Appendix C

Cultural Reports

Appendix C-1

San Francisco 2004 and 2009 Housing Element Historic Resources Report

San Francisco 2004 and 2009 Housing Element Historic Resources Report

FINAL

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Project Title

San Francisco 2004 and 2009 Housing Element Case No.: 2007.1275E

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Project Location

Citywide

EXECUTIVE SUMMARY

The City and County of San Francisco is preparing an Environmental Impact Report (EIR) for the 2004 and 2009 Housing Element. Pursuant to Housing Element law (Government Code section 65580 *et seq.*), the City of San Francisco developed two extensive Housing Element documents: 1) the 2004 Housing Element, which generally encourages new housing in neighborhood commercial districts and mixed-use districts near downtown, and 2) the 2009 Housing Element which generally encourages housing in new commercial or institutional projects and through community planning efforts. The areas with the greatest amount of housing capacity[1] are the areas most likely to absorb these new housing units and they are also those areas that have the greatest potential for impacts to historic resources.

On behalf of Christopher A. Joseph & Associates, Circa: Historic Property Development was tasked with the preparation of this 2004 and 2009 Housing Element Historic Resources Report (report). This report was prepared to provide technical information regarding housing potential within neighborhood locations containing known or potential historic resources, as well as to evaluate the Housing Element policies that could affect known or potential historic resources. The finding of this report is that the policies in both Housing Elements promote quality new housing while balancing the extent of impacts to historic resources. While some policies could result in potential impacts there are many policies that would also reduce impacts. By applying the appropriate Policies and complying with federal, state, and local regulations as discussed in this report, the 2004 and 2009 Housing Elements would have a ***less than significant*** impact with respect to historic resources and therefore no mitigation measures are warranted.

I. INTRODUCTION

This San Francisco 2004 and 2009 Housing Element Historic Resources Report has been prepared to provide technical information regarding capacity for new housing development within neighborhood locations containing known or potential historic resources, as well as to provide an analysis of the effects of the Housing Element policies on these resources.[2] The technical information is provided in sufficient detail to determine the extent to which the 2004 and 2009 Housing Element policies may affect sensitive historical resources. A detailed discussion of methodology is provided below. In general, this report evaluated all areas of the City where the City has the highest capacity for residential growth. This report presents existing conditions with respect to historical resources and a discussion of the policies that may have potential impacts as well as those policies that may reduce identified impacts. Findings from this technical study will facilitate preparation of the Environmental Impact Report (EIR) for the 2004 and 2009 Housing Element being prepared by the San Francisco Planning Department pursuant to the California Environmental Quality Act (CEQA).

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[1] "Housing capacity" refers to sites that are developed to less than 30 percent of their maximum potential under the zoning designation for that site.

[2] Known historic resources and potential historic resources are defined in San Francisco Preservation Bulletin No. 16. Potential historic resources are identified by the City Planning Department using GIS analysis.

II. PROJECT OVERVIEW

a. Project Description

The following summarized project description is quoted from the re-circulated Notice of Preparation (NOP) letter dated September 2, 2009:

> The City and County of San Francisco is preparing an EIR for the 2004 and 2009 Housing Element. The Housing Element is a policy document that consists of goals and policies to guide the City and private and non-profit developers in providing housing for existing and future residents to meet projected housing demand, as required under Government Code section 65580 *et seq* ("State housing element law"). State law requires the housing element to be updated periodically, usually every five years. The most recent update of the housing element occurred in 2004, when the City adopted the 2004 Housing Element, an update to the 1990 Residence Element. Subsequent to adoption of the 2004 Housing Element, the California Court of Appeals determined the environmental document prepared for the 2004 Housing Element inadequate, and directed the City to prepare an EIR for the 2004 Housing Element. The City must also comply with state housing element law and prepare a periodic update (usually every five years) of the Housing Element. The City has undergone a comprehensive planning process and prepared the next update of the housing element, the 2009 Housing Element. This EIR will satisfy the City's legal requirements for preparing an EIR on the 2004 Housing Element and will also analyze the environmental effects of the 2009 Housing Element.[3]

b. High Housing Capacity Districts

While projected additional residential units could occur to some degree throughout the City of San Francisco, areas with the highest capacity for potential residential development (between 3,000 – 4,000 + net units each[4]) are located primarily in the eastern half of the City. [See Figure 1] These include:

- Bayview/Hunters Point (Areas A&B)
- Downtown
- Market/Octavia
- Mission
- South Bayshore
- South Central
- Western Addition

Additionally, several neighborhoods in the City have been rezoned since 1990, or are in the process of rezoning, and thus expanded or increased the overall available housing capacity in the City. The following planning districts and area plans have, or are in the process of, rezoning efforts which would update the allowable uses and, in part, the capacity for those districts to develop new housing: Mission Bay, Treasure Island, Candlestick Point/Hunters Point Shipyard,

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[3] Notice of Preparation of an Environmental Impact Report, Case No. 2007.1275E, City of San Francisco, September 2, 2009.

[4] See Estimated Housing Capacity map.

Park Merced, East and West South of Market (SoMa), Visitacion Valley, Executive Park, Mission, Potrero Hill/Showplace Square, Transit Center District Plan, India Basin, Central Waterfront, Balboa Park and Japantown.

c. Historic Resources within High Housing Capacity Districts

Due to the development patterns of the City of San Francisco since the 1850s, a number of the areas that are expected to absorb new housing units over the five-year planning period of the Housing Element also have a high probability of containing historic and cultural resources. Historic and cultural resources include buildings, districts, sites and/or landscapes, generally over fifty years of age, that retain physical integrity.[5] Historic resources in San Francisco are identified and evaluated through a survey process as summarized in Section IV of this report.[6] New construction or rehabilitation of buildings therefore must be designed in a way that does not result in a significant adverse impact to the integrity of buildings, districts, sites and/or landscapes. Activities or actions that could cause a significant impact include: demolition of a historic resource; inappropriate design adjacent to a historic resource or historic district; and inappropriate alteration to a historic resource. Under certain circumstances, relocation of a resource and changes in use of a historic resource (or within a historic district) may also cause a significant adverse impact to a resource or district.

III. HISTORICAL SETTING

The following description of San Francisco's historical setting is quoted from the 2007 Draft Preservation Element of the General Plan:

> The character of San Francisco’s built environment has been influenced over time by a number of factors, including significant historical events, cultural influences, technological advances, significant individuals, and evolving trends in urban design and architecture. Any discussion of San Francisco’s development, however, must begin with an understanding of the City’s dramatic topography. At the tip of a peninsula, with the Pacific Ocean to the west merging through the Golden Gate into the San Francisco Bay on the east, the City occupies roughly 47 square miles. It is distinguished by hills offering a myriad of views of the Ocean, the Bay, and the City skyline. The cultural landscape that emerged here during the 19th and 20th centuries resulted in the alteration of the original physical landscape, as coves and marshes along the Bay were filled in, and hills and dunes were leveled. Located at an important natural harbor, maritime commerce played a vital role in the development of San Francisco. In turn, the economic and commercial importance of the port was balanced by the City’s relative geographic isolation by land; until the 1930s and the construction of the iconic Golden Gate and Bay Bridges, the only direct approach to San Francisco from points north and east was by boat or ferry. These natural features played a key role in the development of today’s San Francisco.

[5] For a more comprehensive definition of historic and cultural resources, please see San Francisco Preservation Bulletin No. 16.

[6] For a comprehensive discussion of the San Francisco Survey Process see San Francisco Preservation Bulletin No. 11.

Extant buildings in San Francisco date to as early as the late 18th Century, corresponding to the arrival of Spanish missionaries and military personnel in 1776. Archeological remains of the settlements of indigenous peoples date back much further, to at least 5,000 years ago. Indigenous peoples living in the area when the Spanish arrived were subjected to brutal treatment, including displacement from their traditional homelands, conversion that was often forced, and virtual enslavement on the missions; although they had no control over the subsequent development of their lands, descendents of those who survived this period continue to live in the area.

The government of Spain first established a military outpost, or *Presidio*, at the northern end of the peninsula near the mouth of the Golden Gate. At the same time, Catholic missionaries established the sixth in a chain of 21 California missions near what is now 16th Street and Dolores Street, today called Mission Dolores. Beginning in 1821 with Mexico's independence from Spain, the area became a territory of the Mexican government. By 1835 the civilian port settlement, the Pueblo of Yerba Buena, had been established in the area of California and Montgomery Streets, initially supported by the export of California hides and tallow and the import of goods from the eastern United States and Europe.

Two development patterns were established in these early years. In 1839, the pueblo's first survey platted the area around Portsmouth Square in what is known as the 50 Vara Survey. The survey established a rectangular grid of blocks, each composed of six square lots. Each lot was 50 Mexican varas on a side (a vara being 33 inches), separated by streets 25 varas wide. Later surveys repeated this pattern from San Francisco Bay to Market Street, and from Sansome Street to Presidio Avenue. In 1847, Market Street was laid out at an angle to the earlier streets, running from the center of the shoreline of Yerba Buena Cove (approximately at the intersection of present day Battery and Market Streets) toward Twin Peaks, with much of its route along an old path to Mission Dolores. Soon thereafter, the area south of Market was surveyed with streets parallel to Market Street, again in blocks containing six lots. This time, lots were quadrupled in size, becoming the 100 Vara Survey. These unconventional lot sizes, platted over 150 years ago, are apparent today as extra long blocks south of Market Street.

In 1847, during the Mexican-American War that began the year before, the name Yerba Buena was officially changed to San Francisco. When the war ended and the United States officially assumed control of the territory in 1848, the population had reached about 400, including traders from the eastern United States and other countries. That soon changed, however, with the discovery of gold on the American River in the Sierra Nevada foothills that same year. San Francisco was the closest harbor to the strike, and by 1849 the City was growing exponentially as people flooded in, primarily by sea, bound for gold country. Exact population numbers in 1850 aren't known due to six major fires that swept through San Francisco between late 1849 and June of 1851, destroying records and most of the City's early structures. However, by 1852 the population stood at approximately 34,776, and the character of the place had entirely changed from four years before; it was a City.

With an increasing population came new construction to support housing, commerce and industry. The port was the natural location of trade in goods and services, and so commercial structures were concentrated in that area, where the Financial District is located today. Related industrial activities were housed near the port as well, primarily in the South of Market area, with rail spurs providing connections to move materials and goods to and from warehouses and manufacturing plants. Locations for housing were generally linked to transportation corridors, which developed from the original trails linking the three earliest Spanish/Mexican settlements to a regimented street grid system. Streetcars provided a means for people to live further away from the commercial and industrial core, beyond what was within walking distance. These vehicles were rudimentary at first, appearing in the form of horse-drawn cars on tracks in the late 1850s and early 1860s. A significant innovation soon followed with Andrew Hallidie's invention of the cable car in 1873, providing the means to conquer hills and thereby opening more areas to residential development. Electrification of the lines began gradually in the 1890s and accelerated after 1906, although cable lines continued to be used along the steeper hills. By the late 19th century, streetcar lines ran on nearly every major street, extending earlier housing patterns further westward.

At 5:12 a.m. on April 18th, 1906, a massive earthquake with a moment wave magnitude of approximately 7.9 struck San Francisco, and became one of the most significant events in the City's history. Streets and streetcar lines buckled, water pipes and gas pipes broke, houses were knocked off their foundations, and masonry buildings collapsed. But the worst was yet to come. The damage to gas lines and brick chimneys soon produced fires, and the extreme heat of the fires along with damaged water mains made firefighting extraordinarily difficult. The City's residential buildings, most of which were made of wood, served as kindling for the great inferno. Firefighters, augmented by troops from the Presidio, tried to create fire blocks by dynamiting buildings, but sometimes succeeded only in creating new fires. For three days the fire blazed, and some 28,000 buildings that housed an estimated 250,000 people were destroyed; almost every structure east of Van Ness Avenue and north of Duboce Street. Research has concluded that 3,000 or more people perished, and the majority of the entire population of San Francisco was left homeless by the disaster. Businesses were destroyed, and the City's financial system was in ruins.

Rebuilding began immediately. New construction included both reconstruction on previously developed lots and expansion onto formerly vacant lots. New architectural styles emerged, both to address safety concerns more effectively and as a reflection of changing trends in design. In response to earlier fires, the use of brick and other fireproof construction materials had been required within specified commercial zones, and those zones were extended after 1906. Residential construction after 1906 favored flat roof construction with a tar and gravel surface that was more fire resistant than a traditional pitched shingle roof. Victorian asymmetry and ornament lost favor to the more orderly and restrained Classical revival styles. This stylistic shift was perhaps best embodied by the completion in 1915 of the Beaux Arts-style City Hall, and the structures erected on filled land in the Marina District for the Panama Pacific International Exposition that same year, all classically styled buildings that marked the symbolic end of the reconstruction of San Francisco.

The building boom that began after the 1906 earthquake and fire continued nearly unabated through the 1920s. Much of the City had taken the physical shape that prevails today by the time of the Great Depression in the 1930s, during which new construction slowed dramatically. Despite the economic downturn, the Depression years provided the City with some of its finest public works projects. Major structures such as the Bay Bridge, the Transbay Terminal, Coit Tower, Rincon Annex, Aquatic Park, the Cow Palace, and numerous firehouses, libraries, police stations, and schools were constructed with the aid of Federal funds. The Golden Gate Bridge itself did not receive federal funds, but federal funds helped to construct the approaches. During the first half of the 1940s, World War II preempted all construction projects except work that supported military efforts.

Until the 20th century, architecture in San Francisco tended to utilize contemporary styles popular in the East, though on a somewhat delayed timeline. Greek Revival flourished in the 1850s and 1860s, Italianate in the 1870s, Stick Eastlake in the 1880s, Queen Anne in the 1890s, and Classical or Colonial Revival in the early 20th century. There were also a smaller number of homes built in the Gothic Revival, First Bay Area Tradition (also called Western Stick), and Craftsman styles. In the 1910s and 1920s, styles with origins in California were popularized, such as Mission, Spanish Colonial, and Mediterranean Revival. Art Deco was used beginning in the late 1920s, most often on commercial rather than residential buildings, as was the related Streamline Moderne style that emerged in the postwar era. International Modernism also appeared as early as the 1930s in San Francisco in the form of dramatic hillside residential buildings by architects such as Richard Neutra. The 1950s brought the concept of 'urban renewal' to San Francisco, resulting in the loss of many historic resources and a surge of new construction, often in the International style vernacular, in areas including Yerba Buena, the Western Addition, Golden Gateway, Diamond Heights, and parts of the Bayshore District. Brutalist styles and Postmodernism followed, and the Bay Area's Tech Boom of the late 1990s and early 2000s resulted in further development pressure and new construction in emerging 21st century styles.[7]

Today, San Francisco's built environment consists of architectural styles that are as varied and unique as the topography, views and microclimates that have made San Francisco famous. From the most humble cottage to the City's typical 25-foot wide lots to towering skyscrapers, the architecture and traditional development patterns of San Francisco are the physical representation of the City's history and its historic context. The retention of these components is a direct link to understanding and respecting the City's past while moving forward to accommodate modern needs.

IV. SUMMARY OF HISTORIC RESOURCE SURVEYS

The City and County of San Francisco recognizes the potential for properties of historic significance to remain unidentified throughout the City. In an effort to address this uncertainty, the Planning Department developed the Citywide Cultural and Historic Resource Survey (Survey Program). The Survey Program[8] has facilitated a number of surveys in neighborhoods that are undergoing long-range Planning Department projects such as Community or Area Plans and

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[7] *Draft Preservation Element*, City and County of San Francisco General Plan, 2007. This document is available online at: http://www.sfplanning.org/Modules/ShowDocument.aspx?documentid=3928. Accessed April 2, 2010. The 2007 Draft Preservation Element of the General Plan has not been adopted as of writing of this report.

[8] Historic Resources Survey Program information can be found on the Planning Department's website at: http://www.sfplanning.org/index.aspx?page=1826.

Better Neighborhood Plans. As of the writing of this technical report twelve surveys have either been completed or are currently underway. In addition, nine non-Planning Department (Community) surveys have been planned or are currently underway.

The survey areas facilitated by the City within Area Plans are:

- Balboa Park
- Central Waterfront
- Japantown
- Market/Octavia
- Mission
- Showplace Square
- South of Market (Both Western SOMA and East SOMA)

Survey areas relating to other projects:

- Bayview Hunters Point Redevelopment Project Area "B"
- Glen Park
- Hunters Point Shipyard
- Transbay/Transit Center
- Van Ness Automotive Support Structures

Survey areas facilitated by community organizations:

- Aquatic Park/Lower Russian Hill
- Bernal Heights
- India Basin
- Mission Dolores
- North Beach
- Oceanview-Merced-Ingleside
- Parkside
- Russian Hill (West Slope)
- Sunset/Oceanside

In addition to identifying the physical descriptions of the buildings, structures or objects, each potential resource is assessed in their respective reports for their significance.

V. HISTORICAL SIGNIFICANCE CRITERIA

The minimum level of information needed for a property to be included in the Office of Historic Preservation's filing system is the *Primary Record* that gives an overview of each building, structure or object from which a preliminary evaluation may be developed. Once a property is identified as having the potential to be historic, it is evaluated for its Associative Value as defined below. This level of evaluation requires additional research and the completion of the California Department of Parks and Recreation (DPR) 523b *Building, Structure and Object* (BSO) record or DPR 523d *District Record*.

National Register of Historic Places
The National Register of Historic Places is the official list of properties, structures, districts, and objects significant in American history, architecture, archeology, engineering, and culture. National Register properties have significance to the prehistory and history of their community, State, or Nation.

The National Register Criteria for Evaluation is "...the basis for judging a property's significance for their association with important events or persons, for their importance in design or construction, or for their information potential...".[9] The National Register Criteria recognizes the following four categories of Associative Values:

A) Event: properties significant for their association or linkages to events

B) Person(s): properties significant for their association to persons important to the past

C) Design or Construction Value: properties significant as representatives of the manmade expression of culture or technology

D) Information Value: properties significant for their ability to yield important information about prehistory or history

California Register of Historical Resources
The California Register of Historical Resources (CRHR) is the official list of properties, structures, districts, and objects significant at the local, state or national level. Properties that are eligible for the National Register are automatically eligible for the California Register. California Register properties must have significance under one of the following four criteria:

1) Associated with events that have made a significant contribution to broad patterns of local or regional history, or cultural heritage of California or of the United States;

2) Associated with the lives of persons important to the local, California or national history;

3) Embodies the distinctive characteristics of a design-type, period, region, or method of construction, or represents the work of a master, or possesses high artistic value; or

4) Yields important information about prehistory or history of the local area, California or the Nation.

CRHR criteria are similar to National Register criteria, and are tied to CEQA, as any resource that meets the above criteria, and retains sufficient historic integrity, is considered an historical resource under CEQA. In addition to meeting one or more of the above criteria, the CRHR requires that sufficient time must have passed to allow a "scholarly perspective on the events or individuals associated with the resource." Fifty years is used as a general estimate of the time needed to understand the historical importance of a resource.[10] The Office of Historic

[9] Ibid

[10] CCR 14(11.5) §4852 (d)(2).

Preservation (OHP) recommends documenting, and taking into consideration in the planning process, any cultural resource that is 45 years or older.[11]

The CRHR also requires a resource to possess integrity, which is defined as "the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association".[12]

Resources that are significant, meet the age guidelines, and possess integrity will generally be considered eligible for listing in the CRHR.

San Francisco Landmarks and Historic Districts
According to the San Francisco Planning Department:

> The City of San Francisco maintains a list of locally designated City Landmarks and Historic Districts, similar to the National Register of Historic Places but at the local level. Landmarks can be buildings, sites, or landscape features. Districts are defined generally as an area of multiple historic resources that are contextually united. The regulations governing Landmarks, as well as the list of individual Landmarks and descriptions of each Historic District, are found in Article 10 and Article 11 of the Planning Code.
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> Owners of Landmark properties, or of contributors to Historic Districts, may be eligible for property tax relief and other incentives. Consult Preservation Bulletins No. 5, 9, and 10 for more information about Article 10 and Article 11 Landmarks, Historic Districts, and the landmarking process.[13]

According to San Francisco Preservation Bulletin No. 5, the San Francisco Historic Preservation Commission (formally the Landmarks Advisory Board) and the Planning Commission use the National Register Criteria for evaluating potential historic properties.

Historic Districts
According to National Register Bulletin 15 (NRB15), a historic district "possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development." Bulletin 15 continues:

> <u>Concentration, Linkage, & Continuity of Features</u>
> A district derives its importance from being a unified entity, even though it is often composed of a wide variety of resources. The identity of a district results from the interrelationship of its resources, which can convey a visual sense of the overall historic environment or be an arrangement of historically or functionally related properties. For

[11] California Office of Historic Preservation, 1995, p.2. Instructions for Recording Historical Resources. Office of Historic Preservation, Sacramento.

[12] California Office of Historic Preservation, 2006, p.2. California Register and National Register: A Comparison. Technical Assistance Series No. 6. California Department of Parks and Recreation, Sacramento. Assistance Series No. 6. California Department of Parks and Recreation, Sacramento.

[13] http://www.sf-planning.org/index.aspx?page=1825. (accessed 3.10.2010).

example, a district can reflect one principal activity, such as a mill or a ranch, or it can encompass several interrelated activities, such as an area that includes industrial, residential, or commercial buildings, sites, structures, or objects. A district can also be a grouping of archeological sites related primarily by their common components; these types of districts often will not visually represent a specific historic environment.

Significance

A district must be significant, as well as being an identifiable entity. It must be important for historical, architectural, archeological, engineering, or cultural values. Therefore, districts that are significant will usually meet the last portion of Criterion C plus Criterion A, Criterion B, other portions of Criterion C, or Criterion D.

Types of Features

A district can comprise both features that lack individual distinction and individually distinctive features that serve as focal points. It may even be considered eligible if all of the components lack individual distinction, provided that the grouping achieves significance as a whole within its historic context. In either case, the majority of the components that add to the district's historic character, even if they are individually undistinguished, must possess integrity, as must the district as a whole. A district can contain buildings, structures, sites, objects, or open spaces that do not contribute to the significance of the district. The number of noncontributing properties a district can contain yet still convey its sense of time and place and historical development depends on how these properties affect the district's integrity.

Geographical Boundaries

A district must be a definable geographic area that can be distinguished from surrounding properties by changes such as density, scale, type, age, style of sites, buildings, structures, and objects, or by documented differences in patterns of historic development or associations. It is seldom defined, however, by the limits of current parcels of ownership, management, or planning boundaries. The boundaries must be based upon a shared relationship among the properties constituting the district.

Discontiguous Districts

A district is usually a single geographic area of contiguous historic properties; however, a district can also be composed of two or more definable significant areas separated by nonsignificant areas. A discontiguous district is most appropriate where:

- Elements are spatially discrete;
- Space between the elements is not related to the significance of the district; and
- Visual continuity is not a factor in the significance.[14]

[14] U.S. Department of the Interior, National Park Service. National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation, Section IV.

Integrity
"Integrity is the ability of a property to convey its significance. . . . Historic properties either retain their integrity or they do not."[15] Guidance for assessing integrity is in National Register Bulletin 15, Section VIII; relevant portions of this bulletin are quoted below:

> "Integrity is based on significance: why, where and when a property is important. Only after significance is fully established can you proceed to the issue of integrity. . . Ultimately the question of integrity is answered by whether or not the property retained the identity for which it is significant...All properties change over time. It is not necessary for a property to retain all its historic physical features or characteristics.
>
> The property must retain, however, the essential physical features that enable it to convey its historic identity. These essential physical features are those features that define both why a property is significant [Applicable criteria and Areas of Significance] and when it was significant [Periods of Significance]. They are features without which a property can no longer be identified as, for instance, a late 19th century dairy barn or an early 20th century commercial district...
>
> The quality of significance . . . is present in districts, sites, buildings, structures, and objects that possess integrity of:

Location	= Location is the place where the historic property was constructed or the place where the historic event occurred.
Design	= Design is the combination of elements that create the form, plan, space, structure, and style of a property.
Setting	= Setting is the physical environment of the historic property.
Materials	= Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
Workmanship	= Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
Feeling	= Feeling is a property's expression of the aesthetic or historic sense of a particular period of time.
Association	= Association is the direct link between an important historic event or person and a historic property.

> To retain historic integrity a property will always possess several, and usually most, of the aspects. The retention of specific aspects of integrity is paramount for a property to convey its significance. Determining which of these aspects are most important to a particular property requires knowing why, where, and when the property is significant."[16]

[15] Ibid, Section VIII.
[16] Ibid, Section VIII.

Section VIII provides guidance for evaluating integrity under each of the four eligibility criteria. As with the California Register regulations, the National Register recognizes that alterations and changes in a property's use over time may themselves have significance. This is expressed most clearly under Criterion C "A property can be significant not only for the way it was originally constructed or created, but also for the way it was adapted at a later period, or for the way it illustrates changing tastes, attitudes, and uses over a period of time."[17]

The California Register regulations also address integrity. "Integrity is the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resources' period of significance."[18]

Historical resources eligible for listing in the California Register must:

- meet one of the criteria of significance described in CCR §4852(b) of this chapter; and
- retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance.

> "Integrity is evaluated with regard to the retention of: location, workmanship, design, feeling, setting, association, and materials. It must also be judged with reference to the particular criteria under which a resource is proposed for eligibility. Alterations over time to a resource or historic changes in its use may themselves have historical, cultural, or architectural significance. Historical resources that have been rehabilitated or restored may be evaluated for listing."[19]

VI. IDENTIFYING HISTORICAL AREAS OF POTENTIAL EFFECT (APE)

Generally, the Area of Potential Effect (APE) is the geographic area or areas within which an undertaking (project or activity) may cause changes in the character or use of any cultural resources present. The State of California Department of Transportation (Caltrans) defines APE as "...the area, or areas, within which an undertaking may cause changes in the character or use of historic properties, should any be present".[20]

In the broadest sense, the APE is coterminous with the City and County of San Francisco. For the Housing Element one may then reduce the APE to those areas where zoning permits residential development under the jurisdiction of the City (excluding Federal and State lands, parks, etc.). As Housing Element Policies would apply throughout the City, the APE for purposes of this report is the entirety of the City and County of San Francisco. Areas of low potential for effect would include those that permit more than one dwelling per lot, but where the zoning has been, and is not expected to change substantially in the future.

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[17] Ibid, Section VI.

[18] California Office of Historic Preservation Technical Assistance Series #6, California Register and National Register: A Comparison.

[19] Ibid.

[20] Definition of terms can be accessed on the California Department of Transportation website at www.dot.ca.gov/ser/vol2/exhibits/exhibit_1_2_Definitions.htm.

As new development occurs, site specific APE's should be clearly defined at the project level. Officially designated individual historic resources and historic resource areas (historic districts) in San Francisco are listed in the San Francisco Planning Code. Article 10 lists individual Landmarks and Historic Districts. Article 11 lists significant buildings and Conservation Districts within the downtown C-3 zoning districts. The Article 10 and Article 11 Areas are those that retain resources that meet the criteria for historic significance as discussed in the previous report section. [See Figure 2] For specific development projects, these areas will have a high potential for the need to establish a historic APE, as discussed in Section VIII of this report.

Other buildings and properties have not been designated, but have been identified as historic resources for the purposes of CEQA (See San Francisco Preservation Bulletin No. 16, categories A1 and A2). In addition, several other areas of San Francisco have not been subject to survey activity, but are likely to contain historic resources for the purpose of CEQA (See San Francisco Preservation Bulletin No. 16, category B).

According to Figure 2, the greatest capacity for new development on known or potential historic resources, and therefore the areas with the greatest number of potentially affected historic resources are the:

- Western Addition
- Northeast
- Transbay
- Downtown
- West SoMa
- Mission
- Central Waterfront

In addition, areas that have recently undergone, or are currently undergoing, rezoning and community planning efforts may also contain a number of historic resources (e.g., Candlestick Point/Hunters Point Shipyard, Park Merced, etc.). Site-specific APEs should be defined by the extent of future development as specific development occurs in the above-listed areas and throughout the City.

As discussed further in Section VIII of this report, the following categories of policies could potentially result in impacts to historic resources:

- Policies that encourage new housing within the abovementioned areas could have an impact on known or potential historic districts;
- While an individual future project may not have an impact to a larger historic district, cumulative impacts may occur from demolition and/or new housing construction over time; and
- Impacts resulting from policies that would allow for demolition and/or new construction could have direct or indirect impacts on historic resources.

VII. GUIDELINES AND STANDARDS

California Environmental Quality Act (CEQA)

Under CEQA, a project that results in a "substantial adverse change in the significance of an historical resource" may have a significant adverse effect on the environment (Public Resources Code Section 21084.1). An "historical resource" is a resource listed in, or determined to be eligible for listing in, the California Register. All National Register-listed or eligible resources qualify for listing in the California Register. The Public Resources Code defines "substantial adverse change" as "demolition, destruction, relocation or alteration," activities that would impair the significance of an historical resource (Public Resources Code Section 5020.1q and State CEQA Guidelines Section 15064.5 (b)(1) and (2)).

CEQA also defines activities that would impair the significance of an historical resource:

> The significance of an historical resource is materially impaired when a project:
>
> (A) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in the California Register of Historic Resources; or
>
> (B) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historic resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1 (g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
>
> (C) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.[21]

According to CEQA, "Generally, a project that follows The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or The Secretary of the Interior's Standards for Rehabilitating Historic Buildings...shall be considered as mitigated to a level of less than a significant impact on the historical resource".[22]

Secretary of the Interior's Standards for Rehabilitation (SISR)

> The Secretary of the Interior is responsible for establishing standards for all programs under Departmental authority and for advising Federal agencies on the preservation of historic properties listed or eligible for listing in the National Register of Historic Places. In partial

[21] State CEQA Guidelines Section 15064.5 (b)(2)(A)(B)(C)

[22] State CEQA Guidelines Section 15064.5 (b)(3)

fulfillment of this responsibility, the Secretary of the Interior's Standards for Historic Preservation Projects have been developed to guide work undertaken on historic buildings.

The Standards for Rehabilitation (36 CFR 67) comprise that section of the overall historic preservation project standards and addresses the most prevalent treatment. 'Rehabilitation' is defined as 'the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural, and cultural values.'

The intent of the Standards is to assist the long-term preservation of a property's significance through the preservation of historic materials and features. The Standards pertain to historic buildings of all materials, construction types, sizes, and occupancy and encompass the exterior and interior of the buildings. They also encompass related landscape features and the building's site and environment, as well as attached, adjacent, or related new construction.

The following are the Secretary of Interior's Standards for Rehabilitation.

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, and pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.
9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

As stated in the definition, "Rehabilitation" assumes that at least some repair or alteration of the historic resource will need to take place in order to provide for an efficient contemporary use; however these repairs and alterations must not damage or destroy the materials and features -- including their finishes -- that are important in defining the building's historic character.[23]

VIII. IMPACT ANALYSIS AND POLICY COMPARISON

Implementation of the 2004 Housing Element and the 2009 Housing Element would have a less than significant impact on historic resources. As discussed in Section VII of this report, CEQA defines "substantial adverse change" as "demolition, destruction, relocation or alteration," activities that would impair the significance of a historical resource either directly or indirectly. Although the proposed 2004 and 2009 Housing Elements would not directly result in the construction of residential units, they would direct housing to locations where residential growth is appropriate, promote the retention of existing housing, and encourage the provision of affordable housing in accordance with the City's needs. Policies that encourage new construction within Article 10 and Article 11 areas, or other areas of the City with known or potential Historic Resources could result in indirect impacts upon these resources through demolition, removal of character-defining features, alteration or inappropriate new construction. This is discussed further below.

For the purposes of this report, the term *directly* refers to work, alterations or replacement that demolishes or materially alters that specific building, structure or object. In addition, the term *directly* refers to work, alterations or replacement of material in the vicinity of the building, structure or object. The 2004 Housing Element and the 2009 Housing Element would not have any direct impacts related to historic resources. The term *indirectly* refers to policies that could ultimately lead to direct effects on historic properties. As an example: policies that encourage the demolition of an existing resource that is considered underutilized, to build a multi-unit residential building would be an indirect impact of the Housing Elements, not only for the individual resource but potentially a historic district if the resource is a contributor to such.

A few examples of impacts that could result from new development, but are beyond the actual construction limits include:

- Disposal sites or waste areas.
- New or upgraded access or haul roads.
- Staging, storage, and stockpile areas.
- Drainage diversions.
- Changes to the character-defining features of an adjacent historic district.

Additionally, vibration sources associated with future construction activities resulting from housing development could have a direct or indirect impact on historic resources. Prior to an actual construction project it should be determined that structures adjacent to work sites also be evaluated for historical significance due to potential impacts to these structures from vibration

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[23] Secretary of the Interior Standards for Rehabilitation and Illustrated Guidelines for Applying the Standards, NPS, 2001.

generated by construction equipment and construction methods, such as installing sheet piles.[24] According to the *American Association of State Highway and Transportation Officials Maximum Vibration Levels for Preventing Damage - Historic Structures*[25] there would be a number of noise and vibration sources associated with new construction. These include the following vibration sources.

- Backhoe
- Bulldozer/Earthmoving equipment
- Concrete saw
- Vibratory Compactor
- Excavator/Trencher
- Paver/Paving Equipment
- Roller
- Generator
- Pump
- Vibratory sheet pile driver
- Augering/Boring/Drill Rig
- Concrete Mixer/Pump
- Jackhammer
- Crane
- Grader/Scraper
- Front end loader
- Haul and trailer trucks
- Compressor
- Pneumatic Tools
- Other construction support activities
- Private vehicles

In addition to impacts to individual properties, cumulative impacts from new development could arise in these areas over the course of time thereby diminishing the historic significance of the area.

The following potential impacts are organized and defined as:

<u>Inappropriate Alterations/Additions</u> = alterations or new construction that demolishes, alters, removes or conceals those character defining features that convey the historic significance of a historic resource and thereby substantially alters the property's integrity.

> Example: (assumes the property is a historic resource)
> The lifting of a single-story, 1,500 square foot single-family residence to insert a garage. A new two-story vertical and rear horizontal addition will be constructed that will more than double the square footage to accommodate a second unit, and will be highly visible. Original wood sash windows will be replaced to match the windows of the new addition and a coat of stucco will be applied over the original, historic siding to unify the new addition.

<u>Inappropriate New Construction</u> = new construction (allowed by zoning) that demolishes, alters, removes or conceals those character defining features that convey the historic significance of an adjacent historic resource, or inappropriate new construction within a historic district.

> Example: (assumes the property is a historic resource)

[25] Transportation and Construction-Induced Vibration Guidance Manual, Appendix A, Jones and Stokes for California Department of Transportation, June 2004.

Demolition of two single-story commercial buildings that are contributors to a historic district of similarly scaled buildings, for the construction of a six-story, mixed use building thereby removing contributing character defining features and elements, and introducing a new mass and bulk that is out of scale with the existing district.

Demolition by Neglect = the gradual deterioration of a building when routine or major maintenance is not performed and/or is allowed by the owner to remain vacant and open to vandals.

Example: (assumes the property is a historic resource)
A mixed-use building where the upper floors are not occupied and the ground floor commercial spaces are marginally occupied. The upper floors are unheated spaces and are not maintained allowing for water leaks, material deterioration and pest infestation. The lack of oversight also encourages vandals and vagrants to trespass thereby increasing the possibility of further destruction and decay.

Areas of the City with the greatest capacity for new housing are discussed further in subsections II(b) and II(c) of this report.

Policy Analysis

The Association of Bay Area Governments (ABAG), in coordination with the State Department of Housing and Community Development (HCD), uses population and job growth projections from the State Department of Finance to determine the regional housing needs for the Bay Area and allocates housing to cities and counties within the Bay Area through the Regional Housing Needs Allocation (RHNA). Currently, the City is generally meeting ABAG's household projections and is slightly exceeding ABAG's population estimates. Residential development in the City would occur regardless of the proposed Housing Elements. Housing element law was enacted to ensure that localities plan and make land available for new housing. The proposed Housing Elements are policy documents that provide direction for accommodating the need for new housing driven by population growth. In providing direction for meeting regional housing needs, ABAG focuses on both the amount of housing and the affordability of housing. To meet the City's share of the RHNA, the proposed Housing Elements aim to do the following:

1) Preserve and upgrade existing housing units to ensure they do not become dilapidated, abandoned, or unsound, and

2) Provide direction for how new housing development in the City should occur.

For example, the 2004 Housing Element encourages increased housing in neighborhood commercial districts and mixed-use districts near Downtown. The 2009 Housing Element encourages housing in new commercial or institutional projects and accommodating housing through community planning efforts.

The following tables identify impacts associated with the 2004 and 2009 Housing Element Policies. A narrative discussion analyzing the potential impacts identified follows each table.

2004 Housing Element

The following 2004 Housing Element policies could potentially result in impacts to a historic resource through inappropriate alterations and/or additions and inappropriate new construction.

Table 1 - Potential Impacts to Historic Resources from 2004 Housing Element Policies

Potential Impact	2004 Housing Element	1990 Residence Element
Inappropriate Alterations/Additions	Policy 1.1 Encourage higher residential density in areas adjacent to downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are affordable to lower income households. Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood scale and character where there is neighborhood support.	Policy 2.1 Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood character. Policy 2.2 Encourage higher residential density in areas adjacent to downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are permanently affordable to lower income households.
	Policy 1.2 Encourage housing development, particularly affordable housing, in neighborhood commercial areas without displacing existing jobs, particularly blue-collar jobs or discouraging new employment opportunities.	
	Policy 1.3 Identify opportunities for housing and mixed-use districts near downtown and former industrial portions of the City.	Policy 1.2 Facilitate the conversion of underused industrial and commercial areas to residential use, giving preference to permanently affordable housing uses.
	Policy 1.4: Locate in-fill housing on appropriate sites in established residential neighborhoods.	Policy 1.4 Locate infill housing on appropriate sites in established neighborhoods.
	Policy 1.7 Encourage and support the construction of quality, new family housing	

Potential Impact	2004 Housing Element	1990 Residence Element
Inappropriate New Construction	Policy 1.1 Encourage higher residential density in areas adjacent to downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are affordable to lower income households. Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood scale and character where there is neighborhood support.	Policy 2.1 Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood character. Policy 2.2 Encourage higher residential density in areas adjacent to downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are permanently affordable to lower income households.
	Policy 1.2 Encourage housing development, particularly affordable housing, in neighborhood commercial areas without displacing existing jobs, particularly blue-collar jobs or discouraging new employment opportunities.	
	Policy 1.4 Locate in-fill housing on appropriate sites in established residential neighborhoods.	Policy 1.4 Locate infill housing on appropriate sites in established neighborhoods.
	Policy 1.7 Encourage and support the construction of quality, new family housing.	
	Policy 4.1 Actively identify and pursue opportunity sites for permanently affordable housing.	Policy 7.1 Create more housing opportunity sites for permanently affordable housing
	Policy 11.1 Use new housing development as a means to enhance neighborhood vitality and diversity.	
	Policy 11.5 Promote the construction of well-designed housing that enhances existing neighborhood character.	12.4 Promote construction of well designed housing that conserves existing neighborhood character.

To the extent that a given site is identified as an historic resource, alterations/additions to that resource may be inappropriate. As shown above, the 2004 Housing Element proposes policies that support alterations/additions to existing buildings (including Policies 1.2 and 1.7) to a greater degree than the 1990 Residence Element. Similarly, the 2004 Housing Element promotes new residential construction (including Policies 1.2, 1.7, and 11.1) to a greater degree than the 1990 Residence Element. To the extent that new construction is incompatible with any surrounding historic resource, such policies could result in inappropriate new construction. Inappropriate alterations/additions could include demolishing, altering, removing or concealing those character defining features that convey the historic significance of a historic resource and thereby substantially alter the property's integrity. 2004 Housing Element Policy 1.1[26] essentially merged 1990 Residence Element Policies 2.1 and 2.2 and therefore does not represent a shift in policy. 2004 Housing Element Policy 1.3 modified 1990 Residence Element Policy 1.2 by changing the wording from “facilitate” to “identify.” “Facilitate” indicates active conversion and “identify” indicates passive action. Therefore, 2004 Housing Element Policy 1.3 would appear to have less of a potential impact on historic resources than 1990 Residence Element Policy 1.2.

New construction in the vicinity of a historic resource (allowed under existing zoning) could alter, remove, or conceal those character defining features that convey the historic significance of an adjacent historic resource, or result in inappropriate new construction within a historic district. As discussed previously, 2004 Housing Element Policy 1.1 does not represent a shift in policy from its corresponding 1990 Residence Element policies. 2004 Housing Element Policy 1.4 clarifies 1990 Residence Element Policy 1.4 by including the word “residential”. Therefore, 2004 Housing Element Policy 1.4 would appear to have less impact than 1990 Residence Element 1.4 because it promotes residential uses in residential neighborhoods, rather than generally throughout all established neighborhoods. 2004 Housing Element Policy 4.1 modifies 1990 Residence Element Policy 7.1 to encourage a more intense search for opportunity sites.[27] To the extent that any opportunity site is identified as a historic resource or located within an historic district, development of that site could result in demolition or inappropriate new construction. Therefore, the shift in policy to actively identify such sites could encourage demolition for new construction more so than Residence Element Policy 7.1. 2004 Housing Element Policy 11.5 modified 1990 Residence Element 12.4 by changing the wording from “conserve” to “enhance,” though this would be more vague and individual projects could potentially propose a design that may be considered inconsistent with the Secretary of Interior’s Standards of CEQA. The evaluation of an impact to historic resources under any such circumstance is most appropriately evaluated at the specific project-level and the City’s programs and regulations ensure new construction is consistent with the City’s historic districts, to the extent practicable.

Demolition by neglect could result from the gradual deterioration of a building when routine or major maintenance is not performed and/or is allowed by the owner to remain vacant and open to vandals. 2004 Housing Element Policy 4.1 modified 1990 Residence Element Policy 7.1 to

[26] The Court of Appeal deleted the last sentence of 2004 Housing Element Policy 1.1 in its decision regarding the 2004 Housing Element.

[27] Underdeveloped sites are generally classified as soft sites, sites with development potential, or opportunity sites. The City identifies two levels of soft sites, sites that are built to only 30 percent of their maximum potential, and sites that are built to only five percent of their maximum potential, as determined by the zoning for that parcel.

encourage more intense search for opportunity sites, which could have neglected resources. New development or redevelopment of such sites that are consistent with the Secretary of Interior's Standards could help to rehabilitate neglected resources. No polices from the 2004 Housing Element have been identified that would promote neglect of historic resources, such that demolition by neglect could be expected.

Although the aforementioned policies could potentially increase indirect impacts to historic resources, the following 2004 Housing Element policies could reduce the 2004 Housing Element's effects to historic resources by establishing policies for review, criteria for the protection of historic resources and by promoting policies that discourage demolition.

Table 2 - 2004 Housing Element Policies that Reduce Historic Resources Impacts

Potential Impact	2004 Housing Element	1990 Residence Element
Protection of historic resources	Policy 3.6 Preserve landmark and historic residential buildings.	Policy 5.5 Preserve landmark and historic residential buildings.
	Implementation Measure 3.6.1 The Planning Commission will review and adopt the Preservation Element of the General Plan.	
	Implementation Measure 3.6.2 The Planning Department and the Department of Building Inspection will continue to regulate the preservation and protection of landmark and historic buildings by monitoring use, alterations, and demolition.	
	Implementation Measure 3.6.3 The City will continue to implement the Proposition M priority policy that landmarks and historic buildings be preserved.	
	Implementation Measure 3.6.4 The Planning Department's Citywide Cultural Resource Survey program is a multi-year effort that will document resources in neighborhoods and commercial areas throughout San Francisco.	
	Implementation Measure 3.6.5 The Mayor's Office of Housing	

Potential Impact	2004 Housing Element	1990 Residence Element
	and the Redevelopment Agency will continue to fund the acquisition and rehabilitation of landmark and historic buildings for use as affordable housing.	
	Implementation Measure 3.6.6 The Planning Department will encourage property owners to use preservation incentives to repair, restore, or rehabilitate historic resources in lieu of demolition. These include federal tax credits for rehabilitation of qualified historical resources, Mills Act property tax abatement programs, the State Historic Building Code, and tax deductions for preservation easements.	
	Implementation Measure 3.6.7 The Planning Department will continue to assist in federal environmental review and review under Section 106 of the National Historic Preservation Act for historically significant local buildings receiving federal assistance.	
Discourage demolitions, potentially reducing affects to historic resources	Implementation Measure 11.1.3 The Planning Department will encourage historic preservation and adaptive reuse of older buildings to enhance neighborhood vibrancy.	

As shown above, the 2004 Housing Element proposes policies that encourage the establishment of project-level review and criteria for the protection of historical resources (including Policy 3.6 and Implementation Measures 3.6.1 to 3.6.7) to a degree similar as the 1990 Residence Element. 2004 Housing Element Policy 3.6 is identical to its corresponding 1990 Residence Element policy. Implementation Measures 3.6.1 through 3.6.7 do not represent policy shifts. The 2004 Housing Element also proposes policies that discourage demolitions (including Implementation Measure 11.1.3) to a greater degree than the 1990 Residence Element. Implementation Measure 11.1.3[28] encourages historic preservation and adaptive reuse of historic buildings, reducing the potential for demolitions and increasing the potential for retaining existing structures. Both the

[28] The Court of Appeal deleted 2004 Housing Element Implementation Measure 11.1.3 in its decision regarding the 2004 Housing Element.

1990 Residence Element and 2004 Housing Element recognize the need to preserve landmark and historic buildings through project-level review and criteria for the preservation of historic resources, although the 2004 Housing Element more strongly encourages the preservation and adaptive reuse of older buildings.

Although the 2004 Housing Element would not result in the construction of residential units, it would shape how new residential development should occur and ensures that there is adequate land available to meet future housing needs. Potential impacts related to inappropriate alterations and/or additions, inappropriate new construction, and demolition by neglect would be offset by compliance with the previously discussed federal, state, and local regulations, including:

- <u>Secretary of the Interior's Standards for the Treatment of Historic Properties</u>
  The appropriate identified treatment would apply to the alteration of a historic resource or new construction adjacent to a historic resource or within an historic district, depending on whether the property or properties are Article 10 City Landmarks and Historic Districts or in Article 11 Conservation Areas.
- <u>California Environmental Quality Act (CEQA)</u>
  The California Environmental Quality Act gives guidance for the evaluation of properties but also defines impacts to historic resources that meet the criteria of the California Register of Historic Places. Generally, a project that complies with the Secretary of the Interior's Standards will meet the CEQA criteria for less a than significant impact finding.
- <u>Section 106 of the National Environmental Policy Act (NEPA)</u>
  The National Environmental Policy Act gives guidance for the evaluation of properties but also defines impacts to historic resources that meet the criteria of the National Register of Historic Resources.
- <u>The City of San Francisco's Preservation Bulletins Nos. 1-21</u>
  These bulletins provide information, guidance and incentives, depending on the nature of the housing project and its location.
- <u>Articles 10 and 11of the City of San Francisco's Planning Code</u>
  The purpose of this planning code is to protect and maintain historic resources for continued use, and to enhance, protect and maintain the setting and environment of historic districts. The code would apply directly to changes to historic buildings and indirectly for new construction adjacent to a historic resource or within a historic district.
- <u>The Urban Design Element of the San Francisco General Plan</u>
  The Urban Design Element is concerned with the physical character of the City and the protection of these characteristics. Understanding the unique nature of historic districts and conservation districts, the Urban Design Element would serve as guidance for new construction in or adjacent to these districts.
- <u>The California Historic Building Code</u>
  The California Historic Building Code (CHBC) is a mandate for reasonable alternatives to the requirements of standard codes and ordinances, and is applicable to all qualified historic resources as recognized by local building officials.
- <u>The San Francisco Residential Design Guidelines</u>
  The Residential Design Guidelines provide principles of urban design to "maintain neighborhood identity, preserve historic resources, and enhance the City of San Francisco and its residential neighborhoods." The guidelines therefore are applicable for new

construction in or adjacent to these districts. The guidelines also provide guidance for appropriate additions to historic resources, window replacement etc.

- Other Design Guidelines
  There are numerous guidelines available about specific technical issues, such as window replacements, weatherproofing, additions to residential and commercial buildings. The National Park Service *Interpreting the Secretary of the Interior Standards for Rehabilitation* provides simple discussion of what is or is not an appropriate approach to rehabilitation. These guidelines would be applicable to the rehabilitation of historic resources.

Once adopted, the Draft Preservation Element of the General Plan would further establish and maintain preservation of historic resources as City policy.

Impacts to individual historic resources or historic districts are appropriately addressed at the project level, where the historic context and character defining features can be evaluated with respect to a given project proposal. Although some 2004 Housing Element policies could indirectly affect historic resources, other policies in the 2004 Housing Element specifically protect historic resources, reducing the potential for the Housing Element policies to directly or indirectly affect historic resources. Furthermore, the City has well established criteria and procedures to evaluate impacts to historic resources at the project level. Therefore the proposed 2004 Housing Element policies would result in a ***less than significant*** impact to historic resources.

2009 Housing Element
The following 2009 Housing Element policies could potentially result in impacts to a historical resource through inappropriate alterations and/or additions and inappropriate new construction.

Table 3 - Potential Impacts to Historic Resources from 2009 Housing Element

Potential Impact	2009 Housing Element	1990 Residence Element
Inappropriate Alterations/Additions	Policy 4.1 Develop new housing, and encourage the remodeling of existing housing, for families with children.	
	Policy 2.2 Retain existing housing by controlling the merger of residential units, except where a merger clearly creates new family housing.	Policy 3.1 Discourage the demolition of sound existing housing. Policy 3.2 Control the merger of residential units.
	Policy 1.6 Consider greater flexibility in the number and size of units within established building envelopes in community plan areas, especially if it can increase the number of affordable units in	Policy 2.3 Allow flexibility in the number and size of units within permitted volumes of larger multi unit structures, especially if the flexibility results in the creation of a significant number of

Potential Impact	2009 Housing Element	1990 Residence Element
	multi-family structure.	dwelling units that are permanently affordable to lower income households.
Inappropriate New Construction	Policy 1.1 Focus housing growth- and the infrastructure necessary to support that growth- according to community plans. Complete planning underway in key opportunity areas such as Treasure Island, Candlestick Park and Hunter's Point Shipyard.	
	Policy 1.3 Work proactively to identify and secure opportunity sites for permanently affordable housing.	Policy 7.1 Create more housing opportunity sites for permanently affordable housing.
	Policy 2.1 Discourage the demolition of sound existing housing, unless the demolition results in a net increase in affordable housing.	Policy 3.1 Discourage the demolition of sound existing housing.
	Policy 4.1 Develop new housing, and encourage the remodeling of existing housing, for families with children.	

As discussed in the analysis of the 2004 Housing Element's impacts to historic resources, to the extent that a given site is identified as an historic resource, alterations/additions to that resource may be inappropriate. As shown above, the 2009 Housing Element proposes policies that support alterations/additions to existing buildings and promotes new construction (including Policy 4.1) to a greater degree than the 1990 Residence Element. Inappropriate alterations/additions could include demolishing, altering, removing or concealing those character-defining features that convey the historic significance of a historic resource and thereby substantially alter the property's integrity. 2009 Housing Element Policy 4.1 is a new policy that encourages remodeling of existing housing, which could promote additions or alterations that may be inappropriate for that specific resource. Compared to 1990 Residence Element Policies 3.1 and 3.2, 2009 Housing Element Policy 2.2 provides a stipulation that unit merging can occur in cases where the needs for family housing are supported. This policy could impact historic resource by providing more opportunity for unit mergers, which could include inappropriate alterations. However, unit mergers would typically result in a less than significant impact to a resource; as such remodeling projects typically include interior renovations that generally would have little effect on the historic significance of a specific resource. Furthermore, the evaluation of an impact to historic resources under any such circumstance is most appropriately evaluated at the specific project-level and the City's programs and regulations ensure any such alteration is consistent with the Secretary of Interior's Standards for the treatment of historic resources, to the extent practicable.

New construction in the vicinity of a historic resource (allowed under existing zoning) could alter, remove, or conceal those character-defining features that convey the historic significance of an adjacent historic resource, or inappropriate new construction within a historic district. 2009 Housing Element 2.1 modifies 1990 Residence Element 3.1 and qualifies the demolition of properties for the benefit of increased housing stock. 2009 Housing Element Policy 4.1 is a new policy that encourages remodeling of existing housing. This could potentially impact historic resources through inappropriate new construction, if such construction were to occur adjacent to an historic resource.

Demolition by neglect could result from the gradual deterioration of a building when routine or major maintenance is not performed and/or is allowed by the owner to remain vacant and open to vandals. 2009 Housing Element Policy 1.3 modifies 1990 Residence Element Policy 7.1 to encourage a more intense search for infill sites, some of which may contain neglected resources. New development or redevelopment of such sites that is consistent with the Secretary of Interior's Standards could help to rehabilitate neglected resources. No policies from the 2009 Housing Element have been identified that would promote neglect of historic resources, such that demolition by neglect could be expected.

The following 2009 Housing Element policies could reduce the 2009 Housing Element's effects to historic resources by establishing policies for review, criteria for the protection of historic resources and by promoting policies that discourage demolition.

Table 4 - 2009 Housing Element Policies that Reduce Historic Resources Impacts

Potential Impact	2009 Housing Element	1990 Residence Element
Reduce alterations to existing buildings	Policy 2.3 Prevent the removal or reduction of housing for parking.	Policy 3.2 Control the merger of residential units.
	Implementation Measure 20 Planning shall amend the Historic Preservation bulletins and Residential Design Guidelines to discourage the reduction of habitable or potentially habitable space for parking.	
Ensure good design standards	Policy 11.2 Ensure implementation of the accepted design standards in project approvals.	Policy 12.4 Promote construction of well designed housing that conserves existing neighborhood character.
Preserve landmark buildings and historic resources	Policy 11.6 Respect San Francisco's historic fabric, by preserving landmark buildings and ensuring consistency with	Policy 5.5 Preserve landmark and historic residential buildings.

Potential Impact	2009 Housing Element	1990 Residence Element
	historic districts.	
	Implementation Measure 81 Planning Department staff shall continue project review and historic preservation survey work, in coordination with the Historic Preservation Commission; and shall continue to integrate cultural and historic surveys into area plan projects.	
	Implementation Measure 82 Planning shall complete and adopt the Preservation Element of the General Plan	
	Implementation Measure 83 The Mayor's Office of Housing and San Francisco Redevelopment Agency shall continue funding the acquisition and rehabilitation of landmark and historic buildings for use as affordable housing.	
Strengthen sense of history	Policy 11.8 Foster development that strengthens local culture, sense of place and history.	
Consideration of neighborhood character	Policy 11.1 Promote the construction and rehabilitation of well-designed housing that emphasizes beauty, flexibility, and innovative design, respects neighborhood character.	Policy 12.4 Promote construction of well designed housing that conserves existing neighborhood character.
	Policy 11.3 Ensure growth is accommodated without significantly impacting existing residential neighborhood character.	Policy 12.3 Minimize disruption caused by expansion of institutions into residential areas.
	Policy 11.4 Maintain allowable densities in established residential areas at levels with promote compatibility with prevailing neighborhood character.	Policy 12.5 Relate land use controls to the appropriate scale for new and existing residential areas.
Discourage demolition and promote maintenance/rehabilitation	Policy 2.1 Discourage the demolition of sound existing housing, unless the demolition results in a net increase in	Policy 3.1 Discourage the demolition of sound existing housing.

Potential Impact	2009 Housing Element	1990 Residence Element
of housing units	affordable housing.	
	Policy 3.2 Promote voluntary housing acquisition and rehabilitation to protect affordability for existing occupants.	Policy 5.2 Promote and support voluntary housing rehabilitation which does not result in the displacement of lower income occupants.
	Policy 3.4 Preserve "naturally affordable" housing types, such as smaller and older ownership units.	

As shown above, the 2009 Housing Element proposes policies that could reduce the number of alterations to a property (including Policy 2.3 and Implementation Measure 20), encourage the preservation of landmark buildings (including Policy 11.6), and strengthen area's sense of history (including Policy 11.8) to a greater degree the 1990 Residence Element. 2009 Housing Element Policies 11.1, 11.3, and 11.4 are similar to their corresponding 1990 Residence Element Policies. 2009 Housing Element Policy 2.3 and Implementation Measure 20 could result in a decrease in the number of permits to alter the ground floor of structures for parking, thereby decreasing the potential for inappropriate alterations associated with adding garages to the ground floor of historic structures. 2009 Housing Element Policy 11.6 ensures consistency with historic districts, an addition to the 1990 Residence Element Policy 5.5. that seeks to preserve landmark buildings. Implementation Measure 81 states the City would continue current practices related to project review and survey work, which does not represent a shift in policy. Both the 2009 Housing Element and 1990 Residence Element discourage the demolition of structures and encourage maintenance of existing housing units, which could reduce instances of demolition and demolition by neglect. Essentially both the 1990 Residence Element and 2009 Housing Element recognize the need to ensure good design standards, preserve landmark buildings, and consider existing neighborhood character, although the 2009 Housing Element more strongly encourages consistency with historic districts and the strengthening of an area's sense of history.

Although the 2009 Housing Element would not result in the construction of residential units, it would shape how new residential development should occur and ensures that there is adequate land available to meet future housing needs. As discussed previously, impacts to individual historic resources or historic districts are appropriately addressed at the project-level, where the historic context and character-defining features can be evaluated with respect to a given project proposal. Although some 2009 Housing Element policies could indirectly affect historic resources, other policies in the 2009 Housing Element specifically protect historic resources, reducing the potential for the Housing Element policies to directly or indirectly affect historic resources. Furthermore, the City has well-established review criteria and procedures to evaluate impacts to historic resources at the project-level. Therefore the proposed 2009 Housing Element policies would result in a ***less than significant*** impact to historic resources.

IX. CONCLUSION

Generally, to meet their housing needs and goals identified by the Regional Housing Needs Assessment (RHNA), the City of San Francisco's 2004 Housing Element includes policies that encourage new housing in neighborhood commercial districts and mixed-use districts near the downtown. The 2009 Housing Element encourages housing in new commercial or institutional projects and accommodating new housing through community planning processes. The areas with the greatest capacity to accommodate new housing are the areas that have the greatest probability of containing historic and cultural resources and therefore have the greatest potential for impacts to historic resources. The policies in both Housing Elements intend to promote quality new housing in the City and County of San Francisco while balancing the extent of impacts to historic resources. Furthermore, while some policies could indirectly affect potential resources, both the 2004 and 2009 Housing Elements contain policies that would reduce any adverse impacts to potential historic resources.

By applying City policies as discussed in Section VIII of this report, and complying with previously discussed federal, state, and local regulations, identified in Section VIII (including the Secretary of the Interior's Standards for the Treatment of Historic Properties, the City of San Francisco's Preservation Bulletins, Article 10 of the City of San Francisco's Planning Code, the Urban Design Element of the San Francisco General Plan, the California Historic Building Code, the California Environmental Quality Act, and the National Environmental Policy Act) the 2004 and 2009 Housing Elements would have a ***less than significant*** impact with respect to historic resources; therefore, no mitigation measures are warranted.

Figure 1 [Insert Fig IV-5, with Fig number changed to 1]
Potential Residential Unit Capacity
San Francisco, California

Figure 2 [Insert Fig V.E-1, with Fig number changed to 2]

Potential Housing Units: Capacity and Pipeline Units within Article 10 and Article 11 Areas

San Francisco, California

Appendix C-2

Archaeological Technical Memorandum: San Francisco General Plan Housing Element EIR

ARCHAEOLOGICAL TECHNICAL MEMORANDUM
San Francisco General Plan
Housing Element EIR
San Francisco, California

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WSA PROJECT NO. 2008-58
WSA REPORT NO. 2008-66

April 2010

Table of Contents

1.0 Introduction

1.1 Objectives

This Archaeological Technical Memorandum (ATM) has been produced as the background technical support documentation for the archaeological resources environmental evaluation of the San Francisco Planning Department's San Francisco General Plan, Housing Element Environmental Impact Report (EIR). The ATM marshals evidence from existing archaeological resources studies to characterize the nature of archaeological resources that are both common to and distinctive to the City of San Francisco, especially with reference to specific Housing Opportunity Areas (HOA) composed of neighborhoods, districts, or clusters of neighborhoods and/or districts. The ATM introduces archaeological research issues that are relevant to these archaeological resources. The ATM is necessarily concise, analytic, and broad-stroked to reflect the goals of the programmatic EIR.

The purpose of this memorandum is to provide background information for the environmental evaluation of the *2004 and 2009 Housing Element* of the *San Francisco General Plan* regarding potential effects to legally-significant archaeological resources ("significant" archaeological resources as defined by CEQA §15064.5(b) and (c)(1)). To achieve this objective the memorandum provides historical context of the specific Housing Opportunity Areas (HOA) within the plan area of the proposed *2004 and 2009 Housing Element* to serve as the basis for a preliminary identification and significance evaluation of archaeological properties that may be present within the Project Area. The ATM is a collaborative effort between William Self Associates (WSA) staff and Randall Dean, MEA. Aimee Arrigoni, Angela Cook, and Heather Price of WSA prepared sections 4, 5, 6, 8, and 11, and Randall Dean prepared sections 3, 7, 9, and 10.

The historical and archaeological information provided in this report is based on secondary archaeological literature related to the Project Area and on primary and secondary historical documentation including historical maps (U.S. General Land Office plats, U.S. Coast Surveys, Sanborn Fire Insurance maps etc.). This memorandum provides a program-level discussion of the general types of archaeological resources that may be present within the Project Area and, thus, potentially affected by future physical projects under the proposed revisions of the Housing Element of the General Plan.

The state of archaeological knowledge is not static and new archaeological discoveries over time alter assumptions upon which the potential presence of archaeological resources are predicted or upon which the significance of archaeological resources is gauged. This memorandum discusses those archaeological resources that have been documented to date.

1.2 Regulatory Context

The California Environmental Quality Act (CEQA) requires that the effects of a project on an archaeological resource shall be taken into consideration and that if a project may affect an archaeological resource that it shall first be determined if the archaeological resource is an "historical resource", that is, if the archaeological–resource meets one or more of the criteria for listing on the

California Register of Historical Resources (CRHR) (Public Resource Code §5024.1, Title 14 CCR, Section 4852). These criteria for cultural resources require that a cultural resource:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

To be eligible for listing to the CRHR under Criteria A, B, or C, an archaeological site must contain artifact assemblages, features, or stratigraphic relationships associated with important events, or important persons, or exemplary of a type, period, or method of construction (*CEQA Guidelines* § 15064.5(a)(1) and (3) and (c)(1) and (2)). To be eligible under Criterion D, an archaeological site need only show the *potential* to yield important information (United States Department of the Interior 1986). An archaeological resource that qualifies as a "historical resource" under CEQA, generally, qualifies for listing under Criterion "D" of the CRHR (CEQA Guidelines §15064.5 (a)(3)(D). An archaeological resource may qualify for listing under Criterion "D" when it can be demonstrated that the resource has the potential to significantly contribute to questions of scientific/historical importance (CA OHP *Preservation Planning Bulletin* No. 5).

In anticipation of encountering potentially significant historical resources during the course of a project's construction, and the implementation of data recovery to mitigate the effects of construction (i.e., the loss of the resource), it is necessary to identify pertinent research questions that can be used to determine the potential significance of the resource, and then to focus the approach to data recovery, as well as the types of analysis that should be conducted if the resource is determined to be significant.

The following sections identify archaeological resources and relevant research issues presented for the City of San Francisco as a whole, and nine different HOAs, composed of adjacent or related groups of neighborhoods or recognized areas within the City depicted in Figure 1. These include the Southwest (including San Francisco State University, Park Merced, and Balboa Park); the Southeast (Bayview, Hunter's Point, India Basin, South Bayshore, Executive Park, and Visitacion Valley); the Mission District and Market-Octavia; South of Market (SOMA) (including east and west SOMA, and Rincon Hill); Mission Bay; Showplace Square, Potrero Hill, and Central Waterfront; the Northeast (Northeast and Downtown); the West (Marina, Western Addition, Japantown, Buena Vista, Richmond, Golden Gate Park, Outer and Inner Sunset, Central, Ingleside, Glen Park, South Central, and Bernal Heights); and Treasure Island.

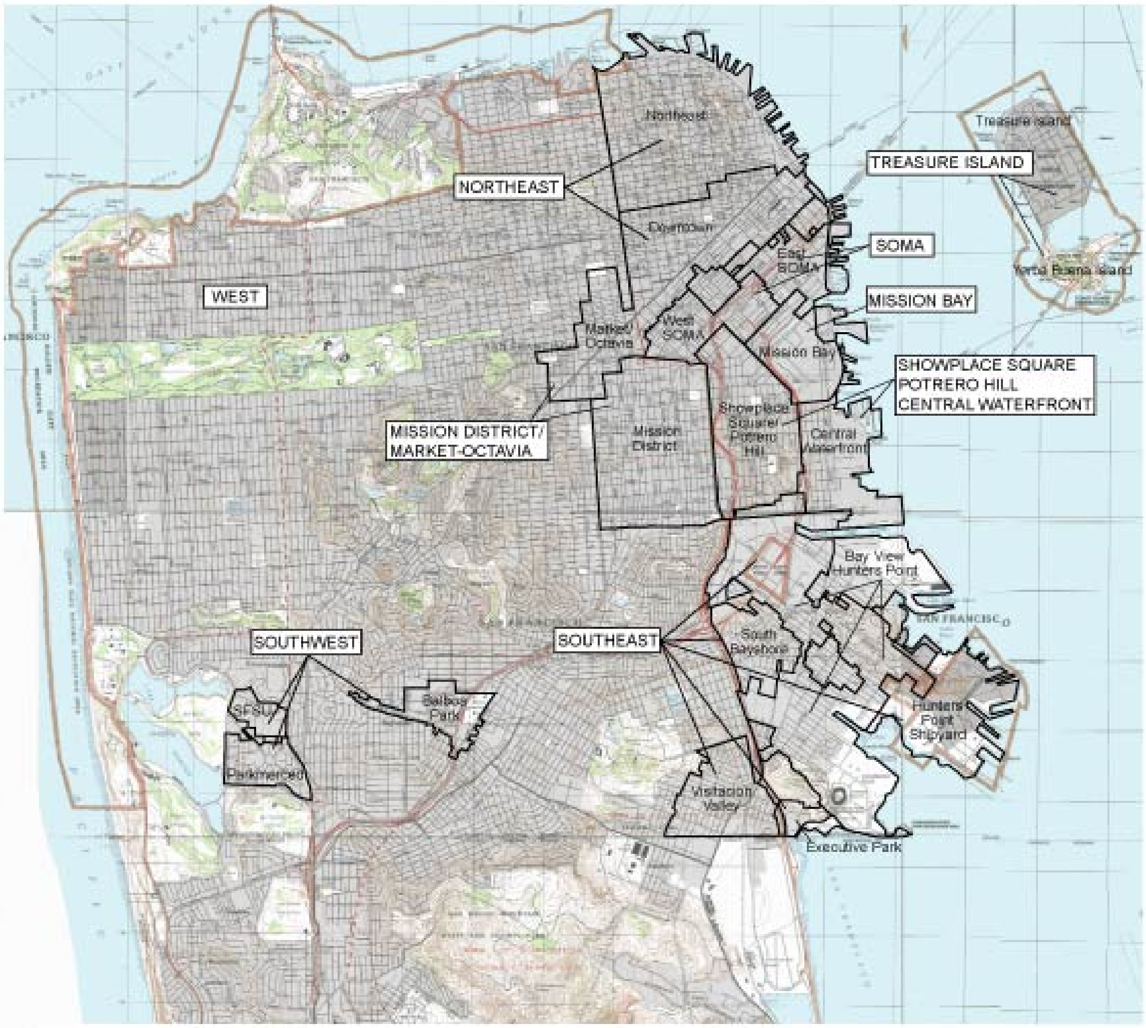

Figure 1. Nine Study Areas discussed in the San Francisco Housing Element EIR/EIS Archaeological Technical Memorandum.

1.3 Project

The City and County of San Francisco is proposing to adopt the 2004 and 2009 Housing Element of the *General Plan*. The Housing Element is a policy document that consists of goals and policies to guide the City and private and non-profit developers in providing housing for existing and future residents to meet projected housing demand, as required under Government Code section 65580 et seq ("State housing element law"). State law requires the housing element to be updated periodically, usually every five years. The most recent update of the housing element occurred in 2004, when the City adopted the 2004 Housing Element, an update to the 1990 Residence Element. Subsequent to adoption of the 2004 Housing Element, the California Court of Appeals determined the environmental document prepared for the 2004 Housing Element inadequate, and directed the City to prepare an Environmental Impact Report (EIR) for the 2004 Housing Element. The EIR for the 2004 and 2009 Housing Elements will analyze the effects on the physical environment, including archeological resources, of changes in objectives, policies, and implementation measures in the 2004 and 2009 Housing Elements from those in the 1990 Residence Element.

2.0 Overview of San Francisco Archaeology

A sizable archaeological literature exists for San Francisco and there has been a considerable amount of archaeological field investigation. Most of this documentation has been more descriptive than analytical in its treatment of archaeological resources and most field projects have been initiated as salvage archaeological efforts rather than the implementation of research or area-wide preservation plans. Until recent years, archaeologists in San Francisco have primarily concentrated on a small range of archaeological resources, specifically prehistoric sites, Gold Rush period structural remains and deposits, buried Gold Rush period storeships, structural remains associated with the Spanish/Mexican Presidio, the foundations of the former City Hall complex, and deposits associated with Chinese households or merchants. A number of archaeological data recovery projects have also been conducted in former cemetery sites involving the removal of a large number of burials. However, with one exception (Buzon et al. 2005) little archaeological analysis of cemetery features, human remains or of the burials themselves has resulted, in part because of inconsistencies in State laws regarding the status and appropriate treatment of discovered human remains and the failure to coordinate a plan of action among interested city departments. A significant research focus in recent archaeological work in San Francisco and in Oakland, across the Bay, has been comparative studies of domestic and commercial deposits after 1860 and before the 1906 earthquake and fire. Freeway projects conducted by Caltrans, stimulated by the damage caused during the 1989 Loma Prieta Earthquake, made possible several in-depth archaeological studies of this period (e.g., Praetzellis 1994; Praetzellis and Praetzellis 1992; Praetzellis and Ziesing 1998; Ziesing 2000). Such studies have shown that archaeological deposits of the late 19th century or early 20th century may have significant research value independent of the existence of a good associated historical record. These studies have shown that the archaeological record of the past 150 years has the potential to fill in the gaps and misrepresentations that characterize the written record, despite having been subject to differential preservation over time, subsequent disturbances, and the biases of the archaeologists in choosing what gets retrieved, recorded, and investigated,.

2.1 Paleoenvironmental Change and San Francisco Prehistory

Since the late Pleistocene, when Indigenous peoples may have first arrived in the Bay Area, the region has undergone significant environmental changes as a result of global climate fluctuations including rising sea levels and changes in the distribution and availability of natural resources. Beginning around 11,000 years ago as the colder Pleistocene geological era gave way to the warmer Holocene era, as a result the broad inland valley, now forming San Francisco Bay became progressively inundated (Atwater 1979; Atwater et al. 1977). Older archaeological sites at lower elevations within the Bay would have been submerged by rising sea levels or buried beneath sedimentary deposits up to the beginning of the Late Holocene.

The oldest evidence for humans in the City of San Francisco was found approximately 75 feet below the modern ground surface, during the construction of the Bay Area Rapid Transit (BART) tunnel near the Civic Center Station, at the western end of the Downtown District. A human skeleton estimated to have been buried more than 5,000 years ago, was found in a clay matrix that was once part of marshlands associated with an inland creek. The majority of known prehistoric era sites in the City of San Francisco are no more than 2,000 years old, and are found buried at depths of from approximately 10 to 20 feet below ground surface. They were originally deposited within the dune sands that were blown eastward from the Pacific coast, across the peninsula (over the past 6,000 years or so).

Prehistoric resources and sites that have survived to be discovered during historic times represent only a portion of the past. The early growth of San Francisco was characterized by filling of the shallow Bay waters and other low-lying lands, removal of hills of sand and rock, and the obscuring of original ground surfaces by fill, roadways, buildings and structures. Nels C. conducted a systematic survey around the perimeter of the entire San Francisco Bay between 1906 and 1909, focusing on mounds of shell partially submerged or adjacent to the Bay waters. He recorded 425 shellmounds, and yet his survey occurred well after the Yerba Buena Cove had been filled and the area heavily developed and covered by the built environment (Nelson 1909). It is likely that the filling of the Cove, and subsequent development obscured any prehistoric occupations that may have existed there. Conversely, the notable concentration of shellmounds observed and mapped by Nelson in the Southeast HOA, quite distinctly following the edge of the bay shore, were visible to him in the first decade of the 20th century because the area had not yet experienced significant filling, construction, and occupation. Even then, the mounds had been damaged (erosion, bisected by roadways, or partially removed and reused for fertilizer/road beds). The majority of the western neighborhoods have not yet yielded archaeological resources from prehistory, but it is not clear whether this is a reflection of past settlement preferences, lack of systematic archaeological investigation, or a combination of changes of landscape over time that have buried or otherwise obscured resources, together with a lack of construction to depths likely to reveal any such buried resources.

Prehistoric Context

Terminal Pleistocene (13,500-11,600 BP[1])

No prehistoric sites dating from this period have as yet been discovered in the San Francisco Bay Area. The nearest Terminal Pleistocene site is the Borax Lake site (CA-LAK-36). Assumedly populations were small and highly mobile. The archaeological signature of such groups would be faint and geographically sparse and easily disturbed by geological processes such as erosion, rising sea level, and alluvial burial.

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[1] BP – before the present

Early Holocene (11,600-7700 BP)
Early Holocene human populations are known from a few Bay Area sites, such as at Los Vaqueros reservoir (CA-CCO-696) and Santa Clara Valley (CA-SCL-178). Communities from this period were semi-mobile hunter-gatherers who in addition to tools, used some "site furniture" such as *manos* and milling slabs. Human burials from this period have also been investigated. There are no documented Early Holocene sites in San Francisco.

Middle Holocene (7700-3800 BP)
Middle Holocene sites are more widespread in the San Francisco Bay Area and are evidenced by substantial settlements, isolated burials, distinct cemeteries, milling slabs, mortars and pestles, and the fabrication and use of shell beads and other ornaments. Differences in burial treatment such as differential distribution of shell beads and ornaments are interpreted as evidence of possible social stratification. The expansion of San Francisco Bay's estuaries and tidal wetlands seems to have resulted in a shift toward coastal and maritime resource exploitation. San Francisco has one Middle Holocene site (CA-SFR-28), the remains of a young woman found in marsh deposits found 75 foot below the surface.

