planner, GGBHT, June 24, 1997.
n. Reflects annual ridership growth of 0.68%, Golden Gate Bridge Highway and Transportation District Short Range Transit Plan (FY 1996/1997 to 2005/2006).
o. Maurice Palumbo, Sr. Planner, GGBHTD, telephone conversation with WSA, October 7, 1997.
p. Maurice Palumbo, Sr. Planner, GGBHTD, telephone conversation with WSA, October 7, 1997. Reflects addition of new Larkspur 325-seat ferry.
q. Reflects annual ridership growth of 2.28%.

Source: Wilbur Smith Associates.

Strategic Plan. The additional trains expected to be in operation by year 2015 would provide three more southbound trains during the p.m. peak hour./79/ This 73% increase in capacity planned by 2010 would be adequate to accommodate the 103% cumulative increase in ridership assumed between 1997 and 2015, indicating that the maximum passenger load would increase about 19% over the current level, to 90% due to cumulative growth. The addition of Mission Bay passengers would increase the year 2015 load factor to 96%

BART

The MTC model estimates a 2.7% annual growth in transbay trips between 1995 and 2015. BART estimates a 1.25% annual growth for the core system between 1996 and 2005./80/ AC Transit estimates an annual growth rate of 2.16% in BART ridership between 1997 and 2010./81/ A compromise of these rates was assumed for the Mission Bay cumulative analysis; an annual growth of 2.0% in BART ridership translates to a total growth of approximately 48% between 1995 and 2015, including growth from the Mission Bay Project Area. BART expects to increase transbay service by increasing the peak capacity from a maximum number of transbay trains per hour of 18 in 1996 to 27 by 2006. This increase in capacity translates to an average increase in p.m. peak hour capacity of 50%. Even if capacity were not further increased between 2006 and 2015, the nine additional trains would be sufficient to carry the anticipated cumulative growth, including growth from Mission Bay, through 2015. The reverse commute trains (from the East Bay to downtown San Francisco) operate with smaller loads, well below capacity, and therefore were not analyzed.

The current p.m. peak hour load factor for trains traveling from San Francisco to Daly City and Colma is 0.88. The additional 130 p.m. peak hour BART trips generated by the project alone would increase the load factor to 0.89. BART is scheduled to provide service from the existing end of the line (Colma station) to the San Francisco International Airport (SFIA) and Millbrae by the year 2000. According to BART's *Short Range Transit Plan for FY 1997-2006*, the Yellow (Pittsburg/Bay Point) and the Red (Richmond) lines would provide service south of the Daly City station, serving SFIA and Millbrae during weekday peak periods. The combined weekday peak period service to SFIA/Millbrae is expected to be about one train every seven minutes. By 2006, there is expected to be a 50% increase in the number of trains traveling in the San Francisco-to-Peninsula direction. This increase in capacity would be sufficient to accommodate the 48% increase in ridership forecast by 2015 due to cumulative growth.

AC Transit

The *AC Transit Draft Transbay Comprehensive Service Plan* estimates a 100% to 130% increase in AC Transit transbay ridership between 1997 and 2010, indicating an additional 9,000 to 12,000 daily passenger trips. Following the BART strike in September, 1997, AC Transit transbay ridership increased substantially, and has stabilized in recent months at a higher level than before the strike. The expected growth in passenger trips, however, has not been reassessed, and the 9,000 to 12,000 additional trips represent a smaller proportion of the revised current ridership. Therefore, expected growth between 1997 and 2010 yields a growth rate of 80% to 110%./82/

AC Transit's growth estimate assumes that the additional capacity BART will gain with smaller headways will consist primarily of trains traveling on the Dublin/Pleasanton Line. This would mean that a large portion of transbay travel demand growth to the northern part of AC Transit's service area could not be directly accommodated by BART. However, BART's *Short Range Transit Plan* suggests that it will be able to accommodate more transbay demand growth than AC Transit predicts. Therefore, a total cumulative growth rate of 80% was assumed over the next 13 years for AC Transit rather than the larger rate. This corresponds to an annual growth of approximately 4.6%. Currently, there are no plans to increase the number of buses or transbay bus runs in the future. Continued growth in demand may prompt a reevaluation of the service provided.

An 80% increase in cumulative passenger trips during the p.m. peak hour would increase the current 83% average load factor to 150%. If all eastbound transbay buses were equally loaded, a load factor of 150% would translate to approximately 23 standees per bus. Because the arrival of passengers to the Transbay Transit Terminal is not likely to be evenly distributed throughout the p.m. peak hour, and because each transbay bus represents a particular bus line that may capture more or less ridership demand than other lines, the passenger loads are unlikely to be the same on each transbay p.m. peak hour bus. Although 23 standees per vehicle can be accommodated, the variable passenger loading suggests that the demand for particular buses during the p.m. peak hour may exceed capacity, while other lines may experience a demand slightly less than capacity. The 295 p.m. peak hour eastbound project-related person trips would contribute an additional 5%, increasing the load factor to 157%, a significant contribution to cumulative impacts on AC Transit. Such a load factor indicates an average of 26 standees per bus, if all eastbound p.m. peak hour buses were equally loaded. Mitigation Measure E.44 in Section VI.E, Mitigation Measures: Transportation, may help to reduce this cumulative impact.

<u>SamTrans</u>

SamTrans is not expected to experience any substantial increases in ridership in the near future. With the planned BART-to-San Francisco International Airport extension, SamTrans plans to revise its bus route system to provide new feeder bus routes to serve the new BART stations. Furthermore, the MUNI Metro Extensions to the Caltrain terminal and to the Caltrain Bayshore Station, would make Caltrain more accessible as a transit mode. Consequently, BART and Caltrain would be expected to carry the vast majority of the additional growth in San Francisco-Peninsula transit ridership.

Golden Gate Transit

The *Golden Gate Bridge, Highway and Transportation District Short Range Transit Plan (FY 1996/1997 to 2005/2006)*/83/ estimates a 0.68% annual increase in bus ridership between 1997 and 2006, which is higher than the no growth estimated for travel between the North Bay and San Francisco by the MTC model. Because on average only 70% of current capacity is used on Golden Gate Transit buses during the p.m. peak hour, the 0.68% annual growth in cumulative ridership, including Mission Bay-generated trips, is estimated to increase the average p.m. peak hour load factor to 85%, assuming capacity remains the same. Not all GGT bus routes have the same passenger loads during the p.m. peak hour, with some carrying more passengers than others. It is assumed that the future allocation of buses to routes and the establishment of future bus route headways could be done by GGT in such a manner that the average future cumulative load factor of 85% would be redistributed without exceeding 100% on any given bus route.

Ferry Services

Golden Gate Transit anticipates ferry ridership to increase at a greater annual rate of 2.28% during the same time period. This annual growth rate was chosen as an appropriate (conservative) value for analysis of Mission Bay development./84/ The expected 2.28% annual increase in ferry ridership extended to the year 2015 corresponds to a 50% increase in current ridership. The estimated ridership growth would increase the commute-direction load factor of the Larkspur Ferry to 75% of capacity, and would increase the commute direction of the Sausalito Ferry to 44% of capacity. As stated in note p. in Table V.E.13, a new, 325-seat ferry boat is expected to be added to the Larkspur Ferry service in the fall of 1998. Even if capacity were not increased by year 2015, the ferries could easily accommodate the estimated 50 persons generated by the project that would be leaving San Francisco on ferries during the p.m. peak hour. The lower existing load factors on the reverse-commute direction ferries could also easily accommodate the 25 people traveling from the North Bay to Mission Bay during the p.m. peak hour.

No project-related trips were assigned to private ferries such as the Blue & Gold Fleet, Vallejo Baylink, Oakland/Alameda, and Harbor Bay ferries. The private ferry service between the North Bay and San Francisco supplements that provided by Golden Gate Transit. The private ferry service between the Ferry Building and the East Bay supplements the transit options provided by AC Transit and BART. All of the private ferries have unused passenger capacity during the p.m. peak hour, such that any shifts from Golden Gate Transit buses to the Blue & Gold Fleet's Tiburon ferry, for example, would be accommodated./85/

San Francisco Municipal Railway

Mission Bay Project Impacts

Although MUNI provides service to all areas of San Francisco, the types of MUNI service provided to each area is different. Due to relative availability of MUNI Metro versus MUNI bus lines in different areas within San Francisco, service to the northeast, northwest, southeast and southwest quadrants of the City were analyzed separately. These quadrants are defined by the MUNI screenlines described in Setting, above, at the end of the "Local Transit Facilities/Services" section, and shown in Figure V.E.6. The extension of light rail on Third Street through the Project Area is also anticipated to influence the relative number of MUNI passengers that would choose between the bus and Metro systems. The allocation of MUNI Metro and bus trips to each City quadrant was based on the relative level of service and coverage each offered to individuals traveling to/from these areas. Based on this evaluation, the relative number of passengers in each quadrant choosing MUNI bus or MUNI Metro was determined.

MUNI buses are expected to carry about 1,790 passengers to and from Mission Bay during the p.m. peak hour, while MUNI Metro is anticipated to carry approximately 4,670 Mission Bay passengers during the same time period. The larger proportion of Metro users is attributable to the combination of the expected origin/destinations of Mission Bay project patrons, and the relative accessibility of MUNI Metro vs. MUNI buses within Mission Bay.

During the p.m. peak hour, it was estimated that about 860 passengers would use MUNI buses to reach Mission Bay, and approximately 930 passengers would travel outbound from the Project Area, using MUNI buses. The number of passengers that would ride MUNI Metro to Mission Bay during the p.m. peak hour would be about 1,810; and 2,860 passengers are estimated to leave the area during this time./86/ MUNI-only passengers make up about 65% of the projected load resulting from Project Area growth. The remaining project-related growth on MUNI would consist of travelers using MUNI to access BART, SamTrans, Golden Gate Transit and other regional transit services.

The impact of Mission Bay project travelers on MUNI has been evaluated at four screenlines, subdivided into nine transit corridors. (See Figure V.E.6 for screenline locations.) These screenlines are intended to measure the movement of MUNI passengers from the greater downtown area to other areas of the City; they represent the majority of demand and service on MUNI in the peak hour. The MUNI screenlines have no relation to the regional traffic screenlines described previously. Table V.E.14 presents the existing and existing-plus-project aggregate passenger loads crossing each of these four screenlines during the p.m. peak hour,/87/ plus the amount of capacity used by these passengers. The table also lists the MUNI corridors and lines that combine to carry these loads across each screenline. It should be noted that the referenced MUNI planning-level capacities shown in Table V.E.14 assume an appreciable number of standees (somewhere between 60% and 80% of the number of seated passengers depending on the specific transit vehicle configuration), such that 100% capacity represents a vehicle that is heavily loaded.

The northwest screenline has the greatest number of existing passengers, with a current p.m. peak hour load of 7,550 riders; transit facilities at this screenline operate at 72% of capacity. The addition

TABLE V.E.14
EXISTING AND EXISTING-PLUS-PROJECT MUNI RIDERSHIP SUMMARY BY SCREENLINE
P.M. PEAK HOUR - PEAK DIRECTION

		Existing Conditions			Existing-Plus-Project Conditions		
Screenline/a/	MUNI Routes	Hourly Capacity /b/	Average Hourly Load /c/	Percent Capacity Used	Project Trips /d/	Average Hourly Load/e/	Percent Capacity Used
Northeast	15, 30, 30X, 45	3,400	2,250	66%	230	2,480	73%
	41, 42, 82X	1,750	900	51%	150	1,030	59%
	Subtotal	*5,150*	*3,150*	*61%*	*380*	*3,510*	*68%*
Northwest	38, 38L, 38AX, 38BX	2,800	2,000	71%	50	2,050	73%
	1, 1AX, 1BX, 2, 3, 4, 5, 21, 22, 31, 31AX, 31BX	7,700	5,550	72%	90	5,620	73%
	Subtotal	*10,500*	*7,550*	*72%*	*140*	*7,670*	*73%*
Southwest	K, L (MMX), M, N	6,800	4,900	72%	290	5,190	76%
	6, 7, 71, F	1,400	1,100	79%	50	1,150	82%
	Subtotal	*8,200*	*6,000*	*73%*	*340*	*6,340*	*77%*
Southeast	J, 9	1,700	1,250	74%	140	1,390	82%
	15	850	350	41%	300	650	76%
	14, 14X	1,500	950	63%	120	1,070	71%
	Subtotal	*4,050*	*2,550*	*63%*	*560*	*3,110*	*77%*

Notes:
a. See Figure V.E.6 for Screenline location.
b. Capacity based on "San Francisco Municipal Railway, Ridership Projections to the Year 2015," April 25, 1997; revised May 5, 1997. It assumes an appreciable number of standees per vehicle (somewhere between 60% and 80% of the number of seated passengers, depending on the specific transit vehicle configuration) and may not include the effects of missed or late runs.
c. Average load at maximum load point, based on MUNI's monitoring data, FY 1995-96.
d. Estimated number of project trips that would cross the screenlines.
e. Average load at maximum load point.

Source: Wilbur Smith Associates

of the projected 140 Mission Bay MUNI outbound riders would increase the maximum capacity utilization to 73%. The southwest screenline would become the most crowded screenline under existing-plus-project conditions. The addition of 340 Mission Bay outbound MUNI riders during the p.m. peak hour would increase the percent capacity used from 73% to 77%. The smallest growth but greatest crowding on this screenline would occur on the surface lines (6, 7, 71, and F), due to their relatively lower overall capacity.

The southeast screenline, being immediately adjacent to the Mission Bay Project Area, would be influenced the most by Mission Bay project development. The addition of 560 MUNI passengers would increase the average p.m. peak hour capacity use from 63% to 77%. Most MUNI bus lines expected to directly serve the Mission Bay Project Area would combine to provide the loads associated with the northeast screenline. The addition of the projected 380 outbound Mission Bay MUNI passengers to the current p.m. peak hour average load would yield a new average load of 3,680 passengers, increasing the percent of capacity used from 64% to 71%.

The macroscopic analysis provided by evaluating passenger loads aggregated at screenlines does not indicate that the additional passenger trips generated in Mission Bay would exceed MUNI's capacity in any of the transit corridors. The impact on individual lines that currently operate near capacity may require some adjustments in some MUNI services to and from the Mission Bay Project Area, such as increasing the frequency or number of cars on the MMX service. However, the existing-plus-project analysis describes a scenario assuming the project travel demand occurs all at once rather than over a period of 20 years or more. During the development period, MUNI's Third Street light rail project is assumed to be constructed and operating, providing additional service in the Project Area, as described below in the 2015 cumulative scenario. However, additional demand from cumulative growth would also occur, as described and analyzed below under "MUNI 2015 Cumulative Scenario."

It should also be noted that because MUNI mostly operates on rights of way shared with vehicular traffic, MUNI operation will be affected not only by transit demand, but traffic demand as well. Increased volumes of vehicular traffic in and near the Project Area would impede the movement of buses just as the flow of private vehicles is affected. MUNI operations would be affected most noticeably in very congested areas, marked by intersections functioning at LOS E or F.

The impact on demand for the UCSF shuttle bus service may require UCSF to increase capacity with more frequent service and, if necessary, additional buses to accommodate the longer route between San Francisco campuses with the addition of a Mission Bay stop, as well as to accommodate the additional patronage that would be generated by UCSF facilities at Mission Bay.

MUNI 2015 Cumulative Scenario

The transit infrastructure available in Mission Bay in 2015 would be different from that provided today. MUNI Metro Extension (MMX) light rail service will be provided from The Embarcadero and extend along King Street to the Caltrain terminal, operating at a six-minute frequency as an extension of the L-Taraval line. In addition, the Third Street light rail extension under the Initial Operating Segment (IOS) phase is assumed to be in place on Third Street and Fourth Street through the entire Project Area. (See "Light Rail Extensions," under "Changes to San Francisco Municipal Railway," above, for a discussion of the IOS phase of the Third Street Light Rail Project.) Under the IOS phase, light rail vehicles (LRVs) would operate along The Embarcadero, King Street, Fourth Street, Third Street and Bayshore Boulevard on a semi-exclusive alignment (except on the Peter Maloney Bridge), as an extension of the J-Church line, providing a base service of a one-car train every ten minutes each way, to be increased to one train every six minutes during the p.m. peak period.

The addition of the Metro light rail service would provide service to passengers traveling across the southwest screenline as well as those transferring to/from other regional transit modes (AC Transit, BART, Golden Gate Transit). The additional capacity provided by light rail service between the Project Area and downtown is estimated to improve the level of service offered to transit users in Mission Bay, directly serving employees and visitors of Mission Bay North. Mission Bay South would be served by the J-line extension of light rail service along Third Street. This transit service addition would improve transit opportunities for individuals traveling beyond the southeast screenline, as well as serve northbound passengers.

MUNI service currently offered by lines 15 and 32 would instead be provided by the L-Taraval line and the Third Street light rail J-Church line on some parts of their routes; thus, MUNI capacity in this area is not expected to increase by the total capacity provided on the new light rail lines. On the other hand, MUNI, in response to expected increases in Mission Bay transit demand, in accordance with the prior Mission Bay development plan, and consistent with the assumptions in the *Third Street Light Rail Project DEIS/DEIR*, plans to extend about 50% of the present 30-Stockton or 45-Union/Stockton trolley coaches south from their current terminus at the Caltrain terminal to somewhere in the vicinity of Third Street and 19th or 20th Streets. Similarly, MUNI would extend the 22-Fillmore into Mission Bay South via 16th and Third Streets to terminate at The Common. (See "Changes to San Francisco Municipal Railway [MUNI] System," under "Year 2015 Transportation System Assumptions," for a more detailed description of the proposed bus changes.) Therefore, the net capacity gain from the additional MUNI service would be substantially greater than the degree of service lost.

MUNI is currently considering a new street car service (E-Embarcadero) to be provided between Fisherman's Wharf and the Caltrain terminal at Fourth and King Streets. Because implementation of this new service is somewhat speculative in terms of hours of operation, headways and funding sources, the transportation analyses for the Mission Bay project have assumed conservatively that the E-Embarcadero line would not be in service in the year 2015.

Table V.E.15 shows the resulting effects of cumulative transit use on the 2015 MUNI network. The northeast screenline would operate at 112% of future capacity as a result of cumulative growth, even without the Mission Bay project. The highest passenger crowding would occur on the Kearny/Stockton corridor (routes 30, 30X, 45), which would be 123% of capacity. The project would contribute about 7% of the cumulative ridership in this corridor.

The southwest screenline would be essentially fully used (99%) by cumulative growth, including that from Mission Bay. Although the screenline as a whole and the two corridors evaluated show slightly fewer transit riders than their maximum planned capacity, individual lines may not have capacity to meet the demand. In some cases passengers would be able to choose a less crowded parallel transit line; in others, individual buses or Metro cars would crowd beyond normally acceptable levels.

The northwest screenline would have some capacity available (about 6%), although most of the routes would be closer to capacity (96%). The southeast screenline would have the lowest overall congestion (89%), although the J-Church line would be full (100%).

Table V.E.16 presents the effects of year 2015 cumulative transit use, including effects of the project, in the immediate vicinity of the Mission Bay Project Area for the four major routes serving the project. As the table indicates, the two trolley bus routes and southbound Third Street light rail service would operate at about 85% or less of their maximum capacity in the vicinity of Mission Bay in the p.m. peak hour. On the other hand, the combined L-Taraval and J-Church light rail service operating on King Street and The Embarcadero would be above its planned capacity (112%), as a result of cumulative growth (including that from the Mission Bay project which would contribute approximately 65% of the trips) resulting in a significant impact on the transit system.

The Third Street and the L-line light rail vehicles will operate on semi-exclusive rights-of-way, separated from potentially conflicting traffic on streets and roadways. However, vehicles from both of these MUNI lines will be required to obey signals, and yield to conflicting traffic movements at intersections. Thus, although MUNI rail service in the area would be less impacted by traffic congestion than MUNI buses, it would still experience some degree of congestion-related delays.

TABLE V.E.15
YEAR 2015 CUMULATIVE-PLUS-PROJECT MUNI RIDERSHIP SUMMARY BY SCREENLINE
P.M. PEAK HOUR - PEAK DIRECTION

		Existing Conditions			Year 2015 Cumulative Conditions				
Screenline/a/	Year 2015 MUNI Routes	Hourly Capacity/b/	Average Hourly Load/c/	Percent Capacity Used	Hourly Capacity/d/	Cumulative Trips w/out Project/e/	Project Trips/f/	Average Hourly Load/g/	Percent Capacity Used
Northeast	30, 30X, 45	3,400	2,250	66%	2,760	3,160	230	3,390	123%
	41, 42, 82X	1,750	900	51%	1,480	1,230	150	1,380	93%
	Subtotal	*5,150*	*3,150*	*61%*	*4,240*	*4,390*	*380*	*4,770*	*112%*
Northwest	38, 38L, 38AX, 38BX	2,800	2,000	71%	3,150	2,780	50	2,830	89%
	1, 1AX, 1BX, 2, 3, 4, 5, 21, 22, 31, 31AX, 31BX	7,700	5,550	72%	8,150	7,750	90	7,840	96%
	Subtotal	*10,500*	*7,550*	*72%*	*11,300*	*10,530*	*140*	*10,670*	*94%*
Southwest	K, L (MMX), M, N	6,800	4,900	72%	7,140	6,830	290	7,120	100%
	6, 7, 71, F	1,400	1,100	79%	1,610	1,530	50	1,580	98%
	Subtotal	*8,200*	*6,000*	*73%*	*8,750*	*8,360*	*340*	*8,700*	*99%*
Southeast	J, 9	1,700	1,250	74%	1,900	1,750	140	1,890	99%
	15/J (3rd St. LRT)	850	350	41%	1,190	460	300	760	64%
	14, 14X	1,500	950	63%	1,540	1,320	120	1,440	94%
	Subtotal	*4,050*	*2,550*	*63%*	*4,630*	*3,530*	*560*	*4,090*	*88%*

Notes:

a. See Figure V.E.6 for Screenline location.

b. Capacity based on "San Francisco Municipal Railway, Ridership Projections to the Year 2015," April 25, 1997; revised May 5, 1997. It assumes an appreciable number of standees per vehicle (somewhere between 60% and 80% of the number of seated passengers, depending on the specific transit vehicle configuration) and may not include the effects of missed or late runs.

c. Average load at maximum load point, based on MUNI's monitoring data, FY 1995-96.

d. Capacity includes elimination of bus routes 15, 32, and 81X, plus implementation of the L-Taraval and J-Church line extensions on the MMX and Third Street Light Rail Services.

e. Estimated from MTC Model projections and preliminary load estimates from MUNI Third Street Light Rail Study.

f. Estimated number of trips from the Mission Bay Project that would cross the screenlines.

g. Average load at maximum load point.

Source: Wilbur Smith Associates

TABLE V.E.16
YEAR 2015 CUMULATIVE MUNI RIDERSHIP IN THE VICINITY OF THE MISSION BAY PROJECT P.M. PEAK HOUR - PEAK DIRECTION

MUNI Route/a/	Hourly Capacity/b/	Cumulative Trips without Project/c/	Project Trips	Average Hourly Load/d/	Percent Capacity Used
22	470	240	100	340	72%
30	1,380	650	500	1,150	83%
MMX (L line), Third St. LRT (J line, northbound at King St. and The Embarcadero)	3,570	1,400	2,600	4,000	112%
MMX (L line), Third St. LRT (J line, southbound at King St. and The Embarcadero)	3,570	800	1,600	2,400	67%
Third St. LRT (southbound, at Mariposa St.)	1,190	700	300	1,000	84%
Third St. LRT (northbound, at Mariposa St.)	1,190	720	200	920	77%

Notes:
a. Assumes route changes as described in text and shown in Figure V.E.10.
b. Capacity based on "San Francisco Municipal Railway Ridership Projections to the Year 2015," April 25, 1997; revised May 5, 1997. It assumes an appreciable number of standees per vehicle (somewhere between 60% and 80% of the number of seated passengers, depending on the specific transit vehicle configuration) and may not include the effects of missed or late runs.
c. Estimated from MTC model projections and preliminary load estimates from MUNI Third Street Light Rail *Project Travel Demand Forecasting Results, Draft Final Report,* Korve Engineering, September 8, 1997.
d. Average load at maximum load point in the vicinity of the Mission Bay Project.

Source: Wilbur Smith Associates.

PARKING IMPACTS

Parking demand for the various land uses in the project was based on estimated auto traffic, vehicle occupancy rates, and parking turnover rates./88/ Parking turnover rates for short term parking were assumed to be six per space per day, except for theater uses, where an average *duration* of two hours was used. The parking demand calculations represent the number of spaces that would be required in order to accommodate all the vehicles anticipated to result from the project if the proposed parking supply was unconstrained. As part of its "transit first" policy, the City and County of San Francisco does not require that the supply of parking spaces equal the demand. Consequently, even though an adequate number of spaces to meet Planning Code requirements is generally proposed to be permitted, it may not be sufficient to accommodate the actual demand. Therefore, individuals who would prefer to drive may use transit because the perceived convenience of driving is lessened by a shortage of parking. This shortage in proposed off-street parking is not considered a significant environmental effect because it implements a policy intended to reduce citywide traffic congestion and air quality effects. Even with a shortage of off-street parking, measures often are implemented that result in a more efficient use of the parking spaces provided. By promoting carpooling, allowing for the shared use of parking, and implementing pricing strategies designed to encourage short-term parking, the spaces provided for nonresidential use would likely be used by more individuals, be vacant for shorter periods of time, and attract drivers needing short-term parking.

Table V.E.17 summarizes the aggregate of estimates consistent with peak parking demand for project land uses and also provides a comparison with the parking standards detailed in the documents prepared for this project as well as the parking requirements identified in UCSF's Long Range Development Plan for the Mission Bay site./89/ The Mission Bay project design documents identify the maximum number of parking spaces to be provided for development in the Mission Bay Redevelopment Areas./90/ For this SEIR analysis, the research and development uses in the Project Area site were assumed to have a parking demand similar to that for office uses, although parking demand for research and development uses is generally less than for office uses. As shown, the demand analysis indicates a need for about 26,125 spaces compared with a maximum requirement of about 21,400 off-street spaces; therefore, the maximum off-street parking supply would be approximately 4,700 spaces less than the estimated peak demand.

- The demand analysis indicates a need for approximately 7,920 residential parking spaces, while a maximum of 6,090 spaces would be permitted, indicating a deficit of about 1,830 spaces. Approximately 18,210 commercial parking spaces are expected to be needed, of which about 40% would be needed for short-term use, while the remaining 60% would be needed for long-term use. This can be compared with a maximum permitted number of about 15,280 spaces, to yield a deficit of at least 2,930 spaces. Residential space comprises approximately 38% of the total shortfall of parking spaces, with the remaining 62% as a shortage of commercial parking.

- Some of the differences between the overall demand and the proposed maximum number of spaces to be provided are attributable to differences in parking rates used for some land uses; for example, the estimated demand per dwelling unit is about 1.3 parking spaces, while the maximum permitted would be 1 parking space per unit. The project proposes to provide one parking space per dwelling unit as called for in the design documents. The proposed number of off-street parking spaces to be built as part of the Mission Bay project would be less than the maximum number of spaces necessary to meet

TABLE V.E.17
PEAK PARKING DEMAND

Project Area	Land Use Type	Short-Term Demand	Long-Term Demand	Total Demand	Proposed Plan/a/
Mission Bay North	Retail	1,118	280	1,398	1,329
	Restaurant	329	220	549	450
	Residential	0	3,900	3,900	3,000
	Movie Theater	715	23	738	675
	Subtotal	*2,162*	*4,423*	*6,585*	*5,454*
Mission Bay South					
Central Subarea	Retail	592	148	740	361
	Hotel	0	83	83	31
	Residential	0	4,017	4,017	3,090
	Subtotal	*592*	*4,248*	*4,840*	*3,483*
East Subarea	Office	640	2,160	2,800	1,328
	Retail	238	60	298	142
	R&D	277	936	1,213	1328
	Large Retail	945	236	1,181	903
	Subtotal	*2,100*	*3,392*	*5,492*	*3,701*
West Subarea	Office	565	1,905	2,470	1,172
	Retail	82	21	103	12
	R&D	245	826	1,071	1,172
	Large Retail	1,073	268	1,341	1,076
	Subtotal	*1,965*	*3,020*	*4,985*	*3,433*
UCSF Subarea/b/	UCSF Site	395	3,803	4,198	5,300
	School	0	25	25	0
	Subtotal	*395*	*3,828*	*4,223*	*5,300*
Total Mission Bay North		2,162	4,423	6,585	5,454
Total Mission Bay South		5,052	14,488	19,540	15,917
TOTAL PROJECT		7,214	18,911	26,125	21,371

Note:

a. Maximum number of parking spaces proposed in *Design Standards and Guidelines: Mission Bay*, Draft C, March 30, 1998, p. 45.

b. UCSF parking would be phased with development of the UCSF site; the actual total number of spaces provided would depend on demand, taking into account use of transit and alternative transportation modes. Parking is proposed to be supplied at a ratio of 2 spaces per 1000 gsf, or a total of 5,300 spaces; as the use of transit and alternative transportation increases, fewer parking spaces may be provided.

Sources: Wilbur Smith Associates; San Francisco Redevelopment Agency, *Design Standards and Guidelines: Mission Bay,* Draft C, March 30,1998; Memorandum from Eric Harrison, *Proposed Mission Bay Parking Standards,* Catellus Development; *UCSF Long Range Development Plan Final EIR*, State Clearinghouse No. 95123032, certified January 1997; UCSF Facsimile Communication from Kevin Beauchamp, Long Range Planner, UCSF Campus Planning, to Wilbur Smith Associates, June 9, 1997.

the estimated demand for all land uses except UCSF and Commercial Industrial space (assumed to be equally split between research and development and office).

UCSF has calculated its own parking demand as part of its Long Range Development Plan. Initially, to construct spaces for the Mission Bay site, UCSF would use a planning ratio of approximately two spaces per 1,000 gross square feet, yielding up to 5,300 spaces. (This ratio is comparable to about 1.6 to 1.7 spaces per 1,000 square feet of occupied space as defined by the City Planning Code). Construction of off-street parking within the UCSF site would be phased with UCSF development, taking into account the availability of expanded transit service in the area, and provision of alternative transporation modes. The LRDP FEIR estimated demand of 4,200 spaces, assuming full realization of UCSF's transportation management programs and expanded transit service in the area. Permanent structured parking would be developed based on then-current demand calculated from employee surveys and/or parking permit waiting lists. Fewer than 5,300 spaces may be constructed on the UCSF site if actual demand is consistent with the analysis contained in the LRDP FEIR. UCSF does not intend to develop off-street parking in excess of its demand.

The off-street parking supply that is planned as part of the Mission Bay project is intended to include all parking required by the design documents and the UCSF Long Range Development Plan as it relates to a major new UCSF site at Mission Bay. If the demand for parking spaces exceeds the supply provided by the project, drivers would seek available on-street parking in the Project Area. In order to encourage non-automobile mode choices, the amount of on-street parking in the Project Area would be minimal, especially during the morning and afternoon peak commute periods. (On-street parking on "internal," private streets is expected to be prohibited, as these streets would be primarily for driveway access or would be pedestrian-oriented streets.) The following streets are proposed to have on-street parking on both sides of the street during both the peak and off-peak periods:

- King Street, between Fifth and Berry Streets, westbound direction (about 30 spaces)
- Berry Street between Third and Fourth Streets, south side only (about 30 spaces)
- Owens Street between Fourth Street and North Common Street, north side only (about 60 spaces)
- Mission Bay Street (about 80 spaces)
- Mission Rock Street, between Fourth Street and Terry A. François Boulevard (about 70 spaces)
- Bay Mud Street (about 20 spaces)
- Rincon Street (about 120 spaces)

- North Common and South Common Streets, between Mission Bay Street and Terry François Boulevard (about 150 spaces)
- Illinois Street, between 16th and Mariposa Streets (about 60 spaces)

Fourth Street, between Owens and Mariposa Streets is proposed to have approximately 400 on-street parking spaces on both sides of the street during off-peak commute periods. During the morning and afternoon peak commute periods, parking on one side of the street would be prohibited to provide one additional travel lane.

Similarly, Berry Street is proposed to have about 30 on-street parking spaces between King and Fifth Streets on the south side during off-peak commute periods. Parking would be prohibited during peak commute periods to provide an additional eastbound travel lane.

Some existing on-street parking would also be lost because of project changes to the existing roadway configuration. The angled parking on Terry A. François Boulevard would be converted to parallel parking, resulting in a net loss of approximately 210 spaces. In addition, the following streets would also have some on-street parking eliminated:

- Mariposa Street (about 65 spaces)
- 16th Street (about 85 spaces)
- Berry Street, between Fourth and King Streets (about 70 spaces)
- Fourth Street, between King and Berry Streets (about 15 spaces)
- Fifth Street, between King and Berry Streets (about 15 spaces)
- Channel Street (about 70 spaces)/91/
- Sixth Street (about 180 spaces)

The total number of on-street parking spaces included with the project would be about 1,050 during the off-peak periods, 820 during peak commute periods, with parking prohibited on one side of Fourth Street between Owens and Mariposa Streets, and on Berry Street between King and Fifth Streets. About 710 spaces would be eliminated by the project, for a net gain of about 340 spaces. In addition, about 300 on-street parking spaces would be lost on Third Street in the Project Area, indicating that in the year 2015 the Project Area would have about 40 more on-street parking spaces than can be found in 1997. With the elimination of parking during the peak commute periods, there would be a net loss of about 190 spaces.

In addition, the project would remove approximately 30 off-street parking spaces at the golf driving range and about 40 spaces at the Bladium in Mission Bay South, and about 520 parking spaces from the block bounded by King, Third, Berry and Fourth Street (used by the China Basin Landing Center). Because the golf driving range facilities and the Bladium would be demolished with project development, the actual net loss of off-street parking would be the 520 spaces for China Basin Landing.

The planned number of on-street parking spaces—about 1,050 spaces—would accommodate about 25% of the excess parking demand, mostly in Mission Bay South, but would be small enough to discourage individuals from driving. On the other hand, because available parking in Mission Bay South would not meet demand, some drivers may seek available parking in surrounding neighborhoods, including Potrero Hill and Lower Potrero areas.

Most of the Project Area development adjacent to and near Lower Potrero and Potrero Hill would be research and development, UCSF, or office uses, which would cause spillover parking demand during the daytime, primarily during mid-morning and early afternoon periods. This increase in parking demand would likely spill over to streets with existing industrial and warehousing uses in the vicinity of the Project Area during those times, which could, in turn, increase demand for parking in nearby Potrero Hill residential areas. Residential streets on Potrero Hill near the Project Area do not now have parking restrictions; if none were established as Mission Bay is built out, some employees working in Mission Bay or in areas near Mission Bay could be willing to walk from Potrero Hill to their work place in order to use "free" parking, or in order to find available parking spaces. Commercial and industrial parking spillover into residential areas is not expected to be a substantial problem because parking demand in the residential areas in Potrero Hill would be highest at night, when the commercial/industrial parking demand is at its lowest. In addition, the parking demand was calculated assuming about 50% of the Commercial Industrial space in Mission Bay South would be in office uses. Because the parking demand for research and development uses is less than that for office uses, and research and development and UCSF uses are expected to predominate in Mission Bay South, the overall parking demand figure is likely to be conservatively high, suggesting that the proposed supply may be somewhat closer to demand. If parking demand is found to exceed supply in the Potrero Hill residential area, the City's residential parking permit program could be expanded to include the area to help ensure availability of parking for local residents.

As shown in Table V.E.17, in Mission Bay North there would be an excess demand of approximately 1,130 parking spaces to which is added the 520 parking spaces lost by the China Basin Landing Center, for a total excess demand of about 1,650 parking spaces. Some drivers would look for parking in garages in the adjacent South of Market neighborhood while others may find MUNI transit more convenient and shift their mode of travel.

On days when sold-out events were scheduled at the Giants Ballpark, parking in South of Market and Mission Bay areas would be in great demand. Those arriving at Mission Bay in the afternoon or evening or on weekends after drivers have started arriving for the ballpark event would have difficulty parking on event days unless they have already-reserved parking, such as the spaces allocated to residential units.

PEDESTRIAN IMPACTS

Existing with Project Conditions

Pedestrian forecasts at the study locations were based on the mode split percentages for person-trips described in the "Project Analysis Methodology" section, above. The pedestrian trips would include not only those who walk to and from Mission Bay North and South, but also those who walk to transit. For most of the Mission Bay South land uses, walking to transit would not involve crossing to the north of China Basin Channel. But for those using Caltrain, there would be some who would walk and some who would take MUNI. To provide a conservatively large number of pedestrians, those who walk to the Caltrain terminal from Mission Bay South were all assumed to do so through the intersection of Fourth and King Streets, although many could instead cross the Channel on the proposed new pedestrian bridge at Fifth Street, avoiding Fourth and King Streets. It was assumed that all of the project person trips generated in Mission Bay North going to and from the Caltrain terminal also would walk through the intersection of Fourth and King Streets. Other pedestrians walking through the two study intersections, Third and King Streets and Fourth and King Streets, would be primarily those traveling to various sites in the Project Area or those walking directly to the MMX light rail line on King Street.

Pedestrians were distributed onto the street network using the assumptions for trip origin to the four quadrants of the City, described at the end of "Local Transit Facilities and Services" under "Existing Project Area Transportation Facilities," in the Setting section, above, and shown in combination with bicycle trips in Table V.E.18. The results of the pedestrian operations analysis with existing-plus-project pedestrian trips are presented in Table V.E.19. The level of service would remain the same at all eight crosswalks as under existing conditions (see Table V.E.4).

If a pedestrian bridge were to be built over China Basin Channel at Fifth Street, it would improve pedestrian circulation opportunities in Mission Bay. The bridge would be most beneficial to pedestrians traveling between Mission Bay North and Mission Bay South, as well as pedestrians wishing to travel between Mission Bay South and the Caltrain terminal or MUNI MMX stations on King Street.

TABLE V.E.18
P.M. PEAK HOUR
PEDESTRIAN AND BICYCLE TRIPS

San Francisco Origin/Destination	Total Walk/Other
Mission Bay North	
Northeast Quadrant	1,890
Northwest Quadrant	180
Southeast Quadrant	350
Southwest Quadrant	70
Mission Bay South	
Northeast Quadrant	1,360
Northwest Quadrant	430
Southeast Quadrant	1,130
Southwest Quadrant	120

Notes:
To be conservatively high for pedestrian and bicycle impact analysis purposes, this table assumes that all of the Walk/Other trips are either walk or bike trips, although some may be motorcycle or other non-vehicle trips.
This table includes both internal and external bicycle/pedestrian trips.

Source: Wilbur Smith Associates.

If a pedestrian bridge were not provided at Fifth Street, pedestrians would have to use the Lefty O'Doul (Third Street) Bridge or Peter Maloney (Fourth Street) Bridge to cross China Basin Channel. The additional walking distance would be approximately twice the block length between Fourth Street and Fifth Street, or 1,650 feet. At a walking pace of 4 feet per second, additional walk time would be approximately seven minutes.

Most of the sidewalks in Mission Bay are proposed to be 12 feet or greater in width. This width would meet city standards./92/ The sidewalks on the Peter Maloney Bridge are proposed to be 9 feet wide. However, the proposed pedestrian bridge at Fifth Street would provide relief from potential problems that could be caused by the relatively narrow sidewalks on the Peter Maloney Bridge. All other sidewalks in Mission Bay are proposed to be at least 10 feet wide. Ten-foot-wide sidewalks are proposed for Mariposa Street, 16th Street, Berry Street, and for the three narrow connectors providing access between North Common Street and South Common Street, in the Central Subarea. Illinois Street is proposed to have 10.5-foot sidewalks, and Third Street is proposed to have 11-foot

TABLE V.E.19
CROSSWALK OPERATIONS ANALYSIS - EXISTING + PROJECT VOLUMES

Crosswalk Location	Time Period	Width (feet)	Walk Time	Volume (pph)/a/ Existing	Project	Existing + Proj	Flow Rate (ppmpf) /b/	Flow Regime /c/
Third Street/King Street								
Northside	4:30 - 5:30 PM	20	29.5%	45	93	138	0.18	Open
Southside	4:30 - 5:30 PM	20	20.5%	4	618	622	0.02	Open
Eastside	4:30 - 5:30 PM	20	14.5%	127	354	481	0.73	Unimpeded
Westside	4:30 - 5:30 PM	20	14.5%	47	563	610	0.27	Open
Fourth Street/King Street								
Northside	4:30 - 5:30 PM	20	45.5%	20	60	80	0.04	Open
Southside	4:30 - 5:30 PM	20	45.5%	20	202	222	0.04	Open
Eastside	4:30 - 5:30 PM	20	15.0%	72	456	528	0.40	Open
Westside	4:30 - 5:30 PM	30	15.0%	97	588	685	0.36	Open

Notes:
See Table V.E.4 for a description of existing conditions at these intersections.
Counts taken June 25, 1997.
Walk time for eastside and westside crosswalks assumed to be percent of green time.
a. pph = Pedestrians per hour.
b. ppmpf = Pedestrians per minute per foot of width.
c. Flow regimes are defined in Appendix Table D.17.

Source: Wilbur Smith Associates

sidewalks near the intersection of Owens Street. Although sidewalks on Illinois and Third Streets are expected to receive comparatively less pedestrian traffic than other sidewalks in the Project Area, the sidewalk widths on these streets may not be adequate to accommodate unusually high pedestrian traffic volumes, such as before and after large events in Pacific Bell Ballpark. During these times, pedestrians may spill over into traffic lanes.

No pedestrian improvements are proposed for Townsend Street except on the south side of the street between Third and Fourth Streets, as the remainder of Townsend Street is outside the Project Area. Pedestrian improvements are not proposed for the length of Seventh Street; the west side of the street is outside the Project Area, and the east side of the street is adjacent to the Caltrain railroad tracks.

A fence is proposed to be constructed adjacent to Seventh Street contiguous with the rail right-of-way between King Street and Mariposa Street to provide for pedestrian safety. There would be signalized, controlled crossings of the tracks along Seventh Street at Berry Street, at the extension of The Common, and at 16th Street.

The proposed realignment of the freight railroad tracks to 16th Street and Terry A. François Boulevard would intrude into the open space areas near the intersection of the two streets. The tracks are used once a month or less frequently, although the Port's *Waterfront Land Use Plan* calls for increased use in the future. Because freight activities are scheduled to occur late at night, between 1 a.m. and 4 a.m., they are not expected to create any pedestrian hazards. Railroad operations on this type of alignment in public street rights-of-way are typically limited to speeds of 5 to 10 miles per hour, further minimizing potential hazards.

Year 2015 Cumulative Pedestrian Conditions

To simulate future pedestrian volumes in the year 2015, the future land use changes in the vicinity were considered. The most likely change in pedestrian volumes at the study intersections would be growth in Caltrain ridership. It was assumed, conservatively, that the pedestrians at the intersection of King and Fourth Streets were walking to/from the Caltrain terminal. Thus the increase in the number of pedestrians at this intersection was assumed to be the same as the growth in Caltrain ridership. As described in the Transit Impacts subsection (under "Regional Carriers, 2015 Cumulative Scenario"), Caltrain ridership was assumed to grow at 2.4% per year. This growth rate was applied to existing pedestrian volumes to arrive at cumulative pedestrian volumes. At the intersection of Third and King Streets, half of the pedestrian volumes were assumed to be affiliated with Caltrain, so half the Caltrain growth rate was assumed.

Project volumes were added to the future cumulative volumes, and the level of service was calculated. The results are presented in Table V.E.20. The eastside and westside crosswalks at the intersection of Fourth and King Streets would worsen slightly, from Open to Unimpeded. (See Appendix Table D.17 for definitions of pedestrian flow descriptions.) However, "Unimpeded" is considered an acceptable level of service.

BICYCLE IMPACTS

Bicycle Forecasts

The Mission Bay Project Area is within easy bicycling distance (four to six miles) of a large portion of the City's residents. Travel time to the Project Area by bicycle would be competitive with MUNI,

TABLE V.E.20
CROSSWALK OPERATIONS ANALYSIS - CUMULATIVE WITH PROJECT VOLUMES

Crosswalk Location	Time Period	Width (feet)	Walk Time	Volume (pph)/a/ Existing	Project	Existing +Proj	Flow Rate (ppmpf) /b/	Flow Regime /c/
Third Street/King Street								
Northside	4:30 - 5:30 PM	20	20.5%	59	93	152	0.18	Open
Southside	4:30 - 5:30 PM	20	20.5%	5	618	623	0.02	Open
Eastside	4:30 - 5:30 PM	20	14.5%	165	354	519	0.73	Unimpeded
Westside	4:30 - 5:30 PM	20	14.5%	61	563	624	0.27	Open
Fourth Street/King Street								
Northside	4:30 - 5:30 PM	20	45.5%	32	60	92	0.04	Open
Southside	4:30 - 5:30 PM	20	45.5%	32	202	234	0.04	Open
Eastside	4:30 - 5:30 PM	20	15.0%	116	456	572	0.40	Unimpeded
Westside	4:30 - 5:30 PM	30	15.0%	156	588	744	0.36	Unimpeded

Notes:
Counts taken June 25, 1997.
Walk time for eastside and westside crosswalks assumed to be percent of green time.
a. pph = Pedestrians per hour.
b. ppmpf = Pedestrians per minute per foot of width.
c. Flow regimes are defined in Appendix Table D.17.

Source: Wilbur Smith Associates

especially for those who may not live on a MUNI Metro line or those who must make at least one transfer. Bicycling could be competitive with the automobile in terms of travel time, depending on the level of traffic congestion and how close one can park one's car. The actual mode share achieved by the bicycle to and from the project would depend on numerous factors, including travel distance; relative travel time and relative costs of other modes; topography of origin/destination areas; weather; amount and location of secure bicycle parking; and safety, directness, and ambiance of the bicycle travel routes.

Given the various transportation options available to the project, it is estimated that about 1,850 of the 33,500 p.m. peak hour person trips to and from the Mission Bay Project Area could be made by bicycle. Table V.E.18 quantifies the number of p.m. peak hour trips that could potentially be made by bicyclists or pedestrians./93/ The northeast and southeast quadrants of the City are the closest to the Project Area and both are fairly well connected to the Project Area by the Bicycle Network in the *San Francisco Bicycle Plan* as well as the least constrained by the topography of San Francisco. Therefore, the bicycle is a more attractive mode for some bicyclists in these areas than either auto or transit would be, compared to bicyclists located in the northwest and southwest quadrants of the City./94/

Bike Routes in the Street Network

The proposed cross-sections of the streets within the Project Area were reviewed in the context of bicycle travel (see Appendix Figures D.2 and D.3). Fourth Street, a major north-south arterial, would be of particular importance to bicyclists after the Third Street Light Rail is constructed, since the new rail tracks would decrease the lane widths that bicycles must share with cars. Fourth Street, as currently planned, would be a designated Class III bicycle route and would have a curb lane 15 feet in width in each direction. During non-peak hours, this curb lane would be a parking lane, which would effectively provide the equivalent of a 7-foot bicycle lane. During peak hours, the curb lane would be a tow-away zone, resulting in the shared use of the curb lane by bike and autos. This width of 15 feet is adequate for a shared lane. Sixteenth Street would be a designated Class II bicycle route in the Project Area, with exclusive 6-foot bicycle lanes on both sides of the street, adjacent to a 12-foot vehicular traffic lane. This width would be more than adequate; most bike lanes in San Francisco are 5 to 6 feet wide./95/

North Common Street and South Common Street between Terry A. François Boulevard and Mission Bay Street would each have one 15-foot-wide traffic lane, to be shared by automobile and bicycle traffic (a designated Class III bicycle route) and would accommodate parking on the curb side. The project calls for Terry A. François Boulevard to be a designated Class II bicycle route for its entire length, with 6-foot-wide striped bicycle lanes on both sides of the street, and parallel curb parking.

Elsewhere in the Project Area, 11- or 12-foot-wide curb lanes are shown either without parking or adjacent to an 8-foot parking lane. On these streets, bicycles would have to share the curb lane with vehicular traffic, although the streets are not expected to, and would not be designed to, accommodate large volumes of bicycle traffic. On the proposed recreational bicycle path on the south side of the Channel, pedestrian and bicycle movements would be separated and delineated.

Bicycle safety concerns can arise whenever there is an increased potential for bicycle and auto conflicts, or when paved surfaces are uneven. Proposed bike routes in Mission Bay would use streets where freight rail tracks may occur (16th Street and Terry A. François Boulevard), but the rail tracks would not be immediately adjacent to the curb, and potential overlap with bicycle lanes would be limited (see "Freight Rail Operation Changes" under "Year 2015 Transportation System Assumptions," above). At the intersection of 16th Street and Terry A. François Boulevard, the southbound bicycle lane would cross the proposed freight rail tracks at an oblique angle; this southbound bicycle lane could be designed to use a portion of the adjacent public open space at that location to provide a more perpendicular crossing. Catellus intends to propose placement of advance warning signs for bicyclists indicating the presence of rail crossings in advance of oblique rail crossings./95a/ There would be no double right-turn lanes within the project area, which would avoid one source of inherent bicycle/vehicle conflicts.

- The Redevelopment Plan documents call for bicycle parking to be provided at a ratio of one bicycle parking space for every 20 off-street automobile parking spaces for residential, retail, commercial industrial, and commercial industrial/retail land uses. The maximum number of parking spaces allowed for the project (21,371) would be used to calculate the minimum bicycle parking supply, resulting in about 1,070 bicycle parking spaces. The *San Francisco Bicycle Plan* provides guidelines for bicycle parking implementation and design. These guidelines address issues of security and location as well as quantifying the number of spaces needed. Appendix Table D.18 details the number of bicycle parking spaces for various land uses, as suggested in *San Francisco Bicycle Plan* guidelines.

- The bicycle parking demand would be for about 2,300 spaces, resulting in a deficit of about 1,230 spaces throughout the Project Area. Some of the deficit could be met by residents parking their bicycles either in garages next to their automobiles or in their residences. Short-term demand could be satisfied by bicycle racks on sidewalks, particularly in neighborhood shopping areas and on the UCSF site.

IMPACT OF THE NEW GIANTS BALLPARK AT CHINA BASIN

As noted earlier in "Pacific Bell Park," under "Year 2015 Transportation System Assumptions" in the Impacts subsection, there will be a new ballpark for the San Francisco Giants baseball team located at China Basin, south of King Street between Second and Third Streets across the street from Mission Bay North. The *San Francisco Giants Ballpark at China Basin EIR*, certified in June 1997, considered the transportation impacts of the ballpark in the context of cumulative future growth, including development in Mission Bay with a major new UCSF site./96/ The following discussion summarizes that analysis.

Events at the ballpark will not occur every day and when they occur, transportation impacts would be most severe prior to and at the conclusion of the games. About 80 to 85 baseball games will be played during the April-through-September baseball season; about 13 of these games are expected to be played on weekday afternoons. Other non-baseball events may also be held when the Giants play out of town as well as at other times during the year. Events will be scheduled to avoid start times or end times that would generate substantial transportation demand during the weekday peak hour of the evening commute period, 4:30 to 5:30 p.m. The start times of the weekday afternoon games, dictated somewhat by Major League Baseball rules, and other special events will be planned to most likely end during the 3:30 to 4:30 p.m. period, and weeknight events will generally start at 7:30 p.m. Games and special events will also be held on weekend days. Transportation travel demands are less during these time periods than during the 4:30 to 5:30 p.m. peak weekday commute hour.

As noted in the Ballpark EIR, sellout events at the ballpark will generate substantial transportation demand. Attendance forecasts prepared by the Giants suggest that about 37% of the total number of games (about 30 games a year) would be sellouts, and there is also a potential for up to five sellout special events each year. The greatest impact would occur after weekday afternoon sellout events, during the 3:30 to 4:30 period when traffic, transit, and pedestrian flows exiting the ballpark area would coincide with the early commute period demand already on the transportation network before the peak commute hour. During this time period for a sellout ballgame, ballpark patrons would generate 10,125 new transit trips and 9,500 new auto trips. Similar demands would occur before and after weeknight and weekend sellout events.

The Ballpark EIR analyzed 66 intersections in the vicinity of the ballpark site and parking areas both north and south of China Basin Channel. Two cumulative scenarios were studied, one with ABAG *Projections '96* growth forecasts for the San Francisco Bay Area and another with growth forecasts augmented by a major new UCSF site in Mission Bay and by additional employment in the Mission Bay South area./97/ This second cumulative scenario included growth in the Mission Bay area that is similar to the development proposed by Catellus for Mission Bay South as analyzed in this Mission Bay SEIR. The results of the Ballpark EIR transportation analysis conducted for this second cumulative scenario showed that fans traveling to and from a sold-out or high-attendance ballgame (or other sold-out high-attendance event at the ballpark) would contribute to substantial congestion on local streets and on MUNI routes between the ballpark parking areas and regional transportation systems before and after the game or event./98/

Without mitigation, and under the cumulative scenario that included UCSF and additional employment in Mission Bay, about 35 intersections of the 66 studied would operate at LOS E or F following a weekday afternoon event ending at about 3:30 p.m., compared to 10 intersections that operated at LOS E or F during this hour in 1996. Of the 66 intersections analyzed in the Ballpark EIR, 27 were analyzed for this SEIR; 9 of the 27 common intersections currently operate at LOS E or F during the 4:30 to 5:30 p.m. peak hour in 1997, and 20 would operate at LOS E or F during the 3:30 to 4:30 p.m. hour after a game under future cumulative conditions which included UCSF and additional employment in Mission Bay. Before weeknight games, about 27 of the 66 intersections studied in the Ballpark EIR would operate at LOS E or F, 21 more than operated at unacceptable levels under 1996 existing conditions. Traffic on local streets in Mission Bay, including King Street, Third Street, Terry A. François Boulevard and Fourth Street south of the Channel, would be congested as ballpark fans leave parking areas, making it difficult for Mission Bay motorists to use those streets to access the area, both inbound and outbound.

Freeway ramps near ballpark parking, including those at Fifth and Bryant Streets, First and Harrison Streets, and Fourth and Harrison Streets, would have long queues of cars waiting to access the freeway after sellout and high-attendance games or events. These queues would contribute to afternoon congestion on days with weekday afternoon games, particularly as the peak commute period lengthens due to cumulative future employment growth in the City. Although for evening events motorists would be generally traveling toward San Francisco while commuters travel away from downtown, as the afternoon peak period expands, intersections leading to freeway ramps would remain congested beyond the 4:30 to 5:30 p.m. peak commute hour, and ballpark-bound traffic using those intersections to access parking sites would contribute to the congestion.

The analysis in the Giants Ballpark EIR assumed the existing street configuration in the Mission Bay Project Area because the development program for Mission Bay South had not yet been defined. The currently proposed internal roadway system for Mission Bay would substantially change the existing street pattern, particularly in Mission Bay South. The proposed plan includes a grid system of local collector streets, new major streets, plus improvements to existing major streets./99/ Because there would be added vehicular capacity, traffic conditions at several intersections within Mission Bay would be expected to operate at better levels of service than identified in the Ballpark EIR.