Late Holocene (3800-170 BP)
It is the Late Holocene that has left the strongest archaeological record of prehistoric populations in San Francisco. This period is marked by the establishment of the large shellmounds. Artifact assemblages are characterized by bone awls (indicating appearance of coiled basketry), net sinkers, mortars (probably indicating greater consumption of acorns), Olivella shell beads, the appearance of the bow and arrow, and diverse beads and ornaments, such as incised bird bone tubes. There is some indication of a greater exploitation of deer, sea otter, mussels, and clams. There is growing indication of shellmounds as planned, constructed landscapes on sites of ancestral, or at least, mortuary importance.

Prehistoric Archaeological Investigations in San Francisco

Although some attempt at archaeological investigation and interpretation of prehistoric sites in San Francisco occurred in the 19th century (for example by C.D. Voy, James Deans, Pocock, and P.M. Jones), use of a systematic investigatory approach to prehistoric sites in the northern portion of the San Francisco peninsula began with Nelson's shellmound survey conducted between 1906 and 1909 (Nelson 1909). Nelson pursued his interest in San Francisco prehistory with excavations at CA-SFR-7 (the Crocker Mound) on the Bay's southeastern shoreline (Moratto 1984:233), among other investigations. Nelson found that CA-SFR-7 contained a variety of flaked stone, worked bone, faunal remains, and 23 human burials. The constituents of this mound indicate long-term residential occupation. Two years later, L. L. Loud excavated another shellmound (CA-SFR-6), approximately 3 feet (1 meter) thick, near the Palace of Fine Arts (Ziesing 2000:32). While interest in the prehistory of the northern San Francisco peninsula began in the early 1900s, the area generally received little attention until more recent times. This was partially a result of the destruction and/or burial of sites due to historic settlement and development.

Within the past 30 years or so, the body of work on the prehistoric northern San Francisco peninsula has expanded, as archaeological sites are uncovered during construction or development activities within the City. Approximately 50 prehistoric archaeological sites have been documented within the northern San Francisco peninsula and Yerba Buena Island; the majority of these were within ½ mile or less from the historic margins of San Francisco Bay. The great majority of prehistoric sites are shell midden sites which have their greatest concentrations in the South of Market Area (12 sites) and the Hunter's Point-Bayview-Candlestick Point-Visitacion Valley area (14 sites). Although midden sites in the latter area have been known since the 1870s and include some of the largest shellmound sites in San Francisco, they have been subject to little investigation and no hard dating. The SOMA sites have, on the other hand, largely only come to light since the 1980s and have been subject to various analytical and absolute dating techniques. The SOMA shell midden sites are also remarkable within Bay Area shellmound studies, in that many of them possess good physical integrity as a result of having been buried beneath natural sand dune deposits for hundreds of years following their abandonment. A third area of apparent intense prehistoric occupation was on the terraces of Islais and Precita Creeks just above their broad tidal estuary and included such sites as CA-SFR-3, 15, and 17, the Anderson Shellmound, the Alemany-Bayshore site, and the Portola Avenue mound. Prehistoric sites documented along the northern bay shore (CA-SFR-23, 26, 29, 30, and 129) and Lands End (CA-SFR-5, 20, 21) appear to be smaller occupation sites or food processing camps. Shell midden sites in the Lake Merced area (CA-SFR-25, 126, and Lake Merced Site) have not been well investigated. One of the well-researched shellmounds in San Francisco is CA-SFR-4 on Yerba Buena Island which has been determined to have been first used exclusively as a cemetery site for around three hundred years by possibly Hokan-speaking populations. After a lapse of more than a thousand years, the site hosted a more intensive and diverse occupation between approximately 1810 and 320 BP, resulting in a multi-component shellmound site. Based on contact era observations of interaction and travel between the mainland and the island, there may have been some relationship between CA-SFR-4 on the island, and CA-SFR-112 in the SOMA district.

On the assumption that prehistoric resources are one of the most vulnerable components of the City's heritage, the draft *Preservation Element* of the *San Francisco's General Plan* states that all indigenous archaeological sites shall be presumed to have *prima facie* significant archaeological research value, including re-deposited or disturbed prehistoric deposits. Disturbed or secondary prehistoric archaeological deposits, under this policy, would be presumed to have potential information value~~,~~ in the absence of a convincing demonstration to the contrary.

Archaeological study of indigenous peoples of San Francisco includes not only prehistory but the study of Native Americans after Mission Dolores was secularized, especially during the Yerba Buena Period (1835-1848) and the early Gold Rush Period (1848-1853). The place of Native Americans (almost assuredly all former neophytes) within local society at this time has received little investigation. However, the historical record reveals their presence in Yerba Buena and the area around Mission Dolores as construction laborers and livestock keepers.

2.2 *Cultural Affiliation and Ethnohistorical Overview*

The City of San Francisco is part of the coastal region occupied by the *Ohlone* or Costanoan group of Native Americans at the time of historic contact with Europeans (Kroeber 1925:462-473). Although the term Costanoan is derived from the Spanish word *costaños*, or "coast people," its application as a means of identifying this population is based in linguistics. The Costanoans spoke a language now considered one of the major subdivisions of the Miwok-Costanoan, which belonged to the Utian family within the Penutian language stock (Shipley 1978:82-84). Costanoan designates a family of eight languages.

Costanoan-speaking tribal groups occupied the area from the Pacific Coast to the Diablo Range and from San Francisco to Point Sur. Modern descendants of the Costanoan prefer to be known as *Ohlone*. The name *Ohlone* is derived from the Oljon group, which occupied the San Gregorio watershed in San Mateo County (Bocek 1986:8). The two terms (Costanoan and *Ohlone*) are used interchangeably in much of the ethnographic literature.

Prehistorians differ as to the precise linguistic affiliation and date of arrival of the first Penutian-speakers in the San Francisco Bay Area. There is near universal belief today that the ancestors of the *Ohlone* arrived in the Bay region much earlier than formerly thought. Based on historical linguistics and archaeological evidence, these populations are thought to have introduced a language, cultural patterns, and mortuary practices quite distinct from that of the indigenous Hokan-speaking populations into the eastern part of the Bay region approximately 4,000 BP. Some archeologists have conjectured that evidence of Hokan material culture at archaeological sites after 4,000 BP may represent either the adoption of some Hokan characteristics, or the survival of remnant Hokan-speaking communities at sites like CA-SFR-4 on Yerba Buena Island or at CA-SFR-112 in the San Francisco SOMA neighborhood, well after Penutian-speaking communities dominated the central Bay region.

Although linguistically linked as a family, the eight Costanoan languages comprised a continuum in which neighboring groups could probably understand each other. However, beyond neighborhood boundaries, each group's language was reportedly unrecognizable to the other. Each of the eight language groups was subdivided into smaller village complexes or tribal groups. The groups were independent political entities, each occupying specific territories defined by physiographic features. Each group controlled access to the natural resources of their territories, which also included one or more permanent villages and numerous smaller campsites used as needed during a seasonal round of resource exploitation.

The Costanoan tribe that occupied the northern end of the San Francisco peninsula in the late 18th century is known under the general term *Yelamu*. The *Yelamu* were divided into three semi sedentary village groups. The *Yelamu* were composed of at least five settlements (*Chutchi*, *Sitlintac*, *Amuctac*, *Tubsinte*, and *Petlenuc*) that were located within present day San Francisco. *Yelamu* may have also been the name of an additional settlement within the vicinity of Mission Dolores. *Sitlintac* may have been located on the bay shore near the large tidal wetlands of the Mission Creek estuary. *Chutchui* was located near the lake (*Laguna de los Dolores*) east of the current Mission Dolores, two to three miles inland. These two villages were probably the seasonal settlements of one band of the *Yelamu* who used them alternately. Another *Yelamu* band seasonally occupied the settlement sites of *Amuctac* and *Tubsinte* ethnohistorically associated with Visitation Valley and perhaps, archaeologically identifiable with the Ralston Shellmound and CA-SFR-35. A third *Yelamu* band, the *Petlenuc*, may have had a small settlement near the Presidio, perhaps CA-SFR-129. The *Yelamu* were allied by marriage to Costanoan groups on the east side of San Francisco Bay.

Within less than two months after the arrival of the Spanish who had begun construction of the first Mission Dolores, all of the *Yelamu* villages in San Francisco were attacked and burned by an expedition sent by the *Ssalson* tribe, the Costanoan tribe of the San Mateo area. The *Yelamu* survivors abandoned all of the San Francisco settlements seeking refuge with other groups in East Bay and Marin. Until they were missionized in the late 18th century, the *Yelamu* only returned to San Francisco for occasional hunting. Prehistoric Costanoan and/ or pre-Costanoan peoples may have maintained settlements or specialized activity sites (shellfish processing, hunting blind, ritual, burial) within the Project Area.

Extended families lived in domed structures thatched with tule, grass, wild alfalfa, or ferns (Levy 1978:492). Semisubterranean sweathouses were built into pits excavated in stream banks and covered with a structure against the bank. The tule raft, propelled by double-bladed paddles, was used to navigate across San Francisco Bay (Kroeber 1925:468).

Mussels were an important staple in the Ohlone diet, as were acorns of the coast live oak, valley oak, tanbark oak and California black oak. Seeds and berries, roots and grasses, and the meat of deer, elk, grizzly, rabbit, and squirrel formed the Ohlone diet. Careful management of the land through controlled burning served to ensure a plentiful, reliable source of all these foods (Levy 1978:491).
In the more recent prehistoric times, through European contact and the early historic period, the *Ohlone* usually cremated the remains of the deceased immediately upon death but, if there were no relatives to gather wood for the funeral pyre, interment occurred. Mortuary goods comprised most of the personal belongings of the deceased (Levy 1978:490).

The arrival of the Spanish in 1775 led to a rapid and major reduction in native California populations. Diseases, declining birth rates, and the effects of the mission system served to disrupt aboriginal life ways (which are currently experiencing resurgence among *Ohlone* descendants). Brought into the missions (the *Yelamu* inhabitants joined Mission San Francisco from 1777 to 1787 [Milliken, 1995:260]), the surviving *Ohlone*, along with the *Esselen*, *Yokuts*, and *Miwok*, were transformed from hunters and gatherers into agricultural laborers (Levy 1978; Shoup et al. 1995). With Mexican independence in 1821 and the subsequent abandonment of the mission system, numerous ranchos were established. Generally, the few Indians who remained were then forced by necessity to work on the ranchos.

In the 1990s, some *Ohlone* groups (e.g., the *Muwekma*, *Amah*, and *Esselen* further south) submitted petitions for federal recognition (Esselen Nation 2007; Muwekma Ohlone Tribe, 2007). Many *Ohlone* are active in preserving and reviving elements of their traditional culture and actively consult on archaeological investigations. For more extensive reviews of *Ohlone* ethnography and ethnohistory please see Bocek (1986), Cambra et al. (1996), Kroeber (1925), Levy (1978), Lightfoot and Parish (2009), Milliken (1995), and Shoup et al. (1995).

2.3 Historic Period

Spanish/Mexican Period (1775-1846)

A Spanish expedition in search of sites for a northern mission and fortified outpost (presidio) passed through the area of modern-day San Francisco in 1775. The first European settlement in San Francisco was a temporary Franciscan mission complex of structures consisting of a small arbor-like chapel, rectory, and compound protectively surrounded by a palisade constructed in 1776. The first mission was constructed near a large freshwater lake (*Laguna de Nuestra Senora de los Dolores*) from which it derives its popular name, *Mission Dolores*, although the mission was dedicated to San Francisco de Asìs. There appear to have been five mission structures, in total, but the precise locations of the first three have only been tentatively identified (MEA Hispanic Period Archaeology GIS Project). The second, third and fourth mission chapels were of *palizada* (similar to wattle and daub) construction and built circa 1776, 1783, and 1787, respectively. The existing Mission Dolores chapel was constructed over a period of several years (1788-1791). It was the first Mission Dolores chapel constructed of adobe and clay roof tiles (*tejas*). Mission Dolores was secularized in 1835 most of its land, building and moveable properties made available to private acquisition by petition and neophytes at least legally removed from the guardianship of the Franciscans. There are, at least, two archaeologically important points to keep in mind about the 59 year period that Mission Dolores was the principal physical and societal institution on the peninsula: 1) the mission complex should be treated as an archaeological landscape since it was composed of an extensive network of structures and operations (tanneries, mills, school, water conveyance system of channels & reservoirs, prison, forge, bathhouse, corrals, weaving and carpentry shops, a music room, library and neophyte village); and 2) the "tribal" or cultural affiliation of the neophytes (Native American converts) at the mission changed over time ranging from *Ohlone*, to *Coastal Miwok*, *Southern Pomo*, and *Wappo* as new converts continually arrived.

The Mission Dolores area underwent a renaissance during the late 1830s through the early 1850s, as many groups relocated to the area, including *Californios* families, remnants of the military at the Presidio, various early Gold Rush entrepreneurs, and a dissident Mormon group. This population influx resulted in the new construction of adobe and wood-frame houses and adaptation of abandoned adobe structures to new uses.

The Presidio, a military reservation that provided training and housing for Spanish troops, administrative support for the military, as well as coastal defense, was established the same year as the mission. Like the mission, the original buildings required rebuilding as they were worn by weather and expanded over time. The Presidio was located on the west side of the northernmost end of the peninsula now occupied by the City of San Francisco and served as a military post from the time of its establishment until the final years of the 20th century (USDI/NPS NRHP Registration Form 1992:7-2).

After Mexico gained independence from Spain in 1821 and took control of California, secularization of the missions began, as the Mexican government took mission lands from the Catholic Church. The extensive mission lands were redistributed and divided into ranchos, which were still large land holdings by today's standards. Most land owners were of Mexican descent or had married into a Mexican family. Each rancho had a compound of residences, kitchens, smaller houses for ranch hands, and structures and outbuildings such as corrals, or stables. On these ranchos expanses of land remained unoccupied, and when unpatrolled, were claimed by squatters.

A trickle of American and British merchants made their way to California during the Mexican period. Like their successors, they were lured by the region's natural resources, and came in search of hides, tallow, sea otter and beaver pelts. Accounts like those found in Richard Henry Dana's *Two Years Before the Mast*, published in 1840, stirred American's interest in the region. While hide, tallow, and sea otter fur traders largely made connections by sea, beaver trappers represented the first wave of overland American exploration. Men like Jedediah Strong Smith and James Ohio Pattie established routes that would lay the groundwork for future westward migration (Rawls and Bean 1997:76).

William A. Richardson arrived in San Francisco via the British whaler *Orion* in 1822. Just two years later he married Maria Antonia Martínez, the daughter of presidio *commandante* Ignacio Martínez, and Richardson became a Mexican citizen (Barker 1994:35). After living for a time in southern California, Richardson returned with his family to San Francisco in 1835 and built the first private dwelling there – a temporary structure in a cove, the beach of which came up to where Montgomery Street is today. The cove became known as Yerba Buena, because of the fragrant plant of that name found growing in the area. It was there that most ships elected to drop anchor, rather than the wind-swept beachfront at North Beach, opposite the presidio, where the Mexican authorities preferred them to be (Barker 1994:37). Richardson's dwelling was just west of what became Portsmouth Square, the center of the town of Yerba Buena, an area that is at the heart of modern day Chinatown north of Market Street (Richards 1999:54).

Richard Henry Dana described Richardson's home as a "shanty of rough boards" (Barker 1994:55). The following year, American trader Jacob P. Leese built a wood house and store near Richarson's home (Barker 1994:37). Richardson moved his family across the Bay to *Rancho Saucelito* in 1841, but during the years he spent at Yerba Buena, he was an active member of the community, piloting vessels in the harbor and promoting the port's growing shipping industry (Barker 1994:37). In these early years, the small number of residents who had made their way to Yerba Buena were clustered in one of three places; the mission, the presidio, or the land along Yerba Buena Cove.

Early American Period (1846-1848)

During the Mexican period, relations between the United States and Mexico became strained, with Mexico fearing American encroachment into their territories. The political situation became unstable and, in 1835, Mexico rejected an American offer to purchase Yerba Buena. In 1836, a revolution in Texas drove out the Mexican government and created an independent republic. This republic was annexed to the United States in 1845, causing a rift in the diplomatic relations of the two nations. The following year Mexico and the United States were at war. American attempts to seize control of

California quickly ensued, and within two months, California was conquered by the United States. Skirmishes between the two sides continued until California was officially annexed to the United States on February 2, 1848 (Kyle 1990:xiii-xiv). Although the signers of the Treaty of Guadalupe Hidalgo did not know it, gold had been discovered in the foothills of the Sierra Nevada just days before the end of the conflict (Rawls and Bean 1997:89). "Mexico thereby ceded sovereignty to about half its national territory, including gold-rich California, just as the value of that territory was poised to appreciate enormously" (Rawls 1999:3).

Early Gold Rush (1848-1851)

By May 1848 the Gold Rush was underway. Relatively sparse settlement and ranching continued in the Mission District and surrounding ranchos, while the growth of the settlement along Yerba Buena Cove was driven by the combined transportation of goods and people, trade, and the wide variety of support services that catered to miners. As travelers on their way to the Gold Country disembarked from ships or boats, they gathered supplies and prepared to make their way inland to the foothills. A broad range of businesses developed in Yerba Buena to service the miners, including banks, laundries, restaurants, saloons, hotels, and retail stores, as well as suppliers of food, clothing, equipment such as tents and the hardware used in gold mining.

The harbor became the hub of the maritime industry that has continued to the present day. Wood wharves were built for loading and unloading ships. Shipyards and boatyards built and repaired watercraft, and broke up abandoned vessels in order to salvage and sell their metal parts and timbers.

Late Gold Rush (1852-1860)

In the process of developing and settling Yerba Buena, the land was altered to facilitate movement and increase the amount of bayside land available for construction and use. The lands adjacent to the Cove were covered by massive sand dunes that created hills and valleys that not only impeded movement and construction, but were liable to shift over short periods of time. Beginning in the early 1850s, lowlands adjacent to and within the cove waters were filled with sand removed from the dunes, and with rubble and debris from various fires, such as the devastating wharf fire of 1851, and deteriorated buildings, as well as with abandoned ships and boats left behind in the aftermath of the Gold Rush. Other vessels were docked and reused as hotels, shops, or storehouses. Services and industries dedicated to miners and mining-related activities accessed a broader network of supply and demand, driving San Francisco's development as an industrial and shipping center at the intersection of North American and the Pacific Rim trade routes (Delgado 2005).

Late 19th/Early 20th Century (1860-1906)

The population of San Francisco grew exponentially and the population and settlement expanded beyond Yerba Buena and the Mission District. By the early 1860s an orderly grid of unpaved streets ran through densely settled neighborhoods of single- and two-story wood and brick buildings. Industrial buildings on a larger scale clustered together in the sections of the City near the wharves. Ship building, repair, and breaking yards that once clustered around Rincon and Steamboat points moved to Potrero Point by this period. Many outlying lands were farmed or gardened in order to supply fresh food not only to San Francisco but beyond, via the railroad and shipping routes. As growth increased in the Downtown and South of Market districts in the later 1800s, City government began to exert control over the nature of growth, and increasingly imposed measures for sanitation.

Industries such as foundries, coal and gaslight facilities, slaughterhouses, and powder works were initially concentrated in Yerba Buena at the waterfront south of Market Street, for convenient access to the harbor. Workers lived in close proximity to their workplaces. By the late 1860s most of these industries had relocated, away from the densely populated City center to the south along the shoreline to Rincon Point, and then further south to Islais Creek and the Hunters Point and Bayview districts along the southeastern bay shore. Foundries did well in Tar Flat just inland of the southern part of Yerba Buena Cove.

Some districts that saw little settlement include those that were overwhelmed by sand dunes, such as the Outer Richmond or Sunset districts. During the 1850s and 1860s, the land west of Divisadero Street was known simply as the Outside Lands. Lying west of the settled portion of San Francisco, the Outside Lands consisted of 13,765 acres, most of which was made up of shifting sand dunes. Areas within the eastern portion of the Outside Lands, as well as some ridges, were covered with arable soil. For example, Strawberry Hill was covered with a low growth of Scrub oak and California cherry, as well as wild strawberry plants. Any large trees that had existed in areas able to support them had been cut for firewood during the Gold Rush, although those areas were relatively few. Early maps show the area as a vast uninhabited region stretching to the Pacific Ocean. Although it remained virtually uninhabited, there was some confusion surrounding land claims as the federal government, the City of San Francisco and several squatters who had homesteaded portions of it sought ownership. Because the federal government eventually gave up claim to the land, the squatters and the City of San Francisco were left to work out a deal.

The San Francisco Board of Supervisors appointed an Outside Lands Committee, headed by C.H. Stanyan, to oversee the effort on the City's behalf. Ultimately, a compromise was reached that allowed settlers to maintain a portion of their land while the City reserved large tracts, such as the acreage that would become Golden Gate Park, for public endeavors. With the messy business of land titles settled, the City began the monumental task of turning a portion of the untamed Outside Lands into a world-class park and open space (Clary 1980:1-4). In 1868, a Santa Rosa newspaper described the area as a "dreary waste of shifting sandhills where a blade of grass cannot be raised without four posts to keep it from blowing away" (Clary 1980:1-4). By the 1870s, the area remained largely inaccessible due to the shifting sand dunes and poor access roads. The Point Lobos Toll Road began near Eddy and Divisadero streets and ran among the dunes south of Lone Mountain across what is now the southeast corner of Golden Gate Park (Clary 1980). Access roads and the need for development space eventually resulted in settlement of areas previously dominated by shifting dunes.

On the eastern shore, the Steamboat Point and Mission Bay shoreline south of Yerba Buena were utilized by early entrepreneurs in the 1860s. The neighborhood was most significantly influenced by the Southern Pacific Railroad and its extensive freight and passenger facilities that were established on the south side of Townsend Street in the early 1870s.

Prior to the Southern Pacific's expansion, the only rail line to serve the City was the San Francisco and San Jose Railroad (SF-SJRR). The SF-SJRR was soon acquired by the Southern Pacific. That acquisition, in combination with the acquisition and filling of additional property, allowed the Southern Pacific to dominate San Francisco's rail shipping until the turn-of-the-century.

In addition to the sixty acres it owned in Mission Bay and a right-of-way extending southward out of the City, the railroad purchased additional property. Soon it owned all the property north of Channel Street between Third and Seventh Street, and south of Channel Street to Sixteenth between Fifth and Seventh streets (Dow 1967:126). The remaining Mission Bay tidelands, only approximately twenty blocks, were auctioned by order of the Board of State Tide Land Commissioners on June 26, 1869 (Dow 1967:127).

In addition to the arrival of the Southern Pacific, filling along the northwestern edge of the Mission Bay shoreline was largely completed in the early 1870s. Not only were the facilities the Southern Pacific established within the former waters of Mission Bay extensive, but they influenced the types of businesses that would occupy the surrounding blocks for decades to come. With the freight depot established, warehouses and lumber yards soon clustered around this important transportation hub. Although passenger facilities were established at this location as well, they were certainly outside of the City's downtown core, and required that once travelers had arrived, they continue their journey via one of San Francisco's horse car lines.

By the late 1880s, the Mission Bay neighborhood was densely developed. It served as an important link in the regional transportation network, and comprised a combination of both residential blocks and large industrial concerns. The waterfront, from First Street to Fourth Street, was made up of a series of wharves and warehouses.

1906 Earthquake and Fire

On April 18, 1906, at 5:12 am, a 296-mile long section of the San Andreas Fault shifted. The epicenter of the resulting earthquake was approximately two miles from the City of San Francisco. An initial shock felt throughout the Bay area was followed 25 seconds later by a quake measuring 8.3 on the Richter scale. While the earthquake itself lasted just 45 seconds, the damage it caused has had a lasting effect on the region (USGS 2006).

No part of the greater San Francisco Bay area was spared from the effects of the earthquake (Lawson 1908:222), although in many areas the damage was limited to fallen chimneys, cracked plaster on walls and ceilings, and damage to household furnishings. The greatest devastation occurred in areas of fill, or "made land" such as the South of Market and Mission districts in San Francisco. Water, gas and sewer lines in those neighborhoods were damaged, which not only increased liquefaction as a result of water-laden soil, but almost completely neutralized the ability to fight the fires that began burning the day of the earthquake (Gilbert et. al 1907:26).

The Great Fire, which began as dozens of small separate fires, started just after the quake on Wednesday, the 18th, and burned until Saturday, the 21st. On the first day, South of Market, Hayes Valley, City Hall, Nob Hill, and the Financial District north of Market Street were consumed. On the second day the blaze spread south to the Mission District, and north to the area east of Van Ness, south of Russian Hill, and west of China Town. During the third day the fire was finally isolated and extinguished in the North Beach and Marina Districts.

The earthquake and subsequent fire dramatically reshaped San Francisco. Many areas of the City were leveled and required rebuilding, which resulted in the redistribution of sectors of the population. Cohesive groups of San Franciscans that had populated 19th century neighborhoods, and often identified with common class and/or ethnic backgrounds, relocated away from the zone of intense damage to more peripheral areas. In addition to dispersing long-time residents, the earthquake marked a significant shift in building styles and materials. Not only were buildings constructed to meet new architectural standards for strength, but fireproof materials were preferred, and architectural styles changed.

The earthquake and fire created huge amounts of building debris and rubble. A large part of central San Francisco is currently resting upon a thick layer of sheet refuse, as well as filled pockets (such as basements). This includes brick and brick fragments, fire-fused glass, metal, charcoal and ash, ceramic and glass tableware and containers, tile, structural glass, wood, and other debris. This refuse sometimes lies where it fell, but was also redistributed widely across the City as needed to fill in low-lying places.

Rebuilding (1906-1929)

While individuals worked to rebuild their lives after 1906, the City as a whole celebrated President Taft's announcement in 1911 that San Francisco won the competition to host the Panama Pacific International Exposition to be held in 1915. Officially, the Exposition celebrated the completion of the Panama Canal, although to San Franciscans it was a potent reminder of their City's ability to thrive in the face of disaster.

The grounds of the 635-acre world's fair took over three years to construct and provided a much needed boost to the local economy. To accommodate the event, the mud flats in what is now the

Marina District (between Van Ness, the Presidio, Chestnut Street, and the Bay) were filled. The Palace of Fine Arts, eventually reconstructed in the 1960s, was originally built as part of the Exposition.

During the same period, the Navy realized the value of maintaining marine facilities on the Pacific Coast, and as a result shipbuilding and repair at the Hunters Point shipyard was bolstered by Navy contracts. In 1908, the Hunters Point shipyard was purchased by the Bethlehem Steel Company. At the time, the Union Iron Works served as Bethlehem's shipbuilding subsidiary and ran the facility (Bamburg 1988:13 in Hamusek-McGann et. al 1998:15). The U.S. Naval fleet, in the process of circumnavigating the globe, arrived in San Francisco for repairs during that same year and twenty-three vessels were repaired at the Hunters Point dry docks (Hamusek-McGann et. al 1998:15).

Although the Union Iron Works wished to upgrade its facilities as early as 1914, it only became feasible to do so when the Navy signed a subsidy contract with the company in 1916. The contract allowed Union to tear down Dry Dock No. 1 and construct Dry Dock No. 3, then the second largest dry dock in the world (Hamusek-McGann et. al 1998:15). By 1917, several shipbuilding companies consolidated and Union Iron Works officially became known as the Bethlehem Shipbuilding Company. The contract between Bethlehem and the Navy continued until 1927 and spurred economic and population growth in and around Hunters Point (Hamusek-McGann et. al 1998:15).

Transportation Connections 1930-1941

In the 19th century, San Francisco's port facilities, combined with passenger and freight rail service, shaped the development of the City. Twentieth-century development was influenced early on by the re-building efforts that followed the earthquake and fire of 1906, as well as the introduction of new modes of transportation and related infrastructure.

Traditionally, the Southern Pacific dominated overland travel in and out of the City and those visitors who wished to access San Francisco via water relied on one of several ferries. The volume of ferry traffic grew from the time it was established in the 1850s until it peaked in the 1930s. In the early years of that decade, 60 million people crossed the Bay on ferries each year (Pacific Transit Management Corp. 1992).

> The Ferry Building was the second busiest transportation terminal in the world in the early 1930s. Each day, some 250,000 persons traveled through the Ferry Building to work or other destinations. Ferries made approximately 170 landings a day at this time, and the Ferry Building was served by trolley lines which left every 20 seconds for city destinations. Ferries to Oakland could carry 4,000 persons, and were designed to incorporate restaurants, shoe shine parlors, and luxury surroundings, including mohair hangings, teak chairs, hammered copper lighting fixtures, and leather chairs in the ladies lounges. The highly efficient Key Route ferry/train transfer at the Oakland Mole enabled 9,000 commuters to load and unload in less [than] 20 minutes (Pacific Transit Management Corp. 1992).

Despite their popularity, ferry routes were quickly abandoned when the San Francisco-Oakland Bay Bridge opened for traffic in 1936. Although the bridge itself was the most prominent element, it was constructed in the context of a larger system, designed to allow automobile and rail traffic to quickly access downtown San Francisco from the East Bay. In addition to the bridge, which was anchored on Rincon Hill, the new system included the Transbay Terminal, which was designed to accommodate the Bridge Railway, an electrified rail line that originally utilized the lower deck of the Bay Bridge. The Bridge Railway carried passenger cars, and provided a connection between East Bay interurban lines like the Key System, Southern Pacific, and Sacramento Northern, and various San Francisco municipal lines (Bunse and Larson 2001:28). When the bridge railway was completed in 1939, it freed passengers who utilized the interurban lines from relying on ferries for the trans-bay portion of their journey. Once across the bridge, the electrified rail line was carried on elevated structures that allowed it to reach the Transbay Terminal and return to the bridge without impacting street traffic (Bunse and Larson 2001:28). In the late 1950s the rail line was removed from the bridge and both the upper and lower deck were dedicated to automobile traffic. In turn, the terminal and the ramps were reconfigured to accommodate bus, and not rail, traffic (Bunse and Larson 2001:28).

In the end, "The vehicle access provided by the Bay Bridge reoriented the distribution system for goods in the Bay Area," and diminished the importance of the City's port and rail facilities while pointing towards a future focused on bus, truck, and automobile travel (Bunse and Larson 2001:29).

With the region's reliance on port and rail facilities diminished, it allowed manufacturers and warehouses to relocate to less costly and less crowded cities throughout the Bay Area. Even before the turn-of-the-century, the search for cheap land and the space to build new factories had lured employers to South San Francisco and then across the Bay to Oakland and the shores of Contra Costa County. In addition, the dispersal of manufacturing and the new transportation model encouraged residents to raise their families in the outlying suburbs that grew rapidly during the mid-20th century.

In 1936, the same year that the Bay Bridge was completed, the construction of Treasure Island began. The 403-acre island was built by the Army Corps of Engineers on the Yerba Buena Island shoals and was initially constructed to host the Golden Gate International Exposition of 1939-1940 (Hamusek-McGann et. al 1997:14).

A World War and the Automobile Remake the City (1942-Present)

World War II had a profound effect on the development and demographics of San Francisco. While there had been a flood of immigrants into California during the Depression the previous decade, the influx during the war was substantially greater. The defense industry expanded and new cities developed rapidly, particularly in the San Francisco Bay area (Kyle 1990: xvi). New shipyards came into existence, the number of factories in use increased by a third, and the population of industrial workers more than doubled (Cole 1988:129).

In San Francisco specifically, the Navy took possession of the dry docks at Hunters Point in 1940 (JRP 1997:13 in Hamusek-McGann et. al 1998:17). The Hunters Point Shipyard was an annex to the Mare Island Shipyard and when the war in the Pacific escalated, the Navy began a massive expansion program at Hunters Point. This included acquiring an additional 200 acres to expand the facility, leveling ground to provide additional area for building, and the construction of dry dock #4 (Hamusek-McGann et. al 1998:17). The construction lasted until 1945, although the facility would again be expanded in the 1950s (Hamusek-McGann et. al 1998:18). This type of expansion meant that established residences and businesses were displaced in order to accommodate the naval facilities. As the *San Francisco News* reported on March 10, 1942, one hundred families had been notified by police that they must be prepared to move on 48-hour notice. "It was not revealed what machinery the Navy had set up to pay property owners or to provide them with new living quarters. All Hunters Point residents are citizens, aliens having been removed several weeks ago," the paper reported.

In 1940, the Navy also took possession of Treasure Island, the former site of the Golden Gate International Exposition (Hamusek-McGann et. al 1997:15). After the attack on Pearl Harbor, the scope of the Treasure Island facilities was greatly expanded, and the island became home port for thousands of sailors (Hamusek-McGann et. al 1997:15).

While the wartime build-up provided economic relief for residents who found work in the defense-related industries, the war also brought with it a wave of anti-Japanese sentiment that permanently altered the demographics of San Francisco neighborhoods. As the *San Francisco News* reported on April 28, 1942, "Several hundred alien and citizen Japanese today left San Francisco in two bus caravans, the first of 3,112 going to the assembly center at Tanforan Race Track." The paper estimated that approximately half of the 1,923 Japanese people living in San Francisco's "primary zone" (bounded by California Street, Van Ness Avenue, Sutter Street, and Presidio Avenue) had been removed that day, with the remainder to follow.

While the automobile was already well established, the construction of freeways accelerated in the post-war period. As the 1950s progressed, San Franciscans began to resist the construction of additional freeways within the City. San Francisco's "freeway revolt" was encouraged by the *Chronicle's* November 2, 1956 publication of a map illustrating the City's existing and proposed freeways. At the same time, public opposition to the construction of the Embarcadero Freeway was given voice in articles written by Allan Temko, the architecture critic for the *Chronicle*. Ultimately, in 1959, the San Francisco Board of Supervisors cancelled seven of ten planned freeways. In the 1960s two additional projects, a freeway through Golden Gate Park and an extension of the Embarcadero Freeway, were also cancelled or rejected. A combination of damage sustained during the Loma Prieta earthquake of 1989, and lingering anti-freeway sentiment, made San Francisco the only major U.S. city to lose freeway miles between 1990 and 2005.

The final element of the existing transportation system was put in place when the Bay Area Rapid Transit (BART) introduced a rail system designed to alleviate the growing pressure on local roadways. The creation of jobs, particularly during the boom associated with World War II, led to wartime and post-war migration to the Bay Area. During the last half of the 20th century, the roadways constructed to serve the region's growing suburbs had become increasingly congested. The BART Commission was created by the State Legislature in 1951 and produced a report recommending the development of a regional transportation master plan in 1957 (San Francisco BART District 2007). Engineering plans were developed for the new system between 1957 and 1962 (San Francisco BART District 2007). The BART District initially included five counties, although two, Marin and San Mateo, withdrew prior to the onset of construction. In addition to having concerns about the cost of the plan, San Mateo County continued to be served by Southern Pacific commuter trains and voted to withdraw. Although the size of the tax base was an issue in Marin, there were also concerns about running trains across the span at the Golden Gate (San Francisco BART District 2007). As a result, the original system was primarily a link between San Francisco and the East Bay. Construction began on June 19, 1964 and in July, 1967, work on the Market Street subway and stations began. By 1972, the system was operational (San Francisco BART District 2007).

Summary

The brief history of San Francisco presented above serves as a context for the identification and discussion of archaeological resources typical of San Francisco, which follows in section 2.4. A discussion of archaeological research issues relevant to San Francisco and its characteristic archaeological resources follows in section 2.5.

2.4 Archaeological Resources Characteristic of San Francisco

Archaeological resources typically attain legal significance from their potential to address relevant research issues, both in terms of listing on the California Register of Historical Resources (and CEQA), and listing on the National Register of Historic Places (and Section 106, NHPA). Resources from periods for which complementary documentary evidence is either rare or nonexistent, have a higher likelihood of legal significance. Such periods include prehistory, the Spanish and Mexican period, and the Gold Rush era. Archaeological resources that can speak to categories of investigation for which documentary evidence tends to be biased, sparse, or silent, also have a higher likelihood of legal significance. Such archaeological resources include, but are not limited to, the remains of the domestic, commercial, and industrial sites of lower economic and social status groups or communities (e.g., an African-American owned general store, or a Chinese shrimp fishing village); hollow features such as privies, cisterns, wells, and trash pits that were filled during the course of the daily lives of working class San Franciscans; or shipwrecks.

Categories of archaeological resources that tend to provide redundant information, and are therefore rarely legally significant, include building foundations, footings, floors and basements from the 1870s onward, when maps, photographs, and drawings depict building outlines and describe building materials, methods and functions. The history of more recent developments in San Francisco, such as the rebuilding after the 1906 earthquake and fire, or installation and growth of the transportation system, or rapid large-scale expansion of the shipyards in response to the needs of World Wars I and

II, is a history of actions more likely to have damaged or destroyed valuable archaeological resources, than to have left behind any new significant resources.

Typical Archaeological Resources from the Prehistoric Period

San Francisco prehistoric period archaeological research has identified two general categories of archaeological resources including residential and non-residential sites. As discussed above, indigenous people lived by hunting and gathering, subsisting on the abundant fauna and flora available in the wooded hills, coastal, and estuarine habitats of the San Francisco peninsula. They hunted deer, trapped smaller animals and birds, caught fish and sea mammals, and ate shellfish. They also ate acorns, berries, and other plant foods that were available at different times throughout the year. In general they moved with the seasons, but also returned to favorite spots and group gathering places. As a result, the archaeological record of San Francisco includes a variety of site types that housed different numbers of people for varying lengths of time (e.g., hunting group, small tribe, or larger gathering of tribes). The majority of prehistoric sites in San Francisco are shell middens that formed in coastal or estuarine habitats. Middens are accumulations or concentrations of objects crafted by people, as well as objects left behind by human activities. Middens most commonly include some combination of flaked stone objects and debris from their manufacture, groundstone implements and fragments, burned and unburned faunal bone, ash, charcoal, and fire-affected rocks. Middens in San Francisco and the surrounding Bay Area are typically characterized by relatively high concentration of shells and shell fragments. Shell middens resulted from long-term or frequent occupation by people carrying out daily activities such as food preparation, eating, and tool making, as well as the gathering and processing of massive quantities of shellfish. Extended occupation by large groups of people led to the accumulation of mounded shell midden, or shellmounds. Even among shellmounds, there were varying sizes and perhaps, varying functions.

The simplest division of archaeological resources is into residential and non-residential sites (e.g., Ziesing 2000:131-132). These are general enough that they encompass evidence from the entire prehistoric period and allow for the study of change through time. Shellmounds are included because they are a site type characteristic of San Francisco and the Bay Area

Residential sites contain evidence of permanent or semi-permanent occupation. In addition to the midden, or soil containing concentrated debris from food processing, preparation and eating, a residential site typically contains fire pits or hearths with ash, charcoal and/or fire-affected rocks, circular or oval depressions of house floors, and often human graves. San Francisco archaeologists further distinguish residential sites to indicate the apparent length and intensity of occupation. Large sites with very thick middens and multiple features such as hearths, house floors, and burials, are inferred to have been villages.

Villages are characterized by large concentrations of a wide variety of artifactual materials, features, and often human burials, and represent long-term and/or frequent occupations by large groups of people. The deposits result from a wide variety of activities relating to daily life. Shellmounds have been found within San Francisco, and most of the larger, more complex shellmounds are thought to have been the sites of villages. These are identified by concentrations of shell and shell fragments from a variety of species of shellfish, and combinations of one or more of the following materials: charcoal, ash, faunal bone, fire-affected rock, shell ornaments, bone tools, groundstone implements, flaked stone tools (e.g., spear, knife and arrow points and the debris from their manufacture), human remains, quartz crystals, mica, ocher, and filled pits or impressions. The upper layers of San Francisco Bay shellmounds are typically no longer present, and to some extent those layers beneath the present ground surface may have been damaged or destroyed, but in many cases, the deepest layers (at least 5 feet below the present ground surface) may remain more or less intact. Examples of village sites include CA-SFR-112 and 135 (thought to be part of the same extensive site), and CA-SFR-114.

In downtown San Francisco, the sites CA-SFR-112 (Walsh 1986) and CA-SFR-135 (WSA 2001a, 2001b) are characterized by shell midden deposits. The sites were found a little over 16 feet (5 meters) below present day ground surface, and averaged about 1 foot (40 centimeters) in thickness. They appear to have been covered by drifting dune sands prior to the historic period (Pastron 1999:20). Walsh (1986) inferred that CA-SFR-112 represented the easternmost toe of a substantial shellmound that extended beneath an adjacent building. CA-SFR-135 was thought to be the possible continuation of the same deposit.

Radiocarbon and obsidian hydration dates place CA-SFR-112 occupation between A.D. 250 and A.D. 850, while obsidian-hydration dates from CA-SFR-135 indicate that the site was intermittently inhabited between A.D. 400 and A.D. 1000. Pastron suggests that CA-SFR-112 was a sizeable village that had been occupied for a substantial period of time (Pastron 1999:20, 21; Walsh 1986; Ziesing 2000:43). If this is correct, then CA-SFR-135 would appear to be part of the same large shellmound, given the similarity in depth, date, and composition.

Archaeological testing conducted by WSA at nearby 40 Jessie Street in 2006 encountered disturbed secondary prehistoric midden deposits from just over 10 feet (3.2 meters) to close to 15 feet (4.8 m) below ground surface (WSA 2006). Due to the proximity to CA-SFR-112, WSA concluded that the midden material represented disturbed components from that site that had been redeposited in the fill at 40 Jessie Street during historic-period construction activities (historic materials were intermixed with the midden sediments).

Like CA-SFR-112, site CA-SFR-114 is a shell midden that Pastron (1999:21) thought represented a large village site occupied for an extended period of time. The site was covered by dune sands and was located at depths of from nearly 10 feet (3 meters) to over 20 feet (6.3 meters) below street level. The midden contained various artifact types and faunal remains, a possible sweathouse feature, and a minimum of 11 human burials, some of which had associated grave goods such as *Olivella* beads and abalone pendants. Radiocarbon dates indicated that the site was occupied from approximately A.D. 350 to A.D. 950, while shell bead types and the depth of the deposit suggests dates of occupation between 550 B.C. and A.D. 950 (Martin 2006:18).

Occupation sites exhibit a concentration of artifacts and materials gathered and/or produced by humans while conducting the range of activities typically carried out at a campsite, when the site was occupied long enough to leave behind features, such as hearths (a concentration of fire-affected rock, charcoal, ash, and perhaps, faunal bone or flaked stone debris); housepits or house floor impressions (hardened earth, sometimes lined with fired clay); and burials (cremations with concentrations of burned human remains, ash, charcoal; or flexed interments with human remains and associated artifacts). Occupation sites are smaller than village sites as they housed smaller groups of people, likely for shorter periods of time. Occupation sites include smaller shellmounds as well as other midden sites with varying concentrations of shell.

Examples of occupation sites include CA-SFR-147 and CA-SFR-155, two relatively small and sparse midden deposits uncovered in 2003. The deposits range from around 12 feet (3.7 meters) to 18 feet (5.5 meters) below ground surface. The sites consisted of intact deposits of shell-flecked, dark, sandy soil within the dune sand that once covered much of San Francisco, overlain by fill sand and disturbed midden intermixed with historic and modern materials. Material within the deposits included shellfish remains, avian, mammal and fish bone, flakes of obsidian, chert and other raw materials, a sandstone charmstone or pipe fragment, two modified chert flakes and an obsidian biface. Large mammal bones were absent at CA-SFR-147 and small to medium sized mammal bones were dominant at CA-SFR-155. Both sites contained evidence of processing and consumption of locally obtained resources in the form of burned and calcined shell and bone, and evidence of on-site seed and nut processing was found at CA-SFR-155. Radiocarbon dates indicate that CA-SFR-147 was occupied ca. 2000 years B.P. (before present), and CA-SFR-155 was occupied around 1700 to 1800 B.P. The excavators of the sites inferred a major shift in shellfish consumption patterns from mussel to clam approximately 1,800 years ago (Martin 2006:18-19).

Non-residential sites are varied but all lack indications of long-term occupation. They represent activities that were carried out away from the residential base, such as temporary hunting or shellfish gathering camps or isolated burials, and are also referred to as special purpose sites. These sites typically contain a concentration of artifacts and materials gathered or produced by indigenous peoples in pursuit of a limited range of activities or a single activity, such as deer hunting, shellfish gathering, butchering, flaked stone implement or shell bead manufacture.

Testing and data recovery at site CA-SFR-154/H revealed a 40 centimeter (16 inches) thick deposit of intact remnant shell midden (Meyer and Martin 2003) yielding shell, and mammal, avian and fish remains, a bone tool, fire-cracked rock, groundstone, and chert and obsidian debitage. Samples of the obsidian debitage were sourced to Napa Valley and dated from 960 to 345 years B.P. A shell was dated by radiocarbon to 520 B.P. and a bone to 150 B.P. The shell collection was overwhelmingly dominated by clams, indicating that the site was likely occupied primarily during the Emergent Period of the Augustine Pattern and may have extended into the historic Mission era (Martin 2006). Martin (2006:iii) observed that the site appeared "geographically, functionally, and temporally distinct" from surrounding prehistoric sites. He inferred that the site was "a small temporary camp or special-use location oriented primarily to the harvesting and consumption of shallow-water or estuarine species - including mollusks, fish, and waterfowl-and at least some terrestrial and marine mammals."

Site CA-SFR-113 is another shell midden site believed to have been a transient hunting camp (Martin 2006:19; Pastron 1999:20, 21). Like CA-SFR-112, the site had been covered by dune sands prior to the historic period, and was located nearly 15 feet (4.5 meters) below street level. The site contained shellfish remains (predominately mussel), small to large mammal bones, avian bones, flaked-stone and groundstone tools and debitage, ocher, asphaltum, baked clay and several features. Obsidian sourcing studies indicate that the obsidian recovered from the site came from at least three sources including Napa Valley, Annadel and Casa Diablo. Pastron's analyses determined that the site was occupied between 100 B.C. and A.D. 100 (Pastron 1999:20, 21).

Prehistoric deposits were found near CA-SFR-113 and at a comparable depth. Concentrations of shell midden material containing faunal bone, shellfish remains, stone tools and debitage, and abundant charcoal were recovered. Radiocarbon dates obtained from charcoal samples indicate that the site was occupied between 250 B.C. and A.D. 30 representing "the oldest dated occupation site in San Francisco, so far" (Pastron and Ambro 2005). In addition, a non-midden deposit of burnt material containing small Napa Valley obsidian flakes, which were inferred to represent a single knapping event, was unearthed. Obsidian hydration analyses of material from this concentration produced dates of A.D. 750 and 850. Archeo-Tec determined that this material was part of CA-SFR-113 and extended the boundaries of CA-SFR-113 to include these deposits (Richard Ambro 2007, pers. comm.).

Shellmounds, some representing residential, and others nonresidential sites, are typical of the bay shore, and have been interpreted not only as locations of occupation, ritual, and burial, but also as symbolic landscapes**.** Coastal and bay shoreline shellmounds would have been highly visible in prehistoric times, and their relative size and locations could have had symbolic, social, political, and historical significance.

The function of shellmounds in the greater San Francisco Bay has always been a topic of interest to archaeologists, but has never been satisfactorily explained. Despite considerable research, archaeologists have not reached consensus as to why hunter-gatherer populations constructed the shellmounds (e.g., Lightfoot 1997; Lightfoot and Luby 2002). The role of shellmounds in the subsistence-settlement system most likely changed over time, as evidenced by the variation in location, characteristics, and interrelationships of the shellmounds. The shellmounds have been proposed as residential bases, garbage dumps, or specialized ceremonial sites. Because many of the mounds contain abundant and intermixed evidence of food remains, hearths, house floors, and burials, it is difficult to devise a simple, comprehensive and satisfying explanation for their function. Lightfoot and Luby argue for the ceremonial significance of the mounds, partly because the mounds they examined once rose above the landscape—some as high as three-story buildings—providing impressive visual markers that they argue must have had symbolic value (Lightfoot and Luby 2002).

Due to the intensive industrialization and urban development of the greater San Francisco Bay, most of the 425 mounds that Nelson documented in 1906 have been either completely destroyed or severely compromised and are no longer visible on the landscape. Archaeological methods have become more sophisticated, and our understanding of the construction and chronology of shellmounds, as well as the cultural history of the surrounding countryside, has grown considerably since the mass excavations and destruction of shellmounds in the first half of the 20th century. Today most analysis and interpretation of the function of shellmounds relies upon existing data that were excavated from the shellmounds with outdated techniques and incomplete understanding of the complexities of chronology and structure. Recent construction projects have rediscovered intact portions of some shellmounds once thought to be completely destroyed. Examples include the Emeryville Shellmound, CA-ALA-309, and its neighbor, CA-ALA-310, which were encountered during the development of a large tract in Emeryville (e.g., Price et al. 2004), and CA-ALA-17, which was first identified in 1876 and more recently rediscovered in West Oakland (Hylkema 1997; Van Bueren et al. 2002). New discoveries are possible, as evidenced by the discovery of a small shell-rich cultural deposit buried beneath the streets of West Oakland, CA-ALA-604 (Pastron and Gottsfield 2003). This small find (under 20 meters in diameter) is of particular significance as the deposit lies approximately 3 feet below modern ground surface and is limited to several species of shell, charcoal, some broken and burned faunal remains, and some fire-affected rock. A few thousand years ago, this concentration of shell and debris from cooking must have appeared as a very small mound or bump on the landscape. With no evidence of burials and such a relatively small profile, this site reminds us of the variations in shellmound size, form, and function and serves as a caution against the search for a facile explanation of shellmound function in prehistory.

Observable patterns in the current Bay Area archaeological data indicate that people settled near marshes adjacent to the bay shoreline and, at the very least, fished, collected shellfish, and hunted sea mammals from the Pacific Ocean and the bay. Local occupants had access to imported materials and shared various regional cultural traits. The level of involvement in exchange of goods and ideas, however, has not been determined. Evidence of the various activities undertaken on-site, such as flaked-stone tool manufacture, food processing and cooking, hide, shell, and bone working, storage, long- or short-term occupation, and burial, contribute to the understanding of prehistoric adaptation to San Francisco and the Bay Area. In order to achieve a more sophisticated and satisfying explanation for variation in shellmounds, Bay Area archaeologists must conduct more comprehensive evaluations of existing shellmound finds, incorporate new data from investigations at sites other than shellmounds, and take full advantage of any newly discovered intact shellmound deposits, whether from previously known shellmounds, or from new discoveries.

Cemeteries: Indigenous burials, including interments and cremations are most often found in association with occupation sites, but occasionally concentrations of burials were placed in a cemetery with no evidence of occupation. There is reportedly a Native American cemetery at the highest point on Yerba Buena Island dating to the 1800s when indigenous people's descendents lived and worked on the island. They worked as laborers in the goat herding and wood cutting enterprise that provisioned ships with meat and wood for their journeys (Boyes 1936). Missions typically dedicated a cemetery or a small area of a cemetery to indigenous peoples, and there is a cemetery associated with Mission Dolores (Pastron and Ambro 2008:31-32; Saunders and Chase 1915:383).

Isolated human remains are occasionally found with no apparent associations. These are important and protected resources. The one example known in San Francisco to date is CA-SFR-28, discovered in 1969 during construction of the Bay Area Rapid Transit (BART) Station at Civic Center. An isolated human skeleton was located at 75 feet (22.9 meters) below street level. A radiocarbon date of 3690 ±

250 B.C. was obtained from organic clay that surrounded the skeleton's pelvis, representing the oldest date for human skeletal material within the San Francisco Peninsula. Analysts suggest that the skeleton was placed within a brackish marsh, in or near a freshwater channel. The marsh deposits were then overlain by approximately 20 feet (6 meters) of dune sand blown across the Peninsula from Ocean Beach and Baker Beach (Martin 2006:20; Pastron 1999:18; Ziesing 2000:42).

Isolated artifacts such as a broken flaked stone spear point, or a groundstone pestle, are occasionally found with no apparent associations. An obsidian scraper was found at the corner of 3rd and Folsom streets with no other objects in association. Such finds may represent objects lost during their use, or more likely, secondary deposits, resulting from construction work, or work such as geotechnical boring, that may bring isolated artifacts up from below the surface, removing them from their context. Isolated artifacts have very limited information potential.

Typical Archaeological Resources from the Historic Period

Historic-period archaeological resources include individual objects; features consisting of spatially and historically associated objects; and sites - historically and spatially meaningful associations of objects, features, structural remains, and elements of landscape. Although features by themselves are often significant, it is their association with something else, such as a person, house or business, that gives them historical meaning. Therefore individual features are included within the more general categories of archaeological resources presented herein. These categories, developed over the past 20 years primarily in the context of the large transportation projects resulting from the Loma Prieta Earthquake (e.g., Praetzellis 1994; Praetzellis and Praetzellis 1992; Ziesing 2000), provide a basis for comparison and consistency between archaeological research efforts, with no intention of confining or stereotyping that research. Nine general categories of resources are identified and are coordinated with the archaeological research issues presented in section 2.5. Two additional categories are defined by a particular time period, the Gold Rush and the Spanish/Mexican periods. The first nine categories are broad enough to encompass evidence from different phases of San Francisco's history allowing for the study of change through time. They include: domestic occupation sites, domestic architecture, commercial sites, institutional sites, industrial sites, storage yards and warehouses, buried ships, wharves, and landfills. Resources from either the Gold Rush era or the Spanish/Mexican period could have relevance to some of the nine general resource categories, however, archaeological resources from these periods are rare, supporting documentary evidence is sparse, and therefore their potential significance to San Francisco history is great and merits individual treatment.

Domestic Sites are places where people lived in the past. Associated archaeological resources include hollow features such as wells, cisterns, basements, outhouse pits, and garbage pits that were used as receptacles for the remains from everyday living. Once garbage collection was organized and mandated by the City, and water and sewage removal was provided by pipes installed and maintained by the City, such hollow features were much less frequently used, if at all. Sheet refuse or imported fill accumulated across a larger area and acted as a seal for caches of artifacts, and can provide evidence for change over time.

Domestic architectural remains of residences and domestic outbuildings such as footings or post holes are unlikely to have legal significance if the buildings are known from the historical record, such as maps, photographs, or drawings and they are less likely to have research potential. Domestic architectural remains from the Gold Rush era and earlier, before neighborhoods were documented systematically by the Sanborn Map Company, for example, are assumed to have historical importance, as they represent a rare resource from time periods with importance to the development of San Francisco.

Commercial Sites include the location of businesses such as retail stores, hotels, saloons, and laundries. They are likely to have similar features, both hollow features and sheet refuse, as domestic occupation sites, but the artifacts associated with each feature are expected to reflect the nature of the particular business.

Institutional Sites include organizations for social services, such as churches, schools, and hospitals. Institutional sites also encompass civic sites such as public parks and amenities. The same hollow features and sheet refuse found in domestic occupation sites and commercial sites have the potential for meaningful analysis. Institutional architectural and structural remains are unlikely to have historical significance unless they represent elements of buildings that were not recorded in documentary sources such as maps or photographs.

Industrial Sites include the archaeological remains of buildings and structures that housed industries, as well as evidence of individual industrial processes themselves, or features. The details of industrial architecture, building plans, and in-depth descriptions of industrial processes and machinery are largely available through resources other than the archaeological record. However, occasionally archaeological resources related to industry are recovered that have the potential to address research questions that could not otherwise be addressed by existing documentary evidence, and in that case, they would have potential significance. Such resources might include innovative modifications of technology, industrial methods, or structures, and evidence from the daily lives of industrial workers.

Storage Sites, such as storage yards and warehouses, do not typically hold research potential in and of themselves; however they represent an expansive floor area that may have covered and protected older, deeper resources of value from disturbance. Storage yards rarely contain information beyond what was stored. Warehouses may have been used for several types of commercial purposes over their lifetime. Only if the architectural remains yield details not available from other sources would they have potential significance.

Ships are a resource characteristic of San Francisco with great research potential. This category includes shipwrecks, storeships, abandoned ships, or ships in the process of being broken down, recycled, or retooled. Ships in their varied forms and purposes, are likely preserved, as they were abandoned and buried in fill, and sank into bay mud where they lay in an anaerobic condition. These resources are time capsules that may reveal information specific to the history of shipping and San Francisco within a particular year. The ship itself could be considered significant if it was associated with a particular historically important individual, or if it represented a particular function or design type, or if the ship was from the Gold Rush era and could be considered important in the exploration and settlement of San Francisco.

Wharves are potentially significant resources because they were important to the early commercial life of San Francisco. The San Francisco shoreline had two kinds of wharves, those that projected into the water and served as piers for the loading and unloading of ships, and those that ran along the margin of the shoreline, effectively holding in fill. Because the number, condition, and associations of historic San Francisco wharves are unknown, they are a rare and relatively unstudied resource and the discovery of a wharf would be treated as a potentially significant resource.

Landfills include purposeful fill events, and unintentional accumulations of unwanted materials. In San Francisco the low lying areas have been filled since the 1850s as a way to create a more useful urban landscape. Unintentional fill occurs through every day living as a function of ad hoc refuse disposal in backyards and vacant lots. The contents of purposeful fill may have no relevance to the location in question as it was often hauled in from un-related contexts off-site. The potential significance of purposeful fill is as a stratigraphic marker, and as a physical seal protecting underlying resources. Like purposeful, or imported fill, unintentional fill may have more innate information potential as lot-specific refuse with associations to the location at a particular point in time. Unintentional fill could also serve as a stratigraphic marker and as a physical seal protecting underlying resources. The fill associated with the 1906 earthquake and fire that created tons of rubble and fire debris is widespread and common in San Francisco and as such may not be considered to have much information value. As a time marker, it can be useful for archaeological investigations, but a context has not yet been encountered in which earthquake and fire fill has legal significance for its research potential.

Spanish and Mexican Period Sites include a wide range of archaeological resources associated with the time period that predates the Gold Rush, from 1776 through 1848. Very few historical documents or detailed maps exist from that earliest period of settlement, and archaeological sites from this period are rare. Privies, refuse dumps, hearths, ovens, and other features, as well as any architectural remains would be treated as potentially significant due to their rarity, lack of documentary sources of evidence, and due to the importance of the period to the history of San Francisco.

Gold Rush Period Sites include a wide range of archaeological resources associated with the time period from 1849 through 1853, the height of the Gold Rush, and with the period from 1853 to 1859 during the subsequent depression. The early Gold Rush settlement in former Yerba Buena was a hodgepodge of tents and other temporary shelters for residences, businesses, and institutions. Surviving privy deposits and the remains of refuse dumps and temporary structures would all be treated as potentially significant due to their rarity, lack of documentary sources of evidence, and the importance of the period to the history of San Francisco.

2.5 Archaeological Research Issues

Research issues currently employed in San Francisco have been developed and refined by archaeologists working on a series of large transportation projects resulting from the 1989 Loma Prieta Earthquake. The earthquake significantly damaged a portion of the Cypress Freeway (Interstate 880) in Oakland, a portion of the San Francisco-Oakland Bay Bridge (SFOBB), and Interstate 480 in San Francisco. In the wake of such damage to key transportation routes, the California Department of Transportation repaired some roadways, abandoned others, and elected to retrofit vulnerable roadways, namely Interstate 80 and the west approach to the San Francisco-Oakland Bay Bridge (SFOBB) in San Francisco to avoid the destruction and disruption that future earthquakes may cause to key transportation routes. These projects have received federal money, and therefore are federal undertakings subject to Section 106 of the NHPA, requiring that project proponents take into consideration the effects of their undertaking on cultural resources. Those cultural resources that are legally significant are called historic properties, and the project proponent must consider protecting them from destruction or impairment. For those historic properties that cannot be avoided by a project redesign, destruction is most often mitigated by data recovery prior to their destruction. To ensure that data recovery is as effective as possible, archaeologists prepare a research design consisting of a historical context and a set of research questions to guide the recovery, analysis and interpretation of data. The research questions are also used to determine if cultural resources newly discovered by the project-related work have the potential for legal significance.

The research context initially prepared for the SF-480 rebuild (Praetzellis and Praetzellis 1992) was subsequently reused and modified for the West Oakland Cypress Structure rebuild (Praetzellis 1994), the SF80 Bayshore Viaduct retrofit (McIlroy and Praetzellis 1997), and the SFOBB West Bay Span retrofit (Praetzellis and Ziesing 1998), and has most recently been revised and reworked for the Point Reyes National Seashore – Golden Gate National Recreational Area statement of archaeological research issues that includes portions of San Francisco (Stewart and Praetzellis 2003). Other work in San Francisco references this body of research issues. Examples of such work include the archaeological inventory and assessment of the Naval Station at Treasure Island (Hamusek-McGann et al. 1997), the Hunters Point Shipyard (Hamusek-McGann et al. 1998), the Mid-Embarcadero surface roadway project (Dean 1998), the data recovery for the prehistoric component at CA-SFR-154/H related to the SFOBB West Approach Replacement Project (Martin 2006), and the extensive project, in progress, to rebuild and redesign the Transbay Transit Center with archaeological research conducted by William Self Associates (e.g., URS 2008).

Most smaller archaeological projects conducted in San Francisco identify valid and relevant research issues with a much more specific focus on the project at hand (e.g., the testing and data recovery projects at CA-SFR-4/H on Yerba Buena Island [Morgan and Dexter 2008], at the Academy of Sciences in Golden Gate Park [WSA 2005a, 2008], and at 300 Spear Street in South of Market [WSA 2005b, 2005c, 2007]).

This ATM, prepared as a reference document for the San Francisco Housing Element EIR, employs a broad set of research issues, based on those defined for the post-Loma Prieta Earthquake road projects. These are intended to provide some guidance while allowing for flexibility in keeping with the programmatic nature of the Housing Element EIR. These research issues, largely developed by the Praetzellis' and their colleagues at Sonoma State University, have proven relevant and vital, and because of their breadth, they can be modified to address specific projects within individual HOAs as necessary. As the results of future archaeological research allow, these research issues can also be elaborated upon or added to with new and innovative lines of research.

Prehistoric Research Issues

The following nine research issues, themes P-A through P-I, are relevant to prehistoric archaeological research in San Francisco. They include:

P-A: Human Occupation and Landscape Evolution
P-B: Culture Chronology
P-C: Culture History
P-D: Vertebrate Archaeofauna Variability
P-E: Invertebrate Archaeofauna Variability
P-F: Coastal Colonization Patterns
P-G: Resource Intensification and Adaptive Change
P-H: Interaction and Social Change
P-I: Research Potential of Redeposited Sites

They are presented in tabular form below, with a set of questions and data requirements, and a brief discussion detailed for each theme. In subsequent sections devoted to individual HOAs, those research issues anticipated to have relevance for the archaeological record of that HOA are presented. They are listed by thematic title with none of the detail presented in this section to avoid repetition in the document.

<table>
<tr><th colspan="2">Theme P-A: Human Occupation and Landscape Evolution</th></tr>
<tr><th>Question and Data Requirements</th><th>Discussion</th></tr>
<tr><td>Question 1. Does the study area contain, or have the potential to yield, buried land surfaces (paleosols) that were available for prehistoric human occupation, and are these land surfaces of sufficient vertical and horizontal extent that they can be used as stratigraphic markers and searched for archaeological remains?</td><td rowspan="4">Prehistoric deposits have typically been found in association with previously stable landforms, and then buried during periods of landform instability. Datable archaeological sites can be compared to paleoenvironmental data to determine if there is a link. Due to changes in landform morphology, and rising sea levels, buried prehistoric deposits may exist within the dune sands that previously covered large parts of the San Francisco peninsula, and older deposits, predating the development of San Francisco Bay, may also exist below sea level.</td></tr>
<tr><td>Question 2. Does the study area contain, or have the potential to yield, radiometrically datable organics (in the form of charcoal, ash, bone, antler, or soil humates, etc.), or other chronometrically datable materials suitable for determining the age and depositional history of natural geological deposits?</td></tr>
<tr><td>Question 3. Does the study area contain, or have the potential to yield, one or more landform-sediment assemblages that can be compared and correlated with other local or regional depositional sequences?</td></tr>
<tr><td>Question 4. Does the study area contain, or have the potential to yield, evidence that contributes to an understanding of the timing and extent of local or regional landscape evolution and the effects of these processes on the location, duration, and mode of prehistoric human land use?</td></tr>
</table>

Theme P-B: Culture Chronology	
Question and Data Requirements	**Discussion**
Question 1. Does the deposit contain, or have the potential to yield, radiometrically datable organics (in the form of charcoal, ash, bone, antler, or soil humates, etc.), obsidian artifacts suitable for hydration analysis, or other chronometrically datable materials?	Datable materials within a relatively intact stratigraphic sequence will assist in the development of reliable interpretations of site components. Multiple lines of evidence will contribute to the reliability of the interpretations.
Question 2. Does the deposit contain, or have the potential to yield, sufficient diagnostic artifacts for archaeological cross-dating determinations to be made independent of other chronometric evidence?	
Question 3. Does the deposit contain, or have the potential to yield, evidence of one or more specific component assemblages, and are the assemblages associated with physical contexts that are vertically and/or horizontally discrete?	

Theme P-C: Culture History	
Question and Data Requirements	**Discussion**
Question 1. Does the archaeological deposit possess sufficient integrity and artifact/assemblage yield to permit cultural-historical assignment?	Culture history, developed in the 19th century, seeks to interpret historical relationships through the classification of stylistic and technological culture traits. Today, culture history primarily serves as a framework for the investigation of other research themes.
Question 2. Are artifacts present that might contribute to regional typological studies?	
Question 3. Does the assemblage(s) contain a sufficient number and variety of artifacts to contribute to regional studies of the material correlates of specific cultural institutions, such as social identity and ritual belief systems?	

Theme P-D: Vertebrate Archaeofauna Variability	
Question and Data Requirements	**Discussion**
Question 1. Does the archaeological deposit have sufficient integrity and yield to produce well-dated archaeofaunal assemblages?	Variability in both the temporal and spatial distribution of archaeofaunal assemblages has been noted within the San Francisco Bay area. Assemblages typically include both terrestrial and marine species, with availability possibly influencing variation in spatial distribution. Explanations for temporal variations range from climate/ environmental changes to resource intensification. One of the differences between San Francisco Bay area archaeofaunal assemblages and those of surrounding regions is the high frequency of small carnivores in Bay area shellmounds.
Question 2. Can the archaeological faunal assemblage contribute to the examination of local or regional differences in hunting strategies?	
Question 3. Can the faunal assemblage contribute to the understanding of the high frequency of dog/coyote bone in shellmound deposits?	
Question 4. Does the assemblage(s) contain a sufficient number and variety of faunal specimens to contribute to analysis of the seasonality and exploitation of these resources?	

Theme P-E: Invertebrate Archaeofauna Variability	
Question and Data Requirements	**Discussion**
Question 1. Does the deposit retain sufficient integrity and contain sufficient shellfish remains to yield datable and typable shell samples?	Temporal variations in the shellfish species exploited by prehistoric peoples have generally been explained as either the result of over-exploitation or a function of climate change. Recent archaeological investigations in the San Francisco Bay area have tended to favor the climate change model.
Question 2. Does the deposit contain a uniform shellfish assemblage, or does it exhibit stratigraphic variability of the type described by Nelson, Gifford, and Greengo?	
Question 3. Does the deposit contain shellfish remains with sufficient preservation to evaluate the former habitat, demography, and epidemiology of shellfish populations?	

Theme P-F: Coastal Colonization Patterns	
Question and Data Requirements	**Discussion**
Question 1. Does the archaeological deposit have sufficient integrity and yield to produce well-dated early to mid-Holocene archaeological components containing toolkits and archaeofaunal assemblages?	The traditional view of the early Californian inhabitants is one that emphasizes the Paleo-hunters, who were thought to be highly mobile big-game hunters. In contrast, Jones (1991) suggests that Paleoindian and Lower Archaic peoples showed a preference for lacustrine, estuarine, and island environments, and exploited a range of coastal resources.
Question 2. Does the archaeological deposit have the potential to distinguish between evidence for the targeted exploitation of large terrestrial/marine game versus an opportunistic encounter-based diet?	
Question 3. Does the archaeofaunal assemblage have sufficient integrity and preservation to shed light on the issue of early Holocene shellfish exploitation?	

Theme P-G: Resource Intensification and Adaptive Change	
Question and Data Requirements	**Discussion**
Question 1. Does the archaeological deposit have sufficient integrity and yield to produce well-dated archaeofaunal, archaeofloral, and technological assemblages indicative of diet and organization?	Archaeological investigations seek to determine the causes and consequences of resource intensification in prehistoric cultures, including the connection between resource intensification and population growth, increased sedentism and increased social stratification. Within the central coast, intensification of acorn exploitation is noted, and within the Bay area, increased reliance on otter, deer and canids has been observed.
Question 2. Does the archaeological deposit have the potential to fit into a time series providing insight into the development of regional resource intensifications?	

Theme P-H: Interaction and Social Change	
Question and Data Requirements	**Discussion**
Question 1. Does the archaeological deposit have the potential to yield items identifiable as trade or exchange markers (e.g., obsidian, other foreign stone, or shell beads)?	Archaeological models have sought to explain the link between the development of exchange systems and social complexity. Inside culture represents a group's internal lifeways, and boundary culture represents the processes by which groups interact with other groups. The development of boundary culture may have resulted in increased social stratification.
Question 2. Does the archaeological deposit contain an adequate quantity and diversity of artifacts to address issues related to status and craft specialization, or variation in the relation between sociopolitical status and exchange wealth?	
Question 3. Does the archaeological deposit have the potential to yield features such as living surfaces, house floors, domestic and external work areas, refuse piles and pits, or other markers of emergent residential activity?	
Question 4. Does the archaeological deposit have the potential to yield evidence for the existence of production for exchange, features related to storage of surplus, or other signatures of emergent tribelet formations?	

Theme P-I: Research Potential of Redeposited Sites	
Question and Data Requirements	**Discussion**
Question 1. Does the redeposit contain sufficient evidence in the form of typeable artifacts and/or datable materials to establish it as the remains of a single-component archaeological site?	Historic cutting and filling within San Francisco has impacted many prehistoric sites. Redeposited materials lack integrity and are typically ineligible for the NRHP. However, a single-component redeposited site may possess sufficient material to allow investigators to address important research questions.
Question 2. Does the redeposit have the potential to yield sufficient frequencies and kinds of artifacts and archaeofaunal and floral remains to address one or more questions presented above under Themes P-A through P-G?	

Historic-Period Research Issues

The following eight research issues, themes H-A through H-H, are relevant to historic-period archaeological research in San Francisco. They include:

H-A: Consumer behavior and strategies
H-B: Ethnicity and urban subcultures
H-C: Institutions
H-D: Industrialization and technology
H-E: Urban geography
H-F: Waterfront: buried ships (wrecks, storeships, etc.) and wharves
H-G: Interpretive potential
H-H: Waste disposal and dumps

They are presented in tabular form below, with a set of questions, a brief discussion of each question, and data requirements detailed for each theme. In subsequent sections devoted to individual HOAs, only those research issues anticipated to have relevance for the archaeological record of that HOA are presented. They will be listed by thematic title with none of the detail presented in this first table to avoid repetition in the document.

Theme H-A: Consumer Behavior and Strategies		
Question	**Discussion**	**Data Requirements**
Question 1. Does this resource enable us to describe the consumer practices and disposal behavior of a household or business with specific social, occupational, economic, and/or ethnic characteristics?	Household refuse, including the remains of domestic activities such as food preparation and consumption, and activities related to personal hygiene and appearance, reflects the values that underlie peoples' consumer choices. Such topics are typically not recorded in written documents and archaeological findings can provide insights into daily life and behavior that would not otherwise be possible.	**Archaeological:** feature and/or layer interfaces, broad exposure **Historical:** associated with specific household/business **Oral history:** interviews with representatives of various ethnic groups to establish relevance of foodways and yard use in traditional behavior **Faunal remains:** economic scaling and ranking of butchering cuts (Lyman 1987; Schulz and Gust 1983a, 1983b); frequencies of types--domestic/wild; presence/absence of types
Question 2. Does this resource add to our knowledge of the availability of various classes of consumer goods at a specific place and	Cost and availability of goods plays an important role in the choices that consumers make. Mercantile sites within San Francisco, such as the Hoff Store site, provide information on the types of goods that were	

Theme H-A: Consumer Behavior and Strategies		
Question	**Discussion**	**Data Requirements**
point in time (i.e., material remains associated with a particular mercantile establishment)?	available for purchase.	**Botanical remains:** frequencies of types--domestic/wild; presence/absence of types **Ceramic and glass function:** MNI frequency/proportion **Social science:** explicit social, economic, and status categories **Household demography:** size, composition, life-course **Documentary:** Mail-order catalogs, advertisements, commercial inventories, merchants' and householders' accounts
Question 3. Does this resource add to our knowledge of adaptive behavior in urban settings associated with the acquisition and consumption of foodstuffs or the organization and use of space?	Residents within San Francisco may have supplemented purchased foodstuffs with items grown in their backyards, or fished or hunted from surrounding areas. Archaeological deposits and pollen analyses may indicate whether spaces surrounding residences were used as gardens, and how the use of outside areas changed through time.	
Question 4. Does this resource, in combination with other classes of data, aid in the understanding of landscape alteration, water and waste management, outbuilding construction, and dwelling renovation as these relate to changes in household composition?	Changes in the use patterns of pit features, such as privies, drains and cisterns, may reflect changes in areas such as family composition and economic status. The pit feature itself, as well as the artifacts found in it, may have interpretive value.	

Theme H-B: Ethnicity and Urban Subcultures		
Question	**Discussion**	**Data Requirements**
Question 1. Does this resource reflect the rise or relative influence of Victorianism as a class-based ideology? Does this resource reflect resistance to Victorian or post-Victorian tastes and mores?	The middle-class typically embraced the Victorian ideology. Archaeological deposits can show evidence of the acceptance of this ideology, as well as resistance. Domestic refuse such as ceramics, toys, and decorative items can provide information regarding the tastes and values of individuals and families.	**Archaeological:** period interface composed of feature and layer interfaces; many households Historical: specific historical associations for each stratum **Documentary:** understanding of ethnic foodways, style-bearing artifacts, etiquette books, fashion magazines **Archival:** ethnic identification, historical background **Oral history:** interviews with representatives of various ethnic groups to explore the relevance of traditional material culture, foodways, and community life **Ceramic, glass, metal containers:** MNI frequency/proportion **Faunal Remains:** frequencies of types/domesticates/wild; presence/absence of types; butchering cuts **Botanical remains**: frequencies of types -domestic/wild; presence/absence of types
Question 2. Can this resource help us to understand the dynamics of cultural pluralism and social stratification during the 19th and early 20th centuries? Does this resource possess material remains that could elucidate economic distinctions between the material culture of members of distinct ethnic and subcultural groups?	Comparisons of cultural deposits associated with residents of distinct ethnicities and socio-economic status can reveal both similarities and differences in the behaviors of different classes of people.	
Question 3. Does this resource possess artifacts and/or faunal remains that could be used to elucidate the role of symbols in defining and maintaining boundaries between groups?	Symbols can be used to maintain group boundaries. These can exist within the private sphere, such as the use of particular ceramic forms by Chinese, as well as in the public sphere, through avenues such as public dress, and landscaping.	

<table>
<tr><th colspan="3">Theme H-C: Institutions</th></tr>
<tr><th>Question</th><th>Discussion</th><th>Data Requirements</th></tr>
<tr><td>Question 1. Can this resource help us to understand the dynamics within the institution? Does this resource possess material remains that could elucidate the relative influences of those controlling the institution upon those controlled by it, in terms of gender, economic, racial, ideological, political, or religious differences? Does this resource possess artifacts or faunal remains that could be used to elucidate the role of symbols in defining and maintaining boundaries between groups within the institution?</td><td>While the purpose of an institution is generally identifiable through historic research, the methods used to implement the goals of an institution, and what other functions they may have served, are not readily available. Archaeological materials can provide insights into the way the institution functioned, as well as the ideologies etc. of those who controlled the institution and those who were the patrons.</td><td rowspan="2">Archaeological: period interface composed of feature and layer interfaces; many households and institutions
Historical: specific historical associations for each stratum
Documentary: understanding of foodways, style-bearing artifacts, etiquette books, social-reform and religious publications
Archival: ethnic identification, historical background of institution, operators, and patrons Oral history: interviews with representatives of various ethnic, religious, and social-reform groups to explore the relevance of traditional material culture, foodways, and community life
Ceramic, glass, metal containers: MNI frequency/proportion
Faunal Remains: frequencies of types/domesticates/wild; presence/absence of types; butchering cuts
Botanical remains: frequencies of types - domestic/wild; presence/absence of types</td></tr>
<tr><td>Question 2. Does this resource demonstrate a change in the relationship between the institution and its patrons through time? Does this resource demonstrate a change in the relationship between the institution and the surrounding community?</td><td>Material remains may provide evidence of changing uses of an institution. For example, segregation of patrons of different gender, race or ethnicity may have increased or decreased through time, possibly in response to changes within the surrounding community, and this may be reflected in the archaeological record.</td></tr>
</table>

Theme H-D: Industrialization and Technology		
Question	**Discussion**	**Data Requirements**
Question 1. Does this resource contain evidence of undocumented or poorly documented industrial processes that could add significantly to our knowledge of the development of a specific industry? Does the resource contain evidence of local innovation or "appropriate technology" as opposed to the adoption of standardized tools and materials? Is there evidence for extensive reuse of equipment, sites, buildings, or artifacts?	Analysis of industrial bi-products and waste can provide information on industrial processes, techniques and innovations that would not otherwise be available. These by-products can have greater interpretive value than the pieces of machinery themselves.	**Archaeological:** feature and/or layer interface **Historical:** associated with industrial activity **Archival:** company records and accounts of various industrial processes **Ceramics and glass function:** MNI frequency/proportion **Faunal remains:** economic scaling and ranking of butchering cuts (Lyman 1987; Schulz and Gust 1983a, 1983b)
Question 2. Does this resource demonstrate the impact of industrialization on landscape, environment, or public health?	Industrial waste was commonly used to infill land during the historic period. Archaeological investigations can locate these potentially toxic materials for clean-up activities, as well as provide data on industry's approach to waste disposal.	

Theme H-E: Urban Geography		
Question	**Discussion**	**Data Requirements**
Question 1. Does this resource help us to understand the characteristics of the natural environment and the landscape modifications made during the historic period? Does this resource aid in our understanding of the beginnings of urban planning and infrastructure-water supply and storage, trash and sewage disposal, fire protection, draining-in San Francisco?	Both cutting and filling of the natural topography took place in San Francisco – to improve property value and create usable land from marshland or waterlots. Similarly, street raising improved transportation in impassable areas. These activities are well-documented when they took place on a large scale. Archaeological investigation allows researchers to determine if this type of activity took place on a smaller scale, and to determine if individual households found solutions for drainage, sewage, and refuse disposal issues outside of the framework provided by city planners.	**Archaeological:** period interface composed of feature and layer interfaces **Historical:** land-use study, patterning identified from archival sources **Archival:** photographs and accounts of industrialization; information on legal statutes **Environmental:** reconstruction of local vegetation based on pollen record **Faunal/Botanical remains:** frequency of types; domesticates/wild; presence/absence of types; paleoscatological remains
Question 2. Does this resource demonstrate the relationship between public perceptions of the environment and public policy? How did society's perceptions of the cultural landscape and modifications to the environment change over time?	Research of fill sequences in New York City reveals that residents were more likely to deposit clean fill (i.e. fill that contained no waste or debris) during times of public health crisis, like a yellow fever outbreak, although as the memory of the outbreak receded they became less concerned, and once again deposited household and industrial waste in vacant lots and other dump areas.	
Question 3. What information about neighborhood formation (i.e., residential differentiation and the emergence of homogeneous neighborhoods along social and economic lines) is available from this resource?	While research at the household level can be revealing, future research should also include comparisons between historically defined neighborhoods.	

<table>
<tr><th colspan="3">Theme H-F: Waterfront: Buried Ships (wrecks, storeships, etc.) and Wharves</th></tr>
<tr><th>Question</th><th>Discussion</th><th>Data Requirements</th></tr>
<tr><td>Question 1. What can this property reveal of ship building in the early 19th century? Is the vessel representative of her class and method of construction, or an unusual example? What can we learn about the repair, refitting, or adaptation of such vessels in the early 19th century?</td><td>The William Gray, at Levi Plaza, and the whaler Lydia, near Pier 42, have been archaeologically excavated and placed on the NRHP. Because there are few extant plans for vessels of this period, the remains themselves provide evidence of early shipbuilding techniques.
[Since this research theme was developed, additional maritime resources have been excavated. These include the remains of the Candace and Charles Hare's shipbreaking yard in the vicinity of Spear and Main.]</td><td rowspan="3">Archaeological: physical integrity of ship's hull, and below and between deck areas; whole artifacts or artifacts broken in situ, duplication of individual artifact types to ascertain storeship status; physical integrity of wharf remains
Historical: ship building technology; history of vessel's construction and operation; for storeship, period of operation and area of specialization; for wharves, local wharf building practices
Archival: ship records; storeship account books; historic photographs and/or lithographs of wharf construction</td></tr>
<tr><td>Question 2. If the property was adapted as a storeship, what architectural evidence is there of the nature of this conversion? If artifacts survive from the use of the vessel as a storeship, what do they reveal about the availability and sources of consumer goods in Gold Rush San Francisco?</td><td>Between 1850 and 1855 many wood ships left in the harbor were converted and used as storage facilities for merchandise. The Niantic, one such storeship, was excavated near the Trans-America building. Storeships are particularly valuable because the potential artifacts associated with them can be tightly dated to the immediate post Gold Rush period.</td></tr>
<tr><td>Question 3. How was the wharf constructed (cobb, crib, or pile)? Are the techniques used in construction typical of this type, or are they unusual, considering the property's location and date? Is there evidence of local innovation in the construction of this wharf?</td><td>Research will focus on wharf technology and construction techniques.</td></tr>
</table>

Theme H-G: Interpretive Potential		
Question	**Discussion**	**Data Requirements**
Question 1. Does the resource have public interpretive potential? For example, could the site provide information about the lifeways of a poorly documented ethnic or occupational group that can be used to better explain the group's position in the city's history to visitors and residents?	Archaeological excavation provides tangible evidence of the past, and puts a human face on individuals and groups that may have otherwise been lost to history. Artifacts are an important part of public displays and allow researchers to convey information.	**Archaeological:** artifacts and historical associations of interest to the public **Oral history:** interviews to document the lifeways of poorly documented ethnic or occupational groups
Question 2. Does the resource contain artifacts that could be used to interpret the past in a museum or public display or as a tangible, hands-on component of a teaching unit developed for use in schools?	Artifacts recovered through archaeological investigation could form the basis for public outreach – specifically for use by teachers, who could incorporate artifacts into California History curriculum.	

Theme H-H: Waste Disposal and Dumps		
Question	**Discussion**	**Data Requirements**
Question 1. Can this refuse dump aid in our understanding of neighborhood or city-wide consumption and disposal patterns? Can this dump contribute to the study of "global archaeology"?	Refuse provides evidence of human behavior and becomes useful for research purposes when associations between the refuse and the people who deposited it can be made – this can be done on an individual, household, neighborhood, or city-wide level. The argument has also been made that the necessity to link refuse to its source becomes increasingly less important as the spatial scale of the analysis increases. Dumps provide insight into the process of urban development and shed light on not only consumption, but the availability of specific consumer goods. San Francisco's main dump was located in the Mission Bay HOA in the final decades of the 19th century, although additional neighborhood and household dumps are located throughout the city. The 1906 earthquake also created an enormous amount of both dumping and filling.	**Archaeological**: large, community refuse deposit, containing a range of domestic artifacts, identifiable community refuse deposit lacking certain types of artifacts **Archival:** Statutes regarding waste disposal, creation of city-wide facilities. Photographs and narrative accounts of community disposal practices
Question 2. What can the study of historic-period dumps contribute to the design of modern garbage landfill sites?	The study of 19th and early 20th century dumps allows researchers to study decomposition processes and potential health hazards. Public health data, like the incidence of disease in proximity to dump sites, may be correlated with archaeological evidence.	

The following sections present a brief history of each HOA and identify archaeological resource types and research themes from the discussion above, likely to be relevant to each HOA.

3.0 Southwest San Francisco

3.1 Archaeological Record

Prehistoric Period

There are three documented prehistoric archaeological sites (CA-SFR-25, 106 and the Lake Merced Site) in the Southwest HOA. Two of the sites are reported as shell midden sites and the SFR-25, an isolate discovery, is a possible midden site. All three sites are near Lake Merced and none of the sites have been archaeologically excavated. It has also been suggested that the alluvial terraces and upper slopes of the headwaters of Islais Creek within the eastern part of this HOA may have contain evidence of temporary prehistoric encampments or seasonal occupation (Dean 2006a). It has been noted (Shoup 1992) that the gap south of Mt. Davidson could have been a travel corridor for prehistoric groups between San Francisco Bay and Islais Creek estuary and the marine and faunal resource-rich ecological zones of the Pacific Ocean shoreline and the marshlands of Lake Merced. The archaeological record left by this transhumant activity may be “small ephemeral activity loci” such as has been encountered in the Sutro headlands. The relative sparseness of documented prehistoric sites in the southwest corner of San Francisco is no indication that this prehistorically resource-rich area was not prehistorically intensely utilized. The San Francisco coast was ignored in Nelson’s shellmound survey and this part of the City has had much less deep-impact development than other portions of the City (e.g., SOMA) where prehistoric sites are well documented.

Historic Period

Francisco de Haro had purchased the 2100 acres rancho that included Lake Merced from José Antonio Galindo in 1837. De Haro constructed a house on the south of the lake in San Mateo County where he died in 1849. In the 1850s, Carmen Cibrian de Bernal, the wife of José Cornelio Bernal had an adobe house constructed near Alemany Boulevard and Ocean Avenue. Shortly afterward two additional houses (adobe?) possibly for Bernal family members were constructed adjacent to the Bernal adobe (Hendry and Bowman 1940, Shoup et al. 1992). This “Bernal Reservation” which also included accessory structures such as adobe oven (*horno*) was intact and occupied until between 1900 and 1915

In the Lake Merced area, Alfred Green, George Green, Lovett and others had established farms by the early 1850s, on the northern end of the lake, perhaps with a sheep or dairy focus. Lake Merced was originally only accessible by the “Road to Port Suello” over Twin Peaks, a route now followed by Portola Avenue (Humphrey 1853). From the 1850s and for several decades the City’s most important recreational circuit extended to a string of seaside resorts along Ocean Avenue. These resort houses (Lake House, Ocean House, Pacific House, Ocean View House, Beach House, Rockaway House) were accessible by an omnibus which brought the holiday goers from Portsmouth Square daily and by a return trip that climbed the narrow road between the Great San Bank and the San Miguel Hill to the Cliff House and then returned to town via Point Lobos Road (Geary Boulevard).

In 1859, the City established a House of Refuge (also known as the "Industrial School") for children from families viewed as too impoverished or morally dissolute to be fit parents. The site today is that of San Francisco City College and Balboa Park. The House of Refuge concept was based on the theory that benign intervention early in the life of a child of morally inferior or impoverished parents could prevent the child's evolvement in crime (Macallaire 2003). Municipal authorities at that time could legally acquire custody of children on the mere basis of vagrancy, homelessness, or committal of petty crimes. Most children committed to the San Francisco Industrial School during its 33-year existence were non-delinquents. School routine was severe – rising at 5:30 a.m., farm work from 6 a.m. to noon, work again until 2:30 and school both before and after supper until bedtime at 9 p.m. There were no playgrounds, gymnasium, or workshops. The children inmates wore distinctive gray uniforms. Over time flogging became an accepted punishment. Recalcitrant or older youth were indentured to merchant ships. Escapes were frequent. Inmates of the Industrial School were in the large majority boys and from three to eighteen years of age. Chinese youth represented the largest inmate ethnic group. The institution was closed in 1892.

Perhaps as early as the late 1850s, a French Swiss dairy farming community settled along Islais Creek, (between Alemany Boulevard and Mission Street today) and maintained major dairy operations at least until the early 1900s. It was the presence of these French Swiss families that was responsible for the place names "Geneva Avenue" With the exception of Chinese farms, no 19th century farms or agricultural sites have been archaeologically investigated in San Francisco.

3.2 Archaeological Research Issues

There have been few archaeological investigations in the Southwest part of San Francisco. Archaeological monitoring of extension of a water supply system by the Fire Department (AWSS Connection project) only encountered one archaeological feature (a portion of a redwood utility conduit) that was determined to have no research value (Voss 1994, 1994b). Expected archaeological resources within the southwest part of San Francisco could contribute significant data to questions regarding prehistoric occupation and resource procurement practices, 19th century farming, and ethnic farming practices. Some of the archaeological resources that may be present within this HOA represent archaeological remains and associated research issues that have not previously been addressed or only partially addressed in San Francisco. These new archaeological properties include 19th century immigrant French Swiss dairy farming communities, 19th century recreational facilities, and the Houses of Refuge movement. A case could be made that Ocean Avenue represented during the period between the 1850s and 1906, an historic suburban recreational corridor. The Ocean Avenue amusements thematically varied over time ranging from seaside resorts to horse/dog racing parks.

4.0 Southeast San Francisco

The Southeast San Francisco HOA includes Bayview, Hunters Point, India Basin, Bayshore, Executive Park, and Visitacion Valley. The southeast has the highest concentration of known prehistoric occupation sites in San Francisco. These are shellmounds located along the edge of the Bay before it was filled. Most if not all of them have been disturbed or destroyed. Those that have been investigated are reportedly at least 8 feet thick, and many are buried underneath 10 feet or more of fill. The southeast was separated from the early sites of historic period settlement, the Mission and Yerba Buena Cove, by hills and marshlands. During the Spanish period (1776-1821) the pasturage for the cattle of Mission Dolores extended into the Islais Creek Basin and Visitacion Valley. During the Mexican period (1821-1846) lands were granted as ranchos by the Mexican government and used primarily for cattle grazing and ranching. Adobe structures associated with these ranchos that have been mapped fall outside of the Southeast San Francisco HOA. By 1850, plans for a development at Hunters Point had not materialized and only a handful of abandoned shacks and a farmhouse existed in the area (Olmsted et. al 1982:94). A Chinese fishing settlement had been established at Hunters Point by 1859 and remained through 1930. The Chinese built wood houses on stilts over the mudflats, and used flat-bottomed boats to fish for shrimp (Olmsted et. al 1982:94). Truck gardens and small farms were scattered in the southeast and tended by Chinese, Italians, and Portuguese. A large city dump attracted vagrants who lived in an encampment adjacent to the dump.

By the 1860s, boat and ship builders were operating along the shoreline at Hunters Point. Bay View Park, a race track with a hotel and pavilion, was located in the marshy lands at Hunters Point from 1863 to 1883 (Olmsted et. al 1982:97). San Franciscans would make the trip from Yerba Buena south for entertainment. Long Bridge was constructed across Mission Bay in 1865 and was extended to Hunters Point within two years, increasing accessibility between the southern waterfront and the South of Market area to the industries of southeast San Francisco (Dean 2006a:8).

San Francisco began expanding south in the second half of the 19th century, and a stone dry dock and 200 foot wharf were constructed at Hunters Point in 1868. The Potrero and Bay View Railroad crossed the district and a road that ran from San Francisco to Bay View was completed (Olmsted et. al 1982:99). A homestead development tried to take advantage of the new ease of access to the Southeast, but was unsuccessful. In 1868, slaughterhouses that had been chased out of the densely populated Yerba Buena relocated in a Butcher's Reserve, or Butchertown, with access to the waters of Islais Creek. By 1877, all 18 slaughterhouses in the City were located there. The slaughterhouses and associated industries were located on wood wharves supported by wood pilings that projected over the Bay's edge. By 1871 over 100 buildings and stables were supported on the wharves. All parts of the cow were used by industries such as tallow works, fertilizer plants, tanneries, glue factories, and curled hair mattress makers (Olmsted et. al 1982:144). Parts of San Francisco were used as pasturage, and cows were driven from these pastures along the Third Street railroad tracks to the stockyards and slaughterhouses near Islais Creek.

In the last four decades of the 1800s, the Southeast HOA was characterized by farms and vegetable gardens, pasture and slaughterhouse-related industries, Chinese fishing camps, ship and boat yards, powder houses, a brewery, dumps for trash from urban Downtown San Francisco, and working-class housing.

In the late 1800s, Union Iron Works, owned by Bethlehem Shipbuilding Co., moved into the Hunters Point area. Wood ship building was largely replaced by steel ship building, and coal and oil-fired power generating facilities soon followed. After the 1906 earthquake and fire, rubble from the center of San Francisco was imported and used as fill in the Islais Creek basin. Filling continued through the 1930s, when rock was quarried from the nearby hills to complete the job. Neighborhoods in Southeast San Francisco, like Visitacion Valley, saw an influx of residents after the 1906 earthquake and fire, and the establishment of street car lines in the early decades of the 20th century also encouraged residential settlement. Among other institutions, the area housed an orphanage between 1908 and 1912, probably necessitated by the earthquake and fire.

By 1916, Hunters Point housed the largest dry-docks in the world. The U.S. Navy moved in and took over the graving docks to produce ships for World War I. The U.S. Navy once again took over the docks and ship building industry during World War II at the Hunters Point Naval Shipyard. Associated with the shipyard was the Naval Radiological Defense Lab.

4.1 Archaeological Record

Within the Southeast San Francisco HOA, Southeastern Bayshore offers a variation of the former Yerba Buena Cove and San Francisco City center. Prehistoric occupation of the former bay shore, prior to filling, left behind shellmounds and burials.

Wood pilings and plank wharves were built along Islais Creek and Hunters Point and ship building yards were active at Hunters Point from the 1860s onwards. The filling of the bay shore and Islais Creek was not finished until the 1930s. Industries close to the water were related to boat and ship building, fishing, slaughterhouses and butchering, powder works, some factories and factory-worker residences. Further away from the shore, lands were used for pasturage and vegetable farming. Settlement was much less intensive as population was mostly concentrated in Bayview and Hunters Point near the factories.

Prehistoric Period

The Southeastern HOA has high potential for archaeological resources from the prehistoric period including both residential and non-residential sites. Shellmounds were recorded along the former bay shore, and there are indigenous sites inland in the Visitacion Valley area. A range of site types are expected, including large village sites, smaller occupation sites, special-purpose sites, and possibly isolated burials and artifacts.

Historic Period

The following list presents the potential historic-period archaeological resources expected within the Southeastern HOA by conceptual category, and historic period. Examples of some of the archaeological resource categories are presented, but the list is not meant to be a complete inventory of all resources present, or expected.

The Southeastern HOA was primarily used for pasturage during the Spanish and Mexican period. There is a low potential for boundary markers, temporary shelters, and the remains of temporary campsites, including fire pits, animal bones from meals, discarded liquor bottles and spent tools, etc. The area remained largely unoccupied during the early American period, and it was only during later periods that the area began to be developed.

Historic site types that may exist within the Southeastern HOA include:

- Domestic sites: these may be composed of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, campsites, single and multiple family dwellings, household gardens, residential hotels, the Chinese shrimp fishing village, and military housing.
- Commercial sites: these may be composed of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, retail stores, hotels and saloons, restaurants, pasturage, garden and truck farms, the Chinese shrimp fishing village, and the racetrack.
- Institutional sites: these may be composed of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Late Gold Rush period onward. Sites may include, but are not limited to, schools, churches, the orphan asylum, and military sites.
- Industrial sites: these may be composed of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Late Gold Rush period onward. Sites may include, but are not limited to, slaughterhouses, stockyards, tanneries, tallow works, fertilizer plants, glue factories, curled hair mattress makers, other factories, breweries, foundries.
- Storage sites: these may be composed of architectural remains. They may date from the Late Gold Rush period onward. Sites may include, but are not limited to, warehouses, and powder houses.
- Buried ships: these may be composed of ship remains and/or ship parts. They may date from the Early Gold Rush period onward. Sites may include, but are not limited to, cargo ships, Chinese fishing boats, and boat and ship building yards (both wood and steel ships).
- Wharves: these may date from the Early American period onward. Sites may include, but are not limited to, wood wharves, wharves that supported Butchertown, dry docks, and graving docks.
- Landfills: these may be composed of unintentional and/or intentional fill, and fill associated with the 1906 earthquake and fire. They may date from the Late Gold Rush period onward. Sites may include, but are not limited to, urban dumps, filling within Islais Creek and filling the perimeter of the bay shore, which may include some debris from the 1906 earthquake and fire.
- Spanish/Mexican period sites: may be composed of hollow features, sheet refuse, and/or architectural remains. Sites may include, but are not limited to, unmapped sites typically associated with early ranching such as ranch hand campsites, and refuse deposits.

- Gold Rush period sites: may be composed of hollow features, sheet refuse, fill and/or architectural remains. Only a handful of dwellings were clustered near the shore at Hunters Point by 1850, otherwise no Gold Rush period sites are anticipated.

4.2 Archaeological Research Issues

The Southeastern HOA has the highest known concentration of prehistoric period archaeological resources in San Francisco and all of the prehistoric research issues could potentially be addressed. These include:

P-A: Human Occupation and Landscape Evolution
P-B: Culture Chronology
P-C: Culture History
P-D: Vertebrate Archaeofauna Variability
P-E: Invertebrate Archaeofauna Variability
P-F: Coastal Colonization Patterns
P-G: Resource Intensification and Adaptive Change
P-H: Interaction and Social Change
P-I: Research Potential of Redeposited Sites

The Southeastern HOA experienced historic-period development later than the Northeast and Central Bayshore. Industries that began in and around Yerba Buena eventually moved down-shore. Archaeological resources from the Spanish/Mexican or Gold Rush periods are very sparse, if present. All identified research issues could be relevant to archaeological resources expected within the Southeastern HOA.

H-A: Consumer behavior and strategies
H-B: Ethnicity and urban subcultures
H-C: Institutions
H-D: Industrialization and technology
H-E: Urban geography
H-F: Waterfront: buried ships and wharves
H-G: Interpretive potential
H-H: Waste disposal and dumps

The Southeastern HOA holds the potential for the study of long-term Chinese shrimp fishing camps. The HOA also offers the potential for comparison to the earlier, more rapid and denser development of Yerba Buena, or South of Market, in terms of organization and layout of commercial and industrial activities, and in terms of domestic working class organization, social choices, and survival strategies, and their relationship to industry and commerce. Furthermore, the Southeastern HOA experienced an influx of refugees from the 1906 earthquake and fire and archaeological resources from the post-

1906 period may be able to address the effectiveness of the government efforts at earthquake relief, and the structure and strategies of refugee populations by ethnicity, social class, or occupation.

5.0 Mission District and Market-Octavia

This HOA includes both the area of San Francisco defined by the Spanish Mission complex and early Mexican land grants, as well as the area between the Mission District and Downtown, referred to as Market-Octavia for two of the main thoroughfares that are roughly central to this district.

Understandably, Mission Dolores forms the heart of the Mission District and remains a vital link to the early years of Spanish settlement within what became the City of San Francisco. The first mission structure was constructed of brush and was likely located in the vicinity of a Yelamu settlement near modern-day Fourteenth and Mission streets (Dean 2004:3). After just a few months, it was replaced by wood and mud structures that were built in approximately the same location and used for at least eight years (Dean 2004:3). Construction of the existing adobe mission began in 1782 and lasted for several years (Dean 2004:4). In the early 19th century, the mission complex contained at least 43 buildings and likely extended from Guerrero Street to Church Street and Fifteenth Street to Dolores Creek south of Eighteenth Street (Dean 2004:4). At its peak, over 1,200 people occupied the mission (Dean 2004:4).

The mission was secularized in 1835 and land ownership was transferred from the church into private hands. While the neighborhood surrounding Yerba Buena Cove embraced the commerce and activity associated with the Gold Rush and the influx of miners and merchants, the somewhat more isolated community surrounding the mission remained what Randall Dean has described as a "community of refuge" for the *Californios* families and neophyte Indians who felt increasingly marginalized as San Francisco experienced rapid change (Dean 2004:5). The mission community petitioned the military governor for recognition as a pueblo separate from San Francisco, although their petition was denied (Dean 2006b:10). By the 1850s, the Mission Dolores community contained over 50 adobe buildings and extended from Fourteenth Street to Mission Street and from Nineteenth Street to Church Street (Dean 2004:5). While the precise location of many of these buildings is not known, the locations of several have been identified.

Juan Prado's adobe house was constructed near Fourteenth and Julian Streets. Jesus de Noe's wood frame (c. 1840) house was probably located on the block bordered by Minna, Fourteenth, Mission, and Fifteenth Streets. A house (c. 1843) of unknown construction type was built to shelter Native American rancho laborers working herds of De Haro cattle on the block bounded by Bryant, Nineteenth, Florida, and Twentieth Streets (Hendry and Bowman 1940 in Dean 2006b:10). There may have been an adobe house whose ruins were still visible in the late 1880s located on the eastern shore of the Mission lagoon between Sixteenth, Alabama, Florida, and Seventeenth streets [Sanborn Fire Insurance Co. 1889 in Dean 2006b:10)].

By 1851, the mission settlement was connected to downtown San Francisco by a plank road that ran along the current alignment of Mission Street, and roadhouses and brothels dotted the plank road between Twelfth and Fifteenth streets. While the plank road was designed to improve transportation and draw those interested in recreation and potential settlement to outlying areas, during the 1850s much of the Mission District and Market-Octavia HOAs were put under cultivation. Chinese, and later, Italian and Portuguese farmers often worked the plots (Dean 2006b:10). While the Mission District was an important source of produce for the rest of the City, it was also a source of fresh water, as windmills pumped water from underground springs (Dean 2006b:10).

During the 1850s, modern-day Hayes Valley in the north portion of the Market/Octavia HOA was a farmstead belonging to Thomas Hayes (Dean 2004:6).While he initially operated a farm, by 1861 Hayes filed a subdivision map for his 160-acre tract and began selling lots for residential development (Dean 2004:6). Improvements were required to draw settlers to this relatively remote location, and Hayes invested in a horse car line and created Hayes Park, which contained a large three-story pavilion that was a popular location for civic and social gatherings (Dean 2004:7).

In the absence of public parks, additional parks built by the private sector, like the Willows, were created. The Willows occupied a block of filled land between Mission, Valencia, Eighteenth, and Nineteenth streets and included picnic areas, a dance pavilion, and menagerie (Dean 2004:7). The Willows was only a block from the Union Race Course (Dean 2006b:10).

Woodward's Gardens, a pleasure garden on a somewhat larger scale, opened in 1866, and occupied the block between Thirteenth, Fourteenth, Valencia, and Mission streets (Dean 2004:7). Robert Woodward, the entrepreneur behind the establishment, sought to appeal to middle-class notions that favored entertainment meant to elevate the participant through education and spiritual uplift (Dean 2004:7-8). To that end, his gardens contained a museum and art gallery, a menagerie with stuffed and live animals, an aquarium, a restaurant, and occasional theatrical and circus performances (Dean 2004:8). Woodward knew his audience well. The gardens remained popular for nearly thirty years, and did not close until 1894, the year after the Midwinter Fair introduced thousands of visitors to new attractions in Golden Gate Park.

Passenger and freight facilities were constructed near the connection between the SFSJ Railroad and the Market Street Railway in the 1860s. The two lines met at Valencia Street and the facilities were constructed between Valencia, Market, Otis, and Brady streets (Dean 2004:8).

Both emigrant (German and Irish) and non-emigrant families settled in the Mission District in the final decades of the 19th century. Unlike more crowded areas such as the South of Market, the Mission District was made up of primarily one and two-family homes. After the 1906 earthquake and fire, the neighborhood, which had sustained some damage itself, absorbed many of the working-class Irish forced to leave the South of Market area (Dean 2004:8). Like surrounding neighborhoods, the structures built in the period after the earthquake often replaced residential housing with light industrial and commercial structures. North of Market, the density of residential development became higher after the earthquake and fire (Dean 2004:9).

The construction of the Central Freeway in the early 1950s impacted both the feel and organization of the area, and likely damaged many below-ground archaeological resources. It was not until the final years of the 20th century that the elevated roadway was removed from the Market-Octavia area north of Market Street. It has been replaced by a surface boulevard.

5.1 Archaeological Record

Prehistoric Period

Both residential and non-residential prehistoric period archaeological resources are expected in the Mission and Market/Octavia HOA. Indigenous peoples occupied the area prior to establishment of the mission, and indigenous traditions, material culture, economy, ideology, population size and distribution, and ways of living were either adapted or destroyed as a result of the introduction of the mission and subsequent incorporation of most Native Americans into the mission system.

Historic Period

The Mission District was occupied from prehistory through the present. Market/Octavia may have housed some prehistoric occupations, but in general the occupation of this portion of the HOA was sparse until the Late 19th/Early 20th century period. Because this HOA does not front the bay shore, there is no potential for buried ships or wharves.

Historic site types that may exist within the Mission and Market/Octavia HOA include:

- Domestic sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, dwellings within the Mission Dolores complex (e.g. neophyte housing, priests' housing, Mexican rancho dwellings), single and multiple family dwellings unassociated with the Mission Dolores complex, and residential hotels.
- Commercial sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, roadhouses, brothels, retail stores, hotels and saloons, restaurants, produce gardens and farms, and entertainment such as Woodwards Gardens and the Union Race Course.
- Institutional sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, the Mission Dolores complex, schools, churches, orphan asylums, union halls, public parks (e.g. the Willows), and military sites (e.g. the National Guard Armory).

- Industrial sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from post-1906 earthquake and fire and onward. Sites may include, but are not limited to, factories, stone cutting yards, and light industry.
- Storage sites: these may consist of architectural remains. They may date from the Late Gold Rush period onward. Sites may include, but are not limited to, warehouses.
- Landfills: these may consist of unintentional and/or intentional fill, and fill associated with the 1906 earthquake and fire. They may date from the Late Gold Rush period onward. Sites may include, but are not limited to, urban dumps and debris from the 1906 earthquake and fire.
- Spanish/Mexican period sites: may consist of hollow features, sheet refuse, and/or architectural remains. Sites may include, but are not limited to, the Mission Dolores complex, and refuse deposits. The mission complex included the mission building, priest's house, sacristy, baptistery, cemetery, rancheria, neophyte rancheria, orchard, garden, and vineyard (and associated walls), corrals, acequia, bathhouse, prison, tanneries, forge, mills, shoe shop, school, granary, soap factory, and soldier's barrack. In the Mexican period once the mission was secularized, a small hamlet formed around the former mission complex, with a Mayordomo's house and servant's quarters, and a school. Local Mexican landholders including Bernal, Guerrero, De Haro, Valencia, and Ruffino had ranchos, complexes that included adobe ranch houses with stone foundations and stone walls. The locations of buildings and structures from the Spanish mission period and succeeding Mexican rancho period are depicted on several surviving maps, but the maps do not provide enough detail to be able to precisely locate mapped structures on the modern landscape. The third mission building survives today.
- Gold Rush period sites: may consist of hollow features, sheet refuse, fill and/or architectural remains. Sites may include, but are not limited to, dwellings.

5.2 Archaeological Research Issues

Both residential and non-residential prehistoric sites may be located within this HOA. All of the prehistoric research issues could potentially be addressed, including:

P-A: Human Occupation and Landscape Evolution
P-B: Culture Chronology
P-C: Culture History
P-D: Vertebrate Archaeofauna Variability
P-E: Invertebrate Archaeofauna Variability
P-F: Coastal Colonization Patterns
P-G: Resource Intensification and Adaptive Change
P-H: Interaction and Social Change
P-I: Research Potential of Redeposited Sites

The Mission and Market/Octavia HOA includes the location of the Mission Dolores complex, one of the earliest settlements within San Francisco. Following the secularization of the mission system, the area became primarily a mix of dwellings of both emigrant and non-emigrant residents, produce gardens, and commerce. Light industry relocated to the area after the 1906 earthquake and fire. Although there is no potential for addressing research questions relating to the waterfront, and there is limited potential for addressing research questions relating to industrialization and technology, the remaining research issues could be relevant to archaeological resources expected within the Mission and Market/Octavia HOA.

H-A: Consumer behavior and strategies
H-B: Ethnicity and urban subcultures
H-C: Institutions
H-D: Industrialization and technology
H-E: Urban geography
H-G: Interpretive potential
H-H: Waste disposal and dumps

6.0 South of Market (SOMA)

The South of Market (SOMA) HOA includes both west and east SOMA as well as Rincon Hill and Rincon Point.

The South of Market HOA was once home to the bustling settlement known as Happy Valley, a Gold Rush encampment for adventurers waiting to journey to the gold fields. It was first a tent city, and then a settlement of frame houses nestled among the sand dunes. It was located near the intersection of today's First and Mission Streets and continued south along the edge of the Cove (Pastron 1986). As depicted on the 1853 and 1859 U.S. Coast Survey Maps, undulating sand dunes in excess of 60 feet in height covered the area north and south of Market Street beginning just west of First Street.

The tents and temporary structures quickly gave way to a densely settled industrial neighborhood centered on the metalworking trades. Coal was essential to the early industrial boom in San Francisco, as it provided the energy needed to keep foundries operating and furnaces burning, and the coal gasification plants in production. The San Francisco Gas Works and its large coal gasification tanks, located at First and Howard streets, began providing gas light to the City in 1854. The presence of the imposing gas works served as a catalyst for further industrialization and many iron and brass foundries, blacksmith shops, woodworking plants, metal working, plating, and machine shops, ink factories, paint shops, lithographers, and warehouses crowded together around Yerba Buena Cove. At the time, Rincon Point accommodated the densest concentration of industrial manufacturing facilities on the Pacific Coast (Praetzellis and Praetzellis 1992:4-94).

As industrial concerns crowded into the area, the Cove itself was filled in order to expand the City eastward. Those maritime businesses that relied on water access, like the ship breaking yards along the Cove, either closed up shop or moved their operations. In addition to the maritime concerns situated along the Cove, shipbuilding and ship repair establishments were clustered at Steamboat Point (Dean 2006b:6). Tichenor's Ways, located at Second and Townsend, was likely one of the most prominent, and remained in business until the 1870s (Dean 2006b:6; WSA 1999).

The eastern portion of the South of Market HOA was characterized by the slough and marsh wetlands southwest of Third Street, as well as a large area of sand dunes extending from Third to Seventh streets (Dean 2006b:13). In the 1850s, the City constructed a plank road along the Brannan Street alignment, linking Third Street to a point just south of Mission Creek (Dean 2006b:13).

Despite the dense industrialization concentrated around the Cove, Rincon Hill was, for a time, home to some of the City's leading families, who lived on large landscaped lots at an acceptable distance from the crowded conditions in nearby neighborhoods. Gold Rush and industrial capitalists were soon joined by those who made their money in the Comstock Lode. In 1869, the Second Street Cut devalued property on Rincon Hill and the elite soon found new locations, like Nob Hill and Pacific Heights, to call home (Dean 2006b:6).

A Chinese fishing village was located along the shoreline at the base of the steep, eastern side of Rincon Hill (Dean 2006b:14; WSA 2007:28, 92, 167-168). The men also worked as laborers in various pursuits, including Charles Hare's shipbreaking yard located on Rincon Point (Archeo-Tec 1987; Dean 2006b:14; WSA 2005b, 2007).

By the mid-1870s, the South of Market area was home to many single, young men often in jobs requiring few skills, frequently living in boarding houses. There were also families, especially before 1906, living in the area, but they were usually tenants with family heads typically in unskilled or semiskilled occupations (Issel and Cherny 1986:58). Kate Douglas Wiggins described the South of Market area in 1878:

> The scene is a long, busy street in San Francisco. Innumerable small shops lined it from north to south; horse [-drawn street] cars, always crowded with passengers, hurried to and fro; narrow streets intersected the broader ones, these built up with small dwellings, most of them rather neglected by their owners. In the middle distance were other narrow streets and alleys where taller houses stood, and the windows, fire-escapes, and balconies of these added greater variety to the landscape, as the families housed there kept most of their effects on the outside during the long dry season.
>
> Still farther away were the roofs, chimneys, and smokestacks of mammoth buildings – railway sheds, freight depots, power-houses, and the like – with finally a glimpse of the docks and wharves and shipping (Issel and Cherny 1986:61).

In the 1880s, San Francisco's economic life was centered in the area bounded on the west by Larkin Street, on the southwest by Seventh Street, and on the north and east by the waterfront. The gradual extension of the living and working environment into the Mission District and the Western Addition was accompanied by, and was dependent on the development of transportation lines that connected the new areas with the central business district. The Market Street Railroad began operations in 1857, and other lines also flourished by the 1880s. By 1900, nearly one in five San Franciscan's lived in the South of Market area. Many families lived in the two- and three-story wood rowhouses that characterized the area (Issel and Cherny 1986:25, 30, 58, 61)

The earthquake and fire of 1906 permanently transformed the land use and demographic pattern of the South of Market HOA. The building inventory was destroyed by fire. Within a day of the earthquake nearly all of the 62,000 residents of the South of Market Area were refugees. The middle and upper class residents did not return or at least not in significant numbers. Initially the white underclass residents, having no alternative, were allowed to return and allowed to construct sheet metal shanties. Eventually, temporary housing was allowed to be constructed for this largely un-employed single male population. Much of this "temporary" housing, which included cheap boarding houses and hotels, soon became permanent. Otherwise, the devastation resulting from the fire sharply propelled tendencies already underway – that of South of Market Area residents moving to newly constructed housing in the Mission District. Many of the industries of the South of Market area did not rebuild on the same sites, so that in many cases, building sites remained vacant and undeveloped well into the 20th century (Dean 2006b:16).

When vacant lots were rebuilt, they were often built to accommodate light industry or warehouses, a pattern that persisted in the South of Market HOA throughout the 20th century.

6.1 Archaeological Record

<u>Prehistoric Period</u>

The South of Market HOA has high potential for archaeological resources from the prehistoric period including both residential and non-residential sites. Shellmounds were recorded along the former bay shore, and a large shellmound, recorded by Nelson, and a site inferred to be a temporary camp or special-use location have been identified within the HOA. A range of site types is expected, including large occupation sites, special-purpose sites, and possibly isolated burials and artifacts.

<u>Historic Period</u>

The South of Market HOA has been intensively occupied since the Gold Rush period. Tent encampments sprang up to house gold seekers preparing to depart for the gold fields. Shortly thereafter, the area became heavily industrial, clustered around the metalworking industries. In addition, maritime trades lined the shoreline, and wealthy families resided atop Rincon Hill. Filling of the Cove produced more land on which to build, and the area remained primarily industrial until the 1906 earthquake and fire, after which the area was characterized by light industry and warehousing.

Historic site types that may exist within the South of Market HOA include:

- Domestic sites: these may be composed of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Early American period onward. Sites may include, but are not limited to, campsites, single and multiple family dwellings, household gardens, residential hotels and boarding houses, and the Chinese fishing village.
- Commercial sites: these may be composed of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Early American period onward. Sites may include, but are not limited to, retail stores, hotels and saloons, restaurants, and the Chinese fishing village.
- Institutional sites: these may be composed of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Early American period onward. Sites may include, but are not limited to, hospitals and hospital complexes (e.g., the U.S. Marine Hospital, St. Mary's Hospital), the Sailor's Home, the Home for Indigents, schools, and churches.
- Industrial sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, livestock slaughtering and hide processing locations, foundries, iron and brass works, gas works, blacksmiths, wood and metalworking plants, machine shops, factories, lithographers, paint shops, garment manufactories, printing and publishing shops, and auto repair shops.
- Storage sites: these may consist of architectural remains. They may date from the Early American period onward. Sites may include, but are not limited to, warehouses, coal storage, and metal storage.
- Buried ships: these may consist of ship remains and/or ship parts. They may date from the Early American period onward. Sites may include, but are not limited to, cargo ships, Chinese fishing boats, and shipbuilding, ship repair and ship breaking yards.
- Wharves: these may date from the Early American period onward. Sites may include, but are not limited to, wood wharves and docks, and the sea wall.
- Landfills: these may consist of unintentional and/or intentional fill, and fill associated with the 1906 earthquake and fire. They may date from the Early American period onward. Sites may include, but are not limited to, urban dumps, filling of Yerba Buena Cove, filling to level other portions of SOMA, and rubble from the 1906 earthquake and fire.
- Spanish/Mexican period sites: may consist of hollow features, sheet refuse, and/or architectural remains. Sites may include, but are not limited to, refuse deposits and livestock slaughtering and hide processing locations.
- Gold Rush period sites: may consist of hollow features, sheet refuse, fill and/or architectural remains. Sites may include, but are not limited to, residential and commercial sites.

6.2 Archaeological Research Issues

Remains of prehistoric occupation sites have been encountered within the South of Market HOA and there remains a high potential for prehistoric archaeological resources to exist within this HOA. All of the prehistoric research issues could potentially be addressed. These include:

P-A: Human Occupation and Landscape Evolution
P-B: Culture Chronology
P-C: Culture History
P-D: Vertebrate Archaeofauna Variability
P-E: Invertebrate Archaeofauna Variability
P-F: Coastal Colonization Patterns
P-G: Resource Intensification and Adaptive Change
P-H: Interaction and Social Change
P-I: Research Potential of Redeposited Sites

The South of Market HOA experienced intensive historic-period settlement beginning in the Gold Rush period, followed by dense industrial development. The area remained primarily industrial until the 1906 earthquake and fire. All identified research issues could be relevant to archaeological resources expected within the South of Market HOA.

H-A: Consumer behavior and strategies
H-B: Ethnicity and urban subcultures
H-C: Institutions
H-D: Industrialization and technology
H-E: Urban geography
H-F: Waterfront: buried ships and wharves
H-G: Interpretive potential
H-H: Waste disposal and dumps

The South of Market HOA has a high potential for studying research issues relating to maritime activities, such as ship building, repair and ship breaking, and wharf construction, as well as the Chinese fishing village. The HOA also has a high potential for studying industrialization and technology, particularly in the second half of the 19th century. Many of the workers who resided within the South of Market area came from other states within the U.S. and from other countries. Archaeological resources, representing the lives of these men and women, possess the potential to address research issues relating to ethnic boundary maintenance, domestic working class organization, social choices, and survival strategies, and their relationship to industry and commerce. Comparisons between the refuse left by working class residents and that of the elite living on Rincon Hill may reveal insights into both similarities and differences in behaviors and ideologies of distinct classes of people.

7.0 Mission Bay HOA

7.1 Archaeological Record

Prehistoric Period

The Mission Bay area has been submerged for the last two or three millennia. This area would have been available for prehistoric human use and occupation during the Middle or Late Holocene period, evidence of which could lie below existing fill and alluvial deposits. The discovery of prehistoric deposits is more likely in the northeast part of Mission Bay that historically formed the headland of Steamboat Point. No prehistoric sites have been discovered in the Rincon Point-Steamboat Point area but the heavy concentration of sites just to the north and the resource-rich prehistoric ecology of the vicinity are favorable to the eventual discovery of prehistoric deposits. Archaeological testing recovered five chipped obsidian waste flakes in three borings at depths ranging from six to ten feet below the surface not distant from what would have been the historic center of Mission Bay. This find was interpreted as either re-deposited prehistoric material or a submerged prehistoric site (Archeo-Tec 2003)

Historic Period

The earliest historical development in Mission Bay was the Steamboat Point boatyards (1854-1890s). During the later Gold Rush, the focal center of ship repair and construction was Steamboat Point. The boatyards of John C. North (1854-1860), Patrick Henry Tiernan (1856-1864), and Henry Owens (exact date unknown) were responsible for producing some of largest steamers (the *Chrysopolis*) and first three-masted schooners on the Pacific Coast. Most of these shipyards relocated to Hunters Point or Potrero Point in the 1860s. There were other ship construction yards (Alexander Hay's and Boole and Beaton's) on the southern shore of Mission Bay who produced coastal and river steamers from the 1860s to around 1900. During the 1860s there were also oyster farms, like that of the Morgan Oyster Company (Chavez 1987; Olmsted 1986). Although Tichenor's Marine Ways at Steamboat Point is outside the Mission Bay development it is an important archaeological site that has been archaeologically investigated. No other Steamboat Point boatyards have been archaeologically studied.

In expectation that an economic boom would follow from completion of San Francisco's linkage to the transcontinental railroad, a causeway was constructed connecting the terminus of Fourth Street at Steamboat Point with points further south, including Potrero Point and Hunters Point. Known as Long Bridge (constructed between 1865 and1867), the timber pile-and-platform causeway permitted San Francisco workmen to more easily reach jobs in the mills, factories, slaughterhouses, and tanneries on Potrero and Hunters Point (Olmsted 1986). In the popular imagination Long Bridge was a major urban recreational venue flanked by rowing club boathouses, saltwater bathhouses, the San Francisco Yacht Club, cafés, saloons, and Hobbs Wharf (used for smelt fishing). Although small portions of Long Bridge have been archaeologically encountered (Pastron and Touton 2008), no explicit research approach has been articulated for Long Bridge or the diverse archaeological resources associated with it. Pastron and Touton encountered piles and remnants of a concrete slab floor which they associated, respectively, with the Fourth Street Wharf (Hobbs Wharf, Cattle Wharf) and the Ariel Rowing Club boathouse but the potential historical significance of the these remnants have not been systematically evaluated with reference to a research design (Pastron and Touton 2006).

The filling of Mission Bay was not a planned or coordinated project but was the result of piecemeal incremental actions over a period of fifty years. In the five Peter Smith water lots sales (1851-1852), the City auctioned off several hundred water lots in Mission Bay. No immediate reclamation of submerged lands seems to have resulted from the sales. The water lot sales remained legally tenuous for years and were eventually voided by the U.S. Supreme Court. By contrast, the California Tidelands Act of 1868 allowed the Southern Pacific and Western Pacific railroads to acquire clear title to 150 acres of submerged Bay lands. The Tidelands Commission disposed of the remaining unreclaimed submerged land within Mission Bay, between 1868 and 1872. Gradually the shallow waters immediately bordering Steamboat Point were filled in by leveling the prominent sandy peak of Malokoff Hill (Lime Hill). By 1877, the northern portion of Mission Bay to the China Basin Channel had been filled in and within less than ten years, the southern side of the Channel had been filled in. China Basin Channel had become the import and distribution point for much of the City's construction-related materials (lumber, brick, milled wood, etc). The southern portion of Mission Bay was not completely filled in until 1910. As with other large water bodies in the City (Yerba Buena Cove, North Beach Cove, and Islais Creek Estuary), no archaeological research framework has been developed for investigating the technological and logistical process of filling in Mission Bay. Archaeological discoveries within Mission Bay have revealed evidence of the systematic planning and design behind the decades-long reclamation project of filling in of the Bay. Archaeological investigations in Dumpville (in use from the mid-1870s through 1895) and of a serpentine rock bulkhead (constructed in the 1870s or early 1880s) indicate infrastructural planning in accord with longer-range development objectives for Mission Bay.

Before the advent of a municipal refuse management system in San Francisco, refuse and garbage that was not recycled by the loosely organized scavenger system was typically dumped at specific points into the Bay and its inlets. From the late 1860s/early 1870s until 1895, the shoreline area between Sixth and Seventh streets along Berry Street was the garbage disposal location for the area south of Market Street known as Dumpville. A population reaching 150 resident scavengers ferreted out salvageable materials or objects from newly arrived cartloads of the City's discards which might then be mended, repaired or processed by micro-industries within Dumpville, commodifying the urban waste. Dumpville grew to an area of 20 acres and was perhaps the City's largest refuse disposal area prior to municipal waste incineration.

Until the early 1860s the Pacific Coast imported almost all glass products and glassware. After this time glass production industries in San Francisco became major regional producers. Excepting some short-lived, small-scale ventures, the Pacific Glass Works was the first successful glass works on the coast. Constructed in 1863 at the northern tip of Potrero Point at the southern end of the mouth of Mission Bay, the Pacific Glass Works produced an unusually broad range of glass products (bottles for pickles, fruits, mustard, catsup, medicine, beer, and wine; demijohns, and window panes). The glassworks used various glass-making technologies, including glass blowing and glass molds fired in pot furnaces. Pacific Glass Works' market sphere (South America, Australia, and the Pacific Islands) provides support for the idea that beginning with the Gold Rush, San Francisco exercised a hegemonic control over maritime commerce throughout the Pacific Rim. In 1865 the San Francisco Glass Works produced almost exclusively druggists' and chemists' glass ware. The glass works developed and patented a special glass melting pot and glass formula for this purpose. The colorless glass known as "Flint glass" distinguished these medicinal bottles from all others. The San Francisco

Glass Works was constructed on newly filled land just southwest of Steamboat Point. In 1868, the glass works burned down. An archaeological data recovery program on the site of the glass works recorded three features associated with the glass works: a composite "feature" consisting of remains of glass firing furnaces, chimney and waste glass; a refuse area of remains of molten waste products from the glass manufacturing process; and a dump-site containing worker refuse since some workers lived on site (Pastron and Vanderslice 2003).

In 1870 the San Francisco Glass Works re-opened in a new plant opposite the former location inland, also recently reclaimed from Mission Bay. Within six years, the company merged with the older Pacific Glass Works. The new company, the San Francisco and Pacific Glass Works (1870-1886), manufactured a much more diverse range of glass products than its predecessor operations, making soda, mineral water, culinary, medicinal, wine, and beer bottles. Archaeological field investigations at the site of the glass works documented three features associated with the glass manufacturer including a water pump glass manufacturing waste dump and a glass furnace or kiln (Pastron and Selover 2005). The archaeological investigations documented the diversity of glass products manufactured and the range of glass colors used. They identified two problem areas in production: bottle finishing and bottle embossing (Pastron and Selover 2005).

One Chinese archaeological site, the Wing Lee Laundry (late 1850s to c. 1877), has been excavated in Mission Bay. The Wing Lee site was rich with 10,000 artifacts recovered of which more than a tenth consisted of buttons (Pastron & Vanderslice 2002; Archeo-Tec 2003). In addition to artifacts clearly consistent with a laundry site, such as bitter bottles containing bright blue and holding bleaching powder, there were other items such as faunal bone, primarily from pig, and food storage containers present in such large quantities requiring further interpretation or another association. It was concluded that the 19th century Chinese business on the site also contained a restaurant or produced Chinese cuisine for some form of external consumption. In addition architectural features (wood porch, doorway threshold) were documented with clear indications that the archaeological deposit was the remains of a fire that had destroyed the laundry. The archaeological consultant conjectured that Wing Lee laundry was one of the many San Francisco Chinese laundries burned down in the Anti-Chinese riots of 1877.

7.2 Archaeological Research Issues

<u>Historic Period</u>

Boatyards

An archaeological study of the 1850s-1860s boatyards at Steamboat Point could shed light on the construction, repairs, and re-outfitting techniques used in the early 19th century. Such a study would reveal what types of ships were repaired and what regional naval architectural styles existed (there were differences in ship construction from state to state in New England). Given its proximity to the Chinese Fishing Village at Rincon Point, did the Steamboat Point boatyards build the fishing boats used by the fishermen at this village?

Long Bridge

Historical treatments of Long Bridge have emphasized its off-site importance to the City's transportation infrastructure, to the enhancement of the capacity to move goods and workers, and to accelerate the relocation and segregation of noxious industries to more remote locations to the south. Archaeologists have the opportunity to balance this picture of Long Bridge by studying its role as a major place for urban recreation in the latter 1900s. It was an important location for recreational fishing, personal health and fitness activities such as swimming, rowing, and sailing. Many amenities (restaurants, saloons, shops) are poorly documented.

The Reclamation of Mission Bay

To date there is no systematic research approach for archaeologically investigating the process of expanding the City through reclamation of historic water bodies and wetlands. The motivating factors and individual histories of development in different locales (e.g., Yerba Buena Cove, Mission Bay, or India Basin) vary. Yerba Buena Cove was filled, in part, as a by-product of the push of wharf stock companies and the City to harness maritime space through the technological device of extending timber pile-and-platform wharves further into the Bay and competitively erecting warehouses and commission merchant offices (or storeships) along the flanks of the wharves near anticipated ship arrivals. In contrast, little has been documented with regard to the history of the filling of Mission Bay. Was the construction of dikes or bulkheads important to the reclamation of Mission Bay and if so what construction techniques were used? Were ships ballasted and scuttled to serve as fill, foundations, or as part of a bulkhead? Were wharves modified to serve as basin walls? What were the various sources of fill used and why were these fill materials chosen? Did ground subsidence and building collapse resulting from the 1906 earthquake have any preservative effect on encapsulated structural and artifactual remains as did the fires of 1849-1851 on many buildings, ships and their contents of Early Gold Rush period San Francisco?

Dumpville

Dumpville deposits provide an opportunity to study the waste disposal and recycling processes in San Francisco from the 1870s to the mid-1890s, including the variable rates at which different kinds of objects and materials became part of the archaeological record in their life cycle. For example, porcelain objects may have been very slow to enter the archaeological record, as opposed to beverage bottles which entered the record quickly. It is clear that sometimes highly organized 19th century discard and recycling practices, distort the "mirror" value of the archaeological record. Archaeological investigations of Dumpville (Pastron and Touton 2007) have struggled with how to meaningfully interpret an artifactual record devoid of associations typically important to archaeologists such as discrete households or commercial establishments. The real importance of Dumpville may be the study of how the 19th century urban archaeological record was created, that is, what sort of things were discarded and at what rates, and even, what sort of things were not discarded at all. Such a study would have implications for the archaeological interpretation of urban contexts elsewhere.

8.0 Showplace Square, Potrero Hill, and Central Waterfront

Prior to the extensive filling that created today's Mission Bay and Central Waterfront neighborhoods, Potrero Hill sat on a small peninsula and rose to an elevation of approximately 100 feet. With the Bay on one side and extensive marshlands on the other, the promontory was not easily accessible by land (Dean 2006b:12). During the Mission period, Potrero Hill was used as pasture land for cattle. It was known as *Potrero Nuevo* and was adjacent to pasture land known as *Potrero Viejo*. The two grazing grounds were separated by an adobe wall that extended from modern-day 24th Street to a point near the southern end of Utah Street (Dean 2006b:12). One adobe house is known to have existed on the north side of Potrero Hill from ca. 1840 to ca. 1920 (Dean 2006b:12). A second adobe structure may have been built in the vicinity, although its location has not been documented.

Isolation from the City center and the direct access to the waters of the Bay did prove advantageous for businesses that would not have been welcome in a dense urban environment. Specifically, two makers of blasting powders were established on Potrero Point in the 1850s. Both Gibbons and Lammot and the Hazard Powder Co. constructed powder magazines and sold blasting powder for use in mining and excavation (Dean 2006b:6). Tubbs' Cordage Company, which made ropes for shipping and mining, was also established nearby.

In the 1860s and 1870s, two medical facilities were constructed on the isolated western side of Potrero Hill. The first, the Magdalen Asylum (later St. Catherine's), was built in 1865, and the second, the San Francisco County Hospital, was built a decade later (Dean 2006b:13).

The Long Bridge was constructed across Mission Bay in 1865, making Potrero Point much more accessible by land. Just a year later, the Pacific Rolling Mills, the first large-scale iron and steel mill in the region, was established at Potrero Point at the foot of modern-day 20th Street (Dean 2006b:8). The men who made the iron bars, rod, and railroad iron produced by the mill were largely of Irish descent. The residential neighborhood near the mill, located on Illinois between 20th and 22nd streets, soon became known as Irish Hill and contained a mix of boarding houses and single-family homes (Dean 2006b:8). Pacific Rolling Mills' Chinese workers appear to have been confined to a "shantie" that abutted the iron foundry (Dean 2006b:17). The Pacific Rolling Mills was only the first of several large-scale industries to locate at Potrero Point in the last half of the 19th century. By 1875, the City Gas Company and its large plant were in operation, and in 1883, the California Sugar Refining relocated there from the South of Market. Soon, Claus Spreckels' operation was joined by the extensive ship yards of the Union Iron Works (Dean 2006b:8). Construction of the iron works required extensive leveling of the Point. Prior to shipbuilding, the Union Iron Works produced mining equipment. With few skilled shipbuilders in San Francisco, many of the men who made up their new workforce were hired from countries like Scotland (Dean 2006b:8). Bethlehem Steel acquired the shipyard in 1905, and used it to produce ships during both World War I and World War II. The area remained largely industrial well into the 20th century, and the ship yards at Potrero Point were the neighborhoods largest employer.

The neighborhood now known as Showplace Square was once home to Butchertown, a concentration of stock yards, tanneries, glue factories, tallow works, and similar establishments that characterized the neighborhood throughout the 19th century (Dean 2006b:13). Attracted by the availability of fresh water and the ability to transport cattle to the Brannan Street Wharf, the businesses were clustered near Ninth and Brannan streets, and were initially far enough away from the City center to avoid complaints. By the 1870s, however, they had been asked to move south to Islais Creek, although it took years before this transition was complete. As was usually the case, the men employed by the stock yards and related industries lived nearby, many of them in boardinghouses and hotels.

The completion of the Bayshore Cutoff in 1907 made the area the primary access point for train traffic entering the City (San Francisco Planning Department 1996). Further, the creation of the Islais Creek Reclamation District in 1925 was a catalyst for 20th century development of the area between 25th Street and Islais Creek (San Francisco Planning Department 1996). Marshes and tidelands were filled, and during World War II, temporary housing was constructed, although the area was always primarily a center for jobs and not homes.

In an earlier era, the port was the entry and exit point for manufactured goods in the Central Waterfront, Showplace Square, and Potrero Point HOA. The completion of the I-280 freeway in 1973, however, ensured that businesses oriented towards warehousing and truck distribution would continue to use the neighborhood as a base of operations.

8.1 Archaeological Record

Prehistoric Period

Although there are no known prehistoric sites within the Central Waterfront, Showplace Square, and Potrero Point HOA, the availability of abundant food and material resources within the area indicates that there is potential for prehistoric archaeological resources to exist, including sites such as seasonally occupied residential sites, and non-residential sites.

Historic Period

During the Mission period, Potrero Hill was used for stock grazing. Due to its inaccessibility from the main settled portion of San Francisco, the area was slow to develop. Following improved access routes, heavy industry moved to Potrero Hill. Showplace Square was originally home to Butchertown, before it was relocated farther south. The port was the main entry and exit point for manufactured goods in the Central Waterfront, Showplace Square, and Potrero Point HOA.

Historic site types that may exist within the Showplace Square, Potrero Hill, and Central Waterfront HOA include:

- Domestic sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, single and multiple family dwellings, and residential hotels and boarding houses.

- Commercial sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, sites associated with Mission ranching, retail stores, hotels and saloons, and restaurants.
- Institutional sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Early American period onward. Sites may include, but are not limited to, medical facilities (e.g. the Magdalen Asylum, the San Francisco County Hospital), schools, churches, and fire and police stations.
- Industrial sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Late Gold Rush period onward. Sites may include, but are not limited to, blasting powder manufacturers, cordage/rope manufacturers, iron and steel mills, gas works, sugar refineries, iron works, soap manufacturers, slaughterhouses, tanneries, glue factories, tallow works, food and oil processing plants, lumber yards and planing mills.
- Storage sites: these may consist of architectural remains. They may date from the Late Gold Rush period onward. Sites may include, but are not limited to, warehouses.
- Buried ships: these may consist of ship remains and/or ship parts. They may date from the Early American period onward. Sites may include, but are not limited to, cargo ships, and shipyards (e.g. Union Iron Works).
- Wharves: these may date from the Early American period onward. Sites may include, but are not limited to, wood wharves.
- Landfills: these may consist of unintentional and/or intentional fill, and fill associated with the 1906 earthquake and fire. They may date from the Late Gold Rush period onward. Sites may include, but are not limited to, urban dumps (e.g. Dumpville), filling of the Bay, creeks, marshes and tidelands.
- Spanish/Mexican period sites: may consist of hollow features, sheet refuse, and/or architectural remains. Sites may include, but are not limited to, dwellings and boundary markers.

8.2 Archaeological Research Issues

There is potential for prehistoric archaeological resources to exist with the Central Waterfront, Showplace Square, and Potrero Point HOA, and all of the prehistoric research issues could potentially be addressed. These include:

P-A: Human Occupation and Landscape Evolution
P-B: Culture Chronology
P-C: Culture History
P-D: Vertebrate Archaeofauna Variability
P-E: Invertebrate Archaeofauna Variability

P-F: Coastal Colonization Patterns
P-G: Resource Intensification and Adaptive Change
P-H: Interaction and Social Change
P-I: Research Potential of Redeposited Sites

The Central Waterfront, Showplace Square, and Potrero Point HOA experienced historic-period development later than the surrounding HOAs. There may be occasional deposits associated with the use of the area for stock grazing during the Mission period, but Gold Rush period sites are not anticipated. All identified research issues could be relevant to archaeological resources expected within the Southeastern HOA.

H-A: Consumer behavior and strategies
H-B: Ethnicity and urban subcultures
H-C: Institutions
H-D: Industrialization and technology
H-E: Urban geography
H-F: Waterfront: buried ships and wharves
H-G: Interpretive potential
H-H: Waste disposal and dumps

The Central Waterfront, Showplace Square, and Potrero Point HOA has the potential for studying research issues relating to industrialization and technology, and ethnicity and urban subcultures. Many of the workers, who resided in neighborhoods near their place of work, came from other states within the U.S. and from other countries. Archaeological resources, representing the lives of these men and women, possess the potential to address research issues relating to ethnic boundary maintenance, domestic working class organization, social choices, and survival strategies, and their relationship to industry and commerce. Comparisons between the refuse left by non-Asian immigrants and that of Chinese workers may reveal insights into both similarities and differences in behaviors and ideologies of distinct classes of people, as well as the ideologies of their employers. Likewise, archaeological resources associated with Dumpville may allow an examination of the values, behaviors and ideologies of the poor who lived alongside the dump.

9.0 Northeast San Francisco

9.1 Archaeological Record

<u>Prehistoric Period</u>

Few prehistoric sites are documented for the Northeast HOA. Within the Late Holocene period, permanent or semi-permanent prehistoric settlements were present along the bluff bordering the Bay in the Fisherman's Wharf – Fort Mason area (CA-SFR-23, 29, 30 and 31). All four sites are shell middens and generally have contained artifactual and ecofactual material (e.g., worked obsidian, *Haliotis* disk bead, fire cracked rock) and features such as hearths. Human burials were present in the

Fisherman's Wharf site (CA-SFR-23) which was curio-hunted during the 1850s (Taylor 1861). The Fort Mason sites have been dated to approximately A.D. 245 and AD. 475. The Fort Mason sites are known to have substantially undisturbed deposits and there is a reasonable probability that intact deposits are still present at CA-SFR-23. No clearly intact prehistoric deposits have been encountered in the central or eastern parts of the Northeast HOA. At what would have been the point of land enclosing Yerba Buena Cove to the north (Clark's Point) near Broadway and Front Street, two prehistoric isolates (worked basalt and obsidian cores) were discovered (Archeo-Tec 2007). At the Pan Magna Plaza/International Hotel project site a large obsidian nodule was recovered, possibly associated with a hawk long bone and unidentified faunal bone fragments (Archeo-Tec 1996). The absence of documented prehistoric shellmound sites around Yerba Buena Cove may reflect the failure to anticipate and document such sites during development up through the 1960s or conversely the absence may reflect a prehistoric settlement preference for the SOMA that possessed greater wetland and freshwater resources such as Sullivan Marsh and Mission Bay. The so-called "BART Woman" (CA-SFR-28) is the oldest prehistoric site (approximately 5,000 years before the present) yet discovered in San Francisco. The deposit consisting of fragmentary human bones within an organic matrix was discovered 75 feet below the surface during construction of the Civic Center Station. The Civic Center prehistoric burial together with several subsequent early prehistoric sites discovered in the San Francisco Bay Area testify to the need to anticipate prehistoric deposits of greater antiquity that have become deeply buried or submerged due to large-scale geological and climatic changes since the Pleistocene era.

Yerba Buena Period (1835-1848)

Yerban Buena was the name of the original Mexican mercantile settlement that after falling under U.S. control became re-christened San Francisco. Initially a hide-and-tallow trading settlement, Yerba Buena came to adopt a Mexican polity with an *alcalde* (mayor), *sinico* (treasurer), and an *ayuntiamento* (governing council). The majority of the population consisted of British, American, and French ex-patriots who in addition to hide-and-tallow related trades (slaughterhouse, tannery, hide houses, Customs house), operated a brewery, bakery, carpentry shop, blacksmithy, grist mill, cabinet shop, and washhouse. Amenities included several "groggeries" and "bowling alleys" and for the probably ex-neophyte Native American laborers working for Richardson, a *temescal* (sweat house). By 1848, Yerba Buena had from 150 to 200 adobe and wood-frame buildings, two wharves (stone and timber), and a cemetery at Clarks Point. The settlement roughly occupied the area bounded by Battery, Bush, Mason, and Vallejo streets. There have been relatively few archaeological discoveries of Yerba Buena period resources, by comparison, for example with Gold Rush period archaeological sites. The apparent difference in the relative state of preservation between Yerba Buena period and Gold Rush period sites may be in part due to the fact that many Gold Rush period structures were constructed on pilings over water which burnt and collapsed in the great fires of the early 1850s and have therefore been anaerobically preserved. Yerba Buena period structures were, by contrast, nearly all land-based and so more likely to have been completely destroyed by the 1850s fires or subsequent development. Prominent among Yerba Buena period archaeological sites was the discovery of remnants of San Francisco's first wharf, the 1839 Leese-Vallejo stone pier discovered in North Beach (Archeo-Tec 2007). Constructed by Jacob Leese and Salvador Vallejo, together with a warehouse, for use by the Russian American Co. at Fort Ross, the exposed wall section of the pier was formed of dressed mortared granite blocks in pattern known as Uncoursed Roughly Squared. The same archaeological investigation also documented features related to Clark's Wharf and warehouse (1847/1848). One feature was a 95-foot-long section of a dressed sandstone block wall interpreted as a retaining wall for the timber wharf. Also exposed were burned stubs of redwood piles and a collapsed wood plank floor structure identified as remnants of Clark's warehouse. The wharf and warehouse were interpreted as having burned and collapsed in the great fire of May 3-4, 1851. Archaeological investigations at the Pan Magna Plaza/International Hotel site recovered an extensive collection of used carpentry/woodworking tools, a fragment of a planked floor, and a pit filled with wood shavings. Also found was a domestic deposit consisting of household furnishings, glassware, ceramics, and children's items. These archaeological deposits were interpreted as post-1849 in origin (Archeo-Tec 1996) but for reasons that were unclear. No other association for the assemblages was offered. In the absence of clear artifactual or depositional evidence to the contrary, the probable association for the Pan Magna features and archaeological assemblages would seem to be the residence and carpentry shop of John C. Davis who occupied the site from 1839 to 1847 and his widow who lived there until the 1850s. Lastly, an archaeologically excavated artifact-filled well (CA-SFR-117H) at 505 Montgomery Street was interpreted as associated with the Hudson Bay Company store building (1838-?) which for many years was the most prominent visual landmark in Yerba Buena.

Early Gold Rush Period (1848-1851)

The most spectacular archaeological discoveries from this signature period in San Francisco history are the storeships. During the period between 1849 and 1852 storeships were ships no longer fit for water transport that were sturdily grounded by some combination of pilings, bridgeways, wharves, and ballasting to function as buildings. Most storeships served as warehouses for commission merchants who regulated the import, export, transshipment, and sale of commodities of all types. Storeships were also used for a wide range of other uses such as offices, hotels, saloons, lodgings, chapels, prisons, and asylums. Estimates vary as to the number of buried Gold Rush period storeships still present in San Francisco. Three storeships, the *Niantic, Apollo*, and the *General Harrison*, from this period have been discovered and archaeologically investigated. All three storeships burned in the fire of May 3-4, 1851. The *Apollo* has been encountered several times (1901, 1921, 1925) and remnants of it are probably still present beneath the Federal Reserve Bank. The *Apollo*'s rudder and an associated artifact assemblage were donated by the Federal Reserve to the San Francisco National Maritime Museum. The *Apollo* was a storeship that housed a variety of tenants (1849-1851). The *Niantic*, the City's most well-known Gold Rush storeship, was a three-masted ship converted to a storeship and hotel in 1849. When the successor Niantic Hotel was demolished in 1872, a portion of the ship's hull was removed. In 1978, the discovery of the remains of the *Niantic* during construction of the current 505 Sansome Street building and the subsequent treatment of the remains resulted in a cultural resource management scandal of national proportion. The archaeological mitigation provisions of the project environmental report required no anticipatory archaeological treatment. When, in the course of the project, the excavation contractor accidentally discovered the *Niantic*, any preservation or data recovery efforts were at the discretion and goodwill of the project proponent. Protests by the National Maritime Museum, the National Trust for Historic Preservation, and the State Historic Preservation Office resulted in emergency mitigatory actions. Archaeological salvage, was undertaken by the National Maritime Museum funded by the National Trust, as well as by volunteers. The work included photogrammetric documentation, removal of a cross-section of the midship, and recovery of select associated artifact assemblages. Smith completed a graduate thesis on the cargo assemblages recovered from the *Niantic* (Smith 1981). The bow of the *Niantic* remains under the Transamerica Building's Redwood Park.

In 2001, remains of the *General Harrison* were discovered. The *General Harrison* was an 1840 merchant vessel that was converted to a storeship in 1850 by E. Mickle & Co., a Chilean-American commission merchant (Delgado et al. 2007). The subsequent archaeological study of the *General Harrison* and of the recovered merchandise associated with the storeship (Delgado 2006) proved important for several reasons. The *General Harrison* is the most complete and intact of any encountered Gold Rush period vessel (with the exception of the *William Grey*). It is the only Gold Rush storeship that has been comprehensively excavated and analyzed. Documentation of the *General Harrison* along with that of the *Niantic*, *Apollo*, and of the Sacramento storeships *La Grange*, *Ninus*, *Dimon*, and *Sterling* has contributed significantly to the knowledge of early 19th century naval architecture, an enterprise involving few, or no architectural plans. The analysis of 1851 merchandise recovered from the *General Harrison* (Delgado 2006) has resulted in a new, revised view of the shift of Euro-American trade into the Pacific basin. Delgado credits this shift, rather than the discovery of Gold and ensuing Gold Rush, as the primary impetus for the emergence of San Francisco as a major American city and port, with San Francisco commission merchants playing the primary role in brokering these changes.

In addition to buried storeships, several Early Gold Rush period commercial archaeological sites have been excavated (e.g., Archeo-Tec 1992; Kelly 1989; Pastron et al. 1990) including Hoff's Store, a store serving the local Chinese community, and a store/residence possibly associated with the commission merchant Philip Caduc. The Hoff's Store archaeological project resulted in the recovery of an unusual quantity (28,000 items) of Gold Rush period store merchandise (Pastron 1990). Various interpretations have been put forward as to the nature of the enterprises associated with the merchandise assemblage based on aspects of the collection, which included items such as construction hardware, maritime supplies, Chinese export porcelain, military supplies, foodstuffs, and footwear. Delgado originally argued that Hoff's Store was in fact a ship chandlery. More recently Pastron (1990) has taken the view that the site is a mixed array from various commercial establishments (Delgado 2006). The Hoff's Store collection will continue to have high interpretive value, since major components of the collection such as Chinese brownware, Euro-American ceramics, textiles, and jewelry have not yet been analyzed. The archaeological site at 343 Sansome Street (Kelly 1989) is also associated with a store or warehouse on Howison's Pier. The archaeological site represented the remains of a building on pilings with two or more rooms that had burned and collapsed in the fire of May 1851. The building likely belonged to the commission merchant Mohler, Caduc & Company, and Philip Caduc may have occupied the living quarters. Caduc constructed Howison's Pier in 1850. Approximately 6,000 items were recovered representing a wide range of merchandise including medicines, earthenware dining- and servingware, porcelain dining-ware, foodstuffs, and remains of butchered meats apparently intended for restaurant use. The close spatial association of an iron cot, brazier, leather male clothing items, fragments of straw and mattress ticking, and three daguerreotypes suggested a second room used as a sleeping quarter or a residence. The portrait images in two of the daguerreotypes have been restored but the subjects have not been identified. A large iron safe with door slightly ajar and a board axe protruding from the interior suggest a hasty attempt to salvage the safe's contents in the 1851 fire (Kelly 1998). The 600 California Street archaeological site revealed the remains of an Early Gold Rush period Chinese store that catered to a Chinese clientele (Archeo-Tec 1998) that burned in the May 1851 fire. Among recovered assemblages from the store inventory were stacked bulk comestibles in large brownware jars, blue-on-white patterned rice bowls, Chinese liquor, and a large number of utilitarian brownware. In addition to items of daily usage, were decorated porcelain serving and dining pieces for Chinese traditional celebratory occasions or for the households of the Chinese elite. The Gold Rush period wharf represents an archaeological resource that is of primary historical importance because of its crucial role in the development of San Francisco as the leading maritime entrepôt in the Pacific basin.

The near-universal wharf type constructed in San Francisco during this period was the timber pile-and-platform projecting wharf or pier. Less use was made of marginal wharves or cribwork wharves than in the eastern seaboard (Bone 1997; Dean 1997). However, a crib wharf was apparently documented at 343 Sansome Street site (Kelly 1989) and the 1839 stone masonry Leese-Vallejo Wharf was probably based on the European-type masonry block-and-bridge pier. The choice of the pile-and-platform wharf is economical where timber is available and labor costs are high. The cribwork wharf and dressed stone wharf types, by contrast, require the use of a large organized labor force and derricks and rigs (Dean 1997). Early Gold Rush period wharves have been frequently encountered but rarely studied or documented.