For example, the intersections of Third Street with 16th Street and with Mariposa Street, which would be operating at a LOS F under the existing street configuration, should improve, most likely to LOS E and possibly to LOS D. The improvement is expected because of street widenings, provision of additional turn lanes, the opening of a new four-lane Owens Street between Fourth Street and the Mariposa I-280 ramps, and, to a certain extent, the extension of Fourth Street parallel to Third Street. Similarly, the intersections of Mariposa Street with the I-280 on- and off-ramps would improve from LOS F to LOS E or possibly D, because of widening of Mariposa Street and the extension of Owens Street to directly connect with the I-280 ramps.

The analysis of cumulative impacts on MUNI service to and from the Mission Bay area in the Ballpark EIR showed a demand for additional light rail vehicles on the Metro Extension at King Street and on the proposed Third Street light rail line, or a demand for additional MUNI buses serving the Mission Bay Project Area. In particular, expected capacity on the Metro Extension and bus lines 30, 45 and 42 serving the South of Market area to Market Street would be exceeded by a combination of demand from growth in Mission Bay and from a sold-out event at the ballpark./100/ Mission Bay transit patrons would find jammed conditions on all of these MUNI facilities if they chose to travel immediately before or after an event at the ballpark. Caltrain would also be expected to serve large numbers of ballpark patrons; project travelers and other workers who use the train to commute to or from the Project Area and downtown San Francisco would find considerably more crowded conditions after a weekday afternoon event or before a weeknight event at the ballpark than during the normal commute periods. Caltrain would have to add three to five additional cars to the early rush-hour trains to satisfy the increase in ridership from ballpark patrons leaving a weekday afternoon high-attendance ballpark or event./101/

These events would also generate parking demands ranging from 8,530 spaces for the weekday afternoon sellout game to 10,590 spaces for a weeknight game or event. The Giants will provide approximately 5,000 spaces on lands owned by the Port of San Francisco (for 9 years from completion of the parking improvements and opening of the ballpark)/102/ and Catellus Development Corporation (for 5 years, through 2005) immediately south of China Basin Channel. Any parking demand not satisfied by these 5,000 spaces will have to be served by the available on- and off-street parking (public and private) located within a 20-minute walk of the ballpark, mainly in the South of Market and South Beach areas. Many ballpark patrons would also attempt to use on-street parking in Mission Bay if longer term parking (longer than the one- to two-hour on-street limits generally established) were made available on any Mission Bay streets within a 15- to 20-minute walk of the ballpark. If no substantial number of parking spaces within a 15- to 20-minute walk-distance of the ballpark were available to baseball fans in the Mission Bay South area, some patrons would be willing to park in the surrounding residential areas, including Potrero Hill and Lower Potrero Hill areas. However, there are commercial/industrial areas west of Mission Bay North that are closer to the ballpark, and most ballpark patrons would find the residential areas too long a walk, beyond 25 minutes, so any parking intrusion into the Potrero Hill residential neighborhoods is likely to be minor.

No plan has been established to provide for ballpark parking after the Catellus and port lease terms have expired. It is possible that port properties could be made available for an extended period, or that experience will show that substantially less parking is needed due to transit accessibility, or that parking garages will be constructed at some location near the ballpark to serve all or a portion of the ballpark parking demand. For analysis purposes, the Ballpark EIR assumed that by 2015 a parking structure or structures had been constructed for up to 5,000 vehicles in an undetermined location south of the Channel. The Ballpark EIR also analyzed the effects of providing no parking south of the Channel in Variant B, concluding that traffic effects in the area near the ballpark would be less because fewer vehicles would be attracted to that location, that a portion of the parking demand would be met in parking facilities and on streets further than a 20-minute walk from the ballpark, and that there could be considerable additional demand for transit services in the Third Street light rail corridor as patrons located parking south of the Mission Bay Project Area close to the new light rail line.

Pedestrian flows before and, in particular, after ballgames will be intense, and will exceed the capacity of sidewalks on King Street in front of the ballpark and on Third Street and Fourth Street between King Street and the Giants parking lots south of the Channel. Without appropriate control measures, pedestrians could spill into the traffic lanes on these street segments and create added traffic congestion. Typical measures would include closing some traffic lanes to provide a wider area to pedestrians, installing fences and barricades clearly delineating the traffic and pedestrian areas, and providing sufficient parking control officers to manage the expected pedestrian and traffic flow surges.

To address the impacts summarized above, the Ballpark EIR proposed a mitigation program that defined measures to accommodate and better manage traffic flows, transit demands, and pedestrian volumes before and after ballgames. As events at the ballpark would not occur every day, and the size and nature of the events would vary, the mitigation program focused on measures that would provide flexibility in addressing the transportation demands of each event. As a result, the approach was to manage ballpark travel demand rather than constructing new roadway, transit, pedestrian, and parking facilities.

The mitigation program described in the Ballpark EIR included reallocations and rerouting of existing transit resources to provide service to and from the ballpark before and after events. Traffic demands would be accommodated through the application of the pre-game and post-game traffic routing plans. The routing plans were designed to prevent all traffic from using streets adjacent to the ballpark, to route non-ballpark related traffic away from the key routes to and from ballpark parking, and to provide ballpark related traffic with routes to and from the areas with available parking. A pedestrian circulation plan was provided to accommodate the peak flows of pedestrians near the ballpark. The plans for added transit service, traffic routing, and pedestrian control presented in the Ballpark EIR were identified as examples of the type of transportation improvement measures that could be implemented before and after ballgames.

The plan presented in the Ballpark EIR involved the closure for one hour before and after the games of King Street between Second and Third Street, and of Third Street between Fourth and King Streets, except for MUNI vehicles and pedestrians. It also included making Fourth Street one-way southbound between King and Third Streets prior to a game, and converting to a one-way northbound street after a game. Because the currently preferred alignment for MUNI's Third Street light rail extension/103/ calls for a bi-directional track alignment on the Peter Maloney (Fourth Street) Bridge, and not on the Lefty O'Doul (Third Street) Bridge as assumed in the Ballpark EIR, some of the proposed measures included in the illustrative plan would be infeasible and will have to be modified.

For example, rather than completely closing the Lefty O'Doul Bridge to automobile traffic, the three most westerly lanes could remain open to automobiles, in the southbound direction prior to a game and in the northbound direction after a game, while the rest of the bridge remains for pedestrians only. Similarly, two lanes on the Peter Maloney Bridge would be reserved for MUNI light rail operation, while the remaining third lane could be used by MUNI buses exclusively, or, most likely, shared with automobile traffic. These and other modifications to the overall mitigation program were expected, as it was impossible at the time that the EIR was completed to determine how streets and transit would ultimately be configured in the area around the ballpark site.

The Ballpark EIR determined that the actual measures to be implemented would be defined as part of a ballpark Transportation Management Plan (TMP) to be prepared by the Giants in coordination with a Ballpark Transportation Coordinating Committee (BTCC). This mitigation measure has been adopted and a coordinating committee is part of the ballpark project. The BTCC, which includes representatives of the key transportation agencies, UCSF, Catellus, other property owners, and neighborhood groups, will have the responsibility of implementing and managing the application of the measures defined in a ballpark TMP. As conditions governing transportation around the ballpark change over time, the BTCC would be responsible for refining and modifying the ballpark TMP to address those changing conditions. For example, when the ballpark opens in the year 2000, the Mission Bay project would be in its earliest phases of planned development, and the transportation network would be much as it is today. As phases of the Mission Bay project are implemented, new development and transportation infrastructure would be put in place. The ballpark TMP will need to be refined regularly to reflect this new development and the availability of the new transportation facilities.

Even with the application of the measures defined in the ballpark TMP, the travel demands associated with ballpark events would result in traffic delays and congestion on streets in and around the Mission Bay project. Transit facilities and services in the area would be crowded and subject to delays. Some pedestrian routes nearest the ballpark would also be crowded and difficult for non-ballpark pedestrians to use. The employees, residents, and visitors of the Mission Bay Project Area who choose to travel during the period before and after ballpark events would likely experience some degree of inconvenience and delay. For example, Mission Bay residents and employees who normally use MUNI to or from the area would find buses and Metro cars crowded and schedules could be temporarily changed to accommodate ballpark patrons. The traffic routing plan may require Mission Bay motorists to use routes different from their normal travel paths. In some cases, special measures may be required to allow these motorists to travel on street segments that would otherwise be closed to traffic.

Any parking that is open to the public within a 20-minute walk of the ballpark is likely to be used by ballpark patrons. Unless special controls or restrictions are applied, ballpark related parking could displace other parking activity. For example, access to waterfront land uses and activities might be diminished if ballpark patrons park in public parking on and along Terry A. François Boulevard. Further, traffic congestion on Terry A. François Boulevard due to the flow of vehicles in and out of the Giants parking lots could cause delays for those trying to access the waterfront. While the Ballpark EIR proposed measures to address these types of impacts, it will be the responsibility of the BTCC to ensure that the appropriate measures are implemented.

TRANSPORTATION ISSUES DURING BUILD-OUT

Phasing of New Transportation Facilities

The project includes construction of new streets, widening of some existing streets, modification of existing traffic signals and installation of new signals, and extension of existing 22 and 30/45 MUNI trolleybus lines into the Project Area./104/ If these transportation features were not developed at appropriate points during build-out of the project, transportation impacts could occur as growth in traffic and in demand for transit could exceed the capacity of available facilities. To reduce potential impacts to a less-than-significant level or to avoid them infrastructure, such as streets and traffic signals, is proposed to be installed in phases corresponding to building development phases.

Most of the circulation and transportation components of the project would be triggered by an "adjacency" concept. As each development phase is constructed, adjacent sidewalks, new streets or improvements to existing streets, driveways and curb cuts, and pedestrian pathways, as applicable, would be included. The developer of each phase would submit preliminary infrastructure plans to the Redevelopment Agency for review by the Redevelopment Agency and by appropriate City departments as coordinated by the Department of Public Works (see "Review Process for Proposed Phases," under "Phasing of Construction of Infrastructure and Improvements in the Project Area," Section III.B, Project Description, for additional information about the review process). Each preliminary infrastructure plan would show adjacent roadway and other transportation improvements, would include the types of land uses proposed and square footages of these uses, and would identify any major circulation improvements triggered by the amount of development proposed.

For major improvements such as extending Fourth Street and Owens Street, and for improvement of or addition of rail crossings proposed at Berry and Seventh Streets and at the new intersection of The Common with Seventh Street, installation would be triggered by an amount of development established based on expected p.m. peak hour vehicle trips generated by the project. These triggers have been identified for the land uses analyzed in this SEIR based on the proposed square footage of project build-out. The triggers are described more fully in Section VI.E, Mitigation Measures: Transportation.

Existing Uses

During the period that the Project Area is being developed, some existing uses would remain for periods established in the Redevelopment Plans. Some of the existing uses would be permitted limited expansion for defined periods. Existing buildings might also be permitted to house different uses while other parts of the Project Area were being developed. These land uses would be different from those expected to be in place following full development of the Project Area in 2015.

Continuation of and limited expansion of existing uses would not be expected to cause significant increases in traffic volumes or transit demand compared to existing conditions described in the Setting section. Minor changes of use or expansions in existing buildings would not likely cause substantial changes in traffic patterns or increases in traffic volumes near the particular site.

Interim Uses and Interim Conditions

<u>Interim Uses</u>

Interim uses could include parking lots, structures incidental to environmental clean-up, construction-related temporary structures, retail and sales offices incidental to newly developed uses, open recreational uses, and truck parking. These uses would be allowed for up to 15 years, with 5-year extensions possible.

The transportation effects of most interim uses expected to be permitted in the Project Area would be less than those described for the project at full build-out. If changes to the circulation system, described above under "Changes to Circulation Patterns in Mission Bay" in the Impacts section and to MUNI service, described above under "Changes to San Francisco Municipal Railway (MUNI) System," in the Impacts section assumed to be in place in the Project Area by 2015, have not been completed at a particular location, some interim uses such as truck parking might cause localized effects at a nearby intersection that might reduce existing levels of service, but would not likely degrade conditions below those presented in the impacts analysis for the project. Completion of the MUNI Third Street Light Rail project in about 2003 would provide additional transit capacity for employees and residents in the Project Area and could help to reduce potential traffic impacts.

Among the interim uses would be surface parking lots for the Giants Ballpark planned for sites on Third Street and Fourth Streets and for the UCSF site in Mission Bay South. Under the UCSF Preliminary April 1998 Development Plan, during Phase I about 800 feet of Fourth Street would be improved, north of 16th Street, to its ultimate configuration to provide access to the first three structures and interim UCSF surface parking lots. The transportation effects of ballpark parking have been analyzed in the Giants Ballpark FEIR and are summarized above in "Impact of the New Giants Ballpark at China Basin."

If parking lots for commuters working in Nearby Areas were included in the interim uses or if the ballpark lots were made available for use by commuters, impacts would be directly related to the level of usage, which would in turn depend on the number of spaces permitted, and the cost and convenience for commuters. If interim commuter parking lots were to accommodate several thousand vehicles, and if the lots were convenient enough, based on the availability of transit from parking lots to businesses in the South of Market or downtown areas, for example, this interim use could cause substantial congestion during the p.m. peak at intersections in and around the Project Area that lead to regional access points. If commuter parking lots were established, they would not produce traffic volumes as great as would the project at buildout; insofar as planned intersection improvements, such as exclusive left turn lanes and new traffic signals, were not in place, traffic from the lots could cause localized reductions in service levels until improvements were carried out.

Although commuter parking areas could theoretically be established in the Project Area, the determination issued by the Zoning Administrator for the Port/Catellus ballpark parking permits use of these lots for ballpark parking only, not commuter use, and would need to be amended to make commuter use possible on those lots./105/ UCSF has indicated it does not intend to accommodate non-UCSF commuter parking.

Interim Conditions During Buildout Period

Seismic retrofit of the San Francisco-Oakland Bay Bridge approaches is planned by Caltrans for the period from about 1999 to 2004./105a/ The capacity of the freeway approach to the Bay Bridge (I-80 eastbound) will be temporarily reduced and various on- and off-ramps may be closed for extended periods. Traffic congestion in the areas of the freeway ramps leading to the Bay Bridge, particularly those at Fifth and Bryant Streets and on Harrison Street at Essex and at First Street, is likely to be substantially greater than described in the Traffic Setting section, above, and could be greater than that analyzed for the 2015 cumulative conditions for some periods of the retrofit, depending on what facilities are closed or reduced. Any development that was completed and occupied in Mission Bay before 2003 would contribute to this extensive traffic congestion. It is possible that some downtown employees who commute between the City and the East Bay will shift to BART and AC Transit during this period, increasing crowding on these transit facilities. The retrofit would be completed several years before the 2015 analysis year; therefore, it would not affect the results of the transportation analysis for full build-out of the Project Area.

Temporary Uses

Other uses that may be established in the Project Area during the project development period include temporary uses such as fairs or carnivals, seasonal sales facilities like Christmas tree lots, and convention staging facilities. These uses would be permitted for no more than 90 days. They would not be expected to have long-term local or regional transportation impacts greater than those described for full development of the Project Area, although short-term, temporary congestion could occur. Any short-term traffic and/or transit congestion that might result from a fair in the Project Area, for example, would occur primarily during weekend and/or evening hours, because that is when most people would visit such an attraction. The traffic and transit congestion would be substantially less than that described for a sold-out ballgame or event at the San Francisco Giants Ballpark, summarized above, because the entire visitor population would not arrive at a fair or carnival at one time as they would for a ballgame. Based upon experience to date with temporary uses at Mission Bay, these uses are expected to be infrequent.

LOADING OPERATIONS

The demand for loading spaces in the Mission Bay project, including that for the UCSF site, was estimated based on the Planning Department's *Guidelines for Environmental Review: Transportation Impacts,* Appendix 7./106/ Daily truck trips generated per 1,000 gross square feet (gsf) were calculated based on the information in Table 7.1, then converted to hourly demand based on a 9-hour day and a 25-minute average stay. Average hourly demand was converted to a peak hour demand by multiplying it by 1.25, as specified in the *Guidelines.*

The estimated loading space demand was then compared with requirements in Section 152 of the City Planning Code. Table V.E.21 presents a summary of the estimated truck peak demand for loading spaces and a comparison with the minimum San Francisco Planning Code requirements. The loading space standards incorporated in the project's design documents pursuant to the Redevelopment Plans would be the same as the San Francisco Planning Code standards./107/ As shown in Table V.E.21, approximately 158 loading spaces are estimated to be needed in the peak period for freight delivery and service vehicle demand, which generally occurs between 10:00 a.m. and 1:00 p.m., compared with the design documents' minimum requirement for 106 loading spaces. The estimated loading space demand would be larger than the minimum number of loading spaces required for the Mission Bay North Subarea, and the East, West, and UCSF Subareas in Mission Bay South. If the loading demand is not met, trucks could temporarily double-park and partially block local streets while loading and unloading goods in the Project Area. In the Central Subarea, on the other hand, with housing, hotel, and retail uses, the estimated loading space demand would be less than the minimum

TABLE V.E.21
WEEKDAY LOADING DEMAND AND SUPPLY

Project Area	Land Use Type	Daily Truck Generation	Average Hour Loading Dock Space Demand	Peak Hour Loading Dock Space Demand	Minimum Planning Code/ Design For Development Requirement
Mission Bay North	Retail	190	9	11	11
	Restaurant	360	17	21	0
	Residential	90	4	5	14
	Movie Theater	34	3	4	1
	Subtotal	*674*	*33*	*41*	*26*
Mission Bay South Central Subarea	Retail	75	3	4	4
	Hotel	45	2	3	2
	Residential	93	4	5	22
	Subtotal	*213*	*9*	*12*	*28*
East Subarea	Office	310	14	18	8
	Retail	41	2	2	2
	R&D	310	14	18	8
	Large Retail	55	3	3	6
	Subtotal	*716*	*33*	*41*	*24*
West Subarea	Office	274	13	16	7
	Retail	10	0	1	0
	R&D	274	13	16	7
	Large Retail	68	3	4	6
	Subtotal	*626*	*29*	*37*	*20*
UCSF Subarea	UCSF Site	445	21	26	N/A
	School	10	0	1	N/A
	Subtotal	*455*	*21*	*27*	*N/A*
Total Mission Bay North		674	33	41	26
Total Mission Bay South		2,010	92	117	80
TOTAL PROJECT		2,684	125	158	106

Notes:
N/A = Not Applicable
The Planning Code and Redevelopment Plan loading requirements would not apply to the UCSF site or to the public school site.

Sources: Wilbur Smith Associates.

number of spaces required. Because any effects of unmet loading demand would be temporary inconveniences, any excess demand would not be a significant impact. The Redevelopment Plan design documents used to calculate expected loading supply establish a minimum number of loading spaces; more could be provided as part of individual development proposals.

RAIL FREIGHT OPERATIONS

The proposed project would not directly impact freight rail operations in terms of the ability to maintain service to existing users of the railroad. As described earlier in this section, under "Freight Rail Operation Changes" in "Changes to Circulation Pattern in Mission Bay" under "Year 2015 Transportation System Assumptions," the project proposes to relocate the existing railroad tracks near 16th Street, to follow 16th Street, Terry A. François Boulevard, and Illinois Street alignments. Trains would follow the public street right-of-way to connect with the existing trackage on Illinois Street south of the Project Area, to provide access to Pier 80 to the south. Freight train operations would be restricted to approximately the 1 a.m. to 4 a.m. time period, which would not substantially impact circulation in and through the Project Area.

If it became desirable to provide rail access to Piers 48 and 50 (Mission Rock Terminal), the proposed short trackage on Terry A. François Boulevard could be extended north, following the street's public right-of-way, to reach the piers./108/ Therefore, the reconfigured rail trackage would provide the same level of access for existing and recent former users as does the current configuration.

CONSTRUCTION IMPACTS

Construction of the project would occur in several phases. The duration of each phase would vary, depending on the type of development (e.g., residential, research and development laboratories) and on the amount of building space included in the phase. It is estimated that an average phase would require approximately 18 months to complete. Additional traffic (both trucks and autos) would be generated during all phases of construction. While the exact timing of construction for each is not available, the preliminary schedule provided by the project's construction management consultant shows that the most intense construction impact (in terms of number of workers and vehicles) would occur when the 500-room hotel is built./109/ Therefore, to ensure the most conservative approach, the data related to this construction stage are used in the analysis.

During the peak phase of construction of the hotel (i.e., the superstructure and finish phases), there would be approximately 200 workers and 145 vehicles (both trucks and autos) on-site each day. A maximum of 125 one-way truck trips could occur on a single day. While daily truck traffic operation is expected to occur from 7:00 a.m. till 6:00 p.m. and would impede the flow of non-construction traffic on access streets and major haul routes, only 5% of that traffic would operate during the afternoon commute hours (between 4:00 p.m. and 6:00 p.m.). Most of the truck loading and unloading activities would occur within or adjacent to the development site and would have minimal impacts on adjacent streets.

The typical work shift for most construction workers would be from 7:00 a.m. to about 3:30 p.m. on weekdays; this work schedule would minimize the traffic impact on neighborhood streets during the typical afternoon commute hours. Further, because of the large amount of vacant land in the Project Area, construction worker vehicles would likely park near construction sites in the Project Area during most phases, and would not occupy parking spaces on neighborhood streets.

All project construction operations would include plans for the closure of traffic/parking lanes and sidewalks adjacent to construction sites./110/ The closure of sidewalks and parking lanes could last throughout the entire construction phase for each building or group of buildings (about 18 months). The location of lane closures would depend on the location of construction sites during different development phases. It is expected that no more than one traffic lane would be closed during construction of individual buildings in the Project Area, and closed traffic lanes would reopen during the afternoon peak period (after 4:00 p.m.). It is possible that more than one location in the Project Area could be under construction at any one time during the project development period. Thus, several parking lanes and sidewalks could be closed for construction at one time, causing temporary inconvenience for motorists and pedestrians.

While the exact routes that construction trucks would be using would depend on the location of individual construction sites, it is expected that Third Street and César Chavez Street would be the primary haul and access routes to or from San Francisco via U.S. 101. Trucks would use Third Street and the ramps at Mariposa Street to access I-280. From the East Bay, trucks would use the Fifth Street and Fourth Street ramps to arrive at the Project Area.

The construction of certain phases of the project would overlap with other construction activities in Nearby Areas, such as the San Francisco Giants Ballpark and the Third Street Light Rail project. The Giants Ballpark, to be located at King and Third Streets, is expected to be completed by the year 2000, while the Third Street Light Rail Extension is expected to be finished by the year 2003. If the first buildings to be built in the Project Area were located on Third Street north of China Basin Channel, some cumulative construction transportation effects could occur on Third Street. Construction management consultants for the various projects would be required to collaborate with

City Public Works and MUNI staff to establish construction schedules, staging areas, and access locations to minimize temporary traffic and transit impacts related to obstructed street rights-of-way; the Mission Bay Transportation Management Association described in Mitigation Measure E.46 in Section VI.E, Mitigation Measures: Transportation, could assist in coordinating construction traffic.

NOTES: Transportation and Circulation

1. San Francisco Planning Department, *Mission Bay Final Environmental Impact Report*, Planning Department File No. 86.505E, State Clearinghouse No. 86070113, Certified August 23, 1990, Volume Two, p. VI.E.1a.*

2. California Department of Transportation, Traffic survey files, 1996.

3. California Department of Transportation, Traffic survey files, 1996; and San Francisco County Transportation Authority, Congestion Management Plan (CMP) network annual monitoring reports, 1995.

4. San Francisco County Transportation Authority, Congestion Management Plan (CMP) network annual monitoring reports, 1995.

5. San Francisco County Transportation Authority, Congestion Management Plan (CMP) network annual monitoring reports, 1995.

6. California Department of Transportation, Traffic survey files, 1996.

7. California Department of Transportation, Traffic survey files, 1996.

8. California Department of Transportation, Traffic survey files, 1996.

9. California Department of Transportation, Traffic survey files, 1996.

10. The I-80/U.S. 101 "split" is the location where Interstate 80 ends in San Francisco and becomes U.S. 101. At that point, U.S. 101 turns north to the "Central Freeway," but the driver perceives the main freeway as a continuation of I-80 leading south for westbound drivers or leading east for northbound drivers on U.S. 101.

11. California Department of Transportation, Traffic survey files, 1996.

12. Caltrain Time Table and Information Guide, effective July 6, 1997 - January 3, 1998.

13. Peninsula Corridor Joint Powers Board, *Caltrain 20-Year Strategic Plan, Fiscal Year 1997/1998 to Fiscal Year 2016/2017,* October 1997.*

14. A one-way couplet is a pair of one-way streets that are parallel to and adjacent to each other.

15. SamTrans Bus System Route Map; SamTrans Service Time Tables, effective May 4, 1997.

16. Headways are the amounts of time between scheduled runs of a bus or rail line.

17. San Mateo County Transit District, *Short Range Transit Plan, FY 1995/96 - FY 2004/05*, September 1995.*

18. BART Service and Schedules, April 1997.

19. San Francisco Bay Area Rapid Transit District, *Short Range Transit Plan, July 1995 through June 2005, FY 1996-FY 2005*, September 14, 1995.*

20. BART uses these standards as a way to determine the quality of the service it provides to its customers. BART does not automatically add more cars or trains any time the standard is reached or exceeded.

21. AC Transit Transbay Route Map, April 1997.

22. Paul Bignardi, Associate Planner, AC Transit District, Technical Memorandum, October 3, 1997, and personal communication with Wilbur Smith Associates, December 5, 1997.*

23. Golden Gate Transit relocated its Civic Center bus service from Folsom Street, Howard Street and the Transbay Terminal to Mission Street in March, 1997.

24. Golden Gate Transit, Bus & Ferry Transit Guide, June 8 - September 6, 1997.

25. Maurice Palumbo, Senior Planner, Golden Gate Bridge, Highway, and Transportation District, Technical Memorandum to Wilbur Smith Associates, June 24, 1997.*

26. Blue & Gold Fleet Ferry Schedule No. 2; Red & White Fleet Ferry Schedule No. 154; Alameda/Oakland Ferry Schedule, effective May 19 through December 31, 1997; Vallejo Baylink Ferry Schedule; Jim Reed, Port Captain, Red & White Fleet, telephone conversation with Wilbur Smith Associates, November 20, 1997.

27. According to the City and County of San Francisco, *San Francisco General Plan,* Transportation Element, a "Major Arterial" is a "cross-town thoroughfare whose primary function is to link districts within the city and to distribute traffic from and to the freeways; these are routes generally of citywide significance; of varying capacity depending on the travel demand for the specific direction and adjacent land uses." p. I.4.35.*

28. According to the City and County of San Francisco, *San Francisco General Plan,* Transportation Element, "Secondary Arterials" are "primarily intra-district routes of varying capacity serving as collectors for the major thoroughfares; in some cases supplemental to the major arterial system." p. I.4.35.*

29. Note that the San Francisco Congestion Management Program (CMP) does not consider deficient those roadway segments that operate at LOS "E," or those that were already operating at LOS "F" when the baseline monitoring was conducted for the first CMP in 1991. For CEQA purposes, however, a change in intersection LOS from "D" to "E" or "F" is considered a significant impact.

30. Bridge tenders are on duty 24 hours a day because under Federal Drawbridge Operating Regulation, 33 CFR 117.149 China Basin, Mission Creek, a bridge tender must open both bridges "on signal if at least one hour advance notice is given."

31. Robert Peters, City and County of San Francisco, Department of Public Works, Bureau of Street and Sewer Repair, written communications to Wilbur Smith Associates, June 20, 1996.*

32. San Francisco Municipal Railway, Street and Transit Map, 1996; *Short-Range Transit Plan, July 1, 1995 - June 30, 2005*, October 15, 1995.

33. Peter Straus, Director of Service Planning, San Francisco Municipal Railway, personal communication to Wilbur Smith Associates, June 18, 1997.

34. Screenlines are hypothetical lines that would be crossed by persons traveling between two points. In particular, MUNI's percentages of capacity utilized were based on the total number of passengers crossing a screenline during the p.m. peak hour.

35. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report,* Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, pp. III.95-III.99, and Table X.C.5, pp. A.105-A.106.

36. Pushkarev and Zupan, *Urban Space for Pedestrians*, MIT Press, 1975.*

37. San Francisco Board of Supervisors Resolution 225-97, adopted March 4, 1997.

38. Bill Harris, Santina & Thompson, Inc., personal communication with Wilbur Smith Associates, October 1, 1997.

39. Donald Miller, Hawk Engineers, Inc., written communication to Wilbur Smith Associates, July 8, 1997.

40. Bill Harris, Santina & Thompson, Inc., personal communication with Wilbur Smith Associates, October 1, 1997. Charles Mitchell, Chief Warfinger, Port of San Francisco, telephone conversation with EIP Associates, March 2, 1998.

41. Charles Mitchell, Chief Warfinger, Port of San Francisco, telephone conversation with EIP Associates, March 2, 1998.

42. The Metropolitan Transportation System is a regional network of freeways, major and secondary arterials, transit and recreational streets meeting criteria developed by the Metropolitan Transportation Commission as part of the Regional Transportation Plan. City and County of San Francisco, Planning Department, *San Francisco General Plan*, Transportation Element, Table 1: Classification of Elements in Vehicular Circulation Plan, p. I.4.35.

43. The project to extend Caltrain to downtown has been delayed because the San Francisco Board of Supervisors voted, in July 1997, not to complete the environmental impact report. See discussion in Section V.E, Transportation, "Caltrain San Francisco Downtown Extension Project" for more information.

44. San Francisco Bay Conservation and Development Commission, *San Francisco Bay Plan*, January 1969, as amended, p. 25.*

45. 1990 FEIR, Volume II, p. VI.E.49.*

46. San Francisco Bay Conservation and Development Commission Resolution 96-06, May 8, 1996.

47. City and County of San Francisco, *San Francisco General Plan*, Transportation Element, City Planning Commission Resolution 13907, July 6, 1995.*

48. 1990 FEIR, Volume II, p. VI.E.45, citing City and County of San Francisco, *San Francisco General Plan,* Transportation Element.*

49. The San Francisco Bicycle Plan was prepared by the Department of Parking and Traffic and was adopted by the San Francisco Board of Supervisors in Resolution 225-97, March 4, 1997.

50. Port of San Francisco, *Waterfront Land Use Plan*, adopted June 24, 1997, pp. 34, 44, 45, 60.*

51. The specific iterative technique used in the MTC origin/destination trip tables adjustment is known as a *Fratar* process. It adjusts the number of trips in each geographic area within the model individually by applying specified "production" or "origin" and "attraction" or "destination" growth factors to each trip table. Since the application of the origin factors affects the total number of trips destined to a geographic area and vice versa, the factoring process is repeated several times, in order to converge on a reasonable solution which, to the extent possible, preserves the already estimated totals for both origins and destinations for each geographic area.

52. As discussed in Appendix C., Business Activity, Employment, Housing, and Population, under "SEIR Cumulative Growth Scenario Compared to *Projections '98*," ABAG's latest growth forecast for San Francisco includes employment increases similar to those in the updated San Francisco cumulative growth estimates and includes a slightly slower growth in households than was assumed in the San Francisco cumulative growth estimates. To the extent that the population growth forecast used for this SEIR is higher than Projections '98, the resulting transportation and related effects (air quality, transportation, noise) are greater than if Projections '98 forecasts were used, providing a more conservative result. *Projections '98* was published in December 1997, and so was not available in time to use in the transportation analysis.

53. Similarly, EIRs under preparation for other projects included in the revised San Francisco projections may assume more buildout for the particular project that is the subject of the EIR, to ensure a conservative analysis of impacts. However, outside of the project that is the subject of the EIR, each EIR is using consistent assumptions about growth in the rest of the City.

54. Catellus is initiating the necessary steps to obtain approvals from the Peninsula Corridor Joint Powers Board (Caltrain) and the State of California Public Utilities Commission for this crossing.

55. San Francisco Board of Supervisors Resolution 225-97, March 4, 1997.

56. San Francisco Bay Conservation and Development Commission, Permit No. 4-97 granting the Port of San Francisco permission to construct a shed in China Basin, August 25, 1997.

57. David Knadle, Director, Construction Services, Catellus Development Corporation, personal communication with Wilbur Smith Associates, December 10, 1997.

58. Caltrans, *Central Freeway Replacement Project Draft Environmental Assessment,* April 1997.

59. Although results in the Project Transportation Study area would not be substantially different with either of the Caltrans alternatives for the Central Freeway, the updated MTC regional level demand model used in the transportation analysis of this project assumes that Alternative 1A/B would be built.

60. The updated MTC regional travel demand model used in the transportation analysis of this project assumed that Alternative 1A/B would be built. However, because both freeway replacement alternatives would follow the same path, with the only difference being the touchdown point and the type of crossing of Market Street near Octavia Street, which is located about two miles away from the

Project Area, it is not expected that traffic conditions in the project's study area would be substantially different if Alternative 8B were to be built.

61. Michael Chronbach, Transit Planner, San Francisco Municipal Railway, telephone conversation with Wilbur Smith Associates, February 6, 1998.

62. Changes to the 9X, 9AX, and 9BX bus routes would occur outside the project's study area and would not affect Mission Bay-related transit demand or supply. See *Third Street Light Rail Project - Detailed Definition of Alternatives - Working Paper #3*, City and County of San Francisco Public Transportation Commission Municipal Railway, September 1997, for a more complete description of proposed bus operating plans related to the MUNI Third Street Light Rail Project.

63. Peter Straus, Director of Service Planning, San Francisco Municipal Railway, facsimile to Wilbur Smith Associates, July 17, 1997, and letters to Paul Deutsch, San Francisco Planning Department, August 29 and October 17, 1997.

64. Carmen Clark, Executive Director, S.F. Transportation Authority, telephone conversation with EIP Associates, August 19, 1997.

● 64a. San Francisco Planning Department and Federal Transit Administration, *Third Street Light Rail Project DEIS/DEIR*, State Clearinghouse #96102097, Planning Department File No. 96.281E, April 3, 1998, pp. 2-8 to 2-12 and 3-7.

65. The San Francisco Board of Supervisors voted on July 21, 1997, not to conduct additional work to complete the Draft EIS/EIR.

66. San Francisco Bay Area Rapid Transit District, *Short Range Transit Plan, July 1996 through June 2006*, September 26, 1996.

67. San Mateo County Transit, *FY 1995/96-FY 2004/05 Short Range Transit Plan*, September/October, 1995, p.4-4.

68. City and County of San Francisco Planning Department, *San Francisco Giants Ballpark Final Environmental Impact Report,* Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, p. IV.197.*

69. Caltrain District 4 and Metropolitan Transportation Commission, *Bay Bridge Traffic Survey Series,* April 1996.

70. The local traffic analysis directed southbound traffic to Third Street at Mariposa Street in order to provide a worst-case analysis for this main thoroughfare, and to determine whether capacity would be adequate. As the level of service would remain at D or better at Third and Mariposa Streets, it is not expected that the number of vehicles that might use Minnesota Street to travel southbound in the p.m. peak hour would be large enough to cause a significant change in traffic conditions. However, some vehicular trips were assigned to Minnesota Street in á separate analysis, to provide a conservative assumption for impacts. The traffic analysis results are also provided for this assumption.

71. Transit trips to the Peninsula and South Bay comprise about 6% of the total trips to/from Mission Bay in the p.m. peak hour.

72. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark Final Environmental Impact Report,* Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, p. IV.197.*

73. Bay Area Rapid Transit District, *BART Short Range Transit Plan*, July 1995 through June 2005, September 1995.

74. Paul Bignardi, Associate Planner, AC Transit, telephone conversation with Wilbur Smith Associates, December 5, 1997.

75. Bay Area Transit Information Webpage: www.transitinfo.org

76. Maurice Palumbo, Senior Transit Planner, Golden Gate Bridge, Highway and Transportation District, facsimile to José Farrán, Wilbur Smith Associates, June 24, 1997.

77. Peninsula Corridor Joint Powers Board, *Caltrain San Francisco Downtown Extension Project Draft EIS/EIR,* State Clearinghouse No. 95063004, March 1997.

78. Peninsula Corridor Joint Powers Board, Caltrain *20-Year Strategic Plan, FY 1997/98 to 2016/17*, October 1997.

79. Daryl Maxey, Chief Engineer, Peninsula Corridor Joint Powers Board, estimated future train schedules, October 1997.

80. Bay Area Rapid Transit District, *San Francisco Bay Area Rapid Transit Short Range Transit Plan, FY 1996-2005,* September 1995.

81. AC Transit District, *AC Transit Draft Transbay Comprehensive Service Plan*, February 1997.

82. Paul Bignardi, Associate Planner, AC Transit, telephone conversation with Wilbur Smith Associates, December 5, 1997.

83. *Golden Gate Bridge, Highway and Transportation District Short Range Transit Plan*, September 1995.

84. Maurice Palumbo, Senior Planner, Golden Gate Bridge, Highway and Transportation District, Technical Memorandum, June 24, 1997.

85. Jim Reed, Port Captain, Red & White Fleet, telephone conversation with Wilbur Smith Associates, November 20, 1997.

86. San Francisco Planning Department, *Guidelines for Environmental Review: Transportation Impacts*, July 1991.*

87. Ridership data for the p.m. peak hour study period was assumed to comprise 60% of the ridership data provided by MUNI for the two-hour p.m. peak period (4 p.m. to 6 p.m.).

88. San Francisco Planning Department, *Guidelines for Environmental Review: Transportation Impacts*, July 1991.*

89. San Francisco Redevelopment Agency, *Design Standards and Guidelines, Mission Bay,* Draft C, prepared by Catellus Development Corporation; as adopted by the Mission Bay Citizens Advisory Committee on December 11, 1997, revised March 30, 1998, p. 45. University of California San Francisco, *1996 Long Range Development Plan*, Adopted January 1997, p. 211.

90. The design documents for Mission Bay North and South include provisions to modify the maximum parking limits for some uses based on parking demand studies to be conducted after buildings are occupied. San Francisco Redevelopment Agency, *Design Standards and Guidelines, Mission Bay,* Draft C, prepared by Catellus Development Corporation; as adopted by the Mission Bay Citizens Advisory Committee on December 11, 1997, revised March 30, 1998, p. 45.

91. Although, on-street parking would be eliminated on Channel Street, the existing 50-space parking area leased by the Mission Creek Harbor Association from the Port of San Francisco would remain.

92. San Francisco Bureau of Engineering, Department of Public Works Standard Plan, Dwg 55.017 Rev.2, Section at Standard San Francisco Curb Ramp. The ramp requirement establishes a standard sidewalk width of about 10.5 feet for a six-inch curb.

93. Based on results of a survey made at the De Young Museum, "Visitor Survey," December, 1996.

94. Although non-auto, non-transit trips are more likely means of traveling between Mission Bay and other parts of the northeast and southeast quadrants of the City, the proportion of bicycle trips to walk trips would be less in the northeast and southeast quadrants than in the northwest and southwest quadrants. This is because one is more likely to bike than walk from the southwest quadrant to Mission Bay, but someone living in the southeast quadrant is more likely to bike or walk (rather than drive or take transit) than is someone living in the northwest or southwest areas of the City.

95. The policy of the San Francisco Department of Parking and Traffic for bicycle lane widths is to recommend a minimum of 5 feet if there is no on-street parking and a minimum of a 6-foot bicycle lane and 8-foot parking lane if there is on-street parking. Required minimum widths are 4 feet without on-street parking and 5 feet with on-street parking.

● 95a. Eric Harrison, Project Manager, Catellus Development Corporation, telephone conversation with Wilbur Smith Associates, August 4, 1998.

96. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report*, Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, pp. IV.108-IV.110.*

97. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report*, Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, pp. IV.108-IV.110. Note that neither cumulative future scenario included the revised growth forecast for San Francisco County prepared for this SEIR or other San Francisco EIRs now in preparation.*

98. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report*, Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, Volume Two, pp. IV.166-IV.172 and IV.183-IV.200.*

99. See "Changes to Circulation Pattern in Mission Bay: Traffic Circulation" in "Year 2015 Transportation System Assumptions" in the Impacts subsection for a more detailed description of the Mission Bay circulation plan.

100. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report*, Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, Volume Two, pp. IV.183 - IV.185.*

101. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report*, Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, Volume Two, p. IV.197.*

102. Lease between City and County of San Francisco and China Basin Ballpark Company, LLC, as approved by the San Francisco Board of Supervisors, Resolution 880-97, September 22, 1997.

103. See more detailed descriptions of the MUNI Third Street light rail proposal in Section V.E, Transportation: Impacts, under "Changes to San Francisco Municipal Railway (MUNI) System."

104. It is assumed that the MUNI Metro Third Street Light Rail Project would be in place in about 2003 and would serve any uses in the Project Area.

105. Robert Passmore, Zoning Administrator, San Francisco Planning Department, letter to Douglas Wong, Executive Director, Port of San Francisco, and Don Parker, Senior Vice President, Catellus Development Corporation, September 4, 1997. See particularly p. 7 of 10.

● 105a. Arvind Joshi, Caltrans, telephone conversation with Wilbur Smith Associates, August 14, 1998.

106. San Francisco Planning Department, *Guidelines for Environmental Review, Transportation Impacts*, July 1991, Appendix 7.*

107. San Francisco Redevelopment Agency, *Design Standards and Guidelines, Mission Bay,* Draft C, prepared by Catellus Development Corporation; as adopted by the Mission Bay Citizens Advisory Committee on December 11, 1997, revised March 30, 1998, p. 46. Note that these standards were also used to establish likely loading requirements for the UCSF site because no loading standards were established in the UCSF LRDP. San Francisco Planning Code Section 152 requirements for residential loading were used for Mission Bay residential, because no standards were included in the Design Standards document.*

108. Pier 64 is listed in the *Waterfront Land Use Plan* as condemned and is not proposed for any industrial use that might need rail access.

109. Dean Browning, Senior Project Sponsor, Charles Pankow Builders, Ltd., facsimile to Eric Harrison, Project Manager, Catellus Development Corporation, April 3, 1997.

110. Dean Browning, Senior Project Sponsor, Charles Pankow Builders, Ltd., facsimile to Eric Harrison, Project Manager, Catellus Development Corporation, April 3, 1997.

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

F. AIR QUALITY

This section describes the environmental setting and impacts for air quality. The Setting subsection includes a summary of the climate in the Project Area; federal, state, and regional air quality standards; and existing air quality data and emissions for the San Francisco Bay Area for both "criteria air pollutants"/1/ and "toxic air contaminants." The impact analysis focuses on expected emissions of criteria air pollutants and toxic air contaminants from stationary and mobile sources in the Project Area and from cumulative development.

Criteria air pollutants refer to a group of pollutants for which regulatory agencies have adopted federal, state, or regional ambient air quality standards and pollution reduction plans. Criteria air pollutants include ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), small-diameter particulate matter (PM_{10}), and lead./2/

Toxic air contaminants refer to a category of air pollutants that pose a present or potential hazard to human health, but which have more localized impacts than criteria air pollutants. Some toxic air contaminant sources are regulated with emission- and risk-based regulations at the federal, state, and local levels. There are more than 700 toxic air contaminants recognized by different regulatory agencies. This Air Quality section is concerned with routinely emitted toxic air contaminants. Possible emissions of biohazardous materials and radioactive substances (which are not typically considered toxic air contaminants), and nonroutine releases of hazardous chemicals, are discussed in "Hazard Assessment" in Appendix H.

The air quality analysis in the 1990 FEIR has been updated for this SEIR based on the revised traffic analysis. In addition, an expanded discussion of toxic air contaminants is presented. A Glossary appears at the end of this section, and the endnotes for this section begin on p. V.F.45.

SETTING

CLIMATE

Regional Climate

The San Francisco Bay Area's regional meteorological conditions are dominated by the semi-permanent high pressure area in the eastern Pacific Ocean, which is in large part responsible for the warm, dry summers and cool, wet winters. This pressure system is also responsible for the westerly winds that tend to transport air pollutants inland. The marine layer typically extends from the ground surface to an elevation of 2,000 feet. The mean maximum summer temperature is 71.5 degrees Fahrenheit; the annual mean temperature is 57.2 degrees Fahrenheit./3/

Regionwide elevated temperature inversions, caused when a layer of cool air is suspended between warm air layers above and below, are common in late summer and fall. In the absence of wind to transport pollutants out of the region, air pollution concentrations will rise during an inversion. These inversions can last for extended periods of time and, when combined with strong sunlight, can produce the worst-case conditions for ozone generation and smog formation. Ozone is formed by a series of chemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO_x). Surface inversions, formed on winter nights when surface air cools faster than the air above it, are also common in many parts of the Bay Area. When surface inversions coincide with low, surface wind speed conditions, air pollutants disperse less readily and concentrations rise. In general, the potential for air pollution problems in the Project Area is greatest during fall and winter when winds are light and inversion heights are low.

The global climate, and perhaps regional climate, is changing due to the enhanced greenhouse effect. The greenhouse effect is the warming of the atmosphere due to the trapping of infrared radiation from the sun, and this effect is being enhanced by humankind's burning of fossil fuels./4/

Wind Patterns

Wind patterns are an important element of climate because they affect air pollution dispersion and transport. High winds tend to cause an increase in dispersion and dilution of emissions. Stable conditions, where wind speed is low and an inversion (thermal boundary layer preventing upward escape of pollutants) is present, tend to trap air pollutants near their source of emissions. Therefore, understanding the wind directions and speeds in the Project Area is important to understanding the transport and fate of air pollutants.

In the Project Area, the generally prevailing wind direction is westerly during most of the year. Therefore, pollutants from the Project Area tend to disperse and move out to the Bay, away from receptors. Four wind directions comprise the greatest frequency of occurrence as well as the majority of strong wind flow; these are northwest, west-northwest, west, and west-southwest winds./5/ Wind direction may vary considerably in the Project Area due to the surrounding topography. Wind direction during the day may be predominantly westerly, and may shift at night to predominantly easterly, thereby transporting pollutants from the east towards downtown San Francisco and the Project Area. These types of changes in wind patterns are common occurrences in San Francisco. Calm conditions occur about 2% of the time.

Meteorological data are currently not collected within the Project Area. A more accurate classification of existing wind patterns in the Project Area would require on-site meteorological monitoring. While there are meteorological stations at sites in Nearby Areas, these sites may not be representative of conditions in Mission Bay because of variations in topography and the location of tall buildings near the monitoring sites. Turbulence created by large buildings can alter localized wind patterns. Construction of tall buildings may also alter localized wind patterns from conditions that were previously recorded at the old Federal Building (a source of meteorological data for the area).

REGULATORY FRAMEWORK

Criteria Air Pollutants

Air quality is regulated at the federal, state, and local levels. A series of laws and regulations has been designed to provide a basis for air pollutant control efforts. The major control efforts focus on criteria air pollutants, pollutants for which ambient standards have been established.

Based on the authority of the federal Clean Air Act, as amended, and the California Clean Air Act, federal and state regulatory agencies set upper limits on the airborne concentrations of ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and small-diameter particulate matter (PM_{10}). Federal and state standards for these pollutants are presented in Table V.F.1. Such upper limits or "ambient air quality standards" are designed to protect segments of the population most susceptible to the pollutants' adverse effects (e.g., the very young, the elderly, people weak from illness or disease, or persons doing heavy work or exercise). The potential human health effects of these air pollutants are presented in Table V.F.2. The Bay Area Air Quality Management District (BAAQMD) is primarily responsible for planning, implementing, and enforcing federal and state ambient standards in the Bay Area. Current plans for air quality improvement include the Ozone and Carbon Monoxide Attainment/Maintenance Plans/6/,/7/, which address federal requirements/8/, and BAAQMD's 1997 Clean Air Plan./9/

Criteria pollutants are described briefly below. They include ozone (and its precursors, reactive organic gases and oxides of nitrogen), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and small-diameter particulate matter (PM_{10}).

TABLE V.F.1 ● FEDERAL AND STATE AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standard/a/	Federal Standard/b/
Ozone	1-hour	0.09 ppm	0.12 ppm
Carbon Monoxide	1-hour	20.00 ppm	35.00 ppm
	8-hour	9.00 ppm	9.00 ppm
Nitrogen Dioxide	1-hour	0.25 ppm	—
	Annual Average	—	0.053 ppm
Sulfur Dioxide	1-hour	0.25 ppm	—
	3-hour	—	1,300 $\mu g/m^3$
	24-hour	0.04 ppm	365 $\mu g/m^3$
	Annual Average	—	80 $\mu g/m^3$
Particulate Matter (PM_{10})	24-hour	50 $\mu g/m^3$	150 $\mu g/m^3$
	Annual Geometric Mean	30 $\mu g/m^3$	—
	Annual Arithmetic Mean	—	50 $\mu g/m^3$
Lead	30-Day Average	1.5 $\mu g/m^3$	—
	Calendar Quarter	—	1.5 $\mu g/m^3$

Notes:
ppm = parts per million by volume
$\mu g/m^3$ = micrograms per cubic meter
— = No standard in this category

a. California standards for ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and particulate matter (PM_{10}) are values that are not to be exceeded.
b. National standards, other than for ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is "not exceeded" when the expected number of days per calendar year with maximum hourly average concentration above the standard is equal to or less than one.

Source: EIP Associates.

Ozone

Ozone is a secondary pollutant which forms from the interaction of ROG and NO_x in the presence of sunlight. Motor vehicles are the primary source of ROG and NO_x in the Bay Area. Ozone standards have been violated most often in the Santa Clara, Livermore, and Diablo Valleys because local topography and meteorological conditions favor the buildup of ozone and its precursors.

TABLE V.F.2 ●
HEALTH EFFECTS SUMMARY OF THE MAJOR CRITERIA AIR POLLUTANTS

Air Pollutant	Adverse Effects
Ozone	Eye irritation. Respiratory function impairment.
Carbon Monoxide	Impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin. Aggravation of cardiovascular disease. Impairment of central nervous system function. Fatigue, headache, confusion and dizziness. Can be fatal in the case of very high concentrations in enclosed places.
Nitrogen Dioxide	Risk of acute and chronic respiratory illness.
Sulfur Dioxide	Aggravation of chronic obstruction lung disease. Increased risk of acute and chronic respiratory illness.
Particulate Matter (PM_{10})	Increased risk of chronic respiratory illness with long exposure. Altered lung function in children. With SO_2, may produce acute illness.
Particulate Matter ($PM_{2.5}$)	May be inhaled and possibly lodge in and/or irritate the lungs. Same adverse effects as PM_{10}.
Lead	Gastrointestinal and central nervous system effects in adults. Anoxeria, vomiting, malaise, convulsions, and possibly, permanent brain damage, in children.

Source: Bay Area Air Quality Management District Air Quality Handbook, 1993; Zannetti, Paolo, *Air Pollution Modeling*, 1990; The Merck Index, 10th ed., 1983.

Carbon Monoxide

In 1995, about 65% of the carbon monoxide (CO) in the Bay Area was generated by motor vehicles./10/ The one-hour and eight-hour CO standards have been occasionally exceeded in San Francisco, San Jose, and Vallejo, which are areas with high traffic volumes and frequent surface inversions during the winter months. Compliance strategies include stricter motor vehicle emission limits statewide, with local biannual motor vehicle inspection/maintenance and transportation control measures.

Particulate Matter

Particulate levels in the Bay Area are low near the coast. Levels increase with distance inland and reach their highest levels in dry, sheltered valleys, such as the Santa Clara, Diablo, and Livermore Valleys. The largest human-caused sources are motor vehicle travel over paved and unpaved roads, demolition and construction activities, and agricultural operations and burning. Natural sources (i.e., wind-raised dust) are also significant. Particulate standards refer to particulates that are small enough to be inhaled (i.e., PM_{10}, those less than 10 microns in diameter) or $PM_{2.5}$, those less than 2.5

microns in diameter./11/ The state ambient air quality standards for PM_{10} are exceeded regularly in the Bay Area.

Nitrogen Dioxide

The major sources of nitrogen oxides (NO_x) are vehicular, residential, and commercial fuel combustion. Concentrations of nitrogen dioxide (NO_2), the most abundant form of ambient NO_x, are highest in the South Bay. No NO_2 standard violations have been measured at any monitoring station in the Bay Area since the early 1980's.

Sulfur Dioxide

Burning of high sulfur fuels for activities such as electricity generation, petroleum refining, and shipping is the major source of sulfur dioxide (SO_2). The highest levels of SO_2 are recorded by monitoring stations located in a relatively narrow crescent along the Bay shore of northern Contra Costa County, where major petroleum refineries are located. The SO_2 standard is currently being met throughout the Bay Area.

Lead

The Bay Area is in attainment for both the federal lead standard of 1.5 micrograms per cubic meter (based on a calendar quarter averaging time) and state lead standard of 1.5 micrograms per cubic meter (based on a 30-day average). Lead concentrations have dropped substantially since the introduction of unleaded gasoline. In the last 15 monitoring years, ambient concentrations have not approached the lead standards, and no violations have been reported. The highest concentration recorded in 1996 was 0.48 microgram per cubic meter, approximately one-third of the standard.

Toxic Air Contaminants

Historically, air quality laws and regulations have concentrated on "criteria" pollutants, which are emitted by numerous types of industries, automobiles, and other sources. Over the last decade, the importance of specific, highly toxic pollutants, which often cause cancer, has been realized. These pollutants are called "toxic air contaminants" under California law.

To define toxic air contaminants more specifically, they comprise a category of air pollutants that may cause or contribute to an increase in mortality or serious illness, or that may pose a present or potential hazard to human health. Unlike criteria pollutants, there are no regional ambient standards for toxic air contaminants; stationary sources of toxic air contaminants are regulated through standards and risk reduction strategies implemented at the sources of emissions. This is primarily due to the localized adverse health impacts caused by toxic air contaminant emissions.

Fundamentals of Risk Assessment

Adverse health impacts from toxic air contaminants are often described in terms of risk. There are four distinct steps to risk assessment: hazard identification, exposure assessment, toxicological assessment, and risk characterization. Hazard identification means determining the compounds of concern. Exposure assessment involves calculating (typically using a computer model) the emission and dispersion of the compounds of concern. Toxicological assessment means gathering the most recent toxicity data for the compounds of concern. Risk characterization roughly means summing up the risks. (Risk assessments are discussed in greater detail under "Toxic Air Contaminants" in Appendix E.)

Toxic air contaminant risks can be chronic (resulting from long-term toxic air contaminant exposure) or acute (resulting from short-term exposure). Chronic health effects can include cancer and noncancer effects. Cancer risk is expressed as an increased risk for an individual or an increase in the number of cancer cases per 1 million persons in a population. Typically, increased cancer risk is expressed in terms of the chance of developing cancer over a lifetime, such as a 10-in-1-million increased risk for an individual./12/ Risk assessments use the term maximally exposed individual (MEI), which is the hypothetical person near a facility who would receive the maximum exposure to toxic air contaminants from the facility (calculated for a resident and for an off-site employee). A residential MEI would be assumed to reside at the MEI location all day, every day, between 30-70 years depending on the risk assessment guidelines being used./13/ An occupational MEI would be assumed to work normal work hours (week days only) at the location for a number of years more typical of employees. More information about how MEIs are determined is provided under "Exposure Assessment" under "Toxic Air Contaminants" in Appendix E.

Noncancer risks are generally not described in terms of cases per million persons in a population. Instead, noncancer risks are described in terms of a "hazard index." A hazard index compares the maximum exposure an individual is likely to experience to an exposure level considered to be protective of human health. The hazard index is a numerical value derived by dividing the maximum possible exposure by the acceptable exposure. If the hazard index is greater than or equal to 1 (i.e., if the possible exposure exceeds safe levels), adverse health effects could occur.

Regulatory Requirements for Stationary Sources of Toxic Air Contaminants

Key points of federal, state, and regional programs regarding toxic air contaminants are discussed below. "Toxic Air Contaminants" in Appendix E provides additional detail.

Federal Regulations

At the federal level, Title III of the federal 1990 Clean Air Act Amendments regulates certain toxic air contaminants referred to as "hazardous air pollutants." Title III sets forth Maximum Achievable Control Technology (MACT) standards to reduce hazardous air pollutants from specific source categories./14/ The U.S. EPA is responsible for developing and enforcing the MACT standards to reduce hazardous air pollutant emissions from specific types of industry source classifications./15/ This technology-based approach will eventually address the control and/or reduction of risk from urban area sources after an affected industry has complied with the MACT standards. Title III of the Clean Air Act, as amended, Section 112(r), also addresses risk management concerning the accidental release of extremely hazardous chemicals.

State Regulations

California has taken a different approach to regulating toxic air contaminant emissions from stationary sources than the federal government has. California's approach is risk based, whereas the federal approach is technology based. California's Air Toxics "Hot Spots" Information and Assessment Act of 1987 (also referred to as Assembly Bill 2588) requires facilities (defined as any structure associated with emissions or potential emissions of toxic air contaminants) to quantify their emissions and, if necessary, assess the health risks attributable to these emissions./16/ ("Hot Spots" refers to the localized impacts associated with toxic air contaminant emissions.) This program has resulted in substantial reductions in toxic air contaminant emissions throughout the state.

One part of the "Hot Spots" Act deals with the identification of toxic air contaminants and generic ways to reduce their emissions. Based on the information collected under the Air Toxics "Hot Spots" Act and through research and evaluation, the Air Resources Board (ARB) identifies what compounds should be considered toxic air contaminants. ARB has identified over 729 toxic air contaminants (including the 189 federal hazardous air pollutants) as part of the "Hot Spots" Act. After ARB identifies specific toxic air contaminants and evaluates their health effects, ARB may develop measures to control toxic air contaminants from stationary sources. These measures are called Air Toxics Control Measures, and may include control technologies or changes in processes.

Another part of the "Hot Spots" Act deals with individual facilities. The essentials of the "Hot Spots" Act process for an individual facility are as follows: Certain facilities must submit emissions inventory plans, followed by reports describing emissions of toxic air contaminants. Air quality management districts review these reports and prioritize facilities into high, medium, and low priority categories. A "high priority designation" means that a facility requires a comprehensive, facility-wide health risk assessment./17/ If the air district decides the health risks warrant notification of the public, the facility is required to notify its neighbors (for example, through public meetings and direct mail).

If the air district determines that the health risk assessment shows a significant risk associated with the facility's emissions, the operator must develop a plan that will reduce emissions so that risks are below the significant risk level within five years./18/ The five-year period may be shortened if the air district finds that the facility's emissions pose an unreasonable health risk or that it is technically feasible and economically practicable to achieve the result earlier./19/ The five-year period may also be extended by an additional five years, if the air district finds that the actions necessary are not technically feasible or would impose an unreasonable economic burden, and the health risk is not unreasonable./20/

The Air Toxics Hot Spots Act was originally intended to assess health impacts associated with emissions from existing facilities,/21/ but recent amendments make the law applicable to new facilities./22/ If a new facility falls outside the local air management district's permit process, then it must submit an emissions inventory plan and report to the district under the "Hot Spots" Act,/23/ and it must file quadrennial emissions inventory updates.

If an existing or new facility shows that its health risks fall below significance criteria set by the air district, then it may become exempt from further reporting under the Act./24/ But, even if a facility has achieved exempt status, a change in operations or surrounding conditions may make the facility subject to "Hot Spots" Act reporting requirements. Examples of changes in operations that may require additional reporting are: 1) increasing the emissions of a listed substance by more than 100% of the previously reported level, and 2) emitting a listed substance not included in the previous emissions inventory./25/ A key change in circumstances that may require additional reporting is when a sensitive receptor has been established or constructed within 500 meters of the facility after the facility became exempt./26/,/27/ An exempt facility is only required to submit an emissions inventory update for such changes in operations or circumstances if the air district sends the facility a notice requesting an update./28/ This procedure is usually only invoked by the BAAQMD in response to a complaint from the public./29/

Local Programs

At the local and regional level, air quality management districts carry out a number of activities related to toxic air contaminants. In the San Francisco Bay Area, the Bay Area Air Quality Management District (BAAQMD) implements the state's Air Toxics Hot Spots program. BAAQMD may use the inventory compiled under the Air Toxics Hot Spots program to identify sources that pose a substantial risk and adopt a source-specific rule to control emissions from a particular class of stationary sources./30/ BAAQMD also evaluates new facilities for air toxics through its trigger mechanism and its permit program, both of which are discussed below. BAAQMD's "Risk Management Policy" may require that a risk assessment be performed for a facility or that controls be installed for emissions of toxic air contaminants. BAAQMD may also, possibly, deny a permit./31/

BAAQMD Trigger Mechanism

BAAQMD's trigger mechanism is a means of reviewing the potential toxic air contaminant emissions from a facility to determine if further assessment is required./32/ State law provides a mechanism for cities and counties to identify to BAAQMD projects that may emit toxic air contaminants. Cities and counties are prohibited from issuing final certificates of occupancy for such projects unless the applicants demonstrate compliance with air district permitting requirements./33/ The process is as follows. Local building departments instruct applicants for building permits to contact BAAQMD. When applicants contact BAAQMD, BAAQMD staff request information regarding the types of chemicals to be used, and their potential air emissions./34/ BAAQMD staff compare these potential emissions to "trigger levels" for toxic air contaminants (see Table V.F.6, under "Potential Emissions From the Proposed Project" in the Impacts subsection). Trigger levels roughly represent a (worst case) 1-in-1-million cancer risk or hazard index greater than 1 for a hypothetical maximally exposed individual under worst case conditions. For those toxic air contaminants where toxicology data are unavailable or limited, BAAQMD does not provide trigger levels.

If a facility requiring a building permit would emit any compound above its trigger level, then BAAQMD proceeds to perform, or have the applicant perform, a risk screening analysis. A risk screening analysis uses a simple computer model and worst-case assumptions to conservatively estimate the risk from a project. A risk screening analysis relies on information regarding stack parameters (e.g., height, diameter, flowrate, gas exit temperature); building dimensions; building ventilation; zoning; and distances to the property line and sensitive receptors./35/ BAAQMD staff review this information, and sometimes require a formal risk assessment; a formal assessment uses more specific data and assumptions.

Permit Program

For facilities that must obtain a permit to operate from BAAQMD, BAAQMD's normal permitting procedures require air toxics risk screening analyses. Where an operating permit is required, BAAQMD's position is that an individual facility includes all stationary emissions sources as part of an identifiable business located on a contiguous parcel operated by a single entity./36/ Based on this approach, the proposed UCSF site could be considered one facility by BAAQMD staff, if a UCSF activity were to require an operating permit.

For facilities with an estimated cancer risk greater than 1 in 1 million for the maximally exposed individual, or a ground level concentration in excess of relevant non-cancer effect criteria for the MEI, BAAQMD will require that toxics best available control technology (TBACT) be applied to facility sources. In most cases, BAAQMD will not grant a permit to a facility with a cancer risk greater than 10 in 1 million or an excessive non-cancer health risk. BAAQMD may, within its discretion, approve permits for facilities with risks that exceed these thresholds, assuming that TBACT would be used.

Some types of facilities, including research and teaching laboratories, are ordinarily exempt from obtaining a permit to operate from BAAQMD because their emissions of individual toxic air contaminants typically do not exceed trigger levels./37/ However, a facility (including laboratory facilities) would be required to obtain a BAAQMD permit if it has the potential to emit toxic air contaminants greater than the trigger levels described above, unless it could establish to the satisfaction of BAAQMD that the emissions would pass a risk screening analysis./38/ Thus, if a facility's potential emissions exceed trigger levels (i.e., if adverse health effects could occur), BAAQMD could require the facility to perform a risk assessment.

School Siting Criteria

State laws regulate toxic air contaminant emissions and related risks from exposure from a facility. State laws also require air pollution control districts to prepare and distribute a public notice prior to approving an application for a permit to construct or modify an existing source that emits toxic air contaminants, regardless of quantity, if it is within 1,000 feet of a school./39/ In determining whether or not to grant the permit, the Air Pollution Control Officer is required to take the public's comments into consideration. To enable this to happen, the facility seeking the permit is required to notify the affected public and to receive input from the public on steps that could be taken to minimize risk impacts. The Air Pollution Control Officer also has the authority at any time to take action to address a reasonably foreseeable threat of a toxic air contaminant release from a source within 1,000 feet of the boundary of a school, if the release would violate emissions limits. These actions could include issuing an order to prevent the release, if required to prevent or minimize injury./40/

State law also requires consideration of health and safety risks through the school site selection process. A school district may not approve a school site acquisition unless, among other things, the lead agency preparing the environmental impact report or negative declaration for the school has consulted with the air quality management district to identify facilities with potentially hazardous air emissions within one-fourth mile of the school site. The district must make a written finding that either there are no such facilities or that the health risks from the facilities would not pose an actual or potential health risk to students or staff./41/

Regulatory Requirements for Mobile Sources of Toxic Air Contaminants

Vehicles emit toxic air contaminants, including benzene, polycyclic aromatic hydrocarbons, and formaldehyde. Currently, there is no regulatory guidance or scientific consensus for estimating risks from mobile sources. Modeling toxic air contaminant emissions from mobile sources is rarely undertaken due to its difficulty and complexity. There are no control requirements for toxic air contaminant emissions from mobile sources, except for lead,/42/ but as new fuels are developed or other measures are implemented to reduce criteria pollutants, it is likely that toxic air contaminant emissions will decrease. Emissions control measures for mobile sources have typically focused on vehicle emissions and fuel efficiency standards, and recently on reformulation of fuels.

REGIONAL AND LOCAL AIR QUALITY

Criteria Air Pollutants

The BAAQMD has compiled inventories and projections of CO, ROG, NO_2, SO_2, and PM_{10} emissions for the major pollutant sources in the Bay Area for the years 1995, 2000, and 2010. Table V.F.3 presents a summary of the emissions inventory and trends of air pollutants for the Bay Area. The substantial reductions apparent in the ROG and CO emissions from 1995 to 2000 are attributed to the stringent emission controls that have been or will be imposed on motor vehicles and stationary sources. PM_{10} is forecasted to increase, mostly due to the growth in motor vehicle travel foreseen for the Bay Area. SO_2 is also forecasted to increase. The BAAQMD emissions projections assume the following:

TABLE V.F.3
BAY AREA CRITERIA POLLUTANT EMISSIONS INVENTORY AND PROJECTIONS
(Tons/Day - Annual Average)

	CO	ROG/a/	NO_2	SO_2	PM_{10}/b/
1995					
Total Emissions	2,425	535	454	102	462
Motor Vehicle Emissions	1,598	242	200	10	321
(Motor Vehicles' Percent of Total)	(66%)	(45%)	(44%)	(10%)	(70%)
2000					
Total Emissions	1,963	464	441	107	501
Motor Vehicle Emissions	1,108	166	171	10	355
(Motor Vehicles' Percent of Total)	(56%)	(36%)	(39%)	(9%)	(71%)
2010					
Total Emissions	1,600	406	449	115	582
Motor Vehicle Emissions	697	88	161	12	427
(Motor Vehicles' Percent of Total)	(44%)	(22%)	(36%)	(10%)	(73%)

Notes:
a. Reactive organic gases (excluding emissions from natural vegetation).
b. Including entrained road dust. (Projections are based on the Base Year 1990 Air District Emission Inventory.)

Source: Bay Area Air Quality Management District and Association of Bay Area Governments, *Improving Air Quality Through Local Plans & Programs*, October 1994.

- Population, housing, employment, economic growth, and land use will increase as regionally forecast./43/
- Cars will become cleaner, as required by California regulations.
- The recently improved "Smog Check" program will continue.
- Controls on industry and business will continue.
- Current transportation control measures will continue.

Both the federal Clean Air Act and the California Clean Air Act require that the State Air Resources Board designate as "nonattainment areas" portions of the state where federal or state ambient air quality standards are not met. The nine-county San Francisco Bay Area Air Basin has a history of recorded violations of federal and state ambient air quality standards for ozone, carbon monoxide, and PM_{10}. Since the early 1970's, substantial progress has been made toward controlling these pollutants.

In 1995, the U.S. Environmental Protection Agency (U.S. EPA) designated the Bay Area as an attainment area for the federal ozone standard/44/ and is considering a request for a similar designation for the federal CO standard. However, U.S. EPA recently redesignated the Bay Area as nonattainment for ozone because of violations of the standard in 1995 and 1996. The California Air Resources Board has designated the Bay Area as an attainment area for the state CO standard. Occasional violations of state ozone and PM_{10} standards still persist, however, and although further air quality improvement is anticipated, attainment of state standards for these pollutants is not expected within the current 20-year planning horizon. In summary, the Bay Area is not in attainment for ozone under federal and state standards, and not in attainment of state PM_{10} standards.

BAAQMD operates monitoring stations at 10 Arkansas Street at the foot of Potrero Hill, about a mile southwest of the Project Area, and at 939 Ellis Street, about 2 miles northwest of the Project Area. Appendix Table E.1 summarizes the most recent five years of available data. The following conclusions can be drawn from these data: ozone, CO, and NO_2 levels near the monitoring stations have not exceeded federal or state standards for the past five years; PM_{10} levels near the monitoring stations occasionally exceed the state 24-hour standard, but not the federal standard.

Toxic Air Contaminants

Regional

In the Bay, BAAQMD reports that the background cancer risk from the combined emissions of toxic air contaminants from stationary and mobile sources is approximately 303 in 1 million over a lifetime in downtown San Francisco./45/,/46/ Ambient levels of toxic air contaminants in air are reasonably consistent throughout the Bay Area. Other factors (e.g., genetic predisposition, diet, use of tobacco products, and exposure to sunlight) affect the total cancer risk each individual experiences. Roughly one in three individuals contracts cancer within his or her lifetime./47/ This corresponds to a total risk of about 333,000 cancer cases for every 1 million persons. As indicated above, approximately 300 of these 333,000 cases can be attributed to toxic air contaminant exposure in ambient air.

Local

BAAQMD measures ambient levels of toxic air contaminants at a number of monitoring stations. Table E.2 in Appendix E summarizes 1996 monitoring data for selected toxic air contaminant concentration levels at 10 Arkansas Street, near the Project Area. The largest mean concentrations of toxic air contaminants were observed for toluene, meta/para-xylene, methylene chloride, and benzene. Toluene and benzene are usually associated with automobile emissions. These data represent the combined emissions of toxic air contaminants from various emission sources, including stationary and mobile sources.

Currently, the Project Area is industrial in nature and is occupied by warehouses, concrete and gravel processing facilities, truck terminals, light manufacturing, and a few auto body shops. Typical toxic air contaminant emissions from such sources include crystalline silica, chromium, and isocyanates. Emissions inventory data from these facilities are unavailable.

Residential receptors are not located adjacent to existing stationary sources of toxic air contaminants in the Project Area. Residences near the Project Area include houseboats in the Channel, live/work units near the intersection of 18th and Minnesota Streets, and residences near Tennessee and 18th Streets and several blocks south of this intersection. Since risk decreases with distance from the sources of toxic air contaminants, it is likely that nearby residents are not currently substantially affected by emissions from Project Area sources.

IMPACTS

STANDARDS OF SIGNIFICANCE

A project would have a significant effect on the environment with respect to air quality if it would violate any ambient air quality standard or contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations, or permeate its vicinity with objectionable odors.

BAAQMD has established thresholds for assessment of project impacts on air quality that are commonly employed in determining the significance under CEQA of most air quality impacts. In its CEQA Guidelines, BAAQMD sets forth different standards of significance and different methodologies for evaluating projects and plans (defined below). While the Mission Bay project has aspects of both a plan and a project, its size, scope, and two Redevelopment Plans make it more like a plan. This section, however, describes both project-related and plan-related standards of significance.

Criteria Air Pollutants

To evaluate criteria air pollutants on a project level, construction-related emissions are typically considered less than significant if appropriate mitigation is employed to minimize particulate emissions. For operational impacts, emissions of 80 pounds per day of reactive organic gases, nitrogen oxides, and inhalable particulates are considered significant. Carbon monoxide (CO) emissions are considered in the context of roadside concentrations, since CO is a local pollutant that does not readily disperse. CO concentrations are measured against the state standard (which is more stringent than the federal standard).

To evaluate criteria pollutants using a plan-level analysis, in accordance with the BAAQMD CEQA Guidelines, plans would have a less than significant impact if the following can be demonstrated over the planning period:/48/

- populations growth for the jurisdiction will not exceed the values included in the current *Clean Air Plan,* and
- the rate of increase in vehicle miles traveled for the jurisdiction is equal to or lower than the rate of increase in population.

For example, the BAAQMD CEQA Guidelines use these tests to determine whether a General Plan is consistent with the BAAQMD's *Clean Air Plan.*

Toxic Air Contaminants

BAAQMD's CEQA Guidelines address the significance of toxic air contaminant emissions. For the CEQA analysis of a development project, BAAQMD recommends that any project with the potential to expose sensitive receptors (including residences) or the general public to substantial levels of toxic air contaminants would be deemed to have a significant impact./49/,/50/ Generally, BAAQMD uses the term "project" to refer to a single facility. Proposed development projects that have the potential to expose the public to toxic air contaminants in excess of the following thresholds would be considered to have a significant air quality impact. These thresholds are, in part, based on California's Proposition 65 reporting requirements for chemicals known or suspected to cause cancer./51/

- Probability of contracting cancer exceeds 10 in 1 million for the maximally exposed individual (MEI)./52/
- Ground-level concentrations of noncarcinogenic toxic air contaminants would result in a hazard index greater than 1 for the maximally exposed individual.

These criteria refer to incremental risk of the proposed project.

In contrast to a project-level analysis, for the CEQA analysis of a local plan, BAAQMD does not recommend specific risk thresholds as standards of significance. Rather, the significance test is qualitative./53/ BAAQMD recommends that buffer zones be established around existing and proposed land uses that would emit toxic air contaminants to ensure that the impact is less than significant./54/ BAAQMD includes general plans, redevelopment plans, general plan amendments, and specific area plans, in its definition of local plans./55/

CRITERIA AIR POLLUTANTS

Methodology

Regional Air Quality

Mobile Sources

For the project-level analysis, the URBEMIS, version 5, computer model (URBEMIS5) was used to assess regional air quality impacts that would result from the project-related traffic. URBEMIS5 was developed by the California Air Resources Board as a planning tool to help assess the impacts of proposed projects. URBEMIS5 utilizes the EMFAC7F1.1 emission factors to assess the pollutants which would be generated by vehicle trips associated with the project land uses. Trip generation numbers were developed for each of the land use categories, and average trip lengths were also calculated from each of the project subareas. The default values recommended by the BAAQMD CEQA Guidelines for percentages of cold starts and trip speed were also utilized in this analysis. All pollutants were analyzed under summer temperature conditions using a temperature of 75 degrees Fahrenheit except carbon monoxide, which was analyzed under winter temperature conditions at 50 degrees Fahrenheit.

Stationary Sources

Emissions from stationary sources were estimated using standard emission factors from the U.S. EPA.

Local Carbon Monoxide Concentrations

For the "project"-level analysis, Caltrans' CALINE4 program was used to model local CO impacts. The CALINE4 model was used according to the Caltrans guidelines ("*CO Protocol*")./56/ Emission factors recommended by the BAAQMD CEQA Guidelines were used. More detail on CO analysis methods is presented in Appendix E.

For the purpose of this analysis, CO concentrations were modeled under "worst-case" conditions at all of the intersections. Under worst-case conditions, receptors are placed in locations of maximum exposure, and a stable atmospheric environment is assumed in which dispersion of CO concentrations is minimal. The receptors were sited according to *CO Protocol* recommendations: for one-hour CO levels, receptors were located at 5 meters (16 feet) from the near edges of the nearest travel lanes; for eight-hour CO levels, at 7 meters (23 feet) from the near edges of the nearest travel lanes. If sensitive receptors were located at these minimum setback distances, they would experience the theoretical, projected maximum CO concentrations. Since CO levels fall off rapidly as distance from the intersection increases, sensitive receptors located at greater setback distances would experience much lower CO levels. At most of the modeled CO receptors, only the nearest surface streets were included because of their dominant influence on local CO levels.

Analysis of Plan Impacts

To perform a plan-level analysis, the population estimates for the Mission Bay plan were compared to the population assumptions in the 1997 *Clean Air Plan* (CAP). The Mission Bay population assumptions are based on the San Francisco cumulative growth scenario/57/ while the 1997 CAP population assumptions are based on ABAG *Projections '96.*

Regional Air Quality Impacts

Mobile Sources

For the "project"-level analysis, Table V.F.4 shows the BAAQMD's significance thresholds for the evaluation of the ozone precursors, particulate matter, and the threshold for further analysis of carbon monoxide. The primary source of these pollutants during project "operation" would be vehicular emissions from new traffic associated with development of the Project Area. The project's average daily emissions were estimated using vehicular emissions factors from the California Air Resources Board's computer model (EMFAC7F1.1) combined with estimated vehicular miles traveled for trips associated with the project's land uses.

As Table V.F.4 shows, vehicular emissions of ROG, NO_x, and PM_{10} would exceed the 80 pound-per-day (lb/day) significance threshold. Emissions of ROG, NO_x, and PM_{10} would be more than ten times greater than their respective thresholds. Maximum development under the proposed project would have a potentially significant impact to ozone, since the Bay Area is not in attainment under applicable ozone standards. The project would also have a significant regional impact in terms of

TABLE V.F.4
ESTIMATED VEHICULAR EMISSIONS FROM PROJECT-RELATED TRAFFIC AT BUILD-OUT (2015)

Pollutant	BAAQMD Significance Threshold (lb/day)	Estimated Vehicular Emissions in 2015 (lb/day)
Reactive Organic Compounds/a/	80	865
Nitrogen Oxides/a/	80	1,324
Particulate Matter/a/	80	1,968
Carbon Monoxide/b/	550	12,228

Notes:
a. The BAAQMD regards this amount of emissions as a threshold of significance for a regional impact.
b. For carbon monoxide, the BAAQMD does not regard 550 lb/day as a threshold of significance, but rather, an indicator to perform micro-scale analysis.

Source: EIP Associates. Estimates are results of modeling using the California Air Resources Board's URBEMIS version 5 model.

PM_{10} emissions. Because CO emissions would be more than 550 lb/day, micro-scale analysis of CO concentrations at the intersection level is appropriate, as provided below.

Mitigation Measure F.1 would require implementation of measures to decrease vehicle trips as discussed in this SEIR (see "Traffic Impacts" in Section V.E, Transportation: Impacts). Even if these trip reduction measures are imposed upon the project, they would not reduce vehicle emissions of ROG, NO_x, and PM_{10} below the respective BAAQMD significance thresholds, because the projected emissions are so far above the thresholds. The effectiveness of transportation control measures is too limited to achieve such reductions./58/ Therefore, the vehicular emissions, specifically of ROG, NO_x, and PM_{10} from maximum development of the Project Area would be an unavoidable significant air quality impact.

Stationary Sources

For the "project"-level analysis, project development would include new facilities and stationary equipment such as boilers, chillers, emergency generators, and possibly a cogeneration plant (within the UCSF portion of the Project Area). This equipment would generate criteria air pollutants, such as CO, SO_2, PM_{10}; ozone precursors (ROGs and NO_x); and toxic air contaminants. The primary source of these emissions would be the combustion of fossil fuels, either natural gas or diesel oil. The nature and extent of the emissions from these sources is not known at this time, as it depends upon the number, type, and rated capacity of the units installed and the efficacy of control equipment. Many of the new buildings in the Project Area would rely on electricity from a utility company for supply of power for heating and cooling. Some buildings would possess individual boilers, emergency generators, and chillers. Annual operational energy consumption was tabulated in the Initial Study (see Appendix A, Table A.2).

The source categories with the largest natural gas consumption would be UCSF and the Commercial Industrial uses. This natural gas consumption is largely attributable to boilers and emergency generators. The actual consumption rate and resulting emissions would vary widely depending on the type of equipment installed. No specific consumption rates are available for proposed Commercial Industrial development, but UCSF rates may be comparable to other future individual development. For example, if UCSF installs small commercial boilers equipped with low NO_x burners in individual buildings, the potential emissions increase per year would be 2.34 tons of VOCs, 16.6 tons of CO, 10.5 tons of NO_x, 0.4 ton of SO_x, and 2.8 tons of PM_{10}./59/ However, if UCSF installs a central cogeneration plant rated at 148 million British Thermal Units (BTU) per hour, the potential emissions increase per year, before control, would be 0.9 ton of VOCs, 24.6 tons of CO, 49.9 tons of NO_x, 0.4 ton of SO_x, and 1.9 tons of PM_{10}./60/ Diesel-fired emergency standby engines on the UCSF site could contribute additional yearly emissions of 7.2 tons of VOCs, 16.4 tons of CO, 75.5 tons of NO_x, 1.1 tons of SO_x, and 5.2 tons of PM_{10}. Actual emissions may be reduced through the use of Best Available Control Technology, as explained below.

Installation of new equipment would be subject to BAAQMD's New Source Review (NSR) rule which is intended to ensure that the Bay Area achieves compliance with all National Ambient Air Quality Standards and to prevent further deterioration of air quality. Under NSR, equipment with emissions over 10 pounds per day of VOCs, CO, NO_x, SO_2, or PM_{10} would be required to install Best Available Control Technology (BACT)./61/ Installation of BACT would substantially reduce the potential emissions. In addition to the provisions of BACT, emissions offsets would be required for emissions of ozone precursors over 15 tons per year./62/ While pollutants emitted by the stationary equipment could potentially interfere with the attainment of regional and local air quality standards, the NSR rule accounts for cumulative pollutant increases through the use of emission offsets and BACT. Therefore, emission increases from new stationary sources are accounted for in the BAAQMD's ozone attainment plan through the NSR rule. Compliance with the BAAQMD's NSR rule would substantially reduce emissions and result in a less than significant impact from stationary source emissions of criteria air pollutants.

Local Carbon Monoxide Concentrations

For the project-level analysis, thirteen intersections were chosen to represent a combination of specific sensitive land uses in the Project Area, based on a visual survey. Figure V.F.1 shows the locations of the intersections modeled in and near the Project Area. The intersection of Mariposa and De Haro Streets is adjacent to a church. Possible residential receptors were identified at 4 of the 13 intersections modeled: Bryant and Second Streets, Harrison and Second Streets, Third and Townsend Streets, and Harrison and Fremont Streets.

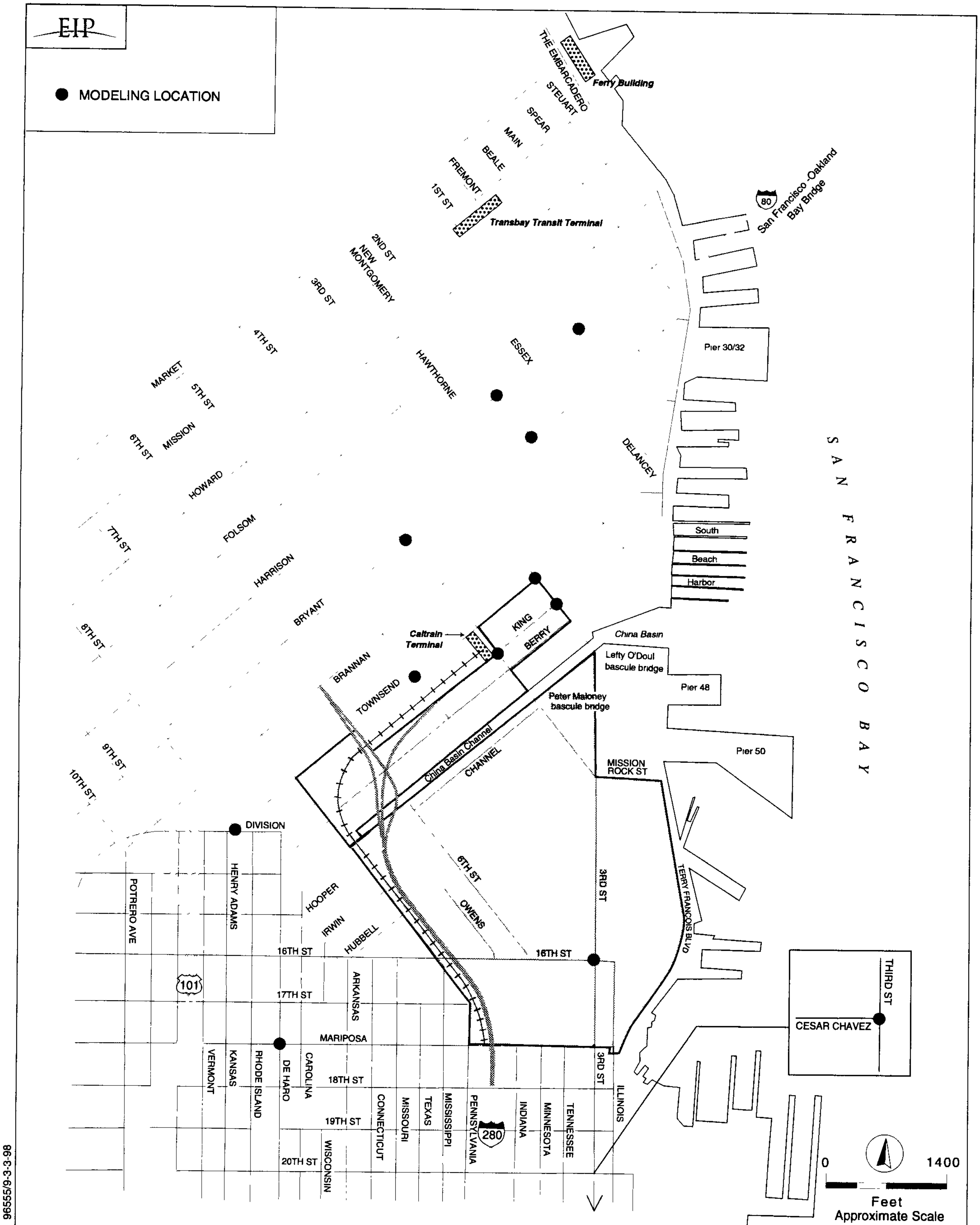
Traffic information for the following four scenarios, as calculated by the project transportation consultants, was used to estimate the local CO concentration impacts:

- Existing (1997)
- Existing with Project
- Cumulative without Project (2015)
- Cumulative with Project (2015)

Existing traffic conditions were modeled using current traffic volume information for the selected intersections. The future cumulative scenario was analyzed for the year 2015, both with and without the project development, using employment estimates, and corresponding traffic estimates for proposed development plans and other areas of the City.

Total CO concentrations were obtained by adding regional background levels to the local CO concentrations estimated using the CALINE4 model. Background CO levels were determined by applying the methodologies specified in the *BAAQMD CEQA Guidelines*.

The BAAQMD considers local CO concentrations to be significant if they exceed state or federal ambient standards. Project or cumulative sources would contribute significantly to these impacts if they produced measurable increases in CO levels at places where CO standards would be exceeded./63/ Worst-case one-hour and eight-hour average CO concentrations were estimated, as shown in Table V.F.5.



SOURCE: EIP Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.F.1 SELECTED INTERSECTIONS FOR MODELING OF LOCAL CARBON MONOXIDE CONCENTRATIONS

TABLE V.F.5
ESTIMATED EXISTING AND FUTURE LOCAL CARBON MONOXIDE CONCENTRATIONS AT SELECTED INTERSECTIONS IN AND NEAR THE PROJECT AREA

	One-Hour Total CO Concentration (ppm)/a/				Eight-Hour Total CO Concentration (ppm)/b/			
Intersection (Streets)	Existing 1997	Existing with Project	2015 Cumulative without Project/c/	2015 Cumulative with Project/c/	Existing 1997	Existing with Project	2015 Cumulative without Project/c/	2015 Cumulative with Project/c/
Second and Harrison	14.5	17.0	8.1	8.8	8.8	10.2	5.0	5.5
Harrison and Fremont	12.4	13.3	7.0	7.5	7.4	8.2	4.5	4.8
Mariposa and De Haro	8.4	8.6	5.5	5.6	5.4	5.6	3.7	3.7
Third and 16th	14.4	21.9	8.6	11.0	8.1	12.0	5.1	6.3
Third and Cesár Chavez	15.3	21.5	8.9	10.5	8.7	12.0	5.5	6.2
Third and King	20.5	29.1	10.6	13.6	11.3	15.0	6.2	7.6
Third and Townsend	19.2	26.8	10.5	12.1	10.0	13.4	6.0	6.6
Fourth and Bryant	14.2	16.0	7.8	8.3	8.6	9.5	4.9	5.3
Fourth and King	19.4	25.6	9.4	12.1	10.5	13.1	5.6	6.9
Eighth and Townsend	11.1	20.1	6.6	9.9	6.8	11.2	4.2	5.4
Second and Bryant	12.0	16.6	7.6	8.9	7.4	9.7	4.7	5.6
Seventh and Townsend	16.5	23.0	9.6	10.1	9.1	11.9	5.6	5.6
Fifth and King	18.6	22.6	9.5	10.8	10.0	11.9	5.5	6.1

Notes:
a. The state one-hour standard is 20 ppm; the federal one-hour standard is 35 ppm.
b. The state and federal eight-hour standard is 9 ppm.
c. Estimated CO concentrations in 2015 are generally lower due to emission controls (i.e., cleaner cars) in the future.

= State and federal standard exceeded   = State standard exceeded

Source: EIP Associates.

Existing Conditions

Existing emission factors (1997) and traffic data were used to prepare modeling estimates, which show that violations of the state and federal CO standards now occur from traffic under existing conditions.

Under existing conditions, 1 of the 13 intersections modeled violated the state's one-hour CO standard of 20 ppm/64/. No violations of the federal CO standard (35 ppm) were indicated. The intersection of Third and King Streets showed the highest concentration at 20.5 ppm. The remaining ten intersections had CO concentration values ranging from 8.4 ppm to 19.4 ppm, all of which are below state and federal standards. The lowest CO concentration was estimated at the intersection of Mariposa and De Haro Streets, near a sensitive receptor (church).

Carbon monoxide concentrations at 5 of the 13 modeled intersections were estimated to violate the eight-hour state and federal standards of 9 ppm. The highest concentration (11.3 ppm) was at the intersection of Third and King Streets. The lowest concentration (5.4 ppm) was estimated at the Mariposa and De Haro Streets intersection.

Existing-with-Project Conditions

The existing-with-project analysis evaluated potential impacts using the hypothetical assumption that instantaneous project development would occur in 1997 in order to compare project air quality effects with the existing setting, as called for in CEQA./65/,/66/ Using emission factors for the existing vehicle fleet and projected increased traffic levels associated with the Mission Bay project development, violations of the one-hour and/or eight-hour air quality standards would result at almost all of the intersections studied. However, full build-out is not likely to occur until after the year 2015, when, due to implementation of anticipated stringent CO controls (i.e., cleaner cars), emissions would be considerably less; therefore, anticipated exceedances of CO standard are expected to be eliminated (see discussion in "Cumulative Conditions with Project, Year 2015," below).

In this hypothetical situation, one-hour violations of the state standard (i.e., concentrations above 20 ppm) were estimated to occur at 8 of the 13 intersections in the study, ranging in concentration from 20.1 ppm to 29.1 ppm. The highest concentration was modeled at the intersection of Third and King Streets. The intersection of Mariposa and De Haro experienced the lowest concentration at 8.6 ppm.

Under these hypothetical circumstances, violations of the state and federal eight-hour CO standards (9 ppm) would occur at 11 of the 13 intersections modeled. Concentrations at the intersections of

Harrison and Fremont Streets and Mariposa and De Haro did not exceed the standard. The highest value (15.0 ppm) was estimated at the intersection of Third and King Streets.

Cumulative Conditions without Project, Year 2015

For the future cumulative growth conditions without the project, all of the intersections modeled would be below the state and federal standards for one-hour and eight-hour exposures. For one-hour worst-case exposure concentrations, the values ranged from 5.5 ppm to 10.6 ppm. The highest one-hour concentration was estimated at the intersection of Third and King Streets. The lowest concentration was at the Mariposa and De Haro Streets intersection.

Estimated worst-case eight-hour exposure concentrations ranged 3.7 ppm to 6.2 ppm, with the intersection of Third and King Streets having a concentration of 6.2 ppm. The lowest concentration was projected at the intersection of Mariposa and De Haro Streets.

Cumulative Conditions with Project, Year 2015

As indicated by the analysis, no violations of the state and/or federal one-hour or eight-hour CO standards at any of the intersections modeled would be anticipated for the Cumulative-with-Project scenario. For one-hour estimates, values ranged from 5.6 ppm to 13.6 ppm, well below the 20 ppm state standard. As in the other scenarios, the highest concentration was estimated at the Third and King Streets intersection and the lowest at the intersection of Mariposa and De Haro Streets. Estimated eight-hour CO concentrations were also below the state and federal standards of 9 ppm. Values ranged from 3.7 ppm (Mariposa and De Haro Streets) to 7.6 ppm (Third and King Streets).

Although there would continue to be large project-related traffic volume increases and low vehicular travel speeds in the Project Area, their adverse effects on CO levels would be offset by the stringent vehicular CO emission controls expected to be implemented over the next 20 years./67/ In general, in both 1997 and 2015, one-hour and eight-hour CO concentrations would increase with the addition of traffic associated with the project. In general, CO concentrations at all of the intersections were shown to decrease in 2015, compared to 1997 levels.

Mission Bay Project with Giants Ballpark, Year 2015

The modeling results discussed above already take into account cumulative traffic, but they do not specifically model cumulative traffic with the Mission Bay project and traffic from an event at the Giants Ballpark at the p.m. peak hour. The Giants Ballpark EIR contains a cumulative transportation and air quality analysis, including UCSF/Mission Bay development with ballpark traffic added/68/, and that analysis is incorporated by reference and summarized below.

Modeling results for CO concentrations in the Giants Ballpark EIR indicate that no violations of the state and federal CO standards would occur in the Cumulative with Project, year 2015 conditions./69/

Plan-Level Analysis

As described above under "Standards of Significance" the plan-level analysis has two components: a population projection component and a vehicle miles traveled component. First, the Mission Bay North Redevelopment Plan and the Mission Bay South Redevelopment Plan would cause a significant air quality impact if the population growth would exceed the population growth assumptions in the current *Clean Air Plan* (CAP). The population assumptions for the Mission Bay project are presented in Section V.C, Business Activity, Employment, Housing, and Population. These were compared to the assumptions in the 1997 CAP, which relied upon ABAG *Projections '96* projections. Appendix Table E.3 shows the comparison; the San Francisco cumulative growth scenario used for Mission Bay is higher than the CAP population assumptions.

It should be noted that the 1997 Clean Air Plan is based on ABAG *Projections '96* which were recently updated by ABAG *Projections '98*. *Projections '98* have population estimates which are more consistent with those used in the project analysis (see Appendix Table C.9 for a comparison). The CAP will be updated in 2000 and will most likely use updated population estimates. Therefore, the inconsistency between the plans may only occur on a short-term basis.

The second test is whether the rate of increase in vehicle miles traveled for the jurisdiction is equal to or lower than the rate of increase in population. Because the project would include land uses which could attract regional trips, vehicle miles traveled could increase at a higher rate than the projected increase in population. However, such an increase might be minimized by the provisions and mitigation measures that promote transit use. In addition, the *General Plan* discourages automobile use and encourages alternative transportation, which is consistent with the types of Transportation Control Measures called for in the *'97 Clean Air Plan*.

Because the population assumptions for Mission Bay exceed those presented in the 1997 CAP and VMT could increase at a higher rate than the projected population increase, the plan would have a significant air quality impact./70/

Although not part of current plan-level analysis methodologies, another consideration is potential contribution of greenhouse gases. The project would result in greenhouse gases from stationary and mobile sources which would contribute to the atmospheric concentrations. The exact nature and extent of these emissions can not be accurately quantified at this time because it is dependent upon the nature of stationary equipment installed, fuel combustion rates, and emission increases of greenhouse gases from mobile sources. Because climate change occurs on a global level, the emission increases associated with this project would not be expected to significantly alter the atmospheric concentrations. Although greenhouse gases are attributable to the project, these emissions are only a small portion of emissions associated with national and global development.

Air Pollutant Emissions from Demolition and Construction Activities

Demolition and construction activities can generate emissions that impact air quality. Of concern are PM_{10} emissions.

The SEIR analysis of project construction impacts follows BAAQMD recommendations in focusing effort on the development of effective and comprehensive PM_{10} control measures rather than the detailed quantification of emissions, primarily because the mitigation measures, if adopted, would reduce temporary construction air quality impacts to insignificant levels./71/ The BAAQMD does not consider construction emissions of CO and ozone precursors significant, because they have already been included in the District's regional planning inventories and are not expected to impede regional attainment or maintenance of air quality standards.

Demolition and excavation activities, construction vehicle travel on unpaved ground, and wind blowing over exposed earth surfaces would generate PM_{10}. Such emissions and the resultant ambient concentrations near construction sites would be very sensitive to local meteorology and topography, to variations in soil silt and moisture content, and to the intensity of equipment use. Such emissions could be as high as 51 lb/acre/day for each construction site. Calculation of construction-related PM_{10} is shown in Appendix E. These emissions could lead to violations of federal and state ambient PM_{10} standards at nearby sensitive receptors, particularly the existing and proposed residential uses north, south, and west of the Project Area, unless a BAAQMD-approved program of mitigation measures were imposed. Emissions leading to violation of federal and state ambient PM_{10} standards during construction would be a significant impact; Mitigation Measure F.2 in Section VI.F, Mitigation Measures: Air Quality, would address this impact. With proper control, PM_{10} emissions would be reduced substantially. The use of water as a dust suppressant can reduce particulate emissions by as much as 90% when applied properly in a diligent manner./72/ The effectiveness of the control depends on a number of factors including frequency of watering, percentage of silt, and wind speed.

TOXIC AIR CONTAMINANTS

The Mission Bay project includes both Redevelopment Plans and a somewhat detailed proposed land use development program. The land use development program as proposed by Catellus and the Redevelopment Agency sets forth certain land uses, including enumerated limits on square footage by use, height zones that in turn would influence stack heights and locations of potential sensitive receptors within the Project Area. While the Mission Bay project has aspects of a local plan and aspects of a project, its size, scope, and two Redevelopment Plans make it more like a plan in terms of the BAAQMD CEQA Guidelines. Information about the specific characteristics of Project Area toxic air contaminant sources is not available at the level of detail necessary to support a quantitative analysis of risk, as would be needed to use BAAQMD's project-level significance criteria. It is therefore more appropriate to evaluate the potential toxic air contaminants impact qualitatively in terms of buffer zones.

Under the BAAQMD CEQA Guidelines, a project with a significant air quality impact automatically would be deemed to have a significant cumulative air quality impact. The BAAQMD CEQA Guidelines do not specifically address the manner in which the cumulative impact of a local plan should be assessed with other adjacent development.

Locations of Future Sensitive Receptors

The BAAQMD CEQA Guidelines define sensitive receptors for toxic air contaminant impact analysis to include residences, schools, and child care facilities./73/ Several proposed land use designations would include these uses, as described in greater detail in "Proposed Land Uses" in Section III.B, Project Description. Residences would be located on at least a portion of each large block in Mission Bay North and on each large block in the Central Subarea of Mission Bay South, with the exception of the hotel block. Commercial Industrial uses and UCSF would be located to the south of The Common. A public school would be located somewhere within the UCSF Subarea. Before the final decision regarding the location of the proposed school is made, the location would be reviewed using the criteria described under "School Siting Criteria" in the Setting section, above. These criteria include consideration of toxic air contaminant emissions sources.

Local-serving child care facilities could be located throughout the Project Area, with the exception of the Mission Bay Open Space and Mission Bay Public Facilities land use designations. Local-serving child care facilities would be allowed as principal uses within the Mission Bay North Retail, Mission Bay South Retail, Hotel, and Commercial Industrial/Retail land use designations. In addition, local-serving child care facilities would be allowed as secondary uses within the Mission Bay Residential and Commercial Industrial land use designations. UCSF plans to have child care facilities within its site. Local-serving child care facilities would provide less than 24-hour care for children of residents and employees in the surrounding neighborhood. Non-local-serving child care facilities would not be permitted under the proposed Redevelopment Plans.

Existing residential receptors near the Project Area are expected to remain. These include houseboats in the Channel, live/work units near the intersection of 18th and Minnesota Streets, and residences near Tennessee and 18th Streets and several blocks south on Minnesota Street. Other existing sensitive receptors are Potrero Hill Middle School students located at 19th and De Haro Streets, about six blocks southwest of the Project Area.

Potential Emissions from the Proposed Project

Under the proposed project, toxic air contaminants would be released from various sources in the Project Area, including stationary sources and mobile sources. Toxic air contaminants could also be released during construction, as addressed under "Contaminated Soils" at the end of this section and in "Previously Unidentified Subsurface Hazards Encountered During Construction," in Section V.J, Contaminated Soils and Groundwater: Impacts.

<u>Stationary Sources</u>

Expected Types of Toxic Air Contaminant Emissions

Routine emissions of toxic air contaminants would be generated by several types of stationary sources in the Project Area, including boilers and emergency generators, research and development facilities, light industrial operations, and retail operations. With the exception of the uses planned by UCSF, the proposed businesses/74/ that would be located in the Project Area can be described and analyzed only in general terms and by industry type, because specific uses have not been identified. Therefore, the potential future operations and resulting emissions of these businesses can only be described in terms of industry profiles rather than in detail on a use-specific basis. Of the uses that would be allowed under the Redevelopment Plans, light industrial, research and development, and various service businesses (dry cleaning, automobile service station, printing shop, newspaper publication, blueprinting shop, sign-painting, sheet metal fabrication) would have the greatest potential to emit toxic air contaminants, based on the types and quantities of hazardous materials they may handle. These uses would be allowed within the Commercial Industrial, Commercial Industrial/Retail, and UCSF land use designations. (The types and quantities of hazardous materials associated with UCSF and Commercial Industrial Uses are discussed in "Hazardous Materials Use, Storage, and Disposal" under Section V.I, Health and Safety: Impacts.)

Examples of the types of toxic air contaminants that could be used by facilities in the Commercial Industrial, Commercial Industrial/Retail, and UCSF land use designations are provided in Table V.F.6 along with trigger levels established by the BAAQMD for some of the substances. As explained in the Setting, above, trigger levels are the emission rates (pounds per year) that would most likely result in cancer risk levels below 1 in 1 million or a hazard index less than 1 under worst case conditions. Facilities that emit toxic air contaminants at rates above these trigger levels are required to evaluate the risks they pose. For those toxic air contaminants where toxicology data are unavailable or limited, BAAQMD does not provide trigger levels.

In addition to toxic air contaminant emissions associated with chemicals used in research and development facilities, toxic air contaminant emissions would also result from operation of utility equipment, such as boilers and emergency back-up generators. Toxic air contaminants of potential concern from the combustion of natural gas in boilers and diesel fuel in generators are benzene, polycyclic aromatic hydrocarbons, and formaldehyde. Other small businesses that have the potential to emit toxic air contaminants may be located in the Project Area. Of these, dry cleaning facilities that emit perchloroethylene would be of concern. Perchloroethylene is a highly toxic chemical carcinogen.

Expected Risks from Toxic Air Contaminant Emissions

While the types of uses that would occupy the Project Area have been identified, the future occupants of the Project Area are unknown, except for UCSF. Therefore, project-related stationary sources cannot be described in detail at this time. Without specific information on the types of pollutants, how these pollutants would be emitted (e.g., stack locations and parameters), locations of receptors, and meteorological conditions, it is impossible to quantify the resulting risk from the stationary sources of the various types of facilities that could be located in the Project Area. (See "Toxic Air Contaminants—Fundamentals of Risk Assessment" in Appendix E for an explanation of the steps needed to quantify the potential risks.)

Individual Facilities Within the Mission Bay Project—Illustrations of Risks from Similar Facilities

Although quantitatively estimating the risks posed by all project-related stationary sources is infeasible, a description of some specific facilities and their risks attributable to toxic air contaminant emissions is instructive in understanding the nature of potential risks associated with the project.

TABLE V.F.6
EXAMPLES OF POSSIBLE PROJECT-RELATED TOXIC AIR CONTAMINANT EMISSIONS AND THEIR BAAQMD TRIGGER LEVELS

Chemical	BAAQMD Trigger Level (lb/yr) /c/
Acetone /a,b/	--
Acetonitrile /b/	0.67
Alkanes and Alkenes /a/	--
Ammonia /b/	19,300
Arsine /b/	--
Benzene /a,b/	6.7
Benzyl Chloride /b/	2,320
Butane /a/	--
2-Butanol /b/	137,000
Butenes /a/	--
t-butylbenzene /a/	--
Butyraldehyde /a/	--
Carbon tetrachloride /b/	4.6
Chlorobenzene /a/	13,500
Chloroform /a,b/	36
Chloromethane /a/	--
Cyclopentane /a/	--
Dicholorosilane /b/	--
Ethylbenzene /a/	193,000
Formaldehyde /a,b/	33
Formic Acid /a/	--
Glutaraldehyde /a,b/	328
Heptane /a/	--
Hexanal /a/	--
n-Hexane /a,b/	83,000
Hydrazine /b/	0.039
Hydrobromic Acid /b/	4,630
Hydrochloric Acid /a/	1,350
Hydrofluoric Acid /b/	1,140
Isopentane /a/	--
Isopropanol /a,b/	444,000

(Continued)

TABLE V.F.6 (Continued)

Chemical	**BAAQMD Trigger Level (lb/yr) /c/**
Mercury /b/	57.9
Methane /a/	--
Methanol /a,b/	120,000
Methylene Chloride /a,b/	190
n-Methylpyrrolidone /b/	183,000
Nitric Acid /a/	2,340
Nitrobenzene /b/	328
Pentane /a/	--
Phenol /b/	8,690
Piperidine /a/	--
Pyridine /a/	--
Toluene /a,b/	38,600
Trichloroacetic Acid /a/	--
1,1,1-Trichloroethane /a/	61,800
Trichlorofluoromethane /a/	--
Valeraldehyde /a/	--
Xylenes /a,b/	57,900

Note: "--" means that trigger levels have not been specified for these compounds.

Sources:

a. University of California, San Francisco, *Assessment of Environmental Impacts for the University of California, San Francisco: Phase III, Health Risk Assessment*, prepared by Radian Corporation, August 31, 1989, pp.5-9.

b. City of Emeryville, *Health Risk Assessment and Wind Tunnel Modeling: Chiron Development Plan*, prepared by Environmental Science Associates, February 1995 (revised April 1995), p.7.

c. BAAQMD Rules and Regulations, Table 2-1-316, "Toxic Air Contaminant Trigger Levels," June 1995; Bay Area Air Quality Management District, *BACT/TBACT Workbook: Guidelines for Best Available Control Technology including Best Available Control Technology for Toxics (TBACT)*, Appendix B, Tables 2-5-1 and 2-5-2 (revised May 25, 1994), 1995.

Because a new UCSF site would be located within the Project Area, it is anticipated that many of the research and development activities in the Commercial Industrial areas would be related to health sciences or biotechnology. Health risks posed by existing UCSF facilities and other life science operations illustrate a range of possible health risks that could result from project operations. In addition, because of the Project Area's proximity to Silicon Valley, semiconductor and computer research and development operations could locate in the Project Area; therefore, health risks from similar high-tech facilities could illustrate the nature of potential project-related impacts. Risks from other UCSF sites and from other industrial facilities are discussed below for illustrative purposes.

University of California San Francisco. In 1989, UCSF completed an assessment of toxic air contaminant emissions from its Parnassus Heights site, and seven other satellite facilities, entitled *Assessment of Environmental Impacts for the University of California, San Francisco.*/75/ For the Parnassus site assessment, a survey of laboratory and fume hood uses identified all the major groups of chemicals by amounts estimated to be released to the air or into the sewers. Based on the survey, representative low-level, mid-level, and high-level emission sources (including 35 laboratory hood vents) were sampled for three eight-hour periods. At the same time, seven ambient air samples were taken from two to five blocks away from Parnassus. In addition to the laboratory vents, other sources of toxic air contaminant emissions included general building exhaust, hospital patient care hood vents, a medical waste incinerator, and two sterilizers. Toxic air contaminants included 1,4-dioxane, formaldehyde, chlorinated hydrocarbons, and benzene. Next, a health risk assessment modeled each source for total risk and cancer burden at 55 receptors to identify the maximally exposed individual (MEI). The model was then rerun with that MEI receptor specified. The study estimated that the calculated risk to the MEI from the five sources was 14 in 1 million. The most significant emissions were from the two sterilizers using ethylene oxide without controls (estimated risk of 9 in 1 million) and the incinerator (estimated risk of 3 in 1 million). The study concluded that, with controls on the sterilizers providing a 98% reduction in ethylene oxide concentrations, the cancer risk would drop from 14 in 1 million to 5 in 1 million./76/ The portion of risk attributed directly to laboratory-related toxic air contaminants was estimated to be 0.48 in 1 million.

Currently, the sterilizers have been controlled to a 99.9% reduction in accordance with BAAQMD requirements, and the medical waste incinerator has been permanently shut down, bringing the risk from patient care, laboratory, and general building emissions to an estimated 2 in 1 million./77/ However, the 1989 study did not model emissions from the then existing power plant and emergency generators at Parnassus, because they were not considered to be a major source of toxic air contaminants. A 1993 health risk assessment for the proposed new central utilities plant concluded that operation of the cogeneration facility (recently completed) and existing emergency generators would have a total risk of 5 in 1 million. Because the MEIs in the two health risk assessments are on opposite sides of the Parnassus site, the theoretical cumulative total risk from the entire Parnassus site would be less than 7 in 1 million. The divergence between the locations suggest that the actual combined risk of all UCSF Parnassus site emissions is much lower than 7 in 1 million. This more recent study estimated the risk attributable directly to laboratory-related toxic air contaminants to be 0.54 in 1 million./78/

UCSF also conducted health risk assessments at its Laurel Heights site for the conversion of about 280,000 gross square feet (sq. ft.) into School of Pharmacy laboratories (no longer proposed), and at Mount Zion Medical Center for the addition of about 640,000 gross sq. ft. to the 450,000 gross sq. ft. Medical Center. Sensitive receptors at Laurel Heights included residences on three sides of the site, and a child care center across California Street. Because of the site's location and topography, the MEI was considered to be directly adjacent to, and above, the building emissions sources, resulting in a total risk estimate of 8 in 1 million. Emissions from laboratory and general building sources were estimated to each contribute about one-half of the risk./79/ At Mount Zion, there are a number of sensitive receptors in the area including residences and schools; however, the risk assessment focused on patient care in the main hospital. The total risk was estimated to be 5 in 1 million at full build-out in 2010. Laboratory sources were estimated to contribute about 2 in 1 million of the total. Currently, the total risk is estimated to be 4 in 1 million, of which the laboratory-source risk is estimated to be 1.5 in 1 million./80/

Although it is difficult to generalize about health risks without knowing precise locations and toxic air contaminant concentrations, emissions at the UCSF site would likely be comparable to those at the Parnassus Heights site, because the UCSF site in Mission Bay is a large site with a similar proximity to potential sensitive receptors. The *UCSF Long Range Development Plan FEIR* estimates that increased cancer risk from toxic air contaminant emissions from a central cogeneration plant or utility plant would be 5 in 1 million and from other general building emissions would be substantially lower than 10 in 1 million./81/ Toxic air contaminant emissions for the Mission Bay UCSF site were estimated in the *UCSF Long Range Development Plan FEIR* to be below UCSF significance thresholds. Although UCSF would not be subject to BAAQMD's "trigger" analysis because it would not obtain local building permits, UCSF intends to keep within the 10-in-1-million emissions standard and a hazard index of less than 1. UCSF would work with BAAQMD, as necessary, to keep site risks below BAAQMD, as necessary, thresholds of significance.