Late Gold Rush Period (1852-1860)

Archaeological sites dating from the Late Gold Rush period are characterized by fewer sites, substantially smaller artifactual assemblages, but a broader range of historical associations. The *William Gray*, a storeship discovered in 1979, qualifies as the most important archaeological find from this period (Pastron et al. 1981). Constructed in 1827, the 285-ton, three-masted ship was used as a storeship by Frederick Griffing at Shaw's Wharf until 1852, when it was scuttled to form the base for the construction of Griffing's Wharf. In consultation with SHPO, the decision was made to record the storeship and re-bury it for future investigation. The *William Gray* (CA-SFR-104/H) is the most complete and intact Gold Rush period vessel discovered to date in San Francisco. The structural remains of John Cowell's warehouse, dating from the 1850s, were exposed and documented within the same site as the 1839 Leese-Vallejo stone pier and Clark's 1847/1848 wharf and warehouse (Archeo-Tec 2007). The archaeological work revealed the original foundation of Douglas Fir planks over Telegraph Hill sandstone rock fill and segments of the brick masonry walls of the first floor of the Cowell's three-story masonry warehouse. This structure later served as the basement for subsequent buildings on the site. Two well preserved brick floors (CA-SFR-117H) were discovered in the 505 Montgomery Street project site of which one floor (mortared brick in a herringbone pattern) was associated with the banking house of James King of William (1850) and the other floor (unmortared) was dated to 1849/50 but no clear association was determined. In the North Waterfront area, fragmentary remains of Meigg's Wharf (1852-1881) were exposed and documented in 2005 (CA-SFR-163H). Meigg's pier, constructed to accommodate lumber schooners, was the longest wharf in the City. The feature consisted of redwood timbers, a crosspiece, and a wooden pile (Praetzellis 2005). A vertical ferrous cylinder was conjectured to be a part of a crane or elevator system for loading small watercraft. In the late 1990s, remains of Fort Gunnybags, the building that served as the headquarters of the 2nd Vigilance Committee in 1856, were discovered (Pastron et al. 2000). The 2nd Vigilance Committee was an ad hoc organization of local grandees that in 1856 supplanted the legally constituted authorities, widely viewed as corrupt and impotent, in maintaining law and order. During their occupation of the nearly block-long, granite, pillared building, the Committee held a State Supreme Court justice hostage for nearly two months until he vacated his seat. Archaeologists uncovered and documented structural remains including part of the redwood flooring and the complex foundation composed of several alternating layers of Douglas Fir planks, foot-square beams, and sand fill. Although a good sample of Gold Rush period artifacts were recovered, none could be clearly associated with the 1856 Committee.

The site of Yerba Buena Cemetery (1850-1867) is now covered by United Nations Plaza and several public and private buildings. In 1852, the Yerba Buena Cemetery received reinterred burials from the North Beach cemetery which dated from at least the 1840s. The Yerba Buena Cemetery (YBC) served as the first municipal public cemetery, hosting victims of the annual cholera epidemics of 1850-1854. The cemetery was closed after the creation of Lone Mountain Cemetery and during 1867-1868 burials in YBC were transferred to the new cemetery. In 1870 YBC was converted to a public park. Of the approximately 9,000 grave lots in YBC, as few as 1,868 burials may have actually been re-located (Basin Research Associates 1994). Nearly all construction projects within the former site of YBC have encountered burials as follows: Methodist Book Concern (1906) – 25 burials; Federal Building (1932) – 20 burials; Main Library (1992-1993) – over 59 burials; Asian Art Museum (2000-2001) – over 200 burials. YBC has demonstrated substantial research value in a number of areas, including the study of 19th century epidemiology, diversity of treatment of the dead, the prominence of fist fighting, and of the routine carrying of heavy loads by certain population groups (Basin Research Associates 1994).

Later 19th & Early 20th Century (1860-1906)

Little serious archaeological work has focused on this period in the Northeast HOA for at least two reasons. The Northeast HOA has yielded comparatively few archaeological features (e.g., artifact-filled privies, wells, pits) due to early urbanization and installation of public utilities, which subverted the need for privies, wells, and trash pits. And archaeologists working without the benefit of a research design have not grasped the research significance of post-Gold Rush period deposits in this area. Important archaeological resources from this period include the Old Sea Wall, constructed between 1867 and 1868. Among early San Francisco's problems in developing an efficient harbor for coastal and trans-oceanic trade, such as obstruction by abandoned vessels and poor maintenance of proprietary wharves, was the continuous silting up around the piers. As long as the wharves were privately-owned, the wharf companies were unable to collaborate on a joint effort to construct a badly needed bulkhead along the shoreline. After the State Harbor Commission assumed control of the City's port in 1864, plans were developed to construct a seawall to reduce the necessity for constant dredging. The alignment of the Old Seawall extends approximately from Green Street to Mission Street along Front Street, and along the western edge of the Embarcadero. The Old Seawall was designed to be constructed of rock rip rap with a base 60 to 100 feet wide in a channel 20 feet below mean low tide and narrowing to an apex 13 feet wide. Capping the base was to be a concrete pediment supporting a nearly 10 foot high masonry wall, faced with ashlar granite. The Old Seawall has been investigated archaeologically several times (e.g., Archeo-Tec 1981; William Self Associates 1996, 1998) and was determined to be NRHP-eligible in 1979. The main focus of archaeological research has been the documentation of any deviations of the Old Seawall as constructed from the original design specifications.

The archaeological monitoring program for the Main Library project resulted in the archaeological exposure and the Historic American Building Survey/Historic American Engineering Record-level documentation of the remaining foundations and walls of the former San Francisco City Hall constructed 1871-1897 (Basin Research Associates 1994). The design and construction plans of this building are no longer extant. The archaeological field project was able to expose and record the foundations of the southern end of the Larkin Street Wing and the Portico Wing. Archaeological/architectural analysis of the City Hall remains addressed several research issue related to the historical record of the building's construction. There was no evidence of grossly inferior materials, substandard workmanship, or unaccountable material failure.

Sailors' boardinghouses and sailors' saloons represent an important archaeological resource along the waterfront. These institutions were important in sailors' land-side lives as venues of camaraderie and identity (boardinghouses and saloons were oriented to sailors of specific ethnicities/national origin and vessel-types). They were also important in maritime commerce for their role in shanghaiing practices (abducting sailors and non-sailor to involuntarily). To date the only sailors' boardinghouse that has been archaeologically investigated was in SOMA but historically these institutions were more concentrated in the Northeast HOA.

9.2 Archaeological Research Issues

Prehistoric Period

Is the absence of documented prehistoric settlement sites around Yerba Buena Cove, the result of destruction of such sites by urban development since the 1850s or an indication that prehistorically this area was spurned for settlement in favor of more resource abundant SOMA locations?

Our ignorance of the Early and Middle Holocene period Bay Area ecological landscape, requires us to explore different approaches to anticipating deeply buried prehistoric site, like CA-SFR-28, such as the identification of prehistoric living surfaces or paleosols through geoarchaeological analysis.

Yerba Buena Period (1835-1848)

What can the archaeological record tell us about the maritime trading network of this small hide-and-tallow trading community? We know that the importation of Chinese goods in California was strong well before the Gold Rush, but was this embrace of things Chinese the consequence of consumption choice or consumption constraints?

Early Gold Rush Period (1848-1851)

The study of archaeologically recovered merchandise assemblages from Gold Rush period storeships, warehouses, and commercial establishments may cause us to revise or set aside much of the written history of this period, if further discoveries confirm archaeological findings to date that suggest the Gold Rush was a convenient catalyst, not a formative cause, of San Francisco's rapid urbanization and emergence as the leading maritime entrepôt in the Pacific basin in the 19th century. Future archaeological investigations of the Early Gold Rush period should test the suggestion that waterfront and municipal development during this period, far from its conventional historical characterization as myopic and irrational, was conducted from a broader point-of-view, controlled by the long-range plans and objectives of commission merchants.

Since ships were generally constructed in the 19th century without plans, what can the archaeological record reveal about the 19th century naval architecture?

Although pre-1852 wharves have been frequently encountered in San Francisco, they have been, at best, poorly documented. Aesthetically less appealing to the archaeologist's eye than Gold Rush storeships or artifact assemblages, the archaeological value of wharves may be slighted by archaeologists from a failure to develop a research context for their investigation. Themes suggested here (the planned development of San Francisco as the major port for Pacific trade, the port planning role of commission merchants) may provide some initial lines for questioning the choices for wharf type, design, and technological adaptations.

Late Gold Rush Period (1852-1860)

Research issues identified for the Early Gold Rush period have applicability to Late Gold Rush period San Francisco, but examined against an economy, society and land use pattern that had become more diversified, stratified, and geographically delineated. As the waterfront migrated east- or bay-ward, the adaptation of buildings, storeships, and structures to urban foci is discoverable only through archaeology.

Of the several archaeological field investigations that have been undertaken within the former Yerba Buena Cemetery (1850-1867), little opportunity for an adequate level of archaeological analysis has been afforded and none have been guided by clear research objectives. The YBC likely contains thousands of burials, some dating from the Yerba Buena period (1835-1848). Aside from mortuary studies, YBC is an enormous reservoir of data for modern epidemiologists studying the trajectories of various diseases.

Later 19th & Early 20th Century (1860-1906)

Archaeological remains from the late 19th and early 20th century had been under-studied by archaeologists prior to the efforts by Caltrans-managed freeway repairs stemming from the 1989 Loma Prieta Earthquake. While the textual and photographic documentation for this period may be more plentiful than that for earlier periods, the archaeological record offers a more representative view than the documentary record. Whereas the written record always has an author with a motivation to write a particular story, the archaeological record is intrinsically authorless and unintentional and therefore reflects less bias than the written record. In approaching urban archaeological phenomena of this period, archaeologists have begun to reexamine the commonly assumed 19th century functions, purposes, and meanings of the phenomena they investigate (e.g., orphanage, hand laundry, prostitution house, Chinese shop, or salt-water bath house).

10.0 West San Francisco

West San Francisco includes the Marina, Western Addition, Japantown, Buena Vista, Richmond, Golden Gate Park, Outer and Inner Sunset, Central, Ingleside, South Central, and Bernal Heights.

10.1 Archaeological Record

Prehistoric Period

Documented prehistoric sites are sparse and, to date, are limited to the shoreline in the West San Francisco HOA. There are two midden sites recorded in the Presidio (CA-SFR-26 and 129), and three recorded prehistoric sites at Lands End (CA-SFR-5, 20, 21). One of these sites (CA-SFR-129) may represent a sizable village that may be associated with the village of *Petlenuc*, known from the ethnohistoric record. The Lands End sites were first documented in Jones' coastal shellmound survey in 1901 and may refer to portions of the same site. Investigations at SFR-5 identified a temporary food processing and procurement station. Covered by a vast sand dune field for at least the last 2,000-3,000 years, few locations within the West San Francisco HOA would have been hospitable for human occupation. Stable Middle or Early Holocene geologic deposits that could have sustained prehistoric human occupation may be present below the more recently deposited deep sand deposits that characterize the area.

Historic Period

Remote, windy, with frequent fog, and largely composed of a vast sand dune field, the Western San Francisco HOA remained largely undeveloped until the late 1860s and 1870s. In the 1860s, dairy farmers in the northwest part of the region sponsored construction of the Point Lobos Toll Road (which is now Geary Boulevard). Beginning in 1854, the area south of Lone Mountain became the focus of the development of a cemetery district for the city, under the belief that the area was remote from any foreseeable development pressure. The cemeteries were segregated along confessional or fraternal organization lines. Lone Mountain Cemetery (1854), Calvary Cemetery (1860), Masonic Cemetery (1864), Odd Fellows Cemetery (1865) and Laurel Hill Cemetery (1867). By the late 1860s Golden Gate Cemetery, a municipal cemetery was established at Lands End (today's Lincoln Park). The development of the large park-like cemeteries followed a mid-19th century trend away from simple graveyards ancillary to parish churches to elaborately landscaped memorial parks, with ornately sculpted monuments and mausoleums, colonnades and fountains. Although the City's cemeteries were mandated by ordinance to relocate all burials to Colma, archaeological discoveries have demonstrated that a large proportion of the burials were not removed. One of the most interesting archaeological studies of 19th century cemetery populations is the osteological study of a sample of 90 adult burials from the more than 500 human burials recovered during the Palace of Legion Honor expansion project (Buzon et al. 2005). Unlike the ornately landscaped private cemeteries between Laurel Heights and Lone Mountain, Golden Gate Cemetery was a public cemetery used to bury the poor and indigent, victims of sudden, large epidemics, and people of Chinese ancestry. Buzon and coauthors studied evidence of the living conditions of economically disadvantaged, 19th century urban populations through the osteological analysis of their remains (Buzon et al. 2005). The study excluded remains from Chinese burials and children. The study revealed many health problems typical of the urban poor, but also found a high incidence of enamel hypoplasia in the San Francisco population, which could indicate a specifically local problem of malnutrition, impure drinking water, and/or crowded living condition. The number of weapon wounds in the Golden Gate Cemetery/Legion of Honor collection suggests the frequency of interpersonal violence among these populations in San Francisco.

Archaeological investigations during the California Academy of Sciences Project (William Self Associates 2008) recovered artifactual material associated with the Cairo Street exhibit in the Oriental Village of the 1894 Midwinter Fair in Golden Gate Park. The collection included many souvenir items such as coin charms, metal pins (some impressed with writing in Arabic script including one with the *Tahlîl* - the beginning of an important Islamic prayer), a spoon labeled "Turkey", glass perfume vials (some embossed with Arabic personal names), and a faux bone fan handle. Other materials may have been related to the exhibit or participants' costumes (earrings, glass bangles, beads, sequins, buttons, bells, textile fragments). Souvenir items from other exhibits (Agricultural Building, Mines and Mining Building) were also recovered, as well as faunal remains from cuts of veal, lamb, and deer, associated with eateries on Cairo Street or other nearby food concessions. The final report notes that in 19th century European and American fairs and expositions, an important part of the purpose of featuring "ethnological displays" (and of accompanying guidebooks by which to interpret them), was to reinforce prevailing existing Victorian stereotypes of the cultures of other societies.

Shipwrecks are another resource type that can be anticipated within the shoreline margin of the West San Francisco HOA. A magnetometer survey and testing project carried out for a seawall construction project along Ocean Beach (Espey, Huston, & Associates 1988) verified the remains of the *King Philip* (1856 clipper ship) and the *Reporter* (1876 lumber schooner) in or near Ocean Beach. Another shipwreck tentatively located, was the *Atlantic* (1851 New Bedford-built whaling barque). Although in most cases shipwreck remains are within lands under the jurisdiction of the Golden Gate National Recreation Area (GGNRA), some shipwreck sites are within city jurisdiction.

Although the West San Francisco HOA is largely residential, little archaeological investigation has been undertaken of domestic contexts. One exception is the investigation of archaeological features associated with a prosperous 19th century Irish family discovered during excavation for a new medical office building for the Kaiser Permanente Hospital campus (Clark et al. 2005). Three features including an artifact-filled brick well and two trash pits were associated with the Daniel Sheerin household living on the site from at least 1870 to 1903. Sheerin owned a successful nearby stonecutting yard that in addition to supplying stonework for the cemetery district just to the west, did the stonework for a number of prominent San Francisco buildings including the Pacific Stock Exchange and the Bank of California. The Sheerins had eight children, servants, and various boarders in their household. Daniel Sheerin was a leader, or at least active, in several local Irish religious, political, benevolent, and fraternal organizations (e.g., Ancient Order of Hiberians, Knights of St. Patrick, the Irish National League, and Irish National Land League). An abundant and diverse collection of domestic artifactual material was recovered from the three features including clothing, shoes, food, beverage and medicinal bottles, tools, toys, ceramics, glass beads, toiletries, and faunal remains. There were strong indications that the deposit occurred around 1878-1879. The relative lack of fine ceramic ware and the absence of signs of thriftiness (such as the retention of bottles that could have been refilled or returned for deposits, the absence of wear on shoes, the discard of clothing with beads and buttons intact) seemed to indicate a family that lived modestly for their means. The faunal remains, primarily adult chicken but also some mutton/lamb and beef, seem to have resulted from a single event. The large ceramic collection appeared to be almost "an entire household supply of dishes and perhaps more" (Clark et al. 2005). Although there were strong indicators that the large domestic deposit was consistent with some catastrophic event, archaeologists found no evidence of a fire or seismic event. No alternative explanation was identified for the large quantity and broad range of domestic material discarded in the pits and well.

10.2 Archaeological Research Issues

Prehistoric sites are of concern near historically known bodies of water, including the coast, Laguna Honda, Washer Woman's Lagoon and watercourses such as Lobos and Islais creeks. Early and Middle Holocene prehistoric sites may be present at the base of, or below sand dune deposits, requiring special research approaches and methods geared towards the likely sparseness and fragility anticipated of the archaeological footprint of human populations of this time.

Archaeological deposits and features associated with 19th century fairs and expositions have research importance related to shifting values in Victorian urban amusements and technological innovations that occurred with these shifts (for example, the transition from the morally uplifting scenic railways to the thrill-oriented roller coaster). Ethnological exhibits sent mixed messages, de-mystifying and yet reinforcing mythical visions of Native Americans and non-European peoples. Many of the exhibits in the 1854 San Francisco Midwinter Fair had been re-located from the Columbian Exposition in Chicago. As a successful prototype, how was the Midwinter Fair different from the Chicago Exposition? How did the Midwinter Fair localize or otherwise modify attractions brought from or based on the Columbian Exposition?

Shipwreck sites offer important clues for such topics as historical naval architecture, or 19th century maritime commerce including but not limited to the California coastal lumber trade.

Research issues relevant to 19th century domestic archaeological sites for other HOAs within San Francisco would be generally applicable to domestic archaeological sites in the West San Francisco HOA, including research themes that specifically relate to differences in social and economic class, ethnicity, race, and religious affiliation. Individual histories of specific ethnic, national, and religious enclaves in the West San Francisco HOA are only partially known and documented. Since the historical documentary record for many of these groups may be meager and fragmentary, research-driven investigations of the archaeological remains of such populations have the unique potential to incorporate them into the historical record.

11.0 Treasure Island

The Treasure Island HOA includes Yerba Buena Island and Treasure Island. Yerba Buena Island, a natural island located approximately 2¼ miles northeast of San Francisco, was called Seabird Island, Wood Island, and Goat Island before the name Yerba Buena Island was formalized. The island has yielded evidence of indigenous occupation in prehistoric times. The site was occupied intermittently over a long period of time. Some burials have been recovered in association with occupation deposits at least three feet thick. Ethnographic information suggests that members of tribelets living on either side of the Bay traveled across the Bay on rafts made of tule reeds and likely stopped over at the island on their way across (Morgan and Dexter 2008:27). The two groups are known to have intermarried.

A speech given on the island by General Mariano Vallejo on Arbor Day 1886, brought the audience back to the year 1806, as Vallejo told listeners that an expedition of soldiers had been sent to recover horses stolen from the mission by the *Tuchayunes*, indigenous people who maintained a fishing station and a sweat house on the island. While the 80-year lapse between the reported event and the speech make Vallejo's account somewhat unreliable, it points to the possibility that local Native Americans continued to use the island into the historic period (*The Morning Call*, Nov. 8, 1886:3 in Morgan and Dexter 2008:29).

Russian fur traders also installed a temporary Aleutian fur hunters' camp on the island in the early 1800s. The camp was used as a base for hunting sea otters that lived near the rocky shores.

From the time Europeans entered the San Francisco Bay, Yerba Buena Island was used to provision ships. At first the island provided wood, but by the late 1830s, Nathan Spear had been granted permission by the Mexican government (via Captain Gorham Nye) to raise goats on the island. Soon the island was providing both wood and goat meat to ships on their way out to sea (Hamusek-McGann 1997:10).

Some reports indicate that local indigenous people lived and worked on the island in the mid 19th century as well. William A. Richardson, early settler and Captain of the Port of San Francisco, testified that Juan Jose Castro occupied the island in 1839 (Morgan and Dexter 2008:29). According to Richardson, Castro built a house on the north side of the island near a stream. The house was occupied by the Native Americans whom Castro employed to cut wood and burn charcoal (Scanlon 1962:55 in Morgan and Dexter 2008:29).

In 1849 a handful of men established residences and associated outbuildings and structures, such as barns, corrals, wharves and boatways, and a carpenter's shop and forge. The settlers raised animals, worked oyster beds, repaired boats, and mined a quarry. The rock and earth removed from the quarry that was cut into the west shore of the island provided sandstone building material that was used by the government for construction on Alcatraz and Mare islands (U.S. Senate 1871 in Morgan and Dexter 2008:31-32). Fresh water springs were supplemented by wells and windmills. The residents remained on the island until it was occupied by the Army in the late 1860s (Hamusek-McGann 1997:11).

The U.S. Army established a compound on the island and had 125 men in place by 1868 (Hamusek-McGann 1997:11). The base included a depot and training facility. In 1875 a lighthouse was installed, but by 1878 the post was abandoned when the Fourth Artillery Detachment was transferred to the Presidio (Hamusek-McGann 1997:11). A caretaker continued to occupy the lighthouse station. In 1891 the Army returned for a time to produce and stock torpedoes (today called "mines"). In 1896 the army post was leveled and the locations of former houses and post buildings were covered with as much as 8 feet of fill. Ownership of the island was transferred to the U.S. Navy and a Naval Training Station and other naval facilities were located there from 1898 to 1960.

The barracks, completed on January 10, 1900, was the first building constructed in association with the training station (Hamusek-McGann 1997:13). The training station housed between 400 and 500 trainees at any given time and was most active between the years 1900 to 1923 (Hamusek-McGann 1997:13). During World War I, dozens of new buildings were constructed to accommodate additional recruits (Hamusek-McGann 1997:13).

The island has a cemetery, as well as isolated burials, including that of a favorite horse. In 1886 and again in 1904 trees were planted in a cross-formation centered on the apex of the island. A signal tower is located here as well.

Yerba Buena Island served as an anchorage point for the Bay Bridge, which opened for traffic in 1936. At the same time, the federal Works Progress Administration created Treasure Island by building a seawall around shoals adjacent to Yerba Buena Island in 1936 and 1937, and filling it with sand dredged from the Bay. The island hosted the Golden Gate International Exposition in 1939 and 1940. Treasure Island housed the U.S. military until 1996 when it was decommissioned and opened for civilian use.

11.1 Archaeological Record

Prehistoric Period

Archaeological excavation has revealed evidence of at least 5,000 years of occupation on Yerba Buena Island, primarily represented in a single large residential site with concentrated shell midden, evidence of long-term and periodic occupation, and burials (CA-SFR-4). The island potentially holds evidence of non-residential activities as well.

Historic Period

During the early historic period, Native Americans likely continued to visit the island. Aleutian fur traders also camped on the island while procuring sea otters. After the mission era, Native American laborers reportedly lived on the island, chopped wood, herded goats, and provided meat and wood to ships that were provisioned before going back out to sea. Reports of a Native American cemetery at the apex of the island may date to this historic-period occupation. Yerba Buena Island, and subsequently Treasure Island, has been occupied intermittently by military personnel from 1868 to 1996.

Historic site types that may exist within the Yerba Buena Island HOA include:

- Domestic sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, a fur hunters' camp, laborers' camps, single and multiple family dwellings, and military housing.

- Commercial sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, a fur hunters' camp, sites associated with goat herding and stock raising (e.g. butchery stations, barns and corrals), and the Golden Gate International Exposition.
- Institutional sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Late 19th/Early 20th century period onward. Sites may include, but are not limited to, the U.S. Army military compound, the U.S. Navy compound, and a cemetery.
- Industrial sites: these may consist of hollow features, sheet refuse, fill and/or architectural remains. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, lumber yards, carpenters shop and forge, quarries, and weapon manufacturers.
- Storage sites: these may consist of architectural remains. They may date from the Early American period onward. Sites may include, but are not limited to, weapons storage.
- Buried ships: these may consist of ship remains and/or ship parts. They may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, shipwrecks, and ship building and repair yards.
- Wharves: these may date from the Spanish/Mexican period onward. Sites may include, but are not limited to, wharves and boatways.
- Landfills: these may consist of unintentional and/or intentional fill, and fill associated with the 1906 earthquake and fire. They may date from the Late 19th/Early 20th century period onward. Sites may include, but are not limited to, fill associated with the leveling of the army post, and the construction of Treasure Island.
- Spanish/Mexican period sites: may consist of hollow features, sheet refuse, and/or architectural remains. Sites may include, but are not limited to, a fur hunter's camp, dwellings, sites associated with goat herding, wood cutting, and charcoal production.

11.2 Archaeological Research Issues

There is evidence of 5,000 years of occupation on Yerba Buena Island. Treasure Island was created with landfill between 1936 and 1939. Any prehistoric period archaeological resources found on Treasure Island would be redeposited, most likely from neighboring Yerba Buena Island. All prehistoric-period research issues may have relevance for archaeological resources discovered on Yerba Buena Island, and only P-I, redeposited sites, could have relevance for archaeological resources discovered on Treasure Island. The known prehistoric site on Yerba Buena Island has evidence of long-term occupation and the potential to address all of the research issues below. Change through time can be addressed within the site itself, but also by comparison to sites along the bay shore in San Francisco, as well as on the east side of the Bay.

P-A: Human Occupation and Landscape Evolution
P-B: Culture Chronology
P-C: Culture History

P-D: Vertebrate Archaeofauna Variability
P-E: Invertebrate Archaeofauna Variability
P-F: Coastal Colonization Patterns
P-G: Resource Intensification and Adaptive Change
P-H: Interaction and Social Change
P-I: Research Potential of Redeposited Sites

Historic period research issues identified for other HOAs would have relevance on Yerba Buena Island, but from a different perspective. The island is small, and was isolated from the rapid growth and development experienced by some of the mainland HOAs. The island served as a refuge, as a source of provisions, a homestead for a handful of families, and a place to visit for recreation or clandestine activities. The island also served as a military training center, and weapons manufacture and storage site.

H-A: Consumer behavior and strategies
H-B: Ethnicity and urban subcultures
H-C: Institutions
H-D: Industrialization and technology
H-E: Urban geography
H-F: Waterfront: buried ships and wharves
H-G: Interpretive potential
H-H: Waste disposal and dumps

12.0 Conclusion

The City of San Francisco provides a unique opportunity to study change over time on the once isolated west coast of the United States. In addition to long-term prehistoric occupation, the City has been shaped by powerful historic movements, including the arrival of missionaries in the 19th century, the discovery of gold and the massive migration of people that followed, the forces of rapid urbanization in the 19th century, the destruction of the earthquake and fires of 1906, and a massive rebuilding effort in the 20th century. Past archaeological investigations have complimented the written record, and are particularly important for documenting people whose lives were not often recorded in written documents.

This ATM, prepared as a reference document for the cultural resources section of the San Francisco Planning Department's San Francisco General Plan, Housing Element Environmental Impact Report (EIR), is intended to provide guidance regarding the nature of archaeological resources that are both common to and distinctive of the City of San Francisco, as well as to introduce archaeological research issues that are relevant to these archaeological resources. In addition, the document summarizes previous archaeological investigations in order to determine the archaeological site types likely associated with each HOA. These are intended to provide some direction while allowing for flexibility in keeping with the programmatic nature of the Housing Element EIR. Additional environmental analysis will be required at the project level for individual projects.

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Appendix D

Noise Data

Appendix D-1

Noise Volume Summaries

ID	INTERSECTION	NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND	sum NB SB	sum EB WB
1	Geary Blvd / 25th Ave	49	16	134	101	65	235
2	Geary Blvd / Park Presidio Ave	211	185	59	138	396	197
3	Geary Blvd / Masonic Ave	42	175	20	35	217	55
4	Geary Blvd / Gough St	0	126	193	300	126	493
5	Geary Blvd / Franklin St	476	0	0	78	476	78
6	Geary Blvd / Van Ness Ave	331	176	0	130	507	130
7	Lombard St / Richardson Ave	79	268	36	0	347	36
8	Lombard St / Van Ness Ave	96	44	211	11	140	222
9	Stockton St / Broadway	11	0	82	69	11	151
10	The Embarcadero / Broadway	345	177	40	0	522	40
11	The Embarcadero / Washington St	362	187	56	0	549	56
12	The Embarcadero / Harrison St	250	100	267	0	350	267
13	1st St / Market St	0	288	96	70	288	166
14	1st St / Mission St	0	292	44	37	292	81
15	1st St / Harrison St	38	221	121	231	259	352
16	2nd St / Folsom St	211	293	533	0	504	533
17	2nd St / Bryant St	79	144	98	0	223	98
18	3rd St / King St	1572	0	469	780	1572	1249
19	4th St / King St	29	478	136	228	507	364
20	4th St / Harrison St	0	283	0	361	283	361
21	4th St / Bryant St	0	335	468	192	335	660
22	6th St / Market St	241	124	89	47	365	136
23	6th St / Mission St	239	139	164	105	378	269
24	6th St / Brannan St	93	386	500	136	479	636
25	Market St / Van Ness Ave	861	-152	50	23	709	73
26	Mission St / South Van Ness Ave	579	92	32	-204	671	-172
27	10th St / Brannan St / Potrero St / Division St	102	373	368	41	475	409
28	9th St / Market St	612	0	39	35	612	74
29	10th St / Howard St	0	576	0	354	576	354
30	16th St / Mission St	26	18	23	54	44	77
31	16th St / Potrero St	446	563	407	1218	1009	1625
32	16th St / 3rd St	214	706	108	165	920	273
33	Market St / Octavia St	397	561	254	404	958	658
34	Market St / Guerrero St / Laguna St	287	37	28	32	324	60
35	Mission St / Otis St / Division St	511	543	133	50	1054	183
36	Fell St / Divisadero St	164	220	0	236	384	236
37	15th St / Market St / Sanchez St	99	32	34	42	131	76
38	Fulton St / Stanyan St	79	69	197	156	148	353
39	Lincoln Wy / 19th Ave	139	482	87	98	621	185
40	Taraval St / 19th Ave	229	257	0	9	486	9
41	Sloat Blvd / 19th Ave	78	395	108	252	473	360
42	Winston Dr / 19th Ave	128	151	185	36	279	221
43	Junipero Serra Blvd / 19th Ave	314	308	28	14	622	42
44	Junipero Serra Blvd / Ocean Ave	55	103	76	120	158	196
45	Phelan Ave / Ocean Ave / Geneva St	170	407	913	1091	577	2004
46	Lake Merced Blvd / Brotherhood Wy	206	540	0	108	746	108
47	Mission St / Geneva St	140	213	50	194	353	244
48	Mission St / Silver Ave	301	198	17	125	499	142
49	Mission Street / Ocean Ave	138	263	42	0	401	42
50	Sunnydale Ave / Bayshore Blvd	1875	1167	66	189	3042	255
51	Gilman St / Paul Ave / 3rd St	469	388	105	44	857	149
52	Industrial St / Bayshore Blvd / Alemany Blvd	265	573	280	254	838	534
53	3rd St / Palou Ave	192	459	85	137	651	222
54	3rd St / Evans Ave	1029	1148	465	671	2177	1136
55	3rd St / Cesar Chavez St	1088	1234	402	198	2322	600
56	Evans Ave / Cesar Chavez St	546	0	673	579	546	1252
57	Bryant St / Cesar Chavez St	15	211	674	874	226	1548
58	Mission St / Cesar Chavez St	239	38	391	472	277	863
59	Mission St / 24th St	170	4	41	9	174	50
60	San Jose Ave / Randall St	475	677	49	55	1152	104

Legend	
	Highest EB/WB segments
	Highest NB/SB Segments
	Overlaps both categories

Appendix D-2

Off-Site Noise Levels (Cumulative)

OFF-SITE TRAFFIC NOISE LEVELS

Project Name: SF Housing Element

Background Information

Model Description:	FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s):	Cumulative (2025) Traffic Volumes
Source of Traffic Volumes:	TJKM Traffic Impact Study, April, 2010.
Community Noise Descriptor:	L_{dn}: X CNEL:

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Traffic Noise Levels

Analysis Condition Roadway Name	Roadway Segment	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor[1]	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	Peak Hou dB(A) L_{eq}	24-Hour dB(A) Ldn
Cumulative Traffic Volumes														
NB/SB roads														
18	3rd St. North of King		4	25		27,880	30	50	0	0	1.8%	0.7%	0.0	68.5
18	3rd Street South of King		4	25		33,020	30	50	0	0	1.8%	0.7%	0.0	69.3
54	3rd St North of Evans		4	20		30,270	30	50	0	0	1.8%	0.7%	0.0	68.7
54	3rd St. South of Evans		4	20		27,930	30	50	0	0	1.8%	0.7%	0.0	68.4
55	3rd St. North of Cesar Chavez		4	20		36,580	30	50	0	0	1.8%	0.7%	0.0	69.5
55	3rd St. South of Cesar Chavez		4	20		41,440	30	50	0	0	1.8%	0.7%	0.0	70.1
50	Bayshore Blvd. North of Sunnydale		4	20		48,010	30	50	0	0	1.8%	0.7%	0.0	70.7
50	Bayshore Blvd South of Sunnydale		4	20		42,970	30	50	0	0	1.8%	0.7%	0.0	70.2
60	San Jose Ave North of Randall		6	15		52,020	30	50	0	0	1.8%	0.7%	0.0	72.0
60	San Jose Ave South of Randall		6	15		55,440	30	50	0	0	1.8%	0.7%	0.0	72.3
Cumulative Traffic Volumes														
EB/WB Roads														
45	Ocean Ave west of Phelan/Geneva		4	0		40,940	30	50	0	0	1.8%	0.7%	0.0	69.5
45	Ocean Ave east of Phelan/Geneva		4	0		36,550	30	50	0	0	1.8%	0.7%	0.0	69.0
31	16th St. West of Potrero		4	0		28,360	30	50	0	0	1.8%	0.7%	0.0	67.9
31	16th St. East of Potrero		4	0		27,060	30	50	0	0	1.8%	0.7%	0.0	67.7
57	Cesar Chavez west of Bryant		6	10		46,230	30	50	0	0	1.8%	0.7%	0.0	71.2
57	Cesar Chavez east of Bryant		6	10		55,310	30	50	0	0	1.8%	0.7%	0.0	72.0
56	Cesar Chavez west of Evans		4	0		40,140	30	50	0	0	1.8%	0.7%	0.0	69.4
56	Cesar Chavez east of Evans		4	0		36,240	30	50	0	0	1.8%	0.7%	0.0	69.0
18	King west of 3rd St.		6	0		40,270	30	50	0	0	1.8%	0.7%	0.0	70.1
18	King east of 3rd St.		6	0		42,930	30	50	0	0	1.8%	0.7%	0.0	70.4

[1] Distance is from the centerline of the roadway segment to the receptor location.

Appendix E

Air Quality Data

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: \\.host\Shared Folders\Bryan On My Mac\Desktop\Current Projects\SF Housing\Operational.urb924

Project Name: SF Housing Element

Project Location: San Francisco County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	PM10
Natural Gas	24.53	317.65	0.61
Hearth			
Landscaping - No Winter Emissions			
Consumer Products	2,037.70		
Architectural Coatings	285.05		
TOTALS (lbs/day, unmitigated)	2,347.28	317.65	0.61

Area Source Changes to Defaults

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	PM10
Single family housing	23.85	32.92	99.17
Apartments low rise	994.57	1,372.50	4,135.01
TOTALS (lbs/day, unmitigated)	1,018.42	1,405.42	4,234.18

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2025 Temperature (F): 40 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	236.00	9.57	dwelling units	708.00	6,775.56	57,929.00
Apartments low rise	2,558.94	6.90	dwelling units	40,943.00	282,506.70	2,415,347.61
					289,282.26	2,473,276.61

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	61.0	0.0	100.0	0.0
Light Truck < 3750 lbs	10.9	0.0	100.0	0.0
Light Truck 3751-5750 lbs	16.5	0.0	100.0	0.0
Med Truck 5751-8500 lbs	4.7	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	0.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	0.1	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.3	0.0	0.0	100.0
Motorcycle	3.5	34.3	65.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.2	0.0	100.0	0.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2009

Roadway Data

Intersection: Van Ness and Geary
Analysis Condition: Existing (2009) Conditions

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Van Ness Ave	At Grade	8	20	20
East-West Roadway:	Geary Blvd	At Grade	4	20	20

A.M. Peak Hour Traffic Volumes

		N				E
		0	0	0		
W		<	v	>		E
0 ^					^	0
0 >					<	0
0 v					v	0
		<	^	>		
		0	0	0		
S						

P.M. Peak Hour Traffic Volumes

		N				
		211	1,469	0		
W		<	v	>		E
0 ^					^	153
0 >					<	784
0 v					v	94
		<	^	>		
		157	1,383	0		
S						

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	3,216
E-W Road:	0	E-W Road:	1,152

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	8.5	5.7	4.6	3.4	0	4.92	0.00	0.00	0.00	0.00
East-West Road	3.3	2.6	2.2	1.7	0	4.92	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	8.5	5.7	4.6	3.4	3,216	4.92	1.34	0.90	0.73	0.54
East-West Road	3.3	2.6	2.2	1.7	1,152	4.92	0.19	0.15	0.12	0.10

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	7.2	3.4
25 Feet from Roadway Edge	5.7	6.7	3.0
50 Feet from Roadway Edge	5.7	6.6	2.9
100 Feet from Roadway Edge	5.7	6.3	2.7

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2009

Roadway Data

Intersection:	2nd St and Folsom St
Analysis Condition:	Existing (2009) Conditions

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	2nd St.	At Grade	4	15	15
East-West Roadway:	Folsom St.	At Grade	4	15	15

A.M. Peak Hour Traffic Volumes

		N			
		0	0	0	
W		<	v	>	E
0 ^				^	0
0 >				<	0
0 v				v	0
		<	^	>	
		0	0	0	
		S			

P.M. Peak Hour Traffic Volumes

		N			
		0	598	204	
W		<	v	>	E
165 ^				^	0
856 >				<	0
89 v				v	0
		<	^	>	
		0	268	97	
		S			

Highest Traffic Volumes (Vehicles per Hour)

	A.M.	P.M.
N-S Road:	0	1,235
E-W Road:	0	1,157

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	11.9	7.0	5.4	3.8	0	5.73	0.00	0.00	0.00	0.00
East-West Road	3.3	2.6	2.2	1.7	0	5.73	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	11.9	7.0	5.4	3.8	1,235	5.73	0.84	0.50	0.38	0.27
East-West Road	3.3	2.6	2.2	1.7	1,157	5.73	0.22	0.17	0.15	0.11

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	6.8	3.0
25 Feet from Roadway Edge	5.7	6.4	2.8
50 Feet from Roadway Edge	5.7	6.2	2.7
100 Feet from Roadway Edge	5.7	6.1	2.6

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2009

Roadway Data

Intersection:	2nd St and Folsom St
Analysis Condition:	Existing (2009) Conditions

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	2nd St.	At Grade	4	10	10
East-West Roadway:	Bryant St	At Grade	4	10	10

A.M. Peak Hour Traffic Volumes

		N				
		0	0	0		
W		<	v	>		E
0	^				^	0
0	>				<	0
0	v				v	0
		<	^	>		
		0	0	0		
		S				

P.M. Peak Hour Traffic Volumes

		N				
		0	520	32		
W		<	v	>		E
404	^				^	0
1,163	>				<	0
79	v				v	0
		<	^	>		
		0	615	262		
		S				

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	1,571
E-W Road:	0	E-W Road:	1,646

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	11.9	7.0	5.4	3.8	0	6.89	0.00	0.00	0.00	0.00
East-West Road	3.3	2.6	2.2	1.7	0	6.89	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	3.3	2.6	2.2	1.7	1,571	6.89	0.36	0.28	0.24	0.18
East-West Road	11.9	7.0	5.4	3.8	1,646	6.89	1.35	0.79	0.61	0.43

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	7.4	3.5
25 Feet from Roadway Edge	5.7	6.8	3.1
50 Feet from Roadway Edge	5.7	6.5	2.9
100 Feet from Roadway Edge	5.7	6.3	2.7

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2009

Roadway Data

Intersection:	6th St and Brannan St
Analysis Condition:	Existing (2009) Conditions

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	6th St.	At Grade	6	5	5
East-West Roadway:	Brannan St	At Grade	6	5	5

A.M. Peak Hour Traffic Volumes

	N			
	0	0	0	
W	<	v	>	E
0 ^			^	0
0 >			<	0
0 v			v	0
	<	^	>	
	0	0	0	
	S			

P.M. Peak Hour Traffic Volumes

	N			
	116	1,728	0	
W	<	v	>	E
0 ^			^	42
330 >			<	684
486 v			v	769
	<	^	>	
	0	1,410	767	
	S			

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	5,160
E-W Road:	0	E-W Road:	2,592

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 E.O.R.	A_2 25 Feet	A_3 50 Feet	A_4 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations E.O.R.	25 Feet	50 Feet	100 Feet
	Reference CO Concentrations									
A.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	0	8.56	0.00	0.00	0.00	0.00
East-West Road	2.8	2.3	2.0	1.7	0	8.56	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	5,160	8.56	4.20	2.70	2.17	1.55
East-West Road	2.8	2.3	2.0	1.7	2,592	8.56	0.62	0.51	0.44	0.38

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	10.5	5.7
25 Feet from Roadway Edge	5.7	8.9	4.5
50 Feet from Roadway Edge	5.7	8.3	4.1
100 Feet from Roadway Edge	5.7	7.6	3.6

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2009

Roadway Data

Intersection:	16th St and Potrero St
Analysis Condition:	Existing (2009) Conditions

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Potrero	At Grade	6	5	5
East-West Roadway:	16th St	At Grade	4	5	5

A.M. Peak Hour Traffic Volumes

	N				
		0	0	0	
W		<	v	>	E
0 ^				^	0
0 >				<	0
0 v				v	0
		<	^	>	
		0	0	0	
	S				

P.M. Peak Hour Traffic Volumes

	N				
		178	920	57	
W		<	v	>	E
48 ^				^	48
308 >				<	608
186 v				v	48
		<	^	>	
		8	567	29	
	S				

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	1,818
E-W Road:	0	E-W Road:	1,336

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations E.O.R.	A_2 25 Feet	A_3 50 Feet	A_4 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	0	8.56	0.00	0.00	0.00	0.00
East-West Road	3.3	2.6	2.2	1.7	0	8.56	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	1,818	8.56	1.48	0.95	0.76	0.54
East-West Road	3.3	2.6	2.2	1.7	1,336	8.56	0.38	0.30	0.25	0.19

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	7.6	3.6
25 Feet from Roadway Edge	5.7	6.9	3.2
50 Feet from Roadway Edge	5.7	6.7	3.0
100 Feet from Roadway Edge	5.7	6.4	2.8

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2009

Roadway Data

Intersection:	Sloat Blvd. & 19th Ave
Analysis Condition:	Existing (2009) Conditions

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	19th Ave	At Grade	6	5	5
East-West Roadway:	Sloat Blvd	At Grade	8	5	5

A.M. Peak Hour Traffic Volumes

N				
	0	0	0	
W	<	v	>	E
0 ^				^ 0
0 >				< 0
0 v				v 0
	<	^	>	
	0	0	0	
S				

P.M. Peak Hour Traffic Volumes

N				
	412	2,311	220	
W	<	v	>	E
248 ^				^ 333
887 >				< 1,116
63 v				v 0
	<	^	>	
	0	2,209	56	
S				

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	5,733
E-W Road:	0	E-W Road:	2,726

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	0	8.56	0.00	0.00	0.00	0.00
East-West Road	2.6	2.2	1.9	1.6	0	8.56	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	5,733	8.56	4.66	2.99	2.41	1.72
East-West Road	2.6	2.2	1.9	1.6	2,726	8.56	0.61	0.51	0.44	0.37

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	11.0	6.0
25 Feet from Roadway Edge	5.7	9.2	4.8
50 Feet from Roadway Edge	5.7	8.5	4.3
100 Feet from Roadway Edge	5.7	7.8	3.8

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2009

Roadway Data

Intersection:	Winston Dr. & 19th Ave
Analysis Condition:	Existing (2009) Conditions

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	19th Ave	At Grade	8	10	10
East-West Roadway:	Winston Dr	At Grade	4	10	10

A.M. Peak Hour Traffic Volumes

N				
	0	0	0	
W	<	v	>	E
0 ^			^	0
0 >			<	0
0 v			v	0
	<	^	>	
	0	0	0	
S				

P.M. Peak Hour Traffic Volumes

N				
	73	2,204	0	
W	<	v	>	E
141 ^			^	30
309 >			<	345
314 v			v	29
	<	^	>	
	379	2,080	3	
S				

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	5,009
E-W Road:	0	E-W Road:	1,561

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	8.5	5.7	4.6	3.4	0	6.89	0.00	0.00	0.00	0.00
East-West Road	3.3	2.6	2.2	1.7	0	6.89	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	8.5	5.7	4.6	3.4	5,009	6.89	2.93	1.97	1.59	1.17
East-West Road	3.3	2.6	2.2	1.7	1,561	6.89	0.35	0.28	0.24	0.18

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	9.0	4.6
25 Feet from Roadway Edge	5.7	7.9	3.9
50 Feet from Roadway Edge	5.7	7.5	3.6
100 Feet from Roadway Edge	5.7	7.1	3.2

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2009

Roadway Data

Intersection:	Junipero Serra & 19th Ave
Analysis Condition:	Existing (2009) Conditions

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Junipero Serra	At Grade	8	5	5
East-West Roadway:	19th Ave	At Grade	6	5	5

A.M. Peak Hour Traffic Volumes

	N	0	0	0	
W		<	v	>	E
0 ^				^	0
0 >				<	0
0 v				v	0
		<	^	>	
	S	0	0	0	

P.M. Peak Hour Traffic Volumes

	N	14	1,261	21	
W		<	v	>	E
0 ^				^	48
105 >				<	37
2,711 v				v	31
		<	^	>	
	S	1,975	1,552	10	

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	7,540
E-W Road:	0	E-W Road:	4,842

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	8.5	5.7	4.6	3.4	0	8.56	0.00	0.00	0.00	0.00
East-West Road	2.8	2.3	2.0	1.7	0	8.56	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	8.5	5.7	4.6	3.4	7,540	8.56	5.49	3.68	2.97	2.20
East-West Road	2.8	2.3	2.0	1.7	4,842	8.56	1.16	0.95	0.83	0.70

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	12.3	7.0
25 Feet from Roadway Edge	5.7	10.3	5.5
50 Feet from Roadway Edge	5.7	9.5	5.0
100 Feet from Roadway Edge	5.7	8.6	4.3

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2009

Roadway Data

Intersection: Bayshore Blvd and Sunnydale Ave
Analysis Condition: Existing (2009) Conditions

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Bayshore Blvd	At Grade	6	20	20
East-West Roadway:	Sunnydale Ave	At Grade	2	20	20

A.M. Peak Hour Traffic Volumes

	N				
		0	0	0	
W		<	v	>	E
	0 ^			^	0
	0 >			<	0
	0 v			v	0
		<	^	>	
		0	0	0	
	S				

P.M. Peak Hour Traffic Volumes

	N				
		141	604	19	
W		<	v	>	E
	124 ^			^	7
	0 >			<	4
	29 v			v	14
		<	^	>	
		49	746	7	
	S				

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	1,641
E-W Road:	0	E-W Road:	347

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	0	4.92	0.00	0.00	0.00	0.00
East-West Road	3.7	2.7	2.2	1.7	0	4.92	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	1,641	4.92	0.77	0.49	0.40	0.28
East-West Road	3.7	2.7	2.2	1.7	347	4.92	0.06	0.05	0.04	0.03

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	6.5	2.9
25 Feet from Roadway Edge	5.7	6.2	2.7
50 Feet from Roadway Edge	5.7	6.1	2.6
100 Feet from Roadway Edge	5.7	6.0	2.5

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2009

Roadway Data

Intersection:	Evans & Cesar Chavez
Analysis Condition:	Existing (2009) Conditions

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Evans Ave	At Grade	2	15	15
East-West Roadway:	Cesar Chavez St.	At Grade	6	15	15

A.M. Peak Hour Traffic Volumes

	N				
		0	0	0	
W		<	v	>	E
0 ^				^	0
0 >				<	0
0 v				v	0
		<	^	>	
		0	0	0	
	S				

P.M. Peak Hour Traffic Volumes

	N				
		0	0	0	
W		<	v	>	E
0 ^				^	0
635 >				<	1,093
370 v				v	334
		<	^	>	
		468	0	344	
	S				

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	1,516
E-W Road:	0	E-W Road:	2,566

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	14.0	7.6	5.7	4.0	0	5.73	0.00	0.00	0.00	0.00
East-West Road	2.8	2.3	2.0	1.7	0	5.73	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	3.7	2.7	2.2	1.7	1,516	5.73	0.32	0.23	0.19	0.15
East-West Road	9.5	6.1	4.9	3.5	2,566	5.73	1.40	0.90	0.72	0.51

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	7.4	3.5
25 Feet from Roadway Edge	5.7	6.8	3.1
50 Feet from Roadway Edge	5.7	6.6	2.9
100 Feet from Roadway Edge	5.7	6.4	2.8

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2009

Roadway Data

Intersection: Bryant & Cesar Chavez
Analysis Condition: Existing (2009) Conditions

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Bryant St.	At Grade	2	15	15
East-West Roadway:	Cesar Chavez St.	At Grade	6	15	15

A.M. Peak Hour Traffic Volumes

		N			
		0	0	0	
W		<	v	>	E
0	^			^	0
0	>			<	0
0	v			v	0
		<	^	>	
		0	0	0	
		S			

P.M. Peak Hour Traffic Volumes

		N			
		62	58	261	
W		<	v	>	E
27	^			^	169
1,459	>			<	1,670
8	v			v	288
		<	^	>	
		2	23	6	
		S			

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	600
E-W Road:	0	E-W Road:	3,853

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	14.0	7.6	5.7	4.0	0	5.73	0.00	0.00	0.00	0.00
East-West Road	2.8	2.3	2.0	1.7	0	5.73	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	3.7	2.7	2.2	1.7	600	5.73	0.13	0.09	0.08	0.06
East-West Road	9.5	6.1	4.9	3.5	3,853	5.73	2.10	1.35	1.08	0.77

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	7.9	3.9
25 Feet from Roadway Edge	5.7	7.1	3.3
50 Feet from Roadway Edge	5.7	6.9	3.1
100 Feet from Roadway Edge	5.7	6.5	2.9

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2025

Roadway Data

Intersection: 2nd St and Folsom St
Analysis Condition: Cumulative 2025

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	2nd St.	At Grade	4	5	5
East-West Roadway:	Folsom St.	At Grade	4	5	5

A.M. Peak Hour Traffic Volumes

		N				
		0	0	0		
W		<	v	>		E
0 ^					^	0
0 >					<	0
0 v					v	0
		<	^	>		
		0	0	0		
		S				

P.M. Peak Hour Traffic Volumes

		N				
		0	816	279		
W		<	v	>		E
202 ^					^	0
1,305 >					<	0
136 v					v	0
		<	^	>		
		0	409	167		
		S				

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	1,706
E-W Road:	0	E-W Road:	1,751

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 E.O.R.	A_2 25 Feet	A_3 50 Feet	A_4 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	11.9	7.0	5.4	3.8	0	2.34	0.00	0.00	0.00	0.00
East-West Road	3.3	2.6	2.2	1.7	0	2.34	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	3.3	2.6	2.2	1.7	1,706	2.34	0.13	0.10	0.09	0.07
East-West Road	11.9	7.0	5.4	3.8	1,751	2.34	0.49	0.29	0.22	0.16

(Columns A_1–A_4: Reference CO Concentrations)

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	6.3	2.7
25 Feet from Roadway Edge	5.7	6.1	2.6
50 Feet from Roadway Edge	5.7	6.0	2.5
100 Feet from Roadway Edge	5.7	5.9	2.5

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2025

Roadway Data

Intersection: 2nd St and Folsom St
Analysis Condition: Cumulative 2025

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	2nd St.	At Grade	4	5	5
East-West Roadway:	Bryant St	At Grade	4	5	5

A.M. Peak Hour Traffic Volumes

```
        N|                            |
         |    0        0        0|
W        |    <        v        >         E
    0 ^                           ^       0
    0 >                           <       0
    0 v                           v       0
         |    <        ^        >
         |    0        0        0|
        S|                            |
```

P.M. Peak Hour Traffic Volumes

```
        N|                            |
         |    0      655       41|
W        |    <        v        >         E
  428 ^                           ^       0
1,232 >                           <       0
   84 v                           v       0
         |    <        ^        >
         |    0      670      286|
        S|                            |
```

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	1,794
E-W Road:	0	E-W Road:	1,744

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 E.O.R.	A_2 25 Feet	A_3 50 Feet	A_4 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations E.O.R.	25 Feet	50 Feet	100 Feet
	Reference CO Concentrations									
A.M. Peak Traffic Hour										
North-South Road	11.9	7.0	5.4	3.8	0	2.34	0.00	0.00	0.00	0.00
East-West Road	3.3	2.6	2.2	1.7	0	2.34	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	11.9	7.0	5.4	3.8	1,794	2.34	0.50	0.29	0.23	0.16
East-West Road	3.3	2.6	2.2	1.7	1,744	2.34	0.13	0.11	0.09	0.07

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	6.3	2.7
25 Feet from Roadway Edge	5.7	6.1	2.6
50 Feet from Roadway Edge	5.7	6.0	2.5
100 Feet from Roadway Edge	5.7	5.9	2.5

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2025

Roadway Data

Intersection: 6th St and Brannan St
Analysis Condition: Cumulative 2025

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	6th St.	At Grade	6	5	5
East-West Roadway:	Brannan St	At Grade	6	5	5

A.M. Peak Hour Traffic Volumes

	N					E
		0	0	0		
W		<	v	>		E
0 ^					^	0
0 >					<	0
0 v					v	0
		<	^	>		
		0	0	0		
	S					

P.M. Peak Hour Traffic Volumes

	N					
		138	2,092	0		
W		<	v	>		E
0 ^					^	60
535 >					<	785
781 v					v	786
		<	^	>		
		0	1,473	797		
	S					

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	5,929
E-W Road:	0	E-W Road:	2,963

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations E.O.R.	A_2 25 Feet	A_3 50 Feet	A_4 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	0	2.34	0.00	0.00	0.00	0.00
East-West Road	2.8	2.3	2.0	1.7	0	2.34	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	5,929	2.34	1.32	0.85	0.68	0.48
East-West Road	2.8	2.3	2.0	1.7	2,963	2.34	0.19	0.16	0.14	0.12

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	7.2	3.4
25 Feet from Roadway Edge	5.7	6.7	3.0
50 Feet from Roadway Edge	5.7	6.5	2.9
100 Feet from Roadway Edge	5.7	6.3	2.7

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2025

Roadway Data

Intersection:	16 St & Potrero St.
Analysis Condition:	Cumulative 2025

			No. of	Average Speed	
		Roadway Type	Lanes	A.M.	P.M.
North-South Roadway:	Potrero	At Grade	6	5	5
East-West Roadway:	16th St	At Grade	4	5	5

A.M. Peak Hour Traffic Volumes

	N				
		0	0	0	
W		<	v	>	E
0 ^				^	0
0 >				<	0
0 v				v	0
		<	^	>	
		0	0	0	
	S				

P.M. Peak Hour Traffic Volumes

	N				
		256	1,316	146	
W		<	v	>	E
66 ^				^	300
583 >				<	1,528
300 v				v	94
		<	^	>	
		103	892	55	
	S				

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	2,976
E-W Road:	0	E-W Road:	2,836

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	0	2.34	0.00	0.00	0.00	0.00
East-West Road	3.3	2.6	2.2	1.7	0	2.34	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	2,976	2.34	0.66	0.42	0.34	0.24
East-West Road	3.3	2.6	2.2	1.7	2,836	2.34	0.22	0.17	0.15	0.11

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	6.6	2.9
25 Feet from Roadway Edge	5.7	6.3	2.7
50 Feet from Roadway Edge	5.7	6.2	2.6
100 Feet from Roadway Edge	5.7	6.1	2.5

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO: San Francisco
Background 1-hour CO Concentration (ppm): 5.7
Background 8-hour CO Concentration (ppm): 2.3
Persistence Factor: 0.7
Analysis Year: 2025

Roadway Data

Intersection: Sloat Blvd. & 19th Ave
Analysis Condition: Cumulative 2025

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	19th Ave	At Grade	6	5	5
East-West Roadway:	Sloat Blvd	At Grade	8	5	5

A.M. Peak Hour Traffic Volumes

	N	0	0	0	
W		<	v	>	E
0 ^				^	0
0 >				<	0
0 v				v	0
		<	^	>	
	S	0	0	0	

P.M. Peak Hour Traffic Volumes

	N	485	2,718	259	
W		<	v	>	E
277 ^				^	409
992 >				<	1,370
70 v				v	0
		<	^	>	
	S	0	2,308	59	

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	6,456
E-W Road:	0	E-W Road:	3,194

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	0	2.34	0.00	0.00	0.00	0.00
East-West Road	2.6	2.2	1.9	1.6	0	2.34	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	6,456	2.34	1.43	0.92	0.74	0.53
East-West Road	2.6	2.2	1.9	1.6	3,194	2.34	0.19	0.16	0.14	0.12

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	7.3	3.4
25 Feet from Roadway Edge	5.7	6.8	3.1
50 Feet from Roadway Edge	5.7	6.6	2.9
100 Feet from Roadway Edge	5.7	6.3	2.8

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2025

Roadway Data

Intersection:	Winston Dr. & 19th Ave
Analysis Condition:	Cumulative 2025

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	19th Ave	At Grade	8	5	5
East-West Roadway:	Winston Dr	At Grade	4	5	5

A.M. Peak Hour Traffic Volumes

N						
		0	0	0		
W		<	v	>		E
0	^				^	0
0	>				<	0
0	v				v	0
		<	^	>		
		0	0	0		
S						

P.M. Peak Hour Traffic Volumes

N						
		79	2,395	0		
W		<	v	>		E
186	^				^	33
408	>				<	384
414	v				v	32
		<	^	>		
		405	2,221	3		
S						

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	5,470
E-W Road:	0	E-W Road:	1,876

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 E.O.R.	A_2 25 Feet	A_3 50 Feet	A_4 100 Feet	B Traffic Volume	C Emission Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
	Reference CO Concentrations						Estimated CO Concentrations			
A.M. Peak Traffic Hour										
North-South Road	8.5	5.7	4.6	3.4	0	2.34	0.00	0.00	0.00	0.00
East-West Road	3.3	2.6	2.2	1.7	0	2.34	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	8.5	5.7	4.6	3.4	5,470	2.34	1.09	0.73	0.59	0.43
East-West Road	3.3	2.6	2.2	1.7	1,876	2.34	0.14	0.11	0.10	0.07

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	6.9	3.2
25 Feet from Roadway Edge	5.7	6.5	2.9
50 Feet from Roadway Edge	5.7	6.4	2.8
100 Feet from Roadway Edge	5.7	6.2	2.7

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2025

Roadway Data

Intersection:	Junipero Serra & 19th Ave
Analysis Condition:	Cumulative 2025

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Junipero Serra	At Grade	8	5	5
East-West Roadway:	19th Ave	At Grade	6	5	5

A.M. Peak Hour Traffic Volumes

	N	0	0	0	
W		<	v	>	E
0 ^				^	0
0 >				<	0
0 v				v	0
		<	^	>	
	S	0	0	0	

P.M. Peak Hour Traffic Volumes

	N	18	1,655	28	
W		<	v	>	E
0 ^				^	55
106 >				<	43
2,747 v				v	36
		<	^	>	
	S	2,205	1,733	11	

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	8,387
E-W Road:	0	E-W Road:	5,119

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	8.5	5.7	4.6	3.4	0	2.34	0.00	0.00	0.00	0.00
East-West Road	2.8	2.3	2.0	1.7	0	2.34	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	8.5	5.7	4.6	3.4	8,387	2.34	1.67	1.12	0.90	0.67
East-West Road	2.8	2.3	2.0	1.7	5,119	2.34	0.33	0.28	0.24	0.20

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	7.7	3.7
25 Feet from Roadway Edge	5.7	7.1	3.3
50 Feet from Roadway Edge	5.7	6.8	3.1
100 Feet from Roadway Edge	5.7	6.6	2.9

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO: San Francisco
Background 1-hour CO Concentration (ppm): 5.7
Background 8-hour CO Concentration (ppm): 2.3
Persistence Factor: 0.7
Analysis Year: 2025

Roadway Data

Intersection: Bayshore Blvd and Sunnydale Ave
Analysis Condition: Cumulative 2025

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Bayshore Blvd	At Grade	6	5	5
East-West Roadway:	Sunnydale Ave	At Grade	2	5	5

A.M. Peak Hour Traffic Volumes

	N				
		0	0	0	
W		<	v	>	E
0 ^				^	0
0 >				<	0
0 v				v	0
		<	^	>	
		0	0	0	
	S				

P.M. Peak Hour Traffic Volumes

	N				
		199	1,511	221	
W		<	v	>	E
164 ^				^	173
0 >				<	5
55 v				v	36
		<	^	>	
		91	2,533	53	
	S				

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	4,801
E-W Road:	0	E-W Road:	514

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations E.O.R.	A_2 25 Feet	A_3 50 Feet	A_4 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	0	2.34	0.00	0.00	0.00	0.00
East-West Road	3.7	2.7	2.2	1.7	0	2.34	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	9.5	6.1	4.9	3.5	4,801	2.34	1.07	0.68	0.55	0.39
East-West Road	3.7	2.7	2.2	1.7	514	2.34	0.04	0.03	0.03	0.02

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	6.8	3.1
25 Feet from Roadway Edge	5.7	6.4	2.8
50 Feet from Roadway Edge	5.7	6.3	2.7
100 Feet from Roadway Edge	5.7	6.1	2.6

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2025

Roadway Data

Intersection: Evans & Cesar Chavez
Analysis Condition: Cumulative 2025

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Evans Ave	At Grade	2	5	5
East-West Roadway:	Cesar Chavez St.	At Grade	6	5	5

A.M. Peak Hour Traffic Volumes

	N					
		0	0	0		
W		<	v	>		E
0	^				^	0
0	>				<	0
0	v				v	0
		<	^	>		
		0	0	0		
	S					

P.M. Peak Hour Traffic Volumes

	N					
		0	0	0		
W		<	v	>		E
0	^				^	0
1,060	>				<	1,536
618	v				v	470
		<	^	>		
		800	0	558		
	S					

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	2,446
E-W Road:	0	E-W Road:	4,014

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	14.0	7.6	5.7	4.0	0	2.34	0.00	0.00	0.00	0.00
East-West Road	2.8	2.3	2.0	1.7	0	2.34	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	3.7	2.7	2.2	1.7	2,446	2.34	0.21	0.15	0.13	0.10
East-West Road	9.5	6.1	4.9	3.5	4,014	2.34	0.89	0.57	0.46	0.33

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	6.8	3.1
25 Feet from Roadway Edge	5.7	6.4	2.8
50 Feet from Roadway Edge	5.7	6.3	2.7
100 Feet from Roadway Edge	5.7	6.1	2.6

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Title: SF Housing Element

Background Information

Nearest Air Monitoring Station measuring CO:	San Francisco
Background 1-hour CO Concentration (ppm):	5.7
Background 8-hour CO Concentration (ppm):	2.3
Persistence Factor:	0.7
Analysis Year:	2025

Roadway Data

Intersection:	Bryant & Cesar Chavez
Analysis Condition:	Cumulative 2025

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Bryant St.	At Grade	2	5	5
East-West Roadway:	Cesar Chavez St.	At Grade	6	5	5

A.M. Peak Hour Traffic Volumes

		N				
		0	0	0		
W		<	v	>		E
0	^				^	0
0	>				<	0
0	v				v	0
		<	^	>		
		0	0	0		
		S				

P.M. Peak Hour Traffic Volumes

		N				
		97	90	405		
W		<	v	>		E
40	^				^	239
2,116	>				<	2,355
12	v				v	407
		<	^	>		
		3	34	9		
		S				

Highest Traffic Volumes (Vehicles per Hour)

	A.M.		P.M.
N-S Road:	0	N-S Road:	905
E-W Road:	0	E-W Road:	5,531

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

	A_1	A_2	A_3	A_4	B	C				
	Reference CO Concentrations				Traffic	Emission	Estimated CO Concentrations			
Roadway	E.O.R.	25 Feet	50 Feet	100 Feet	Volume	Factors[2]	E.O.R.	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour										
North-South Road	14.0	7.6	5.7	4.0	0	2.34	0.00	0.00	0.00	0.00
East-West Road	2.8	2.3	2.0	1.7	0	2.34	0.00	0.00	0.00	0.00
P.M. Peak Traffic Hour										
North-South Road	3.7	2.7	2.2	1.7	905	2.34	0.08	0.06	0.05	0.04
East-West Road	9.5	6.1	4.9	3.5	5,531	2.34	1.23	0.79	0.63	0.45

[1] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).
[2] Emission factors from EMFAC2002 (2003).

Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration[2]
8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration[2]

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
Roadway Edge	5.7	7.0	3.2
25 Feet from Roadway Edge	5.7	6.5	2.9
50 Feet from Roadway Edge	5.7	6.4	2.8
100 Feet from Roadway Edge	5.7	6.2	2.6

[2] Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

Appendix F

Traffic Study

TJKM
Transportation
Consultants

Vision That Moves Your Community

San Francisco General Plan Housing Element Final Transportation Impact Study
Case No: 2007.1275!

Prepared for the City and County of San Francisco, Planning Department

June 2010

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Vision That Moves Your Community

San Francisco General Plan Housing Element
Final Transportation Impact Study
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www.tjkm.com

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1. Introduction

This report presents the results of a Transportation Impact Study (TIS) for the proposed 2004 and 2009 Housing Elements, an update of the *San Francisco General Plan* (*General Plan*). The TIS presents a program-level analysis of the potential transportation-related impacts resulting from the Housing Element update. The Housing Element is an element of the *General Plan* that comprehensively addresses issues relating to the supply of housing within the City. It is a document that consists of goals and policies to guide the City and private and nonprofit developers in providing housing for existing and future residents to meet projected housing demand, as required under California Government Code section 65580 (referenced in this report as "housing element law").

The subject of this TIS is the proposed update to the Housing Element of the *General Plan*. This TIS evaluates the potential transportation impacts of adopting the proposed 2004 Housing Element and proposed 2009 Housing Element (collectively, "the proposed projects"). This TIS also analyzes the following alternatives to these housing elements: (1) The No Project Alternative (Alternative A); (2) a modified 2004 Housing Element (Alternative B) and; (3) additional housing concepts that more aggressively encourage attainment of San Francisco's housing needs (Alternative C). The 2004 and 2009 Housing Elements and alternatives are discussed further in Section 2, Project Characteristics.

The transportation impacts for the following scenarios are addressed in this study:

1. 2004 Housing Element;
2. 2009 Housing Element;
3. Alternative A (No Project);
4. Alternative B (Modified 2004 Housing Element); and
5. Alternative C (Additional Housing Concepts).

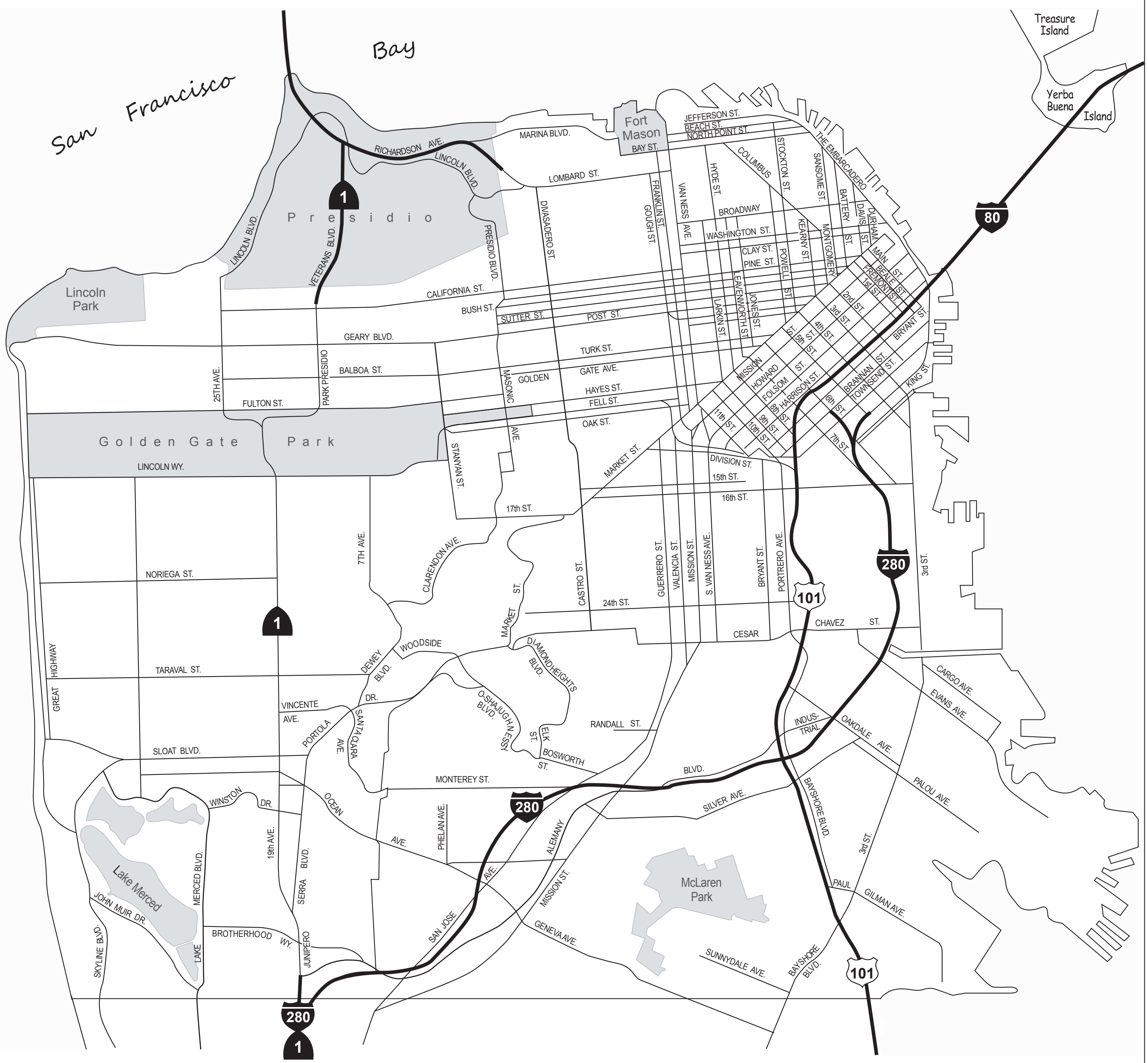
Project Description

Location

San Francisco is a consolidated city and county. The City and County of San Francisco (the City) is located on the tip of the San Francisco Peninsula with the Golden Gate Strait to the north, San Francisco Bay to the east, San Mateo County to the south, and the Pacific Ocean to the west. The City is one of nine counties adjacent to San Francisco and San Pablo Bays. Daly City and the City of Brisbane abut San Francisco to the south. San Francisco is approximately 49 square miles in size. The City is made up of several distinct neighborhoods and plan areas (areas which have undergone, or are in the process of, a comprehensive community planning effort). Although San Francisco is densely developed, there remain developable vacant parcels for new housing construction, as well as underused parcels available for increased development, in various locations throughout the City. The project area is defined as the entirety of the city and county of San Francisco and is depicted in Figure 1. Figure 2 illustrates the 60 study intersections to be analyzed and discussed later in this report.

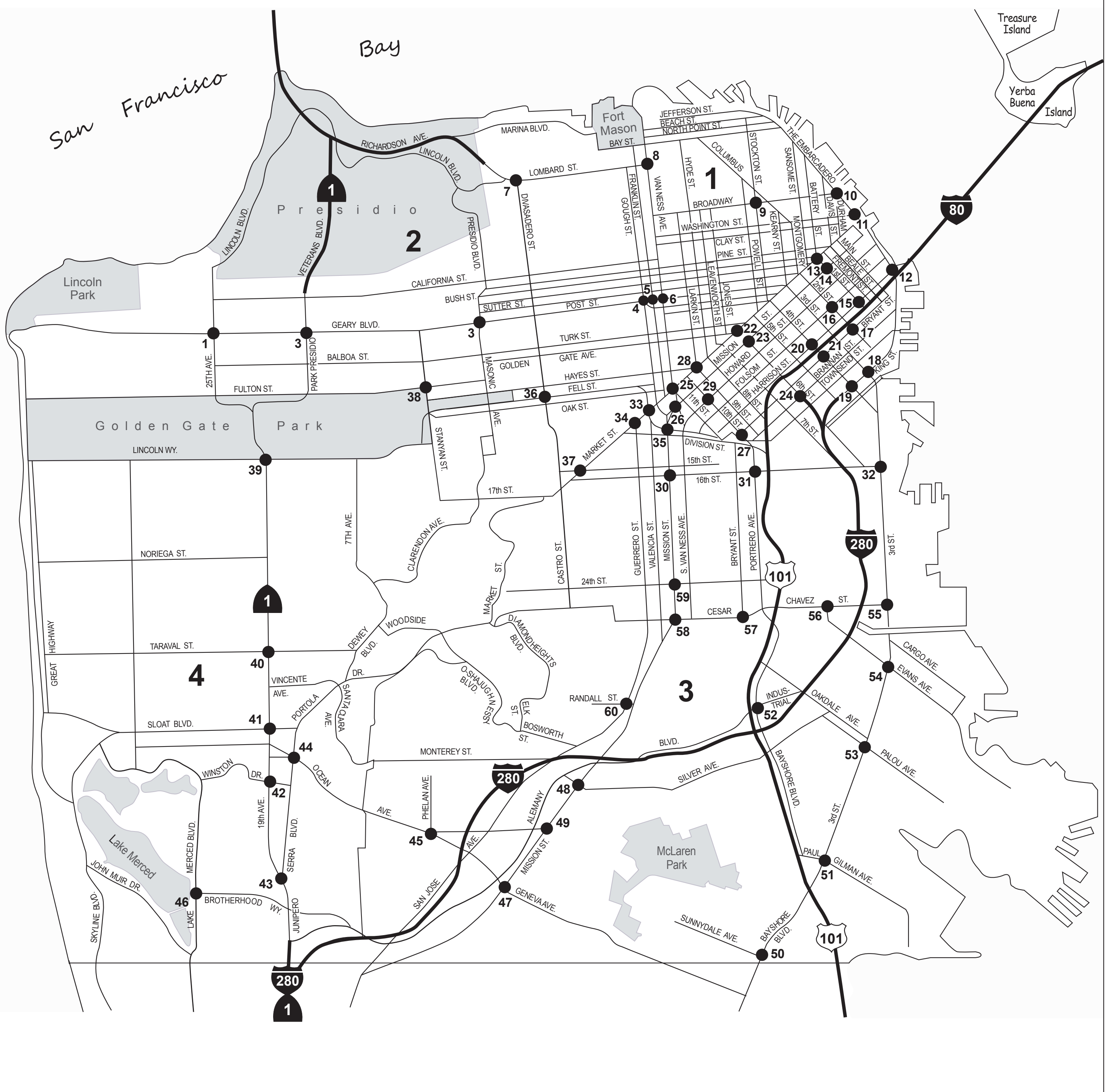
Vicinity Map

Figure
1



NORTH
Not to Scale

Figure
2


San Francisco Bay
Treasure Island
Yerba Buena Island
Fort Mason
Presidio
Lincoln Park
Golden Gate Park
Lake Merced
McLaren Park
NORTH
Not to Scale
TJKM

Project Objectives

The objectives of the proposed project are to:

1. Provide a vision for the City's housing and growth management through 2014;
2. Maintain the existing housing stock to serve housing needs;
3. Ensure capacity for the development of new housing to meet the Regional Housing Needs Allocation (RHNA) at all income levels;
4. Encourage housing development where supported by existing or planned infrastructure, while maintaining existing neighborhood character;
5. Encourage, develop and maintain programs and policies to meet projected affordable housing needs;
6. Develop a vision for San Francisco that supports sustainable local, regional and state housing and environmental goals; and
7. Adopt a housing element that substantially complies with California housing element law as determined by the California Department of Housing and Community Development.

Proposed Housing Elements Analyzed in this TIS

In order to be in compliance with state housing element law, a housing element must include an updated Data and Needs Analysis. Therefore, each proposed Housing Element utilizes the most recent data on citywide housing found in the Draft 2009 Housing Element Part I Data and Needs Analysis. In addition to the No Project Alternative, this TIS analyzes the following Housing Element proposals. Appendix A contains a comprehensive list of Housing Element objectives and policies for each alternative analyzed in this TIS.

2004 Housing Element: This option includes the objectives, policies, and implementation measures of the 2004 Housing Element. For purposes of this TIS analysis however, the 2004 Housing Element utilizes the updated Data and Needs Analysis (Part I) of the 2009 Housing Element and an updated RHNA.

2009 Housing Element: This option includes the objectives, policies, implementation measures, and strategies for further review identified in the proposed 2009 Housing Element. The strategies for further review that are introduced in the 2009 Housing Element refer to ideas that were raised over the course of development and outreach for the 2009 Housing Element. Most of the strategies require further examination, and potentially long-term study, before they can be directly implemented. However, in some instances, the strategies are more concrete and could potentially become implementation measures. For purposes of this TIS, the strategies for further review are treated as implementation measures of the 2009 Housing Element.

Alternative A (No Project Alternative): Alternative A consists of the policies and objectives of the 1990 Residence Element coupled with Part I of the proposed 2009 Housing Element, which utilizes an updated RHNA. The No Project Alternative assumes that the City would comply with state housing element law, which mandates the inclusion of an updated Data and Needs Analysis (Part I of the 2009 Housing Element) in the City's *General Plan*. Thus, the No Project Alternative uses the objectives and policies contained in the 1990 Residence Element coupled with the most recently identified RHNA allocation and an updated Data and Needs Analysis.

Alternative B (Modified 2004 Housing Element): This option includes the objectives, policies and implementation measures of the 2004 Housing Element minus those policies that were stricken by the court in the appeal of the 2004 Housing Element (See *San Franciscans for Livable Neighborhoods v. City and County of San Francisco* [June 22, 2007]).[1] Section 2. Project Characteristics contains a complete list of the objectives, policies and implementation measures that were removed by the Court of Appeals.

Alternative C (Additional Housing Concepts): This option includes concepts that more aggressively encourage attainment of the RHNA. This option explores the following concepts: (1) Allow for limited expansion of allowable building envelopes for those who provide family-size units in onsite affordable housing, (2) Requirement for development to fully build to the allowable building envelope under zoning in locations that are directly on the Rapid transit network lines identified in the Transit Effectiveness Project (TEP), (3) Height and/or density bonus for development that exceeds affordable housing requirements in locations that are directly on the Rapid transit network lines identified in the TEP, (4) Height and/or density bonus for 100% affordable housing in all zones except in RH-1 and RH-2 zones, and (5) Granting of administrative variances (i.e. over-the-counter) for parking spaces required for additional units if the development is: a. in an RH-2 zoning district (or denser), b. in an area where additional curb cuts would further exacerbate parking shortfalls, such as in Residential Parking Program areas, or c. on a Transit Preferential Street.

Existing Capacity

Housing element law requires local governments to prepare an inventory of land suitable for residential development to help identify sites that can be developed for housing within the housing element planning period. Using various data sources, the Planning Department has taken an inventory of land on which new residential development could occur under existing zoning. This was done to satisfy the Housing and Community Development (HCD) requirement to identify the supply of land still available to help the City meet its share of the regional housing need as projected by the RHNA.

Existing Zoning

Generally, the highest housing densities in the City exist in the Downtown area, at an average density of up to 283 dwelling units per acre, while lower densities (as low as 14 dwelling units per acre) exist in the western and southern areas in the City.

The Planning Department has identified that approximately 60,995 new housing units could be accommodated under existing zoning. Specifically, as presented in
Table I, there are approximately 1,649 parcels totaling 366 acres that are classified as vacant or near vacant (sites that are developed to less than 5 percent of their maximum potential) where approximately 20,543 new housing units could potentially be constructed. Another 4,111 lots are also seen as underdeveloped and could be redeveloped for residential uses, which could possibly yield another 40,452 new units. Underdeveloped sites are generally classified as soft sites, sites with development potential, or opportunity sites. These terms are used interchangeably throughout the

[1] See *San Franciscans for Livable Neighborhoods v. City and County of San Francisco* [June 22, 2007]. In response to the court's directive, the Planning Department has prepared this TIS that assesses the environmental effects of the changes from the 1990 Residence Element to the 2004 Housing Element.

document. The City identifies two levels of soft sites, sites that are built to only 30 percent of their maximum potential, and sites that are built to only five percent of their maximum potential, as determined by the zoning for that parcel. These units represent the allowable number of new housing units that could be accommodated under existing zoning. The City is also in the process of updating zoning controls for many of San Francisco's neighborhoods. These rezoning efforts will increase the existing capacity in those neighborhoods, allowing for the development of additional housing units.

Table I: Estimated New Housing Potential in Undeveloped and Underdeveloped Sites by Zoning District

Zoning Groups That Allow Housing	*Vacant or Near Vacant Sites*			*Underdeveloped Sites*			*Total No. of Parcels*	*Total Net Units*	*Total Acres*
	No. of Parcels	*Net Units*	*Acres*	*No. of Parcels*	*Net Units*	*Acres*			
Residential[1]	923	4,491	102.7	1,156	8,423	148.94	2,079	12,914	251.21
Neighborhood Commercial[2]	282	4,292	86.30	1,846	14,901	232.02	2,128	19,193	318.22
Mixed Use Districts[3]	194	2,975	34.10	485	7,876	95.11	679	10,851	129.21
Downtown Commercial[4]	63	1,745	33.92	183	1,125	43.54	246	2,870	77.46
Downtown Residential[5]	14	787	2.63	18	1,728	4.87	32	2,515	7.50
Industrial[6]	173	6,253	107.02	423	6,399	112.42	596	12,652	219.45
Totals	**1,649**	**20,543**	**491.27**	**4,111**	**40,452**	**636.90**	**5,760**	**60,995**	**1,003.15**

Source: City and County of San Francisco, Planning Department, March 2010.

[1] Zoning group includes the following zoning districts: RH, RM, and RTO.
[2] Zoning group includes the following zoning districts: NCD, NC, NCTD, NCT, and SoMa NCT.
[3] Zoning group includes the following zoning districts: CCB, CRNC, CVR, India Basin SUD, MUG, MUO, MUR, RC-3, RC-4, RED, RSD, SLI, SPD, UMU, SLR, and SSO.
[4] Zoning group includes the following zoning districts: C-2, C-3, and C-M.
[5] Zoning group includes the following zoning districts: SB-DTR, VNMDRSUD, and RH DTR.
[6] Zoning group includes the following zoning districts: M-1 and M-2.

Updated Zoning Controls

The City's Planning Department and Redevelopment Agency have recently updated zoning controls for the following neighborhoods: Market/Octavia, Mission, East South of Market (SOMA), Showplace Square/Potrero Hill, Central Waterfront, Rincon Hill, and Balboa Park. These planning efforts have developed appropriate zoning, heights, bulks, and densities in balance with infrastructure and funding strategies to support new growth. A number of other planning efforts are currently underway including the Transit Center District Plan, Treasure Island, Candlestick Point, Hunters Point Shipyard, Parkmerced, and West SoMa, which could result in increased residential development potential. Under existing zoning capacity, these planning areas could accommodate 3,669 net new housing units, representing approximately six percent of the total citywide existing capacity of 60,995 units as described above. The additional potential capacity with rezoning initiatives currently underway is approximately 28,844 units (see Table II). Should these rezoning initiatives be adopted and implemented, the City would be able to accommodate 89,839 net new housing units, which, if developed, would represent a 25 percent increase in the City's housing stock.[2]

[2] *City and County of San Francisco, Planning Department, Draft Housing Element, Part I: Data and Needs Analysis, April 2009, at page 24. The existing housing stock is estimated at 363,662 housing units citywide.*

Table II: Estimated New Housing Construction Potential with Proposed Rezoning of Select Neighborhoods

Area	*Under Current Zoning*			*With Proposed Rezoning*	
	Undeveloped	*Underdeveloped*	*Total Estimate*	*Total New Estimate*	*Additional Potential Units with Rezoning*
Executive Park	114	97	211	1,600	1,389
Glen Park	5	6	11	100	89
Japantown[1]	99	514	613	To be determined	
Park Merced	3	0	3	5,600	5,597
Transit Center District	44	78	122	1,200	1,078
Western SoMa	466	743	1,209	2,700	1,491
India Basin				1,200	1,200
Hunters Point Shipyard			1,500	4,000	2,500
Candlestick Point				7,500	7,500
Treasure Island				8,000[2]	8,000
Total	**731**	**1,438**	**3,669**	**31,900[3]**	**28,844**

Source: City and County of San Francisco, Planning Department, Draft Housing Element, Part I: Data and Needs Analysis, April 2009, at page 84.

[1] Planning efforts for Japantown are currently underway and the estimated number of new housing units that could be accommodated with rezoning initiated as part of this area plan is currently unknown.

[2] This figure varies from that in Part I: Data and Needs Analysis, April 2009, page 84 because Treasure Island is now proposing 8,000 units instead of 7,000 units. Therefore the totals have also been increased by 1,000 to reflect these new proposed units.

[3] This total does not include potential new housing that could be accommodated by implementation of the Japantown Better Neighborhoods area plan.

Pipeline Projects

As of the first quarter of 2009, there were approximately 360 projects under construction or with approved building permits in the City that could add up to 9,628 new housing units. An additional 625 projects have been approved by the Planning Department, filed for Planning Department approval, or filed for a building permit. These projects could result in an additional 46,807 new residential units. Collectively, these 56,435 new units represent San Francisco's pipeline projects. Pipeline projects include projects currently under construction, projects that have approved building permits, projects that have building department applications on file, projects that have been approved by the Planning Department, and projects that have Planning Department applications on file. It is possible that some of these projects may not go forward due to shifts in economic and legislative conditions. Three major projects, i.e., Candlestick Point-Hunters Point Shipyard, Treasure Island, and Park Merced, comprise approximately half of the pipeline project units and could be completed by approximately 2020. Production trends over the last decade show that approximately 65 to 70 percent of pipeline project units are completed within five to seven years.[3] This production trend is applicable to the pipeline project units that are not associated with major projects, which comprise approximately half of the total pipeline project units.

3 City and County of San Francisco, Planning Department, March 2010.

2. Project Characteristics

Part I of each Housing Element provide background demographics and regional housing need information, but does not include objectives or policies. Part II of each housing element sets forth the objectives, policies, and implementing strategies intended to address the City's housing needs. Part II of each option analyzed in this TIS is discussed below. Later in this report, policies of the proposed 2004 Housing Element and the proposed 2009 Housing Element that could potentially result in physical environmental impacts are identified, together with the corresponding objectives or policies of the 1990 Residence Element (if any), the environmental impacts of which were addressed in a previous EIR.

2004 Housing Element

The purpose of the revisions in the 2004 update of the City's Housing Element was to reorganize, clarify, and update the 1990 Residence Element in order to guide the City in addressing its housing production. The update was one component of a comprehensive planning effort called the Citywide Action Plan (CAP) being undertaken by the Planning Department. As part of the CAP, the Housing Element was updated in order to provide a policy basis for more specific planning efforts, including the Better Neighborhoods Program; the Eastern Neighborhoods Community Plans for the Mission, Central Waterfront, East SOMA, and Showplace Square/Potrero Hill districts; and the Downtown Neighborhoods Community Plans for the C-3-O and Rincon Hill districts. The 2004 Housing Element update did not include any specific proposals for future development, but was rather a set of policies intended to guide the City's consideration of future development plans and proposals with regard to housing.

The objectives and policies in the 2004 Housing Element were revised in the following ways: (1) Part II was reorganized; (2) 52 policies and nine objectives also included in the 1990 Residence Element were at least partially re-worded; (3) five policies and three objectives found in the 1990 Residence Element were removed; (4) seven new policies were added; and (5) a series of Implementation Measures were added to serve as a tool for implementing the policies and objectives. In general, the policies contained in the 2004 Housing Element are intended to encourage increased residential density, especially in areas well served by transit, improve the livability of existing neighborhoods, protect the affordability of housing, streamline the housing production process, create mixed-income communities, provide more family housing, and manage homelessness. The 2004 Housing Element also includes implementation measures that direct the Planning Department to continue to identify areas for potential housing development throughout a Better Neighborhoods-type planning process.

The 2004 Housing Element focused on the following themes: housing supply; housing retention; housing condition; housing affordability; housing choice; homelessness; housing density, design, and quality of life; and regional and state housing needs. Some objectives, policies, and implementation measures, such as those focused on homelessness and affordability, generally would not result in impacts to the transportation network.

2009 Housing Element

Part II of the proposed 2009 Housing Element sets forth the objectives, policies, and implementing strategies intended to address the City's housing needs based on the RHNA provided by ABAG in 2007.

The objectives and policies are revised from the 1990 Residence Element in the following ways: (1) Part II is reorganized by grouping policies under different broad themes and objectives; (2) 18 policies and one objective found in the 1990 Residence Element are removed; (3) 15 policies and one objective not found in the 1990 Residence Element are added; and (4) a series of Implementation Measures are added to serve as a tool for implementing the policies and objectives of the proposed 2009 Housing Element. In general, the policies contained in the proposed 2009 Housing Element are intended to prioritize permanently affordable housing; recognize and preserve neighborhood character; integrate the planning of housing, jobs, transportation and infrastructure; and maintain the City as a sustainable model of development. The 2009 Housing Element also identifies areas with development capacity under existing zoning (or soft sites, as discussed above) for future potential housing throughout the City.

The proposed 2009 Housing Element also includes a series of "Strategies for Further Review." These strategies are ideas that were raised over the course of development and outreach for the 2009 Housing Element. Most of the strategies require further examination, and potentially long-term study, before they can be directly implemented. For purposes of this TIS, the strategies for further review are treated as implementation measures of the 2009 Housing Element.

The 2009 Housing Element focuses on themes such as adequate housing sites; conservation and improvement of existing housing stock; equal housing opportunities; affordable housing; removing constraints to the construction and rehabilitation of housing; maintaining the character of neighborhoods; and balancing construction and infrastructure. Some objectives, policies, and implementation measures related to homelessness and access to housing would not result in impacts to the transportation network.

Alternative A (No Project)
Alternative A consists of the policies and objectives of the 1990 Residence Element coupled with Part I of the proposed 2009 Housing Element, which utilizes an updated RHNA. The No Project Alternative assumes that the City would comply with state housing element law, which mandates the inclusion of an updated Data and Needs Analysis (Part I of the 2009 Housing Element) in the City's *General Plan*. Thus, the No Project Alternative uses the objectives and policies contained in the 1990 Residence Element coupled with the most recently identified RHNA allocation and an updated Data and Needs Analysis.

Alternative B (Modified 2004 Housing Element)
Alternative B analyzes the effects of the 2004 Housing Element as revised by the Court of Appeals in *San Franciscans for Livable Neighborhoods v. City and County of San Francisco* [June 22, 2007]. Pursuant to the Court of Appeals direction, the following objectives, policies and implementation measures were modified or removed from the 2004 Housing Element.

1. The following text was removed under the description of Objective 1 (To provide new housing, especially affordable housing, in appropriate locations which meets identified housing needs and takes into account the demand for affordable housing creased by employment demand): "New residential development must be of a character and stability that enhances the City's neighborhoods and maintains the quality of life for existing and future residents. How this new residential development can be accommodated without jeopardizing the very assets that make living in San Francisco desirable must be discussed. In order to enhance the City's livability, the supply of housing must be increased and new

housing developments should respect the scale and character of the surrounding neighborhood."

2. The following text was removed from Policy 1.1 and the discussion under Policy 1.1: "Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood scale and character where there is neighborhood support." And "along transit-preferential streets are numerous in-fill-housing opportunities. While different zoning controls may result in different housing configurations and densities on these parcels, residential parking requirements in these cases should be, if appropriate, modified." And "There is a reduced need for automobile use in these areas due to their proximity to transit, services, employment, and entertainment. Parking and traffic problems can be further addressed by community parking facilities and car-sharing programs, and other creative transportation programs."
3. The following implementation measure was removed: "Implementation Measure 1.1 [Implementation Measure 1.1.1] - A citywide action plan (CAP) should provide a comprehensive framework for the allocation of higher density, mixed-use residential development in transit-rich areas with stable urban amenities in place. In these areas, specific CAP strategies should include: higher densities and reduced parking requirements in Downtown areas or through a Better Neighborhoods type planning process; pedestrian-oriented improvements to enhance the attractiveness and use of transit."
4. Policy 1.2 and supporting text was deleted entirely: "Policy 1.2- Encourage housing development, particularly affordable housing, in neighborhood commercial areas without displacing existing jobs, particularly blue-collar jobs or discouraging new employment opportunities." And "The City's neighborhood commercial districts offer the potential for new additional housing over ground floor retail uses. In many cases, additional floors can be constructed to make full and efficient use of appropriately scaled height limits. If necessary, private open space requirements could also be modified, with alternative access to the outdoors considered. New housing represents not only an expanded market to support neighborhood retail, but its residents will serve as the eyes and ears of the streets. In the long term, neighborhood commercial district controls and standards should be revised to recognize and enhance the supporting role and centrality of these districts to the surrounding residential districts."
5. Implementation Measure 1.2.1 was deleted entirely: "Implementation Measure 1.2 [Implementation Measure 1.2.1]- The Planning Department will review planning and permit procedures to remove impediments to the production of housing and neighborhood serving uses in commercial and neighborhood commercial areas near transit corridors that are defined and determined to be served by sufficient and reliable transit."
6. The following text from Implementation Measure 1.3.1 was deleted: "Downtown areas and areas subject to a Better Neighborhoods type planning process will be expected to absorb major office and residential developments over the next decade. Planning and zoning code changes should include floor-to-area ratio exemptions."
7. The following text was deleted from Implementation Measure 1.6.1 with respect to providing incentives for commercial project developments in the Downtown C-3 District: "…no residential parking requirement; and no density requirements for residential projects."
8. Implementation Measure 1.6.2 was deleted entirely: "The Planning Department and the Redevelopment Agency will propose increasing height limits, eliminating density requirements and modifying off-street parking requirements in the Transbay/Rincon Hill

redevelopment survey areas. The Mid-Market redevelopment survey area will be re-zoned to include mixed-use residential areas and reduced residential parking requirements."

9. Policy 1.7 and all three implementation measures were deleted entirely: "Policy 1.7- Encourage and support the construction of quality, new family housing. Children and families are very much part of the City's vitality and diversity. They bring life and transform even the City's least child-friendly Downtown neighborhoods. But San Francisco's families with children are leaving as family-sized housing become scarce or prohibitive, outbid by more affluent and flexible non-family households that form as a response to the City's high rents and housing costs. The changing demographics of the City also hint at larger, extended families. Families with children and elderly members have few options as only 25% of the City's housing stock has three or more bedrooms. Much of the housing constructed in the last decade was studios and one- or two-bedroom units – too small to accommodate larger families. Single-family residential builders and contractors should be encouraged to develop the almost one thousand vacant lots in residential neighborhoods that can accommodate new single-family housing or duplexes.

   New family housing, particularly affordable housing, need not be confined to the suburban residential neighborhoods. Children thrive in and can benefit from urban living. The compact nature of urban living can offer children proximity and access to various activities, especially those that appeal to their recreational and cultural interests. New residential development opportunities, including affordable family housing, have been identified in neighborhoods near Downtown. Developments that include various unit sizes that can accommodate families with children should be supported and encouraged.

   Implementation Measure 1.7-[Implementation Measure 1.7.1] In response to the increasing number of families in San Francisco, the Planning Department will develop zoning amendments to require a minimum percentage of larger family units, ranging from two to four bedrooms, in new major residential projects. The Planning Department will also propose eliminating density requirements within permitted building envelopes in Downtown areas and areas subject to a Better Neighborhoods type planning process to maximize family units constructed."

   [Implementation Measure 1.7.2] Mayor's Office of Housing and the San Francisco Redevelopment Agency will continue to administer programs for development of affordable family rental housing. Priority will continue to be given to projects that include affordable family units for the homeless and those at-risk of homelessness, and include supportive services for residents.

   [Implementation Measure 1.7.3] The Planning Department will study the feasibility of "flexible" development projects to accommodate family growth, shrinkage, expansion, and extension. Loft sleeping areas, family rooms and master bedrooms could be designed to ease future conversion to efficiency apartments for family members, or as an income unit."

10. The following text was deleted from Policy 4.4 with respect to granting incentives for affordable housing: "…and parking requirement exemptions"

11. Objective 11, Policy 11.1 and its three implementation measures were deleted entirely: "Objective 11- In Increasing the supply of housing, pursue place making and neighborhood building principles and practices to maintain San Francisco's desirable urban fabric and enhance the livability in all neighborhoods. Housing quality involves not only the physical condition of the housing structure itself but also the condition of the surrounding neighborhood and the adequacy of its amenities, facilities, and services. Quality urban housing can exist only in full service neighborhoods. New housing development must address these issues.

Policy 11.1- Use new housing development as a means to enhance neighborhood vitality and diversity. New in-fill housing development should be compact, mixed-use, mixed income, and have a mix of unit sizes. Major multi-family housing projects that accommodate non-residential uses such as neighborhood serving retail, childcare or after school facilities, or even institutional uses such as a public library, should be encouraged and supported. Minimum density requirements and maximum parking standards should be used to encourage a mix of unit sizes in areas well served by transit and neighborhood retail.

Implementation 11.1- [Implementation Measure 11.1.1] The new Land Use Element will identify in-fill sites appropriate for mixed-use residential projects. Appropriate neighborhood serving retail, public facilities and supportive amenities should be encouraged.

[Implementation Measure 11.1.2] The City will continue to implement its policy that the design of all housing sites and related amenities make a positive contribution to surrounding public space and to overall neighborhood vitality.

[Implementation Measure 11.1.3] The Planning Department will encourage historic preservation and adaptive reuse of older buildings to enhance neighborhood vibrancy."

12. Policy 11.5 and its three Implementation Measures were deleted entirely: "Policy 11.5- Promote the construction of well-designed housing that enhances existing neighborhood character. Residents of San Francisco should be able to live in well-designed housing suited to their specific needs. To ensure that housing provides quality living environments and complements the character of the surrounding neighborhood, the following general design and amenity guidelines should be applied in evaluating new residential developments and alteration of existing buildings:

a) Exterior Appearance

i) Design new and substantially altered buildings in a manner that conserves and protects neighborhood character (See *Residential Design Guidelines*, Department of City Planning, 2003 for more specific guidelines and illustrations.)

b) Recreation/Open Space

i) Provide adequate on-site usable open space and relate the type, amount and location of open space to the types of households expected to occupy the building. (See Figure 9, "Residential Open Space Guidelines" in the Recreation and Open Space Element, for more specific guidelines.)

c) Facilities

i) In larger projects include needed amenities such as storage, laundry, community rooms, and recycling, and adopt green building practices to the maximum extent possible.

ii) Provide sites for childcare facilities to serve residents of the immediate vicinity if such facilities do not exist nearby, or if nearby facilities are at or near capacity.

iii) Provide sites for convenience shopping facilities to serve the immediate vicinity if such facilities do not exist nearby.

d) Security

i) Incorporate concepts of security in the design of the building, especially in the number of units per entrance, sense of personal space and ability of the residents to effect self-policing of the grounds and immediate surroundings. Also, provide adequately lit unit address numbers that are easily read from the street or walkways.

e) Art Work

i) Incorporate artwork in larger buildings.

f) Subdivisions and Planned Unit Developments

i) For larger subdivisions and planned unit developments, provide a lot layout and pattern that integrates well with the surrounding urban fabric and create a street pattern that ties into the surrounding streets.

ii) Create a street pattern which ties into surrounding streets.

iii) Avoid creating dead-end streets and cul-de-sacs where it is possible to create through streets.

iv) On wide blocks, create mid-block lanes that function as public streets.

v) Create pedestrian passageways to provide convenient circulation within the project and convenient connections to areas outside the project.

vi) Create lot or building patterns that orient the fronts of buildings to, and create multiple building entries from the street.

vii) Avoid creating overly wide streets. Provide sidewalks wide enough to accommodate street trees.

g) Underground utilities.

Implementation 11.5- [Implementation Measure 11.5.1] The Planning Department will continue to study the construction methods and design components of well-designed housing that enhances the existing urban fabric of San Francisco.

[Implementation Measure 11.5.2] The Planning Department will continue to use the Residential Design Guidelines when reviewing projects.

[Implementation Measure 11.5.3] Each project will be considered on its own merit and on its ability to make a positive contribution to the immediate neighborhood and the City."

13. Policy 11.6 and its Implementation Measure were deleted entirely: "Policy 11.6-Employ flexible land use controls in residential areas that can regulate inappropriately sized development in new neighborhoods, in Downtown areas and in other areas through a Better Neighborhoods type planning process while maximizing the opportunity for housing near transit. Increased allowable densities should not detract from established neighborhood characteristics. In many cases, design and efficient site uses can make use of maximum housing densities while keeping resulting units affordable and compatible with neighboring structures.

    Implementation 11.6-[Implementation Measure 11.6.1] The City will continue to promote increased residential densities in areas well served by transit and neighborhood compatible development with the support and input from local neighborhoods."

14. Policy 11.7 and its Implementation Measure were deleted entirely: "Policy 11.7-Where there is neighborhood support, reduce or remove minimum parking requirements for housing, increasing the amount of lot area available for housing units. San Francisco first imposed residential parking requirements in the 1950s, when prevailing notions assumed that cars were becoming the primary way of getting around and automobile parking should be provided accordingly. This 1:1 parking requirement generated traffic and took up valuable space, but created a distinct neighborhood character in the western part of the City. One parking space reduces the amount of housing a parcel can accommodate by as

much as 25%. Building parking space also adds $20,000 to $50,000 per parking space to the cost of housing construction.

Enforcing one off-street parking space for each new dwelling unit is essentially a suburban practice and diverges from the City's tradition of compact, urban, walkable places in the older neighborhoods. Much of San Francisco was built before the advent of the automobile and most places are easily accessible by foot or public transit.

Implementation 11.7- [Implementation Measure 11.7.1] The Planning Department will work to reduce parking in older neighborhoods and in other areas through a Better Neighborhoods type planning process with the support and input from local neighborhoods."

15. Policy 11.8 and its two Implementation Measures were deleted entirely: "Policy 11.8- Strongly encourages housing project sponsors to take full advantage of allowable building densities in their housing developments while remaining consistent with neighborhood character. The Planning Department, with housing project sponsors, should explore and encourage project configurations that take full advantage of allowable building densities. Department support should go beyond technical assistance and include coordinated and timely neighborhood outreach and accelerated processing. The Department should strongly support projects that creatively address residential parking and open space requirements, resulting in higher densities with a full range of unit sizes.

    Implementation 11.8-[Implementation Measure 11.8.1] The Planning Department, with the support and input from local neighborhoods, study the impacts of reduced parking and private open space provisions and will consider revising the Planning Code accordingly. [Implementation Measure 11.8.2] The Planning Department will work with housing advocates to educate residents on the benefits of traditional urban neighborhood supporting housing densities."

16. Policy 11.9 and its four Implementation Measures were deleted entirely: "Policy 11.9 Set allowable densities and parking standards in residential areas at levels that promote the City's overall housing objectives while respecting neighborhood scale and character. In setting allowable residential densities in established neighborhoods, consideration should be given to the prevailing building type in the surrounding area so that new development does not detract from existing character. Established architectural characteristics should be respected. Design and efficient site uses can make use of maximum allowable densities while keeping resulting units affordable and compatible with neighboring structures. In areas where an urban scale and character is yet not established, densities should be set at levels that support transit and neighborhood amenities that are enjoyed by the City's more established neighborhoods.

    Implementation 11.9-[Implementation Measure 11.9.1] The City, through a Better Neighborhoods type planning process, will continue to work to improve and enhance housing with the goal of more housing and vital, attractive transit served neighborhoods.

    [Implementation Measure 11.9.2] The Planning Department will continue to employ Residential Design Guidelines and implement the General Plan to ensure new projects are compatible with established neighborhoods.

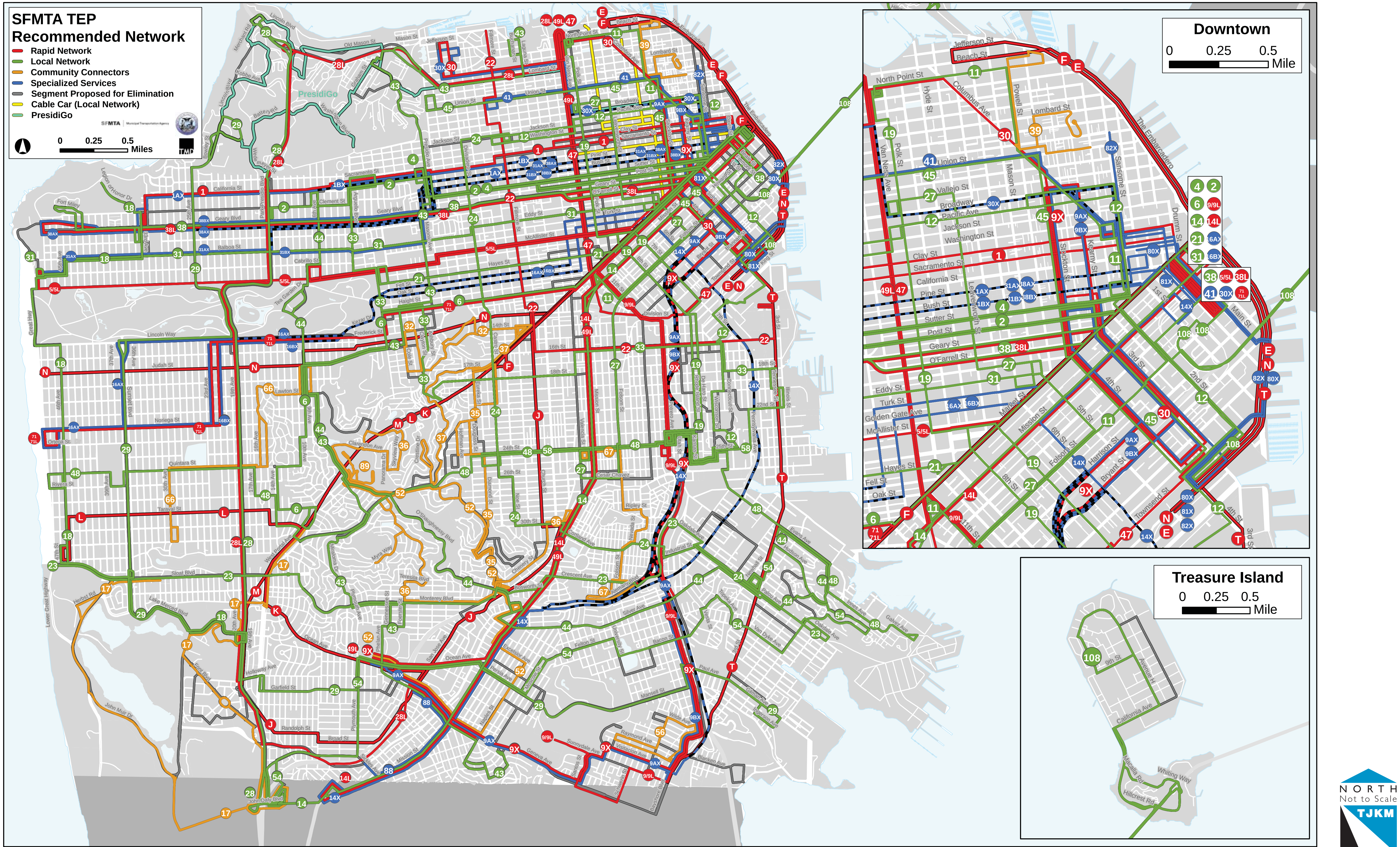
    [Implementation Measure 11.9.3] The new Land Use Element will, within the framework of a comprehensive citywide action plan (CAP), identify areas where higher densities are appropriate.

[Implementation Measure 11.9.4] The updated Urban Design Element will reconcile the City's established and well formulated urban design principles with the City's housing objectives."

Alternative C (Additional Housing Concepts)
Alternative C includes concepts for housing strategies that more aggressively encourage attainment of the 2007-2014 RHNA. This alternative includes the 2009 Housing Element policies and explores five concepts, as follows:

1. Allow for limited expansion of allowable building envelopes for those who provide family-size units in onsite affordable housing.
2. Requirement for development to fully build to the allowable building envelope under zoning in locations that are directly on the Rapid transit network lines identified in the Transit Effectiveness Project (TEP), as shown in Figure 3.
3. Height and/or density bonus for development that exceeds affordable housing requirements in locations that are directly on the Rapid transit network lines identified in the TEP, as shown in Figure 3.
4. Height and/or density bonus for 100% affordable housing in all zoning districts except in RH-1 and RH-2 zones.
5. Granting of administrative variances (i.e. over-the-counter) that waive off-street parking requirements for additional units if the development is:
    a) In an RH-2 zoning district (or greater),
    b) In an area where additional curb cuts would further exacerbate on-street parking deficits, such as in Residential Parking Program areas, or
    c) On a Transit Preferential Street, as shown in Figure 4.

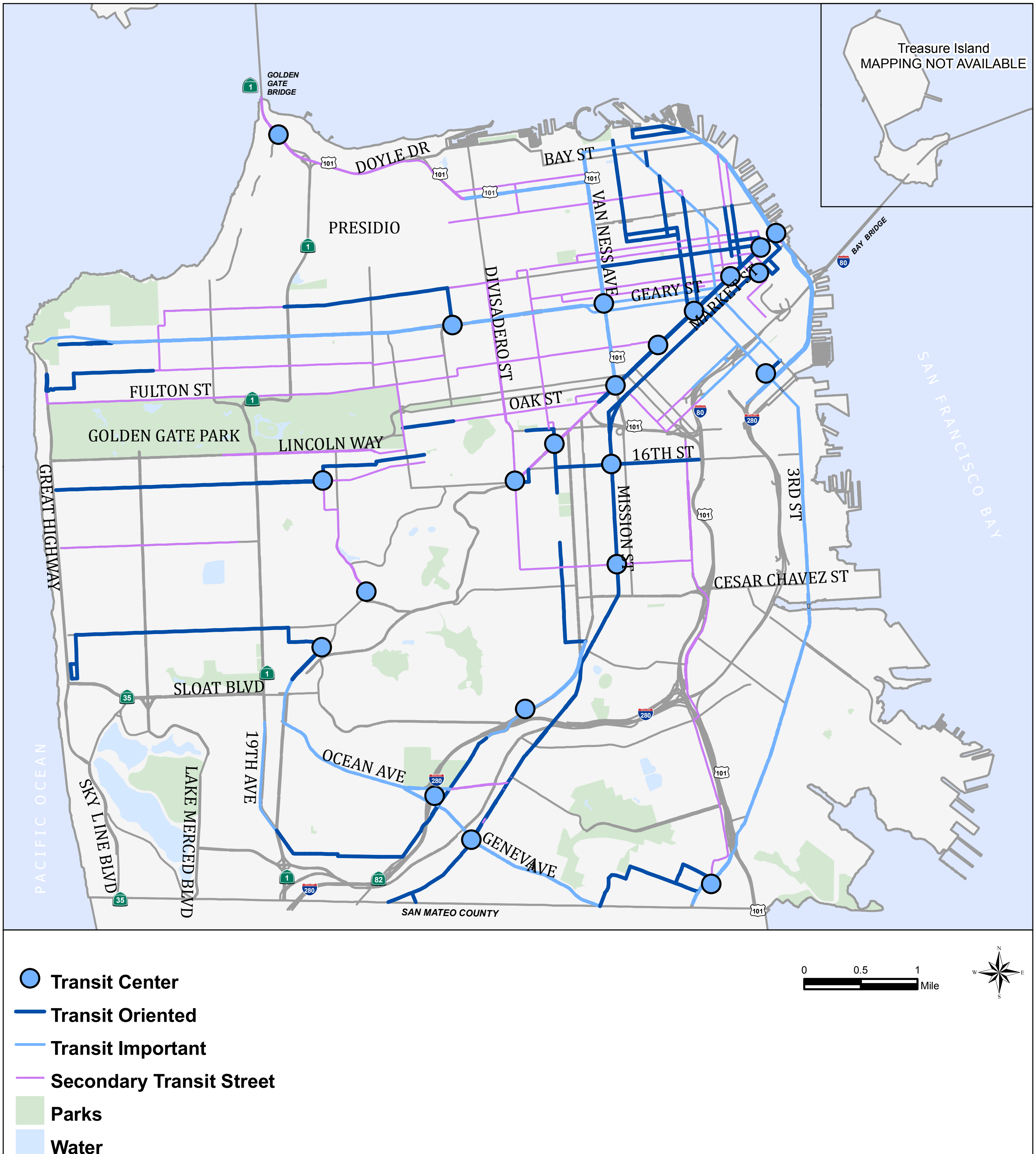
The 1990, 2004 and 2009 Housing Element policies, in addition to the project alternatives, that could potentially affect the transportation network are discussed in Section 6, Analysis of Housing Element Policies.



Source: San Francisco Municipal Transportation Agency, January 2009

Muni Transit Preferential Streets Network

Figure 4



Source: San Francisco General Plan, Transportation Element, Map 9, June 2010.

3. Study Methodology

The scope of work for this study was approved by the San Francisco Planning Department on October 29, 2009. This report has been prepared according to the approved scope of work, which is included in Appendix B.

Study Scope and Approach
The proposed Housing Elements are each organized into two main parts. Part I of each Housing Element consists of the Data and Needs Analysis section, which provides a statistical baseline for determining appropriate housing objectives, policies and implementation strategies. This section includes San Francisco population and employment trends, housing data, and inventories of land available for increased housing development. Part I does not contain any changes to city policy and would have no effect on the transportation and circulation system.

Part II of the proposed Housing Elements contains the objectives, policies and implementation measures that are designed to meet the Regional Housing Needs Allocation (RHNA). The RHNA identifies the amount of new housing anticipated for the Housing Element's planning period, and distributes these units by affordability levels. Thus, while the Housing Elements do not propose new residential development, local jurisdictions must show, through their Housing Elements, that they have capacity available to meet the RHNA. If there is not available capacity to meet the RHNA, a jurisdiction must rezone a portion of their land to accommodate the RHNA.

The 2007-2014 RHNA anticipates a need for approximately 31,000 housing units during the planning period for this housing element. According to the soft site analysis conducted for the Housing Element Environmental Impact Report (EIR), the City has additional capacity for approximately 61,000 housing units. Therefore, rezoning to accommodate the RHNA is not required. Additionally, implementation of the proposed Housing Elements would not result in changes to height and bulk districts or to allowable uses under the *Planning Code.*

The 2004 Housing Element and 2009 Housing Element do not include any changes to the land use objectives and policies in the City of San Francisco's area plans or redevelopment plans for certain city areas. Therefore, the applicable area plan or redevelopment plan, which includes objectives and policies related to circulation, would continue to guide future development in those specific neighborhoods or districts. The proposed Housing Elements do, however, promote housing through neighborhood and area plans as part of the planning process. For example, 2004 Housing Element Policy 11.6 calls for the completion of the Better Neighborhoods area plans, and 2009 Housing Element Policy 1.1 calls for community planning processes to guide housing growth. The Housing Elements also propose policies and implementation measures to encourage new housing. Therefore, although implementation of the proposed Housing Elements would not directly affect existing area plans or redevelopment plans, it would nonetheless encourage many planning-related strategies to accommodate growth.

The Association of Bay Area Governments (ABAG) population estimates project that the City will grow by approximately 39,568 households by 2025 (2009-2025), requiring about 41,651 new housing units to accommodate the 2025 growth projections. As discussed above, the Housing Elements do not propose to develop new housing. Therefore, the 2004 and 2009 Housing Elements would not generate any new person trips beyond the 2025 ABAG projections. Residential growth within the City would occur regardless of the proposed Housing Elements; the Housing Elements would provide direction for how new residential development in the City should occur.

To meet the City's share of the RHNA, the proposed 2004 and 2009 Housing Elements aim to do the following: 1) preserve and upgrade existing housing units to ensure they do not become dilapidated, abandoned, or unsound, and 2) provide direction for how new housing development in the City should occur. With respect to the latter, the 2004 Housing Element generally encourages increased housing in neighborhood commercial districts and mixed-use districts near Downtown. The 2009 Housing Element, on the other hand, encourages housing in new commercial or institutional projects, housing near major transit lines, and accommodating housing through community planning efforts. This TIS presents future Cumulative 2025 Conditions for the City's transportation network and qualitatively analyzes the potential for the 2004 and 2009 Housing Elements (and the project alternatives) to affect the distribution of projected person trips among the transportation network.

Significance Criteria
The City of San Francisco Planning Department uses the following criteria of significance to determine the potential impacts associated with a proposed project:

Traffic: The operational impacts on signalized intersections are considered significant when project-related traffic causes the intersection level of service to deteriorate from LOS D or better to LOS E or LOS F, or from LOS E to LOS F. The project may result in significant adverse impacts at intersections that operate at LOS E or LOS F under Existing Conditions depending upon the magnitude of the project's contribution to worsening the average delay. In addition, the project would have a significant adverse impact if it would cause major traffic hazards, or would contribute considerably to the cumulative traffic increases that would cause the deterioration in levels of service to unacceptable levels.

Transit: The project would have a significant impact on the environment if it would cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service; or cause a substantial increase in operating delay or operating costs such that significant adverse impacts in transit service levels could result. With the Muni and regional transit screenlines analyses, the project would have a significant effect on the transit provider if project-related transit trips would cause the capacity utilization standard to be exceeded during the p.m. peak hour.

Pedestrian: The project would have a significant effect on the environment if it would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.

Bicycle: The project would have a significant effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

Loading: The project would have a significant effect on the environment if it would result in a loading demand during the peak hour of loading activities that could not be accommodated within the proposed on-site loading facilities or within convenient on-street loading zones, and if it would create potentially hazardous traffic conditions or significant delays affecting traffic, transit, bicycles or pedestrians.

Emergency Vehicle: The project would have a significant impact on the environment if it would hinder emergency vehicle access.

Construction: Construction-related impacts generally would not be considered significant due to their temporary and limited duration.

Evaluation of Existing Conditions

The existing traffic conditions were evaluated at 60 study intersections during the p.m. peak period for a typical weekday. The peak period analyzed was between 4:00 p.m. and 6:00 p.m., which is generally the period of peak demand on the transportation network. The study intersections were identified by the Planning Department as the intersections citywide that experience the most congestion or represent the constraints on the transportation network.

The following 60 study intersections were analyzed for this TIS, as shown in Figure 2.

1. Geary Boulevard / 25th Avenue
2. Geary Boulevard / Park Presidio Avenue
3. Geary Boulevard / Masonic Avenue
4. Geary Boulevard / Gough Street
5. Geary Boulevard / Franklin Street
6. Geary Boulevard / Van Ness Avenue
7. Lombard Street / Richardson Avenue
8. Lombard Street / Van Ness Avenue
9. Stockton Street / Broadway
10. The Embarcadero / Broadway
11. The Embarcadero / Washington Street
12. The Embarcadero / Harrison Street
13. 1st Street / Market Street
14. 1st Street / Mission Street
15. 1st Street / Harrison Street
16. 2nd Street / Folsom Street
17. 2nd Street / Bryant Street
18. 3rd Street / King Street
19. 4th Street / King Street
20. 4th Street / Harrison Street
21. 4th Street / Bryant Street
22. 6th Street / Market Street
23. 6th Street / Mission Street
24. 6th Street / Brannan Street
25. Market Street / Van Ness Avenue
26. Mission Street / South Van Ness Avenue
27. 10th Street / Brannan Street / Potrero Avenue / Division Street
28. 9th Street / Market Street

29. 10th Street / Howard Street
30. 16th Street / Mission Street
31. 16th Street / Potrero Avenue
32. 16th Street / 3rd Street
33. Market Street / Octavia Street
34. Market Street / Guerrero Street / Laguna Street
35. Mission Street / Otis Street / Division Street
36. Fell Street / Divisadero Street
37. 15th Street / Market Street / Sanchez Street
38. Fulton Street / Stanyan Street
39. Lincoln Way / 19th Avenue
40. Taraval Street / 19th Avenue
41. Sloat Boulevard / 19th Avenue
42. Winston Drive / 19th Avenue
43. Junipero Serra Boulevard / 19th Avenue
44. Junipero Serra Boulevard / Ocean Avenue
45. Phelan Avenue / Ocean Avenue / Geneva Street
46. Lake Merced Boulevard / Brotherhood Way
47. Mission Street / Geneva Street
48. Mission Street / Silver Avenue
49. Mission Street / Ocean Avenue
50. Sunnydale Avenue / Bayshore Boulevard
51. Gilman Street / Paul Avenue / 3rd Street
52. Industrial Street / Bayshore Boulevard / Alemany Boulevard
53. 3rd Street / Palou Avenue
54. 3rd Street / Evans Avenue
55. 3rd Street / Cesar Chavez Street
56. Evans Avenue / Cesar Chavez Street
57. Bryant Street / Cesar Chavez Street
58. Mission Street / Cesar Chavez Street
59. Mission Street / 24th Street
60. San Jose Avenue / Randall Street

Existing transit conditions are described in terms of available routes, transit ridership and capacity at the screenlines for San Francisco Municipal Railway (Muni) and regional transit carriers. A public transit screenline analysis was performed on key Muni routes and regional transit carriers for 2025 Cumulative Conditions. Existing pedestrian and bicycle conditions and facilities are described qualitatively. Existing parking conditions in the city are qualitatively described with emphasis on the Residential Parking Permit program and its locations.

Trip Generation
As discussed above, the Housing Elements do not propose to develop new housing. Therefore, the 2004 and 2009 Housing Elements would not generate any new person trips. Residential growth within the City would occur regardless of the proposed Housing Elements; the Housing Elements would provide direction for how new residential development in the City should occur, with an emphasis on affordability.

Typically for San Francisco transportation studies, trip generation estimates are made based on the *SF Guidelines*. However, because future residential growth will occur regardless of the adoption of the 2004 or 2009 Housing Element policies, and the policies themselves would not generate new trips, no trip generation estimates are provided as part of this study. This TIS does present future (2025) Cumulative Conditions that incorporate recently updated zoning controls, including (but not limited to) the neighborhoods of Market/Octavia, Mission, East South of Market (SOMA), Showplace Square/Potrero Hill, Central Waterfront, and Balboa Park. The cumulative scenario for these area plans would not change as a result of the proposed Housing Elements. Future residential growth from the City's area plans and redevelopment plans, and incremental growth anticipated by residential projects (the City's pipeline) have been incorporated into the traffic analysis results for Cumulative 2025 Conditions in this TIS.

Any new development within the City would be subject, on a project-by-project basis, to independent environmental review pursuant to the California Environmental Quality Act (CEQA). This analysis would present the site-specific effects of proposed development projects on the City's transportation network. While the 2004 and 2009 Housing Element policies would not generate any new trips, their effects can be generally categorized into three areas: 1) directing growth to particular locations within the City, such as neighborhood commercial areas, areas near transit, and former industrial areas; 2) addressing the provision of off-street vehicle parking for new developments through reduced parking requirements and other measures, and 3) directing increased residential density to certain locations within the City. These indirect effects are evaluated qualitatively in this TIS.

Trip Distribution
As part of this study, the Planning Department has identified and analyzed 60 intersections that experience the most congestion or represent constrained nodes in the citywide transportation network. Although the Housing Elements would not generate new trips, as discussed above, the Housing Elements do contain policies that direct growth to certain areas of the City and include policies intended to encourage a modal shift to transit, bicycling, and walking. The TIS qualitatively analyzes the potential for the 2004 and 2009 Housing Elements to affect the distribution of projected person trips among the City's transportation network.

Parking Demand
With regards to parking, the 2004 and 2009 Housing Elements propose policies that promote an overall reduction in parking for new development, either through reduced parking requirements, or encouraging housing in locations where alternative methods of transportation are available. The 2004 Housing Element promotes reduced parking primarily by exemptions from parking requirements (for example, 2004 Housing Element Policies 4.4 and 11.7). The 2009 Housing Element promotes reduced parking by advocating against reducing livable space for parking and promoting housing in locations with available alternative transportation, thereby reducing the need for parking (2009 Housing Element Policies 2.3 and 13.3).

The 2004 and 2009 Housing Elements also promote increased density in certain areas of the City. (See 2004 Housing Element Policies 1.7, 11.6, and 11.9 and Implementation Measures 1.7.1, 1.7.3, 1.8.4, 4.4.1, 4.5.1, 4.6.3, 11.7.1, and 11.8.1; and 2009 Housing Element Policies 1.4, 1.5, 1.6, 7.5, and 11.4). Increased density in certain areas throughout the City could result in potentially larger developments, which combined with reduced parking, could increase the on-street parking demand in localized areas. On the other hand, increased density, particularly when located near areas rich in transit, bicycle, and pedestrian facilities, generally produce lower vehicle ownership rates and therefore, generate less parking demand than would otherwise occur for the same amount of housing provided in less dense settings throughout the City. It should be noted that recently updated area plans in the neighborhoods of Market/Octavia, Mission, East South of Market (SOMA), Showplace Square/Potrero Hill, Central Waterfront, and Balboa Park contain detailed parking demand analyses for these specific areas.

Pedestrian and Bicycle Facilities

As discussed above, the effects of the 2004 and 2009 Housing Element policies can be generally categorized into three areas: 1) directing growth to particular locations within the City, such as neighborhood commercial areas, areas near transit, and former industrial areas; 2) addressing the provision of off-street vehicle parking for new developments through reduced parking requirements and other measures, and 3) directing increased residential density to certain locations within the City. The indirect effects of the Housing Element policies on pedestrian and bicycle facilities are analyzed qualitatively in this TIS.

4. Setting

This chapter describes of the existing transportation network, including descriptions of the existing roadway and transit network, parking, pedestrian, and bicycle conditions. This chapter also includes a discussion of adopted and proposed transportation plans and programs that could affect the city transportation network in the future.

Roadway Network

This section describes the roadway system serving the project site using the classifications from the 'Transportation Element' of the San Francisco *General Plan*. The *General Plan* classifies roadways within the city as Freeways, Major Arterials, Transit Conflict Streets, Secondary Arterials, Recreational Streets, Collector Streets, and Local Streets. It also identifies Transit Preferential Streets, which include Primary Transit Streets (transit-oriented, non-major arterials), Primary Transit Streets (transit-important, major arterials), and Secondary Transit Streets. Transit Conflict Streets are similar to Primary Transit Streets (transit-oriented).

Regional Access

This subsection describes the existing regional roadway network in the study area, including Interstate 80 (I-80), U.S. Highway 101 (US 101), and Interstate 280 (I-280). In addition, State Route 1 (SR 1) and State Route 35 (SR 35) also serve the City. These facilities are described below.

<u>I-80</u> is generally an east-west freeway, connecting San Francisco with the East Bay and points east via the San Francisco-Oakland Bay Bridge. I-80 is a six- to eight-lane facility from the west side of the Bay Bridge to the connection with US 101 south of Downtown San Francisco.

<u>US 101</u> provides regional access to both the north and south of San Francisco. The north portion of US 101, from Mission and Howard Streets to Doyle Drive in the Presidio, operates as an arterial street along Van Ness Avenue and Lombard Street. Doyle Drive is a freeway that connects to the Golden Gate Bridge. The south portion of US 101, from Mission and Howard Streets to San Mateo County, operates as a six- to eight-lane facility. US 101 connects to I-80 southwest of Downtown San Francisco.

<u>I-280</u> is generally a north-south freeway, providing regional access to western San Francisco and the South Bay and the Peninsula. 1-280 terminates in the South of Market area at two locations: Brannan Street/Sixth Street and King Street.

<u>SR 1</u> is an arterial street on the western side of San Francisco, traveling via 19th Avenue, Crossover Drive through Golden Gate Park, Park Presidio Boulevard, Veterans Boulevard, and joins US 101 at Doyle Drive in the Presidio.

<u>SR 35</u> is an arterial street that travels via Skyline Boulevard and Sloat Boulevard servicing southwest portion of the City.

Local Access

This subsection describes the existing local roadway network within the City and presents an analysis of the 60 study intersections. The roadways are described in terms of roadway designation, number of travel lanes, traffic flow directions, and curbside parking regulations. The functional designation of these roads is obtained from the San Francisco *General Plan* Transportation Element. Detailed definitions of the *General Plan*'s roadway classification schemes are included in Appendix C.

Market Street is a two-way arterial that runs between The Embarcadero to the east and Portola Drive to the west. Market Street generally has two lanes in each direction with sidewalks on both sides of the street. Market Street is designated as a Transit Preferential Street between Castro Street and Steuart Street and is heavily used by transit vehicles. Bi-directional streetcar tracks run along the center lanes of Market Street between Castro Street and Steuart Street. West of Fifth Street, one travel lane in each direction is reserved for buses only. In the San Francisco *General Plan*, Market Street is designated as a Pedestrian Network Street, a Neighborhood Commercial Street, and is part of the Citywide Bicycle Route Network. There are Class II bicycle lanes along Market Street between 8th Street and Castro Street, while the section from 8th Street to the Embarcadero is designated as a Class III bicycle route.

Mission Street is a two-way arterial that runs east-west between The Embarcadero and South Van Ness Avenue and continues in a north-south direction west of South Van Ness Avenue to San Mateo County. Mission Street connects the South of Market area to the Mission District and northern San Mateo County. Mission Street is generally a two-way street with two lanes in each direction. The San Francisco *General Plan* identifies Mission Street as a Transit Preferential Street, Neighborhood Pedestrian Street, and as part of the Citywide Pedestrian Network. It is also described as a Major Arterial and part of the Metropolitan Transportation System (MTS) Network between Cesar Chavez Street and San Jose Avenue.

Howard Street is an arterial street that runs between The Embarcadero and South Van Ness Avenue. Howard Street between The Embarcadero and Fremont Street is a two-way arterial with two travel lanes in each direction. From Fremont Street to 11th Street, Howard Street is a one-way arterial with three travel lanes in the westbound direction. Howard Street forms a one-way couplet with Folsom Street between Fremont Street and Eleventh Street. The San Francisco *General Plan* identifies Howard Street as a Major Arterial and a Citywide Bicycle Route. It is part of the Congestion Management Program (CMP) and Metropolitan Transportation System (MTS) networks. A Class II bike lane (Bike Route 30) runs along the north side of Howard Street between Fremont Street and Eleventh Street. The segment between The Embarcadero and Fremont Street is designated as a Class III bicycle route. Typically, there are sidewalks and on-street parking on both sides of the street.

Folsom Street runs east-west between The Embarcadero and Thirteenth Street, and continues in a north-south direction to the west of Thirteenth Street. Folsom Street is a one-way street with four lanes in the eastbound direction between Eleventh Street and Main Street. Folsom Street forms a one-way couplet with Howard Street between Main Street and Eleventh Street. East of Main Street, Folsom Street is a two-way arterial with three lanes in the eastbound direction and one lane in the westbound direction. The San Francisco *General Plan* identifies Folsom Street as a Major Arterial, and a Citywide Bicycle Route. It is part of both the CMP and MTS networks. Folsom Street includes a Class II bicycle lane on the south side of the street.

Harrison Street runs east-west between The Embarcadero and Thirteenth Street, and continues in a north-south direction to the west of Thirteenth Street. Harrison Street provides direct access to I-80 westbound/U.S.-101 on- and off-ramps at First Street and Fremont Street. The street generally has three westbound and two eastbound travel lanes, except between First Street and Second Street where it narrows down to two westbound lanes and two eastbound lanes. West of Third Street, Harrison Street operates as a one-way arterial with five travel lanes in the westbound direction. Typically, there are sidewalks and on-street parking on both sides of the street. The San

Francisco *General Plan* identifies Harrison Street as a Major Arterial, a Transit Preferential Street, and as a Neighborhood Commercial Street. Harrison Street is also identified as part of the CMP and MTS networks.

Bryant Street is a five-lane roadway that runs east-west between The Embarcadero and Thirteenth Street, and continues in the north-south direction to the west of Thirteenth Street. Bryant Street provides the primary access to and from I-80 eastbound, including the on-ramps at Fifth Street and Sterling Street (high-occupancy vehicles and trucks only between 3:30 p.m. and 7:00 p.m.), and off-ramps at Seventh Street and Fourth Street. West of Sterling Street, Bryant Street operates as a one-way arterial with five travel lanes in the eastbound direction. East of Sterling Street, Bryant Street operates as a two-way street with one travel lane in each direction. In general, there are sidewalks and on-street parking on both sides of the street. The San Francisco *General Plan* identifies Bryant Street as a Major Arterial that is part of the CMP network, a MTS Street, a Transit Preferential Street, and a Neighborhood Commercial Street.

Fifth Street runs between Market Street and Third Street. It provides direct access to I-80 through the intersections of Harrison Street and Bryant Street. There are sidewalks and on-street parking on both sides of the street, except on the east side of the street between Mission Street and Howard Street, where the parking lane is utilized as the right-turn/queuing lane for the Fifth and Mission Street Parking Garage. The San Francisco *General Plan* identifies Fifth Street as a Major Arterial between Market Street and Brannan Street, and as a Citywide Bicycle Route between Market Street and Townsend Street. Fifth Street is designated as a Class III bike route (Bike Route 19). Fifth Street is also designated as a Neighborhood Pedestrian Street between Market Street and Mission Street and a Freight Traffic Network Street between Market Street and Brannan Street.

Sixth Street runs between Market Street and Sixteenth Street. The street segment between Brannan Street and Channel Street is discontinuous due to the I-280 alignment and the China Basin Channel. Sixth Street is a two-way roadway with two lanes in each direction. It provides access to the I-280 on-ramp at Brannan Street. Typically, there are sidewalks and on-street parking on both sides of the street. On-street parking is provided on both sides of the street during the off-peak periods. The San Francisco *General Plan* identifies Sixth Street as a Major Arterial that is part of the CMP Network. It is also designated as a MTS Street and a Freight Truck Route.

Seventh Street runs between Market Street and 16th Street. Between Harrison Street and Mission Street, Seventh Street is a one-way arterial street with four travel lanes in the northbound direction. In general, there are sidewalks and on-street parking on both sides of the street. The San Francisco *General Plan* identifies Seventh Street as a Major Arterial that is part of the CMP network between Market Street and Bryant Street, and a Secondary Arterial between Bryant Street and 16th Street. It is also designated as a MTS Street and a Bicycle Route between Market Street and Townsend Street. Seventh Street includes a Class II bicycle lane (Bike Route 23) along the east side of the street.

Geary Boulevard (designated as Geary Street east of Van Ness Avenue) is an east-west street that runs between 48th Avenue and Market Street. Geary Boulevard is a two-way street between 48th Avenue and Gough Street, and becomes one-way westbound east of Gough Street. West of Gough Street, Geary Boulevard generally has two to three travel lanes in each direction. East of Gough Street, Geary Boulevard generally has two to three travel lanes and one bus-only lane in the westbound direction and on-street parking on both sides of the street. In the San Francisco *General*

Plan, Geary Boulevard between 40th Avenue and Market Street is classified as a Major Arterial in the CMP Network and part of the MTS Network.

25th Avenue is a north-south street that runs between its northern terminus in the Presidio and Fulton Street, and intermittently between Martin Luther King Jr. Drive in Golden Gate Park and Eucalyptus Drive. 25th Avenue generally has one travel lane in each direction. Parking is generally permitted on both sides of the street. The San Francisco *General Plan* identifies 25th Avenue between El Camino del Mar and Fulton Street as a Secondary Arterial and part of the MTS Network.

Park Presidio Boulevard is a north-south street that runs between Crossover Drive in Golden Gate Park and Doyle Drive (US 101) in The Presidio. Park Presidio Boulevard generally has three travel lanes in each direction between Crossover Drive in Golden Gate Park and Lake Street, and two travel lanes in each direction between Lake Street and US 101. On-street parking is prohibited. Park Presidio Boulevard is designated as SR 1. The San Francisco *General Plan* identifies Park Presidio Boulevard as a Major Arterial in the CMP Network and part of the MTS Network.

Masonic Avenue is a north-south street that runs between Roosevelt Way and Pine Street. Masonic Avenue generally has two to three travel lanes in each direction. Parking is generally permitted on both sides of the street with peak hour restrictions. The San Francisco *General Plan* identifies Masonic Avenue between Oak Street and Pine Street as a Major Arterial in the CMP Network and part of the MTS Network; between Frederick Street and Oak Street as a Secondary Arterial.

Gough Street is a north-south street that runs between Bay Street and Otis Street. Gough Street generally has two travel lanes in each direction and on-street parking on both sides of the street. In the San Francisco *General Plan*, Gough Street is classified as a Major Arterial in the CMP Network and part of the MTS Network.

Franklin Street is a north-south street that runs between Bay Street and Market Street. Franklin Street generally has three to five travel lanes in the northbound direction and on-street parking on both sides of the street. In the San Francisco *General Plan*, Franklin Street is classified as a Major Arterial in the CMP Network and part of the MTS Network.

Van Ness Avenue is a north-south arterial street that runs from the Central Freeway towards the northern section of the city. It begins at Market Street near Civic Center, extending to the north and ends at Fort Mason. To the south after crossing Market Street, Van Ness Avenue becomes South Van Ness Avenue and continues south through the city's South of Market and Mission districts until it ends at Cesar Chavez Street. The part of the street between Lombard Street and 13th Street is designated as US 101. Van Ness Avenue generally has three travel lanes in each direction with on-street parking on certain sections north of 13th Street, and generally has two travel lanes in each direction with on-street parking on both sides of the street south of 13th Street. The San Francisco *General Plan* identifies Van Ness Avenue as a Major Arterial in the CMP Network and part of the MTS Network.

Lombard Street is an east-west street that begins at Presidio Boulevard inside The Presidio and runs east through the Cow Hollow neighborhood. For 12 blocks between Richardson Avenue/Broderick Street and Van Ness Avenue, it is a major arterial road that is designated as US 101. Lombard Street then runs intermittently through the Russian Hill and Telegraph Hill neighborhoods and finally terminates at The Embarcadero as a collector road. Lombard Street generally has three travel lanes in each direction between Richardson Avenue and Van Ness Avenue and on-street parking on both sides of the street. West of Richardson Avenue and east of Van Ness Avenue, Lombard Street generally has one travel lane in each direction and parking on both sides of the street, with the exception that between Hyde Street and Leavenworth Street, known as the "Crookest Street", Lombard Street runs one-way in the eastbound direction. The San Francisco *General Plan* identifies Lombard Street between Richardson Avenue and Van Ness Avenue as a Major Arterial in the CMP Network and part of the MTS Network.

<u>Richardson Avenue</u> is a northwest-southeast street that runs between Doyle Drive in The Presidio and Lombard Street. Richardson Avenue is designated as US 101. Richardson Avenue has three travel lanes in each direction and on-street parking on both sides of the street. The San Francisco *General Plan* identifies Richardson Avenue as a Major Arterial in the CMP Network and part of the MTS Network.

<u>Stockton Street</u> is a north-south street that runs between Market Street and Beach Street near Pier 39. It passes Union Square, a major shopping district in the city. Stockton Street tunnels under a section of Chinatown for about three blocks. Stockton Street generally has one to two travel lanes in each direction and on-street parking on both sides of the street.

<u>Broadway</u> is an east-west street that runs between Lyon Street and The Embarcadero. The Broadway tunnel runs under Russian Hill and provides for uninterrupted traffic flow along Broadway for a stretch of six blocks, between Powell Street on the east and Larkin Street on the west. East of Fillmore Street, Broadway generally has two travel lanes in each direction and on-street parking on both sides of the street; west of Fillmore Street, it generally has one travel lane in each direction and on-street parking on both sides of the street. The San Francisco *General Plan* identifies Broadway between Gough Street and The Embarcadero as a Major Arterial in the CMP Network and part of the MTS Network.

<u>The Embarcadero</u> is a two-way roadway that runs between the intersection of 2nd and King Streets near AT&T Park and Taylor Street, near Fisherman's Wharf. In general, it has two travel lanes in each direction with a wide center median for light rail transit, and parking on both sides of the street. The San Francisco *General Plan* identifies The Embarcadero as a Major Arterial in the CMP Network, part of the MTS Network, a Transit Preferential Street, and a Neighborhood Commercial Street. In addition, The Embarcadero is part of the Bicycle Route #5 and is part of the Bay, Ridge, and Coast Trail, which is a recreational pedestrian/bicycle path connecting several Bay Area cities.

<u>Washington Street</u> is an east-west street that runs between Arguello Boulevard and Scott Street west of Alta Plaza Park, and between Steiner Street and The Embarcadero. West of Gough Street, Washington Street generally has one travel lane in each direction and on-street parking on both sides of the street. Between Gough Street and Powell Street, Washington Street operates as a one-way street with one to two travel lanes in the eastbound direction and on-street parking on both sides of the street. East of Powell Street, Washington Street operates as a one-way street with one to two travel lanes in the westbound direction and on-street parking on both sides of the street. The San Francisco *General Plan* identifies Washington Street between Kearny Street and The Embarcadero as a Major Arterial in the CMP Network and part of the MTS Network; between Powell Street and Kearny Street as a Secondary Arterial and part of the MTS Network.

Brannan Street is an east-west arterial, extending between The Embarcadero and 10th Street. It generally has two travel lanes in each direction and on-street parking on both sides of the street. Brannan Street is designated as a Major Arterial in the CMP Network and part of the MTS Network in the San Francisco *General Plan*.

First Street is a one-way street, with four southbound travel lanes. Between Market and Howard Streets, one lane is reserved for transit vehicles only. Between Market Street and Howard Street, First Street is designated as a Neighborhood Commercial Street in the Pedestrian Street Network. In the San Francisco *General Plan*, First Street is identified as a Major Arterial in the CMP Network, and as part of the MTS Network. First Street connects to the First Street on-ramp of eastbound I-80 and the Bay Bridge.

Second Street is a two-way north-south street, with generally two lanes in each direction. Between Mission Street and Market Street, only one northbound lane is provided. Second Street is designated as a Neighborhood Commercial Street in the Pedestrian Street Network in the San Francisco *General Plan*. Second Street is also part of the Bicycle Route #11. Metered, on-street parking is generally provided along each curb.

Third Street is a major one-way northbound arterial. It generally has four traffic lanes. Third Street is a Transit Important Street in the Transit Preferential Street Network. The section of Third Street between Market Street and Harrison Street is also part of the Citywide Pedestrian Network. In the San Francisco *General Plan*, Third Street is identified as a Major Arterial in the CMP Network, and as part of the MTS Network.

Fourth Street is a four-to-five lane southbound one-way arterial. Fourth Street connects to a westbound I-80 on-ramp at Harrison Street. In the San Francisco *General Plan*, Fourth Street is identified as a Major Arterial in the CMP Network, and as part of the MTS Network.

King Street runs between The Embarcadero and Fourth Street, and between Seventh Street and Division Street/De Haro Street. West of Fourth Street, King Street connects with the I-280 ramps. King Street generally has two travel lanes in each direction, and parking is generally permitted on the north side of the street. In the San Francisco *General Plan*, King Street is identified as a Major Arterial in the CMP Network, part of the MTS Network, a Transit Preferential (transit important) Street, and a Neighborhood Network Connection Street.

10th Street is a north-south street that runs between Market Street and Potrero Avenue. 10th Street generally has four travel lanes in the southbound direction and on-street parking on both sides of the street. In the San Francisco *General Plan*, 10th Street is classified as a Major Arterial in the CMP Network and part of the MTS Network and is part of the Bicycle Route #25 between Market Street and Mission Street.

16th Street is an east-west street that runs between Flint Street and Illinois Street. 16th Street generally has one travel lane in each direction and on-street parking on both sides of the street. In the San Francisco *General Plan*, 16th Street is classified as a Secondary Arterial, part of the MTS Network, a Transit Preferential Street (Primary Transit Street – transit important) and a Neighborhood Pedestrian Street (neighborhood commercial).

Potrero Avenue runs north-south between Brannan Street and Cesar Chavez Street. Potrero Avenue connects with the US 101 southbound on-ramp at Cesar Chavez Street, and south of

Cesar Chavez Street, Potrero Avenue connects with Bayshore Boulevard. Between 25th Street and 17th Street, Potrero Avenue generally has two travel lanes in each direction, a center median for shared mid-block left turns and dedicated left turn pockets at key intersections, as well as a bicycle lane in each direction. North of 17th Street, Potrero Avenue generally has three travel lanes in each direction. All along Potrero Avenue there are sidewalks and on-street parking on both sides of the street. The San Francisco *General Plan* identifies Potrero Avenue as a Major Arterial in the CMP Network, part of the MTS Network, and a Transit Preferential (secondary transit) street. Potrero Avenue is part of the Bicycle Route #25 between Cesar Chavez Street and 17th Street.

<u>Octavia Street</u> is a north-south street that runs discontinuously between Bay Street and Market Street. Octavia Street generally has one travel lane in both directions and on-street parking on both sides of the street. Between Fell Street and Market Street, Octavia Street is known as Octavia Boulevard, and it has two travel lanes in each direction and frontage roads on both sides of the street. In the San Francisco *General Plan*, Octavia Street is designated as part of the Bicycle Route #4, #6, and #106 between Bay Street and Green Street and Route #45 between Fulton Street and Market Street.

<u>Guerrero Street</u> is a north-south street that runs between Market Street and 28th Street. South of 28th Street, Guerrero Street turns into San Jose Avenue. Guerrero Street generally has two travel lanes in each direction and on-street parking. In the San Francisco *General Plan*, Guerrero Street is classified as a Secondary Arterial and part of the MTS Network.

<u>Laguna Street</u> is a north-south street that runs between Beach Street and Market Street. Laguna Street generally has one travel lane in both directions and on-street parking on both sides of the street.

<u>Otis Street</u> is a north-south street that runs between South Van Ness Avenue and Duboce Avenue. Otis Street has four lanes in the southbound direction and on-street parking on both sides of the street.

<u>Division Street</u> runs east-west between King Street/De Haro Street and Bryant Street. Division Street generally has one travel lane in each direction between King Street/De Haro Street and Potrero Avenue, and two lanes in each direction between Potrero Avenue and Bryant Street. It has on-street parking on both sides of the street. Division Street continues to the west of Bryant Street as 13th Street. Division Street has a bicycle lane between Eighth Street and Ninth Street, and connects with Bicycle Route #36 between Ninth Street and 11th Street. The San Francisco *General Plan* identifies Division Street as a Major Arterial in the CMP Network and part of the MTS Network.

<u>Fell Street</u> is an east-west street that runs between Stanyan Street and Polk Street. Fell Street is a one-way street in the eastbound direction between Franklin Street and Polk Street, a two-way street between Franklin Street and Gough Street, and one-way westbound between Stanyan Street and Gough Street. Fell Street generally has three to four travel lanes on the one-way section and two lanes in each direction on the two-way section. On-street parking is generally permitted on both sides of the street with peak hour restrictions. Fell Street forms a one-way couplet with Oak Street between Stanyan Street and Gough Street. In the San Francisco *General Plan*, Fell Street is classified as a Major Arterial in the CMP Network and part of the MTS Network.

Divisadero Street is a north-south street that runs between 14th Street and Marina Boulevard. Divisadero Street generally has two travel lanes in each direction and on-street parking on both sides of the street between Castro Street and California Street, and has one travel lane in each direction and on-street parking on both sides of the street on other sections. In the San Francisco *General Plan*, Divisadero Street between Pine Street and its intersection with Castro Street is classified as Major Arterial in the CMP Network and part of the MTS Network. Divisadero Street between Lombard Street and Pine Street is classified as Secondary Arterial.

15th Street is an east-west street that runs discontinuously between Roosevelt Avenue and Carolina Street. 15th Street generally has one travel lane in each direction and on-street parking on both sides of the street. Between Guerrero Street and South Van Ness Avenue it is a one-way street in the westbound direction.

Sanchez Street is a north-south street that runs between Duboce Avenue and Randall Street. Sanchez Street generally has one travel lane in each direction and on-street parking on both sides of the street. In the San Francisco *General Plan*, Sanchez Street is part of the Bicycle Route #47 from Duboce Avenue to 17th Street and #49 from Jersey Street to 13th Street.

Fulton Street is an east-west street that runs between the Great Highway and Franklin Street. Fulton Street generally has two travel lanes in each direction and on-street parking on both sides of the street west of Baker Street, and generally has one travel lane in each direction and on-street parking on both sides of the street between Baker Street and Franklin Street. In the San Francisco *General Plan*, Fulton Street between Park Presidio Boulevard and Masonic Avenue is classified as a Major Arterial in the CMP Network; between The Great Highway and Park Presidio Boulevard it is classified as a Secondary Arterial.

Stanyan Street is a north-south street that runs between Belgrave Avenue and Geary Boulevard. Stanyan Street generally has two travel lanes in each direction and on-street parking on both sides of the street between Frederick Street and Fulton Street while it runs beside Golden Gate Park, and generally has one travel lane in each direction and on-street parking on both sides of the street on other sections. In the San Francisco *General Plan*, Stanyan Street between Turk Street and Fulton Street is classified as Major Arterial in the CMP Network; between 17th Street and Fulton Street and between Turk Street and Geary Boulevard as a Secondary Arterial.

Lincoln Way is an east-west street that runs between the Great Highway and Frederick Street. Lincoln Way generally has two travel lanes in each direction and on-street parking on both sides of the street. In the San Francisco *General Plan*, Lincoln Way between 19th Avenue and Kezar Drive is classified as Major Arterial in the CMP Network and part of the MTS Network. Lincoln Way between The Great Highway and 19th Avenue is classified as a Secondary Arterial and part of the MTS Network.

19th Avenue is a north-south street that runs between St. Charles Avenue and Lincoln Way south of Golden Gate Park and between Fulton Street and its terminus north of Lake Street. 19th Avenue generally has three travel lanes in each direction and on-street parking on both sides of the street between Junipero Serra Boulevard and Lincoln Way, and generally has one travel lane in each direction and on-street parking on both sides of the street on other sections. 19th Avenue between Junipero Serra Boulevard and Lincoln Way is designated as SR 1. In the San Francisco *General Plan*, 19th Avenue between Junipero Serra Boulevard and Lincoln Way is classified as Major Arterial in the CMP Network and part of the MTS Network.