Commercial Industrial Uses. An example of the type of life science-related research and development that could locate in Commercial Industrial and Commercial Industrial/Retail areas within the project is Chiron Corporation's facility in Emeryville, California. A health risk assessment prepared for Chiron's Emeryville campus indicated that that facility emits toxic air contaminants from boilers, laboratory fume hoods, and chemical storage tanks./82/ These sources emit benzene, chloroform, 1,4-dioxane, formaldehyde, and isopropanol, among other toxic air contaminants. The health risk assessment for an expansion of the Chiron facility estimated that the maximum cancer risk would be 0.25 in 1 million, with an acute noncancer hazard index of 0.15 and a chronic noncancer hazard index of about 0.21. All of these levels are well below BAAQMD's Risk Management Policy thresholds.

Although it is difficult to generalize about health risks without knowing the location of receptors and the types, emission characteristics, and concentrations of toxic air contaminants, the distances between receptors and sources on the Chiron campus are comparable to the distances between receptors and sites located within the Project Area. It is conceivable, therefore, that a number of facilities similar to Chiron could locate in the Project Area without individually posing significant health risks to area residents. Building massing and configuring information, along with source strength and location data, would be required to estimate more accurately the dispersion of toxic air contaminants and their potential effects on nearby residents and employees in the Project Area.

Although life science research and development would be expected to occupy most Commercial Industrial space, it is also possible that semiconductor research and development could be located in the Project Area. In addition to the types of chemicals found in life science-related facilities, semiconductor research and development would potentially emit several other types of toxic air contaminants. These include various organometallic compounds, fluorine gas, and chlorinated solvents. Since these operations would not likely be involved in large-scale manufacturing of semiconductors or related components, the potential for emission of large amounts of toxic air contaminants would be smaller than that of large-scale production and manufacturing plants.

The Santa Barbara Research Corporation, a major electronic/aerospace research and development facility in Santa Barbara County, could be representative of toxic air contaminant emissions and receptor distances in the Project Area, if "high tech" or semiconductor research and development were to dominate Commercial Industrial uses, instead of research and development related to the life sciences. According to a health risk assessment of the facility, the cancer risk was estimated to be 2 in 1 million./83/ Toxic air contaminant emissions from this facility include various solvents and metals. Solvents included trichloroethylene, isopropyl alcohol, and xylene. Metals responsible for most of the risk were chromium and lead. These risk assessment results probably exemplify worse case emissions from Project Area facilities because of the types of chemicals handled at the Santa Barbara Research Corporation facility. As with the Mission Bay project, residential receptors are located at distances across the streets adjacent to the Santa Barbara facility's property boundary (within 100 feet). There are currently live/work units approximately a block away from the

Co‥mercial Industrial land use in the southern portion of the Project Area, and there are numerous res. ıtial receptors in the Potrero Hill area several blocks south of the southern edge of the Project Area. However, to infer any quantitative conclusions about the project from the results of health risk assessments at other facilities would require assuming that the same types and quantities of toxic air contaminant emissions would undergo similar dispersion patterns in the Project Area, which may or may not be the case.

Retail Uses. Along with Commercial Industrial operations, such as biotechnology, semiconductor, and multimedia or software research and development operations, commercial retail facilities are proposed. Of these commercial operations, dry cleaning facilities with on-site plants are of particular concern. Toxic air contaminant emissions, in the form of perchloroethylene (tetra chloroethylene), are associated with these facilities. In the Bay Area, dry cleaning facilities are now required to use the best available control technology on toxic air contaminant emissions; however, risks to receptors immediately adjacent to these types of operations may be substantial and considered significant; Mitigation Measure F.5, in Section VI.F, Mitigation Measures: Air Quality addresses this impact./84/ Although future new emissions control and product technologies may help reduce the risk posed by these operations, it is impossible to predict these reductions at this time.

Evaluation Processes for the Above Uses

As explained in the Setting, facilities required to obtain a permit to operate from BAAQMD are reviewed by the BAAQMD regarding emissions of toxic air contaminants and, if appropriate, must go through the risk screening procedure./85/ In addition, facilities emitting toxic air contaminants not otherwise subject to permitting are still required to undergo BAAQMD scrutiny,/86/ because building permit applicants are referred to BAAQMD.

Although certain types of uses, such as certain research laboratories, are exempt from BAAQMD permit requirements (see below), these uses would be referred to BAAQMD through the building permit process. BAAQMD would review information it receives to determine whether the facility is subject to the trigger analysis and, possibly, permitting.

Focusing on research and development uses, research laboratories of less than 25,000 sq. ft. in a building or less than 50 fume hoods are exempt from BAAQMD permits, provided that they use "Responsible Laboratory Management Practices."/87/ Responsible Laboratory Management Practices focus on preventing the escape of volatile toxic air contaminants during procedures, waste storage, and disposal./88/ UCSF's teaching laboratories would be exempt from BAAQMD permitting./89/

Project facilities that would require a permit from BAAQMD (either due to a specific source rule or because of the trigger mechanism process) would be subject to a screening-level risk assessment by BAAQMD. Under BAAQMD's risk management policy, permits to construct and operate would ordinarily be denied to facilities whose risks were estimated at above 10-in-1-million cancer risk or a hazard index greater than 1. Therefore, the BAAQMD review process would be an effective check to reduce the potential risks from most facilities. Although it is not certain that any individual facility would cause a significant impact, Mitigation Measure F.3 in Section VI.F, Mitigation Measures: Air Quality, would ensure that all facilities contact BAAQMD for evaluation.

Turning from the facility approval phase to the operational phase, the Air Toxics "Hot Spots" Information and Assessment Act allows BAAQMD to require a facility that has shown its risk to be less than significant to submit an emissions inventory update, if there are certain types of changes in operations or surrounding conditions, as discussed above in the Setting./90/ A key change in circumstances that requires reevaluation is when a sensitive receptor has been established or constructed within 500 meters (1,640 feet or about one-third of a mile) of the facility.

For example, if a child care center or a school were to locate within 1,640 feet of a previously exempted facility that emits toxic air contaminants, BAAQMD may request an updated emissions inventory from the facility, following receipt of notice from BAAQMD of the presence of such sensitive receptor./91/

If, after evaluating potential risks to a proposed child care facility or school, BAAQMD were to determine that the facility's emissions would create significant risks to the center or school, the emissions source would be required to prepare and implement a plan for reducing these risks to a less-than-significant level, generally within five years./92/

Combined Risk of Individual Facilities Within the Mission Bay Project Area

Under the BAAQMD's Risk Management Policy, BAAQMD ordinarily would issue permits to a facility with estimated risks below the thresholds (1-in-1-million cancer risk and acute and chronic non-cancer hazard indices less than 1) or to a facility with a cancer risk between 1 in 1 million and 10 in 1 million, with TBACT required. It is conceivable that the risk from multiple facilities could combine to produce a cancer risk greater than 10 in 1 million and/or a hazard index of 1, even though risk assessments for individual facilities may have risk levels below significance thresholds. For instance, two or more facilities located next to one another, each with cancer risks less than 10 in 1 million from their toxic air contaminant emissions, may produce a combined cancer risk greater than 10 in 1 million for a particular MEI. The same can be true for noncancer health risks, i.e., individual hazard indices could be less than 1, but especially if MEIs are close together, a combined hazard index could be greater than 1.

The issue of risk from multiple facilities is not addressed through the permitting requirements of BAAQMD, nor are there any established significance thresholds for such combined risks. BAAQMD takes a facility-by-facility approach. No federal, state, or local program requires assessment of combined risks from multiple facilities/93/, although the Air Toxics Hot Spots Program seeks to build the database for examining risks beyond individual facilities. As discussed above and in "Regulatory Framework" in the Setting section, the ARB and BAAQMD use the information compiled under the Hot Spots program to identify areas of concern and high-risk stationary sources. Once a high-risk source is identified, an air toxic control measure or source specific rule may be adopted to control the risk from a specific class of sources. In addition, the inventory information is used in the development of BAAQMD and state policies. Similarly, there are no quantitative guidelines regarding what level of risk is acceptable from combined facilities. Instead, BAAQMD relies on buffer zones for plans under which combined risks from multiple facilities can be anticipated. Accordingly, the combined health risks of individual industrial, research and development, service, and UCSF research uses cannot be quantified at this time and are instead evaluated against qualitative criteria./94/

Buffers Between Uses Emitting Toxic Air Contaminants and Sensitive Receptors

The *BAAQMD CEQA Guidelines* provide for evaluating the significance of toxic air contaminant emissions from stationary sources in the Project Area by assessing whether sufficient buffers are present between toxic air contaminant sources and sensitive receptors. The Guidelines do not contain specific guidance regarding how to assess the adequacy of buffers. The overall Mission Bay land use program places the Commercial Industrial land use designations (the most likely locations for future toxic air contaminant emitters along with UCSF) in a partial ring around the UCSF site, to its east, south, and west, segregated from proposed residential designations. UCSF's contribution to combined toxic air contaminant concentrations in the Project Area would be limited, because UCSF intends to limit toxic air contaminant emissions from stationary UCSF sources at the site to achieve exposures to a cancer risk of less than 10 in 1 million and acute and chronic non-cancer hazard indices of less than 1. Areas adjacent to the proposed Commercial Industrial designations on the west, south, and east (outside of the Project Area) are mostly zoned M-2 (Heavy Industrial), and existing uses are largely industrial and commercial with some live/work and residential uses. On the north, an area of proposed Commercial Industrial uses east of Third Street would be separated from proposed residential areas by The Common, providing about 200 feet of separation.

Residences

Residences would be located on each large block in Mission Bay North and on each large block in the Central Subarea of Mission Bay South, with the exception of the hotel block. The residences in Mission Bay North could be located near, above, or on top of retail uses that could include service businesses that emit air toxics, such as dry cleaners and automotive gasoline stations. Although many sources would be separated from receptors by streets or open space, no buffers can be assumed. However, individual facilities would be required to comply with BAAQMD permit standards, including the Risk Management Policy.

The closest residences to the Commercial Industrial and UCSF land use designations are those on the north side of The Common. The Common provides a buffer of approximately 200 feet. BAAQMD Guidelines do not indicate whether this buffer is sufficient.

Existing live/work and residential uses directly to the south of the Project Area would also be separated by about 200 feet from the nearest proposed future Commercial Industrial uses between Third Street and Illinois Street south to Mariposa Street. The bulk of the Commercial Industrial area is at least 400 feet north of Mariposa Street. The Commercial Industrial area that would extend to Mariposa Street is approximately 250 feet wide. The live/work and residential uses south of Mariposa are located in an M-2 (Heavy Industrial) zoning district, the least restrictive district in San Francisco. Some facilities emitting toxic air contaminants are likely to exist in that district now, and new facilities may locate in the area (outside the Project Area) subject to BAAQMD permitting requirements. The UCSF and Commercial Industrial areas would provide greater buffers to the existing live/work and residential uses in this area than the adjacent M-2 district.

Public School

A public school occupying a site of at least 2.2 acres would be located somewhere within the UCSF subarea. The specific site location has not been determined. The possibility that the public school site would be located directly adjacent to research laboratories cannot be ruled out. It could also be located directly across a street (i.e., Owens, Mariposa, or Third Street) from Commercial Industrial uses. Because the location has not yet been established, no buffer is provided in the Redevelopment Plans. The site selection for the proposed school, however, would be subject to the siting criteria described previously under "School Siting Criteria." Pursuant to this process, the school district must find that the zoning of the surrounding properties is compatible with schools in that it would not pose potential health or safety risks. Lead agencies considering whether to approve a new school site would also comply with CEQA requirements pertaining directly to schools./95/

The Potrero Middle School is more than 3,000 feet from the Project Area; therefore, it is assumed to be sufficiently far away to have an adequate buffer.

Child Care Facilities

Local-serving child care centers (or pre-schools) could be located throughout most of the Project Area, in the Mission Bay North Retail, Mission Bay South Retail, Commercial Industrial, Commercial Industrial/Retail, UCSF, Mission Bay Residential and Hotel land use designations. There are no constraints in the Redevelopment Plans, related documents, or UCSF Long Range Development Plan that require any buffer between child care centers (or pre-schools) and facilities that may emit toxic air contaminants. Therefore, no buffer can be assumed.

Conclusion

Notwithstanding the existing mechanisms to protect sensitive receptors, in the absence of specific data on proposed facilities, the Redevelopment Plans cannot be shown to provide sufficient buffers for residences or the child care centers, to separate them from potential sources of toxic air contaminant emissions within the Project Area. On the other hand, California law and BAAQMD rules provide various mechanisms designed to protect sensitive receptors, including school siting procedures, BAAQMD permit procedures, BAAQMD "trigger mechanism" review of toxic air contaminant emissions, and Air Toxics "Hot Spots" Information and Assessment Act provisions when a sensitive receptor locates within 500 meters (1,640 feet) of a source of toxic air contaminants.

In addition, combined emissions of toxic air contaminants from the stationary sources located at the UCSF site would not be expected to exceed the 10-in-1-million threshold. Accordingly, the combination of these factors suggests that adequate safeguards likely exist to address toxic air contaminant concentrations from stationary sources. However, because specific future facilities in the Project Area that could emit toxic air contaminants are unknown, combined toxic air contaminant concentrations cannot be modeled. Without the ability to predict future toxic air contaminant concentrations, and in the absence of specific standards of significance for risks from toxic air contaminants from combined facilities, the significance of this potential impact is unknown. However, to avoid underestimating the importance of the impact, this SEIR concludes that the potential for significant combined risks to individuals in certain locations cannot be ruled out, and therefore the impact could be significant. Mitigation Measure F.6 in Section VI.F, Mitigation Measures: Air Quality, addresses this impact.

Mobile Sources

Vehicle toxic air contaminant emissions would include such compounds as benzene, polycyclic aromatic hydrocarbons, and formaldehyde resulting from combustion of vehicle fuels and gasoline evaporation. Emissions from mobile sources are not typically included in health risk assessments. In fact, no authoritative body has developed a standard protocol for assessing risks from mobile sources.

Vehicles in and around the Project Area would cause exhaust and evaporative emissions containing toxic air contaminants (mostly benzene). There is no scientific consensus or regulatory guidance on the proper procedures to estimate risks from mobile sources. Although a standard protocol has not been developed to quantify the risk posed by mobile source emissions for the project, an illustrative example is provided here. Air monitoring data and local meteorological information were used in a limited study conducted in the Santa Barbara County Air Pollution Control District to assess the contribution of mobile source emissions to background risk levels./96/ The study concluded that risks from vehicle emissions of benzene at a typical busy intersection in downtown Santa Barbara was approximately 500-in-1-million cancer risk for a lifetime (70-year) exposure.

In addition to increased vehicle trips associated with traffic from the project, emissions from heavy equipment performing construction activities over the life of the development would also contribute to toxic air contaminant emissions. In particular, diesel exhaust contains polycyclic aromatic hydrocarbons and formaldehyde. People would be living in and around the Project Area during the build-out period. Detailed information on the phased development of residential units and on construction project scheduling and the numbers and types of equipment to be used is not yet available.

Because estimating the health risk posed by project-related mobile sources is infeasible, the significance of this impact is unknown. It is assumed, however, to be at least potentially significant. Mitigation Measure F.1 in Section VI.F, Mitigation Measures: Air Quality, addresses this impact.

Contaminated Soils

Although most of the construction would be above existing grade, some disturbance of the soil would be necessary for utilities access to construction projects on the site and subterranean parking on certain sites within the Project Area. Chemicals such as metals and some organic compounds have been detected in Project Area soils at varying concentrations. Excavation could result in the generation of dust-containing toxic air contaminants and adverse impacts on construction workers and the public. "Exposure from Construction Activities," under "Impacts During Project Development" in Section V.J, Contaminated Soils and Groundwater: Impacts, discusses potential toxic air contaminant risks from excavation of contaminated soils in the Project Area.

Cumulative Impacts Regarding Toxic Air Contaminants

Foreseeable development in San Francisco and throughout the Bay Area would contribute to cumulative toxic air contaminant emissions and their resulting risks. Both stationary and mobile sources would contribute to these toxic air contaminant emissions. Only sources that would be relatively close to one another would be likely to directly result in any substantial cumulative exposure and risk because toxic air contaminant concentrations attenuate substantially with distance. However, all toxic air contaminant sources would likely contribute to ambient conditions in the Bay Area.

As discussed in "Regional and Local Air Quality" in the Setting section, existing ambient concentrations of toxic air contaminants pose a cancer risk of about 303 in 1 million./97/ Cumulative development, including project development, could increase this risk, but the magnitude of the possible increase cannot be estimated. A substantial portion of the risk results from benzene emissions associated with motor vehicles.

Federal and state agencies, including the U.S. Environmental Protection Agency and the California Air Resources Board, address toxic air emissions from mobile sources by adopting vehicle emissions standards and by controlling the composition of vehicle fuels. Recent changes in the composition of fuels sold in the Bay Area have substantially reduced the cancer risks posed by ambient levels of toxic air contaminants. Additional measures could reduce these risks further; however, none are assured at this time.

No authoritative regulatory body has adopted any standard to determine whether the risks posed by existing levels of toxic air contaminants should be considered acceptable and, in turn, whether possible increases in ambient risks could potentially be considered significant. However, under the BAAQMD CEQA Guidelines, a project with a significant air quality impact would automatically be deemed to have a significant cumulative air quality impact. As discussed above, the project could be considered by some to pose a significant environmental impact related to combined toxic air contaminant emissions. Because the project could, by itself, pose a significant impact, this SEIR assumes that the cumulative impact of the project could also be significant with respect to combined toxic air contaminant sources. All of the mitigation measures proposed to address project-related impacts, as identified in Section VI.F, Mitigation Measures: Air Quality, would also be effective in reducing this cumulative impact.

INTERIM USES

Interim uses in the Project Area could include parking lots or structures and truck parking activities, which could contribute to existing air emissions in San Francisco and the region.

The project at full build-out would have a significant unavoidable impact on regional air quality as discussed in "Regional Air Quality Impacts: Mobile Sources," above. Operation of the proposed interim uses would not cause a significant contribution to local carbon monoxide levels or to regional air quality, as their traffic volumes and related emissions would be substantially less than for the project at build-out.

The analysis of localized carbon monoxide effects for the project is based on an improved traffic circulation and signalization system in the Project Area that is included as part of the project infrastructure. If some of these infrastructure improvements were not made early because long-term project development phases had not reached a particular location, and permanent uses had not reached levels triggering new transportation infrastructure (see Section VI.E, Mitigation Measures: Transportation), traffic congestion from newly developed interim and temporary uses in the Project Area could occur at key intersections such as at Third and King Streets. This traffic congestion might cause temporary localized carbon monoxide emissions somewhat greater than those shown in the analysis for the proposed project until traffic improvements were provided, reducing congestion, or until a temporary use ended (see next subsection regarding temporary uses).

TEMPORARY USES AND EVENTS

Some temporary uses, such as fairs or carnivals, could attract large amounts of traffic that could cause localized congestion and could contribute temporarily to local carbon monoxide concentrations, particularly if they were to occur before traffic improvements were in place. If very successful, these temporary uses might occasionally attract a number of attendees similar to a sold-out event at the nearby 42,000-seat Giants Ballpark. Traffic patterns for these types of events are different than ballpark traffic, as trips are generally dispersed throughout the day with no single, substantial influx of traffic. Therefore, congestion for a very large temporary event would be less than the conditions analyzed in the Ballpark EIR and the potential for exceedance of the local CO standards would also be reduced. A fair or other temporary event attracting a 40,000 person crowd would be a rare occasion; no known event of this magnitude has occurred in the Project Area.

Parking and vehicle and pedestrian traffic on unpaved surfaces for temporary uses would generate dust which could be annoying to nearby land uses. As these events would be intermittent, the dust generation associated with these events would be less than significant.

GLOSSARY

The following is a list of definitions used to describe risk assessment issues and related emissions.

Toxic Air Contaminant: A designation of any air pollutant that can cause an increase in mortality or serious illness. Adverse health effects of toxic air contaminants may be acute (short term) or chronic (long term). Chronic effects may be carcinogenic (cancer-causing) or noncarcinogenic.

Cancer Risk: Usually expressed as the number of cancer cases predicted in a hypothetical population of one million individuals exposed to a toxic air contaminants. Residential exposure is typically assumed to be 24 hours a day for 30 years (based on U.S. EPA Risk Assessment Guidelines) or 70 years (based on Air Toxic "Hot Spots" Risk Assessment Guidelines), while occupational exposure is typically assumed to be much less.

Chronic Noncancer Health Risk: The expression of adverse health impact estimated from long-term exposure to toxic air contaminants. Typical impacts can be disease or damage to the respiratory system, central nervous system, and organs.

Acute Noncancer Health Risk: The expression of adverse health impacts associated with short-term (usually one-hour) exposure to a toxic air contaminant. Typical impacts may range from respiratory irritation or irritation of mucus membranes to central nervous system damage and death.

Hazard Index: Used to express noncarcinogenic risk from exposure to a toxic air contaminant. A hazard index (HI) is calculated by dividing the modeled receptor exposure concentration by an acceptable exposure concentration or reference level. Results greater than or equal to one may indicate an unacceptable exposure level.

Receptor: A hypothetical or actual physical location where a toxic air contaminant exposure is modeled.

Maximally Exposed Individual (MEI): A theoretical receptor that experiences the greatest risk as a result of toxic air contaminant exposure.

Risk Assessment: The quantification of adverse health impacts associated with exposure to a toxic air contaminant using computer modeling techniques. There are usually four distinct steps: hazard identification, exposure assessment, toxicological assessment, and risk characterization.

Trigger Level: Emissions levels specified by BAAQMD for purpose of initial screening of toxic air contaminants. If exceeded by a source, the source would be required to perform a risk screening analysis.

TBACT: "Toxics best available control technology," technologically feasible control equipment for toxic air contaminant emissions.

NOTES: Air Quality

1. National Ambient Air Quality Standards have been established for criteria pollutants, named for the "criteria" documents that justified their regulation.

2. "PM_{10}" refers to particulate matter less than 10 microns in diameter.

3. National Weather Service Data, 1961-1996.*

4. Intergovernmental Panel on Climate Change, *Climate Change 1995--The Science of Climate.* Report of the IPCC Working Group I. (Cambridge; New York: Cambridge University Press).

5. U.S. Weather Bureau data from observations atop the Old Federal Building at 50 United Nations Plaza during the years 1945-1950. Data were collected hourly, annually for 16 wind directions.*

6. Bay Area Air Quality Management District (BAAQMD), Final San Francisco Bay Area Redesignation Request and Maintenance Plan for National Ozone Standards, August 1993.*

7. BAAQMD, Final San Francisco Bay Area Attainment Contingency Plan for National Carbon Monoxide Standards, August 1993.*

8. In July 1997, the U.S. EPA promulgated new standards for both ozone and particulate matter. There may be legislative or legal changes to the new standards. The U.S. EPA's new ozone standard is 0.08 ppm averaged over eight hours, rather than the existing 0.12 ppm averaged over one hour. Under the new ozone standard, it will be much more difficult for the Bay Area to achieve compliance. The former particulate standards limited concentrations of particulate matter less than 10 microns in diameter (PM_{10}). Due to increased concern over smaller particulate matter being responsible for health impacts, the new standards limit concentrations of particulate matter 2.5 microns or less in diameter ($PM_{2.5}$). The new standard will be implemented in 2000 as the attainment status is being based on 1997, 1998, and 1999 monitoring data.

9. BAAQMD, 1997 Clean Air Plan, a supplement to the 1994 Clean Air Plan, 1997 (adopted December 17, 1997).*

10. BAAQMD, *1994 Clean Air Plan*, 1994.

11. In July 1997, the U.S. EPA promulgated new standards for both ozone and particulate matter. There may yet be changes to the new standards.

12. For instance, an increased risk of 10 excess cancer cases per 1 million persons exposed would mean that, for a hypothetical population of 1 million persons at the MEI location exposed to a specific toxic air contaminant concentration over a lifetime of 30 years (based on U.S. EPA Risk Assessment Guidelines) and 70 years (based on Air Toxic "Hot Spots" Risk Assessment Guidelines), 10 individuals could develop cancer. The cancer may be fatal or nonfatal.

13. 30 years is the standard default assumption presented in U.S. EPA's Risk Assessment Guidelines for Superfund Sites. 70 years is the default assumption presented in CAPCOA's Air Toxic "Hot Spots" Risk Assessment Guidelines. U.S. Environmental Protection Agency (USEPA). *Risk Assessment*

Guidance for Superfund. Volume I: Human Health Evaluation Manual. Supplemental Guidance. Standards for Default Exposure Factors. Office of Emergency and Remedial Response. March 25. 1991. CAPCOA Air Toxics "Hot Spots" Program, Revised 1992, Risk Assessment Guidelines. October 1993.

14. United States Code, Title 42, Section 7412(d).

15. United States Code, Title 42, Section 7412(d).

16. California Health and Safety Code, Sections 44340, 44341, 44360, 1997.

17. BAAQMD, Toxic Air Contaminant Control Program Annual Report 1995, Vol. 1, (body) p. 6, November 1996. California Health and Safety Code Section 44360, 1997.

18. California Health and Safety Code, Section 44391(a), 1997.*

19. California Health and Safety Code, Section 44391(b), 1997.*

20. California Health and Safety Code, Section 44391(c), 1997.*

21. The 1987 Air Toxics "Hot Spots" Information and Assessment Act required existing emitters of toxic air contaminants to submit reports regarding their emissions starting in 1988, 1989, and 1990. California Health and Safety Code, Sections 44320 (applicability), 44322 (implementation schedule), 1997.* Facilities were grouped based on total emissions of criteria pollutants, with the largest required to report in 1988. California Health and Safety Code, Section 44322(a), 1997.* The act requires facilities to update their reports every four years, unless they demonstrate that their risks have been reduced. California Health and Safety Code, Section 44344, 1997.* A facility that shows its "prioritization scores" for cancer and noncancer health effects to be equal to or less than one, becomes exempt, and is no longer required to report. California Health and Safety Code, section 44344.4(a), 1997.* A prioritization score of one is regarded as the significance threshold.

22. California Health and Safety Code, Section 44344.5, 1997.*

23. A new facility is not required to file an emissions plan and report if three conditions are met: The facility is subject to an air district program; the district determines that it has a less-than-significant risk; and the air district issues a permit authorizing construction or operation of the new facility. California Health and Safety Code, Section 44344.5(b), 1997.*

24. California Health and Safety Code, Section 44344.4, 1997.*

25. California Health and Safety Code, Section 44344.7(b)(1)-(2), 1997.*

26. California Health and Safety Code, Section 44344.7(a)(2), 1997.*

27. Significance criteria found in California Health and Safety Code, Section 44360, for establishing priority facilities include consideration of proximity to potential receptors, including, but not limited to, hospitals, schools, day care centers, work sites, and residences.

28. California Health and Safety Code, Section 44344.7(a), 1997.*

29. Brian Bateman, Air Toxics Supervisor, BAAQMD, telephone conversation with EIP Associates, March 12, 1998.

30. The air district must report on the status of such control measures, along with other information, in its annual report under the "Hot Spots" program. See California Health and Safety Code, Section 44363(a)(4).*

31. BAAQMD, "Risk Management Policy," May 9, 1991.*

32. Steve Hill, Air Quality Engineering Manager, BAAQMD, meeting with EIP Associates, OER, and Catellus, February 5, 1998.

33. California Government Code, Section 65850.2.

34. See BAAQMD Regulation 1, Rule 1-410 providing that a person responsible for emission of air contaminants must provide information to BAAQMD.

35. See "Request for Information: Risk Screening Analysis" in the BAAQMD Permit Handbook.*

36. BAAQMD Regulation 1, Rule 1-215, 1982.

37. BAAQMD, Regulation 2, Rule 1-113, Exemption, Sources and Operations, June 1995.*

38. BAAQMD Regulation 2, Rule 1-316, 1995.*

39. California Health and Safety Code, Article 1, Section 42301.6(a).*

40. California Health and Safety Code, Section 42301.7.*

41. California Education Code, Section 17213; Public Resources Code, Section 21151.4.

42. Lead was one of the first hazardous air pollutants to receive national attention in the 1970's. Since lead emissions can be extremely toxic, National Ambient Air Quality Standards were developed to reduce the public's exposure under the Clean Air Act. Therefore, lead has the dual distinction of being a criteria pollutant and a hazardous air pollutant/toxic air contaminant.

43. BAAQMD, *'97 Clean Air Plan*, Volume IV, Appendix G. Source Inventory Description, p. G-5; BAAQMD *'97 Clean Air Plan*, p. D-1.

44. BAAQMD, *Ozone and Carbon Monoxide Attainment/Maintenance Plan*, 1993.*

45. BAAQMD, *Toxic Air Contaminant Control Program Annual Report 1995*, Volume I, November 1996, p. 21.*

● 46. BAAQMD, *Toxic Air Contaminant Control Program Annual Report 1995*, Volume I, November 1996, p. 21.*

● 47. BAAQMD, *Toxic Air Contaminant Control Program Annual Report 1995*, Volume I, November 1996.*

48. BAAQMD, *BAAQMD CEQA Guidelines*, 1996, p. 21.*

49. BAAQMD, *BAAQMD CEQA Guidelines*, 1996, p. 17.*

50. This applies to receptors (e.g., residences, schools) locating near existing sources of toxic air contaminants, as well as sources of toxic air contaminants locating near existing receptors. *BAAQMD CEQA Guidelines*, 1996, p. 17.*

51. Steve Hill, Air Quality Engineering Manager, BAAQMD, meeting with EIP Associates, OER, and Catellus, February 5, 1998.

52. The maximally exposed individual (MEI) is the hypothetical person whose exposure to toxic air contaminants from a project results in the greater risk. For residential receptors, the MEI is assumed to live near the source all his or her life (assumed to be 30 years [based on U.S. EPA Risk Assessment Guidelines] or 70 years [based on Air Toxic "Hot Spots" Risk Assessment Guidelines]).

53. Henry Hilken, Senior Environmental Planner (one of the three principal authors of the BAAQMD's 1996 CEQA Guidelines), Bay Area Air Quality Management District, meeting with EIP Associates, OER, and Catellus, February 5, 1998.

54. BAAQMD, *BAAQMD CEQA Guidelines*, 1996, p. 22.*

55. BAAQMD, *BAAQMD CEQA Guidelines*, 1996, p. 22.*

56. Caltrans, *Transportation Project-Level Carbon Monoxide Protocol*, August 1995.*

57. Keyser Marston and Associates, Inc., "San Francisco Cumulative Growth Scenario for 2015," draft memorandum to Stan Muraoka, San Francisco Redevelopment Agency, August 27, 1997.*

58. See the BAAQMD's *1994 Clean Air Plan* for a discussion of the effectiveness of individual transportation control measures.

59. Potential emissions were calculated using standard emission factors from U.S. EPA's AP-42, 5th ed., Compilation of Air Pollutant Emission Factors, Table 1.4-2, p. 1.4-4.*

60. A cogeneration plant at UCSF's major new site was previously addressed in the *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, certified January 1997, pp. 356-357. Actual emissions from the cogeneration plant would be expected to be similar to emissions reported in the Parnassus Heights Central Utility Plant FEIR, pp. 101-105. University of California, San Francisco, Parnassus Heights Central Utilities Plant Project, Final Environmental Impact Report, January 5, 1994.

61. BAAQMD, Regulation 2, Rule 2-301, June 1995.*

62. UCSF anticipates that the cogeneration plant would have emissions similar to the plant operation at UCSF's Parnassus Heights site. The controlled emissions from Parnassus Heights are subject to a BAAQMD site-specific annual emissions limit of 14.8 tons of NO_x per year. By complying with a similar emissions limit at the Mission Bay site, UCSF would remain below the emissions offsets threshold for No_x.*

63. BAAQMD, *Bay Area Air Quality Management District CEQA Guidelines: Assessing the Air Quality Impacts*, April 1996, p. 15.*

64. An expression of concentration in parts per million (ppm).

65. As mentioned elsewhere in this document, build-out by 2015 is a conservative assumption.

66. Public Resources Code Section 21100 (d); State CEQA Guidelines Sections 15125 and 15126.

67. The emission factors are developed assuming existing regulations that control automobile emissions (such as reformulated gasoline, exhaust pipe emissions controls and regular smog checks for cars) continue in force and that the number of old, polluting vehicles in the regional fleet declines over time as drivers replace old cars with new ones.

68. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report*, Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, Volume I, pp. IV.108-IV.10.

69. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report*, Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, Volume I, p. IV.275.

70. BAAQMD, *BAAQMD CEQA Guidelines*, April 1996, p. 21.*

71. BAAQMD, *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts*, April 1996, p. 27.*

72. Thus particulate emissions could be reduced to 5.1 lb/acre/day.

73. "Sensitive receptors are children, the elderly, people with illnesses or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of facilities that house or attract sensitive receptors." BAAQMD, *BAAQMD CEQA Guidelines*, 1996, p. 9.*

74. The term "businesses" is used in this discussion to represent both businesses and other organizations (called institutions in the Redevelopment Plans).

75. Radian, *Assessment of Environmental Impacts for the University of California, San Francisco, Phases I-III.* (Final Report published August 31, 1989, in six volumes).*

76. Radian, *Assessment of Environmental Impacts for the University of California, San Francisco, Phase III, Health Risk Assessment*, August 31, 1989, pp. 5-5 - 5-14, and 8-2.*

77. BAAQMD, Dentistry Sterilizer, Source Air Permit, 1990; Moffitt Sterilizer Source Air Permit, 1990, certified June 1994; Department of Public Health, 1995 Medical Waste Application (which includes decommission of Pathological Waste Incinerator).

78. Radian, *Phase III Health Risk Assessment*, Table 7-7, and *Parnassus Heights Central Utilities Plant Project FEIR*, certified January 1994, pp. 107, 125, 126.

79. University of California San Francisco, *University of California San Francisco - Laurel Heights Final Environmental Impact Report*, certified May 1990, Appendix J, p. 6-5.

80. ENSR Consulting and Engineering, *Risk Assessment of the UC San Francisco-Mount Zion Hospital and Medical Center*, September 1989, p. 7-16.*

81. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, certified January 1997, Volume II, p. 357.

82. Environmental Science Associates, *Health Risk Assessment and Wind Tunnel Modeling, Chiron Development Plan*, February 1995.

83. Risk Assessment Results for Santa Barbara Research Corporation, Main Building, Santa Barbara County Air Pollution Control District, 1996.*

84. CAPCOA Draft Industry wide Risk Assessment Guidelines, 1996.*

85. BAAQMD, Regulation 2, Rule 1-316, New or Modified Sources of Toxic Air Contaminants, June 1995 (requiring new or modified sources that emit one or more air toxic contaminant in quantities above the trigger levels, to obtain permits, unless the owner or operator of the source can demonstrate that the source would pass a risk screening analysis within 90 days of receipt of a request by the BAAQMD).

86. California Government Code, Section 65850.2(c).

87. BAAQMD, Regulation 2, Rule 1-113.2.12, Exemption, Sources and Operations, June 1995.

88. Responsible Laboratory Management Practices include all of the following: avoiding open container procedures where feasible, avoiding storage of volatile hazardous chemical wastes in open containers, training employees to minimize emissions of volatile toxic air contaminants, posting notices on fume hoods, monitoring fume hoods to assure proper face velocity, and forbidding evaporation as a means of disposing of hazardous chemical waste containing toxic air contaminants. BAAQMD, Regulation 2, Rule 1-224, Responsible Laboratory Management Practices, June 1995.

89. BAAQMD, Regulation 2, Rule 1-113.2.11, June 1995.*

90. California Health and Safety Code, Section 44344.7(a)(2), 1997.*

91. California Health and Safety Code, Section 44344.7, 1997.*

92. California Health and Safety Code, Section 44391(a), 1997.*

93. Steve Hill, Air Quality Engineering Manager, BAAQMD, meeting with EIP Associates, February 5, 1998.

94. Even though the impacts of toxic air contaminants are localized, it is possible that one or more uses in the Project Area may result in a combined risk for a hypothetical maximally exposed individual that exceeds BAAQMD thresholds for evaluating a project under CEQA. Nevertheless, this comparison is inappropriate, since the Mission Bay project falls under the category of a local plan.

95. Public Resources Code, Sections 21151.2, 21151.4, and 21151.8.

96. Santa Barbara County Air Pollution Control District, 1995 Air Toxics "Hot Spots" Annual Report, November 1996.

97. BAAQMD, *Toxic Air Contaminant Control Program Annual Report 1995*, Volume I, November 1996, p. 21.

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

G. NOISE AND VIBRATION

This section describes existing conditions and potential project impacts with regard to noise and vibration in and adjacent to the Project Area. The Setting subsection presents a discussion of noise and how it is measured and a discussion of vibration and how it is described. In addition, existing noise sources and levels are identified, potential existing vibration sources are identified, and applicable regulatory standards for noise and vibration are presented. The Impacts subsection analyzes potential future noise and vibration sources and levels in and adjacent to the Project Area.

The traffic noise analysis in the 1990 FEIR has been updated for this SEIR based on the revised traffic analysis. Other operational noise issues discussed in the 1990 FEIR have also changed as the proposed project has been revised; for example, the Caltrain terminal is no longer proposed to be moved to Seventh Street and the resulting noise impacts on houseboat residents discussed in the 1990 FEIR would no longer occur. Construction noise effects analyzed in the 1990 FEIR remain generally applicable and have been summarized in the Initial Study (Appendix A), under "Construction Noise."

The endnotes for this section begin on p. V.G.32.

SETTING

NOISE

This section describes what noise is and the terms used to express its measurement. In addition, existing sources of noise and applicable regulations for noise control are discussed.

Sound creates pressure differentials in air. These pressure levels are measured in decibels (dB)./1/ Each 3 dB increase or decrease in sound level represents a doubling or halving, respectively, of sound energy. Although decibels can describe the purely physical intensity of sound, they cannot accurately describe loudness as perceived by the human ear. The pitch or frequency of a sound must be taken into account when measuring human response to sound. For this reason, a frequency-dependent weighting system must be employed whenever sound is measured. These measurements are generally reported in A-weighted decibels (dBA). In general, a difference of 3 dB is noticeable to most people and a difference of 10 dB is perceived as a doubling of loudness. Appendix F provides additional information on noise measurements and human reactions to environmental noise.

Noise levels typically fluctuate over time. Several indicators have been developed to describe environmental noise. Two of the most commonly used indicators are L_{eq} and L_{dn}./2/,/3/ L_{eq} is an average of noise over a stated time period; L_{dn} is a 24-hour average which accounts for the greater sensitivity of most people to nighttime noise. Community Noise Equivalent Level (CNEL) is also a 24-hour average, like L_{dn}, but is further weighted for sensitivity to evening noise./4/ These and other indicators are used to describe noise from different sources in different locations. For example, L_{dn} and CNEL are often used to describe general community noise levels, as they provide average noise levels over the entire 24-hour day; in the analysis for the proposed project, L_{dn} is used to discuss traffic noise during the 24-hour day at residential uses. The L_{eq} over a one-hour period is used to describe the traffic noise near nonresidential sensitive receptors like churches and schools because most people would not stay in those locations for more than a few hours.

Noise levels from a particular source decline as distance to the listener increases. A commonly used rule of thumb is that for every doubling of distance from the source, the noise level is reduced by about 6 dB./5/ Noise levels are also reduced by intervening structures—generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dB./6/

EXISTING NOISE SOURCES AND NOISE LEVELS

Major noise sources in the Project Area and vicinity include motor vehicles on major thoroughfares and Interstate 280 (I-280); freight and passenger trains; freight loading and unloading; and heavy equipment and machinery operation. Noise in and around the Project Area can be characterized in terms of a relatively steady "background" noise level upon which "intrusive" noises—noise events that stand out clearly from the background noise—are superimposed. Background and intrusive noise are two distinct descriptors of the sound environment. Intrusive noise is responsible for much of the annoyance generated by noise sources. However, since intrusive noise is generally intermittent and short in duration, it generally does not contribute to long-term average noise levels upon which community noise standards are based. Background noise can have a wide range of averaging periods, from one-hour averages used to characterize peak-hour traffic noise to 24-hour averaging periods used to express overall community noise exposure. Appendix F provides a general discussion of what noise is and how it is described.

Background Noise

Traffic on I-280 and Third Street is the primary source of background noise in the Project Area. Activities such as machinery operations, diesel truck traffic, and freight loading and unloading contribute to the background noise level. Factors such as local meteorological conditions and geographic locations can help intensify or reduce the noise level at any given location.

Traffic Noise

The ambient noise within the Project Area is dominated by vehicular traffic, particularly flows on the major adjacent streets (i.e., Third Street, Fourth Street, and Mariposa Street). Noise from traffic-related activities (e.g., bus idling, bus/delivery truck back-up signals, vehicle queuing for parking) and from stationary equipment also contributes, to a lesser extent, to the ambient noise level.

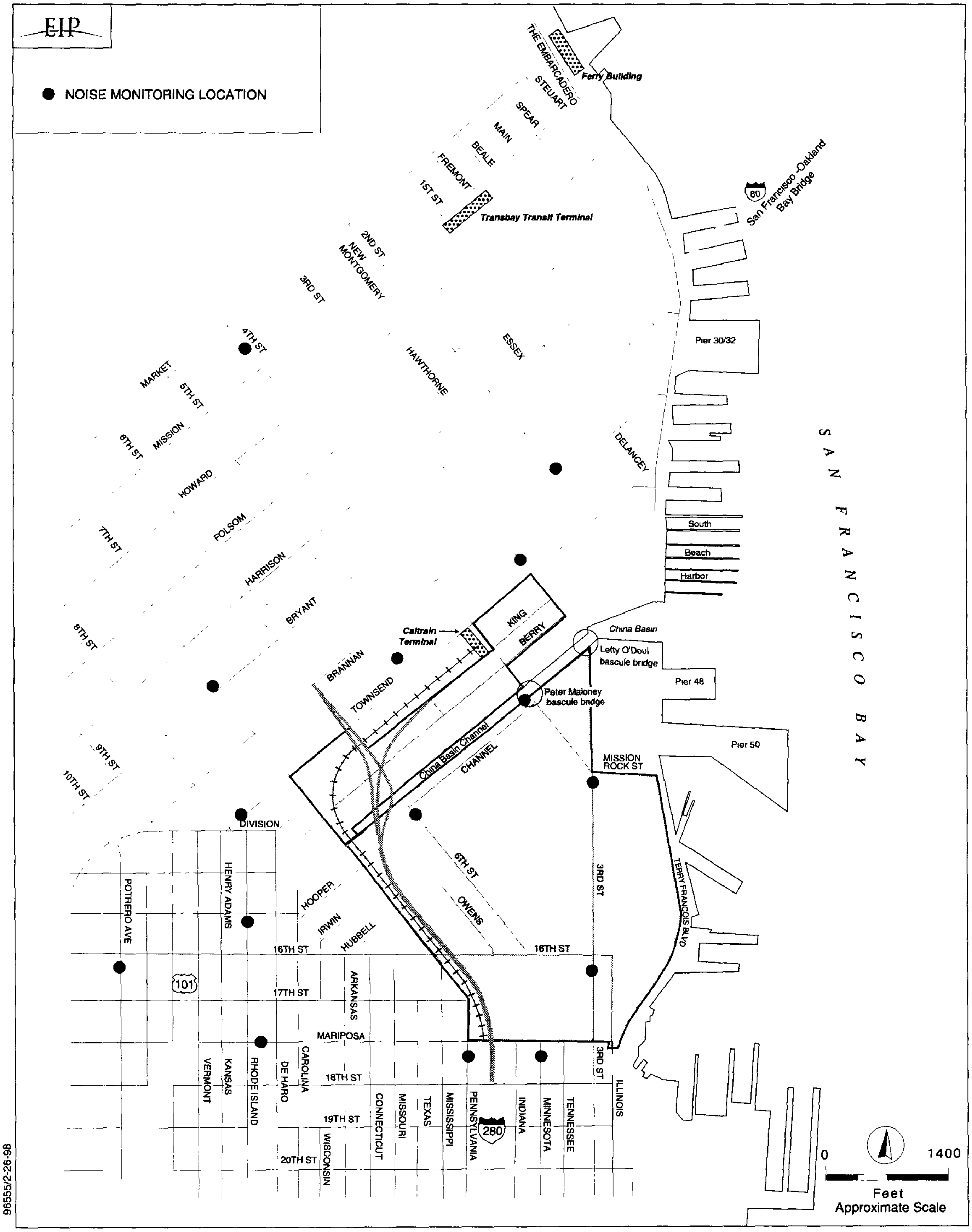
Short-term noise levels were monitored at locations in and near the Project Area. Traffic was counted during the short-term measurement periods to calibrate the SOUND32 traffic noise prediction computer model used for subsequent project and cumulative traffic noise modeling. Ambient noise measurement locations are identified in Figure V.G.1. Figure V.G.2 shows the seven locations selected for study. Appendix Table F.2 presents noise measurement field data for these seven study locations, which were used to calibrate the SOUND32 model. Table V.G.1 (in the Impacts subsection) presents the existing ambient noise levels based on SOUND32 modeling results. The field measurements of ambient noise levels conducted for the future intersection of The Common Streets with Owens Street at the circle were in the vicinity of the houseboats located in China Basin Channel. The model results for existing traffic noise at this intersection are representative of traffic noise on streets nearest the houseboats.

Intermittent Noise Sources

Caltrain

An additional existing source of noise within the proposed Project Area is the Caltrain commuter trains. The rail alignment generally follows Townsend Street from Fourth Street west to I-280, heading south parallel to the freeway in the Project Area. The Caltrain terminal is located south of the intersection of Townsend Street and Fourth Street, adjacent to the Project Area.

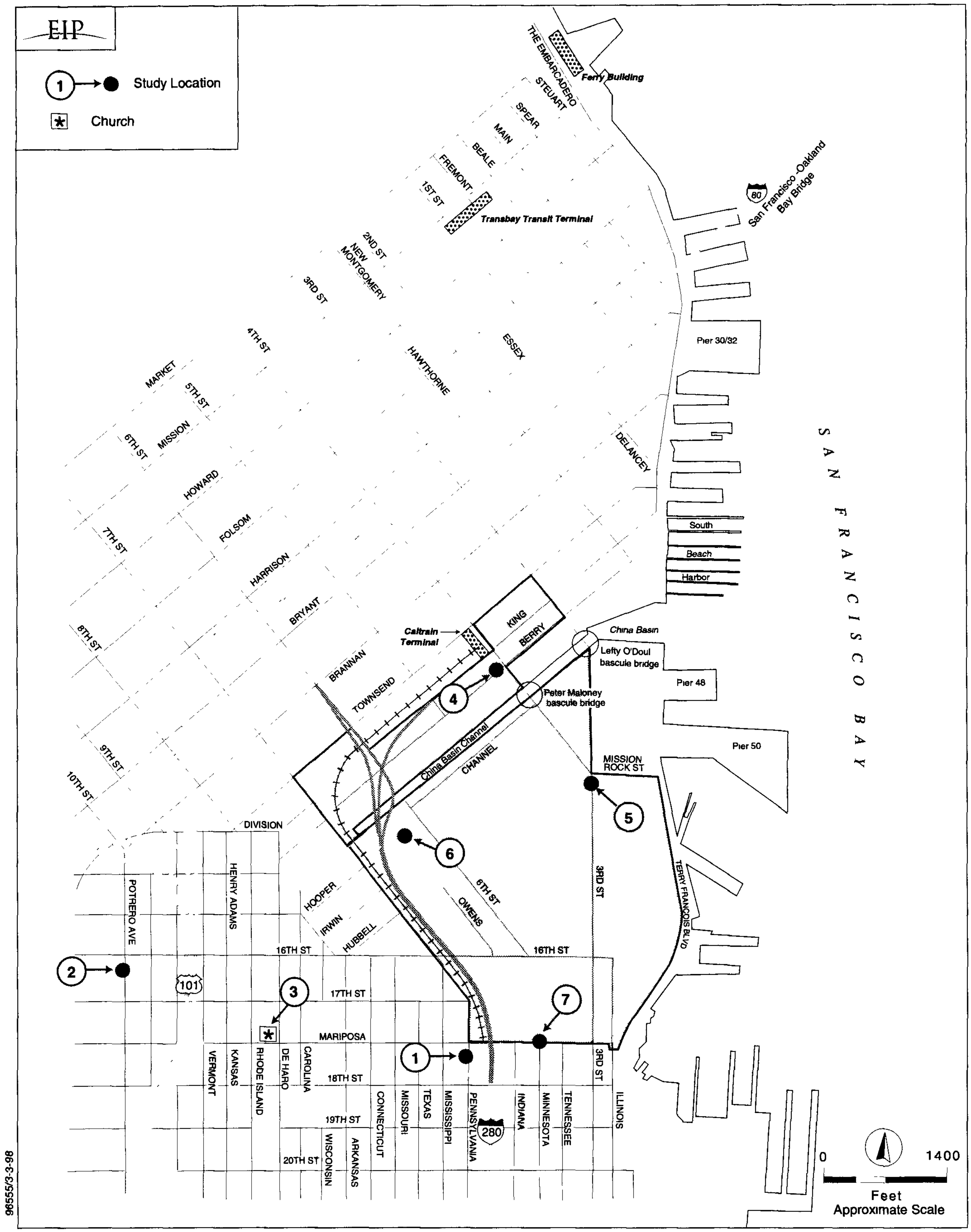
Although there is a considerable amount of noise associated with the operation of Caltrain, the noise generated is most likely less than that of automobile traffic carrying the equivalent number of commuters. Caltrain currently creates intermittent noise within the Project Area; there are currently no sensitive receptors in the Project Area near the Caltrain terminal and tracks under existing conditions. The houseboats at the west end of the Channel, adjacent to the Project Area, are close enough to the tracks for residents to notice trains and train whistles.



SOURCE EIP Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.G.1 AMBIENT NOISE MEASUREMENT LOCATIONS FOR BASELINE ANALYSIS



SOURCE EIP Associates

MISSION BAY SUBSEQUENT EIR

FIGURE V.G.2 NOISE STUDY LOCATIONS

San Francisco Giants Ballpark

A comprehensive analysis of traffic, crowd, and concert noise was conducted for the 1997 *San Francisco Giants Ballpark at China Basin EIR.*/7/ In that report, existing crowd noise levels were monitored at 3Com Park during Giants ballgames. Several sites near the new ballpark were monitored for two or three days to establish existing noise levels. Existing ambient noise levels at several locations in the Project Area near the ballpark were also estimated using computer modeling techniques.

Existing traffic noise levels on most streets near the residential receptors studied in the Giants Ballpark EIR were high enough (above 65 dBA) for the *San Francisco General Plan* Environmental Protection Element to discourage new residential developments unless substantial noise reduction features were included in their designs. The ballpark traffic increment, while small and relatively infrequent, could add to the level of annoyance of some residents on streets affected by ballpark traffic. Full capacity, amplified music concerts without noise controls at the ballpark could occur three times a year; other amplified music concerts are required to limit noise increases at residential sites to less than 3 dBA over the existing ambient noise levels./8/ While not a regular activity, these concerts would increase noise levels at residential locations in the Project Area. Representative sites were studied in the San Francisco Giants Ballpark EIR and are discussed in the Impacts section below.

Bascule Bridges (Third and Fourth Streets)

The Lefty O'Doul and Peter Maloney Bridges at Third and Fourth Streets generate noise when the bridges are lifted. The frequency and duration of bridge openings varies depending on watercraft traffic in the Channel. Openings are tracked by the work shift hours of the operators. More bridge openings occur during the weekend and holiday shifts than during any other shift, followed by the night shifts (3:00 p.m. to 11:00 p.m.), day shifts (7:00 a.m. to 3:00 p.m.), and graveyard shifts (11:00 p.m. to 7:00 a.m.), respectively. Each bridge is opened approximately 45 times each month on holidays and weekends. An average of 21 bridge openings occur each month during the night shift. The average number of openings per month for the day shift is 19 times. During the graveyard shift, an average of 12 openings occur each month. Since the approximate time for opening and closing each bridge is five minutes, the contribution to background noise is considered insignificant.

NOISE-SENSITIVE USES

Certain types of land uses are considered more sensitive than others to higher noise levels. Schools, churches, libraries, hospitals, and nursing homes are generally more sensitive to noise than commercial, office, and industrial uses. Residential land uses are also generally considered noise-sensitive uses because noise can disrupt sleep, conversation, reading, and similar activities that can occur at any time. Noise has been found to be especially disruptive in the evening and at night.

Sensitive Uses in the Project Area and Nearby Areas

There are currently no sensitive land uses in the Project Area. The areas around the project comprise a mix of industrial, commercial, and residential uses. The areas surrounding the Mission Bay Project Area have been broken down into nine Nearby Areas. Sensitive uses in these Nearby Areas have been identified and are discussed below.

Residential uses in three Nearby Areas, designated as North Potrero, Potrero Hill, and Lower Potrero, may also be impacted by noise from increased traffic associated with the project. In particular, the Potrero Hill area contains a residential neighborhood and a sensitive receptor—a church at the intersection of Mariposa and De Haro Streets. In addition, houseboats along the Channel are existing residences that may be affected by the project.

The Inner Mission, South Bayshore, Central Bayfront, and Showplace Square Nearby Areas do not currently contain sensitive receptors that would be affected by the project, although there are residential uses in most of these Nearby Areas.

REGULATORY FRAMEWORK

The following is a discussion of the San Francisco Noise Ordinance and adopted policies related to community noise.

San Francisco Noise Ordinance

The San Francisco Noise Ordinance regulates both construction noise and fixed-source noise. Sections 2907 and 2908 of the San Francisco Police Code regulate construction noise and provide that:

- Construction noise is limited to 85 dBA at 100 feet (ft.) from the equipment during daytime hours (7 a.m. to 8 p.m.). Impact tools are exempt provided that they are equipped with intake and exhaust mufflers.
- Nighttime construction (8 p.m. to 7 a.m.) that would increase ambient noise levels by 5 dBA or more is prohibited unless a permit is granted by the Director of Public Works.

Section 2909 regulates fixed-source noise such as mechanical noise from buildings, measured at the property line of the *affected* property, establishing maximum noise limits. The noise limits are established for zoning districts in which the affected property is located. In residential areas, generally noise levels are limited to 55 to 60 dBA during the day and 50 to 55 dBA during the night. In commercial areas, acceptable noise levels are 60 dBA at night and 70 dBA during the day. In industrial areas, 70 dBA is the established acceptable noise level any time.

A general provision in the ordinance permits the City to regulate unnecessary, excessive, or offensive noise that is annoying to most people. This provision, summarized below from Sections 2915 and 2901.11, generally prohibits excessive noise from a stationary source:

- Unnecessary, excessive or offensive noise which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance of any reasonable person of normal sensitivity residing or working in the area is prohibited. A noise level which exceeds the ambient noise level by 5 dBA or more, as measured at an affected receptor's property line, is deemed a *prima facie* violation of the Ordinance.