Taraval Street is an east-west street that runs between The Lower Great Highway and Dewey Boulevard. Taraval Street generally has two travel lanes in each direction, with the center lane shared with L-Taraval light rail, and on-street parking on both sides of the street between 15th Avenue and 46th Avenue, and has one travel lane in each direction and on-street parking on both sides of the street on all other sections. In the San Francisco *General Plan*, Taraval Street between 19th Avenue and Dewey Boulevard is classified as a Secondary Arterial.

Sloat Boulevard is an east-west street that runs between The Great Highway and Junipero Serra Boulevard. Sloat Boulevard generally has three travel lanes in each direction and on-street parking on both sides of the street. In the San Francisco *General Plan*, Sloat Boulevard between Skyline Boulevard and Junipero Serra Boulevard is classified as Major Arterial in the CMP Network and part of the MTS Network. Sloat Boulevard between The Great Highway and Skyline Boulevard is classified as a Secondary Arterial and part of the MTS Network.

Winston Drive is an east-west street that runs between Lake Merced Boulevard and Junipero Serra Boulevard. Winston Drive generally has one travel lane in each direction and on-street parking on both sides of the street with the exception that when it goes through Stonestown Galleria, Winston Drive has two travel lanes in each direction.

Junipero Serra Boulevard is a north-south street that runs between Sloat Boulevard and SR 1 / I-280. Junipero Serra Boulevard generally has three to four travel lanes in each direction and on-street parking on both sides of the street. In the San Francisco *General Plan*, Junipero Serra Boulevard is classified as a Major Arterial in the CMP Network and part of the MTS Network.

Ocean Avenue is an east-west street that runs between Country Club Drive and Mission Street. Ocean Avenue generally has two travel lanes in both directions with a center-running Muni light rail line, and on-street parking along both sides of the street. In the San Francisco *General Plan*, Ocean Avenue is classified as a Major Arterial in the CMP Network and part of the MTS Network.

Phelan Avenue is a north-south street that runs along the western edge of the City College of San Francisco between Flood Avenue and Ocean Avenue. Phelan Avenue generally has two travel lanes in each direction and on-street parking on both sides of the street. Phelan Avenue is the main western access to the City College of San Francisco.

Geneva Avenue is a two-way east-west roadway that extends west of Bayshore Boulevard to Phelan Avenue in the Balboa Park neighborhood. Geneva Avenue generally has two lanes in each direction with sidewalks on both sides of the street and on-street parking to the west of Talbert Street. In the San Francisco *General Plan*, Geneva Avenue is designated as a Major Arterial in the CMP Network, a Transit Preferential Street (Primary – Transit Important), a Neighborhood Commercial Street, and a part of the Bicycle Route #5.

Lake Merced Boulevard is a north-south street that runs along the east shore of Lake Merced. Lake Merced Boulevard extends between Skyline Boulevard in the north and the City boundary with Daly City and beyond. Lake Merced Boulevard generally has two travel lanes in each direction. The San Francisco *General Plan* identifies Lake Merced Boulevard between Sunset Boulevard and the City boundary as a Secondary Arterial and part of the MTS Network.

Brotherhood Way is an east-west street that runs between Lake Merced Boulevard and Alemany Boulevard. Brotherhood Way generally has two travel lanes in each direction. The San Francisco

General Plan identifies Brotherhood Way between Junipero Serra Boulevard and Alemany Boulevard as a Major Arterial in the CMP Network, and part of the MTS Network. Brotherhood Way between Lake Merced Boulevard and Junipero Serra Boulevard is identified as a Secondary Arterial and part of the MTS Network.

Sunnydale Avenue is a two-way east-west roadway that extends west of Bayshore Boulevard to Persia Avenue/Mansell Street. To the east of Bayshore Boulevard, Sunnydale Avenue is an unpaved dead-end roadway. West of Bayshore Boulevard, the roadway has one lane in each direction with sidewalks and on-street parking on both sides of the street.

Silver Avenue is an east-west street that runs between Alemany Boulevard and Palou Avenue. Silver Avenue generally has one travel lane in each direction, and on-street parking on both sides of the street. The San Francisco *General Plan* identifies Silver Avenue between Bayshore Boulevard and Palou Avenue as a Secondary Arterial.

Bayshore Boulevard is a four-lane north-south arterial that functions as the east-side frontage road for US 101. It is an undivided roadway with two travel lanes, left turn lanes at key intersections, and parking on both sides of the street. South of the US 101 interchange, Bayshore Boulevard becomes a four-lane arterial, with light rail in the center median. The San Francisco *General Plan* identifies Bayshore Boulevard as a Major Arterial in the CMP Network, and part of the MTS Network. It also identifies Bayshore Boulevard as a street with significant truck traffic. Portions of Bayshore Boulevard are part of Bicycle Route #25.

Gilman Street is an east-west roadway between Third Street (at Paul Avenue) and the Candlestick Point State Recreation Area where it becomes Hunters Point Expressway. Between Third Street and Griffith Street, Gilman Avenue is primarily a residential street. Because it serves as the continuation of the Hunters Point Expressway around the Candlestick Park parking lots, Gilman Avenue is one the primary access and egress routes to the stadium. Gilman Avenue currently has two westbound and one eastbound lane between stadium parking lot Gates 3 and 4, and two westbound and three eastbound lanes between stadium parking lot Gate 4 and Arelious Walker Drive. West of Arelious Walker Drive, the lanes on Gilman Avenue is reversed to accommodate event traffic. Gilman Avenue between Hunters Point Expressway and Arelious Walker Drive is part of Bicycle Route #805, and is part of the unimproved on-street Bay Trail.

Paul Avenue is an east-west local street between San Bruno Avenue and Third Street. Paul Avenue has two westbound travel lanes and one eastbound travel lane. East of Third Street, Paul Avenue continues as Gilman Street. On-street parking is permitted on the north side of Paul Avenue, west of the Caltrain tracks. Paul Avenue is part of Bicycle Route #5 and #75.

Third Street runs between Bayshore Boulevard and Market Street. North of Townsend Street, Third Street is a one-way northbound roadway, with five to six travel lanes (with one lane reserved for transit vehicles). Outside of Downtown, Third Street generally has two travel lanes in each direction, with the median occupied by the T-Third Street light rail line. On-street parking is generally permitted along both sides of the street. In the San Francisco *General Plan*, Third Street is designated as a Major Arterial in the CMP Network, part of the MTS Network, a Transit Preferential Street (transit important), a Citywide Pedestrian Network Street and a Neighborhood Commercial Street.

Industrial Street is an east-west street that runs between Bayshore Boulevard and Oakdale Avenue. Industrial Street generally has two travel lanes in each direction, and on-street parking on both sides of the street. Industrial Street is designated as a Secondary Arterial in the San Francisco *General Plan*.

Alemany Boulevard is a north-south street that runs between the Industrial Street/Bayshore Boulevard intersection and Junipero Serra Boulevard. Alemany Boulevard generally has two travel lanes and one bicycle lane in each direction, plus on-street parking on both sides of the street. In the San Francisco *General Plan*, Alemany Boulevard is classified as a Major Arterial in the CMP Network and part of the MTS Network.

Palou Avenue is an east-west roadway between Barneveld Avenue and Griffith Street. It generally has one travel lane in each direction, and parking on both sides of the street. Palou Avenue has truck restrictions between Selby Street and Griffith Street, where vehicles in excess of 6,000 pounds are prohibited. Between Phelps Street and Griffith Street, Palou Avenue is part of Bicycle Route #7 and #70.

Evans Avenue is an east-west arterial, with two travel lanes in each direction. Evans Avenue extends between Cesar Chavez Street and Jennings Street, where is becomes Hunters Point Boulevard. The San Francisco *General Plan* identifies Evans Avenue between Cesar Chavez Street and Third Street as a Major Arterial in the CMP Network, and part of the MTS Network. Evans Avenue between Third Street and Jennings Street is identified as a Secondary Arterial and part of the MTS Network. The San Francisco *General Plan* also identifies Evans Avenue as a street with significant truck traffic. Evans Avenue is part of Bicycle Route #68, and, between Third Street and Jennings Street, a bicycle lane is provided in each direction.

Cesar Chavez Street is an east-west arterial extending from Douglass Street east, ending at cargo facilities at the Port of San Francisco's North Container Terminal (Pier 80). Cesar Chavez Street serves as a connector between Third Street, I-280 and US 101. It generally has two to three lanes in each direction, with additional left- and right-turn lanes at some intersections. On-street parking is generally permitted on Cesar Chavez Street except at those locations in close proximity to freeway interchanges. The San Francisco *General Plan* identifies Cesar Chavez Street as a Major Arterial in the CMP Network, and part of the MTS Network. It also identifies Cesar Chavez Street east of US 101 as a street with significant truck traffic, and an area needing improved freight route connections. Cesar Chavez Street is part of Bicycle Route #60, and bicycle lanes are provided on the section between Pennsylvania Street and Third Street.

24th Street is an east-west street that runs between Grand View Avenue and Vermont Street, and intermittently between Kansas Street and Michigan Street. 24th Street generally has one travel lane in each direction with on-street parking on both sides of the street.

San Jose Avenue is a north-south street that runs between 27th Street and the San Jose Avenue/Belper Street/Mission Street intersection. San Jose Avenue generally has two travel lanes in each direction with a center-running Muni light rail line, and limited on-street parking (due to the Muni tracks). In the San Francisco *General Plan*, San Jose Avenue is classified as a Major Arterial in the CMP Network and part of the MTS Network.

Randall Street is an east-west street that runs between Mission Street and Harper Street. Randall Street generally has one travel lane in each direction and on-street parking on both sides of the street. The short section of Randall Street between San Jose Avenue and Mission Street has two lanes in each direction.

Transit Network

Local transit service within the city limits is provided by the San Francisco Municipal Railway (Muni), the transit division of the San Francisco Municipal Transportation Agency (SFMTA). Muni bus, cable car and light rail lines can be used to access regional transit operators. BART, AC Transit and ferries provide service to and from the East Bay; Golden Gate Transit buses and ferries provide service to and from the North Bay; and Caltrain, SamTrans, and BART provide service to and from the Peninsula and South Bay. Figure 5 shows the transit network in the study area.

Local Transit Service

Muni currently operates 80 routes throughout San Francisco with stops within two blocks of 90 percent of all residences in the city. Most routes operate seven days a week, between 6:00 a.m. and midnight. Limited late night (Owl) service is available between 1:00 a.m. and 5:00 a.m. on sections of 13 Muni routes. On weekdays, frequencies generally range from 4 to 12 minutes during midday, and 10 to 30 minutes during evenings. On weekends, base frequencies range from 5 to 60 minutes. In addition to standard services, Muni operates 15 express lines and 5 limited-service (semi-express) lines. Express lines only run during peak hours in the commute directions. All express lines have an "X", "AX", or "BX" following the line's number. Limited-service lines provide faster service by making fewer stops than the standard line along their routes. All limited-service lines have an "L" following the line's number.

<u>Recent Changes to Muni Service</u>

On April 7, 2009 the San Francisco Municipal Transportation Agency (SFMTA) Board held a hearing to consider a declaration of fiscal emergency and on April 21, 2009, the SFMTA Board approved Resolution 09-064 in which SFMTA declared that it found a fiscal emergency existed within the definition of CEQA § 21080.32. In order to address the fiscal emergency, on April 30, 2009, the SFMTA Board approved the 2009-2010 amended Operating Budget and related actions, and on December 5, 2009, Muni service changes associated with the budget deficit were implemented.

The fiscal emergency declared on April 21, 2009 continues through the Fiscal Year (FY) 2010. As a result, the SFMTA has faced a shortfall in its current FY, which ends on June 30, 2010. To address the continuing fiscal emergency, on May 8, 2010, the SFMTA executed additional reductions in service, beyond those implemented on December 5, 2009, which resulted in a 10 percent overall cut in service hours. The cuts were realized across almost all Muni routes, and resulted in a combination of both reduced frequency of service, as well as shortened hours of operation of many routes. The SFMTA is endeavoring to find new sources of revenue as well as reduce operating costs, in order to restore service.

Regional Transit System

<u>BART</u>: The Bay Area Rapid Transit District (BART) operates regional rail service between the East Bay (from Pittsburg/Bay Point, Richmond, Dublin/Pleasanton, and Fremont lines) and San Francisco, and between northern San Mateo County (San Francisco International Airport and Millbrae) and San Francisco. During the p.m. peak period, headways are generally 5 to 15 minutes for each line. The most recent BART ridership data showed weekday average ridership is approximately 342,274 between October and December 2009.

Caltrain: The Peninsula Commute Service (Caltrain) provides passenger rail service on the Peninsula between Gilroy and San Francisco. The San Francisco terminal is located at the intersection of Fourth/Townsend Streets. Caltrain currently operates 98 trains each weekday, with a combination of express and local services. Headways during the p.m. peak period are approximately 5 to 15 minutes. Caltrain staff estimated the average weekday ridership to be 39,122 boardings in February 2009.

Caltrain has plans to modernize the system by electrifying trains along its route and extending service to the San Francisco Downtown area in a modernized Transbay Terminal. It is anticipated that the high-speed rail will also be built and extend to the Transbay Terminal.

SamTrans: The San Mateo County Transit District (SamTrans) provides bus service between San Mateo County and San Francisco. SamTrans operates 12 diesel bus lines that serve San Francisco, including nine routes into the Downtown area. Nine of these routes operate as peak-only commute routes, one route operates as an express route, and two routes provide service throughout the day. The total average weekday ridership to and from Downtown San Francisco is approximately 11,300 per day. Headways during the p.m. peak period are approximately 20 to 30 minutes per line.

AC Transit: The Alameda-Contra Costa Transit District (AC Transit) provides local bus service in the East Bay (western Alameda and Contra Costa Counties). In addition, AC Transit operates Transbay bus service between the East Bay and San Francisco. All Transbay routes terminate at the Transbay Terminal located on Mission Street between First and Fremont Streets. Most Transbay bus lines are for peak period and peak direction (to San Francisco during the a.m. peak period and from San Francisco during the p.m. peak period), with headways of 15 to 30 minutes per route. AC Transit has an average daily Transbay ridership of approximately 13,000 passengers.

Golden Gate Transit (bus): Golden Gate Transit, operated by the Golden Gate Bridge, Highway, and Transportation District (GGBHTD), provides bus service between the North Bay (Marin and Sonoma Counties) and San Francisco. Golden Gate Transit operates 22 commuter bus routes, nine basic bus routes and 16 ferry feeder bus routes. Most routes serve either the Civic Center (via Van Ness Avenue and Mission Streets) or the Financial District (via Battery and Sansome Streets). Basic bus routes operate at 15 to 90 minutes, depending on the time and day of the week. Commute and ferry feeder bus routes operate at more frequent intervals in the mornings and evenings. Golden Gate Transit carries approximately 6,700 passengers per day to and from San Francisco.

Golden Gate Transit (ferry): The GGBHTD provides ferry service between the North Bay and San Francisco. During the a.m. and p.m. peak periods, ferries are operated between Larkspur and San Francisco and between Sausalito and San Francisco. The San Francisco terminal is located at the Ferry Building on The Embarcadero at Market Street. Approximately 900 passengers ride the ferry to North Bay during the p.m. peak hour.

Existing Transit Network **Figure 5**

Source: SFMTA, April 2010.

Parking Conditions

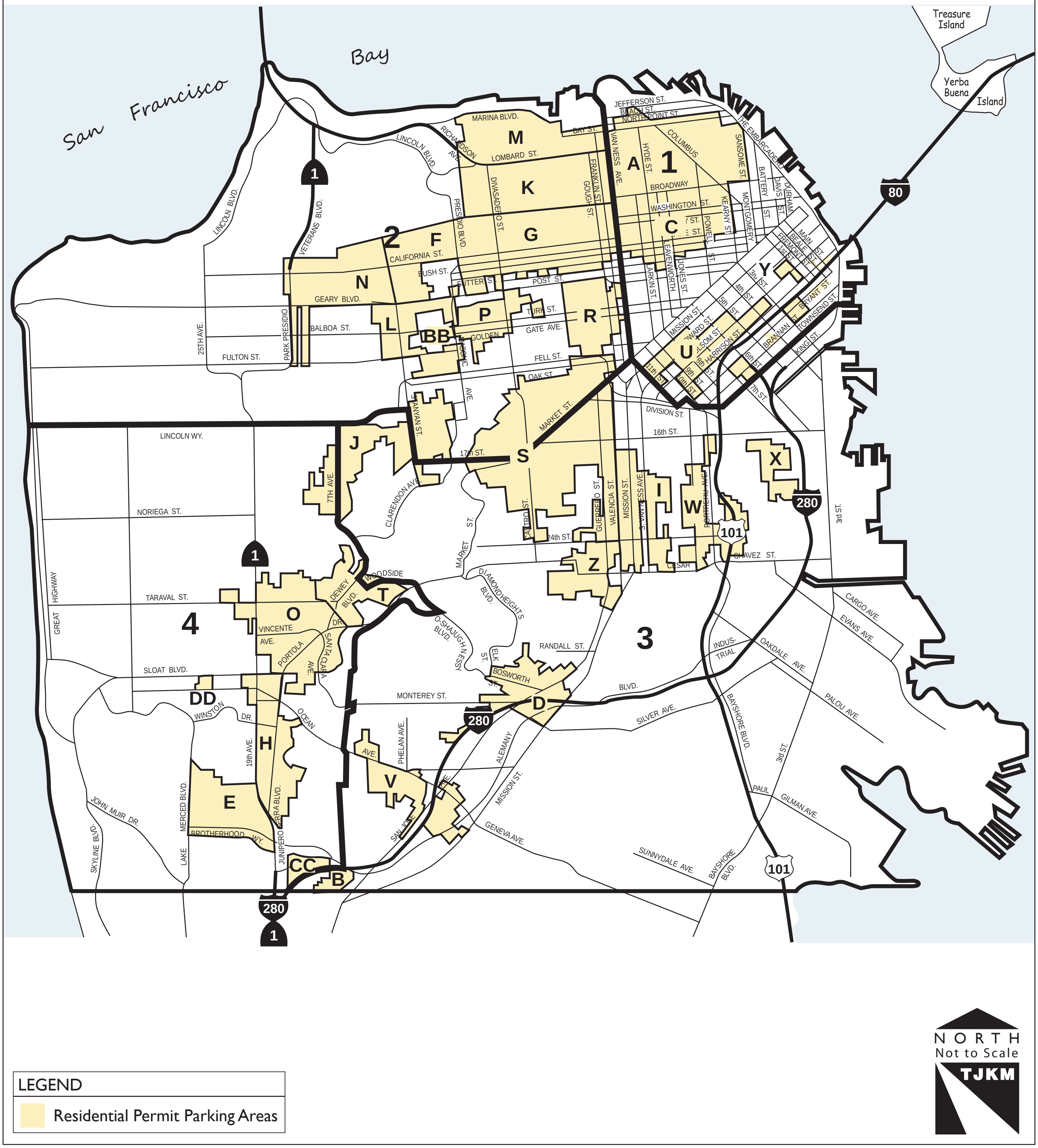
Parking conditions vary throughout the City depending upon the location. Most San Francisco streets include on-street parking, and metered parking is typical in the Downtown area and on commercial districts throughout the City. Off-street parking facilities (surface lots, above-ground and below-ground parking structures) are available in Downtown and in some shopping areas, where demand is highest. Many of these facilities charge a fee for the provision of parking.

San Francisco's streets with on-street parking include parallel parking, diagonal parking, or perpendicular parking configurations. On-street parking is prohibited during the peak periods (7:00-9:00 a.m. and/or 4:00-6:00 p.m.) on certain streets, so that additional travel lanes can be provided. SFMTA estimated that there are 320,000 on-street parking spaces and 25,000 metered parking spaces in the City. The *San Francisco Planning Code* generally requires a minimum of one off-street space for each residential unit; however in certain areas within the City, such as Downtown and the Market/Octavia Plan area, the *Planning Code* does not require any parking spaces per dwelling unit and sets limits on the maximum amount of parking that can be built per unit. Residential Preferred Parking (RPP) zones limit long-term (greater than one to four hours) parking to residents only during daytime hours. This program helps to ensure that residents of densely populated areas have reasonable access to parking near their residences, while short-term parking is permitted for retail uses. Figure 6 shows the location of the RPP zones in the City. Currently there are 27 RPP zones in the City.

Pedestrian Conditions

Sidewalks are provided for most city streets on both sides of the street. On major pedestrian corridors such as Market Street and The Embarcadero, wide (greater than 30 feet) sidewalks exist to provide a pedestrian friendly environment. Major pedestrian corridors often coincide with major transit and bicycle corridors. The heaviest pedestrian activities are encountered at major tourist attractions (e.g., Fisherman's Wharf, Golden Gate Bridge, and Chinatown) and Downtown commercial areas. Most of the intersections with major pedestrian activities are signalized and include crosswalks with pedestrian signals. San Francisco is in the process of installing pedestrian countdown signals citywide, which improve safety by alerting pedestrians of the remaining time to cross the street.

Residential Permit Parking Zones



Bicycle Conditions
San Francisco has a large and growing bicycle route network. Bikeways are typically classified as Class I, Class II, or Class III facilities. Class I bikeways are bike paths with exclusive right-of-way for use by bicyclists or pedestrians. Class II bikeways are bike lanes striped with the paved areas of roadways and established for the preferential use of bicycles, while Class III bikeways are signed bike routes that allow bicycles to share streets or sidewalks with vehicles or pedestrians.

Currently San Francisco has 23 miles of Class I facilities, 45 miles of Class II facilities, 79 miles of Class III facilities, 53 miles of Class IIIA facilities (Class III Bicycle route with wide curb lanes), and 8 miles of other facilities. Figure 7 shows the existing bikeways in the City. Major bicycle corridors often coincide with major transit and pedestrian corridors. Bicycles are generally allowed to be carried on racks on Muni buses.

Loading Conditions
Within San Francisco, loading facilities for residential land uses can be located both on-street and off-street, and for the loading of both freight and passengers.

Off-street facilities: In most sections of the city, residential developments of over 100,000 square feet are required to provide at least one off-street freight loading dock, as described in the *Planning Code*[4]. However, in Downtown Residential Districts, there is a maximum instead of minimum number of freight loading docks; land uses with up to 100 units are permitted one dock, while larger developments are permitted to have more than one dock.

While some residential developments have a *porte cochere*, which is an off-street passenger loading driveway, the *Planning Code*[5] prohibits their construction within the Downtown C-3 zoning district or in Downtown Residential Districts.
On-street facilities: On-street parking spaces that are reserved for freight loading activities are prevalent throughout San Francisco and can be distinguished by the yellow curb painting. These spaces can be utilized for residential freight loading activities. Additionally, on-street parking spaces can be reserved for a residential move-in through the Municipal Transportation Agency.

On-street passenger loading spaces are located throughout San Francisco and can be distinguished by the white curb painting. The Municipal Transportation Agency processes requests for passenger loading zones for large residential developments.

Emergency Vehicle Access Conditions
Generally, emergency vehicles utilize the roadway network when accessing residential land uses. The San Francisco Fire Department (SFFD), which has 43 fire stations geographically spread throughout the city, is usually the first responder at the scene of an emergency.

Emergency vehicles are permitted to utilize transit lanes as a means to avoid congestion. Some SFFD vehicles are equipped with signal priority devices, which give emergency vehicles a green light at signalized intersections.

[4] San Francisco *Planning Code* Sections 152 and 152.1.
[5] San Francisco *Planning Code* Section 155(s)5(B)

San Francisco Bicycle Network | **Figure 7**

Source: SFMTA, April 2010.

Adopted and Proposed Citywide Transportation Plans and Programs

A number of citywide transportation-related plans and programs have been recently adopted or are currently proposed. These programs are anticipated to reduce traffic congestion through improved traffic management, increased viability of transit service, and promotion of non-motorized modes of transportation across the transportation network.

Adopted Plans and Approved Projects

- *SFPark:* The SFPark program, as being implemented by the SFMTA, will improve on-street parking management. Sensors embedded within the pavement will detect parking occupancy, which can be downloaded onto smart phones and vehicle navigation systems, directing drivers to available parking. Further, SFPark will manage the cost of on-street parking to respond to demand, achieving the correct price point where most parking spaces are occupied, but some vacant spaces remain, enabling a driver to always find a parking space.

  The SFPark program will reduce traffic congestion related to drivers circling blocks in search of an available parking space. By correctly pricing parking in response to demand so that several spaces are always available on any given block, and by directing drivers to available parking spaces, parking-related congestion is expected to be reduced.

- *SFGo:* The SFMTA is in the process of implementing the SFGo project, which is an advanced citywide traffic management system. A new centralized traffic control station, staffed by SFMTA traffic engineers, is connected to traffic signal controllers across the city, and also has closed-circuit television cameras installed to monitor traffic conditions in real-time. SFMTA engineers are able to dynamically adjust traffic signal timing plans in response to observed congestion and incidents. Engineers also control electronic message boards installed along major roadways that can alert drivers to traffic conditions and advise on alternate routes. In the future, the traffic control station will be combined with Muni Central Control, so that transit operations can also respond in real-time to congestion and incidents.

  SFGo is expected to reduce congestion by increasing the efficiency of the transportation network. Signals will adjust to flush queues or handle unexpected traffic surges, and drivers will be alerted to alternate routes before becoming stuck in gridlock. Transit reliability is also expected to improve, enticing drivers to switch modes onto transit.

- *San Francisco Bicycle Plan*: The SFMTA is in the process of implementing the Bicycle Plan, which will add new bicycle lanes and bicycle parking throughout the city. This Bicycle Plan is expected to increase convenience and safety for bicyclists.

  The Bicycle Plan is expected to reduce congestion by enhancing the attractiveness of bicycling in the city, which will entice drivers to shift modes and use a bicycle instead of a car for travel needs. In limited circumstances, new bicycle facilities (such as bike lanes) will come at the expense to drivers, either due to reductions in roadway travel lanes or reductions in on-street parking spaces, which would further entice motorists to switch modes, resulting in fewer vehicles and less congestion citywide.

- *Transbay Terminal, Caltrain Electrification and High Speed Rail:* The Transbay Terminal at First and Mission Street is planned to be torn down and replaced with a larger, modern multi-modal terminal, allowing an increased volume of buses to serve the city. The Caltrain commuter rail service is planned to be upgraded from diesel to electric train service, and extended in a tunnel to terminate at the reconstructed Transbay Terminal, allowing for a more direct transit connection from the peninsula to Downtown, and for more rapid acceleration and deceleration of trains, both of which are expected to reduce transit travel times. It would also allow trains to be run at higher frequencies, increasing convenience and capacity. Also, the California High Speed Rail project is planned to link San Francisco with San Jose as well as points south via high-speed electric trains.

These improvements would improve the convenience, travel time and capacity of rail transit to points south of the City, and also improve bus service to points east of the City. It is anticipated that provision of better transit service would facilitate a mode shift from vehicles to transit, which would result in fewer vehicles and less congestion citywide, and particularly in Downtown.

- *Central Subway:* The SFMTA is constructing the Central Subway, which will link the Third Street light rail service with the South of Market, Union Square and Chinatown neighborhoods to the north via a new subway. It is anticipated that provision of better transit service and connection to neighborhoods currently not served by a subway would facilitated a mode shift from vehicles to transit.

Proposed Plans and Projects

- *Congestion Pricing:* The San Francisco County Transportation Authority (SFCTA) is currently investigating the feasibility of a congestion pricing charge in San Francisco. The proposed charge would apply to vehicles entering a defined zone, which could be either Downtown San Francisco, or the entire city limits, or a zone in between these sizes. The charge could vary by time of day, for different types/sizes of vehicles, and for different users (such as residents). Similar congestion pricing schemes have been implemented in cities around the world (London, Stockholm, Singapore, and others) but have not been implemented in the US.

  Such a pricing program could cause a change in travel demand patterns, which would reduce traffic congestion during peak periods. Fewer vehicles would enter the congestion zone when it is in effect, which would be expected to reduce congestion. There could be a mode shift from vehicles to other modes, such as transit and bicycle, and there could also be a shift of vehicles traveling during off-peak times (peak spreading). Both of these shifts would be expected to reduce congestion during peak travel periods.

- *Transit Effectiveness Project (TEP):* The proposed Transit Effectiveness Project (TEP) is the first comprehensive effort in over 25 years to review Muni and recommend ways to transform it into a faster, more reliable and more efficient public transit system for San Francisco. Launched in May 2006, the TEP has gathered an unprecedented level of ridership data, studied best practices from other transit systems, and conducted extensive public outreach to community stakeholders, policy makers and SFMTA employees. Informed by these efforts, the TEP developed a set of preliminary proposals designed to improve reliability, reduce travel delay, and update routes to better meet current and project travel patterns throughout the City. The SFMTA Board of Directors endorsed the TEP recommendations in October 2008. The TEP recommendations focus on service factors aimed at increasing customer convenience: improved reliability, reduced travel time, more frequent service and updated Muni bus routes and rail lines that track with current travel patterns. The recommendations focus on providing resources where they are most needed. This includes new routes and route extensions, more service on busy routes and elimination or consolidation of certain routes or route segments with low ridership. By investing in delay reduction techniques and shifting resources to crowded routes, these recommendations are expected to deliver more service to Muni customers without increasing Muni's operating budget.

The improved Muni service is expected to make transit more competitive with auto travel, encouraging auto users to shift mode to transit instead. Further, transit-preferential roadway treatments such as transit lanes or traffic signal priority may come at the expense of increased delay to private vehicles, which could entice drivers to switch to transit. A shift in mode from vehicles to transit could reduce traffic congestion.

- *Van Ness Avenue and Geary Boulevard Bus Rapid Transit*: The SFCTA and the SFMTA are currently preparing the *Van Ness Corridor Bus Rapid Transit (BRT) Study* and the *Geary Corridor Bus Rapid Transit (BRT) Study*. The agencies initiated these studies in 2004 and these projects are currently in the environmental review stage. Bus rapid transit would increase bus service frequency along Van Ness Avenue and Geary Boulevard by giving buses a dedicated travel lane, priority at traffic signals, and high-quality bus stations. The agencies are considering these improvements to benefit existing riders and to attract new transit riders.

  The improved service along the Van Ness and Geary corridors are expected to make transit more competitive with auto travel, encouraging auto users to shift mode to transit instead. Further, transit-preferential roadway treatments may come at the expense of increased delay to private vehicles, which could entice drivers to switch to transit. A shift in mode from vehicles to transit could reduce traffic congestion.

- *Better Streets Plan*: The Planning Department and SFMTA are proposing the Better Streets Plan, which aims to improve pedestrian safety and convenience citywide through enhanced sidewalks, crosswalks, and other pedestrian amenities. The plan contains a set of pedestrian enhancements that would be implemented over time as city streets are maintained and reconstructed.

  The Better Streets Plan is expected to increase the attractiveness of walking in the city, as well as enhance access to transit stops. Provision of better pedestrian amenities could encourage a shift in mode and potentially result in fewer vehicles and less congestion citywide.

5. Existing and Cumulative 2025 Conditions

This section presents Existing Conditions and an analysis of 2025 Cumulative Conditions for the City's transportation network and is used as the basis for analyzing the effects of the proposed projects.

Future 2025 traffic and transit conditions were developed using the San Francisco County Transportation Authority (SFCTA) travel demand model information. The SFCTA travel demand model incorporates anticipated neighborhood developments, including the planning areas of Market/Octavia, Mission District, East South of Market (SOMA), Showplace Square/Potrero Hill, Central Waterfront, Transit Center District Plan, Treasure Island, West SOMA, Balboa Park and other pipeline projects. Since the Housing Element policies would not be expected to generate trips that are not included in the model, the results of the model capture the future development that would occur during the planning period for the proposed Housing Elements. Existing and 2025 Cumulative Conditions are presented below in terms of study intersection traffic operations and local and regional transit screenline analyses.

Intersection Operating Conditions

An analysis was performed for the study intersections for both Existing Conditions and modeled future 2025 Cumulative Conditions. Existing and 2025 Cumulative Conditions at the study intersections were quantified through the determination of level of service (LOS), a qualitative measure describing operational conditions within a traffic stream. There are six levels of service defined for each type of facility (i.e., roadway or intersection) that is analyzed. LOS has letter designations ranging from A to F, with LOS A representing free flow traffic with little or no delay and LOS F representing jammed conditions with excessive delay and long back-ups. Procedures for analyzing each type of facility are based on the *Highway Capacity Manual 2000 (HCM 2000)*. The LOS methodology is described in detail in Appendix D.

Existing Traffic Conditions

Following the procedure described in the San Francisco Planning Department's *Transportation Impact Analysis Guidelines for Environmental Review* (*SF Guidelines*), existing vehicle counts were collected during the weekday p.m. peak period (4:00 p.m. to 6:00 p.m.), which represent the time of maximum utilization of the transportation system in the City. All counts were collected on typical weekdays during non-holiday weeks. Figure 8 shows the existing lane geometry and traffic controls at the 60 study intersections. Figure 9 shows existing turning movement volumes at the study intersections.

The sources of the data used to analyze existing traffic conditions varied. Data collection and LOS analysis for 27 of the 60 study intersections were based on traffic counts conducted in October 2009. For the remaining 33 intersections, data were compiled from existing transportation studies completed for recent development projects.

Table III summarizes the p.m. peak hour levels of service for all 60 study intersections under Existing Conditions and also future 2025 Cumulative Conditions. Detailed LOS calculations are provided in Appendices E and F for Existing and 2025 Cumulative Conditions, respectively. Under Existing Conditions, the following 13 study intersections currently operate at LOS E or F, and therefore, operate below City standards:

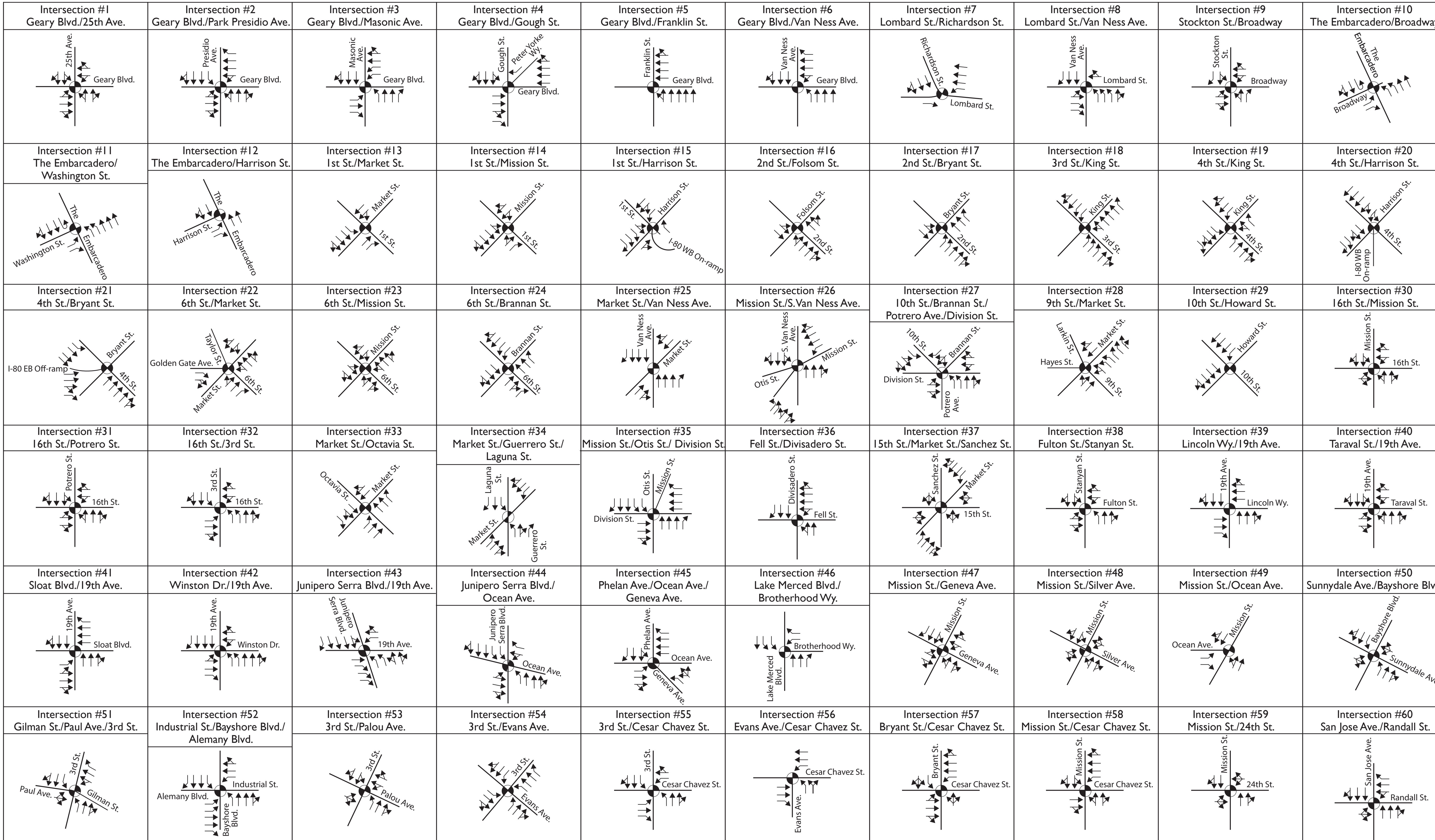
#13 1st Street / Market Street
#14 1st Street / Mission Street
#15 1st Street / Harrison Street
#17 Second Street / Bryant Street
#20 4th Street / Harrison Street
#24 Sixth Street/ Brannan Street
#26 Mission Street / South Van Ness Avenue
#27 Tenth Street / Brannan Street / Potrero Avenue / Division Street
#35 Mission Street / Otis Street / Division Street
#39 Lincoln Way / 19th Avenue
#41 Sloat Boulevard / 19th Avenue
#42 Winston Drive / 19th Avenue
#43 Junipero Serra Boulevard / 19th Avenue

The majority of the failing intersections are located in the South of Market area of the City as well as along 19th Avenue. The remaining 47 study intersections currently operate at LOS D or better, and therefore, operate within acceptable City standards.

City of San Francisco - Housing Element EIR

Existing Lane Geometry and Traffic Controls

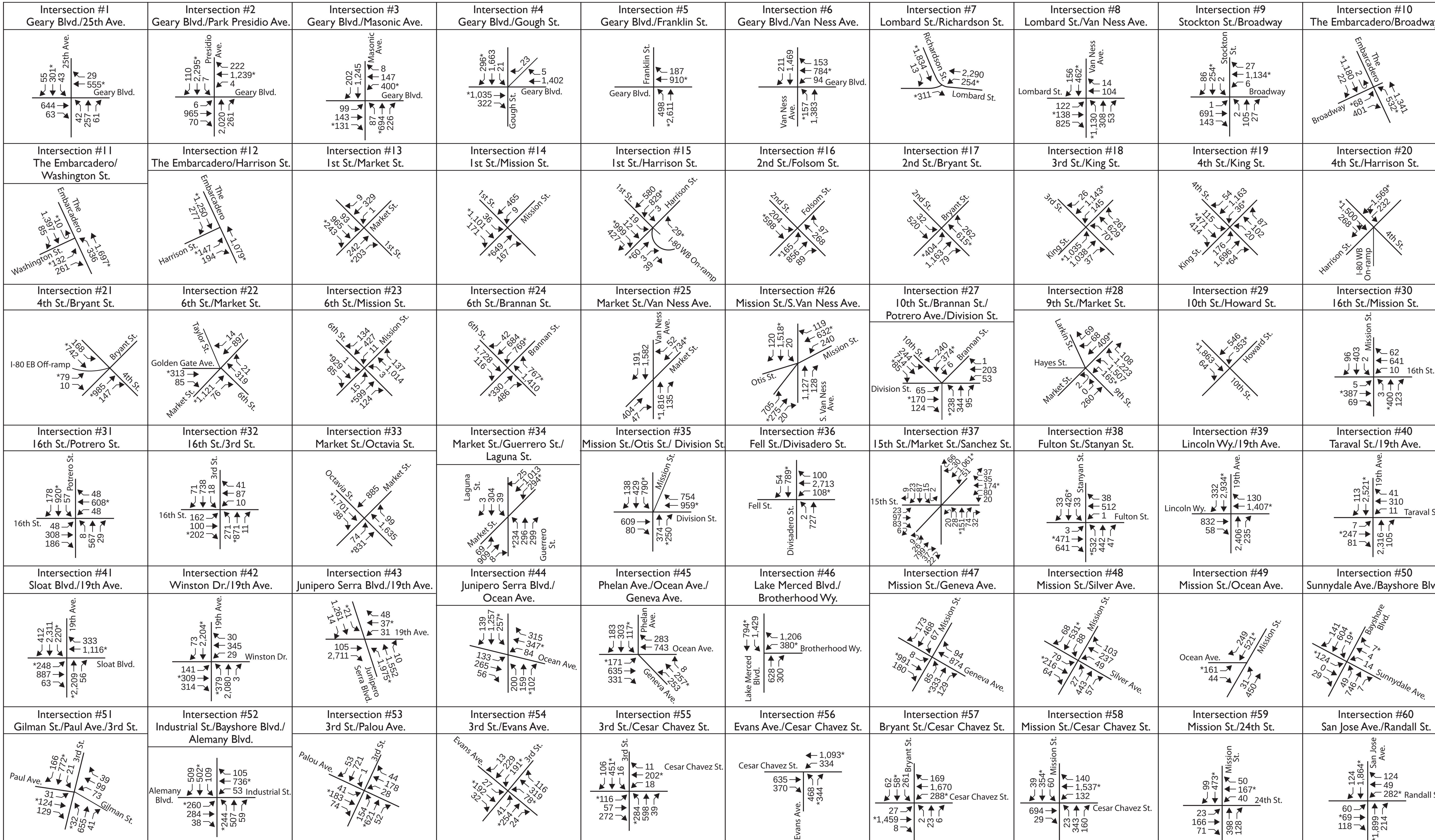
Figure 8



City of San Francisco - Housing Element EIR
Existing Turning Movement Volumes

LEGEND	
XX	P.M. Peak Hour Volume
*	Critical Movement

Figure 9



Cumulative 2025 Traffic Conditions

The 2025 traffic forecast for the study intersections was developed by utilizing the latest SFCTA travel demand model runs (CHAMP model version 3.4.0, CHAMP networks version RTP2005/3/2/8) for years 2005 and 2025. The difference between 2005 and 2025 model link volumes were calculated to estimate a sixteen-year growth increment between the existing (2009) and 2025 analysis years. This increment was added to existing turning movement volumes proportionately based on existing left, through, and right turn volumes at the study intersections to calculate 2025 turning movements. **Error! Reference source not found.** shows the resulting 2025 turning movement volumes.

Table III shows the results of an intersection level of service analysis for all study intersections during the p.m. peak hour for both Existing and 2025 Cumulative Conditions. Detailed LOS worksheets are provided in Appendix F. Under 2025 Cumulative Conditions, 37 of the 60 study intersections are expected to operate at unacceptable levels of service (LOS E or F). Compared with Existing Conditions, there are 24 more intersections expected to operate unacceptably.

Table III: P.M. Peak Hour Intersection LOS – Existing Conditions and Cumulative (2025) Conditions

ID	*Intersection*	*Existing Conditions*			*Cumulative (2025) Conditions*		
		P.M. Peak			*P.M. Peak*		
		Delay	*LOS*	*V/C*	*Delay*	*LOS*	*V/C*
1	Geary Blvd / 25th Ave	16.0	B		15.9	B	
2	Geary Blvd / Park Presidio Ave	22.9	C		26.8	C	
3	Geary Blvd / Masonic Ave	38.2	D		41.8	D	
4	Geary Blvd / Gough St	22.8	C		38.0	D	
5	Geary Blvd / Franklin St	20.6	C		47.1	D	
6	Geary Blvd / Van Ness Ave	35.9	D		**67.2**	**E**	
7	Lombard St / Richardson Ave	45.1	D		**61.5**	**E**	
8	Lombard St / Van Ness Ave	22.7	C		23.5	C	
9	Stockton St / Broadway	16.0	B		15.7	B	
10	The Embarcadero / Broadway	53.5	D		**>80.0**	**F**	0.768
11	The Embarcadero / Washington St	42.5	D		**69.1**	**E**	
12	The Embarcadero / Harrison St	24.2	C		**55.0**	**E**	
13	1st St / Market St	**67.7**	**E**		**>80.0**	**F**	0.750
14	1st St / Mission St	**>80.0**	**F**	1.253	**>80.0**	**F**	1.307
15	1st St / Harrison St	**>80.0**	**F**	1.204	**>80.0**	**F**	1.403
16	2nd St / Folsom St	44.7	D		**>80.0**	**F**	1.558
17	2nd St / Bryant St	**60.3**	**E**		**>80.0**	**F**	1.451

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ID	Intersection	Existing Conditions			Cumulative (2025) Conditions		
		P.M. Peak			P.M. Peak		
		Delay	LOS	V/C	Delay	LOS	V/C
18	3rd St / King St	43.7	D		**>80.0**	**F**	1.178
19	4th St / King St	35.0	D		**57.3**	**E**	
20	4th St / Harrison St	**63.2**	**E**		**67.4**	**E**	
21	4th St / Bryant St	20.9	C		23.8	C	
22	6th St / Market St	29.1	C		**60.2**	**E**	
23	6th St / Mission St	46.0	D		**>80.0**	**F**	1.231
24	6th St / Brannan St	**>80**	**F**	1.263	**>80.0**	**F**	1.418
25	Market St / Van Ness Ave	21.8	C		54.9	D	
26	Mission St / South Van Ness Ave	**70.3**	**E**		**>80.0**	**F**	0.940
27	10th St / Brannan St / Potrero St / Division St	**72.0**	**E**		**>80.0**	**F**	1.264
28	9th St / Market St	15.1	B		17.9	B	
29	10th St / Howard St	18.9	B		24.9	C	
30	16th St / Mission St	30.8	C		34.7	C	
31	16th St / Potrero St	19.5	B		**>80.0**	**F**	1.722
32	16th St / 3rd St	35.8	D		37.3	D	
33	Market St / Octavia St	41.9	D		**>80.0**	**F**	1.273
34	Market St / Guerrero St / Laguna St	40.1	D		45.1	D	
35	Mission St / Otis St / Division St	**65.2**	**E**		**70.8**	**E**	
36	Fell St / Divisadero St	20.1	C		25.4	C	
37	15th St / Market St / Sanchez St	47.9	D		**56.5**	**E**	
38	Fulton St / Stanyan St	47.8	D		**70.3**	**E**	
39	Lincoln Way / 19th Ave	**>80**	**F**	1.243	**>80.0**	**F**	1.229
40	Taraval St / 19th Ave	18.3	B		21.8	C	
41	Sloat Blvd / 19th Ave	**>80**	**F**	1.346	**>80.0**	**F**	1.411
42	Winston Dr / 19th Ave	**62.7**	**E**		**>80.0**	**F**	1.373
43	Junipero Serra Blvd / 19th Ave	**75.9**	**E**		**>80.0**	**F**	1.269
44	Junipero Serra Blvd / Ocean Ave	40.4	D		**59.0**	**E**	
45	Phelan Ave / Ocean Ave / Geneva St	17.6	B		34.7	C	
46	Lake Merced Blvd / Brotherhood Way	49.2	D		**>80.0**	**F**	1.158
47	Mission St / Geneva St	28.9	C		33.9	C	
48	Mission St / Silver Ave	15.7	B		20.9	C	
49	Mission Street / Ocean Ave	8.2	A		8.9	A	
50	Sunnydale Ave / Bayshore Blvd	23.6	C		**>80.0**	**F**	1.523
51	Gilman St / Paul Ave / 3rd St	23.9	C		33.3	C	
52	Industrial St / Bayshore Blvd / Alemany Blvd	51.2	D		**>80.0**	**F**	1.150

Table continued on next page.

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ID	Intersection	Existing Conditions			Cumulative (2025) Conditions		
		P.M. Peak			P.M. Peak		
		Delay	LOS	V/C	Delay	LOS	V/C
53	3rd St / Palou Ave	30.1	C		**57.1**	**E**	0.713
54	3rd St / Evans Ave	35.7	D		**>80.0**	**F**	1.309
55	3rd St / Cesar Chavez St	27.6	C		**>80.0**	**F**	0.951
56	Evans Ave / Cesar Chavez St	47.4	D		**>80.0**	**F**	1.365
57	Bryant St / Cesar Chavez St	51.4	D		**>80.0**	**F**	1.474
58	Mission St / Cesar Chavez St	27.7	C		**64.9**	**E**	
59	Mission St / 24th St	28.0	C		36.3	D	
60	San Jose Ave / Randall St	25.8	C		52.9	D	

Note: Delay = Overall average control delay in seconds per vehicle;
V/C = overall volume to capacity ratio;
LOS = overall level of service.

The LOS results for Cumulative 2025 Conditions reveal several anticipated traffic operational trends along a number of corridors in San Francisco:

- Existing Embarcadero corridor service levels will deteriorate from acceptable levels under Existing Conditions to unacceptable levels (LOS E/F) under Cumulative 2025 Conditions;
- Current Sixth Street corridor service levels will deteriorate from acceptable to unacceptable conditions in 2025, and the Sixth/Brannan intersection in particular would remain at unacceptable service levels;
- Additional SOMA intersections are expected to deteriorate from currently acceptable to unacceptable service levels in 2025, including the 1st / Harrison, 4th / King, and 6th / Mission intersections;
- 19th Avenue corridor intersections currently operating unacceptably at LOS E and LOS F would deteriorate to a worse LOS F condition in 2025;
- Junipero Serra corridor intersections operating at LOS D (acceptable) and LOS E (unacceptable) would worsen to LOS E or F in 2025; and
- Key intersections on the Cesar Chavez Street, Market Street, Bayshore Boulevard, and Third Avenue corridors currently operating acceptably would deteriorate to LOS E or F in 2025.

It should be noted that although the above corridors and intersections are expected to deteriorate in traffic operations in 2025, the degraded service levels are not due to the proposed 2004 and 2009 Housing Elements, since the specific policies contained in those documents would not result in the generation of new trips. Furthermore, several neighborhood-wide and development-specific transportation studies have been conducted that have already identified the above deficient roadway corridors, and proposed appropriate mitigations to address the respective projects' impact. Under 2025 Cumulative Conditions, traffic volumes are projected to substantially increase throughout the City, resulting in noticeable increases in the average delays per vehicle at many of the study intersections. It is recognized that under 2025 Cumulative Conditions, 37 of the study intersections are anticipated to operate at unacceptable levels. While the proposed projects are not trip generating and the 37 identified intersection are expected to operate at unacceptable level of service irrespective of whether the proposed projects are approved, a number of steps could be taken to address vehicular congestion at these locations.

As conditions warrant, SFMTA could implement changes to the study intersections in order to reduce congestion. Measures that could potentially improve traffic operations to acceptable levels include:

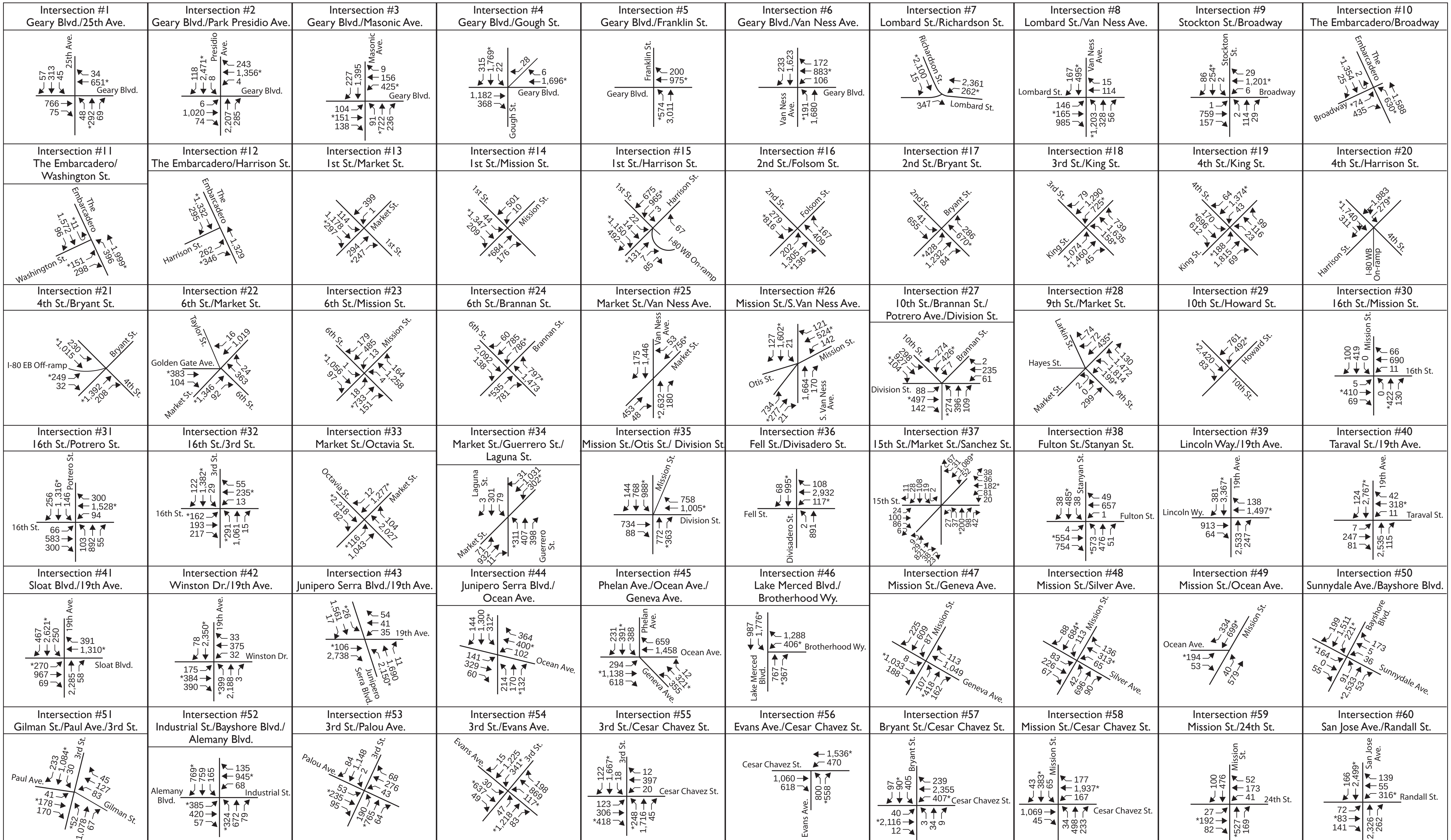
- Adding traffic lanes by eliminating on-street parking;
- Restriping and reconstructing medians;
- Modifying traffic signal timing or extending traffic signal cycle length to improve traffic operations;
- Geometric changes (e.g., changing shared lanes to exclusive turn lanes, providing exclusive right turn or left-turn pockets); and
- Implementation of on-street parking restriction during peak periods to provide for additional vehicular capacity.

These measures are not currently programmed by SFMTA. Feasibility studies would be required prior to actual implementation of the potential improvement measures. As appropriate and feasible, the SFMTA would implement these measures if and when conditions warrant.

City of San Francisco - Housing Element EIR
Cumulative 2025 Turning Movement Volumes

LEGEND
XX P.M. Peak Hour Volume
* Critical Movement

Figure 10



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Furthermore, several previous transportation studies have been conducted for specific neighborhood areas in San Francisco. As a result of these previous studies, mitigation measures have been identified and adopted as part of those projects. Appendix H lists the transportation study sources for the mitigations described below.

The following measures have been identified in the Eastern Neighborhoods Rezoning and Area Plan:

- #18 Third Street / King Street: The intersection is expected to operate unsatisfactorily at a LOS F, with a V/C ratio of 1.18. To improve intersection operation, additional northbound, eastbound and westbound capacity would need to be provided. Improvements associated with the Mission Bay development have been implemented at this intersection, though additional right-of-way is not available to provide additional capacity. Since it is not known if these improvements are feasible, thus further evaluation will be conducted when conditions warrant.

- #35 Mission Street / Otis Street / Division Street: The intersection would operate unsatisfactorily at a LOS E, with 70.8 seconds of average delay. This intersection serves traffic destined to and from the U.S. 101 ramps at South Van Ness. To improve the Cumulative 2025 Conditions at this intersection, additional northbound and westbound capacity would need to be provided. It is not known if widening is feasible, thus further evaluation will be conducted when conditions warrant.

The following measures have been identified in the Market and Octavia Area Plan:

- #26 Mission / Otis / South Van Ness: The intersection is expected to operate unsatisfactorily at a LOS F, with a V/C ratio of 0.94. The following improvement measures do not bring the operating LOS to satisfactory levels, but reduce the average delay at this intersection.

  It may be possible to add right turn pockets to the southbound approach on Mission Street and the northbound approach on South Van Ness Avenue. In addition, minor changes to the signal timing at the intersection to allow more time for impacted movements would improve intersection conditions. Implementation of signal timing changes would be dependent upon an assessment of transit and traffic coordination along Van Ness Avenue and Mission Street to ensure that the changes would not substantially affect Muni bus operations, signal progressions, pedestrian minimum green timing requirements, and programming limitations of signals. Since it is not known if signal timing changes are feasible, further evaluation would be conducted when conditions warrant.

- #37 Market / Sanchez / 15th: The intersection is expected to operate unsatisfactorily at a LOS E, with 56.5 seconds of average delay. The following improvement measure was identified to improve cumulative operating conditions at this intersection.

  It may be possible to add a right turn pocket to the westbound approach on 15th Street. With this change, the level of service would improve to LOS D. In addition, minor changes to the signal timing at the intersection to allow more time for impacted movements may improve intersection conditions. Implementation of signal timing changes would be dependent upon an assessment of transit and traffic coordination along Market Street to ensure that the changes would not substantially affect Muni bus operations, signal progressions, pedestrian minimum green timing requirements, and programming limitations of signals. Since it is not known if signal timing changes are feasible, further evaluation will be conducted when conditions warrant.

The following measure has been identified in the Balboa Park Area Plan:

- #44 Ocean Avenue / Junipero Serra Boulevard: The intersection would operate unsatisfactorily at a LOS E, with 59.0 seconds of average delay. The following improvement measure was identified to improve cumulative operating conditions at this intersection:

  Extend the cycle length by 15 seconds (from 90 to 105 seconds), with the additional green time provided to the eastbound and westbound approaches. With this change, the intersection operations would improve to LOS D with an average delay of 42.5 seconds. Since it is not known if signal timing changes are feasible, further evaluation will be conducted when conditions warrant.

The following measure has been identified in the Visitacion Valley Redevelopment Plan:

- #50 Bayshore Boulevard / Sunnydale Avenue: The intersection would operate unsatisfactorily at a LOS F, with a V/C ratio of 1.52. No feasible improvement measures were identified for this intersection, but planned infrastructure improvements may alleviate this intersection's congestion.

  There are three regional roadway improvements planned, including an extension of Geneva Avenue from its current terminus at Bayshore Boulevard to a new interchange with US 101; a new US 101 interchange at Geneva Avenue / Harney Way; and widening of Harney Way between US 101 and Jamestown Avenue. These improvements are expected to change the traffic patterns significantly at this intersection, and bring the operation condition from LOS F to LOS D.

The analysis of 2025 Cumulative conditions shows that a number of key intersections are expected to operate at unacceptable Level of Service. In addition to the specific measures identified above to improve the operating conditions at these intersections, the City has developed a number of plans and programs that aim to reduce the overall level of congestion citywide. These plans and programs are describes on page 45 of this report. Generally, these plans and programs are designed to make alternative modes of transportation more attractive, such that there would be a mode shift from single-occupancy vehicles to transit, biking and walking.

Local Transit Network Conditions

This section presents existing local Muni transit conditions and a local Muni transit screenline analysis for future 2025 Cumulative Conditions.

Existing and future 2025 Cumulative Conditions of Muni service were analyzed in terms of a series of screenlines. The concept of screenlines is used to describe the magnitude of travel to or from the greater Downtown area by corridors, and to compare estimated transit volumes to available capacities. Screenlines are hypothetical lines that would be crossed by persons traveling between Downtown and other parts of San Francisco and the region. The screenline data were updated in 2009 using information from the ongoing Transit Effectiveness Project (TEP). Figure 11 shows the four Muni screenlines surrounding the greater Downtown area. Appendix G shows the locations of both the Muni and regional transit screenlines used for analysis.

Existing Muni Screenline Analysis

Four screenlines (Northeast, Northwest, Southeast, and Southwest) have been established to evaluate Muni operations into and out of the greater Downtown area, roughly corresponding to Superdistricts 1, 2, 3, and 4, respectively. Each screenline is further divided into key corridors such as the Geary Corridor within the Northwest screenline and the Mission Corridor within the Southwest screenline, for which ridership and capacity are presented separately from other lines. Together, the lines included in the screenline analysis represent the primary commute lines into and out of the greater Downtown area. In contrast, "policy" lines (lines with headways greater than ten minutes) or lines which pass through Downtown but do not attract a significant number of Downtown riders are generally excluded from the analysis. For the purposes of this analysis, screenline calculations consider only inbound service (towards Downtown) during the weekday a.m. peak hour and outbound service (from Downtown) during the weekday p.m. peak hour, as these are the primary commute directions for the greater Downtown area. Table IV shows the Muni peak period screenline groupings described above.

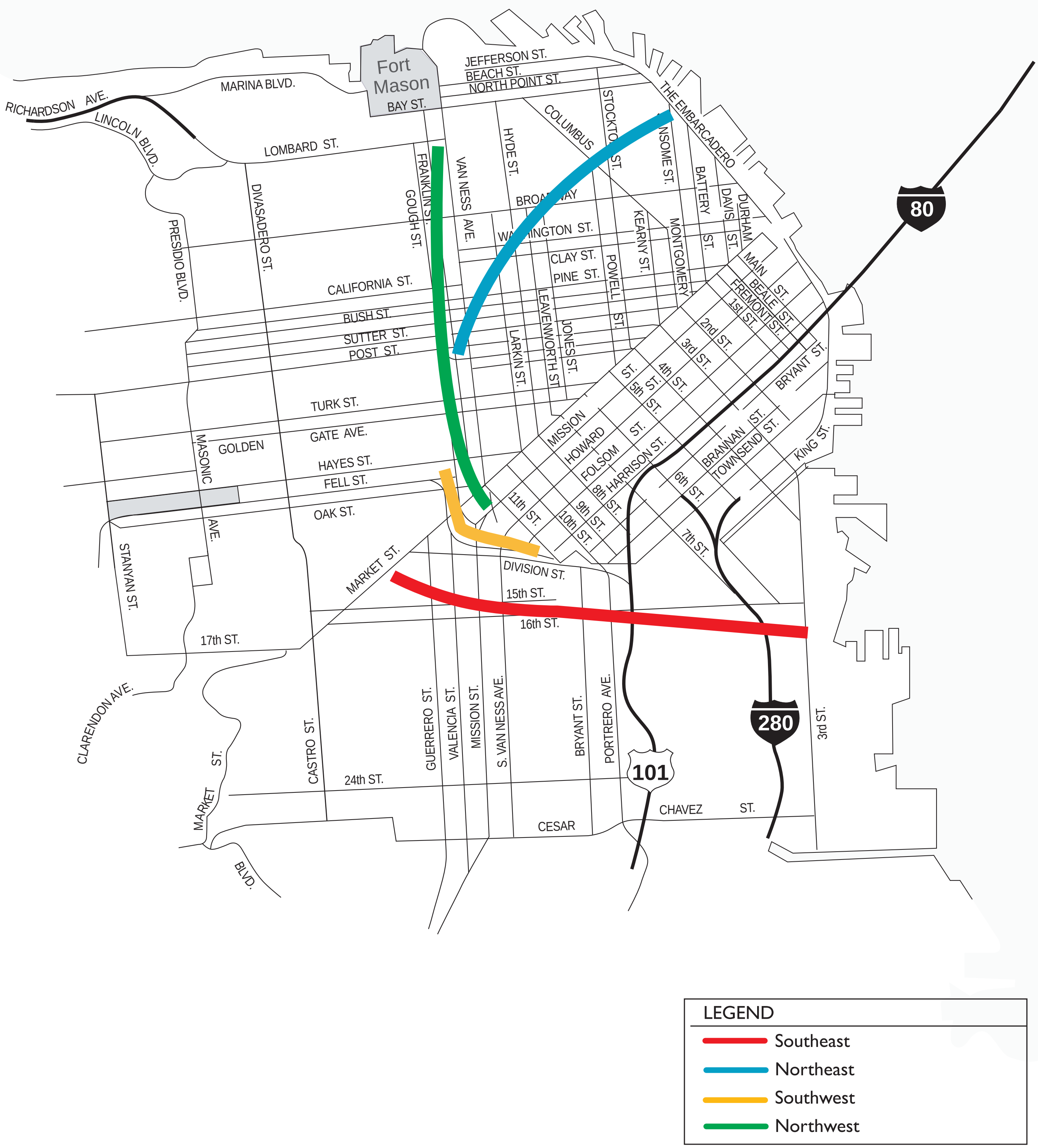
Fort Mason
JEFFERSON ST.
BEACH ST.
NORTH POINT ST.
BAY ST.
MARINA BLVD.
RICHARDSON AVE.
LINCOLN BLVD.
LOMBARD ST.
COLUMBUS
THE EMBARCADERO
PRESIDIO BLVD.
DIVASADERO ST.
FRANKLIN ST.
GOUGH ST.
VAN NESS AVE.
HYDE ST.
BROADWAY
WASHINGTON ST.
CLAY ST.
PINE ST.
CALIFORNIA ST.
BUSH ST.
SUTTER ST.
POST ST.
TURK ST.
GOLDEN GATE AVE.
HAYES ST.
FELL ST.
OAK ST.
MASONIC AVE.
STANYAN ST.
LARKIN ST.
LEAVENWORTH ST.
JONES ST.
POWELL ST.
KEARNY ST.
MONTGOMERY
BATTERY ST.
DAVIS ST.
DURHAM
MAIN ST.
BEALE ST.
FREMONT ST.
1st ST.
2nd ST.
3rd ST.
4th ST.
5th ST.
6th ST.
7th ST.
8th ST.
9th ST.
10th ST.
11th ST.
MISSION ST.
HOWARD ST.
FOLSOM
HARRISON ST.
BRYANT ST.
BRANNAN ST.
TOWNSEND ST.
KING ST.
80
MARKET ST.
DIVISION ST.
15th ST.
16th ST.
17th ST.
CLARENDON AVE.
CASTRO ST.
GUERRERO ST.
VALENCIA ST.
MISSION ST.
S. VAN NESS AVE.
BRYANT ST.
PORTRERO AVE.
280
3rd ST.
101
24th ST.
CESAR CHAVEZ ST.
MARKET ST.
BLVD.
LEGEND
Southeast
Northeast
Southwest
Northwest

Table IV: Muni Peak Period Screenline Groupings

Screenline / Corridor	*Transit Lines*			
Northeast Screenline				
Kearny / Stockton	20	Columbus	9X	Bayshore Express
	30	Stockton		
	45	Union-Stockton		
Other	F	Market & Wharves		
	10	Townsend		
	41	Union		
Northwest Screenline				
Geary	38	Geary	38AX	Geary A Express
	38L	Geary Limited	38BX	Geary B Express
California	1	California	1AX	California A Express
			1BX	California B Express
Sutter / Clement	2	Clement		
	3	Jackson		
	4	Sutter		
Fulton / Hayes	5	Fulton		
	21	Hayes		
Balboa	31	Balboa	31AX	Balboa A Express
			31BX	Balboa B Express
Chestnut / Union	30	Stockton	30X	Marina Express
	41	Union		
	45	Union-Stockton		
Southeast Screenline				
Third	T	Third Street		
Mission	14	Mission	14X	Mission Express
		Mission	14L	Mission Limited
	49	Van Ness-Mission		
San Bruno / Bayshore	9	San Bruno	9X	Bayshore Express
			9AX	Bayshore A Express
			9BX	Bayshore B Express
Other	J	Church		
	12	Folsom		
	19	Polk		
Southwest Screenline				
Subway	K	Ingleside		
	L	Taraval		
	M	Ocean View		
	N	Judah		
Haight / Noriega	6	Parnassus	16AX	Noriega A Express
	7	Haight	16BX	Noriega B Express
	71	Haight-Noriega		
	71L	Haight-Noriega Limited		
Other	F	Market & Wharves		

Source: Muni, 2008; AECOM, 2009.

It should be noted that the points of measurement for the screenline analysis do not actually follow the alignments schematically shown in the figure. Rather, the screenline for each route reflects the maximum load point (MLP) for the Muni lines that cross one of the screenlines. The MLP is the point along the Muni route at which the bus or light rail vehicle is at its highest passenger load. The MLP for each individual line may occur at some point on either side of the schematic lines drawn for graphic representation. For the purpose of this analysis, Muni ridership measured at the four San Francisco screenlines and sub-corridors represents the peak direction of travel and patronage loads for the Muni system. Table V shows the existing and future 2025 Cumulative utilization at the Muni screenlines during the p.m. peak hour. All screenlines operate within the 85 percent capacity utilization standard. However, it should be noted that under Existing Conditions in the Southwest screenline, the subway corridor operates above the capacity utilization standard at 87 percent.

Available space on each Muni line can be determined using the concept of capacity utilization, which relates the number of passengers per transit vehicle to the design capacity of the vehicle. The design capacity is based on Muni's maximum load standard for each size of vehicle. The capacity includes seated passengers and an appreciable number of standing passengers per vehicle (the number of standing passengers is between approximately 30 and 80 percent of the seated passengers, depending upon the specific transit vehicle configuration).

Muni capacity standards include standing passengers, and therefore Muni screenlines and sub-corridors at or near capacity operate under noticeably crowded conditions with many standees. Each screenline and most sub-corridors include several Muni lines with multiple transit vehicles from each line. As a result, some transit vehicles operate at or above capacity and are extremely crowded during the p.m. peak hour while others operate under less crowded conditions. The extent of crowding is accentuated whenever targeted headways are not met either because of missed runs and/or bunching in service. Thus, transit operators may experience substantial problems in service delivery well short of established service capacity standards.

Cumulative 2025 Muni Screenline Analysis

Table V shows the results of an analysis of Muni screenlines under the existing and future 2025 Cumulative Conditions during the p.m. peak hour.

As shown in the Muni screenline analysis under Existing Conditions, some of the existing Muni corridors operate near capacity. Under future 2025 Cumulative Conditions, none of the Muni corridors would operate above Muni's capacity utilization standard of 85 percent. Under 2025 Cumulative Conditions, the California corridor in the Northwest screenline would operate near the capacity utilization standard, as would the subway corridor in the Southwest screenline.

Table V: Muni Screenline Analysis – Existing vs. Cumulative (2025) P.M. Peak Hour Conditions

Screenline / Corridor	Existing Conditions			Cumulative (2025) Conditions		
	Ridership	Capacity	Capacity Utilization	Ridership	Capacity	Capacity Utilization
Northeast Screenline						
Kearny / Stockton	1,129	2,010	56%	1,207	2,634	46%
Other	757	1,589	48%	1,256	2,065	61%
Subtotal	**1,886**	**3,599**	**52%**	**2,463**	**4,699**	**52%**
Northwest Screenline						
Geary	1,684	2,230	76%	1,914	2,700	71%
California	1,413	2,050	69%	1,722	2,050	84%
Sutter / Clement	565	1,008	56%	652	945	69%
Fulton / Hayes	861	1,260	68%	948	1,638	58%
Balboa	615	1,247	49%	567	1,326	43%
Chestnut / Union	1,483	2,328	64%	1,422	2,953	48%
Subtotal	**6,621**	**10,123**	**65%**	**7,225**	**11,612**	**62%**
Southeast Screenline						
Third	554	714	78%	2,107	2856	74%
Mission	1,254	2,350	53%	1,342	2,256	60%
San Bruno / Bayshore	1,671	2,256	74%	2,184	3,008	73%
Other	1,189	1,708	70%	1,464	1,820	80%
Subtotal	**4,668**	**7,028**	**66%**	**7,097**	**9,940**	**71%**
Southwest Screenline						
Subway	5,883	6,783	87%	6,523	7,973	82%
Haight / Noriega	1,247	2,140	58%	1,230	1,890	65%
Other	304	700	43%	303	840	36%
Subtotal	**7,434**	**9,623**	**77%**	**8,056**	**10,703**	**75%**
Total All Screenlines	**20,609**	**30,373**	**68%**	**24,841**	**36,954**	**67%**

Source: Muni, 2008; AECOM, 2009

Notes: Capacity = design capacity x number of scheduled bus trips.
Capacity Utilization = passenger demand / capacity. It should be noted that Muni uses a capacity utilization service standard of 0.85, which includes a substantial number of standees (between 30 to 80 percent) and that each screenline and most sub-corridors include more than one line. Therefore, there may be individual lines within a screenline that operate at or above 100 percent with extreme crowding even if the average capacity utilization for an entire screenline is less than 100 percent.

Regional Transit Network Conditions

The following presents the existing regional transit conditions and a screenline analysis of future 2025 Cumulative regional transit conditions.

Existing Regional Screenline Analysis

Three screenlines (East Bay, North Bay, and South Bay) were established to evaluate the regional transit operations into and out of the greater Downtown area. Each screenline is subdivided by transit operator (or mode, where appropriate), with ridership and capacity presented for each. Screenline calculations only consider the outbound service (from Downtown) during the weekday p.m. peak hour, since this is the primary commute direction. Available information on vehicle ridership data was combined with the vehicle capacities and service frequencies of the regional transit operators to obtain the operator capacity utilization. With the exception of BART, all regional transit operators including ferries have a one-hour capacity utilization standard of 100 percent, meaning a fully seated load on each vehicle. Passengers are not expected to stand since regional transit trips are typically long distance. BART, on the other hand, has a one-hour capacity utilization standard of 135 percent, meaning a full-seated load and an additional 35 percent of the seated load as standees, or 1.35 passengers per seat. The operators and their capacity and ridership information were grouped into the appropriate screenlines to obtain screenline capacity utilization. The resulting regional peak hour screenline operations are summarized in Table VI.

As shown in Table VI, regional transit services generally operate below capacity under Existing Conditions. Capacity utilization is highest on the East Bay screenline during the existing p.m. peak hours. During the p.m. peak hours, BART operates at 120 percent capacity utilization for the East Bay service, but under 100 percent capacity utilization for the South Bay service. Both services operate under its one-hour capacity utilization standard of 135 percent.

Cumulative 2025 Regional Screenline Analysis

Similar to Existing Conditions, regional screenline data were analyzed in terms of the regional transit operations into and out of the greater Downtown area. Three screenlines (East Bay, North Bay, and South Bay) were established to evaluate the regional transit operations into and out of the greater Downtown area. Table VI shows the results of the regional transit screenline analysis for Existing and Cumulative 2025 Conditions.

Table VI: Regional Screenline Analysis – Existing vs. Cumulative (2025) P.M. Peak Hour Conditions

Screenline / Operator	Existing Conditions			2025 Cumulative Conditions		
	Ridership	Capacity	Capacity Utilization	Ridership	Capacity	Capacity Utilization
East Bay						
BART	16,985	14,140	120%	26,404	19,600	135%
AC Transit	2,517	4,193	60%	3,913	6,600	59%
Ferries	702	1,519	46%	1,753	2,719	64%
Subtotal	**20,204**	**19,852**	**102%**	**32,070**	**28,919**	**111%**
North Bay						
GGT Bus	1,397	2,205	63%	2,205	2,205	100%
Ferries	906	1,700	53%	1,430	1,700	84%
Subtotal	**2,303**	**3,905**	**59%**	**3,635**	**3,905**	**93%**
South Bay						
BART	9,545	10,360	92%	9,908	14,000	71%
Caltrain	1,986	3,250	61%	3,463	6,400	54%
SamTrans	575	940	61%	439	940	47%
Ferries	- [1]	- [1]	- [1]	73	300	24%
Subtotal	**12,106**	**14,550**	**83%**	**13,883**	**21,640**	**64%**
Total All Screenlines	**34,613**	**38,307**	**90%**	**49,588**	**54,464**	**91%**

Note: [1] There is no South Bay ferry service under Existing Conditions. Under 2025 Cumulative Conditions, ferry service will be added that connects South San Francisco to San Francisco.

As shown in Table VI, regional transit services are generally expected to operate below capacity in 2025. Capacity utilization is expected to be highest on the East Bay screenline during the p.m. peak hours, with BART expected to operate at 135 percent capacity utilization for the East Bay service during the p.m. peak hours. However, capacity utilization is expected to be at or under 100 percent for the South Bay and North Bay service. Both services are expected to operate at or below its one-hour capacity utilization standard of 135 percent.

Pedestrian and Bicycle Conditions

As the City continues to grow, the transportation network would absorb additional pedestrian and bicycle trips. These trips are expected to occur irrespective of whether the proposed projects are adopted. As discussed in page 45, the City has recently adopted the *San Francisco Bicycle Plan*, which will add new bicycle lanes and bicycle parking throughout the city. The Bicycle Plan is expected to increase convenience and safety for cyclists. Furthermore, the City is proposing to implement the *Better Streets Plan*, which aims to improve pedestrian safety and convenience citywide through enhanced sidewalks, crosswalks, and other pedestrian amenities. Given the above plans, the new pedestrian and bicycle trips could be accommodated within the transportation network and would not substantially overcrowd public sidewalks or create potentially hazardous conditions.

6. Analysis of Housing Element Policies

This section includes a qualitative program-level review of the 2004 and 2009 Housing Element policies, and project alternatives, to determine the potential for housing element policies to affect the transportation network. Based on the definition of a "project" under the California Environmental Quality Act ([CEQA] Section 15378 of the CEQA Guidelines) and case law interpreting CEQA, environmental review of an amendment to a General Plan or General Plan element need only analyze *changes* from a previously adopted plan or element. Therefore, this TIS addresses the policy changes of the following five Housing Element proposals (described more thoroughly in Section 2. Project Characteristics) from the 1990 Residence Element.

<u>2004 Housing Element:</u> This option includes the objectives, policies, and implementation measures of the 2004 Housing Element. For purposes of this TIS analysis however, the 2004 Housing Element utilizes the updated Data and Needs Analysis (Part I) of the 2009 Housing Element and an updated Regional Housing Needs Allocation (RHNA).

<u>2009 Housing Element:</u> This option includes the objectives, policies, implementation measures, and strategies for further review identified in the proposed 2009 Housing Element. The strategies for further review that are introduced in the 2009 Housing Element refer to ideas that were raised over the course of development and outreach for the 2009 Housing Element. Most of the strategies require further examination, and potentially long-term study, before they can be directly implemented. However, in some instances, the strategies are more concrete and could potentially become implementation measures. For purposes of this TIS, the strategies for further review are treated as implementation measures of the 2009 Housing Element.

<u>Alternative A (No Project Alternative):</u> Alternative A consists of the policies and objectives of the 1990 Residence Element coupled with Part I of the proposed 2009 Housing Element, which utilizes an updated RHNA. The No Project Alternative assumes that the City would comply with state housing element law, which mandates the inclusion of an updated Data and Needs Analysis (Part I of the 2009 Housing Element) in the City's General Plan. Thus, the No Project Alternative will use the objectives and policies contained in the 1990 Residence Element coupled with the most recently identified RHNA allocation and an updated Data and Needs Analysis.

<u>Alternative B (Modified 2004 Housing Element):</u> This option includes the objectives, policies and implementation measures of the 2004 Housing Element minus those policies that were stricken by the court in the appeal of the 2004 Housing Element at the time of this TIS (See *San Franciscans for Livable Neighborhoods v. City and County of San Francisco* [June 22, 2007]). Section 2. Project Characteristics contains a complete list of the objectives, policies and implementation measures that were removed by the Court of Appeals.

<u>Alternative C (Additional Housing Concepts):</u> This option includes concepts that more aggressively encourage attainment of the RHNA. This option explores the following concepts: (1) Allow for limited expansion of allowable building envelopes for those who provide family-size units in onsite affordable housing, (2) Requirement for development to fully build to the allowable building envelope under zoning in locations that are directly on the Rapid transit network lines identified in the Transit Effectiveness Project (TEP), (3) Height and/or density bonus for development that exceeds affordable housing requirements in locations that are directly on the Rapid transit network

lines identified in the TEP, (4) Height and/or density bonus for 100% affordable housing in all zones except in RH-1 and RH-2 zones, and (5) Granting of administrative variances (i.e. over-the-counter) for parking spaces required for additional units if the development is: a. in an RH-2 zoning district (or greater), b. in an area where additional curb cuts would further exacerbate parking, such as in Residential Parking Program areas, or c. on a Transit Preferential Street.

With respect to the effects of the 2004 and 2009 Housing Elements (and project alternatives) on the transportation and circulation network, the housing element policies generally fall within three major categories as follows:

1. Policies that direct growth to particular locations in the City, including neighborhood commercial districts, transit rich areas, Downtown, former industrial lands, mixed use areas, and Brownfields;

2. Policies that address the provision of off-street vehicle parking for new developments, such as reduced parking requirements; and

3. Policies that are related to increases in residential density.

Below are examples of the 2004 Housing Element policies that relate to each of these three areas:

1. <u>Directing Growth: 2004 HE Policy 1.3:</u> Identify opportunities for housing and mixed-use districts near Downtown and former industrial portions of the City.

2. <u>Parking: 2004 HE Implementation Measure (IM) 11.7.1 -</u> The Planning Department will work to reduce parking requirements in older neighborhoods and in other areas through a Better Neighborhoods type planning process with the support and input from local neighborhoods.

3. <u>Residential Density: Implementation Measure (IM) 1.1.1</u> – A Citywide Action Plan (CAP) should provide a comprehensive framework for the allocation of higher density, mixed-use residential development in transit-rich areas with stable urban amenities in place. In these areas, specific CAP strategies should include: higher densities and reduced parking requirements in Downtown areas or through a Better Neighborhoods type planning process; pedestrian-oriented improvements to enhance the attractiveness and use of transit.

Below are examples of the 2009 policies that relate to each of the three areas identified above:

1. <u>Directing Growth: 2009 Housing Element Policy 12.1</u> – Encourage new housing that relies on transit use and environmentally sustainable mode choices.

2. <u>Parking: 2009 Housing Element Policy 2.3</u> – Prevent the destruction or reduction of housing for parking.

3. Residential Density: 2009 Housing Element Policy 1.6- Consider greater flexibility in the number and size of units within established building envelopes in community plan areas, especially if it can increase the number of affordable units in multi-family structures.

While this TIS classifies the policies into three separate categories to facilitate the transportation analysis, it is important to note that a number of policies and implementation measures are related to two or three of the above categories. For example, 2004 Housing Element *Implementation Measure 11.7.1 – The Planning Department will work to reduce parking requirements in older neighborhoods and in other areas through a Better Neighborhoods type planning process with the support and input from local neighborhoods,* is a parking-related strategy in the housing element but is also a residential density-related strategy because a reduced parking requirement would allow for more area to be devoted to residential uses and could result in an increase in the number of residential units than could otherwise be constructed.

2004 Housing Element Analysis

Table VII provides a comparison of 2004 Housing Element objectives, policies, and implementation measures and comparable 1990 Residence Element objectives and policies categorized by: 1) policies related to directing growth to specific areas of the City; 2) Policies related to parking; and 3) policies related to residential density.

Table VII: Comparison of 1990 Residence Element and 2004 Housing Element Objectives, Policies and Implementation Measures That Could Affect the City Transportation Network

Impact	2004 Housing Element	Corresponding 1990 Residence Element Policy
Direct growth to certain areas of the City.	Policy 1.1: Encourage higher residential density in areas adjacent to Downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are affordable to lower income households. Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood scale and character where there is neighborhood support.	Policy 2.1: Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood character. Policy 2.2: Encourage higher residential density in areas adjacent to Downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are permanently affordable to lower income households.
	Implementation Measure 1.1.1: A Citywide action plan (CAP) should provide a comprehensive framework for the allocation of higher density, mixed-use residential development in transit-rich areas with stable urban amenities in place. In these areas, specific CAP strategies should include: higher densities and reduced parking requirements in Downtown areas or through a Better Neighborhoods type planning process; pedestrian-oriented improvements to enhance the attractiveness and use of transit.	
	Policy 1.2: Encourage housing development, particularly affordable housing, in neighborhood commercial areas without displacing existing jobs, particularly blue-collar jobs or discouraging new employment opportunities.	

Impact	2004 Housing Element	Corresponding 1990 Residence Element Policy
	Implementation Measure 1.2.1: The Planning Department will develop proposals in neighborhood commercial districts (NCDs) well served by transit to strengthen their functions as a traditional "town center" for the surrounding residential districts.	
	Policy 1.3: Identify opportunities for housing and mixed-use districts near Downtown and former industrial portions of the City.	Policy 1.2: Facilitate the conversion of underused industrial and commercial areas to residential use, giving preference to permanently affordable housing uses.
	Implementation Measure 1.3.1: Downtown areas and areas subject to a Better Neighborhoods type planning process will be expected to absorb major office and residential developments over the next decade. Planning and zoning code changes should include floor-to-area ratio exemptions. These development bonuses would be conferred only incases where in return the development will provide major public benefits to the community.	Implementation Measure 1.1.3: Inclusion of housing in Downtown.
	Implementation Measure 1.3.2: The Planning Department will introduce zoning changes in the traditionally industrial eastern parts of the City. The areas under study are: Mission, South of Market, Showplace Square/Potrero Hill, Bayview Hunter's Point, and Visitacion Valley. Housing, especially affordable housing, will be encouraged in former industrial areas where residential neighborhoods are established and urban amenities are in place or feasible.	
	Policy 1.4: Locate in-fill housing on appropriate sites in established residential neighborhoods.	Policy 1.4: Locate in-fill housing on appropriate sites in established neighborhoods.
	Policy 1.6: Create incentives for the inclusion of housing, particularly permanently affordable housing, in new commercial development projects.	

Impact	2004 Housing Element	Corresponding 1990 Residence Element Policy
	Implementation Measure 1.6.2: The Planning Department and the Redevelopment Agency will propose increasing height limits, eliminating density requirements and modifying off-street parking requirements in the Transbay/Rincon Hill Redevelopment survey areas. The Mid-Market redevelopment survey area will be rezoning to include mixed-use residential areas and reduced residential parking requirements.	
	Implementation Measure 1.6.4: The Planning Department will update the Land Use Element to define areas for mixed-use development focused along transit corridors that are determined to be served b sufficient and reliable transit.	
	Implementation Measure 1.8.1: The Board of Supervisors has introduced Planning Code amendments to allow secondary units in new buildings that are in close proximity to neighborhood commercial districts and public transit.	
	Implementation Measure 2.4.2: As part of the Planning Department's current citywide action plan, planning efforts in the eastern neighborhoods of the City, where housing exists in commercial and industrially zoned districts, should address housing retention as new policies and zoning are established. Mixed use should be encouraged where appropriate.	
	Implementation Measure 4.1.4: The City will work to identify underutilized, vacant, and Brownfield sites that are publicly or privately owned and suitable for affordable housing development. TH City will work with for profit and non-profit housing developers to acquire these sites for permanently affordable housing.	Implementation Measure 1.1.1: Aggressive pursuit of development opportunities [on] underused public sites. Implementation Measure 1.1.4: In-fill housing on vacant or underused sites.

Impact	2004 Housing Element	Corresponding 1990 Residence Element Policy
	Implementation Measure 4.1.6: Permanently affordable housing sites will be especially sought out in places where transportation and existing amenities are in place.	
	Policy 11.6: Employ flexible land use controls in residential areas that can regulate inappropriately sized development in new neighborhoods, in Downtown areas and in other areas through a Better Neighborhoods type planning process while maximizing the opportunity for housing near transit.	12.5: Relate land use controls to the appropriate scale for new and existing residential areas.
	Implementation Measure 11.6.1: The City will continue to promote increased residential densities in areas well served by transit and neighborhood compatible development with the support and input from local neighborhoods.	
Parking-related policies	Policy 4.4: Consider granting density bonuses and parking requirement exemptions for the construction of affordable housing or senior housing.	No corresponding Policy
	Policy 11.7: Where there is neighborhood support, reduce or remove minimum parking requirements for housing, increasing the amount of lot area available for housing units.	No corresponding Policy
	Implementation Measure 1.1.1: A citywide action plan (CAP) should provide a comprehensive framework for the allocation of higher density, mixed-user residential development in transit rich areas with stable urban amenities in place. In these areas, specific CAP strategies should include: higher densities and reduced parking requirements in Downtown areas or through a Better Neighborhoods type planning process; pedestrian oriented improvements to enhance the attractiveness and use of transit.	No corresponding Implementation Measure

Impact	2004 Housing Element	Corresponding 1990 Residence Element Policy
	Implementation Measure 1.6.1: The Planning Department will review the following incentives for commercial project developments in the Downtown C-3 District; Floor-to-area ratio (FAR) exemption for housing; no residential parking requirements, and no density requirement for residential projects. Housing in excess of the base FAR in the Downtown General (C-3-G) and Downtown Support (C-3-S) Districts has also been proposed by the Board of Supervisors.	No corresponding Implementation Measure
	Implementation Measure 1.6.2: The Planning Department and the Redevelopment Agency will propose modifying off-street parking requirements in the Transbay/Rincon Hill Redevelopment survey areas. The Mid-Market redevelopment survey areas will be re-zoned to include mixed-use residential areas and reduced residential parking requirements.	No corresponding Implementation Measure
	Implementation Measure 1.8.3: The Planning Department will study the impacts of relaxing parking requirements for secondary units located in all neighborhoods.	No corresponding Implementation Measure
	Implementation Measure 4.4.1: Until the Planning Department establishes uniform requirements for affordable and senior housing development, affordable and senior housing projects will continue to be granted reduced parking requirements on a case-by-case basis.	No corresponding Implementation Measure
	Implementation Measure 4.4.2: The Planning Department will investigate appropriate parking requirements for all affordable or senior housing projects.	No corresponding Implementation Measure
	Implementation Measure 11.7.1: The Planning Department will work to reduce parking requirements in older neighborhoods and in other areas through a Better Neighborhoods type planning process with the support and input from local neighborhoods.	No corresponding Implementation Measure

Impact	2004 Housing Element	Corresponding 1990 Residence Element Policy
	Implementation Measure 11.8.1: The Planning Department, with the support and input from local neighborhoods, will study the impacts of reduced parking and private open space provisions and will consider revising the Planning Code accordingly.	No corresponding Implementation Measure
Promote increased density-related development standards	Policy 1.1: Encourage higher residential density in areas adjacent to Downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are affordable to lower income households. Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood scale and character where there is neighborhood support.	Policy 2.1: Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood character. Policy 2.2: Encourage higher residential density in areas adjacent to Downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are permanently affordable to lower income households.
	Implementation Measure 1.1.1: A Citywide action plan (CAP) should provide a comprehensive framework for the allocation of higher density, mixed-use residential development in transit-rich areas with stable urban amenities in place. In these areas, specific CAP strategies should include: higher densities and reduced parking requirements in Downtown areas or through a Better Neighborhoods type planning process; pedestrian-oriented improvements to enhance the attractiveness and use of transit.	
	Implementation Measure 1.3.1: Downtown areas and areas subject to a Better Neighborhoods type planning process will be expected to absorb major office and residential developments over the next decade. Planning and zoning code changes should include floor-to-area ratio exemptions. These development bonuses would be conferred only incases where in return the development will provide major public benefits to the community.	Implementation Measure 1.1.3: Inclusion of housing in Downtown (allowing housing to exceed permitted Floor-Area-Ratios [FARs] in C-3-G and C-3-S Districts).

Impact	2004 Housing Element	Corresponding 1990 Residence Element Policy
	Policy 1.6: Create incentives for the inclusion of housing, particularly permanently affordable housing, in new commercial development projects.	Policy 1.3: Create incentives for the inclusion of housing, particularly permanently affordable housing, in new commercial development projects.
	Implementation Measure 1.6.2: The Planning Department and the Redevelopment Agency will propose increasing height limits, eliminating density requirements and modifying off-street parking requirements in the Transbay/Rincon Hill Redevelopment survey areas. The Mid-Market redevelopment survey area will be rezoning to include mixed-use residential areas and reduced residential parking requirements.	
	Policy 1.7: Encourage and support the construction of quality, new family housing.	
	Implementation Measure 1.7.1: In response to the increasing number of families in San Francisco, the Planning Department will develop zoning amendments to require a minimum percentage of larger family units ranging from two to four bedrooms, in new major residential projects. The Planning Department will also propose eliminating density requirements within permitted building envelopes in Downtown areas and areas subject to a Better Neighborhoods type planning process to maximize family units constructed.	
	Policy 1.8: Allow new secondary units in areas where their effects can be dealt with and there is neighborhood support, especially if that housing is made permanently affordable to lower income households.	Policy 1.5: Allow new secondary units in areas where their effects can be dealt with and there is neighborhood support, especially if that housing is made permanently affordable to lower income households.
	Implementation Measure 1.8.1: The Board of Supervisors has introduced Planning Code amendments to allow secondary units in new buildings that are in close proximity to neighborhood commercial districts and public transit.	

Impact	2004 Housing Element	Corresponding 1990 Residence Element Policy
	Implementation Measure 1.8.3: On-going planning will propose Planning Code amendments to encourage secondary units where appropriate.	
	Policy 4.4: Consider granting density bonuses and parking requirement exemptions for the construction of affordable housing or senior housing.	Policy 7.3: Grant density bonuses for construction of affordable or senior housing.
	Implementation Measure 4.4.1: The Planning Department will look at establishing uniform density bonus standards and equal requirements for affordable and senior housing development. Until then, affordable and senior housing will continue to be granted density bonuses and reduced parking requirements on a case-by-case basis.	
	Policy 4.5: Allow greater flexibility in the number and size of units within established building envelopes, potentially increasing the number of affordable units in multi-family structures.	Policy 2.3: Allow flexibility in the number and size of units within permitted volumes of larger multi unit structures, especially if the flexibility results in creation of a significant number of dwelling units that are permanently affordable to lower income households.
	Policy 11.6: Employ flexible land use controls in residential areas that can regulate inappropriately sized development in new neighborhoods, in Downtown areas, and in other areas through a Better Neighborhoods type planning process while maximizing the opportunity for housing near transit.	Policy 12.5 Relate land use controls to the appropriate scale for new and existing residential areas.
	Implementation Measure 11.6.1: The City will continue to promote increased residential densities in areas well served by transit and neighborhood compatible development with the support and input from local neighborhoods.	
	Policy 11.7: Where there is neighborhood support, reduce of remove minimum parking requirements for housing, increasing the amount of lot area available for housing units.	

Impact	2004 Housing Element	Corresponding 1990 Residence Element Policy
	Implementation Measure 11.7.1: The Planning Department will work to reduce parking in older neighborhoods through a Better Neighborhoods type planning process with the support and input from local neighborhoods.	
	Policy 11.8: Strongly encourage project sponsors to take full advantage of allowable building densities in their housing developments while remaining consistent with neighborhood character.	
	Policy 11.9: Set allowable densities and parking standards in residential areas at levels that promote the City's overall housing objectives while respecting neighborhood scale and character.	Policy 2.1: Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood character.

Notes: [1] The policies in this Table are not exhaustive and, where necessary, this TIS also addresses potential physical environmental impacts associated with the objectives, implementation measures, and strategies in the Housing Elements.
[2] The Housing Elements contain additional themes beyond what is presented in this Table. However, those themes, which include (but are not limited to) Homelessness, Housing Condition, Seismic Safety, and Displacement, do not have associated policies that could result in potential environmental impacts.

Growth in Certain Areas

As shown in
Table VII, the 2004 Housing Element proposes policies that direct growth to certain areas in the City (see Policies 1.1, 1.2, 1.3, 1.4, 1.6, and 11.6, and Implementation Measures 1.1.1, 1.2.1, 1.3.1, 1.3.2, 1.6.2, 1.6.4, 1.8.1, 2.4.2, 4.1.4, 4.1.6, and 11.6.1) to a greater degree than the 1990 Residence Element. The 1990 Residence Element includes policies that direct growth to industrial and commercial areas (1990 Residence Element policy 1.2) as well as in areas adjacent to Downtown and in neighborhood commercial districts (1990 Residence Element policy 2.2). The 2004 Housing Element policies direct growth to these areas but also include a series of implementation measures to more aggressively encourage new development within those specific areas of the City. The 2004 Housing Element also directs growth along transit corridors (see Policy 11.6 and Implementation Measures 1.1.1, 1.6.4, 1.8.1 and 11.6.1), while the 1990 Residence Element does not contain any policies specifically directing housing near transit (although 1990 Residence Element Policy 12.1, which advocates for housing to be provided with adequate public improvements, services and amenities, could be interpreted as promoting housing near adequate transit infrastructure).

Policies that direct growth to industrial and commercial areas, and areas near the Downtown, promote residential uses in proximity to job cores and services. The Downtown and most commercial areas of the City are also adequately served by transit. Due to the nature of uses within these areas (mix of uses- office, commercial, and/or residential), many of these areas may already experience congested conditions. Increasing the number of residents in these areas could result in additional localized congestion under future 2025 Cumulative Conditions. Under Cumulative 2025 Conditions, four SOMA intersections are anticipated to operate at unacceptable levels, as are several intersections along the Embarcadero, 19th Avenue, and Junipero Serra corridors, and key intersections on Cesar Chavez Street, Market Street, Bayshore Boulevard and Third Avenue. New development in industrial and commercial areas and the Downtown could contribute to future congestion.

However, the proposed 2004 Housing Element does not propose new growth that would not otherwise be projected to occur. Furthermore, individual residential developments within the City would continue to be subject, on a project-by-project basis, to independent environmental review pursuant to CEQA. Those analyses would present the site-specific effects of the proposed development project on the City's transportation network.

Although the 2004 Housing Element contains policies that encourage housing in areas of the City that may experience increased congestion under 2025 Cumulative Conditions, many of the policies could reduce overall vehicle trips and vehicle miles traveled (VMT) by locating residents near job cores and/or commercial areas and encouraging utilization of the existing transit system. Locating residents near places of employment, such as within the Downtown or in commercial areas of the City, would increase the likelihood that those individuals would utilize available public transit, or other alternative modes of transportation (bicycle and walking) to work, decreasing the overall number of vehicle trips or VMTs citywide. It also follows that housing in proximity to neighborhood services (such as along neighborhood commercial districts, mixed-use districts, or commercial areas) could reduce vehicle trips by shifting a portion of those trips to transit, bicycle or pedestrian trips. Proximity to neighborhood services could also result in lower VMT. Given that San Francisco's Downtown and many of its commercial areas are adequately served by transit, increasing residential uses in these areas would promote increased use of alternative transportation, potentially reducing the overall number of 2025 vehicle trips anticipated under Cumulative Conditions.

Further, 2004 Housing Element Policy 1.9 would require certain new developments to provide housing for the demand generated. This policy could reduce the City's overall VMT, which could minimize the burden on the City's roadways and public transit system by encouraging housing near major educational institutions and commercial developments.

The 2004 Housing Element proposes Implementation Measures 1.1.1, 1.2.1, 1.6.2, 1.6.4, 1.8.1 and 11.6.1, which are specifically directed towards locating residential uses near existing transit. These implementation measures could encourage residential development that could ultimately result in increased congestion of some portions of the City's transportation network. On the other hand, by encouraging future development to be built in transit-rich areas, overall VMT could be reduced and the City's roadways could, overall, experience improvements in levels of service, as compared to projected Cumulative Conditions. Trips resulting from potential residential development in these areas would be more likely to utilize the available capacity in local public transportation, bicycle, and pedestrian facilities.

It is recognized that under future 2025 Cumulative Conditions, some transit corridors, including the California corridor in the northwest screenline and the Subway corridor in the southwest screenline, would operate near Muni's capacity utilization standard of 85 percent. 2004 Housing Element policies that promote alternative transportation to job cores or neighborhood services, could encourage a mode shift to transit, increasing the capacity utilization of transit lines near capacity under 2025 Cumulative Conditions. The impacts to the public transit system are considered less than significant if the increase in transit ridership can be absorbed within the existing

available capacity of transit lines at the Maximum Load Point (MLP) locations. It is possible that the 2004 Housing Element policies that encourage a mode shift towards transit could result in an increase in transit ridership, which may exceed Muni's capacity utilization standard of 85 percent. Generally, as transit ridership increases, transportation agencies respond by expanding transit service and/or increasing transit frequency. However, given SFMTA's fiscal emergencies, Muni may not be able to increase transit service to accommodate increased transit ridership resulting from the 2004 Housing Element policies that encourage residential development in transit-rich areas or other policies that encourage the use of alternative transportation in the City. Therefore, the 2004 Housing Element could result in a ***potentially significant*** transit impact. The 2004 Housing Element contains additional policies intended to ensure that new development does not overburden the existing infrastructure, including transit infrastructure. 2004 Housing Element Policy 11.2 and Implementation Measures 11.2.1 and 11.2.2 seek to ensure that new housing is provided with adequate public improvements, services, and amenities.
The 2004 Housing Element also includes policies and implementation measures that advocate for accommodating growth in planning processes similar to the Better Neighborhoods program. One purpose for specific planning processes to accommodate growth is to ensure that increased development is adequately supported by services, including transit services, as discussed in 2004 Housing Element Implementation Measure 1.9.1, *(The City, through a Better Neighborhoods type planning process, will continue to work to improve and enhance housing with the goal of more housing and vital, attractive transit served neighborhoods*). Therefore, policies advocating for specific planning processes would not be expected to adversely affect the transportation network. Any planning process to accommodate growth would be required to undergo a separate environmental review pursuant to CEQA with an analysis of the site-specific effects of any proposed area plan.

Without the policies in the 2004 Housing Element that direct growth to certain areas in the City to a greater degree than the 1990 Residence Element, vehicle trips to the Downtown area (for example) could increase because residential uses would not be located in proximity to jobs in a way that more efficiently promotes walking, bicycling and public transit as a means of travel to work. The 2004 Housing Element encourages residential uses near transit-rich areas and could direct housing growth to areas of the City with a higher percentage of trips occurring by alternative transportation modes. Therefore, the 2004 Housing Element could reduce the overall number of vehicle trips to the Downtown area, as compared to the 1990 Residence Element.

For the reasons discussed above, the 2004 Housing Element is not anticipated to direct housing growth in such a way that would adversely affect traffic operations. The 2004 Housing Element encourages residential development that can take advantage of alternative modes of transportation, including transit, walking, and bicycling. Any such mode shift would be in keeping with the City's Transit First Policy (City Charter Article 8A, Section 8A.115). However, given SFMTA's recent fiscal emergencies, Muni may not be able to accommodate increased ridership that may result from the 2004 Housing Element policies and may potentially exceed Muni's capacity utilization standard of 85 percent. Therefore, impacts to the City's transit system from the 2004 Housing Element policies are considered ***potentially significant***. The proposed 2004 Housing Element policies that could direct future growth to certain areas of the City are not anticipated to affect overall bicycle or pedestrian facilities as the Housing Element policies would direct growth in areas that are already served by these facilities. Furthermore, the proposed *Better Streets Plan* and the adopted *Bicycle Plan* are expected to improved pedestrian and bicycle facilities. The 2004 Housing Element policies related to directing growth are also not anticipated to affect loading or emergency access.

Parking Provision

As shown in
Table VII, the 2004 Housing Element proposes policies include reduced parking provisions (see Policies 4.4 and 11.7 and Implementation Measures 1.6.1, 1.6.2, 1.8.3, 4.4.1, 4.4.2, 11.7.1, and 11.8.1) to a greater degree than the 1990 Residence Element. 2004 Housing Element Policies 4.4 and 11.7 are specifically geared towards reducing (or removing) parking requirements associated with residential development. These policies could constrain local parking conditions because less parking would be provided for some new residential developments. The proposed 2004 Housing Element would not introduce new trips to the City's projected 2025 Cumulative Conditions; however, reduced parking requirements could result in locally constrained parking conditions. In the experience of San Francisco transportation planners, the absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, taxi, bicycles, travel by foot) and a relatively dense pattern of development, induces many drivers to seek and find alternative parking facilities, shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to local public transit, bicycle, and pedestrian facilities, would be in keeping with the City's "Transit First Policy", established in the City's Charter Article 8A, Section 8A.115.

As shown in the analysis of 2025 Cumulative Conditions, the California and Subway transit corridors are anticipated to operate near Muni's transit capacity utilization standard of 85 percent in 2025. Parking policies that encourage a mode shift to transit could adversely affect the public transit system, potentially resulting in a capacity utilization standard that exceeds 85 percent. As discussed previously, SFMTA may not be able to increase transit service to accommodate increased ridership resulting from the 2004 Housing Element. Therefore, the 2004 Housing Element policies that encourage a mode shift towards transit may result in a ***potentially significant*** transit impact. The 2004 Housing Element contains additional policies to ensure that new development does not overburden the existing infrastructure, including transit infrastructure. 2004 Housing Element policy 11.2 and Implementation Measures 11.2.1 and 11.2.2 seek to ensure that the City is provided with adequate public improvements, services, and amenities.

Reduced parking requirements, and any subsequent mode shift to transit or other alternative modes of transportation, would likely increase the efficiency of the overall transportation system on a broader scale. Several studies have shown that reducing the number of parking spaces may be an effective measure at discouraging auto travel, thereby encouraging drivers to use a different transportation mode (transit, bicycle, walking). Studies have shown that parking management policies result in a reduction of vehicle traffic attracted to that area. [6,7,8] This may especially apply to new residential development in the Downtown area that would be placed near the Downtown office core where a large percentage of Bay Area jobs and significant transit infrastructure are located.

The related 2004 Housing Element Implementation Measures 1.8.3 and 4.4.2, while not proposing any action, commits the Planning Department to studying parking requirements for secondary units and for affordable and senior housing projects, respectively. It is acknowledged that senior and

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[6] Willson, Richard and Shoup, Donald, 1990. Parking subsidies and travel choices: Assessing the evidence. Transportation 17:141-157.

[7] Kim, Sungyop and Ulfarsson, Gudmundur, 2008. Curbing automobile use for sustainable transportation: analysis of mode choice on short home-based trips. Transportation 35: 723-737.

[8] McShane, Mary and Meyer, Michael, 1982. Parking policy and urban goals: Linking strategy to needs. Transportation 11: 131-152

affordable housing units generally result in fewer vehicle trips and consequently do not create the same level of demand for parking as market-rate housing. Therefore, a percentage of affordable and senior trips would not affect the overall transportation system, but rather would be absorbed by available public transportation, pedestrian, and/or bicycle capacity. Implementation Measures 11.7.1 and 11.8.1, similar to the 2004 Housing Element Policies described above, would encourage a reduction in parking requirements for those uses that generally have a lower parking demand and are therefore not anticipated to have any effect on the City's transportation network.

2004 Housing Element policies that affect the supply of parking citywide could encourage a mode shift to alternative modes of transportation, including transit. Any such mode shift would be in keeping with the City's Transit First Policy (City Charter Article 8A, Section 8A.115). However, given SFMTA's recent fiscal emergencies, Muni may not be able to accommodate increased ridership that may result from the 2004 Housing Element policies and increased ridership could potentially exceed Muni's capacity utilization standard of 85 percent. Therefore, impacts to the City's transit system resulting from the 2004 Housing Element policies are considered ***potentially significant***. The 2004 Housing Element policies related to reduced parking requirements are not anticipated to affect overall pedestrian and bicycle facilities, nor would they impact loading or emergency access. The following discusses the parking-related impacts of the 2004 Housing Element policies that encourage reduced parking.

The City of San Francisco's existing *Planning Code* Section 150 provides the requirements for off-street parking for residential and commercial development. The *Planning Code* is intended to ensure that off-street parking facilities are provided in amounts that are sufficient and consistent with the objectives and the policies of the San Francisco *General Plan*. San Francisco's *General Plan* intends to provide minimal off-street parking to discourage excessive use of auto transportation and encourage use of public transit as an alternative mode of travel.
Table VII, above, identifies some of the 2004 Housing Element policies that may influence an update of the City's parking requirements.

San Francisco does not consider parking supply as part of the permanent physical environment and therefore, does not consider changes in parking conditions to be environmental impacts as defined by CEQA. The San Francisco Planning Department acknowledges, however, that parking conditions may be of interest to the public and the decision makers. Therefore, this report presents a parking analysis for information purposes.

Parking conditions are not static, as parking supply and demand varies from day to day, from day to night, from month to month, etc. Hence, the availability of parking spaces (or lack thereof) is not a permanent physical condition, but changes over time as people change their modes and patterns of travel.

Parking deficits are considered to be social effects, rather than impacts on the physical environment as defined by CEQA. Under CEQA, a project's social impacts need not be treated as significant impacts on the environment. Environmental documents should, however, address the secondary physical impacts that could be triggered by a social impact (CEQA Guidelines § 15131(a)). The social inconvenience of parking deficits, such as having to hunt for scarce parking spaces, is not an environmental impact, but there may be secondary physical environmental impacts, such as increased traffic congestion at intersections, air quality impacts, safety impacts, or noise impacts caused by congestion. As previously discussed, in the experience of San Francisco transportation planners, the absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, taxis, bicycles or travel by foot) and a relatively dense pattern of urban development, induces many drivers to seek and find alternative parking facilities, shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to transit service in particular, would be in keeping with the City's "Transit First" policy. The City's Transit First Policy, established in the City's Charter Article 8A, Section 8A.115 provides that "parking policies for areas well served by public transit shall be designed to encourage travel by public transportation and alternative transportation."

The transportation analysis accounts for potential secondary effects, such as cars circling and looking for a parking space in areas of limited parking supply, by assuming that all drivers would attempt to find parking at or near the project site and then seek parking farther away if convenient parking is unavailable. Moreover, the secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to others who are aware of constrained parking conditions in a given area. Hence, any secondary environmental impacts which may result from a shortfall in parking in the vicinity of the proposed project would be minor, and the traffic assignments used in the transportation analysis, as well as in the associated air quality, noise and pedestrian safety analyses, reasonably addresses potential secondary effects. In summary, changes in parking conditions are considered to be social impacts rather than impacts on the physical environment. Accordingly, the parking analysis above is presented for informational purposes only.

Residential Density

As shown in
Table VII, the 2004 Housing Element proposes policies that encourage increased residential density within individual development projects or within specified areas of the City (see Policies 1.8, 4.4, 11.6, and 11.9 and Implementation Measures 1.7.1, 4.4.1, 11.7.1, and 11.8.1) to a greater degree than the 1990 Residence Element. As discussed throughout this TIS, the proposed Housing Elements would not result in any additional trips beyond those assumed by ABAG in their growth projections, which are accounted for in the 2025 Cumulative Conditions. Measures that encourage increased density for development projects, or within specified areas of the City, could redistribute some of the anticipated future growth. The effects of directing growth to certain areas of the city were addressed above, and are summarized here. Increased density could result in localized increases in transit ridership and add additional cars onto the local roadways, potentially increasing local demands on the City's roadways and traffic system. The 2004 Housing Element policies are intended to encourage sustainable modes of transportation, including transit, bicycling, and walking. Therefore, the 2004 Housing Element policies are, overall, anticipated to reduce citywide vehicle trips and VMT. Therefore, traffic impacts from the 2004 Housing Element would be less than significant. Under 2025 Cumulative transit conditions, some Muni screenlines are anticipated to approach Muni's capacity utilization standard of 85 percent. The 2004 Housing Element policies that promote a mode shift towards transit could potentially increase transit ridership above Muni's capacity utilization standard, resulting in a potentially significant transit impact. The effects of specific 2004 Housing Element policies relating to increased residential density are discussed below.

The 2004 Housing Element encourages increased density more so than the 1990 Residence Element primarily through density bonuses for affordable or senior housing, reducing parking requirements, and through neighborhood planning processes. 2004 Housing Element Implementation Measure 4.4.1 advocates for density bonuses and reduced parking requirements for affordable and senior housing. Senior and affordable housing units generally result in fewer vehicle trips and consequently do not result in the same level of impact on the City's roadways as market-rate housing. Due to lower vehicle trip rates for senior and affordable housing, an increase in affordable and senior units beyond what would occur under the 1990 Residence Element would not substantially affect the overall transportation system, but would be absorbed by available public transportation, pedestrian, and/or bicycle capacity.

As discussed previously, the 2004 Housing Element includes polices that advocate for reduced parking requirements. Reduced parking requirements allow for a greater amount of buildable area that could be used to accommodate additional housing units, and therefore reduced parking is a housing strategy to increase residential density. The effects of reduced parking on the transportation network were discussed previously. With respect to increasing density from reduced parking requirements, increased density is a strategy that is used to reduce overall VMT. A considerable amount of research has been conducted on the links between residential density and travel behavior; studies have shown that a doubling of residential density could lower auto ownership and VMT by 16%.[9] As discussed previously, any reduction in auto ownership (and vehicle trips) and VMT, would result in overall beneficial impacts to the transportation network.

2004 Housing Element Policy 11.6 advocates for increasing housing near transit through a Better Neighborhoods type planning process to ensure that inappropriately sized developments are regulated, which was not proposed by the 1990 Residence Element Policy 12.5. As discussed previously, locating housing near transit-rich areas would direct housing to areas of the City with a greater potential for trips to occur by alternative transportation modes. Therefore, the 2004 Housing Element policies that advocate for increased density near transit could reduce the overall number of vehicle trips citywide compared to the 1990 Residence Element by potentially encouraging a transportation mode shift towards transit. Therefore, the flexible land use controls identified by 2004 Housing Element Policy 11.6 would not adversely affect traffic operations. As discussed previously, 2004 Housing Element policies that promote a mode shift towards transit, could result in increases in transit ridership that may exceed Muni's capacity utilization standard of 85 percent. Therefore, impacts to transit resulting from the 2004 Housing Element policies are considered ***potentially significant***.

New construction with increased density standards could result in a longer duration of housing construction, which could incrementally increase the associated activities that generate temporary traffic and parking demand. On the other hand, if more of the projected future housing units are accommodated within a given building envelope, the overall number of new residential projects to meet projected future housing may incrementally decrease. Therefore, increased residential density is not anticipated to result in substantial construction-related impacts to the transportation network.

Although not shown in
Table VII, the 2004 Housing Element includes a number of policies pertaining to encouraging certain types of housing (see 2004 Housing Element policy 1.7 and Implementation Measures 1.7.1 and 4.5.1). These policies advocate for flexible development controls within a given building envelope to accommodate a variety of units including smaller units and larger, family-sized units. Family-sized units would not necessarily result in a substantial increase in residential density, as fewer units would be constructed within the given building envelope to accommodate more people per unit. Conversely, a building with smaller units (studio and 1-bedroom units) would be anticipated to

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[9] Holtzclaw, 2004. Oral Presentation: Location Efficiency as the Missing Piece of the Energy Puzzle: How Smart Growth Can Unlock Trillion Dollar Consumer Cost Savings. Presented at the 2004 ACEEE Summer Study on Energy Efficiency in Buildings, Asilomar, California. Available online at: www.nrdc.org.

accommodate more total units within the building envelope, although serve a smaller number of people per unit.

Overall, the policies related to increased residential density would not substantially affect operations of roadway, pedestrian and bicycle facilities, nor would they impact loading, emergency access, or construction areas. Policies that encourage a mode shift towards transit, may result in increased transit ridership above Muni's capacity utilization standard of 85 percent, therefore the 2004 Housing Element's impact on the transit system is considered ***potentially significant***. The 2004 Housing Element policies would have a similar effect on the transportation network as the 1990 Residence Element policies that seek to increase density in areas already well served by modes other than automobiles, including public transportation, pedestrian, and bicycle facilities.

2004 Housing Element Analysis Conclusions

The proposed 2004 Housing Element policies related to directing growth, parking provisions, and increased density, as discussed above, would have a less-than-significant impact on the City's traffic operations, and pedestrian and bicycle facilities, and would have a ***potentially significant*** impact on the City's transit system.

The 2004 Housing Element policies would not adversely affect overall operations of the City's roadway network, above those identified under 2025 Cumulative Conditions. As discussed previously, the proposed 2004 Housing Element would not generate any new trips not anticipated under Cumulative Conditions. Policies related to directing growth to certain areas of the City, reduced parking requirements, and increased density are designed to encourage residential development that can take advantage of alternative modes of transportation, including transit, walking, and bicycling, thereby reducing impacts to the City's roadway network that would otherwise occur under 2025 Cumulative Conditions.

The proposed 2004 Housing Element policies encourage residential development to take advantage of alternative modes of transportation. Under 2025 Cumulative Conditions, the California and Subway transit corridors are anticipated to operate near Muni's transit capacity utilization in 2025. Although the proposed housing element would not add any new trips under 2025 Cumulative Conditions, the 2004 Housing Element contains policies that encourage a mode shift to transit. A substantial mode shift along these two transit corridors could adversely affect the public transit system. Given that the 2004 Housing Element policies could potentially encourage increases in transit ridership above Muni's capacity utilization standard of 85 percent, and that SFMTA's fiscal emergencies may not allow for expanded transit service, the 2004 Housing Element may result in a ***potentially significant*** impact on the City's transit system.

The proposed 2004 Housing Element policies would have a less-than-significant impact on citywide pedestrian facilities. The 2004 Housing Element policies would not adversely affect overall operations of pedestrian facilities as they seek to direct growth in areas already well served by modes other than auto, including pedestrian facilities. Furthermore, the policies are not development-specific and therefore, would not generate net new trips. As a result, the policies of the Housing Elements would not result in substantial overcrowding of sidewalks that could not be accommodated. Additionally, as specific residential development projects are proposed at specific locations throughout the City, project-level environmental review would be required to evaluate a variety of impacts, including those that may affect pedestrian facilities.

The proposed 2004 Housing Element policies would have a less-than-significant impact on citywide bicycle facilities. These policies would not adversely affect overall operations of bicycle facilities as these policies seek to direct growth in areas already well served by alternative transportation modes that include bicycle facilities. Furthermore, the policies are not development-specific and therefore, would not generate net new trips. As a result, the policies of the 2004 Housing Element would not result in any degradation of bicycle facility operations. As specific residential development projects are proposed at specific locations throughout the City, project-level environmental review would be required to evaluate a variety of impacts, including those that may affect bicycle facilities.

The proposed 2004 Housing Element policies would have a less-than-significant impact on citywide curb loading areas. The Housing Element policies would not adversely affect overall loading operations, as the policies seek to direct residential growth into various areas of the City. Furthermore, the policies are not development-specific and therefore, would not generate net new loading demand. Individual development projects would be required to provide adequate loading spaces in compliance with *Planning Code* Section 152, or other applicable *Planning Code* requirements pertaining to loading spaces. As a result, the policies of the 2004 Housing Element would not result in any overcapacity of loading areas that could not be accommodated. Additionally, as specific residential development projects are proposed at specific locations throughout the City, project-level environmental review would be required to evaluate a variety of impacts, including those that may affect local loading conditions.

The proposed Housing Element policies would have a less-than-significant impact on citywide emergency vehicle access, since the policies are not development-specific and therefore, would not add any additional trips citywide. As a result, the 2004 Housing Element policies would not hinder any specific emergency access. As residential development projects are proposed at specific locations throughout the City, project-level environmental review would be required to evaluate a variety of impacts, including those that may affect emergency vehicle access in the proposed development vicinity.

The 2004 Housing Element policies would not cause any construction impacts since the policies are not development-specific. Therefore, the 2004 Housing Element would not generate any vehicle trips related to construction of specific developments that would not have occurred under the 1990 Residence Element. As residential development projects are proposed at specific locations throughout the City, project-level environmental review would be required to evaluate a variety of impacts, including those due to temporary construction activity in the vicinity of the proposed development.

2009 Housing Element Analysis

Table VIII provides a comparison of 2009 Housing Element objectives, policies, and implementation measures and comparable 1990 Residence Element objectives and policies categorized by: 1) policies related to directing growth to specific areas of the City; 2) Policies related to parking; and 3) policies related to residential density.

Table VIII: Comparison of 1990 Residence Element and 2009 Housing Element Objectives, Policies and Implementation Measures That Could Affect the City Transportation Network

Impact	2009 Housing Element	Corresponding 1990 Residence Element Policy
Direct growth to certain areas of the City.	Policy 1.1: Focus housing growth- and the infrastructure necessary to support that growth- according to community plans. Complete planning underway in key opportunity areas such as Treasure Island, Candlestick Park and Hunter's Point Shipyard.	Implementation Measure 1.1.2: Pursuit of housing development opportunities in neighborhood and area plans.
	Policy 1.3: Work proactively to identify and secure opportunity sites for permanently affordable housing.	Policy 1.1: Promote development of permanently affordable housing on surplus, underused and vacant public lands.
	Policy 1.6: Consider greater flexibility in the number and size of units within established building envelopes in community plan areas, especially if it can increase the number of affordable units in multi-family structures.	2.5: Allow flexibility in the number and size of units within permitted volumes of larger multi-unit structures, especially if the flexibility results in creation of a significant number of dwelling units that are permanently affordable to lower income households.
	Policy 1.7: Consider public health objectives when designating and promoting housing development sites.	Policy 12.1: Assure housing is provided with adequate public improvements, services and amenities.
	Policy 1.8: Promote mixed use development, and include housing, particularly permanently affordable housing, in new commercial, institutional or other single use development projects.	Policy 1.3: Create incentives for the inclusion of housing, including permanently affordable housing in commercial developments.
	Policy 4.6: Encourage an equitable distribution of growth according to infrastructure and site capacity.	Policy 12.1: Assure housing is provided with adequate public improvements, services and amenities.
	Policy 10.3: Support state legislation and programs that promote environmentally favorable projects.	
	Policy 12.1: Encourage new housing that relies on transit use and environmentally sustainable patterns of movement.	

Impact	2009 Housing Element	Corresponding 1990 Residence Element Policy
	Policy 12.2: Consider the proximity of quality of life elements, such as open space, child care and neighborhood serves, when development new housing units.	
	Policy 13.1: Support "smart" regional growth that locates new housing close to jobs and transit.	
	Policy 13.3: Promote sustainable land use patterns that integrate housing with transportation via transit, pedestrian, and bicycle modes.	
	Implementation Measure 3: Consistent with the SFMTA's Climate Action Plan, MOH shall work with MTA to identify Muni sites that can serve as potential housing sites.	
	Implementation Measure 4: The Mayor's Office of Housing (MOH) shall continue to actively pursue surplus or underused publicly-owned land for housing potential, working with agencies not subject to the Surplus Property Ordinance such as the San Francisco Public Utilities Commission, SFUSD and the Municipal Transportation Agency to identify site opportunities. City agencies shall continue to survey their properties for affordable housing opportunities or joint use potential.	Implementation Measure 1.1.1: Aggressive pursuit of development opportunities [in] underused public sites. Implementation Measure 1.1.4: In-fill housing on vacant or underused sites.
	Implementation Measure 6: To further smaller scale TOD opportunities, Planning and MTA shall evaluate smaller surplus MTA-owned sites (typically surface parking lots) and identify barriers towards their redevelopment, such as Planning Code issues, neighborhood parking needs and communities sentiment.	
	Implementation Measure 8: Planning, Redevelopment and Mayor's Office of Economic and Workforce Development (MOEWD) should complete long range planning processes already underway: Japantown, Glen Park, the Northeast Embarcadero Study, the Bayview Hunters Point Plan, Candlestick/ Hunters Pont, India Basin shoreline community planning process, Treasure Island, and Hunters Point.	

Impact	2009 Housing Element	Corresponding 1990 Residence Element Policy
	Implementation Measure 14: Planning staff shall prioritize support for projects which are located within a reasonable walking distance of stops along major transit lines, including BART, Muni rail lines and "Muni's 24-hour Rapid Network."	
	Implementation Measure 74: The City shall coordinate with regional entities to complete the necessary planning document for SB 375, including a "Sustainable Community Strategy" which promotes sustainable growth; and corresponding updates to the Housing, Recreation and Open Space, and Land Use Elements of the General Plan.	
	Implementation Measure 80: In development of new community plans, Planning shall include mixed-use design standards for both residential and commercial buildings.	
	Implementation Measure 85: Planning shall ensure community plans for growth are accompanied by capital plans and programs to support both the "hard" and "soft" elements of infrastructure needed by new housing.	Implementation Measure 7.7.1: Acquisition and improvement of open space; facilities and public environmental improvements in six neighborhood strategy areas; street improvements; parking facilities in neighborhoods; transit and street improvements.
	Implementation Measure 90: Planning and SFMTA should coordinate housing development with the ongoing Transit Effectiveness Project.	
	Implementation Measure 94: Regional planning entities such as ABAG shall continue to prioritize regional transportation decisions and funding to "smart" local land use policies that link housing, jobs and other land uses, including focusing on VMT reduction. The City shall encourage formalization of state policy that similarly prioritizes transportation and infrastructure dollars for "smart growth" areas such as San Francisco, rather than geographic allocation.	

Impact	2009 Housing Element	Corresponding 1990 Residence Element Policy
	Implementation Measure 97: On a local level, the City shall prioritize planned growth areas such as Better Neighborhoods, other Area Plans or Redevelopment Areas for regional, state, and federal bond and grants, especially for discretionary funding application processes such as the State's Prop 1C.	
Parking-related policies	Policy 2.3: Prevent the removal or reduction of housing for parking.	No corresponding Policy
	Policy 13.3: Promote sustainable land use patterns that integrate housing with transportation via transit, pedestrian and bicycle modes.	No corresponding Policy
	Implementation Measure 12: Planning shall require integration of new technologies that reduce space required for non-housing functions, such as parking, and shall consider requiring parking lifts to be supplied in all new housing developments parked at 1:1 or above.	No corresponding Implementation Measure
	Implementation Measure 101: OEWD will facilitate employer-supported transit and transportation demand management (TDM) programs, including rideshare matching, transit improvements, bicycle and pedestrian facility improvements, parking management and restriction of free parking, and continue to require that employers offer commuter benefits per Section 421 of the Environment Code to encourage employees to use transit or carpool.	No corresponding Implementation Measure

Impact	2009 Housing Element	Corresponding 1990 Residence Element Policy
Promote increased density-related development standards	Policy 1.4: Ensure changes to land use controls are proposed through neighborhood-supported community planning processes.	Policy 2.1: Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood character. Policy 2.2: Encourage higher residential density in areas adjacent to Downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are permanently affordable to lower income households.
	Policy 1.5: Consider secondary units in community plans where there is neighborhood support and when other neighborhood goals can be achieved, especially if that housing is made permanently affordable to lower-income households.	Policy 1.5: Allow new secondary units in areas where their effects can be dealt with and there is neighborhood support, especially if that housing is made permanently affordable to lower income households.
	Policy 1.6: Consider greater flexibility in number and size of units within established building envelopes in community plan areas, especially if it can increase the number of affordable units in multi-family structures.	Implementation Measure 1.1.3: Inclusion of housing in Downtown (allowing housing to exceed permitted Floor-Area-Ratios [FARs] in C-3-G and C-3-S Districts).
	Policy 7.5: Encourage the production of affordable housing through process and zoning accommodations, and prioritize affordable housing in the review and approval processes.	Policy 7.3: Grant density bonuses for construction of affordable or senior housing.
	Policy 11.4: Maintain allowable densities in established residential areas at levels which promote compatibility with prevailing neighborhood character.	Policy 2.1 Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood scale and character.
	Implementation Measure 12: Planning shall require integration of new technologies that reduce the space required for non-housing functions, such as parking, and shall consider requiring parking lifts to be supplied in all new housing developments seeking approval for parking at a ratio of 1:1 or above.	

Impact	2009 Housing Element	Corresponding 1990 Residence Element Policy
	Implementation Measure 13: When considering legalization of secondary units within community planning processes, Planning shall develop a Design Manual that illustrates how secondary units can be developed to be sensitive to the surrounding neighborhood, to ensure neighborhood character is maintained.	
	Implementation Measure 36: Planning shall continue to implement Planning Code Section 209, which allows a density bonus of twice the number of dwelling units otherwise permitted as a principal use in the district, when the housing is specifically designed for and occupied by senior citizens, physically or mentally disabled persons.	Policy 7.3: Grant density bonuses for construction of affordable or senior housing.
	Strategy for further review: MOH and Planning should continue to consider, within the context of a community planning process, zoning categories which require a higher proportion of affordable housing where increased density or other benefits are granted. Options include Affordable Housing Only Zones (SLI); Affordable Housing Priority Zones (UMU) or Special Use District Opportunities.	
	Implementation Measure 64: Planning staff shall support affordable housing projects in the development review process, including allowing sponsors of permanently affordable housing to take advantage of allowable densities provided their projects are consistent with neighborhood character.	
	Implementation Measure 79. Planning staff shall continue to use community planning processes to develop policies, zoning and standards that are tailored to neighborhood character.	Implementation Measure 2.2.1: Densities compatible with neighborhood character.

Notes: [1] The policies in this Table are not exhaustive and, where necessary, this TIS also addresses potential physical environmental impacts associated with the objectives, implementation measures, and strategies in the Housing Elements.

[2] The Housing Elements contain additional themes beyond what is presented in this Table. However, those themes, which include (but are not limited to) Homelessness, Housing Condition, Seismic Safety, and Displacement, do not have associated policies that would result in potential environmental impacts.

Growth in Certain Areas

As shown in Table VIII, the 2009 Housing Element proposes policies and implementation measures (see Policies 1.1, 1.3, 1.6, 1.7, 1.8, 4.6, 10.3, 12.1, 12.2, 13.1, 13.3; and Implementation Measures 3, 4, 6, 8, 14, 74, 80, 85, 90, 94, and 97) that direct growth to certain areas in the City to a greater degree than the 1990 Residence Element. These policies and implementation measures could result in traffic-related impacts if such measures focus specifically on already congested or underserved areas. On the other hand, many of the 2009 Housing Element policies would reduce overall citywide VMT by locating residents near employment and encouraging utilization of the existing transit system.

Areas of the City that are well served by transit include, but are not limited to, the Downtown, commercial, and neighborhood commercial districts. As shown, under existing and future conditions, many of these areas already experience congested conditions. Increasing the number of residents in these areas could result in additional localized congestion, but not above levels assumed under 2025 Cumulative Conditions. As discussed previously, under Cumulative 2025 Conditions, four SOMA intersections are anticipated to fail, the Embarcadero corridor is anticipated to fail, a number of intersections along 19th Avenue are expected to operate at unacceptable levels, as well as the Junipero Serra corridor, and key intersections on Cesar Chavez Street, Market Street, Bayshore Boulevard and Third Avenue.

On the other hand, by encouraging future development to be built in transit-rich areas, overall VMT could be reduced and the City's roadways could, overall, experience improvements in levels of service, as compared to projected 2025 Cumulative Conditions. Trips resulting from potential residential development in these areas would be more likely to utilize the available capacity in local public transportation, bicycle, and pedestrian facilities. Therefore, encouraging residential development along transit lines or in close proximity to places of employment could reduce the effects of future growth on the roadway network by shifting a portion of future vehicle trips to alternative modes of transportation, resulting in overall beneficial impacts to the City's roadway network.

2009 Housing Element Policies 4.6, 12.1, 13.1, and 13.3 would encourage housing near transit lines and existing transit infrastructure to a greater extent than their corresponding 1990 Residence Element policies. It is recognized that under future 2025 Cumulative Conditions, some transit corridors, including the California corridor in the northwest screenline and the Subway corridor in the southwest screenline, would operate near the Muni's capacity utilization standard of 85 percent. 2009 Housing Element policies that encourage new residential development along transit lines are intended to promote alternative transportation and could encourage a mode shift to transit, increasing the capacity utilization of those lines already near capacity under 2025 Cumulative Conditions. The impacts to the public transit system are considered less than significant if the increase in transit ridership can be absorbed within the existing available capacity of transit lines at the MLP locations. It is possible that the 2009 Housing Element policies that encourage a mode shift towards transit could result in and increase in transit ridership, which may exceed Muni's capacity utilization standard of 85 percent. Generally, as transit ridership increases, transportation agencies respond by expanding transit service and/or increasing transit frequency. However, given SFMTA fiscal emergencies, Muni may not be able to increase transit service to accommodate increased transit ridership resulting from the 2009 Housing Element policies that encourage residential development in transit-rich areas or other policies that encourage the use of alternative transportation in the City. Therefore, the 2009 Housing Element could result in a ***potentially significant*** transit impact. The 2009 Housing Element contains numerous policies to reduce the effects related to encouraging new housing along transit corridors; 2009 Housing Element policies 4.6, 12.1, 13.1 and 13.3 seek to ensure that new housing is provided with adequate public improvements, services, and amenities, and to reduce the reliance of residential development on vehicles. However, these policies may not be able to reduce the impact to a less than significant level, therefore, impacts to the City's transit system would remain ***potentially significant***.

2009 Housing Element Policy 1.8 requires single-use development projects to include housing within the developments, a stipulation not required in 1990 Residence Element Policies 1.7 and 1.3. In San Francisco, the commercial and industrial areas are largely located near or along established transit corridors and/or are in proximity to places of employment and neighborhood services. Introducing additional residential development in these areas could result in impacts related to the overall traffic system by encouraging development in some areas of the city that may already experience congested conditions. However, this policy could reduce the overall VMT, by providing housing in proximity to job cores and services. Combined with available modes of alternative transportation, these mixed-use developments could minimize the burden on the City's roadways by shifting a portion of person trips to alternative modes of transportation, including transit, walking and bicycling. As discussed above, the 2009 Housing Element policies that encourage increased transit ridership may result in ***potentially significant*** impacts on the City's transit system.

2009 Housing Element Policy 1.1 calls for promoting housing within adopted and ongoing community planning processes. Ongoing community planning projects include Japantown, Glen Park, the Northeast Embarcadero Study, and a number of planning projects in the Southeast sector of the City. As discussed in Policy 1.4, "*Community plans are an opportunity for neighborhoods to work with the City to develop a strategic plan for their future, including housing, services and amenities*." Community planning processes are geared towards planning processes that consider transportation when planning for housing and vice versa. The 2009 Housing Element proposes Implementation Measures 14, 85, 90, and 94, which are specifically directed towards coordinating planning for housing with planning for transportation infrastructure and promoting alternative transportation choices for commuters. Similar to 2009 Housing Element Policies 4.6, 12.1, 13.1 and 13.3 above, these implementation measures could encourage residential development that could ultimately result in a larger portion of future trips occurring by transit instead of vehicles. By encouraging future development in transit-rich areas and ensuring adequate transit opportunities are provided during the planning process, overall VMT could be reduced and the City's roadways could, overall, experience improvements in level of service. Trips resulting from potential residential development in these areas would likely use available local public transportation, bicycle, and pedestrian facility capacities to a greater degree than trips not located in proximity to transit, job cores, or commercial areas.

Without the policies in the 2009 Housing Element that direct growth to certain areas in the City to a greater degree than the 1990 Residence Element, vehicle trips to new commercial and institutional projects could increase because residential uses would not be located in proximity to jobs and services in such a way that more efficiently promotes walking, bicycling and public transit as a means to travel to work. The 2009 Housing Element encourages residential uses near major transit lines and could direct housing growth to areas of the City with a higher percentage of trips occurring by alternative transportation modes. Therefore, the 2009 Housing Element could reduce the overall number of vehicle trips compared to the 1990 Residence Element, which does not emphasize residential development in transit-rich areas to the degree that the 2009 Housing Element policies do. Further, the 2009 Housing Element includes additional focus on housing that is accommodated by adequate transit infrastructure, reducing potential adverse impact to the City's transit system.

For the reasons discussed above, the 2009 Housing Element policies related to directing housing growth would not adversely affect traffic operations. The 2009 Housing Element encourages residential development that can take advantage of alternative modes of transportation, including transit, walking and bicycling. Any such mode shift would be in keeping with the City's Transit First Policy. However, given SFMTA's recent fiscal emergencies, Muni may not be able to accommodate increased ridership that may result from the 2009 Housing Element policies and may potentially exceed Muni's capacity utilization standard of 85 percent. Therefore, impacts to the City's transit system from the 2009 Housing Element policies are considered ***potentially significant***. The proposed 2009 Housing Element policies that could direct future growth to certain areas of the City are not anticipated to affect overall bicycle or pedestrian facilities as the Housing Element policies would direct growth in areas that are already served by these facilities. Furthermore, the proposed *Better Streets Plan* and the adopted *Bicycle Plan* are expected to improved pedestrian and bicycle facilities in the City. The 2009 Housing Element policies related to directing growth are also not anticipated to affect loading or emergency access.

Parking Provision

As shown above, the 2009 Housing Element proposes policies that could affect parking conditions (see Policies 2.3 and 13.3 and Implementation Measures 12 and 101) to a greater degree than the 1990 Residence Element. 2009 Housing Element Policy 2.3 discourages the modification of housing in favor of parking, which could incrementally reduce the number of new parking spaces met through the conversion of habitable space. 2009 Housing Element Policy 13.3 aims to reduce the use of the private car, by making alternative modes of transportation more attractive, reducing the need for parking. Because less habitable space is anticipated to be converted to parking, and by making alternative modes of transportation more attractive, these policies promote the use of available local public transportation, bicycle, and pedestrian facility capacity. Impacts to the transit system resulting from a mode shift from vehicles to transit were addressed above. Overall, 2009 Housing Element policies related to parking would likely increase the efficiency of the overall traffic system on a broader scale because the 2009 Housing Element could result in fewer VMT.

As mentioned above, there are also implementation measures in the 2009 Housing Element that would impact parking in the City. 2009 Housing Element Implementation Measure 12 directs the Planning Department to require new technologies, such as parking lifts, enabling an increase in the number of parking spaces provided (if provided at a 1:1 ratio or above). On the other hand, 2009 Housing Element Implementation Measure 101 promotes incentives to reduce VMT, which could include parking management and the restriction of free parking. As previously discussed, studies have shown that limited availability of parking in an area may result in the reduction of vehicle traffic attracted to that area, encouraging a mode shift away from automobile use, and resulting in widespread beneficial impacts to the overall transportation system in the City.

As previously discussed, 2009 Housing Element policies that promote a mode shift away from private vehicles to alternative modes of transportation would result in potentially significant impacts on the public transit system. Although any such mode shift to alternatives modes of transportation, including transit would be in keeping with the City's Transit First Policy, given SFMTA's recent fiscal emergencies, Muni may not be able to accommodate increased ridership that may result from the 2009 Housing Element policies. Therefore, impacts to the City's transit system resulting from the

2009 Housing Element policies are considered ***potentially significant***. The 2009 Housing Element policies related to reduced parking requirements are not anticipated to affect overall pedestrian and bicycle facilities, nor would they impact loading or emergency access. The following discusses the parking-related impacts of the 2009 Housing Element policies that encourage reduced parking.

The City of San Francisco's existing *Planning Code* Section 150 provides the requirements for off-street parking for residential and commercial development. The *Planning Code* is intended to assure that off-street parking facilities are provided in amounts that are sufficient and consistent with the objectives and the policies of the San Francisco *General Plan*. San Francisco's *General Plan* intends to provide minimal off-street parking to discourage excessive use of auto transportation and encourage use of public transit as an alternative mode of travel. Table VIII, above, identifies some of the 2009 Housing Element policies that may influence an update of the City's parking requirements.

As discussed in the analysis of the 2004 Housing Element parking-related policies, San Francisco does not consider parking supply as part of the permanent physical environment and therefore, does not consider changes in parking conditions to be environmental impacts as defined by CEQA. The San Francisco Planning Department acknowledges, however, that parking conditions may be of interest to the public and the decision makers.

Residential Density

Overall, the 1990 Residence Element promotes increased density on a broader, citywide, scale to a greater extent than the 2009 Housing Element. However, there are two areas under which the 2009 Housing Element could promote greater density. These include the following themes: increased density for affordable housing projects; and increased density standards that are development through a community planning process.

The 2009 Housing Element proposes policies that encourage increased density for affordable housing (see Policy 7.5), and increased density in certain planning areas (see Policies 1.5 and 1.6) to a greater degree than the 1990 Residence Element. As discussed throughout this TIS, the proposed Housing Elements would not result in any additional trips beyond those assumed by ABAG in their growth projections, which are accounted for in the 2025 Cumulative Conditions. Measures that encourage increased density for development projects or within specified areas of the City could redistribute some of the anticipated future growth.

The 2009 Housing Element encourages increased density for affordable housing to a similar degree as the 1990 Residence Element primarily through density bonuses for affordable housing. 2009 Housing Element Policy 7.5 advocates for process and zoning accommodations for affordable housing, some of which may include increased density. As discussed previously, affordable housing units generally result in fewer vehicle trips than market-rate housing and consequently do not result in the same level of impact on the City's roadways as market-rate housing. Due to lower vehicle trip rates for affordable housing, a percentage of affordable and senior trips would not affect the overall transportation system, but would be absorbed by available public transportation, pedestrian, and/or bicycle capacity.

2009 Housing Element Policy 1.5 advocates for the consideration of secondary unit in community planning processes. This policy is similar to the 1990 Residence Element Policy 1.5, which also advocates for allowing secondary units, although more generally throughout the City, and not restricted to community planning processes. Similarly, 2009 Housing Element Policy 1.6 could promote increased building envelopes, developed through community planning processes, whereas 1990 Residence Element Policy 12.3 could result in increased building envelopes more generally throughout the City. Overall, the 1990 Residence Element promotes increased density more generally citywide, while the 2009 Housing Element limits increased density as a tool to accommodate new housing growth only through community planning processes. With respect to increasing density as part of community planning processes, a considerable amount of research has been conducted on the links between residential density and travel behavior; studies have shown that a doubling of residential density could lower auto ownership and VMT by 16%.[10] As discussed previously, any reduction in auto ownership (and vehicle trips) and VMT, would result in overall beneficial impacts to the transportation network. However, given that the 2009 Housing Element does not substantially promote increased density more so than the 1990 Residence Element, the 2009 Housing Element's density-related policies are not anticipated to result in a substantial mode shift towards transit and would therefore not be anticipated to affect 2025 transit conditions. Therefore, the 2009 Housing Element's transit-related policies would result in a less than significant impact to the City's transit network under future 2025 conditions.

New construction with increased density standards could result in a longer duration of housing construction, which could incrementally increase the associated activities that generate temporary traffic and parking demand. On the other hand, if more of the projected future housing units are accommodated within a given building envelope, the overall number of new residential projects to meet projected future housing may incrementally decrease. Therefore, increased residential density is not anticipated to result in substantial construction-related impacts to the transportation network.

Although not shown in Table VIII, the 2009 Housing Element includes a number of policies pertaining to encouraging certain types of housing (see 2009 Housing Element policies 1.2 and 2.2). These policies advocate for housing that meets the full range of existing and projected housing needs in the City, and supports the merger of residential units only in instances where the merger would support family housing. Merging of units to accommodate family-sized units would not necessarily result in a substantial increase in residential density, as fewer units would be constructed within the given building envelope to accommodate more people per unit. Conversely, a building with smaller units (studio and 1-bedroom units) would be anticipated to accommodate more units within the building envelope, although serve a smaller number of people per unit.

Overall, the 2009 Housing Element policies related to increased residential density would not substantially affect operations of roadway, transit, pedestrian or bicycle facilities, nor would they impact loading, or emergency access. The 2009 Housing Element policies would have a similar effect on the transportation network as the 1990 Residence Element policies that seek to direct growth in areas already well served by modes other than automobiles, including public transportation, pedestrian, and bicycle facilities.

2009 Housing Element Analysis Conclusions

The proposed 2009 Housing Element policies related to directing growth, parking provisions, and increased density, as discussed above, would have a less-than-significant impact on the City's traffic operations, and pedestrian and bicycle facilities. 2009 Housing Element policies that would direct

[10] Holtzclaw, 2004. Oral Presentation: Location Efficiency as the Missing Piece of the Energy Puzzle: How Smart Growth Can Unlock Trillion Dollar Consumer Cost Savings. Presented at the 2004 ACEEE Summer Study on Energy Efficiency in Buildings, Asilomar, California. Available online at: www.nrdc.org.

growth to certain areas of the City and policies that discourage parking could result in a mode shift towards public transit. Any such mode shift, although in keeping with the City's Transit First Policy, could potentially exceed Muni's capacity utilization standard of 85 percent, resulting in a ***potentially significant*** transit impact.

The 2009 Housing Element policies would not adversely affect overall operations of the City's roadway network, above those identified under 2025 Cumulative Conditions. As discussed previously, the proposed Housing Elements would not generate any new trips not anticipated under Cumulative Conditions. Policies related to directing growth to certain areas of the city, reduced parking requirements, and increased density are designed to encourage residential development that can take advantage of alternative modes of transportation, including transit, walking, and bicycling, thereby reducing impacts to the City's roadway network that would otherwise occur under 2025 Cumulative Conditions.

The proposed 2009 Housing Element policies encourage residential development to take advantage of alternative modes of transportation. Under 2025 Cumulative Conditions, the California and Subway transit corridors are anticipated to operate near Muni's transit capacity utilization in 2025. Although the proposed housing element would not add any new trips under 2025 Cumulative Conditions, the 2009 Housing Element contains policies that encourage a mode shift to transit. A substantial mode shift along these two transit corridors could adversely affect the public transit system. Given that the 2009 Housing Element policies could potentially encourage increases in transit ridership above Muni's capacity utilization standard of 85 percent, and that SFMTA's fiscal emergencies may not allow for expanded transit service, the 2009 Housing Element may result in a ***potentially significant*** impact on the City's transit system.

The proposed 2009 Housing Element policies would have a less-than-significant impact on citywide pedestrian facilities. The 2009 Housing Element policies would not adversely affect overall operations of pedestrian facilities as they seek to direct growth in areas already well served by modes other than auto, including pedestrian facilities. Furthermore, the policies are not development-specific and therefore, would not generate net new trips. As a result, the policies of the 2009 Housing Element would not result in substantial overcrowding of sidewalks that could not be accommodated. Additionally, as specific residential development projects are proposed at specific locations throughout the City, project-level environmental review would be required to evaluate a variety of impacts, including those that may affect pedestrian facilities.

The proposed 2009 Housing Element policies would have a less-than-significant impact on citywide bicycle facilities. The 2009 Housing Element policies would not adversely affect overall operations of bicycle facilities as these policies seek to direct growth in areas already well served by alternative transportation modes that include bicycle facilities. Furthermore, the policies are not development-specific and therefore, would not generate net new trips. As a result, the policies of the 2009 Housing Element would not result in any degradation of bicycle facility operations. Additionally, as specific residential development projects are proposed at specific locations throughout the City, project-level environmental review would be required to evaluate a variety of impacts, including those that may affect bicycle facilities.

The proposed 2009 Housing Element policies would have a less-than-significant impact on citywide curb loading areas. The Housing Element policies would not adversely affect overall loading operations, as the policies seek to direct residential growth into various areas of the City. Furthermore, the policies are not development-specific and therefore, would not generate net new loading demand. Individual development projects would be required to provide adequate loading spaces in compliance with *Planning Code* Section 152, or other applicable *Planning Code* requirements pertaining to loading spaces. As a result, the policies of the 2009 Housing Element would not result in any overcapacity of loading spaces that could not be accommodated. Additionally, as specific residential development projects are proposed at specific locations throughout the City, project-level environmental review would be required to evaluate a variety of impacts, including those that may affect local loading conditions.

The proposed Housing Element policies would have a less-than-significant impact on citywide emergency vehicle access, since the policies are not development-specific and therefore, would not add any additional trips citywide. As a result, the 2009 Housing Element policies would not hinder emergency access. As specific residential development projects are proposed at specific locations throughout the City, project-level environmental review would be required to evaluate a variety of impacts, including those that may affect emergency vehicle access in the proposed development vicinity.

The 2009 Housing Element policies would not cause any construction impacts, since the policies are not development-specific and therefore, would not generate any vehicle trips related to construction of specific developments. As specific residential development projects are proposed at specific locations throughout the City, project-level environmental review would be required to evaluate a variety of impacts, including those due to temporary construction activity in the vicinity of the proposed development.

Project Alternatives

This TIS analyzed three alternatives to the Proposed 2004 and 2009 Housing Elements: Alternatives A, B, and C. The following provides a description of each project alternative as well as their potential to affect the transportation network. Similar to the proposed housing elements, each Alternative will be discussed with respect to policies that: (1) direct growth to particular locations in the City, (2) address parking, and (3) relate to increases in residential density.

As discussed previously, ABAG population estimates project that the City will grow by approximately 39,568 households by 2025, requiring about 41,651 new housing units to accommodate the 2025 growth projections. The 2004 and 2009 Housing Elements and the project alternatives do not propose to develop new housing and would therefore, not generate any new person trips. Therefore, residential growth within the City would occur regardless of the proposed Housing Elements or project alternatives; the policies contained in the housing elements and alternatives would provide direction for how new residential development in the City should occur.

Alternative A (No Project Alternative)

Alternative A consists of the policies and objectives of the 1990 Residence Element coupled with Part I of the proposed 2009 Housing Element, which utilizes an updated RHNA. The No Project Alternative assumes that the City would comply with state housing element law, which mandates the inclusion of an updated Data and Needs Analysis (Part I of the 2009 Housing Element) in the City's *General Plan*. Thus, the No Project Alternative would use the objectives and policies contained in the 1990 Residence Element coupled with the most recently identified RHNA allocation and an updated Data and Needs Analysis. The 1990 Residence Element policies listed in Tables VII and VIII related to directing growth to specific areas of the City and residential density would continue to guide new residential development in the City. The 1990 Residence Element does not include any policies that call for reduced parking to accommodate new housing; new housing within the City is primarily guided by policies that direct growth to certain areas of the City and policies that encourage increased residential density.

Growth in Certain Areas

The 1990 Residence Element contains policy 2.2, which encourages higher residential density in areas adjacent to Downtown, in underutilized commercial and industrial areas, and in neighborhood commercial districts, although to a lesser degree than the 2004 and 2009 Housing Element policies. It is therefore anticipated that under the No Project alternative, less future growth would occur in proximity to job cores, services and/or along transit lines. As discussed in the analysis of the 2004 and 2009 Housing Elements, policies that promote development close to jobs and services and/or along transit lines are intended to reduce citywide vehicle trips and promote alternative modes of transportation, including transit, bicycling and walking. Without these policies, it is more likely that the 37 intersections anticipated to operate at unacceptable levels of service under future 2025 Cumulative Conditions would continue to operate unacceptably.