Police Code Section 2915 allows the Chief of Police to consider other factors in determining whether a violation of the Police Code exists.

San Francisco General Plan

The *San Francisco General Plan* Environmental Protection Element includes a section on Transportation Noise, as cars, trucks, and buses are the major source of noise in San Francisco's dense urban setting. The Transportation Noise section contains objectives to reduce transportation noise and to promote land uses that are compatible with the existing noise environment. The Element includes a Land Use Compatibility Chart that suggests "satisfactory" exterior noise levels for various land uses. The maximum exterior L_{dn} considered "satisfactory, with no special noise insulation requirements" is 60 dBA for residential and transient lodging land uses, 65 dBA for schools and churches, and 70 dBA for office buildings. In areas where the 24-hour average noise levels exceed these values, the Environmental Protection Element suggests that a detailed analysis of noise reduction requirements be made and that noise insulation features be included in the design of new development. New residential uses are discouraged in the Element in areas with exterior L_{dn} values above 65 dBA unless noise insulation is included.

Title 24 of the California Code of Regulations (CCR) establishes an interior noise standard of 45 CNEL in new residential buildings (hotels, motels, and multi-unit dwellings) with all doors and windows closed. As noted in "Noise" in Section IV.B of the Initial Study (Appendix A), residential buildings in the Project Area would be subject to Title 24 interior noise requirements, and would need to include noise insulation in most cases, based on existing exterior noise levels. While the Environmental Protection Element establishes the basic noise standards for San Francisco with respect to various land uses, it predates Title 24 requirements and is less stringent in many cases. Therefore, San Francisco relies on Title 24 requirements for the regulation of noise in new building construction.

VIBRATION

This section presents fundamentals of vibration, a regulatory framework for vibration, and information on existing sources of vibration in the Project Area.

Fundamentals of Vibration

Vibration is a trembling, quivering, or oscillating motion of the earth. It is similar to noise in that both are forms of energy that propagate through matter as waves. Vibration is transmitted in noise-like (compression) or ocean-like (transverse) waves through the earth.

There are several ways to categorize vibration sources. One way is to divide vibration into natural and artificial sources. Natural sources include earthquakes, volcanic eruptions, sea waves, and landslides. Artificial sources of vibration include explosions, machinery, traffic, trains, and construction equipment. Vibration sources can also be described as continuous, such as factory machinery, or transient, such as freight trains.

Like noise, vibrations can be described by amplitude and frequency. The vibration amplitude can be described in two ways: displacement and velocity. Particle displacement is the distance the soil particles travel from their original location, usually expressed in inches or millimeters. Particle velocity is the speed of the soil particles, usually expressed in inches per second or millimeters per second. Either peak particle velocity (PPV) or vibration decibels (VdB) can be used to describe vibration; VdB is used in the discussion below. It is a shorthand way of describing vibration using a logarithmic scale similar to the decibel scale.

Vibrations also vary in frequency, expressed as Hertz (Hz) or cycles per second. Typical construction vibrations fall within the 10 to 30 Hz range and usually cluster around 15 Hz. Traffic vibrations also generally range in frequencies from 10 to 30 Hz, with a majority of the frequencies found around 15 Hz.

Regulatory Framework

There are no adopted Federal Highway Administration (FHWA), state, or City and County of San Francisco standards for vibration. The Federal Transit Administration has established vibration impact criteria for evaluating the effects of proposed new transit systems, but these criteria are not adopted regulations./9/ One likely explanation for the lack of regulation in this area is that highway traffic and construction vibrations usually do not pose a threat to buildings and structures, and annoyance to people is no worse than other discomforts experienced from living near highways.

Existing Conditions

There are three common types of vibration sources that may be found in and around the Project Area: heavy truck and bus traffic, light and heavy rail operations, and construction equipment. Vibrations from these sources vary with pavement conditions. Pot holes, pavement joints, and differences in the settlement of pavement all increase vibration levels from traffic. Use of construction equipment, pile driving, pavement breaking, and demolition of structures generate among the highest construction vibrations.

Existing conditions in and around the Project Area include heavy truck and bus traffic. For rail operations, Caltrain and the Muni Metro Extension on King Street are sources of vibration. The freight rail line which uses part of the Caltrain trackage to 16th Street, travels on 16th Street to Terry A. François Boulevard in the Project Area, and then continues south to Pier 80 in Illinois Street, is used occasionally (about 15 times per year), and is not a major source of existing vibration. In addition, there are construction, demolition and pile driving activities in and around the Project Area, such as demolition by Caltrans of the I-280 Berry Street exit ramp.

IMPACTS

STANDARDS OF SIGNIFICANCE

San Francisco has no quantitative CEQA threshold for significance related to increases in noise levels. The San Francisco Noise Ordinance and the Environmental Protection Element Transportation Noise section described above in "Regulatory Framework" under "Noise" provide some guidance in evaluating noise effects from the project but do not provide specific legislated criteria for acceptable noise levels and are not adopted CEQA significance thresholds. In general, project increases in noise are modeled and presented quantitatively, but are evaluated qualitatively by asking the following questions:

- Would the increase in noise at any sensitive receptors be reasonably considered substantial?
- Would the increase in noise substantially affect the use and enjoyment of proximate areas or facilities?

Vibration impacts require a combined assessment of source (e.g., vehicle type), path (e.g., geological conditions), and receiver (e.g., building type) to evaluate severity. Although there is no CEQA threshold for significance related to vibration levels, ground-borne vibration can be disruptive to vibration-sensitive activity. A discussion of potential vibration impacts is provided later in this section. Under CEQA, a significant impact is defined as a substantial adverse environmental change.

NOISE ANALYSIS METHODOLOGY

Noise impacts from the proposed project would result from increases in traffic on local streets and near freeway on-ramps and off-ramps. Amplified music noise from events at the San Francisco Giants Ballpark, which is under construction across Third Street from Mission Bay North, could cause impacts on some new uses in the Project Area. The following discussion includes: 1) an explanation of the analysis methodologies used to estimate traffic noise; 2) results of the analysis of traffic noise using 24-hour day-night average (L_{dn}) levels outside residential receptors and one-hour L_{eq} levels outside nonresidential receptors; and 3) a summary of the analysis of music noise from a full-capacity rock concert at the Giants Ballpark as it could affect proposed uses in the Project Area. Traffic noise was analyzed for existing-plus-project conditions and for cumulative-plus-project conditions.

Quantitative and qualitative analyses were performed for noise sources. For vehicle traffic noise, analysis was performed using computer modeling techniques. A qualitative approach was used for sources such as rail transportation, lift bridges, and ballpark noise. All noise levels presented are ambient levels for locations on the outside of the modeled receptor sites. The interior noise levels would be reduced an average of 15 dB with windows open and 25 dB with windows closed./10/ This is the amount of reduction in decibels afforded by building walls and windows. For example, if the exterior noise level is 70 dBA, the interior noise level with windows open is 55 dBA. The increases in interior noise levels would be the same as the increases in exterior noise levels presented in this section. For example, if project-related traffic would cause a 3 dBA change in exterior noise levels, a 3 dBA change would be experienced indoors as well.

Traffic Noise

Noise from the motor vehicles traveling to/from the Project Area was modeled using the Caltrans SOUND32 computer model, an adaptation of the Federal Highway Administration's Highway Traffic

Noise Prediction Model (FHWA-RD-77-108). Noise measurements and traffic counts along one or two adjacent roadway segments, performed simultaneously, were used to calibrate the model.

Traffic noise levels were modeled at two locations near existing residential uses and an existing church. Traffic noise levels were also modeled at five intersections where traffic was projected to increase greatly as a result of project development. The seven study locations are shown in Figure V.G.2; each is near an ambient noise measurement location shown in Figure V.G.1. The locations were studied under the following four traffic scenarios from the transportation analysis:

- Existing: Existing traffic, not including project increases
- Existing-plus-project traffic
- Cumulative 2015: Cumulative growth in traffic to the year 2015 without the project
- Cumulative-plus-project traffic (2015)

The L_{dn} was used to evaluate traffic noise impacts for current residential study locations and study intersections because these uses often are, or may be in the future, occupied during an entire 24-hour period, and are sensitive at night (when the L_{dn} adds a 10 dBA penalty to ambient noise). The one-hour L_{eq} was used to evaluate the noise impact experienced at the church study location on Mariposa and De Haro Streets. The L_{eq} method was used for the church because of the type of use of the building. A one-hour L_{eq} more accurately reflects the impact experienced at a building which receives occasional use, as opposed to the 24-hour L_{dn} which is more appropriate for a building that is occupied for longer periods of time, such as a residence.

Ballgame Crowd Noise

An analysis of concert noise at the Giants Ballpark was performed for the *San Francisco Giants Ballpark at China Basin EIR* using the computer Environmental Noise Model (ENM)./11/ The ENM incorporates the effects of topography, wind, and temperature gradients on noise propagation, when these issues are relevant to the analysis. The attenuative effects of the ballpark walls (as specified in the plan and section drawings provided by the ballpark project architect) and those of other nearby buildings were taken into account by the model. As described in the *San Francisco Giants Ballpark at China Basin EIR*, study locations were selected to address both existing land uses and the future land uses of projects such as Mission Bay. Later in the Impacts subsection, in "Ballpark Concert Noise" under "Intermittent Noise Source Impacts," results are summarized for sites within the Mission Bay Project Area.

TRAFFIC NOISE IMPACTS

Due to development of the project, traffic noise would increase on streets in the vicinity of the Project Area. Increases in traffic are due to the proposed changes in land uses from either vacant or industrial use to higher-density commercial or industrial uses and high-density residential uses. In some cases, traffic volumes are projected to increase by 200% to 400% during the p.m. peak hour due to development of the Project Area. Traffic increases of this magnitude generally cause noticeable increases in ambient noise levels.

Existing Traffic Plus Project Traffic Noise

Two existing residential study locations (Pennsylvania Avenue south of Mariposa Street and Potrero Avenue south of 16th Street) were studied to assess the noise impacts associated with project-related traffic (see Figure V.G.2). These locations were selected because they would experience the most substantial traffic increases among the intersections studied in the transportation analysis; therefore, these two locations provided a conservative sample of effects on existing residential sites near the Project Area. A church on Mariposa Street, west of De Haro Street, was also studied to assess potential noise impacts due to project traffic increases. In addition, four other study locations (Berry Street west of Fourth Street, Third Street south of Mission Rock Street, the future Common Street roundabout south of the future location of Owens Street, and Mariposa Street west of Fourth Street) were analyzed to assess noise impacts on potential future noise-sensitive land uses that may result from project build-out./12/ There are currently no sensitive receptors at these four other study locations. Potential future noise-sensitive receptors include public open space, and child care facilities, schools, and other educational uses that may be in neighborhood-serving commercial areas.

Table V.G.1 summarizes the modeled noise levels from existing traffic, and from existing-plus-project traffic at the seven study locations, and shows the changes in noise levels due to project traffic. The existing-plus-project analysis uses a hypothetical scenario assuming instantaneous development of the project, in order to compare project traffic noise levels with existing noise at the locations studied.

As shown in Table V.G.1, project traffic would increase noise levels near one of the two existing residential locations studied—by 0.4 dBA L_{dn}. There would be no change at the Pennsylvania and Mariposa Streets location. The 0.4 dBA increase at Potrero and 16th Streets would not be perceptible (as an increase of less than 1.5 dB is generally not heard except in noise laboratory testing).

TABLE V.G.1
TRAFFIC NOISE LEVELS FOR EXISTING AND EXISTING-WITH-PROJECT TRAFFIC VOLUMES

	Traffic Noise Source			Noise Level (dBA)		
Location Number/a/	Study Location	Street Modeled On	Near or At	Existing	With Project	Project Increase
					L_{dn}/b/	
1	Residential Location	Pennsylvania	Mariposa	58.8	58.8	0
2	Residential Location	Potrero	16th St.	71.0	71.4	0.4
3	Church (Sensitive Receptor)	Mariposa	De Haro	62.9	64.3	1.4
4	Other Study Location /c/	Berry	Fourth St.	60.8	65.6	4.8
5	Other Study Location /c/	Third	At Mission Rock	73.8	75.3	1.5
6	Other Study Location /c/, /d/	Common Street (roundabout)	Near Owens	63.4	68.6	5.2
7	Other Study Location /c/	Mariposa	Fourth Street	67.4	72.3	4.9
					L_{eq} (1 hour)/b/	
3	Church (Sensitive Receptor)	Mariposa	Near De Haro	64.0	65.4	1.4

Notes:
a. Figure V.G.2 shows the locations of these sites.
b. L_{dn} is the 24-hour average noise intensity with 10 dBA added to account for sensitivity to nighttime noise. L_{eq} is the average noise intensity during the one-hour analysis period.
c. "Other study locations" are locations that do not currently have receptors but were studied to assess noise impacts on potential future noise-sensitive land uses.
d. Field measurements were taken on Sixth Street, south of Channel Street, because this is the existing street closest to the proposed new intersection, and most existing Sixth Street traffic would be expected to shift to the new, extended Owens Street.

Source: EIP Associates.

With project traffic, traffic noise at Saint Gregory's Episcopal Church, on De Haro Street near Mariposa Street, would increase the L_{dn} by up to 1.4 dBA and the one-hour L_{eq} by 1.4 dBA. A 1.4 dBA increase in exterior traffic noise levels would not be noticeable to most churchgoers. The future interior noise levels would be less than 60.5 dBA due to sound level reductions from building walls, and would be unlikely to meaningfully or substantially impact the usefulness of the facility.

The four other study locations listed in Table V.G.1 show projected changes in traffic noise at locations within the Project Area. Increases at these other study locations would range from 1.5 to 5.2 dBA. These increases would alter interior and exterior noise levels equally. The 5.2 dBA increase would occur at The Common Streets roundabout near Owens Street. The future intersection of The Common Streets circle and Owens Street is the intersection nearest the houseboats. The houseboats would not be directly adjacent to the future intersection. The setback between the houseboats and Owens Street (the nearest street) would be greater than the existing distance between the houseboats and Channel Street, due to the proposed expanded open space along China Basin Channel. The houseboats would experience a smaller noise increase compared with the 5.2 dBA increase modeled for the receptor directly adjacent to the intersection in the existing-with-project and cumulative-with-project scenarios. The houseboats would be about five times the distance from the intersection as the modeled receptor; at this distance the noise increase from the intersection would generally be attenuated to background noise levels, as a doubling of distance corresponds to a 6 dB reduction in noise due to attenuation by distance. Therefore, there would be no noticeable change in noise levels at the houseboats due to project-related traffic. Berry Street near Fourth Street would experience an increase of about 4.8 dBA with project traffic increases. Three of the study locations are planned for residential uses, with neighborhood-serving retail uses permitted on the ground floor. These neighborhood-serving retail uses could include noise-sensitive receptors like small child-care facilities or small institutional uses. The study location on Mariposa Street west of Fourth Street is intended to assess traffic noise effects on the public open space proposed for the northwest corner of Mariposa and Fourth Streets. The exact traffic noise impact at these locations would vary depending on the proximity of new sensitive receptors to traffic noise sources and on the build-out schedule for the project.

Existing traffic noise levels at most of the study locations near residential receptors are high enough (above 65 dBA on the exterior of the building) for the *San Francisco General Plan* Environmental Protection Element to discourage new residential developments unless substantial noise reduction features are included in their designs. Newer residential buildings, such as those recently built in South Beach, are required to meet interior noise standards established in Title 24 of the California Code of Regulations and therefore include noise insulation based on existing noise levels at these sites (see "Noise" in Section IV.B of the Initial Study [Appendix A]). The future ambient exterior noise levels with project traffic noise would range from about 65 to 75 dBA L_{dn}. The interior noise levels would be about 15 dBA less than exterior levels with windows open and 25 dBA less with windows closed. This reduction is due to attenuation afforded by building walls and windows. The exterior noise levels could be annoying to some residents on the streets studied and on other similarly noisy streets within the Project Area; the level of annoyance would depend on a number of factors, including whether or not the buildings in the affected residential areas contained sufficient noise insulation. While exterior noise levels may increase and result in a concomitant interior noise level increase, these increases would not be of the magnitude to substantially alter the exterior noise environment and would not cause a significant impact.

Cumulative (Year 2015) Traffic Noise

Table V.G.2 summarizes the modeled noise levels from existing, cumulative, and cumulative-plus-project traffic at seven noise analysis locations. The cumulative traffic analysis includes p.m. peak hour traffic increases associated with the project and other projected growth within San Francisco and in the Project Area. The p.m. peak hour traffic values were scaled to arrive at a total 24-hour traffic increase./13/

With cumulative growth in traffic alone in 2015, 24-hour traffic noise levels would increase by up to 0.6 dBA at the study locations analyzed. At the two residential locations there would be less than a 1 dBA increase due to cumulative traffic growth; this increase would not noticeably change noise levels. Cumulative traffic growth without project traffic in 2015 on streets near the three other study locations would not cause a substantial increase in traffic noise.

Project-induced traffic, when added to cumulative traffic in the year 2015, would add to the overall noise environment at the sites studied and at similar sites along main access routes in and near the Project Area. The cumulative-plus-project L_{dn} noise level would increase by 0.6 dBA at Potrero Avenue and 16th Street. No change would result at the Pennsylvania, south of Mariposa, residential study location because traffic from the Project Area would not be expected to use Pennsylvania Street south of Mariposa Street on a regular basis. Noise from traffic increases on Mariposa Street would not be noticeable at this residential study location.

Proposed project traffic plus cumulative traffic in 2015 would cause 24-hour L_{dn} noise levels to increase by up to 1.8 dBA at St. Gregory's Episcopal Church and other sensitive uses on Mariposa Street at De Haro Street, while the one-hour L_{eq} for p.m. peak hour traffic would increase by 1.6 dBA with project traffic. These increases in traffic noise would not be noticeable to most individuals and would not be expected to interrupt church activities.

TABLE V.G.2
PROJECT TRAFFIC NOISE LEVELS FOR CUMULATIVE TRAFFIC VOLUMES (YEAR 2015)

				Noise Level (dBA)					
				Traffic Scenario			Impact Determination		
								Cumulative Change	
		Traffic Noise Source							
Location Number/a/	Study Location	Street Modeled On	Near	Existing	Cumulative without Project (2015)	Cumulative with Project (2015)	Project Increase over Cumulative	Increase with Cumulative Alone	Increase with Project
				L_{dn} /b/					
1	Residential Location	Pennsylvania	Mariposa	58.8	58.8	58.8	0	0	**0**
2	Residential Location	Potrero	16th	71.0	71.6	71.6	0	0.6	**0.6**
3	Church (Sensitive Receptor)	Mariposa	De Haro	62.9	63.4	64.7	1.3	0.5	**1.8**
4	Other Study Location /c/	Berry	Fourth	60.8	60.8	65.6	4.8	0	**4.8**
5	Other Study Location /c/	Third	Mission Rock	73.8	73.7	75.8	2.1	-0.1	**2.0**
6	Other Study Location /c/, /d/	The Common	Owens	63.4	63.4	68.6	5.2	0	**5.2**
7	Other Study Location	Mariposa	Fourth Street	67.4	66.8	72.1	5.3	-0.6	4.7
				L_{eq} (1-hour) /b/					
3	Church (Sensitive Receptor)	Mariposa	De Haro	64.0	64.4	65.6	1.2	0.4	1.6

Notes:
a. Figure V.G.2 shows the location of these sites.
b. L_{dn} is the 24-hour average noise intensity with 10 dBA added to account for sensitivity to nighttime noise. L_{eq} is the average noise intensity during the one-hour analysis period.
c. Some locations do not currently have receptors but were studied to assess noise impacts on potential future noise-sensitive land uses.
d. Field measurements were taken on Sixth Street, south of Channel Street, because this is the existing street closest to the proposed new intersection, and most existing Sixth Street traffic would be expected to shift to the new, extended Owens Street.

Source: EIP Associates.

The L_{dn} at the other study locations would increase 2.0 to 5.2 dBA in 2015 with cumulative-plus-project traffic. The increase of 5.2 dBA at the roundabout on Common Street south of Owens Street, and the 4.8 dBA increase on Berry Street, west of Fourth Street, would be noticeable to most individuals if the increase occurred over a short period of time. However, these cumulative increases are expected to occur gradually over 15 to 20 years and would not be noticeable to most people. The response by new occupants of the Project Area would depend, in part, on the build-out schedule. Multi-unit residential buildings are required to include noise insulation under Title 24 of the California Code of Regulations (see "Regulatory Framework" under "Noise," above). The amount of insulation is based on ambient exterior noise levels existing at the time that the building permit is issued. If residential uses, or noise-sensitive uses such as a child-care center or educational facilities, were established relatively early in project build-out, when traffic noise was relatively low, an increase of 3 to 5 dBA over time would be noticeable and could be annoying to some people. While interior noise levels would be lower than exterior noise levels by about 25 dBA with windows closed, the increase in noise levels would be the same (2 dB to 5.2 dB), and this increase would be noticeable over time in residential buildings constructed early in the development program in part because the amount of noise insulation required by Title 24 of the California Code of Regulations would have been based on the earlier, quieter noise levels existing at the time that building was constructed. If the noise-sensitive uses were established in buildings built in late phases of project development, traffic-caused noise increases would have already occurred, and building noise insulation requirements in Title 24 would provide substantial attenuation, so that future interior noise increases would be substantially less than the cumulative-plus-project exterior L_{dn} change from 1997 to 2015 shown in Table V.G.2.

The intersection of Mariposa Street and the future Fourth Street realignment was studied to assess traffic noise effects on the proposed public open space adjacent to the northwest corner of this intersection. The change in the cumulative-plus-project noise level at this location would be 4.7 dBA. Because people would not be permanently located in the park, the resulting noise level and its effect on activities would be of greater interest than the change in the noise level. The resulting noise level would be 72.1 dBA and would be at a level for which construction of a park or playground would be discouraged by the *San Francisco General Plan* Environmental Protection Element without further study./14/ The resulting noise level may detract from some of the possible relatively quiet uses of the park, such as picnics or meditation. Other uses such as soccer, exercise, or other sporting activities would not be affected by the resulting noise level. The 72.1 dBA noise level was calculated using peak hour traffic volumes. Noise levels would be lower at off-peak hours and on weekends, when the open space would likely be more heavily used. While the predicted noise level may reduce the desirability of the open space for some activities at certain times of the day, it would not be expected to substantially alter the use of the open space and would not be considered a significant impact.

INTERMITTENT NOISE SOURCE IMPACTS

Ballpark Traffic Noise

The quantitative cumulative traffic noise analysis described above does not include San Francisco Giants Ballpark game day traffic. The San Francisco Giants Ballpark analysis included an estimate of cumulative impacts, when Mission Bay, UCSF, and ballpark traffic coincide. This estimate and analysis are summarized below. Traffic from sold-out events at the San Francisco Giants Ballpark, located across Third Street from Mission Bay North, would combine with cumulative future traffic from the Project Area and from the rest of the City and region on days when events are scheduled. Ballpark traffic noise was analyzed in the Ballpark EIR; relevant portions of that analysis are summarized here./15/ Ballpark traffic would increase noise levels in and near the Project Area primarily during the hour before and the hour after ballgames and events, when the majority of patrons are assumed to arrive at or leave parking areas near the ballpark. The Ballpark EIR analyzed a number of existing and proposed residential locations along expected traffic routes for ballpark traffic, and calculated the 24-hour average noise levels from that traffic./16/ The results of this analysis show that ballpark traffic would cause noise increases over existing and over cumulative 24-hour traffic noise levels of 1.8 dBA L_{dn} or less at the locations analyzed./17/ This increase alone would not be noticeable to most receptors.

Although the locations analyzed in the Ballpark EIR are not the same as those analyzed for this SEIR, the results indicate that the addition of ballpark traffic to the project and cumulative traffic noise from the Project Area would cause similar increases at locations in and near the Project Area. The greatest 24-hour average noise level increases from ballpark traffic were shown on Third Street, north of China Basin Channel./18/ If these increases also occurred in Third Street south of the Channel, noise levels at the intersection of Third and Mission Rock Streets could increase by about 9 dBA L_{dn} over existing exterior and interior levels with project, cumulative, and ballpark traffic. This change would be perceived as a nearly doubling of loudness if it occurred over a short period of time. The actual effect on Project Area residents and sensitive receptors that may locate on Third Street in Mission Bay South would depend in part on when buildings were built and occupied there; if traffic noise increases from Project Area and cumulative growth have already occurred before Third Street sites are built and occupied, the new buildings would have included noise insulation pursuant to Title 24 of the California Code of Regulations and interior noise levels would be attenuated.

The Ballpark EIR also analyzed one-hour L_{eq} noise levels at a few nonresidential locations, including at the church near Mariposa and De Haro Streets. Ballpark traffic alone would add about 5.4 dBA to existing noise levels at that location, during the period before a high-attendance weeknight ballgame or event (6:30 - 7:30 p.m.)./19/ In combination with cumulative growth in traffic including assumptions about growth from the Mission Bay Project Area with UCSF, the Ballpark EIR showed that traffic would cause noise levels to increase by up to 9.2 dBA if p.m. peak hour traffic volumes were to be the same at 6:30 p.m. as they are at 4:30 p.m./20/ This increase would be perceived as a nearly doubling in loudness and would be annoying to many church users when peak ballpark traffic coincided with church occupancy. Ballpark traffic would contribute about 5.5 dBA of the total 9.2 dBA increase. This analysis was prepared using preliminary traffic data for development in Mission Bay, and it included a conservative analysis which overestimated traffic growth on this segment of Mariposa Street west of the I-280 freeway ramps. The more detailed traffic analysis prepared for this SEIR has refined the traffic data. Therefore, the noise analysis for the SEIR shows a smaller noise increase on Mariposa Street at De Haro Street than was shown in the Ballpark EIR. If this p.m. peak hour traffic noise increase were combined with ballpark traffic noise increases, the result would be less than 9 dBA L_{dn} at the church location. The change would be noticed by some churchgoers, but would not be perceived as a doubling in loudness.

Ballgames and other events at the ballpark would not occur on a daily basis, and noise increases due to ballpark traffic would not occur throughout the year. Therefore, at most locations, ballpark traffic noise would not be considered a significant impact.

Caltrain

Caltrain trains would be expected to generate noise which would be noticeable to future residential receptors within the Project Area. The Caltrain terminal is outside the Project Area immediately to the north, at the southwest corner of Fourth and Townsend Streets. New residential receptors in the Project Area would be close to the terminal and tracks (within 100 feet in some locations in Mission Bay North). Weekday operating hours at the Caltrain terminal are from 5:00 a.m. to 10:00 p.m. The last train leaves the terminal at 10:00 p.m. on weekdays, with an additional train leaving San Francisco at midnight on Fridays. After night baseball games and other high-attendance nighttime events at the ballpark there may be an additional train leaving after 10:00 p.m. on nights other than Fridays. One train arrives at about midnight each night; all other arrivals are scheduled before 10:00 p.m. Caltrain currently operates 66 trains each weekday between San Jose and San Francisco./21/ Frequencies in the weekday peak periods vary between 5 and 30 minutes; in the off-peak periods, trains operate every 30 to 60 minutes.

Because there is only one late night train per week most weeks, the noise impact at night, when people are most sensitive to noise, would be limited. This train activity does not substantially affect the 24-hour average ambient noise levels weighted to account for nighttime noise sensitivity (L_{dn})

because there are no trains leaving after 10:00 p.m. on most nights and only one late night arrival. Therefore, new residential uses near the tracks would not experience an L_{dn} that would be substantially higher than the L_{dn} in similar residential areas. There are single-family homes and multi-family residential buildings within 100 feet of the tracks in other areas of the City and along the tracks on the Peninsula (e.g., in San Bruno along San Antonio Avenue; in Palo Alto across Alma Street; in Atherton where backyards of single-family homes are adjacent to the tracks; and in San Mateo where apartment buildings are immediately adjacent to the track right-of-way). The noise, while noticeable, would not be expected to disrupt daily activities at the new residential locations within the Project Area.

Third Street Light Rail

The extended light rail service under consideration by MUNI from King and Fourth Streets south to the Bayview Hunters Point and Visitacion Valley neighborhoods is proposed to travel on Fourth Street to Owens Street, on Owens Street to Third Street and then on Third Street south through the Project Area. Preliminary noise analyses for the Third Street Light Rail Project EIS/EIR indicate that the light rail trains would produce noise levels ranging from 58 to 60 dBA L_{dn} for a receptor at about 10 to 15 feet from the tracks./22/ Because existing noise levels along Third Street are relatively high (68 to 73 dBA L_{dn} at various locations on Third Street as shown in Appendix Table F.3), the addition of light rail traffic would not cause significant increases in noise exposure.

16th Street Freight Rail Track Rerouting

The proposed Mission Bay project would relocate the existing freight railroad tracks located in the vicinity of 16th and Mariposa Streets, which provide access to Pier 80. Currently, the railroad intersects 16th and Third Streets at a 45-degree angle. The railroad tracks would be relocated to coincide with the 16th Street realignment.

Trains bound for Pier 80 would travel east along 16th Street to Terry A. François Boulevard. Trains would then travel north on Terry A. François Boulevard and reverse direction to reach Illinois Street and continue on to Pier 80. Rail access could also be provided to reach Piers 48 and 50, if trackage were extended further north along the boulevard.

The existing freight rail tracks have been used infrequently in the last year./23/ Future use levels are unknown, and would depend on the amount of cargo generated by Pier 80 activity in the future that would be distributed by rail. Freight trains traveling along the 16th Street rail line would be expected to generate noise that would be noticeable to future residents within the Project Area. Freight trains generally would be restricted to use of the main rail line after Caltrain passenger train operating hours, between the hours of 1:00 a.m. and 4 a.m.

Depending on the frequency of use of the freight line near residential land uses (lines to Piers 48 and 50), noise from the trains during the early morning hours may be noticeable and could be disruptive./24/

Bascule Bridge Openings

Noise measurements taken in the field near the Lefty O'Doul and Peter Maloney Bridges, associated with the opening and closing of the lift bridges, indicated that levels were not substantially different from background noise in the area. In addition, the China Basin Landing buildings are located along the Channel between Third and Fourth Streets. This massive structure acts as a noise barrier to potential receptors in Mission Bay North, between Third and Fourth Streets./25/ Potential noise from the bridge would be attenuated by distance between the lift mechanism and residential sites south of the Channel. Finally, the duration of the siren is very short and the total time for bridge openings is about five minutes. Therefore, noise associated with the bascule bridges would not be considered to significantly impact potential future noise-sensitive land uses in the Project Area.

Ballpark Concert Noise

Two concert scenarios at the proposed Giants Ballpark were analyzed quantitatively for noise effects in the Ballpark EIR: the first, a rock concert (special event) with a capacity crowd of up to 50,000; the second, a smaller concert with about 10,000 in attendance, seated in a limited portion of the ballpark with a stage located at the pitcher's mound and a fabric canopy over the infield area./26/

<u>Full Capacity, Open Air Concert</u>

In general, the maximum crowd-cheering noise level would be higher than the maximum music level, but the hourly crowd L_{eq} would be much less than the hourly music L_{eq}. Thus, music would be the dominant influence on the noise environment, with occasional interruption by crowd cheers.

Several locations within the Mission Bay Project Area were analyzed in the Ballpark EIR to assess effects of concerts on possible residential uses. Locations studied were the residential area between King and Berry Streets east of Fourth Street in Mission Bay North, the potential hotel and residential areas between Third and Fourth Streets north of Mission Rock Street, and the proposed residential area east of Third Street south of Mission Rock Street. These locations are listed in Table V.G.3,

TABLE V.G.3
PROJECTED CONCERT NOISE LEVELS
FOR FULL CAPACITY, OPEN AIR EVENTS AT BALLPARK
(representative locations in Mission Bay)

Location	Height /c/	Existing Weekend or Evening Hourly L_{eq}	Ballpark Music/a/ Noise Level (dBA)		Music Plus/a/ Crowd Noise (dBA)		Total Noise/b/ (dBA)	
			Hourly L_{eq}	Max. Level	Hourly L_{eq}	Max. Level	Hourly L_{eq}	Change in Hourly L_{eq}
Proposed Apartments between King and Berry Streets east of Fourth Street (ground, mid-, and top levels)	a	62	53	59	54	61	63	1
	b	60	53	59	54	61	61	1
	c	57	53	59	54	63	59	2
Mission Bay South between Third and Fourth Streets	a	63	69	75	69	75	70	7
	b	63	75	81	75	81	75	12
Mission Bay South along Terry A. François Blvd.	a	60	66	72	67	74	68	8
	b	60	71	77	71	78	72	12

Notes:

a. "Ballpark Music Noise" and "Music plus Crowd Noise" calculate noise from concert music alone and for noise from music and the audience alone, without regard to any surrounding noise sources. "Maximum Level" is the maximum cheer or applause.

b. Total noise adds music L_{eq} plus crowd noise L_{eq} to existing ambient noise. Note that dB cannot be added together using conventional arithmetic.

c. Height "a" is approximately ground floor, height "b" is at approximately 60 feet, and height "c" is at approximately 130 feet of each multi-unit residential building.

Source: *San Francisco Giants Ballpark at China Basin EIR*, Table IV.F.4, p. IV.258; based on Wilson, Ihrig & Associates, Inc., *San Francisco Pacific Bell Park at China Basin Acoustical Analysis of Impacts from Stadium Noise*, February 1997.

which presents relevant data from the Ballpark EIR./27/ As shown in the table, upper stories of buildings in Mission Bay South that face the ballpark could experience increases in hourly L_{eq} of up to 12 dBA. Increases of this magnitude would be distinctly audible above background noise.

Concert and crowd noise from large music events would be noticeable and could be annoying to residents living in residential buildings near the ballpark in the Project Area. Some residents might find it difficult to sleep or might have their sleep disturbed as a result of a large music event.

Because large, amplified music events would be limited to three per year, with mitigation measures imposed requiring noise limits of no greater than a 3 dBA increase at the nearest residential receptor for additional concerts/28/, music noise from concerts would not be considered to be a significant impact on sensitive receptors in Mission Bay.

Small Concert Events

For small music events, music and crowd noise was added to existing noise levels for study locations near the ballpark in the Ballpark EIR./29/ At locations across the China Basin Channel from the ballpark in the Project Area where existing or planned new buildings would not block sound, one-hour average noise increases of 0 to 1 dBA could occur. While this level of noise increase normally would not be noticeable, because of the difference in character of crowd and music noise, it is possible that at some buildings in Mission Bay North, occasional cheers or applause might be noticeable at upper floors with windows open, depending on the sound-reducing qualities of the material used for the canopy in this scenario. The ballpark structure and other intervening buildings would block sound from small concert events at most Project Area locations. Small concert events would not cause significant noise impacts in the Project Area.

CONSTRUCTION NOISE

Construction noise, with the exception of pile driving, would have a short-term effect at each building location and therefore would not be considered a significant impact; pile-driving noise would be exceptionally loud and noticeable throughout the Project Area during build-out. Construction noise was previously examined in the 1990 FEIR; the impact of the proposed project would not substantially differ from that already analyzed, and no major new information about construction noise has come to light since the 1990 FEIR was certified. Compliance with the San Francisco Noise Ordinance would mitigate potential impacts. All development activity, including UCSF, would comply with the San Francisco Noise Ordinance. Construction noise effects and mitigation measures are summarized in "Noise" in Section IV.B of the Initial Study (Appendix A).

Construction pile driving would create a significant noise impact, addressed by Mitigation Measure G.1 in Section VI.G, Mitigation Measures: Noise.

OTHER POTENTIAL NOISE SOURCES

As mentioned in "South Beach," under "Existing Land Uses in Nearby Areas" in Section V.B, Land Use: Setting, there is a potential for maritime industrial or interim non-maritime industrial uses that could expand on Piers 48 and 50 on port property, immediately adjacent to the Project Area, to the northeast of Mission Bay South. Noise sources associated with industrial activities on these piers could contribute to background noise levels, although it is unlikely that residential or sensitive receptors would be adversely affected because of distance from the noise source (300 to 400 feet or more) and reduction in interior noise levels due to Title 24 construction standards.

Live-work uses may be intermixed with future residential land uses in the Project Area. Residential receptors near the live-work buildings may experience intermittent industrial-type noise. However, this type of noise and the proximity of residential receptors is not uncommon in the east side of the City. The noise level experienced by the residential receptors would be similar to that at upper-level residences where the retail facility below was a restaurant or similar somewhat noisy business. All new residential buildings would be built in compliance with Title 24 noise insulation standards which would minimize the impact of intrusive noise. The noise level generated by live-work facilities would not be expected to routinely disrupt daily activities at nearby residential receptors.

A new fire station is proposed to be located within a residential area in Mission Bay South and would have residential receptors on three sides. The sirens on fire trucks would cause intermittent noise at levels that would be annoying to some residents. At close range, without any intervening barriers, sirens can reach upwards of 90 dBA. This noise would be diminished inside the residential buildings by noise insulation. The frequency of the sirens would vary and would depend on the number of emergency responses per day. Similar fire stations within the City respond to as many as 30 calls per day. The location of a fire station within a residential area is not uncommon in San Francisco. Currently there are other fire stations (e.g., Station No. 28, the Telegraph Hill station located at 1814 Stockton, and Station No. 41, the Nob Hill station located at 1325 Leavenworth) located among housing units. While the intermittent noise levels may be annoying, they would not be expected to significantly change the community noise level or 24 hour L_{dn}.

INTERIM AND TEMPORARY USES

Interim and temporary uses generally would be expected to generate less traffic than is projected for full build-out; therefore, traffic noise levels in the Project Area would be less than predicted for cumulative (2015) plus project conditions. No significant traffic noise impacts were found under existing-plus-project or cumulative-plus-project conditions so no significant impacts would be expected from interim and temporary uses when traffic volumes would be less.

Some potential temporary uses such as fairs and carnivals could attract large amounts of traffic and could increase traffic noise levels on a short-term, localized and intermittent basis. However, traffic to these types of events would be dispersed throughout the day with no single, substantial influx of traffic. In addition, based on current experience, these events would be rare. This type of temporary traffic pattern would not substantially alter the traffic noise environment and therefore would not cause a significant traffic noise increase. Noise from stationary activities associated with temporary uses would be regulated by the City Noise Ordinance.

VIBRATION

The following section describes, in qualitative terms, the impacts of vibration from transportation sources and construction activities in the Project Area.

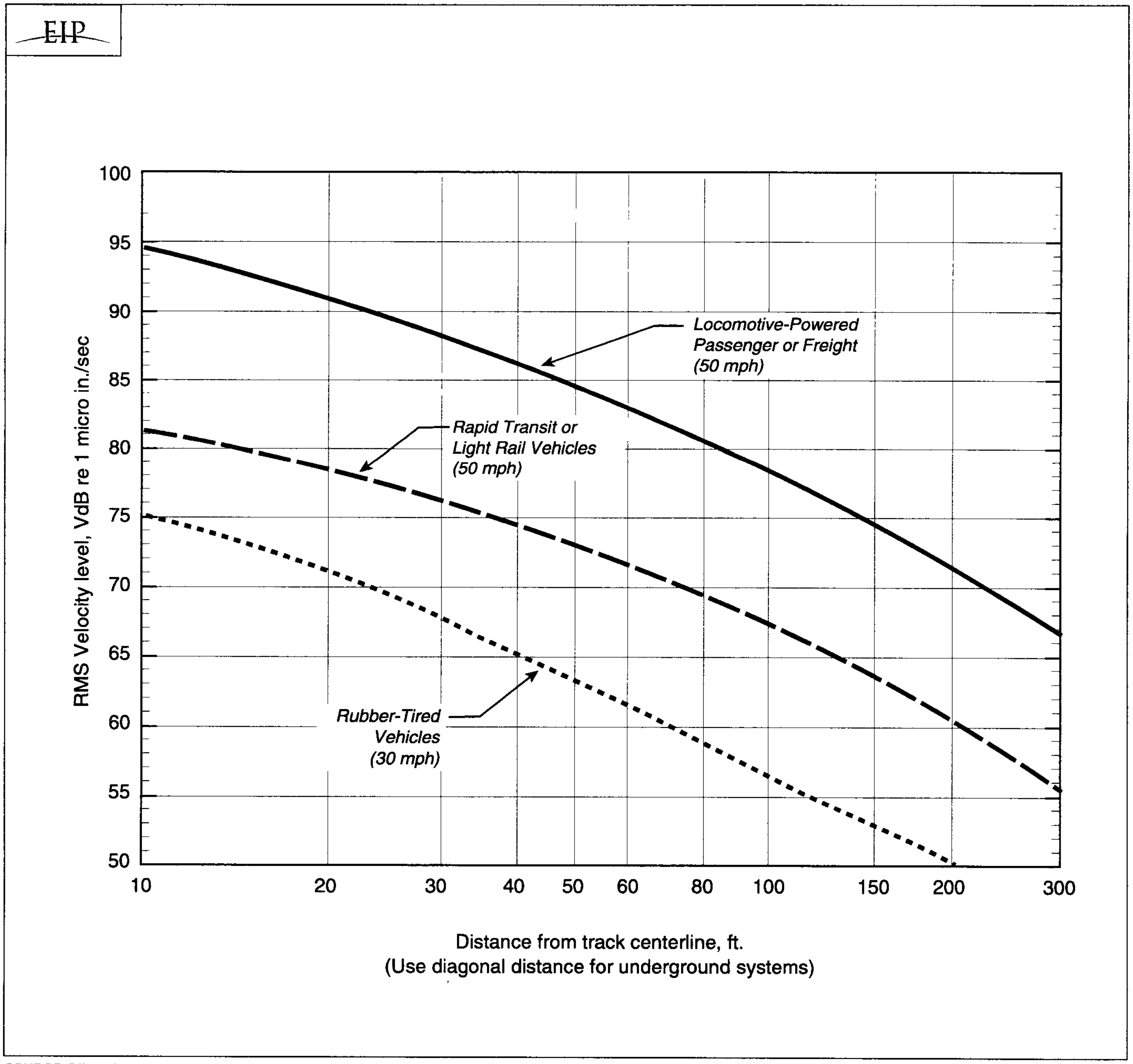
Transportation Vibration Sources

As shown in Figure V.G.3, vibration (VdB) drops off as distance increases from the source. A number of factors are responsible for the attenuation of vibration away from transportation sources. These include source, path, and receiver factors.

Vehicle type, speed, track type (for rail vehicles), or road conditions are considered source factors in the transmission of vibration. Trucks and buses typically cause less vibration than light and heavy rail vehicles./30/ As vehicle speed increases, vibration effects also increase. Rough roadway surfaces increase vibration from heavy trucks and buses. The type of track also plays an important role in vibration from light and heavy rail vehicles; jointed rails cause more vibration than do welded rails, for example. Elevated structures can drastically reduce track vibration. On the other hand, worn track and damaged wheels can increase vibration.

Path factors are associated with the geologic conditions that vibration travels through. For instance, stiff clays will efficiently transmit vibration over greater distances than sand and unconsolidated fill./31/ Depth to bedrock is also important; shallow bedrock less than 30 feet below the ground surface is likely to have efficient propagation of vibration. Depth to bedrock in the Project Area varies from 30 to more than 240 feet below ground surface. (See "Geology/Topography" in Section IV.B of the Initial Study [Appendix A].) In addition to geologic factors, the path that vibration must travel through a building is also important. In general, the heavier the building is, the greater the coupling loss, or effect of vibration. Wood-frame buildings, such as a residential structure, will respond to vibrations more easily than a large masonry building./32/

Finally, the receiver factor accounts for the dispersion, attenuation, or amplification of the vibration energy throughout a building. Vibration generally reduces in level as it propagates throughout a building. A 1 to 2 VdB per floor is usually assumed./33/ Resonances of the building, particularly in the floor, may amplify the vibration, counteracting this attenuation. Therefore, depending on the structural properties of the building, vibration effects may cancel each other out, particularly in a wood-frame building.



SOURCE: Office of Planning, Federal Transit Administration, U.S. Department of Transportation, *Transit Noise and Vibration Impact Assessment Final Report*, April 1995, p. 10-3

FIGURE V.G.3 GENERALIZED GROUND SURFACE VIBRATION CURVES

Proposed project uses that could be affected by transportation vibration sources include new residential uses in buildings on streets adjacent to the proposed alignment of the new Third Street light rail tracks and adjacent to the Caltrain tracks. Most commercial uses in buildings adjacent to the light rail or heavy rail tracks would be less likely to be affected by vibration. However, sensitive and delicate instruments and equipment inside buildings used by research and development firms could be affected by light or heavy rail vibration. Research activities in buildings on the UCSF site located adjacent to 16th Street, where freight rail tracks are proposed to be realigned, and adjacent to Third Street where MUNI proposes new light rail service, could be affected by vibrations if they are using especially sensitive equipment.

Vibration is generally perceptible at levels above 65 VdB, and most people will be strongly annoyed by vibration levels at 85 VdB./34/ (See Appendix Figure F.1 for typical levels of ground-borne vibration.) Typical roadway vibrations from heavy trucks and buses are generally not noticeable under most conditions except when roads are rough or contain potholes, because they operate on rubber tires./35/

As presented in Table 5-18 of the *Draft Third Street Light Rail Project EIS/EIR*, the impact threshold for light rail vehicles on a wood-frame residence was established at 72 VdB, resulting in maximum impact distances in residential land use areas from ground-borne vibration ranging from 20 to 170 feet, without mitigation./36/ Most track segments, including those in the Project Area, have an impact distance of 100 feet for wood-frame residential buildings. According to the Draft EIS/EIR, mitigation measures such as modified suspensions on the trains and vibration control track systems would reduce the impact distance to 55 feet from the source./37/

The Mission Bay project would include multi-unit residential uses within 50 feet of the proposed light rail track along Third Street from North Common Street to Owens Street, and along Owens Street to Fourth Street and the Peter Malony Bridge. The *Third Street Light Rail Project DEIS/DEIR* analysis was prepared for small, wood-frame residential buildings that are more sensitive to vibration than are multi-story masonry buildings. The major buildings in the Project Area are expected to be built with pile-supported foundations that would attenuate vibration. Mat foundations are also likely to be used for some buildings where bedrock is shallow; mat foundations would be more susceptible to ground-borne vibrations than pile foundations but less than wood-frame buildings. If the residential structures on Third and Owens Streets south of the Channel were relatively large concrete construction on piles or spread-footing foundations similar to the residential buildings in South Beach on Townsend and Brannan Streets near The Embarcadero, the impact distance would be reduced to about 25 feet, according to the *Third Street Light Rail Project DEIS/DEIR*./38/ Under these conditions, significant vibration effects on adjacent residential uses would not be expected from light rail vehicles. If any of the residential buildings along the proposed Third Street light rail alignment were to be small, wood-frame buildings, vibration from the light rail vehicles would be noticeable in those buildings and could be annoying to some residents; this type of residential building is not expected to be used in the Project Area on the light rail line, so no significant vibration effect would occur.

Most commercial and industrial buildings facing Third Street south of South Common Street, on the UCSF site and in research and development facilities on the east side of Third Street, would be expected to be in pile supported concrete construction that would attenuate vibration from the proposed light rail line to acceptable levels similar to the residential uses discussed above. Transit vehicle vibration impact criteria for typical commercial and industrial buildings with primarily daytime uses range from 75 VdB to 83 VdB./39/ The *Third Street Light Rail Project DEIS/DEIR* data indicate that vibration levels would range from 70 to 80 VdB at distances of 50 to 100 feet. These vibration levels would not exceed the transit impact criteria for commercial and industrial uses and therefore would not cause significant vibration impacts.

Vibration-sensitive equipment such as optical and electron microscopes in a building calls for a lower impact criterion of 65 VdB, according to the Federal Transportation Administration./40/ As the proposed light rail system could cause vibration levels over 70 VdB at distances of about 50 feet, some impact could occur to more sensitive uses in future buildings located immediately adjacent to Third Street in the Project Area, including those at the UCSF site, unless vibration-reducing measures were included in design and construction of buildings on Third Street or in foundations supporting the vibration-sensitive equipment. It is common for special equipment to be installed with vibration attenuation features in order to avoid disruption from occasional incidents such as loading dock activities in a building; such features would also serve to reduce any vibration from nearby light rail vehicles. Note that the vibration level reported does not account for attenuation due to building construction type; large concrete and steel buildings on pile foundations generally reduce vibration by about 10 VdB/41/, which would reduce the Third Street Light Rail Project vibration to acceptable levels for these sensitive uses without accounting for any measures included in building design, in equipment supports, or in light rail design. Therefore, impacts to vibration-sensitive equipment would be less than significant.

The other main vibration source in the Project Area would be heavy rail from Caltrain tracks in Mission Bay North from the Caltrain terminal and parallel to Seventh Street on the west boundary of the Project Area in Mission Bay South, and from the realigned freight rail tracks in 16th Street, Terry A. François Boulevard and Illinois Street. (Rubber-tire vehicles such as buses and trucks generally do not cause significant vibration effects because the tires and suspension absorb most of the vibration; vibration from these vehicles results mainly from potholes or bumps./42/) In the Project

Area, most residential land use areas are well over 200 feet from the Caltrain tracks, with the exception of residential land uses west of the intersection of Berry Street and Sixth Street. In this block of the Project Area, designated for Mission Bay North Retail land uses, residences may be located as close as 50 feet from the Caltrain tracks on upper stories of buildings. Caltrain is a heavy rail operation and therefore causes greater vibration than would the proposed Third Street light rail vehicles. Generalized ground surface vibration curves, shown in Figure V.G.3, would suggest that vibration could be 85 VdB at 50 feet if Caltrain were operating at 50 miles per hour. The Project Area block closest to the Caltrain tracks is one city block from the train station and the train speed would be less than 20 miles per hour; this reduces vibration by about 8 VdB./43/ In addition, vibration would be reduced by building foundations, would be further reduced by the expected building type (concrete on safe foundations) and by locating residences on upper stories, and would be increased by the jointed track typical of heavy rail tracks and by any worn wheels. The resulting vibration level would likely range from 70 to 75 VdB, depending on the specific nature of the soil and fill on that block. Since no details regarding building size and foundation type are available, the effects of vibration on these residences cannot be quantified, but might exceed the Federal Transit Authority vibration impact criterion of 72 VdB for frequent events (vibration events occurring more than 70 times per day) once Caltrain expands service to 86 trains per day./44/ Thus, it is possible that vibration could be a significant impact for buildings at this location. Mitigation Measure G.2 in Section VI.G, Mitigation Measures: Noise and Vibration, addresses this impact.

Caltrain tracks are located somewhat farther from development sites south of the Channel than from the retail and residential area adjacent to the tracks in Mission Bay North. Vibration impacts would attenuate with distance at these locations.

Freight rail tracks are proposed to be relocated from proposed development parcels south and north of 16th Street to the 16th Street right-of-way between the existing Caltrain tracks and Terry A. François Boulevard as part of the Mission Bay project. This heavy rail vibration source would be within 50 feet of the fronts of buildings located along 16th Street, including future buildings on the southern edge of the UCSF site. If research facilities in these buildings included sensitive equipment like that described above in the discussion of the Third Street Light Rail Project, vibrations from freight trains could impact that equipment unless vibration-reducing measures were included in building designs, or in the foundations supporting sensitive equipment typically included in equipment installation. The existing freight rail tracks, located near 16th Street, are used infrequently, and the use is generally limited to 1 a.m. to 4 a.m. (see "Rail Freight," in "Goods Movement," under "Existing Project Area Transportation Facilities" in Section V.E, Transportation: Setting). Freight trains move at low speeds of 5 to 10 miles per hour in this area, because of the large number of curves and the urban nature of the area (see "Pedestrian Impacts," in Section V.E, Transportation: Impacts), substantially reducing vibration effects. Thus, rail freight use in 16th Street would not cause a significant vibration impact.

Construction Vibration Sources

Pile driving is potentially the greatest source of vibration generated from construction activities. As discussed in Appendix G, multi-story structures would most likely require pile driving for their foundations. There are essentially two types of pile drivers: vibratory and impact. A vibratory pile driver, which can operate at different frequencies, vibrates the pile into the ground. The continuous motion of vibratory pile driver may increase the resonance response (sympathetic vibrations in response to ground vibrations) of building structures. Impact pile drivers produce a high level of vibration for short periods (0.2 second) with sufficient time between impacts to allow a building's resonant effects to decay before the next vibration event./45/

Since much of the Project Area is unconsolidated fill, consisting of sand, rock, clay, debris and mud, it is difficult to quantify the vibration impacts of pile driving activities. Also, because of the irregularities of the fill, and difficulties of driving piles through areas of large rock deposits and heavy debris, holes are likely to be drilled for pile driving. This would tend to decrease vibration levels from subsequent pile driving at the source, since not as much energy would be required to drive or vibrate the piles into predrilled holes.

Due to the relatively large distances of over 100 feet and the vibration attenuating characteristics of the fill, it is unlikely that Nearby Areas would experience vibration impacts from pile driving activities. Inside some future buildings within the Project Area, vibration may have impacts on sensitive and delicate instruments and equipment. Many of these vibration-sensitive instruments would be found in buildings on the UCSF site and in buildings housing research and development uses in the commercial/industrial areas of Mission Bay South. These instruments include transmission and scanning electron microscopes, laser optical systems, magnetic resonance devices, and others.

Impacts to these especially sensitive instruments would depend on the proximity of pile driving activities and to what extent precautions have been taken to isolate this equipment from shock. Sensitive devices generally would incorporate design solutions to limit the effects of ordinary vibrations found in any commercial or industrial building, including the use of shock absorbing materials and independent suspension systems. Equipment could also be relocated to less vibration-prone areas of a building if vibration were found to interfere with use during nearby construction activities. Buildings may also be constructed with flexible elastomeric pads incorporated into their design to isolate the structure, or a part of the structure that would house sensitive equipment, from transportation vibration effects, which would also provide attenuation from construction vibration. Because construction vibration effects on sensitive equipment would be a concern for future users of research buildings, rather than a physical impact on people or the environment, it could be an inconvenience but would not be a significant environmental effect./46/

Vibration Impact Conclusion

In the absence of site-specific soil vibration data; building design and location information; construction equipment type and operational details; sensitive instrument and equipment type, location, and isolation features; and regulatory standards; the impacts of vibration in and adjacent to the Project Area are difficult to quantify. In particular, it is possible that impacts would occur from pile driving activities next to existing and occupied structures in the Project Area. These impacts would be temporary and dependent on such factors as the location of the piles relative to existing structures, the time and energy required to drive the piles, the type of pile driver, the structural design of the building, and steps taken to isolate sensitive equipment from the effects of vibration. However, potential construction and transportation induced vibration sources would be known to developers prior to construction and occupancy of new buildings. It is therefore reasonable to assume that building design and construction and equipment installation would reduce vibration impacts to less-than-significant levels.

NOTES: Noise and Vibration

1. A decibel is the standard unit of sound amplitude, or loudness; decibels are measured on a logarithmic scale, similar to the scale used to measure earthquake intensity. A logarithmic scale is a non-linear scale; for decibels, each increase in 10 dB multiplies the previous value by 10. For example, 50 dBA is 10 times louder than 40 dBA, while 60 dBA is 100 times louder than 40 dBA.

2. L_{eq}, the equivalent steady-state sound level, is the average acoustic energy content of noise for a stated period of time. The L_{eq} of two different time-varying noise events are the same if the events deliver the same acoustic energy to the ear during exposure, no matter what time of the day or night they occur, unlike some other measurements that adjust for differences in noise sensitivity at night.

3. L_{dn} is a day-night average noise level, a 24-hour average L_{eq}; it takes into account the greater sensitivity of persons to nighttime noise and adds 10 dBA to the noise level added during the hours of 10:00 p.m. to 7:00 a.m.

4. CNEL is a community noise equivalent level 24-hour average noise similar to L_{dn} but with an additional 5 dBA added during the hours of 7 p.m. to 10:00 p.m. to account for sensitivity to nighttime noise.

5. Minnesota Pollution Control Agency, *An Introduction to Sound Basics*, May 1983.

6. Federal Transit Administration, Transit Noise and Vibration Impact Assessment, DOT-T-95-16, April 1995, Table 6-10. Shielding provided by a row of buildings provided the gaps in the row of buildings is less than 1/3 of the length of the row.

7. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report,* Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997.*

8. San Francisco Board of Supervisors, Resolution 701-97, July 31, 1997, adopting ground lease for China Basin Ballpark, Exhibit F, Improvement Measures, p. 3, Item 2 under "Concerts and Other Events."

9. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995.

10. U.S. Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974, Appendix B, Table 4.

11. The Environmental Noise Model is a comprehensive, commercially available computer model developed by RTA Software Pty, Ltd., Sidney, Australia, for predicting community noise.

12. Background noise measurements were taken at the intersection of Sixth and Channel Streets to approximate the future intersection of The Common Streets roundabout and Owens Street.

13. This analysis does not include the San Francisco Giants Ballpark game day traffic. The impact on the project area and surrounding locations from Giants Ballpark traffic was analyzed in the Giants Ballpark EIR and is summarized in a separate section below. The Giants Ballpark analysis included estimated traffic from the Mission Bay project; although those estimates were preliminary, the transportation noise analysis results in the Ballpark EIR are conservative and remain valid, generally consistent with Mission Bay SEIR results.

14. City and County of San Francisco, Planning Department, *San Francisco General Plan,* Environmental Protection Element, p. I.G.17.

15. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report,* Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997.*

16. The 24-hour L_{dn} was used because residential land uses are sensitive to noise impacts during an entire 24-hour period.

17. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report,* Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, Table IV.F.1, p. IV.246, and Table IV.F.2, p. IV.249.*

18. As no sensitive receptors or residential uses exist along Third Street south of the Channel, the Ballpark EIR did not analyze sites in this area for noise effects.

19. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report,* Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, Table IV.F.1, p. IV.246.*

20. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report,* Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, pp. IV.250-IV.251.*

21. Caltrain Time Table and Information Guide, effective July 6, 1997 - January 3, 1998.

22. City and County of San Francisco, Planning Department, *Third Street Light Rail Project Draft EIS/EIR,* Planning Department File No. 96.281E, State Clearinghouse No. 96102097, Sections 5.13.1 and 5.13.3.

23. Charles Mitchell, Chief Wharfinger, Port of San Francisco, telephone conversation with EIP Associates, March 2, 1998.

24. It is likely that residents would become more accustomed to freight rail noise if the frequency of use was relatively constant and regular and became part of the "background" noise for the area, similar to the noise of Caltrain passenger trains. People are generally more sensitive to intermittent intrusive noise sources that occur on an irregular basis; many people become accustomed to regular, more frequent noise sources that occur at the same time on a daily (or nightly) basis.

25. Potential noise from the bridge would be attenuated by distance between the lift mechanism and residential sites south of the Channel. There is a 6 dB reduction in noise for each doubling of distance.

26. Concert noise impacts are discussed in the *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report*, Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, pp. IV.256-IV.261.*

27. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report*, Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, Table IV.F.4, p. IV.258.*

28. San Francisco Board of Supervisors, Resolution 701-97, July 31, 1997, adopting ground lease for China Basin Ballpark, Exhibit F, Improvement Measures, p. 3, Item 2 under "Concerts and Other Events."

29. City and County of San Francisco, Planning Department, *San Francisco Giants Ballpark at China Basin Final Environmental Impact Report,* Planning Department File No. 96.176E, State Clearinghouse No. 96102056, certified June 26, 1997, pp. IV.259-IV.261.*

30. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* DOT-T-95-16, April 1995, pp. 7-5 to 7-6.

31. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, p. 7-10.

32. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, page 10-9.

33. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, p. 10-10.

34. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, p. 7-5 to 7-6.

35. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, pp. 7-1, 7-5 and 7-9.

36. City and County of San Francisco, Planning Department, *Third Street Light Rail Project Draft EIS/EIR*, Planning Department File No. 96.281E, State Clearinghouse No. 96102097, Section 5.13.3.*

37. City and County of San Francisco, Planning Department, *Third Street Light Rail Project Draft EIS/EIR 2*, Planning Department File No. 96.281E, State Clearinghouse No. 96102087, Section 5.13.3.*

38. City and County of San Francisco, Planning Department, *Third Street Light Rail Project Draft EIS/EIR*, Planning Department File No. 96.281E, State Clearinghouse No. 96102097, Table 5-18, note /b/.*

39. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, pp. 8-2 to 8-3 and Table 8-1.

40. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, pp. 8-2 to 8-3 and Table 8-1.

41. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, Table 10-1, pp. 10-6 and 10-7.

42. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, pp. 7-9 and 9-1 to 9-3.

43. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, publication DOT-T-95-16, April 1995, Table 10-1, "Adjustment Factors for Generalized Predictions of Ground-bourne Vibration and Noise," pp. 10-6 to 10-7.

44. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, Table 8-1, p. 8-3.

45. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, p. 12-11.

46. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995, p. 11-19.

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

H. SEISMICITY

This section provides the seismic information needed to evaluate potential seismic hazards for the Mission Bay project. This information has been updated from the 1990 FEIR for Mission Bay. The Geology & Seismicity section of the 1990 FEIR is incorporated herein by reference./1/ Relevant text is summarized briefly in Appendix G of this SEIR. The project now being considered would occupy approximately the same area as the project analyzed in the 1990 FEIR for Mission Bay./2/ Updated geologic and soils information is included in the Initial Study (Appendix A) and also appears in Appendix G of this SEIR. Terms that are used in this SEIR pertinent to San Francisco's geologic and seismic conditions are defined in the Glossary at the end of this section. The endnotes for this section begin on p. V.H.20.

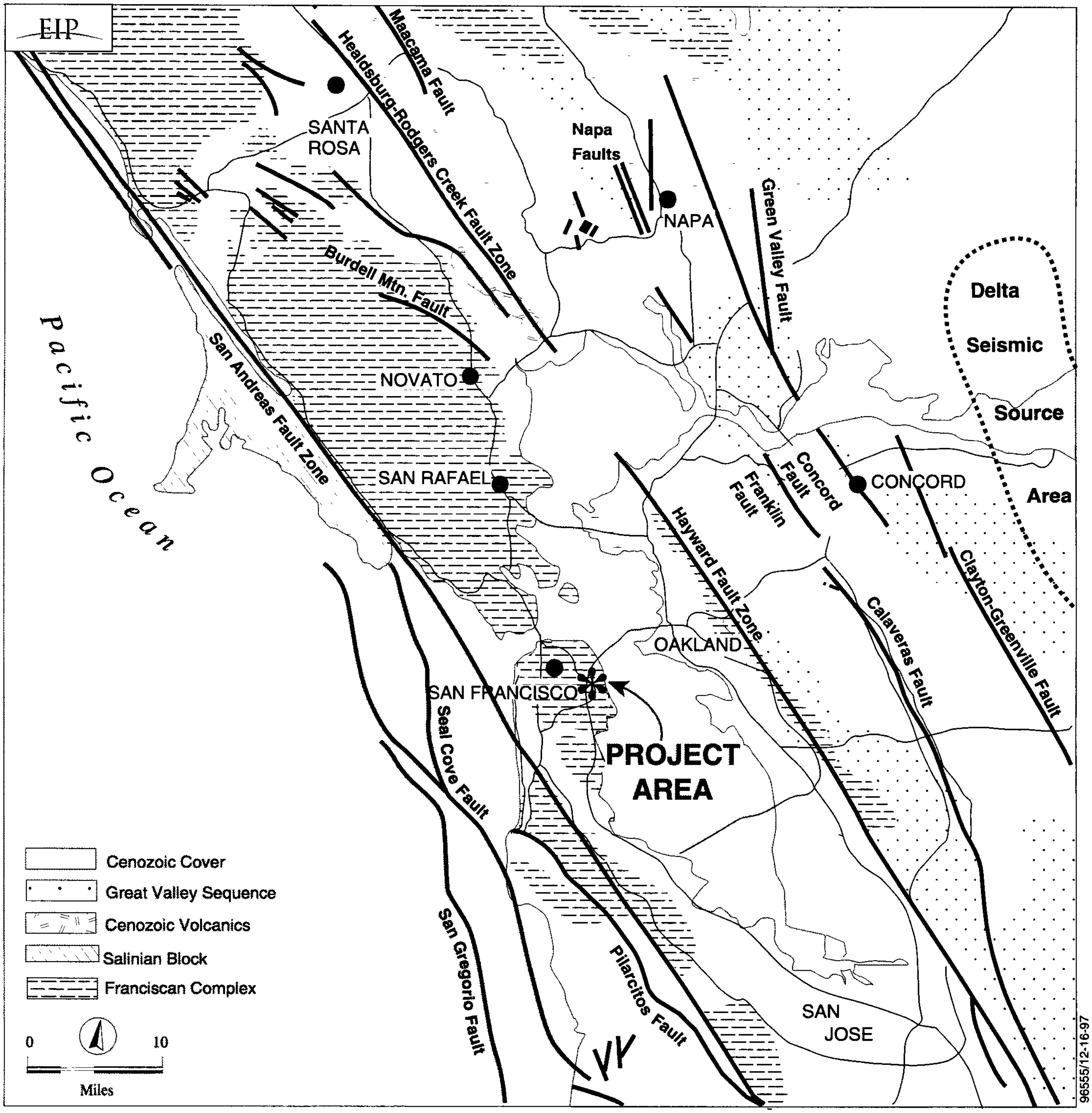
SETTING

REGIONAL CONDITIONS

Fault Activity

There are general conditions of location, composition, and engineering characteristics of geologic units (rock and sediment) that affect seismic design criteria for buildings constructed in San Francisco. Figure V.H.1 shows regional geologic and seismic conditions. The geology of San Francisco is dominated by the San Francisco Peninsula and North Coast segments of the San Andreas fault, the main trace of which divides ancient Franciscan assemblage sandstones, cherts, and shales northeast of the fault trace, from younger claystones, siltstones, and sandstones southwest of the fault trace. The Franciscan rocks are buried by a few feet to a few hundred feet of recent sediments, such as Bay Mud (defined in Glossary), dune sand, and river sand and gravel. These sediments form much of the present ground surface, but in most urban areas that surface has been altered by cuts or the addition of artificial fill. Static and seismic stability of the natural and artificial sediments varies considerably./3/

The Coast Ranges province, in which San Francisco is located, is one of the most active seismic regions in the United States, experiencing numerous low- and moderate-intensity earthquakes every year. About a dozen large-intensity and great earthquakes, causing deaths and property damage, have occurred during recorded history. The major fault zones in the San Andreas fault system (see below) are the sources of these earthquakes, and are likely to be the sources of future earthquakes affecting development in San Francisco, even though no known traces of active faults pass through the City./4/



SOURCE: California Division of Mines and Geology and U.S. Geological Survey, 1994

FIGURE V.H.1 REGIONAL GEOLOGIC MAP

In discussing fault activity, it is necessary to introduce two descriptive terms, "moment magnitude" and "characteristic earthquake"(defined in Glossary)./5/ With the new information from studies of recent large earthquakes (e.g., 1989 Loma Prieta, 1994 Northridge, and 1995 Kobe), it has become necessary to define more precisely the seismic conditions in which planning and development occur, particularly in California. This has been accomplished largely through major revisions to the Uniform Building Code (1994 through 1997), the California Building Code (1995), and the San Francisco Building Code (1995). These specific terms increase the usefulness of the current building codes to people who design, construct, and inspect buildings to meet the standards of the codes. The increasing use of these terms in planning documents facilitates review by city and state agencies responsible for oversight of geotechnical and structural design issues.

The San Andreas, Seal Cove-San Gregorio, Hayward, and Calaveras fault zones (9 miles southwest, 20 miles west, 10 miles northeast, and 22 miles east of the Mission Bay Project Area, respectively) are historically active faults in the San Andreas fault system (i.e., active during the last 200 years). The San Francisco Peninsula segment of the San Andreas fault is capable of generating a characteristic earthquake of moment magnitude (M_w) 7.1; the Seal Cove-San Gregorio fault, M_w 7.3; the Hayward fault, M_w 7.1; and the Calaveras fault, M_w 6.8./6/ Earthquakes of these magnitudes are sufficient to create horizontal ground accelerations (defined in Glossary) greater than 0.5g (50% of the acceleration of gravity) in bedrock or in unconsolidated sediments, which are severe enough to cause major damage to structures, foundations, and underground utility lines./7/ For comparison, the earthquake of April 18, 1906, which ruptured the entire length of the San Andreas fault in the Bay Area, has been estimated at about M_w 7.8 (about M 8.3 on the Richter scale). The Loma Prieta earthquake of October 17, 1989, on the Southern Santa Cruz Mountains segment of the San Andreas fault, was measured at M_w 7.0 (Richter magnitude M 7.1). (Richter magnitude scale defined in Glossary.)

After the 1989 Loma Prieta earthquake, the U.S. Geological Survey estimated the probability of at least one major earthquake (Richter magnitude M 7 or greater) in the San Francisco Bay region within the 30-year period between 1990 and 2020 at about 67%. On the San Francisco Peninsula segment of the San Andreas fault, the probability that a large earthquake would occur in this time frame is estimated at about 23%./8/

Seismic Hazards

Groundshaking

The direct effects of seismically induced groundshaking result from a combination of surface (soil) conditions, the relative stiffness of subsurface geologic units, and the quality of construction at the site. Seismic ground motions range from very low intensities which cannot be detected, except by specialized equipment, to high intensities which can cause buildings to be shaken apart and heavy objects to be thrown into the air. A single earthquake can create the entire range of effects, depending on the moment magnitude of the earthquake, a given site's distance from the source of the earthquake, the geologic conditions at the site, and the design of the buildings on the site. Generally, the intensity of groundshaking increases with proximity to the source of the earthquake, and ground motions tend to be amplified by the presence of a thick sequence of Bay Mud. However, given similar location and seismic energy output, vibrations would be least damaging at sites composed completely of bedrock (as in the northeast corner of the Project Area). Sites underlain by major thicknesses of sediments (such as the fill, Bay Mud, and marine clay beneath most of the Project Area) would experience more severe vibrational damage because of the sediments' tendency to deform to a greater degree than the bedrock./9/ For structures supported on sediments, the combination of ground deformation and susceptible building design (including foundation design) appears to determine the extent of damage, with well-constructed buildings founded on dense, undisturbed native deposits performing considerably better than moderately or poorly constructed buildings on unengineered fill. Pile-supported foundations that depend on firm sediments or bedrock for their support perform better during seismic vibration than structures supported on soft sediments./10/

Liquefaction and Earthquake-Induced Settlement

In San Francisco, the potential for liquefaction (defined in Glossary) poses a hazard in areas of old artificial fill for two reasons: lack of fill compaction, and lack of fill content control. Much of the old artificial fill was placed along the waterfront before modern engineering methods of compaction were developed or known to be needed. Essentially, any available material was dumped into the Bay at the shoreline until the new land surface was above high-tide level. The result was a loose, saturated deposit composed of irregular pockets of sand, gravel, rock, brick, lumber, or other disposed material. Only light structures could be supported on such material because almost any weight caused the fill to consolidate. The fill also settled under its own weight. During seismic groundshaking, vibration can cause this type of fill to settle or liquefy under certain conditions of saturation. Such conditions do not exist throughout all filled areas, but because there is no record of what was used for fill at most sites along the former shoreline, only site-specific geotechnical investigations can demonstrate the presence or absence of liquefiable material. The fill in the Project Area is loose material of this type, some of which is subject to liquefaction./11/

Tsunami and Seiche

Tsunami (defined in Glossary) are large sea waves generated by submarine earthquakes, or similar large-scale, short-duration phenomena, such as volcanic eruptions, that can cause considerable damage to low-lying coastal areas. Seiches (defined in Glossary) are waves, also caused by large-scale, short-duration phenomena, that result from the oscillation of confined bodies of water, such as San Francisco Bay, that have the potential to damage low-lying coastal areas, although not as severely as tsunami. The amount of damage caused by tsunami and seiches in the San Francisco Bay Area in historic times has been small, and there is little reliable data for local pre-historic events, but the potential for damage exists along all of the City's waterfront. Prior to the 1989 Loma Prieta earthquake, tsunami and seiches had been considered phenomena associated only with earthquakes distant from the Bay Area (such as the 1964 Alaska earthquake which generated a tsunami that caused moderate damage around San Francisco Bay) because the mode of faulting along California's coast generally did not cause vertical disruptions of the sea floor./12/ The Loma Prieta earthquake did not cause a tsunami, but did create a 6-inch seiche effect in Monterey Bay, demonstrating that these phenomena can be associated with earthquakes on local faults./13/

PROJECT AREA CHARACTERISTICS

Geotechnical Investigations/14/

In 1995, geotechnical investigation of the Project Area was conducted by Treadwell & Rollo, Inc., Environmental and Geotechnical Consultants./15/ Field investigation included drilling or examining nearly 400 soil borings to depths greater than 240 feet below ground level, logging the borings during drilling, sampling and visually classifying material from the borings, and testing the in-place support capacity of the subsoils. Soil and groundwater conditions encountered during the drilling were recorded. Field and laboratory tests were performed to analyze such physical properties as moisture content, density, strength, compressibility, and corrosiveness. Project engineers used these technical data in formulating foundation and structural designs. Geo-seismic database and literature research provided information on local and regional geology and fault activity needed to formulate such design factors as foundation support, pile lengths, slabs-on-grade, earthwork (excavation and backfill), seismic considerations (soil profile, liquefaction, settlement), and corrosivity of soils.

Subsurface Conditions

Subsurface investigations by Treadwell & Rollo confirm that the site is underlain by fill, Bay Mud, alluvium, Old Bay Clay, colluvium, and Franciscan Bedrock. The sequence is described in Section 9, Geology and Topography, of the Initial Study for this SEIR (see Appendix A). Briefly, the sequence consists of less than 1 foot to more than 45 feet of loose artificial fill, irregularly distributed across the site, and underlain by 10 to 70 feet of soft, compressible, water-saturated, silty clay known as younger Bay Mud; a layer of sandy alluvium between 1 and about 30 feet thick; 1 to 40 feet of the stiff, marine Old Bay Clay; and the Franciscan bedrock, the top of which is weathered and fractured (colluvium), at depths ranging from about 30 feet to about 130 feet below sea level./16/ The locations of old piles, driven to support roadways, buildings, storm drains, and sewer lines, are known along King Street (in Mission Bay North) and in the area west of Third Street (in Mission Bay South)./17/

Groundshaking

The Association of Bay Area Governments' computer models of the damage expected from major earthquakes on various segments of San Francisco Bay Area faults indicate that a M_w 7.1 earthquake on the Peninsula segment of the San Andreas fault would cause moderate structural damage (Modified Mercalli Intensity VIII, in Glossary) in the Project Area. Heavy structural damage (MM Intensity IX) would be caused by a M_w 7.1 earthquake that ruptured the entire length of the Hayward fault./18/

Liquefaction

The depth of the water table below the ground surface in the Project Area ranges from less than 1 foot in areas where railroad tracks remain in place, to as much as 18 feet in the area north of Mariposa Street, as revealed by numerous test borings. The presence of water in loose granular materials such as the unengineered fill by the Project Area produces conditions that could lead to liquefaction during seismic vibration./19/

REGULATORY FRAMEWORK

Seismic Hazard Zones

Two major pieces of state legislation regulate construction near active fault traces: the Alquist-Priolo Earthquake Fault Zoning Act/20/ and the Seismic Hazards Mapping Act./21/ The purpose of the Earthquake Fault Zoning Act is to reduce the hazards posed by surface rupture of a fault. The Project Area is not in an Alquist-Priolo Earthquake Fault Zone, and no earthquake fault zones are located near the Project Area./22/ Consequently, there is little likelihood of surface rupture of a fault within the Project Area.

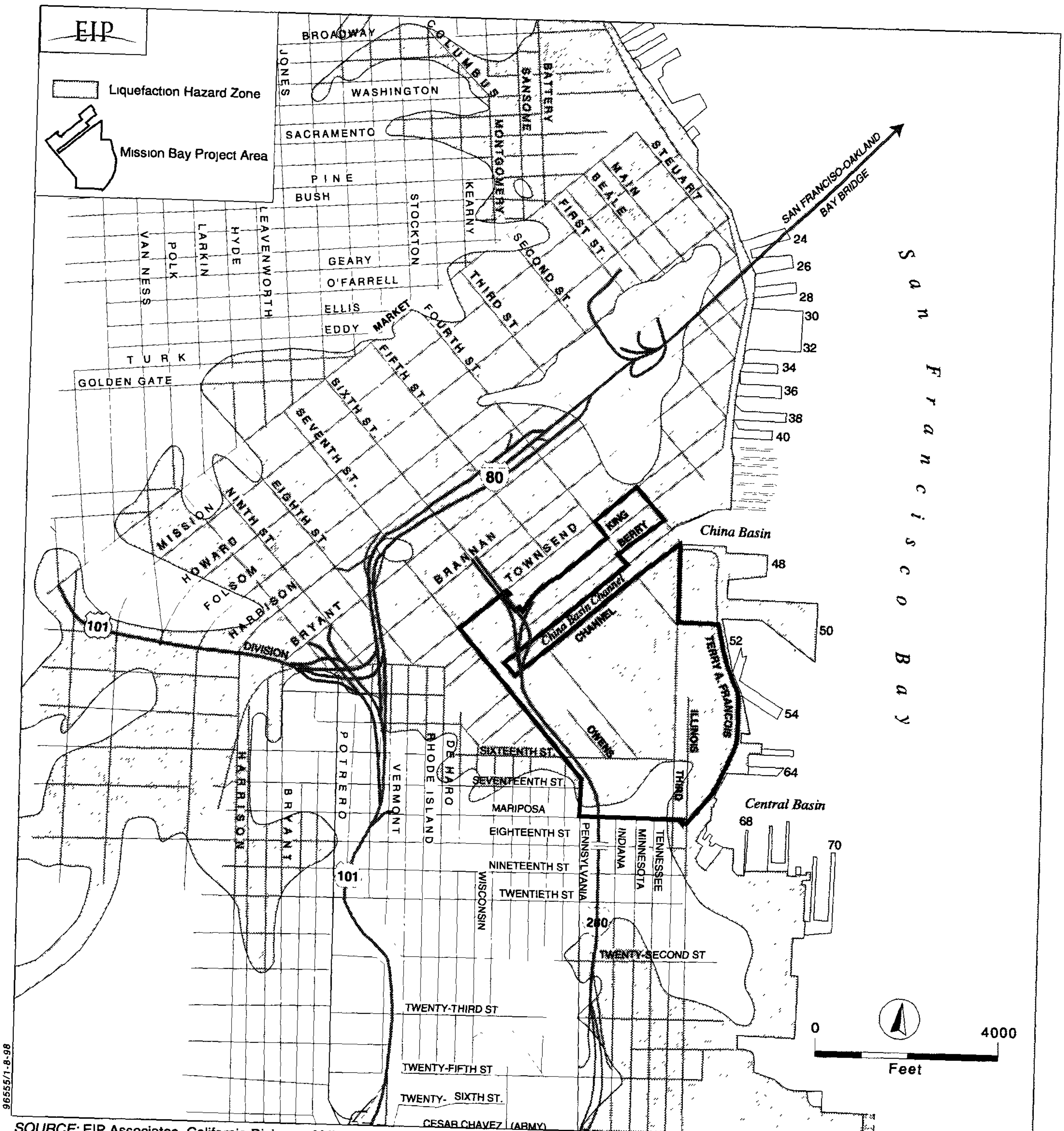
The purpose of the Seismic Hazards Mapping Act is to provide safeguards to the public from the effects of strong groundshaking, liquefaction or other ground failure, and other hazards caused by local conditions during earthquakes. The Act requires the State Geologist to delineate the various seismic hazard zones and requires that "cities and counties, or other local permitting authority regulate certain development projects within the zones. [These agencies] must withhold the development permits for a site within the zone until a geotechnical evaluation is conducted and appropriate mitigation measures have been incorporated into development plans."/23/ The Project Area is in a liquefaction hazard zone, as designated on the Seismic Hazard Zones Map, which covers most of San Francisco (see Figure V.H.2)./24/

Building Codes

The 1994 Uniform Building Code (UBC) is the basis of the current 1995 California Building Code (Title 24, California Code of Regulations, Part 2). The 1995 San Francisco Building Code is a modified version of the 1995 California Building Code, and contains more restrictive standards for structures in areas of San Francisco that are subject to failures from seismically induced groundshaking (structural damage, liquefaction, settlement). At the time the 1990 FEIR was certified, the then-current 1989 UBC was undergoing major revisions that would strengthen the code substantially, and eventually resulted in similar strengthening of the California and San Francisco codes. People on the Mission Bay Advisory Committee who were involved with the UBC update were aware that the Project Area needed geotechnical treatment beyond the requirements of the then-current San Francisco Building Code (see Appendix G). Five years later, the UBC had subsumed many of the concepts embodied in the recommendations of the members of the Advisory Committee. With the adoption of updated codes for California and San Francisco, the specific requirements formulated to address these structural issues became part of the regulatory framework in the 1995 San Francisco Building Code./25/

The Uniform Building Code continues to be updated, and the 1997 revisions, which reflect the latest technology in seismic design and construction, are in the process of being finalized. Adoption of comparable revisions to the California Building Code and the San Francisco Building Code normally would be expected to follow within several months. During the period between the finalization of the 1997 UBC revisions and the adoption of their respective codes by California and San Francisco, the 1997 UBC will contain some provisions which are more stringent than the 1995 San Francisco Code.

Much of the concern regarding seismic effects in the Project Area expressed in the 1990 FEIR grew out of concern that the then-current building codes might not be adequate to address the special conditions of a development the size and location of Mission Bay. As a result of the continued updating of building codes, all the major concerns related to structural design have been addressed satisfactorily as part of the standard regulations in the 1995 San Francisco Building Code, the 1995 California Building Code, or the 1997 Uniform Building Code. Such issues as emergency



SOURCE: EIP Associates, California Division of Mines and Geology, 1997

96555/1-8-98

MISSION BAY SUBSEQUENT EIR

FIGURE V.H.2 STATE OF CALIFORNIA SEISMIC HAZARD ZONE

preparedness, response, and recovery are not regulated by building codes, and are addressed in Section VI.H, Mitigation Measures: Seismicity, of this SEIR.

Community Safety Element

A revised version of the Community Safety Element of the *San Francisco General Plan* was adopted by the Planning Commission on April 27, 1997, and approved by the Board of Supervisors on August 11, 1997. The updated Element continues current policies that require new structures built in areas where site conditions could pose hazards, such as liquefaction or landslide, to be constructed in ways that reduce those hazards. Policy 2-1 is to "assure that new construction meets current structural and life safety standards." Policy 2-3 is to "consider site soils conditions when reviewing projects in areas subject to liquefaction or slope instability." Policy 2-9 is to "consider information about geologic hazards whenever City decisions that will influence land use, building density, building configuration or infrastructure are made."/26/

To implement the life safety policies of the Community Safety Element, as well as the Seismic Hazard Mapping Act, engineers and inspectors at the Department of Building Inspection (DBI) work closely with a developer's geotechnical team to ensure that all life safety issues related to seismic groundshaking are addressed by the special site investigations, and that appropriate recommendations are included in the geotechnical report. The recommendations are incorporated in the permit requirements for the proposed development. Each proposed development site is evaluated individually, based on its actual surface and subsurface conditions, without the use of preconceived development formulae./27/

University of California Policy on Seismic Safety

For the portion of the Mission Bay Project Area to be occupied by the University of California San Francisco, the University Policy on Seismic Safety would apply. In January 1995, this Policy was revised to require that all new University construction comply with the current seismic provisions of Title 24 of the California Code of Regulations (the California Building Code Standards) or local seismic requirements, whichever are most stringent./28/ Because the University Policy on Seismic Safety adopts the most stringent locally applicable code as its guidelines, the current San Francisco Building Code would be followed by the University in most situations. However, the 1997 revisions to the Uniform Building Code are in the process of being finalized. Adoption of similar revisions of the California Building Code and the San Francisco Building Code will follow, but these actions could take place several months apart. Between the adoptions of these two codes, the newer California Code will contain some provisions which are more stringent than the current (1995) San Francisco

Code. The m·t stringent code adopted at the time the University begins construction of a facility would be appl· · by the University to the construction of that facility. In addition, the University has adopted the mitigation measures from the 1990 FEIR dealing with emergency preparedness, response and recovery, which are not addressed by building codes, as part of each University construction project in the Project Area./29/

IMPACTS

STANDARDS OF SIGNIFICANCE

The City has no formally adopted significance standards for potential impacts related to geology and seismicity. However, projects are normally found to have a significant effect on the environment if they will cause substantial soil erosion or unstable ground conditions; or if they will expose substantial numbers of people or structures to major geologic or seismic hazards.

The 1990 FEIR analysis of potential seismic effects in the Project Area reflected the concern that the then-current building codes might not provide adequate protection from seismic forces for the special circumstances of a large development located in an area underlain by artificial fill and Bay mud. Since publication of the 1990 FEIR, building codes have been revised substantially, with the result that all the major concerns related to structural design in the Project Area have been addressed in all areas of concern in the 1995 San Francisco Building Code, the 1995 California Building Code, or the 1997 Uniform Building Code. This impact section begins with a brief examination of the relationship between the updated building codes and the currently proposed project. The remainder of the impact section focuses on the special circumstances related to groundshaking, liquefaction, tsunami and seiche inundation, and exposure of concentrated populations to seismic hazards in the Project Area.

RELATIONSHIP OF CURRENT BUILDING CODES TO THE PROPOSED PROJECT

The seismic safety provisions of the currently applicable San Francisco Building Code (1995 or future revisions) are required to be met for all construction in the Project Area under San Francisco's jurisdiction. As discussed earlier, University of California policy dictates that construction on land owned by the University would meet the San Francisco Building Code requirements voluntarily, or any more stringent provisions of the Uniform Building Code (1997 or future revisions). The provisions of the building codes pertain to the basic structure of each building, such as the foundation design and placement (discussed earlier under "Seismic Hazard Zones" in the Setting subsection), the building design and construction, and certain non-structural issues (such as wall-cladding anchorage), special requirements for certain high-occupancy uses and emergency response facilities (hospitals, police and fire stations), and the way in which large or heavy equipment is secured.

Strict enforcement of seismic standards is the minimum requirement for development of the Project Area to reduce the chance of injury to people in or near the buildings during a major earthquake. The analysis assumes that the more stringent provisions of the 1997 Uniform Building Code will be adopted as part of the San Francisco Building Code prior to initial construction. Compliance with the 1997 Uniform Building Code provisions would reduce regulated hazards to an acceptable level.

GROUNDSHAKING

During the useful economic life of the project, it is probable that the Project Area will be subjected to at least one major earthquake which would create peak ground accelerations in excess of 0.5g throughout the Bay Area. Because the Project Area is underlain partly by thick deposits of Bay Mud and partly by bedrock at relatively shallow depths, sites within the Project Area will respond differently to these seismic vibrations. Based on the models developed by Treadwell & Rollo to analyze the dynamic response of the San Francisco Giants Ballpark site (on the north side of China Basin at King and Third Streets adjacent to Mission Bay North, which contains soil conditions similar to those in the Project Area), peak accelerations as high as 0.6g could occur in the Project Area./30/ This level of groundshaking could cause damage to structural elements of buildings and utility lines (twisting, breakage, debris shedding) and could cause associated ground failure, such as liquefaction (tilting or settlement of foundations), all of which pose risks of injury or death to people in or near the affected structure. To establish appropriate design parameters for the seismic-restraint systems to be built into the foundations and structures in the Project Area, the San Francisco and Uniform Building Codes require site-specific modeling to be conducted, and the resultant measures to be incorporated into the plans and specifications of the project. Incorporation of the modeling recommendations would prevent groundshaking damage to structural elements./31/,/32/

LIQUEFACTION

Treadwell & Rollo's analyses indicate that seismically induced peak ground accelerations of 0.2g or higher would cause liquefaction of some of the saturated subsurface fill materials in the Project Area. During such an earthquake, as much as 1 foot of liquefaction-induced settlement could occur in deep fills, and abrupt liquefaction-induced differential settlement probably would occur in the vicinity of old timber piles. Structures supported on these liquefiable materials could tilt or settle rapidly, thereby exposing occupants to injury or death. Deep foundations (such as pile-supported foundations) are necessary for major structures throughout the vicinity of the Project Area to prevent the effects of liquefaction./33/

To reduce potential effects in the Liquefaction Hazard Zone, Catellus has committed to construct major structures in the Project Area on foundations supported by piles driven into dense sands, stiff clays, or bedrock in areas where such materials are too deeply buried by unengineered fill and/or Bay Mud to provide adequate support for foundations.

Although site-specific conditions dictate the appropriate pile design, precast, prestressed, sulfate-resistant concrete piles commonly are used to penetrate fill and Bay Mud. In the Project Area, piles would be supported on the bedrock in places where it is close enough beneath the ground surface to be reached easily. Where this is not the case, piles would gain support by friction developed between the surface of the pile and the dense sandy and clayey sediments below the Bay Mud. Pile length would range from about 30 feet to more than 200 feet (see Appendix A, Section 9). The location of each pile would determine its length and whether it would be supported on bedrock or in dense sediments. Where appropriate, a sulfate-resistant mix of cement would be used to protect the concrete and reinforcing steel from the corrosive effects of the fill and the Bay Mud.

The piles would be driven at least three pile diameters apart to avoid loss of uplift capacity from grouping effects (piles grouped too closely do not have sufficient soil around them to provide adequate support for the foundation). Pile locations would be predrilled through the fill, thereby reducing the noise and vibration caused by pile driving, which could annoy neighbors or damage nearby structures (discussed in "Construction Noise" in Section V.G, Noise and Vibration: Impacts). Predrilling removes rubble obstructions in the fill (which otherwise could deflect the pile, thereby reducing its support capacity) and facilitates installation of the piles. If existing wooden piles were encountered, they would be cut off below the base of the floor slabs for each new structure, and capped during the construction of the new foundation.

EXPOSURE OF CONCENTRATED POPULATIONS TO SEISMIC HAZARDS

Development of the Mission Bay Project Area would concentrate a portion of the San Francisco Bay Area population in a location subject to seismic hazards. Approximately 11,000 residents, 30,000 employees, and numerous visitors would be expected to occupy the Project Area during a given 24-hour period. The on-site population would be greatest during the normal working hours of a weekday, when most employees would be at their jobs, but many residents would be away from home. At night, the employee population would be much lower, but the resident population would be high.

During a characteristic earthquake (defined in Glossary), seismically induced groundshaking, liquefaction, and ground settlement could cause unsupported pavement and underground utility conduits to separate from pile-supported structures, thereby disrupting the infrastructure intended to serve this population. The San Francisco Bay Bridge and Golden Gate Bridge probably would be closed because of impassable approaches or spans. BART, MUNI, and Caltrain service would be halted, at least temporarily. As described in the 1990 FEIR, access to Mission Bay could be limited, particularly south of China Basin Channel. Street access to Mission Bay South could be limited to 16th Street and the Seventh Street connector which pass under I-280, and Third Street at the southern part of the Project Area. Third Street probably would be impassable at the Channel because of settlement at the Third Street Bridge approaches. The bridge approaches could be made serviceable in a relatively short time if heavy equipment were available. The Third Street Bridge probably would be stuck in its position at the time of the earthquake, most likely in the down position, because of damage to the bridge-raising mechanism. It is expected that the counterweight on the Fourth Street Bridge would be damaged, making the bridge unusable for some time. It is likely that elevated highways would suffer damage; however, it is unlikely that general collapse would occur because of recent retrofitting. The elevated highways may not be passable following a large earthquake, but this would not necessarily block access to and egress from Mission Bay./34/

Access to Mission Bay North could be impaired because of debris from damaged older existing buildings nearby. Warping and fracturing of pavement would result from liquefaction, uneven settlement, and lurching. Some of the roads probably would be passable in trucks and four-wheel drive vehicles. Severely damaged or debris-blocked roads could be made usable in a relatively short time through use of heavy equipment, if it were available locally. Mission Bay North probably would not be cut off from emergency services based north and west of Mission Bay; but travel over streets could be difficult because of damage and debris. Areas north of the Channel probably would be accessible to emergency response vehicles from Fourth Street. Areas south of the Channel would be more difficult to reach because the Third and Fourth Street Bridges would be impassable, at least temporarily. Third Street would provide access from the south, although it probably would be damaged by soil fracture./35/ If not mitigated as described in Chapter VI of this SEIR, the above-described risks to people posed by seismically induced groundshaking and liquefaction would be significant impacts of the project.

One of the major concerns is the availability of water for fighting fires. The primary water supply for fire-fighting in the Project Area is the low-pressure domestic water from the City water mains. The Auxiliary Water Supply System (AWSS), a high-pressure system, is used if the primary system does not have an adequate supply or is out of service. The Auxiliary Water Supply System for fire protection, described under "Water Supply: Setting" in Section V.M, Community Service and

Utilities, is independent of the domestic water system and is under the sole jurisdiction of the Fire Department. Pipes for this system are located under Third Street and around much of the perimeter of the Project Area. The AWSS high-pressure system provides 10,000 gallons per minute, and is adequate to serve existing land uses in the Project Area./36/ The existing system is not fully developed in the center of the Project Area, and is inadequate to serve the needs of the proposed project. Therefore, extension of the AWSS to serve the Project Area is proposed. Figure V.M.6 shows the proposed configuration of the high-pressure water supply system, which would be connected to the rest of the City's system through existing lines in Third Street and Mariposa Street. The Mission Bay North system would be connected with the proposed Mission Bay South System by a new line near Seventh Street and Berry Street, and a relocated line connecting the Fourth Street line with the Third Street line./37/ No cisterns would be located in the Project Area because four existing suction inlets in the China Basin Channel and San Francisco Bay would act as a back-up supply of water for fire-fighting if other water supplies failed.

Beginning with its 1982 landmark study, *Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in the San Francisco Bay Area*, the California Division of Mines and Geology has consistently assumed that "all critical facilities such as hospitals, fire and police stations, emergency communications and operation centers will require standby generating equipment and emergency fuel supplies," for as long as 72 hours following a great earthquake. Even though buildings may remain standing, lifelines (i.e., water supply, communications, electrical power, and other similar facilities) may be impaired, and, thus, medical care would be severely restricted./38/ Medical service centers may be subject to a higher incidence of injuries to elderly persons and those with mobility limitations, medical equipment or supplies may be damaged or destroyed, and building access may be blocked. In the aftermath of an earthquake, integrated emergency response plans, emergency medical and housing facilities, fire-fighting, and debris removal capabilities would be necessary in the Project Area for as long as 72 hours before outside help could be expected./39/ Because of the seismic upgrade of the elevated I-280 freeway structure, emergency access from the west could be less restricted than assessed in the 1990 FEIR; however, access from the north to Mission Bay South would be difficult if one or both of the bridges that cross China Basin Channel were damaged or obstructed (see "Fire Protection: Impacts" in Section V.M, Community Services and Utilities). The City is in the process of upgrading the bridges, which should increase the likelihood that one or both would remain useable. The proposed new fire station in Mission Bay South would improve emergency response to the area in the event of a major earthquake.

Control of the hazards related to the structural components of the buildings to be constructed in the Project Area are regulated by the above-described building codes. Response plans and procedures for dealing with earthquake-related injuries and emergency issues beyond the requirements of the applicable building codes are suggested by the Community Safety Element./40/ Mitigation Measure H.3 in Section VI.H, Mitigation Measures: Seismicity, suggests that the emergency response plan for Mission Bay must be a comprehensive preparedness and response plan for the entire Project Area, rather than a series of un-coordinated building-by-building plans, and should be prepared in consultation with the Mayor's Office of Emergency Services (OES). The components of the plan should address local community coordination and response, as well as coordination with government services such as OES or the police or fire departments. Outreach and training programs should be made available to employees and residents of the Project Area. Issues that need to be addressed by the plan include the availability of food, water, shelter, and sanitation facilities, and consideration of the need and potential locations for special operations and medical facilities in the context of the citywide Emergency Response Plan and the Project Area's location in Emergency Response District 3./41/ Similar mitigation measures were adopted in the 1990 FEIR to address issues beyond the requirements of the then-applicable building codes. Those measures that address various risks related to development of the Project Area, which have not been incorporated in the currently applicable building codes, appear in Section VI.H, Mitigation Measures: Seismicity, including Mitigation Measures H.1 through H.6.

PHASING OF INFRASTRUCTURE AND DEVELOPMENT DURING THE BUILD-OUT PERIOD

Phasing of Infrastructure

As discussed in the "Phasing of Construction of Infrastructure and Improvements in the Project Area" in Section III.B, Project Description, and in Section V.M, Community Services, of this SEIR, the preliminary infrastructure plans for development of the Project Area would extend utilities into the Project Area to serve each specific phase of development using the concept of adjacency, rather than installing all the infrastructure with the first phase. This approach allows maximum utilization of existing infrastructure where appropriate. Consequently, some portions of the Project Area would be served by new infrastructure, constructed to then-current standards, while other portions would be served by existing systems, which were constructed to earlier, less stringent standards, and which may not perform as well as new systems during earthquakes. The development of new, seismically resistant sub-surface utility lines (waste water, storm drains, gas, potable water, and AWSS) would keep pace with the construction of buildings throughout the Project Area. Depending on where initial development may be proposed, a substantial amount of each system could be built in the earliest phases of development simply to connect the Project Area with the existing portions of each system. Portions of the AWSS would be installed when the San Francisco Fire Department indicates the extension of the system is warranted (see "Fire-Fighting Water Supply" under "Water Supply: Impacts" in Section V.M, Community Services and Utilities). Infrastructure construction associated with individual buildings would involve connecting each new structure to the portion of each system already built within the Project Area, thus bringing the infrastructure up to then-current standards on a phase by phase basis. Construction of a mass-care facility and/or an emergency response facility would be necessary when the San Francisco Fire Department indicated the population or building density warranted its/their inclusion in the Project Area.

Some grading of the Project Area, including the excavation of some potentially liquefiable materials and replacement with engineered fill, would occur prior to the construction of underground infrastructure to ensure that the systems could be designed to accommodate expected settlement along their specific routes, and to prevent liquefaction damage. This is necessary to ensure that gravity-flow systems (storm drainage, waste water) continue to have sufficient gradient to operate correctly, and that gas and potable water lines have sufficient flexibility to prevent breaks as the lines settle to their design gradients. Un-reconstructed portions of the Project Area would continue to be subject to settlement and liquefaction under conditions now existing in the Project Area.

Phasing of Development

As build-out proceeds within the Project Area, older structures would be replaced or retrofitted to meet current seismic standards. Existing or newly authorized uses could continue in existing older structures for many years before the structures were replaced or retrofitted. Expansions of, or alterations to, existing structures would be required to comply with current codes. The structures built to current code standards would be more resistant to seismic forces and would have less potential to expose occupants to injury or death during a major earthquake than existing structures which were built to earlier standards, or un-retrofitted structures which predate modern building codes and have not been retrofitted.

A potential hazard exists where older structures are adjacent to or near new structures. Although the new structure would perform adequately under seismic forces, an adjacent or nearby older structure damaged in the same earthquake could shed debris that could endanger the new structure or its occupants. Because the new structure and the infrastructure serving it would be built to then-current seismic standards, debris-shedding would be the only effect caused by its adjacency to older structures during the build-out period. This impact is not considered to be significant because the majority of existing structures are relatively low rise, light weight buildings posing limited hazards.

TSUNAMI AND SEICHE

Computer models of the height of flooding caused by seismic sea wave (tsunami) run-up (defined in Glossary) for San Francisco have been prepared by the U.S. Army Corps of Engineers (flooding levels from seiches were not calculated because they would be lower and therefore, less damaging)./42/ The maximum calculated run-up levels never have been recorded in the City./43/ The Corps' calculations indicate that the Project Area would be subject to as much as 4.70 feet of wave run-up during the 100-year tsunami event, and 7.80 feet of wave run-up during the 500-year tsunami event./44/ The Corps' run-up model was referenced to mean sea level, so an additional 2.95 feet of wave run-up must be factored into the calculation to estimate the height of "worst case" flooding during extreme high tide crest conditions, which occur about 30 times each year, and last for less than 2 hours each time./45/ Therefore, the maximum expected flood elevation from 4.70 feet of wave run-up during the 100-year event would be 7.65 feet above mean sea level, or -1.01 feet San Francisco City Datum [SFCD] (defined in Glossary), during extreme high tide crest conditions. For the 500-year tsunami event, 7.80 feet of wave run-up during the maximum expected extreme high tide would result in an estimated flood elevation of 2.09 feet SFCD.

Tsunami and seiche flooding may pose a hazard to some buildings constructed as part of the project. The basic concept of flood protection is to ensure that the lowest occupied floor has at least 1 foot of clearance above the flood elevation anticipated for the 100-year event. The proposed post-settlement elevations (i.e., the surface of the ground after construction) north of 16th Street generally would be at or below 0 feet SFCD, whereas those south of 16th Street generally would be above 0 feet SFCD./46/ Basement floor elevations would be lower because excavation for basements is an option in the Project Area. Most of Mission Bay North and the portion of Mission Bay South between South Common Street and the Channel would be threatened by the 100-year tsunami event because the finished ground surface elevations would be less than -1 foot SFCD./47/ Subgrade areas would be threatened to an unknown extent, depending on their depth, location, and protection from overland flows.

Setbacks from the Bay and the Channel in the form of open space would provide a measure of protection from the less-than 100-year tsunami event. Without levees or bulkheads rising above the estimated 100-year run-up elevation for extreme high tides, setbacks would be only partially effective for the 100-year event. The lowest portions of the Project Area could be subject to about 2 feet of flooding during the 100-year tsunami or seiche if the event occurred during maximum expected extreme high tide crest conditions. Because these conditions exist during about 30 two-hour windows each year, the likelihood of a 100-year tsunami occurring within that window is less than one hundredth of one percent (<0.01%)./48/

The lowest portions of the Project Area could be subject to between 2 and 5 feet of flooding during the 500-year tsunami or seiche, if the event occurred during maximum expected extreme high tide crest conditions. The likelihood of a 500-year tsunami occurring within one of these 30 two-hour windows is less than two thousandths of one percent ($<0.002\%$), making this a very unlikely occurrence.

GLOSSARY

Bay Mud: A layered sequence of soft, plastic, expansive sediments forming the bottom of San Francisco Bay (often referred to as the "younger" Bay Mud), consisting of clay- and silt-sized particles interspersed with stringers and pockets of peat, fine sand, and minor amounts of gravel, and having a water content ranging between 30 and 92 percent (commonly 50 to 60 percent in the uppermost 50 to 100 feet of the deposit).

Characteristic Earthquake: The "moment magnitude" (see below) of the seismic event considered representative of a particular fault segment, based on seismologic observations and statistical analysis of the probability that a larger earthquake would not be generated during a given time frame. In the Bay Area, the characteristic earthquake for the Peninsula segment of the San Andreas fault has a moment magnitude (M_w) of 7.1; the entire Hayward fault, a M_w of 7.3; and the northern segment of the Calaveras fault, M_w 6.9. The term "characteristic earthquake" replaces the term "maximum credible earthquake" (see below) as a more reliable descriptor of future fault activity.

Horizontal Ground Acceleration: The rate of speed at which soil or rock materials are displaced by seismic waves. It is measured as a percentage of the acceleration of gravity (0.5g = 50 percent of 32 feet per second squared, expressed as an horizontal force). *Peak* horizontal ground acceleration is the maximum acceleration expected from the characteristic earthquake predicted to affect a given area. *Repeatable* acceleration refers to the acceleration resulting from multiple seismic shocks. *Sustained* acceleration refers to the acceleration produced by continuous seismic shaking from a single, long-duration event.

Liquefaction: A response to severe groundshaking that can occur in loose soils. This transformation from a solid state to a liquid state ("quicksand"), as a response to seismically induced groundshaking, can cause ground settling and landsliding. Earthquake-induced liquefaction does not affect bedrock; however, it does affect certain types of alluvium and artificial fill under conditions of saturation. The characteristics of a liquefaction-prone deposit include: (1) uniformly fine sand or sandy soil; (2) saturated conditions — usually by groundwater; (3) loose to moderately dense compaction; (4) little or no clay-sized particles to act as binders. If these conditions occur within about 30 to 40 feet below the ground surface, vibration sufficiently violent to increase pore pressure beyond the shear strength of the sand particles could cause such soils to liquefy. Any structures supported on the soils would be subject to tilting or settlement (sometimes very violent and rapid) as the supporting capabilities of the liquefying soil diminished.

Maximum Credible Earthquake (MCE): The largest Richter magnitude (M) seismic event that appears reasonably likely to occur under the conditions of the presently known geological framework. This term has been replaced by "characteristic earthquake," which is considered a better indicator of probable seismic activity on a given fault segment within a specific time frame.

Modified Mercalli Intensity (MMI) Scale: A 12-point scale of earthquake intensity based on local effects experienced by people, structures, and earth materials. Each succeeding step on the scale describes a progressively greater amount of damage at a given point of observation. Effects range from those which are detectable only by seismicity recording instruments (I) to total destruction (XII). Most people will feel Intensity IV ground motion indoors and Intensity V outside. Intensity VII frightens most people, and Intensity VIII causes alarm approaching panic. The physical effects of Intensity VIII groundshaking are general damage to ordinarily substantial buildings, including partial collapse; some damage to specially designed structures; twisting or fall of chimneys, factory stacks, towers, and unreinforced masonry walls; movement of frame houses on their foundations, if they are not bolted in place; breaking of tree limbs and decayed timber pilings; and cracking of wet ground. The physical effects of Intensity IX groundshaking are considerable damage to specially designed structures; great damage to ordinarily substantial buildings, including partial collapse; destruction of poorly built structures; and liquefaction, settlement, and ground cracking of fill and other saturated fine sandy deposits. The scale was developed in 1902 by Giuseppi Mercalli for European conditions, adapted in 1931 by American seismologists Harry Wood and Frank Neumann for conditions in North America, and modified in 1958 by Dr. Charles F. Richter to accommodate modern structural design features.

Moment Magnitude (M_w): A logarithmic scale used by modern seismologists to measure the amount of energy released by an earthquake. For the purposes of describing this energy release (i.e., the "size" of the earthquake on a particular fault segment for which seismic-resistant construction must be designed), the moment magnitude (M_w) of the characteristic earthquake for that segment has replaced the concept of a maximum credible earthquake of a particular Richter magnitude. This replacement became necessary because the Richter scale "saturates" at the higher magnitudes; that is, the Richter scale has difficulty differentiating the size of earthquakes above M 7.5. The M_w scale is proportional to the area of the fault surface that shifts (slips) during an earthquake and, thus, is directly related to the length of the rupture. It reflects the amount of "work" (in the sense of classical physics) done by the earthquake. Although the numbers of the M_w scale may appear lower than those of the traditional Richter magnitudes, they convey more precise (and more useable) information to geologic and structural engineers.

Richter Magnitude Scale: A logarithmic scale developed in 1935 to 1936 by Dr. Charles F. Richter and Dr. Beno Gutenberg to measure earthquake magnitude (M) by the amount of energy released, as opposed to earthquake intensity as determined by local effects on people, structures, and earth materials (for a description of these effects, see Modified Mercalli Intensity Scale). Each whole number on the Richter scale represents a 10-fold increase in amplitude of the waves recorded on a seismogram and about a 31-fold increase in the amount of energy released by the earthquake. Because the Richter scale tends to saturate above about M 7.5, it is being replaced in modern seismologic investigations by the moment magnitude (M_w) scale (see above).

Run-up (tsunami or seiche): The advance of water (flooding) up the foreshore of a beach or structure, caused by a submarine disturbance (see tsunami and seiche, below). Maximum run-up levels for the 100-year and 500-year tsunami events adjacent to San Francisco Bay have been calculated by Garcia and Houston (see citation in endnotes) without regard for tidal effects, and, thus, reflect the elevation, in feet, of flooding above the normal water surface of the Bay at the time the tsunami occurs. Flooding levels from seiches would be lower, and therefore less damaging.

San Francisco City Datum: For surveying purposes in San Francisco, a local datum was established, in the 19th century, at 8.66 feet above mean sea level, approximately higher high tide at the time.

Seiche: A standing-wave oscillation of the surface of water in an enclosed or semi-enclosed basin (such as a lake, bay, or harbor) that is initiated by landslides, earthquakes, or other geologic phenomena, and continues after cessation of the originating force.

Seismic Hazard Zones: In 1991 the State of California began delineating Seismic Hazard Zones in areas of the State where local geological, geotechnical, slope, or groundwater conditions indicate a potential for permanent ground displacements caused by earthquake vibrations such that mitigation as defined in Public Resources Code Section 2693(c) would be required. The zones are revised as new information becomes available. No structure for human occupancy, with the exception of single-family wood-frame or steel-frame dwellings not exceeding two stories in height and not part of a development of four or more dwellings, may be issued a building permit within a Seismic Hazard Zone until a geotechnical evaluation of the project site is conducted and appropriate mitigation measures are incorporated in the project plans. Liquefaction Hazard Zones have been delineated for San Francisco based on areas where liquefaction has occurred historically, and where local geological, geotechnical, and groundwater conditions indicate the likelihood of permanent ground displacement caused by earthquake-induced liquefaction.

Tsunami: A large sea wave produced by any large-scale, short-duration disruption of the ocean floor, principally shallow submarine earthquakes, but also coastal or submarine earth movements (landslides), subsidence, or volcanic eruptions.

NOTES: Seismicity

1. San Francisco Planning Department, *Mission Bay Final Environmental Impact Report*, Planning Department File No. 86.505E, State Clearinghouse No. 86070113, certified August 23, 1990, Volume One, pp. II.76-II.81; Volume Two, pp. VI.K.1-VI.K.61.*

2. See Section III.B, Project Description, for a discussion of the differences in the project boundaries as compared to the project boundaries in the 1990 FEIR.

3. Schlocker, J. C., *Geology of the San Francisco North Quadrangle, California*, United States Geological Survey, Professional Paper 782, Washington, D.C., 1974, pp. 93-99 and Plates 1 and 2.

4. Jennings, C. W., *Fault Activity Map of California and Adjacent Areas, with Locations and Ages of Recent Volcanic Eruptions*, Geologic Data Map No. 6, California Division of Mines and Geology, 1994; Goter, S. K., *Seismicity of California, 1808-1987*, National Earthquake Information Center, U.S. Geological Survey, Open-File Report 88-286, 1988.

5. These two descriptive terms may be less familiar than "Richter magnitude" and "maximum credible earthquake." They are not new terms, having been used by seismologic investigators for several years, but they embody concepts that provide more useful information about the seismic conditions in California and the Bay Area than the more commonly known terms. The calculations they represent

are those actually used in geologic and structural engineering designs. They have not appeared often in planning documents because until recently the earlier terms generally were adequate for planning purposes.

6. M. D. Petersen et al., *Probabilistic Seismic Hazard Assessment for the State of California,* California Division of Mines and Geology, Open-File Report 96-08 and United States Geological Survey, Open-File Report 96-706, Appendix A, "California Fault Parameters," pp. A-1 through A-3.

7. J. F. Davis et al., *Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in the San Francisco Bay Area*, California Division of Mines and Geology, Special Publication 61, 1982; R. D. Borcherdt *et al.*, *Maximum Earthquake Intensity Predicted on a Regional Scale*, U.S. Geological Survey, Miscellaneous Field Investigations Map MF-709, scale 1:125,000, 1975.

8. Working Group on California Earthquake Probabilities, *Probabilities of Large Earthquakes in the San Francisco Bay Region, California*, U.S. Geological Survey Circular 1053, 1990, p. 29.

9. Borcherdt, R. D., J. F. Gibbs and K. R. Lajoie, *Map Showing Maximum Earthquake Intensity Predicted in the Southern San Francisco Bay Region, California, for Large Earthquakes on the San Andreas and Hayward Faults*, U.S. Geological Survey, Miscellaneous Field Studies Map MF-709, 1975, p. 11 and Sheet 2.

10. Montgomery, D. R., "Representative Damage Photographs from the Loma Prieta Earthquake," in: *The Loma Prieta (Santa Cruz Mountains), California, Earthquake of 17 October 1989*, S. R. McNutt and R.H. Sydnor, editors, California Division of Mines and Geology, Special Publication 104, 1990, pp. 113-120.

11. California Division of Mines and Geology, *State of California Seismic Hazard Zones, Official Map, South Half of the San Francisco North and Part of the Oakland West Quadrangles*, released April 17, 1997, scale 1:24,000.

12. Pierzinski, D., "Tsunamis," in: *California Geology*, California Division of Mines and Geology, Vol. 33, No. 3, March 1981, pp. 58-61.

13. Dr. E. B. Thornton, Department of Oceanography, Naval Post-Graduate School, telephone conversation, October 31, 1997.

14. Geo-seismic information in this SEIR is derived from the current and previous geotechnical investigations of the Project Area, telephone conversations with the geotechnical and project engineers, geotechnical investigations for nearby sites, and published reports about the geology and seismicity of the Bay Area.

15. The results of earlier geotechnical investigations are discussed in the 1990 FEIR, Volume One, pp. II.76-II.77, and Volume Two, pp. VI.K.1-VI.K.11, VI.K.24-VI.K.30.*

16. Treadwell & Rollo, Inc., Environmental and Geotechnical Consultants, Lori A. Simpson, PE, and Frank L. Rollo, PE, *Proposed UCSF Site, Mission Bay, San Francisco, CA*, letter report to Kerstin Magary, Catellus Development Corporation, 31 October 1994, 2 pages accompanied by 38 figures; Treadwell & Rollo, Inc., Environmental and Geotechnical Consultants, Lori A. Simpson, PE, letter to EIP Associates, March 12, 1997, 1 page accompanied by 6 figures.

17. 1990 FEIR, Volume Two, pp. VI.K.9-VI.K.10, VI.K.57.*

18. Association of Bay Area Governments, *On Shaky Ground, City Maps: City of San Francisco*, Publication Number P95002EQK-SF-1, April 1995.

19. Treadwell & Rollo, Inc., Environmental and Geotechnical Consultants, Lori A. Simpson, PE, letter to EIP Associates, March 12, 1997, 1 page accompanied by 6 figures, see "Depth to Water Table" and "Thickness of Fill."

20. *Alquist-Priolo Earthquake Fault Zoning Act*, California Public Resources Code, Division 2. "Geology, Mines and Mining," Chapter 7.5 "Earthquake Fault Zones," Sections 2621 through 2630; signed into law December 22, 1972, amended 1974, 1975, 1976, 1979, 1991, 1993, 1994. Prior to 1994 this legislation was known as the Alquist-Priolo Special Studies Zones Act.

21. *Seismic Hazards Mapping Act*, California Public Resources Code, Division 2. "Geology, Mines and Mining," Chapter 7.8, effective date April 1, 1991.

22. Hart, E.W., *Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps*, California Division of Mines and Geology, Special Publication 42, revised 1994, 34 pages.

23. State Mining and Geology Board, *Guidelines for Evaluating and Mitigating Seismic Hazards*, 1997, p. 7.

24. California Division of Mines and Geology, *State of California Seismic Hazard Zones, Official Map, South Half of the San Francisco North and Part of the Oakland West Quadrangles*, released April 17, 1997, scale 1:24,000.

25. City and County of San Francisco Municipal Code, *1995 San Francisco Building Code*, adopted December 14, 1995, Chapters 16, 18, 33, A16 and A33. Chapters 16 and A16 of the San Francisco Building Code deal with structural force design requirements, including (but not limited to) regulations governing seismic-resistant construction. Chapters 18, 33, and A33 deal with foundations, retaining walls, excavation and grading, including (but not limited to) requirements for foundation investigations, seismic-resistant design, stable cut- and fill-slopes, and drainage and erosion control.

26. City and County of San Francisco, *San Francisco General Plan,* Community Safety Element, adopted April 27, 1997 by the San Francisco Planning Commission, approved August 11, 1997 by the Board of Supervisors, 25 pages, 7 maps (various scales).

27. Charles Ng, Inspector, San Francisco Department of Building Inspection, telephone conversation with EIP Associates, October 24, 1994.

28. University of California, Office of the President, *University Policy on Seismic Safety*, revised January 17, 1995.

29. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, January 1997, pp. 408-410.*

30. Treadwell & Rollo, *Draft Geotechnical Investigation, Pacific Bell Park, San Francisco, CA*, September 4, 1996, Appendix E, Seismic Hazard Analysis, Figures E-7 - E-12. A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

31. C. S. Shields, Geotechnical Engineer, Treadwell & Rollo, Inc., various personal communications with EIP Associates, July 30 to October 4, 1996.

32. C. S. Shields, Geotechnical Engineer, Treadwell & Rollo, Inc., various personal communications with EIP Associates, July 30 to October 4, 1996.

33. Treadwell & Rollo, *Draft Geotechnical Investigation, Pacific Bell Park, San Francisco, CA*, September 4, 1996, Appendix E, Seismic Hazard Analysis, Figures E-7 - E-12.

34. 1990 FEIR, Volume One, pp. II.79-II.80.*

35. 1990 FEIR, Volume One, pp. II.79-II.80; Volume Two, pp. VI.K.34-VI.K.39.*

36. Steve Van Dyke, Superintendent, Bureau of Engineering and Water Supply, San Francisco Fire Department, telephone conversation with EIP Associates, September 5, 1997.

37. The Honorable Mayor Willie Lewis Brown, Jr., Office of the Mayor, *Mission Bay: Conceptual Framework for a Proposal for the Catellus Development Portion of the South of Channel Redevelopment Plan Area,* letter to Commissioner Dar Singh, July 7, 1997, Exhibit C, p. 6.*

38. Davis, J.F., J.H. Bennett, G.A. Borchardt, J.E. Kahle, S.J. Rice, and M.A. Silva, *Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in the San Francisco Bay Area*, California Division of Mines and Geology, Special Publication 61, 1982, pp. 125-134.

39. Steinbrugge, K.V., J.H. Bennett, H.J. Lagorio, J.F. Davis, G.A. Borchardt, and T.R. Toppozada, *Earthquake Planning Scenario for a Magnitude 7.5 Earthquake on the Hayward Fault in the San Francisco Bay Area*, California Division of Mines and Geology, Special Publication 78, 1987, pp. 87-93.

40. City and County of San Francisco, *San Francisco General Plan,* Community Safety Element, adopted April 27, 1997 by the San Francisco Planning Commission, approved August 11, 1997 by the Board of Supervisors, Policies 3.1 through 3.7 and 4.1 through 4.4, pp. I.4.21-I.4.24.*

41. Paul Deutsch, Senior Environmental Planner, Mission Bay EIR Coordinator City and County of San Francisco, Planning Department, memorandum to EIP Associates, March 4, 1998.

42. Garcia, A.W., and J. R. Houston, Type 16 Flood Insurance Study: Tsunami Predictions for Monterey and San Francisco Bays and Puget Sound, U.S. Army Corps of Engineers Technical Report H-75-17, Hydraulics Laboratory, U.S. Army Engineers Waterways Experiment Station, Vicksburg, Mississippi, November 1975, pp. 4-6.

43. City and County of San Francisco, *San Francisco General Plan*, Community Safety Element, adopted April 27, 1997 by the San Francisco Planning Commission, approved August 11, 1997 by the Board of Supervisors, pp. I.4.8 and I.4.11.

44. Garcia, A.W., and J. R. Houston, Type 16 Flood Insurance Study: Tsunami Predictions for Monterey and San Francisco Bays and Puget Sound, U.S. Army Corps of Engineers Technical Report H-75-17, Hydraulics Laboratory, U.S. Army Engineers Waterways Experiment Station, Vicksburg, Mississippi, November 1975, Figure 56.

45. An extreme high tide is any tide rising at least 1.75 feet above mean sea level. This elevation translates to -6.91 feet San Francisco City Datum, because mean sea level is 8.66 feet below the City Datum (-8.66 + 1.75 = -6.91).

Maximum run-up levels for the 100-year and 500-year tsunami events adjacent to San Francisco Bay calculated by Garcia and Houston (see endnote 41) do not account for tidal effects, and, thus, reflect the flood elevations reached above the normal water surface of the Bay at the time tsunami occur. For the 100-year tsunami event at the Project Area, 4.70 feet of wave run-up occurring during an extreme high tide would result in a flood elevation <u>at least</u> as high as 6.45 feet above mean sea level (4.70 + 1.75 = 6.45). This elevation translates to -2.21 feet San Francisco City Datum (-8.66 + 6.45 = -2.21).

Extreme high tides of 2.95 feet above mean sea level (-5.71 feet San Francisco City Datum) occur every winter in San Francisco Bay, so the maximum estimated flood elevation from 4.70 feet of run-up for the 100-year tsunami event during the maximum expected extreme high tide would be 7.65 feet above mean sea level (4.70 + 2.95 = 7.65), or -1.01 feet San Francisco City Datum. For the 500-year tsunami event, 7.80 feet of run-up during the maximum expected extreme high tide would result in an estimated flood elevation of 10.75 feet above mean sea level (7.80 + 2.95 = 10.75), or 2.09 feet San Francisco City Datum.

46. KCA Engineers, Inc., Proposed Grade After Settlement, Sheet 1 of 1, scale 1 inch equals 200 feet, KCA # GRAD-TC 97.0250/15, August 5, 1997.

47. KCA Engineers, Inc., Proposed Grade After Settlement, Sheet 1 of 1, scale 1 inch equals 200 feet, KCA # GRAD-TC 97.0250/15, August 5, 1997.

48. Assuming 30 maximum expected extreme high tide crests of less than 2 hours duration in an average year of 365.25 days (8766 hours), the statistical probability of a 100-year tsunami (i.e., the one percent event) occurring within one of those 30 two-hour windows is $0.01 \times (30 \div [8766 \div 2]) = 0.0000684$. Rounded and expressed as a percent likelihood, this number is smaller than one hundredth of one percent (<0.01%).

Similarly, the statistical probability of a 500-year tsunami (i.e., the one-fifth of one percent (0.2 %) event) occurring within one of the 30 two-hour windows is $0.002 \times (30 \div [8766 \div 2]) = 0.0000137$. Rounded and expressed as a percent likelihood, this number is smaller than two thousandths of one percent (<0.002%).

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

I. HEALTH AND SAFETY

Proposed project-related uses that could involve the use, storage, and disposal of hazardous materials include UCSF uses, research and development, light industry, and some commercial activities. This section describes the existing environmental setting and potential impacts related to such hazardous materials, particularly as they relate to health and safety issues. Because of the nature of the proposed future activities, the types of materials addressed throughout this section include hazardous chemicals, radioactive materials, and biohazardous materials. These terms are defined in the Glossary at the end of this section and in Appendix H, Health and Safety.

Many health and safety issues related to proposed future activities in the Project Area were not addressed in the 1990 FEIR because some Commercial Industrial uses discussed in this SEIR were not anticipated at that time. For this reason, this section contains primarily new information not otherwise included in the 1990 FEIR. The endnotes for this section begin on p. V.I.42.

SETTING

EXISTING HAZARDOUS MATERIALS AND WASTE

Section V.J, Contaminated Soils and Groundwater: Setting, describes subsurface hazardous materials in the Project Area. In addition to these hazardous materials, some existing operations in the Project Area involve hazardous materials use and hazardous waste generation. The Project Area is industrial in nature and is occupied by warehouses, sand and gravel processing facilities, truck terminals, and light manufacturing, among other uses. Large portions of the Project Area are now vacant or covered by large warehouses. As suggested in Table V.I.1, most of the hazardous materials handled in the Project Area are used for maintenance activities, and the existing quantity of hazardous materials is relatively small. None of these existing activities are known to involve radioactive or biohazardous materials or wastes.

HEALTH AND SAFETY LAWS AND REGULATIONS

As a result of the health and safety risks associated with the use of hazardous materials, hazardous materials use, storage, and disposal are subject to numerous laws and regulations at various levels of government. These laws and regulations relate to occupational safety, hazardous materials management, building and fire safety, hazardous waste management, hazardous materials

TABLE V.I.1
EXAMPLES OF EXISTING FACILITIES
LIKELY TO USE HAZARDOUS MATERIALS /a/

Existing Facilities	Type of Operations
Primary Facilities in the Project Area	
SF Autocenter Body Shop 1420 Fourth Street, Suite 299A	Autobody repair, painting, and related service
Cable Car Advertisers, Inc. 1201 Sixth Street	Vehicle storage, rehabilitation, and maintenance
S&S Trucking and Peak Engineering 1335 Sixth Street, Suite 3	Trucking and related maintenance
Bay Area Super Shuttle 700 16th Street, Suites 3A and 3B	Van service maintenance and storage
Pacific Coast Bus Service, Inc. 375 Illinois Street	Charter bus storage and maintenance
Multi-Craft Auto Body Shop 1355A Sixth Street	Autobody repair, painting, and related service
Example Facilities Near the Project Area	
Crowley Marine Services Pier 54	Tug and barge, and related maintenance
Caltrain 700 Fourth Street	Commuter train service and maintenance

Note:
a. Three facilities identified in the 1990 FEIR (Volume Two, Table VI.N.1, p. VI.N.15) that handled hazardous waste are no longer a part of the Project Area. H&H Ship Service has ceased operations, and the site of its former operations is no longer within the boundaries that define the Project Area. The site of Pacific Motor Trucking Company (1355 Sixth Street) is now occupied by American Storage Unlimited, a storage company. The site of Salinas Valley-Santa Cruz Motor Express (1760 Third Street) is now occupied by John Wagner Associates, Inc., a construction company.

Source: EIP Associates.

transportation, radioactive materials, and biological safety. Important health and safety laws that apply to the Project Area include the following:

- Federal Animal Welfare Act
- Federal Hazardous Materials Transportation Authorization Act

- California Occupational Safety and Health Act
- California Hazardous Substances Information and Training Act
- California Hazardous Waste Control Law
- California Accidental Release Prevention Law
- California Underground Storage Tank Law
- California Aboveground Petroleum Storage Act
- California Radiation Control Law
- California Medical Waste Management Act
- San Francisco Fire Code
- San Francisco Building Code
- San Francisco Hazardous Materials Permit and Disclosure Ordinance

Table V.I.2 provides a brief overview of these laws and regulations, and Appendix H provides more detailed information. Appendix H updates and expands the description of hazardous materials and waste regulations summarized in the 1990 FEIR./1/

Generally, UCSF is subject to state and federal regulation, but not local regulation, except where state and federal agencies have specifically delegated oversight authority to local agencies. For this reason, the UCSF site would be subject to the local implementation of state Business Plan requirements through the San Francisco Hazardous Materials Permit and Disclosure Ordinance as described in Table V.I.2 and Appendix H, but not to local San Francisco building and fire codes. UCSF is subject to California building and fire codes. As a Certified Unified Program Agency, the San Francisco Department of Public Health has been authorized by the California Environmental Protection Agency to oversee many hazardous materials and waste management issues at UCSF, as discussed further in Appendix H.

COMMON INDUSTRY PRACTICES

Some aspects of hazardous materials use do not clearly fall within the jurisdiction of any particular agency to regulate and oversee. For example, the use of biohazardous materials is not regulated in the same way as are hazardous chemical and radioactive materials. The U.S. Department of Health and Human Services has established standards for working with biohazardous materials, including infectious agents, infected animals, and recombinant DNA (defined in "Definitions" in

TABLE V.I.2
SUMMARY OF HEALTH AND SAFETY LAWS AND REGULATIONS

Occupational Safety	Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. The California Division of Occupational Safety and Health (Cal/OSHA) and the federal Occupational Safety and Health Administration (Fed/OSHA) are the agencies responsible for assuring worker safety in the handling and use of hazardous materials in the workplace. Cal/OSHA assumes primary responsibility for developing and enforcing standards for safe workplaces and work practices. Among other requirements, Cal/OSHA obligates many businesses to prepare Injury and Illness Prevention Plans/a/ and Chemical Hygiene Plans./b/ Fed/OSHA's Bloodborne Pathogens Standard requires the use of Universal Precautions (handling all human blood and certain body fluids as if they contain infectious agents) in the workplace./c/
Hazardous Materials Management	State, federal, and local laws require planning to ensure that hazardous materials are properly used, stored, and disposed of, and, in the event that such materials are accidentally released, to prevent or to minimize injury to health or the environment. These laws require hazardous materials users to prepare written plans, such as Hazard Communication Plans/d/, Hazardous Materials Business Plans (called "registrations" in San Francisco)/e/, and Chemical Hygiene Plans./f/ Laws and regulations require hazardous materials users to store hazardous materials appropriately and to train employees to manage these materials safely. A number of agencies participate in enforcing hazardous materials management requirements, but the San Francisco Department of Public Health is the agency most involved in overseeing hazardous materials management within San Francisco. The Department of Public Health is the Certified Unified Program Agency in San Francisco. Businesses that handle certain very hazardous substances must undertake a systematic analysis of their operations, study the potential consequences of possible worst-case accidents, and prepare Risk Management Plans to reduce apparent risks./g/ In San Francisco, this process is overseen by the Department of Public Health, which determines compliance with Accidental Release Prevention program requirements. Risk Management Plans are to be made available to the public for review. In addition, the State Office of Emergency Services administers the California Emergency Plan to respond to hazardous materials incidents and to coordinate the responses of other agencies, including the San Francisco Public Health and Fire Departments./h/ Both departments provide hazardous materials emergency response services if needed.
Building and Fire Safety	The San Francisco Building and Fire Codes amend and otherwise incorporate the California Building and Fire Codes./i/ These laws specify management practices for flammable materials, including some packaging and containment requirements. They also set forth appropriate construction standards (e.g., fire separations and fire suppression systems) depending on occupancy classifications. The San Francisco Fire Department and Department of Building Inspection review proposed building design plans to ensure compliance with Fire and Building Code requirements. As a state agency, UCSF is subject only to the State Building and Fire Codes.

(Continued)

TABLE V.I.2 (Continued)

Hazardous Waste Management	The California Environmental Protection Agency Department of Toxic Substances Control regulates the generation, transportation, treatment, storage, and disposal of hazardous waste in California./j/ Laws impose "cradle to grave" regulatory systems for handling hazardous waste in a manner intended to protect human health and the environment. The San Francisco Department of Public Health enforces on-site waste management requirements that apply to hazardous waste generators, such as requirements for secondary containment around stored wastes to prevent environmental contamination in the event of a spill. The Department of Public Health also inspects for compliance with state permitting requirements applicable to facilities conducting hazardous waste operations subject to permit by rule, conditional exemption, or conditional authorization.
Hazardous Materials Transportation	The U.S. Department of Transportation regulates hazardous materials transport between states./k/ Within California, the state agencies with primary responsibility for enforcing federal and state regulations, and for responding to transportation emergencies, are the California Highway Patrol and the California Department of Transportation. Together, federal and state agencies determine driver training requirements, load labeling procedures, and container specifications. Although certain requirements apply to the transport of hazardous materials, requirements for transporting hazardous waste are more stringent, and hazardous waste haulers must be licensed to transport hazardous wastes on public roads.
Radioactive Materials	The Radiologic Health Branch of the California Department of Health Services administers the federal and state radiation safety laws that govern the storage, use, transportation, and disposal of radioactive materials./l/ The Radiologic Health Branch licenses institutions that use radioactive materials. To maintain a radioactive materials license, an institution must meet training and radiation safety requirements and be subject to routine enforcement inspections.
Biological Safety	Biological safety is not regulated in the manner that hazardous chemicals and radioactive materials are; however, the San Francisco Hazardous Materials Permit and Disclosure Ordinance does track the use of infectious agents./m/ Institutions conducting research funded by the National Institutes of Health must follow guidelines for working with biohazardous materials, including infectious agents, infected animals, and recombinant DNA./n/ Under the 1985 Animal Welfare Act, the U.S. Department of Agriculture establishes standards for animal care and worker safety for activities involving certain research animal species./o/ Organizations are required to establish an Institutional Animal Care and Use Committee to review and approve protocols for work in which laboratory animals are used. Institutions that use animals for research and receive federal funds must also comply with the *Guide for the Care and Use of Laboratory Animals*/p/ and the *U.S. Government Principles for the Utilization and Care of Vertebrate Animals*/q/. The California Medical Waste Management Act applies to the generation, transportation, treatment, storage, and disposal of medical waste, and imposes

(Continued)

TABLE V.I.2 (Continued)

Biological Safety (cont.)	a "cradle to grave" tracking system, and a calibration and monitoring system, for on-site treatment./r/ Facilities in San Francisco that treat medical wastes must obtain a permit and are subject to audits by the San Francisco Public Health Department. Medical waste is to be transported in closed red bags marked "biohazard" and placed inside hard-walled containers with lids.

Notes:

a. California Code of Regulations, Title 8, Section 3203(a)(7).
b. California Code of Regulations, Title 8, Section 5191(e).
c. California Code of Regulations, Title 8, Section 5193(c); Code of Federal Regulation, Title 29, Section 19100.1030(q).
d. California Labor Code, Sections 6317 and 6423; California Code of Regulation, Section 5194.
e. California Health and Safety Code, Section 25505; City and County of San Francisco Municipal Code, Health Code, Part II, Chapter V, Article 21.
f. California Code of Regulations, Title 8, Section 5193(e).
g. California Health and Safety Code, Section 25531.
h. California Government Code, Title 2, Section 8550.
I. City and County of San Francisco Municipal Code, Building Code, 1995 Edition; City and County of San Francisco Municipal Code, Fire Code, 1995 Edition.
j. California Code of Regulations, Title 22, Section 66260.1.
k. Code of Federal Regulations, Title 49, Parts 106, 107, 171-179, 190-192, 397.
l. California Code of Regulations, Title 17, Section 30190.
m. City and County of San Francisco Municipal Code, Health Code, Part II, Chapter V, Article 21.
n. U.S. Department of Health and Human Services National Institutes of Health, *Guidelines for Research Involving Recombinant DNA Molecules (NIH Guidelines)*, January 1996. U.S. Department of Health and Human Services Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health, *Biosafety in Microbiological and Biomedical Laboratories*, 3rd Edition, May 1993.
o. United States Code, Title 7, Section 2131.
p. National Research Council, *Guide for the Care and Use of Laboratory Animals*, 1996.
q. Office of Science and Technology Policy, Federal Register, Vol. 50, No.97, May 20, 1985.
r. California Health and Safety Code, Section 25015.

Source: EIP Associates.

Appendix H)./2/ In many instances, following these guidelines is not necessarily required by state or federal laws. However, these standards are normally respected as guidelines and employed as a matter of standard industry practice by most handlers of biohazardous materials.

As discussed in more detail in Appendix H, the U.S. Department of Health and Human Services has defined four levels of containment practices (biosafety levels) to ensure biological health and safety. Biosafety levels are based on the infectious characteristics of the agents involved, the quantities and concentrations of the agents, the safety practices in the laboratory, and the availability of therapeutic measures and vaccines. Following U.S. Department of Health and Human Services guidelines means evaluating the hazards posed by the infectious agents or recombinant DNA to be used, and selecting physical facilities and implementing safety and containment practices as appropriate for the level of hazard (the biosafety level).

APPLICABLE PLANS AND POLICIES

Local plans and policies relating to hazardous materials, hazardous waste, and health and safety are summarized below.

Community Safety Element

San Francisco has adopted a Community Safety Element as part of its General Plan./3/ The goal of the element is to improve coordination of City programs that address physical hazards and potential disasters. An objective of the element is to reduce structural and non-structural hazards to life safety, and to minimize property damage and resulting social, cultural, and economic dislocations resulting from future disasters. To this end, San Francisco policy is to enforce state and local codes that regulate the use, storage, and disposal of hazardous materials so as to prevent, contain, and effectively respond to accidental releases. Another objective of the element is to protect life and property from disasters by providing effective emergency response. Related San Francisco policies include maintaining a comprehensive Emergency Operations Plan (see below), conducting periodic exercises of the plan, maintaining an adequate Emergency Command Center, expanding San Francisco's fire prevention and fire-fighting capabilities, and establishing emergency access routes.

Area Plan for Emergency Response to Hazardous Materials Incidents

Pursuant to the California Emergency Services Act, San Francisco has prepared a plan to address emergencies involving the release of hazardous materials. The *Area Plan for Emergency Response to Hazardous Materials Incidents* addresses pre-emergency planning, describes agency notification and coordination procedures, specifies personnel training, and lists available supplies and equipment./4/ Copies of the plan are distributed among the San Francisco Public Health, Fire, Police, and Public Works Departments; the Red Cross; paramedics; and other agencies.

San Francisco Hazardous Waste Management Plan

Hazardous waste is and would continue to be generated in the Project Area. The *City and County of San Francisco Hazardous Waste Management Plan* was prepared 1) "to protect and preserve public health and safety and maintain the economic viability of the County and the State," 2) "to prevent damage to the environment from the adverse effects of hazardous wastes," and 3) "to control hazardous waste through pollution prevention . . .in this order of priority: source reduction. . .; recycling and reuse; treatment. . .; and disposal. . . ."/5/ The objectives of the plan include, among others, controlling illegal disposal; reducing reliance on out-of-county treatment, storage, and disposal facilities; educating the public about household hazardous waste and providing means for proper disposal of household hazardous wastes; and educating and assisting small businesses in improving their waste management. Programs proposed under the plan include, among others, enforcing San Francisco's Hazardous Materials Permit and Disclosure Ordinance, developing a household hazardous waste education and technical assistance program that includes information about safer substitutes and proper disposal methods, and establishing a small quantity generator storage or treatment station.

The *Hazardous Waste Management Plan* identifies hazardous waste facility (i.e., long-term storage, treatment, or disposal facility) siting criteria. The criteria relate to location (e.g., proximity to public facilities, waste generators, and recreation areas, and zoning), hazards (e.g., seismic, flooding, and unstable soil hazards), public safety (e.g., distance from residents, immobile populations, and transportation routes), and physical limitations (e.g., soils, air quality, and depth to groundwater). The *Hazardous Waste Management Plan* limits the potential sites for new hazardous waste management facilities to areas zoned M-2, upon conditional use authorization provided that certain criteria are met. No hazardous waste facilities are proposed for the Project Area, but the Castle Metals and Esprit sites are currently designated M-2 and could potentially be considered for hazardous waste facility sites.

San Francisco Household Hazardous Waste Element

Policies regarding household hazardous waste are relevant because residents in the Project Area would generate household hazardous waste in the future. The City and County of San Francisco's *Integrated Waste Management Plan* consists of the *City and County of San Francisco Source Reduction and Recycling Element*, the *City and County of San Francisco Solid Waste Generation Study*, and the *City and County of San Francisco Household Hazardous Waste Element*. The objectives of the *Household Hazardous Waste Element* include expanding existing recycling of household hazardous waste; reducing improper household hazardous waste disposal; encouraging source reduction by promoting safer substitutes and reusable products; improving the understanding of San Francisco residents about the need to manage their household hazardous wastes properly; and coordinating efforts with other environmental and waste management education programs./6/

IMPACTS

STANDARDS OF SIGNIFICANCE

Health and safety impacts would be considered significant for purposes of this SEIR if the project would create substantial public health or safety hazards, or would involve the use, production, or disposal of materials in a manner that poses substantial hazards to people or the environment, including animal and plant populations. Impacts would also be considered significant if the project would interfere with emergency response plans or emergency evacuation plans, or would conflict with adopted environmental plans and goals related to hazardous materials and wastes./7/ The significance of impacts of individual projects is determined on a case-by-case basis.

ANALYTICAL APPROACH

In most cases, the laws and regulations pertaining to hazardous materials management are sufficient to ensure worker, public, and environmental health and safety. The "Hazard Assessment" in Appendix H provides evidence that supports the assumption that regulatory compliance effectively minimizes most health and safety risks resulting from hazardous materials and waste management prior to disposal. However, the discussion below identifies areas where impacts related to hazardous materials may, nonetheless, be significant because the enforcement of existing laws and regulations alone does not necessarily ensure that potential impacts will be reduced to a less-than-significant level. In these cases feasible mitigation measures are identified.

This analysis considers the range and nature of foreseeable hazardous materials use, storage, and disposal resulting from the project. It then identifies the primary ways that these hazardous materials could expose individuals or the environment to health and safety risks. It also considers the likely controls that would be in place to minimize these health and safety risks. As indicated above, substantial compliance with applicable federal, state, and local health and safety laws and regulations (as summarized in Table V.I.2 and described in detail in "Regulatory Setting" in Appendix H) by UCSF, residents, and businesses of the Project Area is considered necessary to preclude health and safety impacts. Local and state agencies would be expected to continue to enforce applicable requirements to the extent that they do so now.

The types of businesses and the range and types of uses that are expected to locate in the Project Area can be identified; however, the specific prospective businesses that could locate in the Project Area are unknown at this time. Regulatory compliance records are therefore available only for UCSF. UCSF summarized its record in its *Long Range Development Plan Final Environmental Impact Report*

(LRDP FEIR). Several state and local agencies have cited UCSF for a range of violations, some of which involved occupational safety, air emissions, radioactive materials handling, biohazardous waste management, and fire safety provisions. Many violations have been corrected during the inspections (e.g., closing containers when not in use). Some violations have required corrective action and a notice of compliance (e.g., training hospital staff in the proper disposal of medical waste). Occasionally, a new capital project has been needed to address a violation (e.g., installing a new fire alarm and sprinkler system). In all cases, UCSF has taken steps to respond to and correct these problems./8/,/9/

The project would involve a variety of land uses, including residences, retail space, entertainment facilities, community facilities, open space, and Commercial Industrial uses. UCSF operations would involve a number of these uses, including substantial research activities and a possible community clinic. Commercial Industrial uses could include biotechnology, semiconductor, computer, or other types of research and development operations; multi-media or software companies; light manufacturing; and office space. As a result, this analysis assumes and evaluates a broad range of potential businesses that could handle hazardous materials in the Project Area.

HAZARDOUS MATERIALS USE, STORAGE, AND DISPOSAL

Types of Hazardous Materials Users

Nearly all project uses would involve the use of hazardous materials at varying levels. In each case, the potential hazards would depend on what materials would be used, where the materials would be used, how they would be used, and who would use them. Households and certain businesses (e.g., office-based businesses) would use relatively small quantities of hazardous materials when compared with certain other businesses (e.g., those engaged in research and development or light manufacturing). Businesses that handle larger quantities of hazardous materials would often also use a wider variety of materials. This variety could include less common materials, such as radioactive materials or biohazardous materials. These businesses would be subject to relatively more intense regulation and oversight than businesses that handle smaller quantities of more common materials. Employees of these businesses would also typically receive special training (often required by law) to help them understand the hazards they face.

Because the types of hazardous materials found in homes and many other businesses would often be common household products, and because individuals such as residents and office workers would not usually receive any special hazardous materials training, the hazards associated with these common materials could often go unrecognized. Because residential and other small quantity hazardous materials users would differ from large quantity users in terms of 1) the types of materials handled, 2) the training provided to the individuals who handle the materials, and 3) the regulatory enforcement provided by oversight agencies, the health and safety issues pertaining to these groups would be different. For this reason, this analysis evaluates these two types of hazardous materials users separately in some cases.

Commercial Industrial Uses

Most project-related businesses that handle relatively large quantities of varying types of hazardous materials would occupy the Commercial Industrial space. Commercial Industrial uses could include biotechnology, semiconductor, computer, or other types of research and development operations; multi-media or software companies; light manufacturing; and office space. Many of these uses would involve mostly common office functions. For example, since modern offices rely heavily on the use of personal computers, the potential operations of multi-media or software companies would be similar to those of most office environments. Offices are like households in that, although hazardous materials are used there, the materials are typically common household products. Potentially hazardous office supplies include paints, aerosols, cleaners, disinfectants, adhesives, correction fluid, and fluorescent light bulbs.

Some potential research and development functions of computer firms could resemble office uses, particularly if they were to involve the development of new software. Other research and development operations could involve "dry" laboratories, where relatively small or negligible quantities of chemicals would be used. The remainder of the Commercial Industrial space could consist of "wet" laboratories or light industries, where relatively larger quantities of hazardous materials could be handled routinely. Some of these operations could include radioactive materials or biohazardous materials.

UCSF, which would occupy a substantial portion of the Project Area, would conduct health sciences instruction and research at this site. For this reason, the Project Area could be an attractive location for health sciences businesses seeking to associate with UCSF. These businesses would probably engage in research and development operations complementary to UCSF activities, specializing in biotechnology or other life science-related research and development. If successful, they could also manufacture and market complementary products, such as medical devices or pharmaceuticals. This type of manufacturing would be expected to occupy a relatively small portion of the Commercial Industrial space. Pilot-scale manufacturing would be much more likely than large-scale manufacturing./10/ Large-scale manufacturing would more likely locate away from urban and seismic hazards, where properties could be less expensive and a less expensive work force could be available.

The primary businesses occupying the Commercial Industrial areas would seek to benefit from the intellectual dialogue that would be possible if located near a major research institution such as UCSF.

Operations other than biology-based research and development would be possible at the Project Area, but Commercial Industrial space related to the life sciences would be most likely. Furthermore, other types of "wet" research and development laboratories would rely on many of the same basic techniques found in life science laboratories, as described below.

Research and Development

Laboratory-based research and development (or "wet" research) could involve a broad spectrum of activities requiring the use of laboratory bench space, laboratory support space (e.g., tissue culture rooms, media preparation areas, cold rooms, glassware wash areas, and dark rooms), and other ancillary facilities (offices and work stations, storage areas, libraries, and meeting rooms). Typical "wet" laboratories contain work benches, sinks, storage areas, fume hoods, biosafety cabinets, and a wide variety of instruments and equipment. Each instrument is generally associated with one or more basic techniques. Like the appliances in a typical household kitchen, the instruments range in size from as small as a blender to as large as a commercial restaurant or deli refrigerator (kitchen appliances are, in fact, common in laboratories). The equipment housed in a laboratory depends on the technologies employed and the materials handled. Many laboratories also include space for computers that control instruments or are used to store and analyze data. Most laboratory work in the life sciences is performed at room temperature or body temperature under normal atmospheric pressure. Other types of laboratories could use a greater range (lower and higher) of temperatures and pressures.

Standard laboratory techniques include measuring weights and volumes, gently heating and cooling materials, and shaking and stirring solutions. These standard techniques are often used in association with more sophisticated techniques, as described in Table V.I.3. Some of the techniques described in Table V.I.3 involve the use of hazardous materials. By describing many common laboratory activities, Table V.I.3 suggests the nature of the hazards posed by some laboratory operations. Research and development laboratories typically use relatively small quantities of these materials at any one time.

Hazardous Materials Use, Storage, and Disposal in Research and Development

The quantities of hazardous materials that would be used, stored, and disposed of with the project cannot be quantified precisely because the specific future businesses of the Project Area are unknown,

TABLE V.I.3
COMMON LABORATORY ACTIVITIES

Physical Techniques	*Physical techniques include heating, stirring, and other techniques as illustrated by the following examples.*
Microscopy	The common light microscope is used to magnify small specimens, such as bacteria. More sophisticated microscopes operate on very similar principles.
Photometry	Photometry involves shining ultraviolet, visible, or near-infrared light through less than an ounce of solution to determine what substance is in the solution and how much there is.
Chromatography	Chromatography is a method of separating different components of a mixture by flowing the mixture (dissolved in a water solution with salts or a mixture of organic solvents) through a stationary substance (such as a silica gel or specially coated glass beads). Under appropriate conditions, the mixture may be separated as some components are slowed down by the stationary substance more than others. Chromatography can require several ounces or gallons of material.
Electrophoresis	During electrophoresis, a mixture is placed in a gelatin-like material and a voltage (e.g., 1,000 volts) is applied across the gel. In time, the voltage will separate the components of the mixture by pulling components with greater electric charges through the gel faster. Electrophoresis can require several ounces or quarts of materials.
Centrifugation	Centrifuges spin solutions (usually in capped tubes or bottles) around a central axis. This spinning creates a centrifugal force that drives heavier (and usually larger) particles to the bottom. Researchers centrifuge volumes of liquids ranging from a few drops to about a quart.
Filtration	Filtration separates mixtures on the basis of size. Researchers filter volumes of liquids ranging from a few drops to several quarts to remove suspended particles.
Lyophilization	Lyophilization is "freeze drying." Water and more volatile substances are extracted by freezing a solution and applying a vacuum to it, leaving dry solids or oils behind, as when freeze-drying coffee.
Sterilization	Laboratory materials and equipment are often sterilized through treatment with steam and pressure. Chemical techniques also exist for disinfection.
Chemical Techniques	*Some chemicals are hazardous materials, while others are not. Life science laboratories involve primarily simple chemicals (like sugars and salts) as nutrients in solutions that support cell growth and reproduction. Most molecules of biological interest are handled in water-based solutions. For this reason, biological research typically uses a preponderance of water-soluble chemicals and relatively smaller amounts of organic chemicals, such as solvents.*
Use of Reagents	Researchers use chemical reagents as starting materials for many types of chemical reactions. Such reactions are used to chemically change other chemicals or biological molecules. Chemical reactions are necessary for many techniques, such as staining cells (dyes) and developing photographic film (developers and fixers). The volume used depends on the reactions, but typically involves a quart or less.

(Continued)

TABLE V.I.3 (Continued)

Use of Solvents	Some chemicals can be used to dissolve other materials to create a homogeneous mixture or solution. These solvents can be used to transfer substances between containers, extract substances from complex mixtures, or carry substances through other processes or equipment.
Use of Enzymes	Enzymes are proteins that perform specific biological reactions at the molecular level. In the strictest sense, they are very large chemicals. They perform many biological tasks much more efficiently than other chemical techniques, but are rarely hazardous. Experiments typically require a fraction of a drop of an enzyme-containing solution.
Use of Radionuclides	Certain chemicals contain radioactive atoms, or radionuclides, which emit radiation. Current methods for detecting radionuclides allow researchers to use less than 1 millicurie of these materials in typical experiments. Most radionuclides are used as tracers to find out what happens to an atom or molecule through the course of an experiment.
Biological Techniques	*Most biological techniques involve individual cells, cultures, or tissues and applications of normal biological processes. Use of research animals is sometimes required to study biological effects that cannot be adequately evaluated in a test tube or culture dish. Animal research and care require common veterinary medicine techniques, such as tests of biological functions (e.g., temperature, pulse), clinical assays (on blood or urine), x-rays, injections, surgery, and necropsy. Recombinant DNA technology combines many of the chemical and physical techniques described above in applications related to biological materials. Two primary recombinant DNA techniques are cell culture and cloning, as described below.*
Cell Culture	Cell culture refers to growing cells in a laboratory setting, such as in a culture dish. Microorganisms can be cultured if provided appropriate nutrients for survival in a water-based growth medium. Sometimes several gallons of growth medium can be used to grow a culture. A researcher can select and control which cells are grown in a growth medium by either supplying critical nutrients in the solution or by keeping certain substances necessary for cell survival out of the medium. Typical organisms used for these purposes include *E. coli* K12 and baker's yeast.
Cloning	Extremely specific enzymes are used to cut DNA (deoxyribonucleic acid) molecules at specific, desired points. Later, the DNA fragments may be recombined in a different order using another set of enzymes. The result may be a new or altered DNA genetic code. The process of using the new genetic code to perform some function (like making a protein) is called "expression." Ultimately, many copies of the new DNA may be made by inserting it into cells (e.g., bacteria or yeast) that replicate very quickly. In this way, many copies of the new DNA molecules may be produced. This process is called "cloning." Moving DNA from one organism to another or rearranging an organism's DNA is called "genetic engineering." The use of genetic engineering, in part, defines most biotechnology work.

Source: EIP Associates

and because hazardous materials use, storage, and disposal by any business is subject to continuous change as technologies develop and mature. Even if the project occupants were known, businesses and UCSF cannot reasonably be expected to predict in advance every possible chemical or combination of chemicals they could conceivably use. However, the discussion below illustrates the range and nature of foreseeable hazardous materials use, storage, and disposal by project-related Commercial Industrial uses and UCSF.

Approach Used to Estimate Hazardous Materials Quantities

The estimates presented below assume that research and development laboratories uses would occupy about 50% of the proposed Commercial Industrial space. To ensure a conservative approach, additional estimates are provided that assume that research and development laboratory uses would occupy about 75% of the proposed Commercial Industrial space. This assumption is conservative in that it probably leads to overestimates of hazardous materials quantities. The estimates below also assume that research and development activities would relate primarily to biotechnology, biomedical, or other life science research. This assumption is reasonable because UCSF would be expected to draw these types of uses to the Project Area. This assumption is also somewhat conservative because other types of Commercial Industrial uses (e.g., computer software and multimedia businesses) would likely handle hazardous materials in lesser quantities.

Similar operations undertaken elsewhere can be used to illustrate activities foreseeable at the Project Area. UCSF's LRDP FEIR describes UCSF's laboratory research activities in general terms./11/ In that report, UCSF projected that its Mission Bay site could involve the annual use of about 42,200 gallons of liquid chemicals, 235,000 pounds of solids, and 122,000 cubic feet of compressed gases. UCSF's 1990 *Laurel Heights Environmental Impact Report* describes laboratory research activities related to the School of Pharmacy and provides an inventory of chemicals purchased by the School of Pharmacy./12/ UCSF's 1995 *Revised Laurel Heights Plan; Center for Social, Behavioral and Policy Sciences, and Campus Administration Environmental Impact Report* describes the nature of laboratory research and estimates the types and quantities of hazardous materials for that project on the basis of a representative selection of laboratories at other UCSF sites./13/ The *University of California San Francisco—Mount Zion Hospital and Medical Center Proposed Integration Agreement Environmental Impact Report, University of California San Francisco/Mount Zion Program Revisions and Associated Building Projects Subsequent Environmental Impact Report,* and *University of California San Francisco Parnassus Heights Central Utilities Plant Project Environmental Impact Report* provide additional information about UCSF operations./14/ These documents provide information useful in understanding UCSF's possible hazardous materials use, storage, and disposal activities at its new campus site in the Project Area.

Various environmental impact reports have been prepared for specific research and development projects proposed by private businesses. For example, the *Chiron Development Plan Environmental Impact Report* prepared by the City of Emeryville assesses the impacts of expanding Chiron Corporation's research and development headquarters in Emeryville./15/ Because Chiron is an international biotechnology company engaged in research and development related to molecular biology, biochemistry, and related life sciences, its operations, on average, are representative of many proposed Project Area Commercial Industrial uses. Because Chiron Corporation's Emeryville operations are representative of many prospective Commercial Industrial users, data presented in the *Chiron Development Plan Environmental Impact Report* are used here to illustrate the range and nature of hazardous materials use, storage, and disposal anticipated by Commercial Industrial uses.

Data from the Chiron report were adjusted on the basis of proportional research and development space to reflect the level of activity anticipated for the proposed Commercial Industrial space. In 1994, Chiron Corporation occupied 118,000 gross square feet (gross sq. ft.) of space with research activities and 60,000 gross sq. ft. of space with product development and small-scale manufacturing operations. The total area devoted to these research and development uses was 178,000 gross sq. ft. Commercial Industrial uses in Mission Bay South would occupy 5,557,000 gross sq. ft. of space. Assuming that about 50% of this space would actually be research and development space (with the balance being office space and office-related uses), the combined research and development space in these subareas would be about 2,779,000 gross sq. ft. This amount of space is about 16 times greater than Chiron Corporation's research and development space in 1994 (178,000 gross sq. ft.). Therefore, 1994 data from the *Chiron Development Plan Environmental Impact Report,* increased by a factor of 16, reflect a reasonable estimate of hazardous materials use, storage, and disposal by Commercial Industrial uses under this project.

To ensure a conservative analysis, hazardous materials projections are also presented here assuming that about 75% of the Commercial Industrial space would be occupied by research and development space. Using this assumption, about 4,168,000 gross sq. ft. of the 5,557,000 gross sq. ft. of Commercial Industrial space would be occupied by research and development laboratories, a space about 23 times larger than the space Chiron occupied in 1994.

The estimated hazardous materials quantities provided below are reasonable and illustrative of hazardous materials use, but they are also conservative for the following reasons:

- A substantial portion of the Commercial Industrial research and development space could be occupied by businesses (e.g., software companies) that do not operate "wet" laboratories, whereas relatively little of this space would likely be occupied by greater hazardous materials users.

- In estimating most hazardous materials quantities on the basis of Chiron Corporation data, hazardous materials use related to Chiron's research, development, small-scale manufacturing, and production-scale (large-scale) manufacturing activities were included. However, Chiron's 1994 production-scale manufacturing space (40,000 gross sq. ft.) was not included when calculating the scaling factors of 16 and 23.

- The estimated hazardous materials quantities presented here assume that laboratory-based research and development space (which is a proportion of total floor space within the Commercial Industrial land use designation) would be occupied exclusively by laboratories and ancillary space (as presented in the *Chiron Development Plan Environmental Impact Report*). In contrast, Commercial Industrial space in the Project Area would be occupied by a full complement of business functions (e.g., offices and support space) in addition to the space assigned specifically for laboratories.

Estimated Hazardous Materials Quantities

Estimated quantities of hazardous chemicals, radioactive materials, and biohazardous materials that could reasonably be expected to be managed by the largest potential users of these materials are provided below. These businesses and other entities would be located primarily in Mission Bay South in Commercial Industrial and UCSF space.

Hazardous Chemicals

On the basis of the approach described above, Table V.I.4 presents estimated chemical storage by project-related Commercial Industrial uses and UCSF. To the extent possible, the chemicals in Table V.1.4 have been grouped by category of hazardous material, including flammable materials, corrosive materials, oxidizers (reactive materials that often release oxygen upon reaction), and toxic substances. Appendix Table H.1 lists examples of these types of chemicals by category. These examples include liquids, solids, and gases. As suggested by Appendix Table H.1, some of the chemicals included in Table V.I.4 (e.g., some of those in the "other materials" category, like amino acids and mineral oil) may not be particularly hazardous. Table V.I.5 presents estimated hazardous waste to be generated by Commercial Industrial uses and UCSF. Categories similar to those in Table V.I.4 are used to the extent possible. Table V.I.5 estimates that the total hazardous waste generation by Commercial Industrial uses could reach 1,300 tons per year. This compares to about 63 tons per year estimated by UCSF for its portion of the site./16/ This difference illustrates the conservative assumptions used to estimate quantities for Commercial Industrial businesses. The total quantity of hazardous waste generated throughout San Francisco on an ongoing basis is approximately 16,000 tons per year./17/

TABLE V.I.4
ESTIMATED CHEMICAL STORAGE
BY COMMERCIAL INDUSTRIAL USES AND UCSF (ASSUMING COMMERCIAL INDUSTRIAL OPERATIONS PRIMARILY RELATED TO THE LIFE SCIENCES)

Chemical Type	Chemical Storage (assuming life science labs occupy 50% of the Commercial Industrial space) (tons)	Chemical Storage (assuming life science labs occupy 75% of the Commercial Industrial space) (tons)
Flammable Materials (materials that can sustain a fire if ignited)	200	300
Corrosive Materials (acidic or basic materials, which can corrode living tissue and other materials)	77	120
Oxidizers (reactive materials that often release oxygen upon reaction)	9.4	14
Toxic Substances	23	35
Other Materials /a/	65	97
Commercial Industrial Subtotal	380	570
UCSF	250	250
TOTAL	**630**	**820**

Notes:
All figures in this table have been rounded to two significant figures.
a. The "other materials" category could include some materials that are not hazardous.

Source: EIP Associates, based on information from City of Emeryville, *Chiron Development Plan Environmental Impact Report*, State Clearinghouse No. 94063005, June 1995, and John Shaver, UCSF Office of Environmental Health and Safety, data provided to Michelle Schaefer, Campus Planning Office, February 13, 1998.

Although the hazardous materials projections described above are reasonable, conservative, and illustrative, certain businesses that would be allowed in Commercial Industrial areas could handle a different mix of materials. As indicated above, for example, semiconductor (computer chip) research and development could exist within Commercial Industrial areas. Such research and development operations, while they would involve many of the same physical and chemical techniques described

TABLE V.I.5
ESTIMATED HAZARDOUS CHEMICAL WASTE
GENERATED BY COMMERCIAL INDUSTRIAL USES AND UCSF

Chemical Waste Type	Annual Waste Generation (assuming life science labs occupy 50% of the Commercial Industrial space) (tons)	Annual Waste Generation (assuming life science labs occupy 75% of the Commercial Industrial space) (tons)
Flammable Liquids	330	490
Corrosive Liquids	140	210
Flammable Corrosive Liquids	17	26
Oxidizers	9.4	14
Toxic Substances	9.4	14
Oil	56	84
Other Wastes /a/	330	490
Commercial Industrial Subtotal	890	1,300
UCSF	63	63
TOTAL	**950**	**1,400**

Notes:
All figures in this table have been rounded to two significant figures.
a. The "other wastes" category could include some wastes that are not hazardous.

Source: EIP Associates, based on information from City of Emeryville, *Chiron Development Plan Environmental Impact Report*, State Clearinghouse No. 94063005, June 1995, and University of California San Francisco, *Long Range Development Plan Environmental Impact Report*, State Clearinghouse No. 95123032, January 1997, Volume II, p. 387.

above, would not likely involve radioactive or biohazardous materials. In contrast to research and development in the life sciences, they could involve greater use of certain chemicals, particularly inorganic acids, organic solvents, cryogenic (very cold) liquids, and compressed gases. Compressed gas cylinders could contain such substances as air, argon, helium, nitrogen, oxygen, arsine, chlorine, fluorine, boron trifluoride, phosphine, freons, silane, hydrogen chloride, and hydrogen bromide. Some of these gases are toxic, corrosive, or flammable. Appendix Table H.3 is similar to Table V.I.4, but it assumes computer and other "high tech" research and development instead of life science research and development./18/ It is presented only to illustrate the differences between the hazardous chemicals handled by these two types of research and development. As discussed above under

"Approach Used to Estimate Hazardous Materials Quantities," the data presented in Table V.I.4 are believed to conservatively err on the high side.

The California Department of Toxic Substances reports that the hazardous wastes generated by the semiconductor industry in the greatest volumes are water-based wastes (e.g., hydrofluoric, hydrochloric, phosphoric, and sulfuric acids) and organic solvent wastes (e.g., isopropanol, acetone, and propylene glycol monomethyl ether acetate)./19/ Some semiconductor research and development processes may involve high-temperature work, particularly to create polysilicon crystals. Large-scale semiconductor manufacturing operations are not expected to locate within the Project Area.

Radioactive Materials

Although the use, storage, and disposal of radioactive materials would be highly variable and depend on the specific research and development projects undertaken at any particular time, Table V.I.6 illustrates the quantities of radionuclides that could be used in project-related Commercial Industrial space and at UCSF. It separates long-lived radionuclides from short-lived radionuclides because, as discussed below, available waste disposal options for these two groups differ.

Biohazardous Materials and Animals

Research and development operations in the fields of biotechnology, health, medicine, and related life science disciplines typically involve biological materials. The majority of this work involves non-hazardous organisms, such as *E. coli* K12 bacteria and baker's yeast. *E. coli* K12 is a bacterial strain that, through mutations, has lost the ability to survive in humans. Baker's yeast is the same as the yeast used to make bread. These organisms may be handled using Biosafety Level 1 containment because they pose minimal or no known potential hazard to individuals and the environment.

Biosafety levels are based on the characteristics of the agent handled and the hazards it poses. Agents that require Biosafety Level 2 or Biosafety Level 3 containment pose increasingly greater hazards. Appendix Table H.2 lists examples of infectious agents by the level of containment (biosafety level) typically used to handle them. Most of these infectious agents would not be handled in the Project Area, but these examples represent the range and nature of the biological materials that could be handled there. Depending on particular circumstances, a biosafety level other than that indicated in Appendix Table H.2 could be appropriate when handling a particular infectious agent. Appendix Table H.4 defines the types of hazards posed by infectious agents for each biosafety level and describes appropriate containment facilities and practices. The need for Biosafety Level 4

TABLE V.I.6
ESTIMATED RADIOACTIVE MATERIAL PURCHASES, STORAGE, AND DISPOSAL BY COMMERCIAL INDUSTRIAL USES AND UCSF

	Assuming Life Science Labs Occupy 50% of the Commercial Industrial Space			Assuming Life Science Labs Occupy 75% of the Commercial Industrial Space		
Radionuclides	**Approximate Annual Purchases (curies)**	**Approximate Storage at Any One Time (curies)**	**Approximate Annual Waste Disposal (curies)**	**Approximate Annual Purchases (curies)**	**Approximate Storage at Any One Time (curies)**	**Approximate Annual Waste Disposal (curies)**
Long-Lived Radionuclides						
Hydrogen-3	5.80	3.80	5.30	8.70	5.60	8.00
Carbon-14	0.0038	0.0025	0.41	0.0056	0.0038	0.61
Commercial Industrial Subtotal	5.80	3.80	5.70	8.70	5.60	8.60
UCSF	1.9	1.9	2.00	1.9	1.9	2.00
TOTAL	**7.7**	**5.7**	**7.70**	**11**	**7.5**	**11.00**
Short-Lived Radionuclides						
Phosphorus-32	5.60	0.87	12.00	8.40	1.30	17.00
Sulfur-35	6.90	2.00	5.60	10.00	3.00	8.40
Chromium-51	1.90	0.30	2.80	2.80	0.45	4.20
Iodine-125	1.70	0.39	3.90	2.60	0.59	5.90
Commercial Industrial Subtotal	16.00	3.60	24.00	24.00	5.40	36.00
UCSF	16	5.1	12.00	16	5.1	12.00
TOTAL	**32**	**8.7**	**36.00**	**40**	**10**	**48.00**

Note: All figures in this table have been rounded to two significant figures.

Source: EIP Associates, based on information from City of Emeryville, *Chiron Development Plan Environmental Impact Report,* State Clearinghouse No. 94063005, June 1995; University of California San Francisco, *Long Range Development Plan Environmental Impact Report*, State Clearinghouse No. 95123032, January 1997, Volume II, p. 388; and John Shaver, UCSF Office of Environmental Health and Safety, data provided to Michelle Schaefer, Campus Planning Office, February 13, 1998.

containment is not foreseeable because research involving dangerous or exotic organisms occurs in very few locations in the U.S., primarily at facilities that specialize in such work.

As with all research and development operations, the use of biological materials in the Project Area would be dynamic, especially because living organisms continually grow, multiply, and die. For this reason, biological materials are difficult to quantify or estimate. However, as indicated in the UCSF and Chiron studies, relatively little biohazardous material would be stored when experiments are not in progress./20/ Typically, small containers containing an ounce or less of a master culture are stored in refrigerators and freezers, and these cultures are used to grow larger cultures when needed for experiments. Standard practice is to inactivate or kill most cultures at the end of experiments.

Some research and development activities in the Project Area could involve animals. For example, the U.S. Food and Drug Administration requires experimental drugs to be tested on animals prior to conducting studies in humans. The most common laboratory animals are rodents, but other animals may also be used. At most facilities, animals are typically housed at a central vivarium according to standards described in the *Guide for the Care and Use of Laboratory Animals*./21/ Assuming that 50% of the Commercial Industrial space would house laboratory research and development, about 78,000 rats and mice, 19,000 guinea pigs, 7,800 frogs, and 310 rabbits could be used for research purposes each year by Commercial Industrial activities in the Project Area./22/ If 75% of the Commercial Industrial space were occupied by laboratories, then these numbers could be about 50% greater. Animals other than those listed above could be used, and research animals used by UCSF would be in addition to those estimated here for Commercial Industrial uses.

As a result of work involving biohazardous materials at UCSF and Commercial Industrial businesses, biohazardous waste would be generated. Much of this waste would be inactivated on site, but some could be shipped off site for treatment and disposal as medical waste. Between about 9,000 and 14,000 cubic yards of medical waste could be shipped from the Project Area each year by Commercial Industrial uses, depending on the percentage of the Commercial Industrial space occupied by laboratories./23/ UCSF would generate an additional 2,000 cubic yards of medical waste./24/ If UCSF were to operate an outpatient clinic, additional medical waste could be generated, depending on the nature of the clinic.

POTENTIAL ENVIRONMENTAL IMPACTS OF HAZARDOUS MATERIALS AND WASTE MANAGEMENT

This analysis addresses residents and businesses that would handle relatively small quantities of hazardous materials first, followed by a discussion of businesses that would handle relatively large quantities of these materials.

Small Quantity Hazardous Materials Users

Hazardous materials are handled and stored routinely by households and most businesses. Typical household hazardous materials include oils (e.g., motor oil and hydraulic oil), fuels (e.g., gasoline and diesel), paints (both latex and oil-based), solvents (e.g., degreasers, paint thinners, and aerosol propellants), acids and bases (e.g., automobile battery fluids, swimming pool chemicals, and many cleaners), disinfectants, metals (e.g., thermometers, batteries, and photography chemicals), and pesticides.

Most businesses use similar materials, and some (e.g., gas stations, dry cleaners, and photoprocessors) use hazardous materials specifically related to their business activities. For example, supermarkets and gas stations stock hazardous materials for sale to consumers. Service stations handle fuel, motor oil, antifreeze, and other fluids. Supermarkets handle automotive fluids, cleaners, pesticides, and batteries. Dry cleaners handle perchloroethylene. Photoprocessors handle fixer and developer chemicals.

Although individual households and many businesses use relatively small volumes of hazardous materials, the total volume of the hazardous materials managed by all of these households and businesses is substantial. In 1990, San Francisco households generated about 1,600 tons of hazardous waste./25/ Because many hazardous materials are consumed through their use (e.g., fuel, paint, aerosols), the quantity of hazardous materials handled by San Francisco is believed to be substantially greater than the volume of hazardous waste estimated to be generated. In San Francisco, about 90% of business-related hazardous waste generators are small businesses/26/; therefore, small businesses also use substantial quantities of hazardous materials.

Commercial products are labeled to inform users of potential risks and to instruct users in appropriate handling procedures. Although households are relatively less regulated than businesses, the risks posed by hazardous materials use at project-related residences would be similar to those in similar residential areas. The home use of common household hazardous materials is typically considered to pose an acceptable level of risk.

San Francisco oversees many hazardous materials requirements placed on businesses. Specifically, the San Francisco Department of Public Health, as a Certified Unified Program Agency, oversees hazardous materials registrations, underground storage tank programs, aboveground petroleum storage tank spill prevention control and countermeasure plans, risk management plans, and some fire safety planning. Additionally, businesses are regulated as employers and are therefore required to ensure employee safety./27/ Specific requirements include identifying hazardous materials in the workplace, providing safety information to workers that handle hazardous materials, and adequately training workers. Because of this regulatory structure, the business-related use of relatively small quantities of hazardous materials similar to household products would not pose greater risks than the use of such materials by households. For this reason, the use of relatively small quantities of common hazardous materials by businesses would be within acceptable risk levels and would not create any substantial public health hazards.

Large Quantity Hazardous Materials Users

Businesses using relatively large quantities of hazardous materials (in comparison to households and office-based businesses) would use materials similar to those described for households above, but they could also use other materials. Most large-quantity hazardous materials users would occupy the Commercial Industrial or UCSF space in Mission Bay South. Hazardous materials use, storage, and disposal quantities are estimated for Commercial Industrial and UCSF space above. Some aboveground and underground storage tanks could also be installed to store hazardous materials for project-related businesses (e.g., diesel fuel), and the San Francisco Department of Public Health would oversee their operation and maintenance.

Potential Hazards

The project-related use of hazardous chemical materials would be overseen by the San Francisco Department of Public Health, a Certified Unified Program Agency. If properly managed, hazardous chemicals would generally pose minimal health and safety risks. If improperly managed, hazardous chemicals could pose chronic and acute health and safety hazards. Laboratory activities generally involve relatively small quantities of materials (typically less than 1 quart), but pilot-scale manufacturing or other light industrial activities could involve substantially greater quantities at any one time.

Radioactive materials could also be handled by project businesses and UCSF, particularly in life science laboratories. Typically, less than a millicurie of radioactivity would be used for any single laboratory experiment, and radioactive materials use would be overseen by the California Department of Health Services Radiologic Health Branch according to radioactive materials licenses issued by the branch. Radioactive materials would pose minimal potential for exposure. Exposure would also be limited to individuals in the immediate vicinity of the materials. Accidental exposure to radioactive materials could cause headaches, skin burns, and chronic illnesses, including cancer.

Typical work involving biological materials, including infectious agents, would be conducted using Biosafety Level 1 or Biosafety Level 2 containment practices, because these lower hazard activities would be most common. The particular hazards of potential infection would depend on the specific agent encountered. The need for Biosafety Level 3 containment would be less common, and the need for Biosafety Level 4 containment is not foreseeable, because these most hazardous activities occur at very few locations throughout the U.S. and are not typically necessary for routine research and development operations.

Some animals could be required for study purposes by Commercial Industrial businesses and UCSF. Hazards related to the use of animals for study purposes can be controlled. Animal-related hazards include potential bites or scratches, and the transmittal of naturally occurring or research-related diseases. Specific hazards would relate to the type of animals involved, the types of infectious agents involved, and the ability of the animals to transmit diseases to humans or animals.

Hazard Assessment

The "Hazard Assessment" in Appendix H contains the detailed technical data supporting the hazard assessment summary contained in this section for the project activities that would involve relatively large quantities of hazardous materials. The assessment was used to focus the discussion presented here on the most important issues. The hazard assessment considers the types of materials to be managed and the potential routes whereby human or environmental exposure to these hazardous materials could occur. It then assesses the likely adequacy of foreseeable controls, including compliance with applicable laws and regulations, and the application of standard industry safety practices.

The analysis in Appendix H is in two parts. The first part evaluates potential worker exposure to hazardous materials. Worker exposure is primarily of local importance (i.e., it relates primarily to the immediate vicinity of the hazardous materials operations). The second part evaluates potential exposure of the public (or off-site individuals within or outside the Project Area, but not necessarily in the immediate vicinity of the hazardous materials operations). In each case, both routine and upset (accident) conditions are examined.

As listed in Table V.I.7, the primary routes through which project workers could be exposed to hazardous materials in the workplace would include inhalation, ingestion, contact with skin or eyes, puncture wounds, and other accidents. Standard practices summarized in Table V.I.7 would serve to control the potential for hazardous materials exposure through these pathways. Many of these measures would be required by laws and regulations. Others are not specifically required, per se, but

TABLE V.I.7
EXPOSURE PATHWAYS AND CONTROLS—WORKERS

Exposure Pathway	Examples of Control Measures
Inhalation (breathing a hazardous substance)	• Working with volatile materials in fume hoods /a/ • Working with potentially aerosol-suspended biohazardous materials in biosafety cabinets /b/ • Keeping containers closed when not in use • Wearing face masks or respirators, as necessary
Ingestion (swallowing a hazardous substance)	• Not eating or drinking near hazardous materials • Not storing food in refrigerators used for hazardous materials • Not smoking near hazardous materials • Washing hands and work areas
Contact (absorbing a hazardous substance through the skin or eyes)	• Wearing protective clothing and shoes, as necessary • Wearing eye protection (glasses or goggles), as necessary • Wearing gloves, as necessary • Washing hands and work areas • Working with radioactive materials behind shields • Keeping animals in cages when not handling them
Injection (puncturing or cutting the skin with a contaminated object)	• Participating in awareness training • Keeping sharps in puncture-resistant containers • Keeping animals in cages when not handling them • Learning how to handle animals to prevent bites and scratches
Accidents	• Participating in emergency response training • Maintaining emergency equipment (e.g., safety showers, emergency eye washes, first aid kits, neutralizing substances for corrosive materials) • Providing appropriate lips on shelves where hazardous materials are stored and other restraints where necessary • Storing flammable materials in fire-rated cabinets • Providing secondary containment for hazardous materials that are not in use • Calling San Francisco Fire Department and Hazardous Materials Emergency Response Team, if necessary

Notes:
a. Fumes hoods are cabinets with front-opening (usually sliding) glass doors connected to overhead exhaust fans that draw air from the room through the cabinet and expel it into the atmosphere through rooftop stacks.
b. Biosafety cabinets look similar to fume hoods. They filter aerosols and remove particles from the air, but do not necessarily exhaust the filtered air to the outdoors.

Source: University of California San Francisco, *Revised Laurel Heights Plan; Center for Social, Behavioral and Policy Sciences, and Campus Administration Environmental Impact Report,* State Clearinghouse No. 95033072, September 6, 1996, p. 140. Table modified by EIP Associates.

would likely result from the implementation of regulatory requirements (e.g., the preparation of various health and safety plans as described in Table V.I.2 and Appendix H under "Regulatory Setting"). Many of these measures also serve to control the potential exposure to hazardous materials by off-site receptors.

Table V.I.8 lists the primary routes through which the environment (including off-site receptors) could be exposed to hazardous materials, including air emissions (addressed more fully in "Toxic Air Contaminants" in Section V.F, Air Quality: Setting and Impacts; transport to, from, or around the Project Area; waste disposal; direct and indirect human contact; and possible accidents. The standard practices summarized in Table V.I.8 serve to control the potential for hazardous materials exposure through these pathways. Again, many of these standard practices are required by law, and most others would likely result from any good faith effort to comply with regulatory requirements.

As a result of the analysis presented in Appendix H, two areas of concern are addressed here. These areas relate to standard biohazardous materials practices not required by law and the potential for certain types of accidents to harm individuals in the Project Area and its vicinity. The analysis in Appendix H concludes that other potential exposure paths would be unlikely to result in substantial exposure and, therefore, would not pose significant health and safety risks.

<u>Enforcement of Guidelines for Work Involving Biohazardous Materials and Animals</u>

Relying on the various biohazardous materials guidelines provided by U.S. Department of Health and Human Services agencies (e.g., the National Institutes of Health's *NIH Guidelines*) has become standard industry practice for addressing health and safety issues associated with work involving biohazardous materials and research animals. However, no regulatory body requires businesses in San Francisco to follow such guidance unless the business receives funding from the federal government. UCSF accepts federal funding and, as a matter of institutional policy, adheres to applicable guidelines related to the use of biohazardous materials and research animals. Many businesses that would occupy Commercial Industrial areas of Mission Bay South may not secure federal funding, but most would adhere to standard industry practices anyway. However, no independent organization would oversee the practice of applicable health and safety guidelines, and adherence to these guidelines, however probable, cannot necessarily be assumed. Compliance with applicable guidelines would be needed to conclude that individuals and the environment would not be harmed as a result of work involving biohazardous materials, including research animals. The potential for the project to pose a worker or public health hazard in the absence of compliance with biohazardous materials guidelines could be a significant impact. Mitigation Measure I.1 in Section VI.I, Mitigation Measures: Health and Safety, if implemented, would avoid this significant impact.

TABLE V.I.8
EXPOSURE PATHWAYS AND CONTROLS—PUBLIC AND ENVIRONMENT
(OFF-SITE, BOTH INSIDE AND OUTSIDE THE PROJECT AREA)

Exposure Pathway	Examples of Control Measures
Air Emissions	• Using fume hood ventilation system to dilute and subsequently disperse emissions to the atmosphere /a/
Transport To, From, and Around the Site	• Following packaging requirements specified by the U.S. Department of Transportation, the U.S. Postal Service, and the California Department of Health Services (Radiologic Health Branch and Medical Waste Program) • Identifying container contents with appropriate labels • Using licensed hazardous waste haulers • Documenting hazardous waste shipments • Placing animals in cages or boxes for transport
Waste Disposal	• Training workers • Segregating wastes • Collecting hazardous waste for appropriate disposal • Monitoring wastewater to the extent feasible • Diluting and treating sewage from the site • Checking loads at the San Francisco solid waste transfer station • Labeling trash cans • Following federal and state hazardous waste disposal regulations and procedures, including those for hazardous waste manifest documentation
Human Contact	• Identifying container contents with appropriate labels • Training workers • Implementing standard hygiene practices (e.g., wearing protective clothing and gloves, leaving protective clothing at work, and washing hands and work areas) • Implementing medical surveillance programs to monitor the health of those who work with certain biohazardous materials • Monitoring the exposure of those who work with radioactive materials • Keeping animal cages behind closed doors to prevent escapes
Other Accidents	• Providing emergency response training • Maintaining emergency equipment (e.g., safety showers, emergency eye washes, first aid kits, neutralizing substances for corrosive materials) • Calling San Francisco Fire Department and Hazardous Materials Emergency Response Team, if necessary • Conducting facility inspections and preventative maintenance

Notes:

a. Fume hoods are cabinets with front-opening (usually sliding) glass doors connected to overhead exhaust fans that draw air from the cabinet and expel it into the atmosphere through rooftop stacks. See the discussion in Toxic Air Contaminants under V.F., Air Quality: Impacts.

Source: University of California San Francisco, *Revised Laurel Heights Plan; Center for Social, Behavioral and Policy Sciences, and Campus Administration Environmental Impact Report*, State Clearinghouse No. 95033072, September 6, 1996, p. 141. Table modified by EIP Associates.

Biohazardous materials handling guidelines were developed primarily to protect workers, not the public or the environment. To a substantial degree, compliance with these guidelines would also serve to protect the public and the environment from exposure to biohazardous materials, but in certain cases, adherence to these worker safety guidelines may not adequately protect the public and environment. For example, U.S. Department of Health and Human Services guidelines allow substantial discretion in their application, particularly in regard to appropriate Biosafety Level 3 facilities (Appendix H describes biosafety levels). Of particular concern is that guidelines do not indicate with certainty whether exhaust from Biosafety Level 3 laboratories must be filtered before being released to the atmosphere:

> [In Biosafety Level 3 laboratory facilities,] a ducted exhaust air ventilation system is provided. This system creates directional airflow that draws air from "clean" areas into the laboratory toward "contaminated" areas. The exhaust air is not recirculated to any other area of the building, and is discharged to the outside with filtration and other treatment optional. The outside exhaust must be dispersed away from occupied areas and air intakes. Laboratory personnel must verify that the direction of the airflow (into the laboratory) is proper./28/

Biosafety Level 3 activities involve organisms with a high potential for aerosol transmission. If filtering does not occur, and if the organisms being handled pose serious human health hazards, then these organisms could be released to areas where the public or the environment could be affected. This potential health hazard could pose hazards to people or, depending on the materials being handled, animal or plant populations. Without incorporating adequate assurances regarding filtering exhaust from Biosafety Level 3 laboratories a potentially significant environmental impact could occur. This impact would be caused by activities in Mission Bay South but could affect receptors in Mission Bay South, Mission Bay North, and elsewhere in the vicinity of the Project Area. UCSF has indicated that its activities in the Project Area would probably be limited to those requiring Biosafety Level 1 or Biosafety Level 2 containment./29/ Mitigation Measure I.2 in Section VI.I, Mitigation Measures: Health and Safety, if implemented, would avoid this significant impact.

This analysis assumes that no activities requiring Biosafety Level 4 containment would occur in the Project Area. Biosafety Level 4 containment is appropriate for operations involving dangerous or exotic agents that pose high risks of life-threatening disease or aerosol-transmitted infections, or related agents with unknown risks of transmission./30/ Such operations would be highly unlikely to be proposed in the future, and Mitigation Measure I.3 in Section VI.I, Mitigation Measures: Health and Safety, would ensure that this important assumption of the analysis is correct.

Risk of Upset

The use of hazardous materials poses risks of upset (accidents). Most accident risks would be adequately addressed by implementing required health and safety plans, providing emergency resp e training, and providing emergency response services (discussed as a separate issue below). How er, of particular concern would be materials that could harm people without providing an ample opportunity for evacuation and clean-up. Such materials could include highly toxic gases or explosive materials. An example of a material that could release toxic vapors would be ammonia, a substance UCSF could need to operate emissions control equipment if UCSF were to construct a central utilities plant. Serious risks could also result from handling other types of very hazardous materials. For example, toxic gases often handled in "high tech" or semiconductor research and development could pose substantial hazards to the public or the environment if they were to be released off site.

Businesses that handle sufficient quantities of these very hazardous materials would be required to prepare Risk Management Plans./31/ (These are not the same Risk Management Plans described in Section V.J, Contaminated Soils and Groundwater.) Risk Management Plans must be prepared by some facilities to comply with state and federal Accidental Release Prevention program requirements. The state program calls for facilities preparing Risk Management Plans to systematically study their operations to anticipate worst-case events. Risk Management Plans are to disclose any residents, workers, school children, and children at child care facilities who could be subject to substantial risks in the event of a worst-case accident. Facilities are directed to identify measures they will take to reduce potential accident risks. In California, Risk Management Plans must be made available for public review. Then, local implementing agencies (e.g., the San Francisco Department of Public Health in this case) are to determine whether the Risk Management Plans adhere to applicable regulations.

The potential for school children to be exposed to risks associated with the use of hazardous materials, particularly the types of very hazardous materials for which Risk Management Plans must be prepared, has resulted in school site selection criteria set forth in laws and regulations./32/ These criteria are intended to reduce the risks to which school children could be exposed. Requirements for facilities handling very hazardous materials mirror those for facilities emitting toxic air contaminants, as described under "School Siting Criteria" in Section V.F, Air Quality: Setting.

Implementing Risk Management Plans and following school siting criteria would ensure that the impact of routine accident risks would be less than significant. Because the greatest potential for hazardous materials accidents would occur in Commercial Industrial and UCSF space, this issue relates primarily to Mission Bay South. Residents and other individuals in Mission Bay North and elsewhere near the Project Area could also be affected. California laws regarding the siting of schools near hazardous materials operations are discussed in "School Siting Criteria" in Section V.F, Air Quality: Setting.

POTENTIAL ENVIRONMENTAL IMPACTS OF HAZARDOUS WASTE GENERATION AND DISPOSAL

Residents and Similar Waste Generators

Businesses generate hazardous waste as a routine consequence of handling hazardous materials. Historically, many businesses have found complying with hazardous waste regulations to be difficult and expensive. In one survey, over half of the businesses questioned regarding their hazardous waste management practices admitted to disposing of some hazardous wastes inappropriately./33/ These businesses stored hazardous wastes indefinitely, flushed wastes down sewers, combined hazardous wastes with nonhazardous solid waste for disposal, and poured wastes on the ground./34/ Conditions are believed to have improved in recent years as a result of public awareness campaigns that seek to minimize environmental and safety hazards such as contamination of solid waste landfills and surface water, and sanitation worker injuries./35/

Households have posed similar disposal challenges. According to San Francisco's Household Hazardous Waste Element (prepared in 1992), about 1,600 tons of household hazardous waste are generated in San Francisco each year. At that time, about 1,400 tons (over 85%) was estimated to be disposed of inappropriately./36/ A 1985 Association of Bay Area Governments survey estimated that a typical household improperly disposes of between 1.8 and 3.5 gallons of hazardous waste each year./37/ At this rate, because the project could involve about 5,880 households, between 11,000 and 21,000 gallons of household hazardous waste could be improperly disposed of each year. This estimate is believed to be conservative in light of the programs implemented since the original studies were completed in the mid-1980's.

To provide households and businesses with more convenient and more affordable hazardous waste management options, San Francisco has developed programs specifically targeted to assist households and other small quantity hazardous waste generators with their waste disposal needs. The San Francisco Hazardous Waste Management Program implements public education campaigns, provides advisory and educational services, conducts waste reduction demonstration projects, recognizes waste reduction efforts through an awards program, and offers literature to assist businesses with hazardous waste reduction, recycling, and disposal.

San Francisco also funds a permanent household hazardous waste collection facility where San Franciscans can take their household hazardous waste for disposal at no direct cost. Over 10% (about 400 tons per year) of San Francisco's household hazardous waste is managed through the household hazardous waste collection facility./38/ A similar program for conditionally exempt small quantity generators (businesses that generate very small quantities of hazardous waste) operates one day each month. This program handles about 36 tons per year./39/ Although businesses must pay to use the facility, the cost is substantially less than they would pay by using an independent contractor.

To further reduce the impact of hazardous waste being inappropriately disposed of, San Francisco's solid waste disposal contractor implements a load-checking program called the Waste Acceptance and Control Program. This program seeks to identify hazardous wastes in the solid waste stream and track down the businesses responsible for the waste. Many hazardous materials users are also visited by the San Francisco Water Pollution Prevention Program, which educates businesses regarding acceptable disposal practices. These programs are expected to continue and expand as development occurs in San Francisco.

Larger Waste Generators

Businesses that generate substantial volumes of hazardous waste are less likely to use inappropriate disposal methods as a result of more intense regulatory oversight. However, even proper hazardous waste disposal, regardless of the method selected, often affects the environment. Hazardous waste landfills generally leak at some point and occasionally fail. Waste incinerators release toxic air contaminants to the atmosphere and result in ash that contains unburnable hazardous constituents (such as metals). Most other treatment and recycling methods also result in hazardous residuals that must be disposed of as hazardous waste. These residuals are either incinerated or landfilled. For this reason, the generation and disposal of hazardous waste is considered to be a form of pollution, and current hazardous waste management policies designate hazardous waste disposal as the least desirable management approach./40/ Waste management strategies that seek to prevent pollution by reducing waste generation at its source are considered the most desirable approach. Pollution prevention is a national objective as established by the Pollution Prevention Act of 1990. These priorities are reflected in the *City and County of San Francisco Hazardous Waste Management Plan.*/41/

As indicated above, a project that would involve the disposal of materials in a manner that poses substantial hazards to people or the environment could result in a significant impact. Aside from this qualitative standard no authoritative agency has developed a quantitative standard for determining at what point increased hazardous waste generation and disposal would be considered significant. Therefore, the impacts of each project must be considered on a case-by-case basis, as discussed below for the project's expected contribution to hazardous chemical waste, radioactive waste, and biological and medical waste generation.

Hazardous Chemical Waste

The project would incrementally contribute to the volume of hazardous chemical waste generated in San Francisco. The largest hazardous chemical waste generators in the Project Area would be expected to be located in Mission Bay South, where the Commercial Industrial and UCSF activities would be located. The increased hazardous waste generation would increase the volume of waste managed at hazardous waste facilities inside and outside California. The increased demand for waste treatment and disposal would incrementally contribute to the demand for new hazardous waste treatment, recycling, and disposal facilities. The likely effects of hazardous waste disposal would probably occur far from the Project Area.

California's hazardous chemical waste generators rely heavily on out-of-state treatment and disposal facilities to meet their disposal needs. For example, no hazardous waste incinerators in California accept waste from third-party generators. Out-of-state facilities may not receive environmental supervision equivalent to that of California. Therefore, the possibility exists that some hazardous waste generated as a result of the project could be managed at facilities that do not comply with some standards deemed appropriate by California.

The project would contribute to cumulative hazardous chemical waste generation as discussed under "Cumulative Effects," below.

Radioactive Waste

The California Department of Health Services Radiologic Health Branch issues permits that allow users of radioactive materials to hold short-lived radioactive waste (waste containing radionuclides whose half-lives are less than 90 days) for decay. Under some circumstances, some water-based radioactive substances may be released into the sewer if allowed by the California Department of Health Services and permitted by the San Francisco Department of Public Works. Some biohazardous waste containing radionuclides may be incinerated. Dry long-lived radioactive waste (waste containing radionuclides whose half-lives are greater than 90 days) is to be disposed of at a low-level radioactive waste landfill. Regular disposal is generally required to prevent waste from accumulating and to ensure that little waste remains when a facility is closed.

The availability of radioactive waste landfills to serve California's low-level radioactive waste generators is unreliable. California belongs to the Southwestern Low-Level Radioactive Waste Disposal Compact, a group of four states that, together, are responsible for disposing of their low-level radioactive waste. Since the early 1980's, California has been attempting to construct a low-level radioactive waste disposal facility at Ward Valley, California, to serve the compact. At this time, the project is delayed pending transfer of the disposal site property from the federal government to state control. For this reason, Californians must rely on out-of-state disposal facilities for their radioactive waste. California's low-level radioactive waste disposal facility may become available within the next few years, but for conservative analysis purposes, this SEIR assumes it to be unavailable.

Under the federal Low-Level Radioactive Waste Policy Act and its 1985 amendments, out-of-state disposal sites may choose not to accept California's radioactive waste. At present, project-related radioactive waste generators would have only one facility, located in Barnwell, South Carolina, willing to accept their low-level radioactive waste. The government of South Carolina decides each year whether it will accept out-of-state radioactive wastes. South Carolina has chosen to reject radioactive waste generated outside South Carolina in the past, leaving many California radioactive waste generators with no feasible disposal methods. Until dependable disposal options are established for long-lived radioactive waste, whenever South Carolina rejects shipments, radioactive waste generators could have to indefinitely store these wastes on site or send them off-site to a licensed storage facility until a disposal site becomes available. Storage in lieu of disposal must be approved by the Radiologic Health Branch.

The Radiologic Health Branch guides radioactive waste generators in determining whether to hold, store, or dispose of their radioactive waste. According to the Radiologic Health Branch's advice, California radioactive materials licensees should 1) minimize the amount of low-level radioactive waste in possession and avoid accumulating waste that cannot be disposed of at this time; 2) segregate radioactive wastes subject to compact regulations from wastes not subject to these regulations; 3) segregate waste that can be disposed of or reduced in volume by approved treatment methods, such as incineration or compaction; 4) segregate short-lived radioactive waste for decay; 5) consider recycling radioactive materials; 6) consider extended on-site storage of any remaining low-level radioactive waste; and 7) consider non-radioactive substitutes./42/

Under the project, the type of dry radioactive waste that would generally be sent for landfill would consist primarily of contaminated debris, such as used gloves, bench paper, paper towels, pipettes, and small pieces of plastic. Given the nature of this waste, storage of long-lived radioactive waste for several years would probably not present any substantial health or safety risks to workers or the public. However, the potential for adverse environmental effects would become more difficult to assess if the duration of the disposal limitations were to increase. The project could, over an extended period of time, incrementally contribute to the continuing generation of radioactive waste for which appropriate disposal opportunities may not always exist. Prompt disposal of radioactive waste is a generally recognized standard for radioactive waste management.

Project-related radioactive waste generation would contribute to cumulative radioactive waste generation as discussed below under "Cumulative Effects." Because the Commercial Industrial and UCSF activities anticipated for Mission Bay South would be responsible for the radioactive waste expected to be generated within the Project Area, this issue relates to Mission Bay South and not to Mission Bay North.

Biohazardous and Medical Waste

Most project-related biohazardous and sharps waste would be sterilized on site using an autoclave (pressure and steam treatment) or chemical disinfectants. However, some project-related biohazardous waste would be shipped off site by authorized haulers for disposal as medical waste. Medical waste treatment facilities have been sited regionally with success./43/ California has excess medical waste treatment capacity; therefore, existing medical waste management capabilities would be expected to meet the demands of project-related medical waste generation./44/ Common off-site treatment methods involve autoclaving, microwave sterilization, and incineration. As with all hazardous waste disposal technologies, these options involve water discharges, air emissions, or residuals that must be landfilled. The project-related disposal of medical waste would contribute incrementally to cumulative medical waste generation (see "Cumulative Effects," below).

OTHER ISSUES

Physical Hazards

Potential physical safety hazards would exist in the Project Area, particularly in Commercial Industrial areas and at UCSF. These hazards could include, among others, electrical shock hazards from high voltage equipment,, safety risks posed by compressed gas cylinders (including those filled with inert gases), radiation hazards from x-ray equipment (regulated as radioactive material), and exposure to intense ultraviolet light or lasers. Other more common hazards would include slips and falls, and overexertion. For the most part, individuals in the Project Area would not be exposed to any unusual hazards; however, workers engaged in activities that present special hazards, such as those mentioned above, must be adequately trained in accordance with Injury and Illness Prevention

Plan requirements./45/ Good faith compliance with such occupational safety regulatory requirements would minimize risks posed by physical hazards to a level of insignificance.

Emergency Response Capabilities

Occasional accidents would be probable at the proposed laboratories and other industrial uses during the life of the project. To minimize the risks posed by potential hazardous materials incidents, emergency response planning is a critical component of many health and safety laws and regulations, and standard safety practices.

Most accidents would not have any substantial off-site consequences, but if an accident were to warrant off-site assistance, the San Francisco Fire Department would provide first response capabilities (see "Fire Protection: Setting and Impacts" in Section V.M, Community Services and Utilities). This means that the Fire Department would identify the incident as a hazardous materials incident and deny access to affected areas until hazardous materials specialists could arrive. San Francisco operates a Hazardous Materials Emergency Response Team housed at Fire Station 36 at Oak and Franklin Streets. The San Francisco Department of Public Health offers technical assistance to the Fire Department team 24 hours each day. Under optimal conditions, the Hazardous Materials Emergency Response Team can respond within about 15 minutes of being called by the firefighters providing first response services./46/

At UCSF, Environmental Health and Safety staff respond, and would continue to respond, to relatively minor hazardous materials incidents, such as small spills contained inside laboratory rooms. UCSF would ensure that at least one health and safety professional would be available 24 hours a day to respond to such hazardous materials problems at UCSF. If necessary, UCSF staff would call for assistance from the San Francisco Fire Department.

The San Francisco Fire Department responds to about 180 hazardous materials calls per year (about one every other day)./47/ These hazardous materials responses involve at least six trained and equipped individuals. Of these 180 calls, the Fire Department notifies the Department of Public Health for assistance roughly 40 to 50 times per year. Past incidents have included abandoned waste, hypodermic needles, illicit drug laboratories, asbestos waste, and odor complaints. Incidents that pose serious and immediate safety hazards occur only once or twice a year./48/

Although the capacity of the Fire Department to serve the existing level of demand may be adequate, the project would incrementally increase the demand for these emergency response services. Although the existing frequency of hazardous materials calls is relatively high, no more than one major hazardous materials incident typically occurs at any one time. The project would increase this possibility somewhat, however. Additional personnel and equipment may be necessary to serve the increased demand resulting from the project, but the project would be implemented with adequate emergency response planning because the Project Area would be included in updates to the *Area Plan for Emergency Response to Hazardous Materials Incidents*. Personnel and equipment needs would be fiscal budgeting decisions affecting the City's General Fund, and would not constitute a significant environmental effect under CEQA.

Potential Catastrophes

A major catastrophe could generate demand for emergency response services in excess of available resources, and in San Francisco, a major earthquake is a catastrophe posing realistic concerns (see "Project Area Characteristics" in Section V.H, Seismicity: Setting). The project would increase the population density of the Project Area and develop uses that pose different and potentially greater hazards than those that exist now.

During an earthquake, structures containing hazardous materials or pipelines used to transfer hazardous materials could be damaged. Nonstructural seismic safety (e.g., the potential for falling containers and shelves holding hazardous materials) would be of particular concern. Chemical spills and splashes could release toxic gases or harm individuals working in the vicinity of the hazardous materials. Although incompatible chemicals would be required to be segregated when stored, spills could lead to the mixing of incompatible chemicals. Such mixing could lead to chemical reactions and possible fires or releases. Safety requirements enforced by the Department of Public Health (e.g., securing certain types of containers and installing lips on shelves where hazardous materials are stored) would serve to reduce such risks to acceptable levels, but there is no way to completely eliminate structural and nonstructural seismic safety risks.

By themselves, isolated hazardous materials incidents would likely pose limited serious threats because bench-scale operations involve relatively small quantities of these materials (assuming that emergency response equipment and personnel would be available). But during a catastrophe, many life-threatening incidents could occur at once, and emergency response capabilities could be overwhelmed. Furthermore, during a catastrophe, hazardous materials incidents would not be the only concern. Other types of incidents requiring emergency response services may take priority over responding to hazardous materials problems. The priorities given in response to different incidents occurring at the same time would be determined in accordance with the *San Francisco General Plan* Community Safety Element and the *Area Plan for Emergency Response to Hazardous Materials Incidents*. Emergency responders would be dispatched to locations where they would be most needed.

The emergency evacuation plans and emergency response plans implemented by individual businesses would be the first line of defense in controlling hazardous materials emergencies. This emergency planning is required by several hazardous materials laws and regulations (see Appendix H) and the San Francisco Fire Code. The greatest hazardous material concern in a catastrophe would be risks that cannot be avoided by evacuating the site of an actual or potential hazardous materials release. Evacuation planning is required by Hazard Communication Program regulations./49/

As discussed above, hazardous chemicals can cause safety concerns, such as fires or explosions. In regard to radioactive materials, successful building evacuation would minimize risks of substantial radiation exposure because project-related radioactive materials use would involve low-level radiation sources, and because relatively small quantities would be stored in any one place. In the event of a catastrophic fire (such as one caused by a major earthquake), radioactive materials could be released, but they would likely disperse well into the atmosphere and become more dilute. Any exposure would generally be temporary and relatively small. Similarly, biohazardous materials would be unlikely to be released from buildings in dangerous quantities because liquids and solids would be contained by the building structure. In the event of a catastrophic fire, these materials would likely be destroyed rather than released in an active or hazardous form. Because operations would cease following a catastrophic earthquake, any potentially hazardous airborne aerosols would settle indoors (and probably inside a biosafety cabinet) shortly thereafter. Research animals infected with potentially transmittable diseases, if any, would be unlikely to escape during a catastrophe because, assuming standard guidelines were followed, they would be housed in cages behind closed doors. Multiple levels of containment would obstruct animal escape routes.

Following a major catastrophe, an effective evacuation by individuals in immediately affected areas would be expected to address the most immediate health and safety concerns related to hazardous materials. Providing hazardous materials emergency response capabilities sufficient to respond to all of the hazardous materials incidents likely to follow a major catastrophe may be an unreasonable goal for San Francisco to pursue. Following a catastrophe, the focus of emergency services providers should be to protect the public from imminent dangers and to provide individuals in the community with the means to protect their own safety, as discussed under "Exposure of Concentrated Populations to Seismic Hazards" in Section V.H, Seismicity: Impacts, where a potentially significant impact in this regard is identified. Implementing effective emergency plans would serve to protect the public from serious incidents that do not pose immediate hazards beyond the affected area. Mitigation measures identified in VI.H, Mitigation Measures: Seismicity, would address this concern.

Land Use and Planning Issues

Depending on the risk of upset posed by specific hazardous materials operations, project-related Commercial Industrial uses and UCSF activities could pose hazards to neighboring land uses. As discussed above, the greatest potential for problems would be if UCSF or a business were to handle a hazardous material posing off-site hazards of toxic gas releases or explosions, particularly if such operations were located near residents, schools, day care centers, or public places. Compliance with Risk Management Plan requirements would minimize this impact by reducing the likelihood of an upset occurring. Also, the state school siting criteria would ensure that exposure to hazardous materials is considered in the school siting process.

Land use changes in the Project Area would eliminate the heavy industrial zoning at the Castle Metals site. As a result of this zoning change, this site would no longer meet the siting criteria for new hazardous waste facilities set forth in the *City and County of San Francisco Hazardous Waste Management Plan*. Because this area could no longer be considered a possible site for new hazardous waste management facilities, the siting of such facilities in San Francisco could potentially become incrementally more difficult. Because hazardous waste facility siting criteria relate at least in part to public safety, proposed land uses in the Project Area could also inhibit the development of hazardous waste facilities south of the Project Area by increasing the number of individuals located near the existing M-2 areas to the south. With or without the project, the suitability of these M-2 areas for hazardous waste facilities would be limited due to relatively small site sizes and the proximity of residences and live/work uses.

CUMULATIVE EFFECTS

The health and safety hazards posed by most hazardous materials are local in nature. They do not typically combine in any cumulative sense with the hazards of other projects. The possible exceptions, however, include potential toxic air emissions, transportation of hazardous materials in the project vicinity, and waste disposal. The need to respond to hazardous materials emergencies could also increase as a result of cumulative development.

Regarding cumulative toxic air emissions, cumulative development could increase the overall concentrations of toxic air contaminants in the San Francisco Bay Area, and project-related stationary and mobile emissions sources could contribute to this increase. Cumulative issues related to toxic air emissions are discussed under "Toxic Air Contaminants" in Section V.F, Air Quality: Impacts.

Transportation

Regarding transportation, hazardous materials are transported on virtually all public roads, particularly since all motor vehicles contain hazardous materials (e.g., fuel) in addition to any hazardous cargo that may be on board. The project would contribute little to cumulative transportation hazards. The cumulative effects of transportation of hazardous materials is comprehensively addressed by regulatory requirements. As discussed under "Hazard Assessment" in Appendix H, packaging requirements for hazardous materials and wastes minimize the potential consequences of possible accidents during transport. Also, the vehicle accident rate is relatively small and not all accidents release hazardous materials.

Hazardous Waste Disposal

Regarding waste disposal, as cumulative development occurs in San Francisco and at the state and regional levels, more hazardous wastes will likely be generated. Project-related hazardous waste generation would contribute to cumulative increases in hazardous waste generation. The incremental effects of proposed increases in hazardous waste generation and hazardous waste recycling, treatment, and disposal (discussed under "Larger Hazardous Waste Generators," above) would also contribute to cumulative effects. In light of the discussion above regarding project-related hazardous waste generation, cumulative increases in waste generation could result in the management of wastes in a manner that poses hazards to people and animal and plant populations. While the project's contribution to this cumulative impact would be incremental and relatively small, the potential impact could be considered significant.

The San Francisco Hazardous Waste Management Program is currently working to reduce the volume of hazardous waste generated by San Francisco businesses and sent to hazardous waste treatment, storage, and disposal facilities. Many businesses are required to prepare Hazardous Waste Minimization Plans pursuant to the California Hazardous Waste Source Reduction and Management Review Act. The San Francisco Department of Public Health, as a Certified Unified Program Agency, has the authority to review these plans to improve compliance. This authority is reinforced by provisions of the San Francisco Hazardous Materials Permit and Disclosure Ordinance./50/ Businesses not subject to the California Hazardous Waste Source Reduction and Management Review Act may be asked to prepare a Hazardous Waste Audit Checklist developed by the California Department of Toxic Substances Control.

As discussed in UCSF's LRDP FEIR, UCSF adopted a mitigation measure to implement hazardous waste handling, minimization, and disposal measures at Mission Bay consistent with safety requirements and applicable laws and regulations./51/ By this, UCSF intends to extend its existing hazardous waste minimization plan to the new site; to implement operational controls required to comply with laws and regulations, including monthly safety and compliance audits and training staff; and to implement procedures to minimize increases in long-lived radioactive waste generation.

By encouraging pollution prevention strategies, these measures implemented by the City of San Francisco and UCSF are consistent with the hazardous waste management hierarchy set forth in the *City and County of San Francisco Hazardous Waste Management Plan*./52/ However, the foreseeable project-related contribution to cumulative hazardous waste generation, particularly long-lived radioactive waste generation, would not necessarily be small compared to the existing amount believed to already be generated in San Francisco. Furthermore, San Francisco does not currently oversee any aspect of radioactive waste management. Efforts to address cumulative hazardous waste generation and disposal impacts would require the additional commitment of federal, state, and other local agencies. For these reasons, efforts to offset the project-related contribution to cumulative hazardous waste generation and disposal impacts may not be successful, resulting in a residual impact that could be significant and may be unavoidable.

Hazardous Materials Emergencies

Regarding hazardous materials emergencies, the project and future development in San Francisco could combine cumulatively to increase the demand for hazardous materials emergency response services. This increase could be sufficiently large that emergency responders could be forced to prioritize among more than one hazardous materials incident occurring at the same time. However, two major hazardous materials incidents would remain unlikely to occur simultaneously, and this cumulative impact would be less than significant. As discussed above, however, a major catastrophe could overwhelm emergency response capabilities, including those needed to respond to the Project Area (see Section V.H, Seismicity: Impacts, "Exposure of Concentrated Populations to Seismic Hazards" and Section VI.H, Mitigation Measures: Seismicity).

GLOSSARY

Appendix H presents more detailed definitions of the following terms.

Hazardous materials: Materials that, due to their quantity, concentration, or physical or chemical characteristics, pose a significant hazard to human health and safety, or to the environment, if released into the workplace or the environment.

Hazardous wastes: Wastes that, due to their quantity, concentration, or physical, chemical, or infectious characteristics, may either 1) increase mortality or serious illness, or 2) pose a substantial hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Radioactive materials: Contain atoms with unstable nuclei that spontaneously emit ionizing radiation to increase their stability.

Radioactive wastes: Radioactive materials that are discarded or abandoned.

Biohazardous materials: Materials containing infectious agents that require Biosafety Level 2 or greater safety precautions or cells containing recombinant DNA molecules with codes that can be expressed to create a protein.

Medical waste: Waste resulting from the diagnosis, treatment, or immunization of human beings or animals; research pertaining to these activities; or the production of biologics (naturally occurring therapeutic pharmaceutical products or their derivatives)./53/

NOTES: Health and Safety

1. San Francisco Planning Department, *Mission Bay Final Environmental Impact Report*, Planning Department File No. 86.505E, State Clearinghouse No. 86070113, certified August 23, 1990, Volume Three, pp. XIV.L.1-XIV.L.9a.*

2. a) National Research Council, *Guide for the Care and Use of Laboratory Animals*, 1996.

   b) U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health, *Biosafety in Microbiological and Biomedical Laboratories*, 3rd ed., May 1993.

   c) U.S. Department of Health and Human Services, National Institutes of Health, *Guidelines for Research Involving Recombinant DNA Molecules (NIH Guidelines)*, January 1996.

3. City and County of San Francisco, Planning Department, *San Francisco General Plan,* Community Safety Element, April 1997.*

4. City and County of San Francisco, *Area Plan for Emergency Response to Hazardous Materials Incidents*, March 1993.

5. City and County of San Francisco, *City and County of San Francisco Hazardous Waste Management Plan*, February 1992, pp. ES-2-ES-8, 6-11, 7-3, 7-30, and 7-35.

6. City and County of San Francisco, *City and County of San Francisco Household Hazardous Waste Element*, September 1992, pp. 1-5, 1-6, and 2-6.*

7. CEQA Guidelines, Appendix G.

8. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, certified January 1997, Volume II, p. 103.*

9. Eugene Lau, UCSF Office of Environmental Health and Safety, memorandum to Michelle Schaefer, Campus Planning, March 13, 1998.

10. Large-scale operations involving recombinant DNA are generally defined as those involving more than 10 liters of cell culture growth medium. U.S. Department of Health and Human Services, National Institutes of Health, *Guidelines for Research Involving Recombinant DNA Molecules (NIH Guidelines)*, January 1996.

11. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, certified January 1997.

12. University of California San Francisco, *Laurel Heights Environmental Impact Report*, certified April 1990.

13. University of California San Francisco, *Revised Laurel Heights Plan; Center for Social, Behavioral, and Policy Sciences Environmental Impact Report*, State Clearinghouse No. 95033072, certified September 6, 1995, Volume II, Health and Safety Technical Memorandum.

14. University of California San Francisco, *University of California San Francisco—Mount Zion Hospital and Medical Center Proposed Integration Agreement Final Environmental Impact Report*, State Clearinghouse No. 89060609, certified January 1990; University of California San Francisco, *University of California San Francisco/Mount Zion Program Revisions and Associated Building Projects Final Subsequent Environmental Impact Report*, State Clearinghouse No. 89060609, certified November 1992; University of California San Francisco, *University of California San Francisco, Parnassus Heights Central Utilities Plant Project Final Environmental Impact Report*, State Clearinghouse No. 93013064, certified January 1994.

15. City of Emeryville, *Chiron Development Plan Environmental Impact Report*, State Clearinghouse No. 94063005, certified June 1995.

16. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, January 1997, Volume II, p. 387.

17. Paul Fresina, Business Program Manager, San Francisco Hazardous Waste Management Program, telephone conversation, December 11, 1997.

18. Hewlett Packard Laboratories, Palo Alto, California; Hazardous Materials Management Plans are on file with the City of Palo Alto Fire Department, 1997.

19. California Department of Toxic Substances Control, "Assessment of the Semiconductor Industry Facility Planning Efforts—Report Overview" (http://www.cwo.com/~opptd/ pollprev/pubs/ semicond.htm), Publication No. 530, 1994.

20. a) University of California San Francisco, *Revised Laurel Heights Plan; Center for Social, Behavioral, and Policy Sciences Environmental Impact Report*, State Clearinghouse No. 95033072, certified September 6, 1995, Volume II, Health and Safety Technical Memorandum, p. 4.7.

    b) City of Emeryville, *Chiron Development Plan Environmental Impact Report* (Draft EIR Volume, February 1995, p. III.G.14), State Clearinghouse. No. 94063005, certified June 1995.

21. National Research Council, *Guide for the Care and Use of Laboratory Animals*, 1996.

22. City of Emeryville, *Chiron Development Plan Environmental Impact Report*, State Clearinghouse No. 94063005, certified June 1995.

23. City of Emeryville, *Chiron Development Plan Environmental Impact Report*, State Clearinghouse No. 94063005, certified June 1995.

24. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, January 1997, Volume II, p. 388.

25. City and County of San Francisco, *City and County of San Francisco Household Hazardous Waste Element*, September 1992, p. 2-1.

26. City and County of San Francisco, *City and County of San Francisco Hazardous Waste Management Plan*, February 1992.

27. California Code of Regulations, Title 8.

28. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health, *Biosafety in Microbiological and Biomedical Laboratories*, Third Edition, May 1993, p. 31.

29. This analysis assumes that UCSF has no current plans to operate any laboratories requiring Biosafety Level 3 containment. According to Michelle Schaefer, Environmental Coordinator, University of California San Francisco (facsimile to EIP Associates, January 9, 1998), if UCSF were to engage in activities in the Project Area that were to require Biosafety Level 3 containment, it would conduct additional environmental review, as necessary. The additional environmental review would identify any proposal-specific potential impacts and, if warranted, mitigation measures or alternatives that would reduce or avoid the impacts.

30. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health, *Biosafety in Microbiological and Biomedical Laboratories*, Third Edition, May 1993, p. 14.

31. California Health and Safety Code, Section 25531.

32. California Health and Safety Code, Article 1, Section 42301.6(a); California Code of Regulations, Title 5, Section 14010; California Education Code, Section 17213.

33. Association of Bay Area Governments, *The Disposal of Hazardous Waste by Small Quantity Generators: Magnitude of the Problem*, June 1985.

34. Association of Bay Area Governments, *Toxics Away! The Alameda County Pilot Collection Program for Small Quantity Generators of Hazardous Wastes*, April 1988.

35. City and County of San Francisco, *City and County of San Francisco Hazardous Waste Management Plan*, February 1992.

36. City and County of San Francisco, *City and County of San Francisco Household Hazardous Waste Element*, September 1992, p. 2-6.

37. Association of Bay Area Governments, *The Disposal of Hazardous Waste by Small Quantity Generators: Magnitude of the Problem*, June 1985, p. I-1.

38. a) City and County of San Francisco, *City and County of San Francisco Household Hazardous Waste Element*, September 1992.

b) Aaron Richardson, Technical Writer, Sanitary Fill Company, facsimile to EIP Associates, December 22, 1997.

39. Aaron Richardson, Technical Writer, Sanitary Fill Company, facsimile to EIP Associates, December 22, 1997.

40. U.S. Environmental Protection Agency Office of Solid Waste, *Facility Pollution Prevention Guide*, 1992.

41. City and County of San Francisco, *City and County of San Francisco Hazardous Waste Management Plan*, February 1992, pp. ES-2-ES-8, 6-11, 7-3, 7-30, and 7-35.

42. Edgar D. Bailey, Chief, Radiologic Health Branch, California Department of Health Services, Radiation Safety Bulletin 94-1, "South Carolina Legislature Adjourns Without Extending Access to Barnwell," June 3, 1994.

43. California Integrated Waste Management Board, *Medical Waste Issues Study*, June 1994.

44. California Integrated Waste Management Board, *Medical Waste Issues Study*, June 1994.

45. California Code of Regulations, Title 8, Section 3203(a)(7).

46. Bill Carle, Hazardous Materials Emergency Response Team, San Francisco Fire Department, telephone conversation, August 19, 1997.

47. Harold E. Gamble, Deputy Chief of Administration, San Francisco Fire Department, facsimile to EIP Associates, August 25, 1997.

48. Richard Lee, Senior Industrial Hygienist, San Francisco Department of Public Health, telephone conversation, December 16, 1997.

49. California Code of Regulations, Title 8, Section 5191.

50. San Francisco Health Code, Section 1110.1(e).

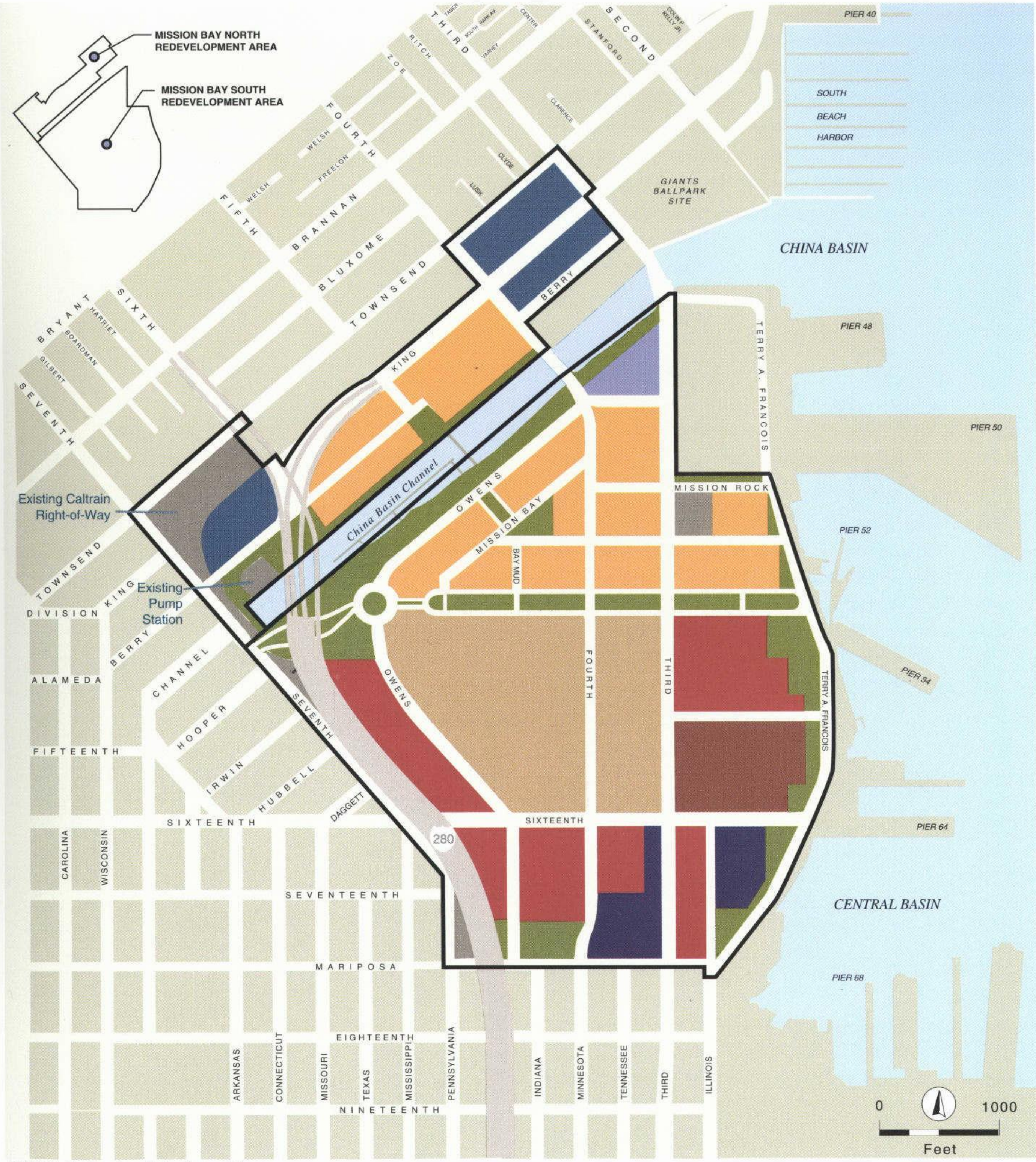
51. University of California San Francisco, *UCSF Long Range Development Plan Final Environmental Impact Report*, State Clearinghouse No. 95123032, certified January 1997, Volume I, p. S-51.

52. City and County of San Francisco, *City and County of San Francisco Hazardous Waste Management Plan*, February 1992, pp. ES-2-ES-8, 6-11, 7-3, 7-30, and 7-35.

53. California Health and Safety Code, Section 25033.2.

* A copy of this report is on file for public review at the Office of Environmental Review Planning Department, 1660 Mission Street, San Francisco.

EIP
ASSOCIATES



SOURCE: San Francisco Redevelopment Agency

- COMMERCIAL INDUSTRIAL
- COMMERCIAL INDUSTRIAL / RETAIL
- MISSION BAY NORTH RETAIL
- MISSION BAY SOUTH RETAIL
- MISSION BAY RESIDENTIAL
- HOTEL
- MISSION BAY OPEN SPACE
- UCSF (includes City school site)
- MISSION BAY PUBLIC FACILITIES
- PROPOSED BOUNDARIES OF MISSION BAY REDEVELOPMENT AREAS

NOTE: See Table III.A.2 for types and amounts of uses.

LAND USE PROGRAM ANALYZED AS THE PROJECT IN THE DRAFT EIR

SEE INSIDE FRONT COVER FOR THE COMBINATION OF PROJECT FEATURES AND VARIANTS AS ADOPTED