Under the No Project alternative, no impacts are anticipated to occur to the City's transit system. The No Project alternative would not encourage a mode shift to alternative transportation options as strongly as either the 2004 or 2009 Housing Element policies; therefore no changes are anticipated to the transit system under 2025 Cumulative Conditions.

Parking Provision

The No Project Alternative does not contain any policies intended to reduce parking requirements or reduce the need for parking. As discussed in this TIS, a reduced parking requirement is a strategy to shift modes of transportation to transit, bicycling or walking. It is therefore anticipated that maintaining the current parking provisions would increase the number of vehicle trips citywide, above those levels anticipated under the 2004 and 2009 Housing Elements, but not in excess of those anticipated under future 2025 Cumulative Conditions. Therefore, it is more likely that the 37 intersections anticipated to operate at unacceptable levels of service under future 2025 Cumulative Conditions would continue to operate unacceptably. No changes are anticipated to the transit system under 2025 Cumulative Conditions because the No Project Alternative does not include reduced parking provisions.

Residential Density

The No Project Alternative includes policies directed at increasing residential density. However, the 2004 Housing Element contains more policies aimed at increasing residential density to a greater degree than the No Project Alternative. As compared with the 2009 Housing Element, the No Project Alternative promotes increased density on a broader, citywide scale. The 2009 Housing Element does contain policies that would increase residential density, although through more limited means (for affordable housing and through community planning processes). As discussed in this TIS, increased residential density is correlated with reduced auto ownership and reduced VMT, resulting in overall beneficial impacts to the City transportation network. Therefore, the 2004 Housing Element would result in more beneficial impacts to the City transportation network than the No Project Alternative, and similar impacts to the transportation network as the 2009 Housing Element policies. The No Project Alternative policies that would increase residential density, could also promote the use of alternative transportation, shifting a portion of trips to transit. However, the No Project Alternative would not be anticipated to affect future 2025 Cumulative transit conditions.

Conclusion

As discussed above, the No Project Alternative can be expected to result in an overall increase in citywide vehicle trips as compared to the 2004 and 2009 Housing Elements because the No Project Alternative does not promote the use of alternative transportation to the degree that the 2004 and 2009 Housing Elements do. However, the effects of future development on the roadway network would not be expected to exceed 2025 Cumulative Conditions that are expected to occur if the policies of the Housing Element are not updated. Furthermore, the No Project Alternative does not propose any new residential development, and would therefore, not generate any new person trips.

Additionally, the No Project Alternative is not anticipated to affect future 2025 Cumulative transit conditions and would therefore, have no affect on the City transit system. The No Project Alternative would have no impact on citywide pedestrian or bicycle facilities, loading areas, emergency vehicle access, or impacts from construction for the same reasons as the 2004 and 2009 Housing Element.

Alternative B (Modified 2004 Housing Element Alternative)

This alternative includes the objectives, policies and implementation measures of the 2004 Housing Element minus those policies that were stricken by the court in the appeal of the

2004 Housing Element at the time of this TIS (See San Franciscans for Livable Neighborhoods v. City and County of San Francisco [June 22, 2007]). Pursuant to the Court of Appeals direction, 16 modifications or entire deletions were made to the 2004 Housing Element Objectives, Policies and associated Implementation Measures. Table IX has been modified to reflect those changes. (Deletions and modifications are shown in strikethrough.)

Table IX: Comparison of 1990 Residence Element and Alternative B Objectives, Policies and Implementation Measures That Could Affect the City Transportation Network

Impact	Alternative B	Corresponding 1990 Residence Element
Policies Related to Directing Growth to Specific City Areas	Policy 1.1: Encourage higher residential density in areas adjacent to Downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are affordable to lower income households. ~~Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood scale and character where there is neighborhood support.~~	Policy 2.1: Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood character.
		Policy 2.2: Encourage higher residential density in areas adjacent to Downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are affordable to lower income households.
	~~Policy 1.2: Encourage housing development, particularly affordable housing, in neighborhood commercial areas without displacing existing jobs, particularly blue-collar jobs or discouraging new employment opportunities.~~	No corresponding Policy
	~~Implementation Measure 1.1.1: A Citywide action plan (CAP) should provide a comprehensive framework for the allocation of higher density, mixed-use residential development in transit-rich areas with stable urban amenities in place. In these areas, specific CAP strategies should include: higher densities and reduced parking requirements in Downtown areas or through a Better Neighborhoods type planning process; pedestrian-oriented improvements to enhance the attractiveness and use of transit.~~	No corresponding Implementation Measure

	~~Implementation Measure 1.2.1: The Planning Department will develop proposals in neighborhood commercial districts (NCDs) well served by transit to strengthen their functions as a traditional "town center" for the surrounding residential districts.~~	No corresponding Implementation Measure
	Policy 1.3: Identify opportunities for housing and mixed-use districts near Downtown and former industrial portions of the City.	Policy 1.2 Facilitate the conversion of underused industrial and commercial areas to residential use, giving preference to permanently affordable housing uses.
	Implementation Measure 1.3.1: ~~Downtown areas and areas subject to a Better Neighborhoods type planning process will be expected to absorb major office and residential developments over the next decade. Planning and zoning code changes should include floor-to-area ratio exemptions~~. These development bonuses would be conferred only in cases where in return the development will provide major public benefits to the community.	No corresponding Implementation Measure
	Implementation Measure 1.3.2: The Planning Department will introduce zoning changes in the traditionally industrial eastern parts of the City. The areas under study are: Mission, South of Market, Showplace Square/Potrero Hill, Bayview Hunter's Point, and Visitacion Valley. Housing, especially affordable housing, will be encouraged in former industrial areas where residential neighborhoods are established and urban amenities are in place or feasible.	No corresponding Implementation Measure, although Map 1 of the 1990 Residence Element depicts Housing Opportunity Areas, which generally cover the same areas mentioned in Alternative B Implementation Measure 1.3.2.
	Implementation Measure 1.6.1: The Planning Department will review the following incentives for commercial project developments in the Downtown C-3 District: Floor-to-area ratio (FAR) exemption for housing; ~~no residential parking requirement, and no density requirements for residential projects.~~ Housing in excess of the base FAR in the Downtown General (C-3-G) and Downtown Support (C-3-S) Districts has also been proposed by the Board of Supervisors.	No corresponding Implementation Measure

	Implementation Measure 1.6.2: ~~The Planning Department and the Redevelopment Agency will propose increasing height limits, eliminating density requirements and modifying off-street parking requirements in the Transbay/Rincon Hill Redevelopment survey areas. The Mid-Market redevelopment survey area will be re-zoned to include mixed-use residential areas and reduced residential parking requirements.~~	No corresponding Implementation Measure
	Implementation Measure 1.6.4: The planning Department will update the Land Use Element to define areas for mixed-used development focused along transit corridors that are determined to be served by sufficient and reliable transit.	No corresponding Implementation Measure
	Policy 1.8: Allow new secondary units in areas where their effects can be dealt with and there is neighborhood support, especially if that housing is made permanently affordable to lower-income households.	Policy 1.5: Allow new secondary units in areas where their effects can be dealt with and there is neighborhood support, especially if that housing is made permanently affordable to lower-income households.
	Implementation Measure 1.8.1: The Board of Supervisors has introduced Planning Code amendments to allow secondary units in new buildings that are in close proximity to neighborhood commercial districts and public transit.	No corresponding Implementation Measure
	Policy 1.9: Require new commercial developments and higher educational institutions to meet the housing demand they generate, particularly the need for affordable housing for lower income workers.	Policy 1.7: Obtain assistance from office developments and higher educational institutions in meeting the housing demand they generate, particularly the need for affordable housing for lower income workers and students.
	Implementation Measure 1.9.2: Institutions are required to have an Institutional Master Plan that conforms to the General Plan. The Planning Department will evaluate higher educational institution's student housing programs through the required Institutional Master Plan.	No corresponding Implementation Measure

	Implementation Measure 2.4.2: As part of the Planning Department's current citywide action plan, planning efforts in the eastern neighborhoods of the City, where housing exists in commercial and industrially zoned districts, should address housing retention as new policies and zoning are established. Mixed use should be encouraged where appropriate.	No corresponding Implementation Measure
	Implementation Measure 8.6.1: The City will continue to encourage and support the development of specialized housing types that meet the particular needs of various user groups. This housing will be especially encouraged in transit rich areas of the City, maximizing mobility and accessibility to services.	No corresponding Implementation Measure
	Implementation Measure 11.1.1: ~~The new Land Use Element will identify in-fill sites appropriate for mixed-use residential projects. Appropriate neighborhood serving retail, public facilities and supportive amenities should be encouraged.~~	No corresponding Implementation Measure
	Implementation Measure 11.4.2: The City will work to require institutions to provide housing for workers and students.	No corresponding Implementation Measure
	Policy 11.6: ~~Employ flexible land use controls in residential areas that can regulate inappropriately sized development in new neighborhoods, in Downtown areas and in other areas through a Better Neighborhoods type planning process while maximizing the opportunity for housing near transit.~~	Policy 12.5: Relate land use controls to the appropriate scale for new and existing residential areas.
	Implementation Measure 11.6.1: ~~The City will continue to promote increased residential densities in areas well served by transit and neighborhood compatible development with the support and input from local neighborhoods.~~	No corresponding Implementation Measure
	Implementation Measure 11.9.1: ~~The City, through a Better Neighborhoods type planning process, will continue to work to improve and enhance housing with the goal of more housing and vital, attractive transit served neighborhoods.~~	No corresponding Implementation Measure

	Implementation Measure 11.9.3: ~~The new Land Use Element will, within the framework of a comprehensive citywide action plan (CAP), identify areas where higher densities are appropriate.~~	No corresponding Implementation Measure
Parking-related policies	Policy 4.4: Consider granting density bonuses and parking requirement exemptions for the construction of affordable housing or senior housing.	No corresponding Policy
	Policy 11.7: ~~Where there is neighborhood support, reduce or remove minimum parking requirements for housing, increasing the amount of lot area available for housing units.~~	No corresponding Policy
	Implementation Measure 1.1.1: ~~A citywide action plan (CAP) should provide a comprehensive framework for the allocation of higher density, mixed-user residential development in transit rich areas with stable urban amenities in place. In these areas, specific CAP strategies should include: higher densities and reduced parking requirements in Downtown areas or through a Better Neighborhoods type planning process; pedestrian oriented improvements to enhance the attractiveness and use of transit.~~	No corresponding Implementation Measure
	Implementation Measure 1.6.1: The Planning Department will review the following incentives for commercial project developments in the Downtown C-3 District; Floor-to-area ratio (FAR) exemption for housing; ~~no residential parking requirements, and no density requirement for residential projects~~. Housing in excess of the base FAR in the Downtown General (C-3-G) and Downtown Support (C-3-S) Districts has also been proposed by the Board of Supervisors.	No corresponding Implementation Measure
	Implementation Measure 1.6.2: ~~The Planning Department and the Redevelopment Agency will propose modifying off-street parking requirements in the Transbay/Rincon Hill Redevelopment survey areas. The Mid-Market redevelopment survey areas will be re-zoned to include mixed-use residential areas and reduced residential parking requirements.~~	No corresponding Implementation Measure

	Implementation Measure 1.8.3: The Planning Department will study the impacts of relaxing parking requirements for secondary units located in all neighborhoods.	No corresponding Implementation Measure
	Implementation Measure 4.4.1: Until the Planning Department establishes uniform requirements for affordable and senior housing development, affordable and senior housing projects will continue to be granted reduced parking requirements on a case-by-case basis.	No corresponding Implementation Measure
	Implementation Measure 4.4.2: The Planning Department will investigate appropriate parking requirements for all affordable or senior housing projects.	No corresponding Implementation Measure
	Implementation Measure 11.7.1: ~~The Planning Department will work to reduce parking requirements in older neighborhoods and in other areas through a Better Neighborhoods type planning process with the support and input from local neighborhoods.~~	No corresponding Implementation Measure
	Implementation Measure 11.8.1: ~~The Planning Department, with the support and input from local neighborhoods, will study the impacts of reduced parking and private open space provisions and will consider revising the Planning Code accordingly.~~	No corresponding Implementation Measure
Policies Related to Encouraging Residential Density	Objective 4: Support affordable housing production by increasing site availability and capacity.	Objective 7: To increase land and improve building resources for permanently affordable housing.
	Policy 4.4: Consider granting density bonuses and parking requirement exemptions for the construction of affordable housing or senior housing.	Policy 7.3: Grant density bonuses for the construction of affordable or senior housing.
	Policy 11.6: ~~Employ flexible land use controls in residential areas that can regulate inappropriately sized development in new neighborhoods, in Downtown areas and in other areas through a Better Neighborhoods type planning process while maximizing the opportunity for housing near transit.~~	Policy 12.5: Relate land use controls to the appropriate scale for new and existing residential areas.
	Policy 11.9: ~~Set allowable densities and parking standards in residential areas at levels that promote the City's overall housing objectives while respecting neighborhood scale and character.~~	Policy 2.1: Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood character.

	Implementation Measure 1.7.1: ~~In response to the increasing number of families in San Francisco, the Planning Department will develop zoning amendments to require a minimum percentage of larger family units ranging from two to four bedrooms, in new major residential projects. The Planning Department will also propose eliminating density requirements within the permitted building envelopes in Downtown areas and areas subject to a Better Neighborhoods type planning process to maximize family units constructed.~~	No corresponding Implementation Measure
	Policy 1.8: Allow new secondary units in areas where their effects can be dealt with and there is neighborhood support, especially if that housing is made permanently affordable to lower income households.	Policy 1.5: Allow new secondary units in areas where their effects can be dealt with and there is neighborhood support, especially if that housing is made permanently affordable to lower income households.
	Implementation Measure 4.4.1: The Planning Department will look at establishing uniform density bonus standards and equal requirements for affordable and senior housing development. Until then, affordable and senior housing projects will continue to be granted density bonuses and reduced parking requirements on a case-by-case basis.	No corresponding Implementation Measure
	Implementation Measure 11.7.1: ~~The Planning Department will work to reduce parking requirements in older neighborhoods and in other areas through a Better Neighborhoods type planning process with the support and input from local neighborhoods.~~	No corresponding Implementation Measure
	Implementation Measure 11.8.1: ~~The Planning Department, with the support and input from local neighborhoods, will study the impacts of reduced parking and private open space provisions and will consider revising the Planning Code accordingly.~~	No corresponding Implementation Measure

Notes: [1] The policies in this Table are not exhaustive and, where necessary, this TIS also addresses potential physical environmental impacts associated with the objectives, implementation measures, and strategies in the Housing Elements and project Alternatives.
[2] The Housing Elements and Alternatives contain additional themes beyond what is presented in this Table. However, those themes, which include (but are not limited to) Homelessness, Housing Condition, Seismic Safety, and Displacement, do not have associated policies that could result in potential environmental impacts.

Growth in Certain Areas

Similar to the 2004 Housing Element, Alternative B includes additional policies that would direct growth to certain areas of the City, although to a lesser degree than the 2004 Housing Element. Implementation Measures 1.3.2, 1.6.1, 2.6.4, 1.8.1, 1.9.2, 2.4.2, 8.6.1, and 11.4.2 would all result in directing growth to certain areas of the City. Policies that were removed from the 2004 Housing Element in development of Alternative B pertain to directing new development to transit-rich areas of the city, neighborhood commercial districts, Downtown and mixed-use areas. Therefore, Alternative B does not as aggressively promote housing growth in proximity to job cores, commercial areas, and areas served by transit. It is therefore anticipated that under Alternative B, less future growth would occur in proximity to job cores, services and/or along transit lines as compared to the 2004 Housing Element. The 2009 Housing Element contains policies that would direct growth to community planning areas and areas near transit (2009 Housing Element Policies 1.6, 1.7, 4.6, 12.1, 12.2, 13.1 and Implementation Measures 6, and 14). As discussed in the analysis of the 2004 and 2009 Housing Elements, policies that promote development close to jobs and services and/or along transit lines are intended to reduce citywide vehicle trips and promote alternative modes of transportation, including transit, bicycling and walking. Without these policies, it is more likely that the 37 intersections anticipated to operate at unacceptable levels of service under future 2025 Cumulative Conditions would continue to operate unacceptably.

Alternative B would not promote residential growth in proximity to job cores, commercial areas, and along transit lines as aggressively as the 2004 and 2009 Housing Elements. Alternative B could result in some portion of future trips shifting to transit, although not as many trips as the 2004 and 2009 Housing Elements might. The analysis of the 2004 and 2009 Housing Elements found that impacts to transit would be potentially significant under Cumulative Conditions. Policies that were not deleted under Alternative B include policies that advocate for zoning changes in many areas of the City that have undergone area planning processes, measures that call for rezoning of the City's industrial and commercial districts to provide mixed use neighborhoods, and encouraging housing along transit for specialized housing types. Therefore, it is possible that encouraging housing in mixed use districts and in industrial and commercial districts where either housing is located in proximity to jobs, services and/or transit could potentially shift some trips to transit. Given that Alternative B could potentially encourage increases in transit ridership, potentially above Muni's capacity utilization standard of 85 percent, and that SFMTA's fiscal emergencies may not allow for expanded transit service, Alternative B may result in a ***potentially significant*** impact on the City's transit system.

Parking Provision

Alternative B does not contain any policies that would modify parking impacts. Therefore, Alternative B would have similar impacts as the No Project Alternative with respect to parking provisions. Alternative B retains two parking policies that commit the City to study the effects of parking requirements for secondary units and affordable housing. Therefore, Alternative B does not contain any policies that could result in reduced parking requirements. As discussed in this TIS, a reduced parking requirement is a strategy to shift modes of transportation to transit, bicycling or walking. It is therefore, anticipated that maintaining the current parking provisions would increase the number of vehicle trips citywide, above those anticipated for the 2004 and 2009 Housing Elements, but not in excess of those anticipated under future 2025 Cumulative Conditions. Therefore, it is more likely that the 37 intersections anticipated to operate at unacceptable levels of service under future 2025 Cumulative Conditions would continue to operate unacceptably. No changes are anticipated to the transit system under 2025 Cumulative Conditions because Alternative B does not include reduced parking provisions.

Residential Density

Alternative B is similar to the No Project Alternative in that it does not as aggressively promote increased residential density as the 2004 Housing Element. Alternative B includes Policies 2.2 and 2.3 from the 2004 Housing Element that could increase residential density more generally throughout the City as compared to the 2009 Housing Element policies that generally limit this strategy to affordable housing and through community planning processes. As discussed in this TIS, increased residential density is correlated with reduced auto ownership and reduced VMT, resulting in overall beneficial impacts to the City transportation network. Therefore, the 2004 Housing Element would result in more beneficial impacts to the City transportation network than Alternative B, and similar impacts to the transportation network as the 2009 Housing Element policies. Housing policies under Alternative B that would increase residential density could also promote the use of alternative transportation, shifting a portion of trips to transit. However, under Alternative B, impacts to the City's transit system would be similar to the No Project Alternative and would not be anticipated to affect future 2025 Cumulative transit conditions.

Conclusion

As discussed above, Alternative B can be expected to result in an overall increase in citywide vehicle trips as compared to the 2004 and 2009 Housing Elements because Alternative B does not promote the use of alternative transportation to the degree that the 2004 and 2009 Housing Elements do. However, the effects of future development on the roadway network would not be expected to exceed 2025 Cumulative Conditions. Furthermore, Alternative B does not propose any new residential development, and would therefore, not generate any new person trips.

Alternative B does contain policies that direct growth towards job cores, commercial areas and/or transit more so than the No Project Alternative, but not as aggressively as the 2004 and 2009 Housing Elements. Under 2025 Cumulative Conditions, the California and Subway transit corridors are anticipated to operate near Muni's transit capacity utilization in 2025. Although Alternative B would not add any new trips under 2025 Cumulative Conditions, Alternative B contains policies that encourage a mode shift to transit. A substantial mode shift to transit could adversely affect the public transit system. Given that Alternative B includes policies that could potentially encourage increases in transit ridership above Muni's capacity utilization standard of 85 percent, and that SFMTA's fiscal emergencies may not allow for expanded transit service, Alternative B may result in a ***potentially significant*** impact on the City's transit system.

Alternative C (Additional Housing Concepts)

This alternative includes the 2009 Housing Element objectives and policies and additional concepts that more aggressively encourage attainment of the RHNA. This option explores the following concepts: (1) Allow for limited expansion of allowable building envelopes for those who provide family-size units in onsite affordable housing, (2) Requirement for development to fully build to the allowable building envelope under zoning in locations that are directly on the Rapid transit network lines identified in the Transit Effectiveness Project (TEP), (3) Height and/or density bonus for development that exceeds affordable housing requirements in locations that are directly on the Rapid transit network lines identified in the TEP, (4) Height and/or density bonus for 100% affordable housing in all zones except in RH-1 and RH-2 zones, and (5) Granting of administrative variances (i.e. over-the-counter) for parking spaces required for additional units if the development is: a. in an RH-2 zoning district (or greater), b. in an area where additional curb cuts would further exacerbate parking, such as in Residential Parking Program areas, or c. on a Transit Preferential Street. None of these concepts were included in the 1990 Residence Element.

Table X below categorizes these concepts by their potential to: (1) direct growth to particular locations within the city, (2) affect parking, and (3) increase residential density.

Table X: Alternative C Concepts

Housing Concept	Direct Growth	Affect Parking	Increase Residentia l Density
1. Allow for limited expansion of allowable building envelopes for those who provide family-size units in onsite affordable housing.			X
2. Requirement for development to fully build to the allowable building envelope under zoning in locations that are directly on the Rapid transit network lines identified in the TEP.	X		X
3. Height and/or density bonus for development that exceeds affordable housing requirements in locations that are directly on the Rapid transit network lines identified in the TEP.	X		X
4. Height and/or density bonus for 100% affordable housing in all zones except in RH-1 and RH-2 zones.	X		X
5. Granting of administrative variances (i.e. over-the-counter) for parking spaces required for additional units if the development is: a. in an RH-2 zoning district (or greater), b. in an area where additional curb cuts would further exacerbate on-street parking supply, such as in Residential Parking Program areas, or c. on a Transit Preferential Street.	X	X	X

Notes: [1] It is acknowledged that increasing density could affect local parking conditions, however, policies that specifically encourage increased density, yet maintain existing parking requirements, were not determined to have an effect on parking because off-street parking would continue to be supplied as determined by *Planning Code* requirements.

Growth in Certain Areas

Alternative C analyzes additional housing element concepts designed to further encourage attainment of the City's housing needs. With respect to directing growth, Alternative C concepts more aggressively encourage increased residential development along transit lines and generally throughout the City. Similar to the 2004 and 2009 Housing Element, Alternative C includes additional policies that would direct growth to certain areas of the City to a greater degree than the 1990 Residence Element. While Alternative C concepts 2 and 3 specifically direct growth along transit lines, concepts 4 and 5 direct growth more generally throughout the City. Concepts 2 and 3 could result in an overall mode shift towards transit for those developments located along transit lines. It is therefore anticipated that under Alternative C, a greater amount of future residential growth would be located along transit, potentially reducing citywide vehicle trips. Without these policies, it is more likely that the 37 intersections anticipated to operate at unacceptable levels of service under future 2025 Cumulative Conditions would continue to operate unacceptably.

Alternative C would promote residential growth in proximity to transit lines more so than the 2004 and 2009 Housing Element and the No Project Alternative. The analysis of the 2004 and 2009 Housing Element found that impacts to transit would be potentially significant because the 2004 and 2009 Housing Elements include policies that could result in a mode shift towards transit. Under 2025 Cumulative Conditions the California and Subway transit corridors are anticipated to operate near Muni's capacity utilization standard of 85 percent. The analysis of the 2004 and 2009 Housing Element policies found that increased transit ridership may exceed Muni's capacity utilization standard and that given SFMTA's current fiscal emergencies, SFMTA may not be able to respond with increased transit service, therefore this impact was found to be potentially significant. Given that Alternative C would include policies that could promote housing in proximity to transit more so than the 2004 and 2009 Housing Elements, Alternative C would similarly result in a ***potentially significant*** impact to the City's transit system.

Parking Provision

Similar to the 2004 Housing Element, Alternative C would allow for reduced parking requirements under specified conditions. Compared to the 2009 Housing Element, Alternative C would allow for parking exemptions, while the 2009 Housing Element generally would not. Therefore, Alternative C would fall in between the 2004 and 2009 Housing Element effects related to parking provisions. As discussed in this TIS, a reduced parking requirement is a strategy to shift modes of transportation to transit, bicycling or walking. It is therefore anticipated that Alternative C could result in a greater portion of future residential trips shifting to alternative transportation modes based on reduced parking requirements than the 2009 Housing Element, and to a similar degree as the 2004 Housing Element policies. Any shift in transportation modes from vehicles to transit, bicycling or walking would be consistent with the City's Transit First Policy. However, as discussed above, any shift in transportation modes to transit could result in potentially significant impacts to the City's transit system under 2025 Cumulative Conditions. Therefore, transit impacts resulting from Alternative C could be ***potentially significant***.

Residential Density

Alternative C is intended to encourage greater attainment of new residential units to meet the City's housing needs. Therefore Alternative C, concepts 1-5 are designed to result in increased residential density as compared to the 2004 and 2009 Housing Elements. As discussed in this TIS, increased residential density is correlated with reduced auto ownership and reduced VMT, resulting in overall beneficial impacts to the City transportation network. Therefore, Alternative C would result in greater beneficial impacts to the City roadway network than the 2004 and 2009 Housing Elements. However, as discussed above, any subsequent shift to transit could result in ridership that exceeds Muni's capacity utilization standard under 2025 Cumulative Conditions. Therefore, transit impacts resulting from Alternative C could be ***potentially significant***.

Conclusion

As discussed above, Alternative C can be expected to result in an overall decrease in citywide vehicle trips as compared to the 2004 and 2009 Housing Elements because Alternative C generally encourages greater residential density throughout the City, reduced parking requirements, and increased density along transit lines as compared to the 2004 and 2009 Housing Elements. Therefore, the effects of future development on the roadway network would not be expected to exceed 2025 Cumulative Conditions. Furthermore, the Alternative C does not propose any new residential development, and would therefore, not generate any new person.

Alternative C contains more aggressive policies that could encourage a greater shift towards alternative transportation, including transit. Therefore, similar to the 2004 and 2009 Housing Element, Alternative C could result in increased ridership that may exceed available transit capacity under 2025 Cumulative Conditions, resulting in ***potentially significant*** impacts to the City's transit system. Alternative C would have no impact on citywide pedestrian or bicycle facilities, loading areas, emergency vehicle access, or impacts from construction for the same reasons as the 2004 and 2009 Housing Elements.

7. Transportation Improvement and Mitigation Measures

This Transportation Impact Study concludes that the proposed 2004 and 2009 Housing Elements would not result in significant impacts to traffic, pedestrian, bicycle, loading, or emergency vehicle access, and would not result in construction-related transportation impacts.

However, this report concludes that the proposed 2004 and 2009 Housing Elements could result in ***significant transit impacts***. The proposed Housing Element policies encourage residential development that takes advantage of alternative modes of transportation, including transit. Under 2025 Cumulative Conditions, the California Street and Market Street Subway transit corridors are anticipated to operate near Muni's transit capacity utilization standard of 85 percent. Although the proposed Housing Elements would not add any new trips onto the transportation network under 2025 Cumulative Conditions, the Housing Elements contains policies that encourage a mode shift to transit. A substantial mode shift could result in an increase in transit ridership above Muni's capacity utilization standard, thereby resulting in overcrowding on the public transit system. The SFMTA could reduce potential overcrowding on transit by increasing capacity on Muni, which can be accomplished in two ways.

The first approach would be for the City to implement the transportation plans and programs listed on page 45 in Chapter 4, which would reduce congestion and decrease transit travel times. By decreasing transit travel times, a given bus can complete more runs in a day, which allows the capacity to be increased without acquiring additional buses, i.e. at no additional cost. While many of the transportation management plans are in the process of being implemented, implementation has not been secured for all of the measures. Furthermore, it is not known whether the implementation of all of the measures would provide a sufficient decrease in travel time (and resulting increase in capacity) to carry all of the projected riders.

The second approach would be for the SFMTA to increase capacity by providing more buses. However, this approach would involve increased costs for the SFMTA for which funding has not been identified. Furthermore, SFMTA has recently cut service due to budget shortfalls, and its ability to restore service to previous levels is uncertain. Securing additional funding to provide increased service would require new sources of revenue.

The impact of the Housing Elements on transit capacity can be mitigated through either a reduction in transit travel time, or the provision of additional transit vehicles, or a combination of the two. However, the certainty of either of these mitigation measures has not been established. For these reasons, the impact on transit would remain ***significant and unavoidable***.

Appendix A – Housing Element Objectives and Policies Analyzed in this TIS

Appendix A: Housing Element Objectives and Policies Analyzed in this TIS

Appendix A-1:

2004 Housing Element Objectives and Policies

I. SUMMARY OF OBJECTIVES AND POLICIES

Housing Supply

OBJECTIVE 1

TO PROVIDE NEW HOUSING, ESPECIALLY PERMANENTLY AFFORDABLE HOUSING, IN APPROPRIATE LOCATIONS WHICH MEETS IDENTIFIED HOUSING NEEDS AND TAKES INTO ACCOUNT THE DEMAND FOR AFFORDABLE HOUSING CREATED BY EMPLOYMENT DEMAND.

POLICY 1.1

Encourage higher residential density in areas adjacent to downtown, in underutilized commercial and industrial areas proposed for conversion to housing and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are affordable to lower income households. Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood scale and character where there is neighborhood support.

POLICY 1.2

Encourage housing development, particularly affordable housing, in neighborhood commercial areas without displacing existing jobs, particularly blue-collar jobs or discouraging new employment opportunities.

POLICY 1.3

Identify opportunities for housing and mixed-use districts near downtown and former industrial portions of the City.

POLICY 1.4

Locate in-fill housing on appropriate sites in established residential neighborhoods.

POLICY 1.5

Support development of affordable housing on surplus public lands.

POLICY 1.6

Create incentives for the inclusion of housing, particularly permanently affordable housing, in new commercial development projects.

POLICY 1.7

Encourage and support the construction of quality, new family housing.

POLICY 1.8

Allow new secondary units in areas where their effects can be dealt with and there is neighborhood support, especially if that housing is made permanently affordable to lower income households.

POLICY 1.9

Require new commercial developments and higher educational institutions to meet the housing demand they generate, particularly the need for affordable housing for lower income workers and students.

Housing Retention

OBJECTIVE 2

Retain the existing supply of housing.

POLICY 2.1

Discourage the demolition of sound existing housing.

POLICY 2.2

Control the merger of residential units to retain existing housing.

POLICY 2.3

Restrict the conversion of rental housing to other forms of tenure or occupancy.

POLICY 2.4

Retain sound existing housing in commercial and industrial areas.

POLICY 2.5

Preserve the existing stock of residential hotels.

POLICY 2.6

Consider legalization of existing illegal secondary units where there is neighborhoods support and the units can conform to minimum Code standards of safety and livability and the permanent affordability of the units is assured.

Housing Condition

OBJECTIVE 3

Enhance the physical condition and safety of housing without jeopardizing the use or affordability.

POLICY 3.1

Ensure that existing housing is maintained in a decent, safe, and sanitary condition without increasing rents or displacing low-income households.

POLICY 3.2

Preserve at risk, privately owned assisted housing.

POLICY 3.3

Maintain and improve the condition of the existing supply of public housing.

POLICY 3.4

Monitor the correction of serious continuing code violations to prevent the loss of housing.

POLICY 3.5

Improve the seismic stability of existing housing without reducing the supply of affordable housing.

POLICY 3.6

Preserve landmark and historic residential buildings.

Housing Affordability

Objective 4

Support affordable housing production by increasing site availability and capacity.

POLICY 4.1

Actively identify and pursue opportunity sites for permanently affordable housing.

POLICY 4.2

Include affordable units in larger housing projects.

POLICY 4.3

Encourage the construction of affordable units for single households in residential hotels and "efficiency" units.

POLICY 4.4

Consider granting density bonuses and parking requirement exemptions for the construction of affordable housing or senior housing.

POLICY 4.5

Allow greater flexibility in the number and size of units within established building envelopes, potentially increasing the number of affordable units in multi-family structures.

POLICY 4.6

Support a greater range of housing types and building techniques to promote more economical housing construction and potentially achieve greater affordable housing production.

OBJECTIVE 5

Increase the effectiveness and efficiency of the City's affordable housing production system.

POLICY 5.1

Prioritize affordable housing projects in the planning review and approval processes, and work with the development community to devise methods of streamlining housing projects.

POLICY 5.2

Support efforts of for-profit and non-profit organizations and other community-based groups and expand their capacity to produce and manage permanently affordable housing.

POLICY 5.3

Create greater public awareness about the quality and character of affordable housing projects and generate community-side support for new affordable housing.

POLICY 5.4

Coordinate governmental activities related to affordable housing.

OBJECTIVE 6

Protect the affordability of existing housing.

POLICY 6.1

Protect the affordability of units in existing buildings at risk of losing their subsidies or being converted to market rate housing.

POLICY 6.2

Ensure that housing developed to be affordable is kept affordable.

POLICY 6.3

Safeguard tenants from excessive rent increases.

POLICY 6.4

Achieve permanent affordability through community land trusts and limited equity housing ownership and management.

POLICY 6.5

Monitor and enforce the affordability of units provided as a condition of approval of housing projects.

OBJECTIVE 7

Expand the financial resources available for permanently affordable housing.

POLICY 7.1

Enhance existing revenue sources for permanently affordable housing.

POLICY 7.2

Create new sources of revenue for permanently affordable housing, including dedicated long-term financing for housing programs.

POLICY 7.3

Develop greater investments in and support for affordable housing programs by corporations, churches, unions, foundations, and financial institutions.

Housing Choice

OBJECTIVE 8

Ensure equal access to housing opportunities.

POLICY 8.1

Encourage sufficient and suitable rental housing opportunities and emphasize permanently affordable rental units wherever possible.

POLICY 8.2

Employ uniform definitions of affordability that accurately reflect the demographics and housing needs of San Franciscans.

POLICY 8.3

Ensure affirmative marketing of affordable housing.

POLICY 8.4

Encourage greater economic integration within housing projects and throughout San Francisco.

POLICY 8.5

Prevent housing discrimination.

POLICY 8.6

Increase the availability of units suitable for users with supportive housing needs.

POLICY 8.7

Eliminate discrimination against households with children.

POLICY 8.8

Promote the adaptability and maximum accessibility of residential dwellings for disabled and elderly occupants.

POLICY 8.9

Encourage the provision of new home ownership opportunities through new construction so that increases in owner occupancy do not diminish the supply of rental housing.

POLICY 8.10

Ensure an equitable distribution of quality board and care centers, and adult day care facilities throughout the City.

OBJECTIVE 9

Avoid or mitigate hardships imposed by displacement.

POLICY 9.1

Minimize the hardships of displacement by providing essential relocation services.

POLICY 9.2

Offer displaced households the right of first refusal to occupy replacement housing units that are comparable in size, location, cost and rent control protection.

Homelessness

OBJECTIVE 10

Reduce homelessness and the risk of homelessness in coordination with relevant agencies and service providers.

POLICY 10.1

Focus efforts on the provision of permanent affordable and service-enriched housing to reduce the need for temporary homeless shelters.

POLICY 10.2

Aggressively pursue other strategies to prevent homelessness and the risk of homelessness by addressing it contributory factors.

POLICY 10.3

Improve coordination among emergency assistance efforts, existing shelter programs, and health care outreach services.

POLICY 10.4

Facilitate childcare and educational opportunities for homeless families and children.

Housing Density, Design and Quality of Life

OBJECTIVE 11

In increasing the supply of housing, pursue place making and neighborhood building principles and practices to maintain San Francisco's desirable urban fabric and enhance livability in all neighborhoods.

POLICY 11.1

Use new housing development as a means to enhance neighborhood vitality and diversity.

POLICY 11.2

Ensure housing is provided with adequate public improvements, services, and amenities.

POLICY 11.3

Encourage appropriate neighborhood-serving commercial activities in residential areas, without causing affordable housing displacement.

POLICY 11.4

Avoid or minimize disruption caused by expansion of institutions, large-scale uses and auto-oriented development into residential areas.

POLICY 11.5

Promote the construction of well-designed housing that enhances existing neighborhood character.

POLICY 11.6

Employ flexible land use controls in residential areas that can regulate inappropriately sized development in new neighborhoods, in downtown areas and in other areas through a Better Neighborhoods type planning process while maximizing the opportunity for housing near transit.

POLICY 11.7

Where there is neighborhood support, reduce or remove minimum parking requirements for housing, increasing the amount of lot area available for housing units.

POLICY 11.8

Strongly encourage project sponsors to take full advantage of allowable building densities in their housing developments while remaining consistent with neighborhood character.

POLICY 11.9

Set allowable densities and parking standards in residential areas at levels that promote the City's overall housing objectives while respecting neighborhood scale and character.

POLICY 11.10

Include energy efficient features in new residential development and encourage weatherization in existing housing to reduce overall housing costs and the long-range cost of maintenance.

Regional and State Housing Needs

OBJECTIVE 12

Strengthen citywide affordable housing programs through coordinated regional and state efforts.

POLICY 12.1

Work with localities across the region to establish a better relationship between economic growth and increase housing needs.

POLICY 12.2

Support the production of well-planned housing region-wide that address regional housing needs and improve the overall quality of life in the Bay Area.

POLICY 12.3

Encourage jurisdictions throughout the Bay Area to recognize their share in the responsibility to confront the regional affordable housing crisis.

POLICY 12.4

Foster educational programs across the region that increase public understanding of the need for affordable housing and generate support for quality housing projects.

POLICY 12.5

Support the State of California in developing and implementing state affordable housing plans and programs.

Appendix A-2:

2009 Housing Element Objectives and Policies

I. Summary of 2009 Housing Element Objectives and Policies

ISSUE 1: ADEQUATE SITES

OBJECTIVE 1

IDENTIFY AND MAKE AVAILABLE FOR DEVELOPMENT ADEQUATE SITE TO MEET THE CITY'S HOUSING NEEDS, ESPECIALLY PERMANENTLY AFFORDABLE HOUSING.

POLICY 1.1

Focus housing growth – and the infrastructure necessary to support that growth- according to community plans. Complete planning underway in key opportunity areas such as Treasure Island, Candlestick Park and Hunter's Point Shipyard.

POLICY 1.2

Plan for the full range of housing needs in the City and County of San Francisco, especially affordable housing.

POLICY 1.3

Work proactively to identify and secure opportunity sites for permanently affordable housing.

POLICY 1.4

Ensure changes to land use controls are proposed through neighborhood-supported community planning processes.

POLICY 1.5

Consider secondary units in community plans where there is neighborhood support and when other neighborhood goals can be achieved, especially if that housing is made permanently affordable to lower-income households.

POLICY 1.6

Consider greater flexibility in number and size of units within established building envelopes in community plan areas, especially if it can increase the number of affordable units in multi-family structures.

POLICY 1.7

Consider public health objectives when designating and promoting housing development sites.

POLICY 1.8

Promote mixed use development, and include housing, particularly permanently affordable housing, in new commercial, institutional or other single use development projects

POLICY 1.9

Require new commercial developments and higher educational institutions to meet the housing demand they generate, particularly the need for affordable housing for lower income workers and students.

ISSUE 2: CONSERVE AND IMPROVE EXISTING STOCK

OBJECTIVE 2

RETAIN EXISTING HOUSING UNITS, AND PROMOTE SAFETY AND MAINTENANCE STANDARDS, WITHOUT JEOPARDISING AFFORDABILITY.

POLICY 2.1

Discourage the demolition of sound existing housing, unless the demolition results in a net increase in affordable housing.

POLICY 2.2

Retain existing housing by controlling the merger of residential units, except where a merger clearly creates new family housing.

POLICY 2.3

Prevent the removal or reduction of housing for parking.

POLICY 2.4

Promote improvements and continued maintenance to existing units to ensure long term habitation and safety.

POLICY 2.5

Encourage and support the seismic retrofitting of the existing housing stock.

OBJECTIVE 3

PROTECT THE AFFORDABILITY OF THE EXISTING HOUSING STOCK, ESPECIALLY RENTAL UNITS.

POLICY 3.1

Preserve rental units, especially rent controlled units, to meet the City's affordable housing needs.

POLICY 3.2

Promote voluntary housing acquisition and rehabilitation to protect affordability for exiting occupants.

POLICY 3.3

Maintain balance in affordability of existing housing stock by supporting affordable moderate ownership opportunities.

POLICY 3.4

Preserve "naturally affordable" housing types, such as smaller and older ownership units.

POLICY 3.5

Retain permanently affordable residential hotels and single room occupancy (SRO) units.

ISSUE 3: EQUAL HOUSING OPPORTUNITIES

OBJECTIVE 4

FOSTER A HOUSING STOCK THAT MEEDS THE NEEDS OF ALL RESIDENTS ACROSS LIFECYCLES.

POLICY 4.1

Develop new housing, and encourage the remodeling of existing housing, for families with children.

POLICY 4.2

Provide a range of housing options for residents with special needs for housing support and services.

POLICY 4.3

Create housing for people with disabilities and aging adults by including universal design principles in new and rehabilitated housing units.

POLICY 4.4

Encourage sufficient and suitable rental housing opportunities, emphasizing permanently affordable rental units wherever possible.

POLICY 4.5

Ensure that new permanently affordable housing is located in all of the City's neighborhoods, and encourage integrated neighborhoods, with a diversity of unit types provided at a range of income levels.

POLICY 4.6

Encourage an equitable distribution of growth according to infrastructure and site capacity

POLICY 4.7

Consider environmental justice issues when planning for new housing, especially affordable housing.

OBJECTIVE 5

ENSURE THAT ALL RESIDENTS HAVE EQUAL ACCESS TO AVAILABLE UNITS.

POLICY 5.1

Ensure all residents of San Francisco have equal access to subsidized housing units.

POLICY 5.2

Increase access to housing, particularly for those who might not be aware of their housing choices.

POLICY 5.3

Prevent housing discrimination, particularly against immigrants and households with children.

POLICY 5.4

Provide a range of unit types for all segments of need, and work to move residents between unit types as their needs change.

OBJECTIVE 6

REDUCE HOMELESSNESS AND THE RISK OF HOMELESSNESS

POLICY 6.1

Prioritize permanent housing solutions while pursuing both short- and long-term strategies to eliminate homelessness.

POLICY 6.2

Prioritize the highest incidences of homelessness, as well as those most in need, including families and immigrants.

ISSUE 4: FACILITATE PERMANENTLY AFFORDABLE HOUSING

OBJECTIVE 7

SECURE FUNDING AND RESOURCES FOR PERMANENTLY AFFORDABLE HOUSING, INCLUDING INNOVATIVE PROGRAMS THAT ARE NOT SOLELY RELIANT ON TRADITIONAL MECHANISMS OR CAPITAL.

POLICY 7.1

Expand the financial resources available for permanently affordable housing, especially permanent sources.

POLICY 7.2

Strengthen San Francisco's affordable housing efforts by planning and advocating at regional, state and federal levels.

POLICY 7.3

Recognize the importance of funds for operations, maintenance and services to the success of affordable housing programs.

POLICY 7.4

Facilitate affordable housing development through land subsidy programs, such as land trusts and land dedication.

POLICY 7.5

Encourage the production of affordable housing through process and zoning accommodations, and prioritize affordable housing in the review and approval processes.

POLICY 7.6

Acquire and rehabilitate existing housing to maximize effective use of affordable housing resources.

POLICY 7.7

Support housing for middle income households, especially through programs that do not require a direct public subsidy.

POLICY 7.8

Develop, promote, and improve ownership models which enable households to achieve homeownership within their means, such as down-payment assistance, and limited equity cooperatives.

OBJECTIVE 8

BUILD PUBLIC AND PRIVATE SECTOR CAPACITY TO SUPPORT, FACILITATE, PROVIDE AND MAINTAIN AFFORDABLE HOUSING.

POLICY 8.1

Support the production and management of permanently affordable housing.

POLICY 8.2

Encourage employers located within San Francisco to work together to develop and advocate for housing appropriate for employees.

POLICY 8.3

Generate greater public awareness about the quality and character of affordable housing projects and generate community-wide support for new affordable housing.

OBJECTIVE 9

PRESERVE UNITS SUBSIDIZED BY FEDERAL, STATE OR LOCAL SOURCES.

POLICY 9.1

Protect the affordability of units at risk of losing subsidies or being converted to market rate housing.

POLICY 9.2

Continue prioritization of affordable preservation as the most effective means of providing affordable housing.

POLICY 9.3

Maintain and improve the condition of the existing supply of public housing, through programs such as HOPE SF.

ISSUE 5: REMOVE CONSTRAINTS TO THE CONSTRUCTION AND REHABILITATION OF HOUSING.

OBJECTIVE 10

ENSURE A STREAMLINED, YET THOROUGH, AND TRANSPARENT DECISION-MAKING PROCESS.

POLICY 10.1

Create certainty in the development entitlement process, by providing clear community parameters for development, and consistent application of these regulations.

POLICY 10.2

Use best practices to reduce excessive time or redundancy in local application of CEQA.

POLICY 10.3

Support state legislation and programs that promote environmentally favorable projects.

ISSUE 6: MAINTAIN THE UNIQUE AND DIVERSE CHARACTER OF SAN FRANCISCO'S NEIGHBORHOODS.

OBJECTIVE 11

SUPPORT AND RESPECT THE DIVERSE AND DISTINCT CHARACTER OF SAN FRANCISCO'S NEIGHBORHOODS.

POLICY 11.1

Promote the construction and rehabilitation of well-designed housing that emphasizes beauty, flexibility, and innovative design, and respects existing neighborhood character.

POLICY 11.2

Ensure implementation of accepted design standards in project approvals.

POLICY 11.3

Ensure growth is accommodated without significantly impacting existing residential neighborhood character.

POLICY 11.4

Maintain allowable densities in established residential areas at levels which promote compatibility with prevailing neighborhood character.

POLICY 11.5

Foster a sense of community through architectural design, using features that promote community interaction.

POLICY 11.6

Respect San Francisco's historic fabric, by preserving landmark buildings and ensuring consistency with historic districts.

POLICY 11.7

Consider a neighborhood's character when integrating new uses and minimize disruption caused by expansion of institutions into residential areas.

POLICY 11.8

Foster development that strengthens local culture, sense of place and history.

ISSUE 7: BALANCE HOUSING CONSTRUCTION AND COMMUNITY INFRASTRUCTURE

OBJECTIVE 12

BALANCE HOUSING GROWTH AND ADEQUATE INFRASTRUCTURE THAT SERVES THE CITY'S GROWING POPULATION.

POLICY 12.1

Encourage new housing that relies on transit use and environmentally sustainable patterns of movement.

POLICY 12.2

Consider the proximity of quality of life elements, such as open space, child care, and neighborhood services, when developing new housing units.

POLICY 12.3

Ensure new housing is sustainably supported by the City's public infrastructure systems.

ISSUE 8: PRIORITIZING SUSTAINABLE DEVELOPMENT

OBJECTIVE 13

PRIORITIZE SUSTAINABLE DEVELOPMENT IN PLANNING FOR AND CONSTRUCTING NEW HOUSING.

POLICY 13.1

Support "smart" regional growth that locates new housing close to jobs and transit.

POLICY 13.2

Work with localities across the region to coordinate the production of affordable housing region-wide according to sustainability principles.

POLICY 13.3

Promote sustainable land use patterns that integrate housing with transportation via transit, pedestrian, and bicycle modes.

POLICY 13.4

Promote the highest feasible level of "green" development in both private and municipally-supported housing.

Appendix A-3:

Alternative A (No Project) Objectives and Policies

SUMMARY OF OBJECTIVES AND POLICIES

SUPPLY OF NEW HOUSING

OBJECTIVE 1

TO PROVIDE NEW HOUSING, ESPECIALLY PERMANENTLY AFFORDABLE HOUSING, IN APPROPRIATE LOCATIONS WHICH MEETS IDENTIFIED HOUSING NEEDS AND TAKES INTO ACCOUNT THE DEMAND FOR AFFORDABLE HOUSING CREATED BY EMPLOYMENT GROWTH.

POLICY 1

Promote development of permanently affordable housing on surplus, underused and vacant public lands.

POLICY 2

Facilitate the conversion of underused industrial and commercial areas to residential use, giving preference to permanently affordable housing uses.

POLICY 3

Create incentives for the inclusion of housing, including permanently affordable housing in commercial developments.

POLICY 4

Locate infill housing on appropriate sites in established neighborhoods.

POLICY 5

Allow new secondary units in areas where their effects can be dealt with and there is neighborhood support, especially if that housing is made permanently affordable to lower income households.

POLICY 6

Discourage development of new housing in areas unsuitable for residential occupancy, or on sites containing existing housing worthy of retention.

POLICY 7

Obtain assistance from office developments and higher educational institutions in meeting the housing demand they generate, particularly the need for affordable housing for lower income workers and students.

POLICY 8

Encourage construction of new single room occupancy residential hotels.

HOUSING DENSITY

OBJECTIVE 2

TO INCREASE THE SUPPLY OF HOUSING WITHOUT OVER CROWDING OR ADVERSELY AFFECTING THE PREVAILING CHARACTER OF EXISTING NEIGHBORHOODS.

POLICY 1

Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood scale and character.

POLICY 2

Encourage higher residential density in areas adjacent to downtown, in underutilized commercial and industrial areas proposed for conversion to housing, and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are permanently affordable to lower income households.

POLICY 3

Allow flexibility in the number and size of units within permitted volumes of larger multi unit structures, especially if the flexibility results in creation of a significant number of dwelling units that are permanently affordable to lower income households.

POLICY 4

Adopt specific zoning districts which conform to a generalized residential land use and density plan and the Master Plan.

RETENTION OF EXISTING HOUSING

OBJECTIVE 3

TO RETAIN THE EXISTING SUPPLY OF HOUSING.

POLICY 1

Discourage the demolition of sound existing housing.

POLICY 2

Control the merger of residential units.

POLICY 3

Consider legalization of existing illegal secondary units where there is neighborhood support and the units can conform to minimum Code standards of safety and livability and the permanent affordability of the units is assured.

POLICY 4

Restrict the conversion of rental housing to condominiums or other forms of tenure or occupancy.

POLICY 5

Prohibit the conversion of rental housing to time share, corporate suite or hotel use.

POLICY 6

Restrict the conversion of housing in commercial and industrial areas.

POLICY 7

Preserve the existing stock of residential hotels.

SEISMIC SAFETY

OBJECTIVE 4

TO REDUCE THE RISK OF BODILY HARM AND LOSS OF HOUSING IN AN EARTHQUAKE.

POLICY 1

Build new replacement housing to compensate for the affordable housing rendered uninhabitable by the October, 1989 earthquake.

POLICY 2

Reduce seismic hazards in unreinforced masonry buildings without reducing the supply of affordable housing.

POLICY 3

Improve the seismic stability of existing housing.

HOUSING CONDITION

OBJECTIVE 5

TO MAINTAIN AND IMPROVE THE PHYSICAL CONDITION OF HOUSING WHILE MAINTAINING EXISTING AFFORDABILITY LEVELS.

POLICY 1

Assure that existing housing is maintained in decent, safe sanitary condition at existing affordability levels.

POLICY 2

Promote and support voluntary housing rehabilitation which does not result in the displacement of lower income occupants.

POLICY 3

Assure correction of serious continuing code violations and loss of housing.

POLICY 4

Maintain and improve the existing supply of public housing.

POLICY 5

Preserve landmark and historic residential buildings.

AFFORDABILITY

OBJECTIVE 6

TO IMPROVE THE CITYWIDE AFFORDABLE HOUSING DELIVERY SYSTEM.

POLICY 1

Reorganize and coordinate governmental activity related to affordable housing

POLICY 2

Expand affordable housing capacities of community based non-profit organizations.

POLICY 3

Improve the planning review and approval process and give priority to permanently affordable housing projects.

POLICY 4

Create greater public awareness of the affordable housing problem and support for affordable housing.

OBJECTIVE 7

TO INCREASE LAND AND IMPROVE BUILDING RESOURCES FOR PERMANENTLY AFFORDABLE HOUSING.

POLICY 1

Create more housing opportunity sites for permanently affordable housing.

POLICY 2

Include affordable units in larger housing projects.

POLICY 3

Grant density bonuses for construction of affordable or senior housing.

POLICY 4

Promote more economical housing construction to achieve affordable housing.

POLICY 5

Encourage energy efficiency in new residential development and weatherization in existing housing to reduce overall housing costs.

POLICY 6

Encourage industrialized housing production techniques where such techniques result in compatible quality of design at lower cost.

POLICY 7

Allow construction of unconventional housing types that reduce cost, if quality can be maintained.

OBJECTIVE 8

TO EXPAND FINANCIAL RESOURCES FOR PERMANENTLY AFFORDABLE HOUSING.

POLICY 1

Enhance existing revenue sources for permanently affordable housing.

POLICY 2

Create new sources of revenue for permanently affordable housing

POLICY 3

Provide new mechanisms to assure long-term financing for permanently affordable housing.

POLICY 4

Develop greater investment in and support for affordable housing programs by corporations, churches, unions and financial institutions.

OBJECTIVE 9

TO IMPROVE THE FOCUS OF AFFORDABLE HOUSING PROGRAMS.

POLICY 1

Employ uniform definitions of permanent affordability.

POLICY 2

Make affordable housing permanently affordable.

POLICY 3

Establish affordable housing priorities which emphasize the needs for very low income housing.

OBJECTIVE 10

TO PROTECT THE EXISTING AFFORDABILITY OF HOUSING.

POLICY 1

Preserve affordability of existing affordable units.

POLICY 2

Protect existing buildings at risk of losing their subsidies or being converted to market rate housing.

POLICY 3

Ensure equal access to, protection for, and affirmative marketing of affordable housing.

POLICY 4

Safeguard tenants from excessive rent increases while assuring landlords fair and adequate rents.

OBJECTIVE 11

TO ACHIEVE AFFORDABILITY THROUGH VARIOUS FORMS OF OWNERSHIP .

POLICY 1

Encourage non-profit and limited equity ownership and management of housing.

POLICY 2

Support new affordable ownership programs.

NEIGHBORHOOD ENVIRONMENT

OBJECTIVE 12

TO PROVIDE A QUALITY LIVING ENVIRONMENT.

POLICY 1

Assure housing is provided with adequate public improvements, services and amenities.

POLICY 2

Allow appropriate neighborhood-serving commercial activities in residential areas.

POLICY 3

Minimize disruption caused by expansion of institutions into residential areas.

POLICY 4

Promote construction of well designed housing that conserves existing neighborhood character.

POLICY 5

Relate land use controls to the appropriate scale for new and existing residential areas.

POLICY 6

Modify proposed developments which have substantial adverse environmental impacts or otherwise conflict with the Master Plan.

ACCESSIBILITY

OBJECTIVE 13.

TO PROVIDE MAXIMUM HOUSING CHOICE.

POLICY 1

Prevent housing discrimination based on age, race, religion, sex, sexual preference, marital status, ancestry, national origin, color, disability, health (AIDS/ARC), source or amount of income, citizenship or employment status as a family day care provider.

POLICY 2

Promote adaptability and maximum accessibility of residential dwellings for disabled occupants.

POLICY 3

Increase the availability of units suitable for special user groups with special housing needs including large families, the elderly, and the homeless.

POLICY 4

Eliminate discrimination against households with children.

POLICY 5

Encourage economic integration in housing by ensuring that new permanently affordable housing is located in all of the City's neighborhoods, and by requiring that all new large market rate residential development includes affordable units.

POLICY 6

Provide adequate rental housing opportunities.

POLICY 7

Expand opportunities for home ownership without significantly diminishing the supply of rental housing.

POLICY 8

Amend regulations relating to group housing to ensure a distribution of quality board and care, adult day care facilities and single room occupancies.

DISPLACEMENT

OBJECTIVE 14

TO AVOID OR MITIGATE HARDSHIPS IMPOSED BY DISPLACEMENT.

POLICY 1

Minimize relocation hardship and displacement caused by the public or private demolition or conversion of housing.

POLICY 2

Permit displaced households the right of first refusal to occupy replacement housing units of comparable in size, location, cost and rent control protection.

POLICY 3

Provide relocation services where publicly funded or private actions cause displacement.

HOMELESSNESS

OBJECTIVE 15

TO DEAL WITH THE ROOT CAUSES OF HOMELESSNESS, RECOGNIZING THE SOLUTION IS MORE THAN THE PROVISION OF EMERGENCY SHELTER.

POLICY 1

Shift focus from provision of temporary shelter to provision of permanent affordable housing.

POLICY 2

Develop strategies to deal with root causes of homelessness including lack of financial resources, employment and health services.

POLICY 3

Provide emergency assistance programs including emergency access to food, clothing and shelter, improve coordination of services in existing shelter programs and expand health care outreach services.

POLICY 4

Facilitate childcare and education for children of homeless families.

POLICY 5

Adopt measures that prevent homelessness.

STATE AND REGIONAL COORDINATION

OBJECTIVE 16

TO ADDRESS AFFORDABLE HOUSING NEEDS THROUGH A COORDINATED STATE AND REGIONAL APPROACH.

POLICY 1

Encourage the balancing of regional employment growth with the development and growth of affordable housing in the region.

POLICY 2

Encourage development of housing in the bay area which will meet regional housing needs and contribute to the quality of life in the region.

POLICY 3

Encourage the distribution of affordable housing throughout the Bay Area without diminishing efforts to expand such housing in the City.

POLICY 4

Encourage the State of California to develop and implement an affordable housing plan.

Appendix A-4:

Alternative B (Modified 2004 Housing Element)

PART II

OBJECTIVES, POLICIES, AND IMPLEMENTATION PROGRAMS

INTRODUCTION

This second part of the *Housing Element* sets forth objectives, policies, and implementing programs to address the critical housing needs identified in Part I. In the last decade, San Francisco's population grew while new housing construction failed to keep pace. San Francisco households grew an average 2,400 annually, yet addition to the housing stock averaged just about 1,000 a year. Vacancy rates plummeted and even middle-income householders found themselves paying 50% or more of their income to rents.

The State Department of Housing and Community Development (HCD), with the Association of Bay Area Governments (ABAG), has estimated that San Francisco needs to build over 2,700 new units a year to meet its share of the region's projected housing demand. As recent production fell short of this annual target, 3,200 new units a year must be built between 2001 and 2006 to meet regional housing goals. At least 40% of these new housing construction should be affordable to low and very low income households, and 32% affordable to households of moderate means.

Objectives and policies are general in nature and serve as the framework for decision making and priority-setting. They address specific needs and are followed by related implementation actions. For these implementation actions to succeed, three major prerequisites must be met:

- An adequate supply of land must be identified;
- Regulatory and other impediments must be removed while incentives are identified and provided; and

- Adequate financing must be available for both private and non-profit housing development.

San Francisco is a mature built–up city with very few large open tracts of land to develop. Still, opportunities for new housing do exist. Scattered across the City are vacant or underused lands suitable for in-fill development. As many as 29,000 new housing units could be built on such parcels under current zoning standards. But high land prices add tremendous costs to housing development. A particularly vocal citizenry can delay or even stop new development. And as housing demand rises, so do housing costs.

Despite this, San Francisco continues to be a highly desirable place to live. It is a traditional employment hub and most workers who live in San Francisco can reduce commute distances and use the city's extensive transit network. Schools, services, institutions and cultural opportunities enrich San Francisco's neighborhoods. Residents value the City's unique combination of natural setting, built environment, and cultural diversity. New residents will continue to be attracted to San Francisco's new and established neighborhoods. City policy makers must determine how to comfortably accommodate the present and future population, keeping it diverse with varying incomes, household size, and composition. Policy makers must also preserve values that San Francisco residents cherish. There must be opportunities for families, children, seniors, and people of different cultural backgrounds to contribute to the unique blend that is San Francisco.

Addressing Housing Needs

Current and future residents of limited means are likely to need assistance to continue to live in San Francisco. Many future San Francisco workers will be earning below 80% of the area's median income. Sales clerks and secretaries, as well as technical professionals and bank executives, must be able to live here. The City must also house the additional firefighters, policemen, teachers, and health, recreation and primary care providers needed to support the City's growing population. Even construction workers who will be building the new houses will need housing they can afford.

The high cost of being a San Francisco resident has already become evident in who now lives here. While service workers make up 44% of the City's workforce, only 14% of residents are employed as service workers. Unless housing is available for local service workers and their families, these trends will continue. Upper income (market rate) housing makes up most of the housing produced in the last 10 years and in the last several years has even exceeded projected needs for this market segment. Federal and state subsidies have provided some funds to build housing affordable to very-low and low-income householders, but moderate-income householders have found themselves in a tight squeeze for housing they can afford.

The average San Francisco household size, which has grown steadily smaller following the War, increased in the 1990s as housing costs rose and forced shared rentals among non-relatives. Family households, which now make up less than half of all San Francisco households, are dramatically under-served by new market rate housing that seldom provides more than two-bedroom units. The proportion of children in the City sank from 25% to less than 15% from 1990 to 2000. Steps must be taken to encourage units suitable for families in neighborhoods with schools, libraries, parks and other services. San Francisco will need to aggressively produce affordable housing to avoid becoming a city where only the rich live or a city with few children.

Increasing the City's housing supply and preserving existing neighborhood character are not mutually exclusive goals. The Planning Department's aim is to plan for growth to enhance the best qualities of San Francisco, strengthen the character of existing neighborhoods, and create new ones. Planning efforts must respond to human needs, ensuring that new development contributes to creating a more livable city. In-fill development should be encouraged in established residential neighborhoods where supporting infrastructure and community services already exists. New neighborhoods planned in redevelopment areas such as Mission Bay and the Hunters Point Naval Shipyard will provide housing in a variety of unit sizes, at both market and affordable rates. Neighborhood services, as well as community facilities, will also be provided.

Neighborhood commercial corridors also provide opportunities for additional upper residential stories to be built above ground level retail. These areas are along transit lines and offer greater possibilities for linking housing, employment, and transportation. Reduced residential parking requirements in these transit intensive areas could be an added incentive to build housing above commercial uses. Denser construction, where it is already allowed, can also significantly boost housing counts and add vitality to street life as well. Sites near downtown and along transit corridors show the most promise for such development.

However, much of the new housing built in the last decade was produced on less-expensive industrial land in the City's eastern portion, displacing some needed services and threatening the vitality of the City's diverse economy. Frequently this development was unconnected to the amenities typically expected and provided in established residential areas, amenities that contribute to the viability and livability of thriving residential neighborhoods. Continuing this trend without clear policies and rules that balance the optimizing of land uses while preserving and enhancing neighborhood character could result in the loss of crucial support services, threaten the City's economy, and diminish the overall quality of life

Citywide Action Plan

To meet the challenge of housing production and affordability, the Planning Department will address the housing targets developed by HCD-ABAG through initiatives of a Citywide Action Plan (CAP). The CAP comprehensively explores the challenge of meeting the need for both housing and jobs in ways that capitalize upon and enhance the best qualities of San Francisco as a place. The CAP will direct a mix of housing and neighborhood-serving uses to places with good public transit and urban amenities, new office uses to the City's compact downtown core, and needed industrial uses to core industrial lands in portions of the City's east side, thereby releasing the rest for housing and other uses. A new *Land Use Element* will identify specific sites in these areas for housing.

The CAP promotes housing by increasing densities in areas well served by transit. Specific strategies in these areas include: reducing parking requirements; floor-to-area ratio (FAR) exemptions; removing density caps in certain areas; increasing height limits; utilizing air-rights for housing; and increased density and height limits at key corner lots.

These strategies will be applied throughout the City. Generally, increased housing densities and reduced parking requirements will be proposed in areas well served by transit. In the Central Waterfront area, a mix of uses is being planned to accommodate housing in a largely industrial area. Lands occupied by the former Central Freeway around Market Street and Octavia Boulevard are being programmed for new housing while increasing existing residential densities. In Balboa Park, new housing is planned capitalizing on city owned land and an existing transit node. In the Downtown area, dense housing is planned on underutilized parcels. In the redevelopment areas of Mission Bay and Hunters Point Naval Shipyard, new neighborhoods are planned that promise approximately 7,600 units. However, these density increases must be combined with the capture of some of the added development value through the provision of public benefits.

The Eastern Neighborhoods, representing roughly one-quarter of the City, are being studied and re-zoned to identify core areas where vital production, distribution, and repair (PDR) businesses are needed to maintain economic diversity. These core areas will be zoned to promote business and job expansion while the rest of the Eastern Neighborhoods will allow or expressly encourage housing. In the Mission District and South of Market, residential densities will be increased along transit corridors and additional land will be re-zoned for housing. In Showplace Square, housing will be integrated into a vibrant and historic light industrial area. In Bayview, a town center will be created around the planned rail service allowing greater residential densities. In Visitacion Valley, an existing brownfield site will be developed into housing, open space, and neighborhood serving retail. These rezoning efforts can boost the City's housing capacity by as much as 12,000 additional housing units.

Other strategies to increase housing include the expanded Jobs Housing Linkage Program that requires new large commercial developments to provide housing or pay an in-lieu fee to meet the housing demand new jobs generate. The recently revised and expanded inclusionary affordable housing ordinance now applies to all new residential developments of 10 units or more. Publicly owned lands are also being reviewed to assess residential development potential while revenues from surplus public land sales will be dedicated to future affordable housing production. Institutional Master Plans will be required to encourage higher educational institutions to provide housing. Education programs to foster the acceptance of new housing, particularly affordable housing, are also planned.

Although there are more than enough in-fill housing sites to meet projected housing needs and aggressive housing policies and programs are set to encourage housing development, realizing the City's housing targets would require tremendous financing. It has been estimated that enormous amounts of public funding would be necessary to bridge the gap between the state-mandated housing production targets and what can be realistically be expected in the next five and a half years (Table I-58).

Financing for housing production will continue to be affected by economic cycles. With the availability of future public subsidies impossible to predict, an optimistic assumption would anticipate funding that would sustain the previous decade's affordable housing production. Achieving production and affordability targets are clearly very difficult, but accepting more "realistic" ones will only weaken efforts to obtain the additional resources necessary to meet the City's housing needs. Consequently, the City will uphold these housing production targets and annually assess priorities against the reality of available resources.

The objectives and policies detailed below address the state's, the region's and the City's goals of achieving decent, suitable, and affordable housing for current and future San Franciscans. Increasing the City's housing stock, protecting and conserving existing units, and encouraging housing choice are objectives predicated on affordability. The homeless and households with special needs are given particular attention as these vulnerable populations have limited housing options. Livability will not be sacrificed with the push to expand the City's housing supply. New housing will be directed to appropriate locations, with sufficient supporting infrastructure, institutions and urban amenities. The implementing programs accompanying these objectives and policies are in response to meeting San Francisco's fair share of the regional housing needs. These objectives and policies are instructed by and consistent with two of the *General Plan*'s Priority Policies. These are:

- That the City's supply of affordable housing be preserved and enhanced.

- That existing housing and neighborhood character be conserved and protected in order to preserve the cultural and economic diversity of our neighborhoods.

HOUSING SUPPLY

OBJECTIVE 1
TO PROVIDE NEW HOUSING, ESPECIALLY PERMANENTLY AFFORDABLE HOUSING, IN APPROPRIATE LOCATIONS WHICH MEETS IDENTIFIED HOUSING NEEDS AND TAKES INTO ACCOUNT THE DEMAND FOR AFFORDABLE HOUSING CREATED BY EMPLOYMENT DEMAND.

New housing, particularly permanently affordable housing, is required to help meet the City's housing needs. New housing is needed to accommodate projected population growth, improve the jobs/housing balance so that fewer new San Francisco workers will have to live outside the city and commute to work, relieve rent pressures, meet the needs of specific population groups not adequately housed in the existing stock, and reduce homelessness.

~~New residential development must be of a character and stability that enhances the City's neighborhoods and maintains the quality of life for existing and future residents. How this new residential development can be accommodated without jeopardizing the very assets that make living in San Francisco desirable must be discussed. In order to enhance the city's livability, the supply of housing must be increased and new housing developments should respect the scale and character of the surrounding neighborhood.~~ The lot pattern and building bulk should relate to surrounding properties. Transit and other public and private services should be available to serve the new residents. High quality design should ensure that new residential development is compatible with, and enhances, its surroundings. Neighborhood groups, project sponsors, and

City agencies should work together to create designs that contribute to great neighborhoods for current and future residents.

To ensure a balanced approach to development and the rate of change in San Francisco, the City should use its planning powers including zoning and permit review to encourage residential development in areas where it can be accommodated well and discourage it where it is less appropriate. The City should use its zoning and land use controls, environmental review processes, *General Plan* policies, area plans, and capital improvements and financial programs to address the location and intensity of growth in San Francisco.

In order to advance *General Plan* policies, including the *Housing Element*, the Planning Department is engaged in several on-going projects and studies on overall growth in the City and housing need. These efforts include the Better Neighborhoods program, the drafting of a new *Land Use Element* of the *General Plan*, and community planning activities for the Eastern Neighborhoods of the City. These projects will result in specific zoning and design guidelines that will encourage housing development in appropriate locations throughout San Francisco.

Over the past decade, the City's employment growth has far exceeded the production of housing. The significant jobs/housing imbalance specifically meant that not enough new housing was built to meet the needs of the City's expanding workforce. This jobs/housing imbalance has particularly harmed lower-income households who are unable to compete in the housing market as demand for and the cost of housing escalates. In the face of increasing pressures in the housing market, households with the fewest resources such as households with children and those with special needs became the most vulnerable to extreme rent burden, evictions, or even homelessness.

POLICY 1.1

Encourage higher residential density in areas adjacent to downtown, in underutilized commercial and industrial areas proposed for conversion to housing, and in neighborhood commercial districts where higher density will not have harmful effects, especially if the higher density provides a significant number of units that are affordable to lower income

households. ~~**Set allowable densities in established residential areas at levels which will promote compatibility with prevailing neighborhood scale and character where there is neighborhoods support.**~~

San Francisco enjoys an extensive network of transit line~~s and along transit-preferential streets are numerous in-fill housing opportunities. While different zoning controls may result in different housing configurations and densities on these parcels, residential parking requirements in these cases should be, if appropriate, modified.~~

Proximity to transit does influence rates of auto ownership and the need for parking. Some 29% of the City's households do not own cars and 31% of San Franciscans take public transit to work. These rates are even higher for households living in areas well served by transit. Locating new housing along transit-served areas supports the City's transit first policy and can discourage car dependency.

Additional housing should be encouraged in neighborhood commercial districts, including floors above ground-level commercial uses, and in areas well served by transit. ~~There is a reduced need for automobile use in these areas due to their proximity to transit, services, employment, and entertainment. Parking and traffic problems can be further addressed by community parking facilities and car-sharing programs, and other creative transportation programs.~~

Moderate to high densities presently exist in many established residential areas adjacent to downtown. These levels should be maintained. These neighborhoods provide housing close to urban employment centers, homes for newcomers, and serve as centers for culture and the arts. They are among the traditional neighborhoods that give San Francisco its flavor and character. New neighborhoods close to downtown should be built emulating these urban densities to foster urban values.

IMPLEMENTATION 1.1

- ~~A citywide action plan (CAP) should provide a comprehensive framework for the allocation of higher density, mixed-use residential development in transit-rich areas with~~

~~stable urban amenities in place. In these areas, specific CAP strategies should include: higher densities and reduced parking requirements in downtown areas or through a Better Neighborhoods type planning process; pedestrian-oriented improvements to enhance the attractiveness and use of transit.~~

- All City agencies, including the Mayor's Office of Housing and the Redevelopment Agency, will continue to provide support for below market rate housing in other areas well served or planned to be served by transit.

~~POLICY 1.2~~

~~Encourage housing development, particularly affordable housing, in neighborhood commercial areas without displacing existing jobs, particularly blue-collar jobs or discouraging new employment opportunities.~~

~~The City's neighborhood commercial districts offer the potential for new additional housing over ground floor retail uses. In many cases, additional floors can be constructed to make full and efficient use of appropriately scaled height limits. If necessary, private open space requirements could also be modified, with alternative access to the outdoors considered. New housing represents not only an expanded market to support neighborhood retail, but its residents will serve as the eyes and ears of the streets. In the long term, neighborhood commercial district controls and standards should be revised to recognize and enhance the supporting role and centrality of these districts to the surrounding residential districts.~~

~~IMPLEMENTATION 1.2~~

- ~~The Planning Department will develop proposals in neighborhood commercial districts (NCDs) well served by transit to strengthen their function as a traditional "town center" for the surrounding residential districts.~~

- ~~The Planning Department will review planning and permit procedures to remove impediments to the production of housing and neighborhood serving uses in commercial and neighborhood commercial areas near transit corridors that are defined and determined to be served by sufficient and reliable transit.~~

POLICY 1.3

Identify opportunities for housing and mixed-use districts near downtown and former industrial portions of the City.

Opportunities exist for new residential development in downtown areas. New housing can also be developed in some underused industrial and commercial districts in parts of the city without significant displacement of existing residential units or viable commercial and industrial activities. Housing should also be encouraged in former industrial areas where newer residential neighborhoods have already become established. Certain sites, because of their location or existing use, may not be appropriate for new residential development.

IMPLEMENTATION 1.3

- ~~Downtown areas and areas subject to a Better Neighborhoods type planning process will be expected to absorb major office and residential developments over the next decade. Planning and zoning code changes should include floor-to-area ratio exemptions.~~ These development bonuses would be conferred only in cases where in return the development will provide major public benefits to the community.

- The Planning Department will introduce zoning changes in the traditionally industrial eastern part of the City. The areas under study are: Mission, South of Market, Showplace Square/Potrero Hill, Bayview Hunters Point, and Visitacion Valley. Housing, especially affordable housing, will be encouraged in former industrial areas where residential neighborhoods are established and urban amenities are in place or feasible.

- The Planning Department will continue to encourage housing development on brownfield sites where clean-up costs are not prohibitive and attractive residential neighborhoods can be established.

POLICY 1.4
Locate in-fill housing on appropriate sites in established residential neighborhoods.

In established residential neighborhoods, new in-fill housing construction should be located: on vacant sites that are not designated for open space; where buildings cannot feasibly be rehabilitated or brought to acceptable levels of seismic safety; and where non-conforming uses have been terminated.

IMPLEMENTATION 1.4

- The Planning Department and the Planning Commission will continue to approve new in-fill housing construction in compliance with residential guidelines in established neighborhoods.

POLICY 1.5
Support development of affordable housing on surplus public lands.

Opportunities for housing development, particularly permanently affordable housing, on surplus vacant or underused public property should be aggressively pursued. The Planning Department should work with the Department of Real Estate, which manages the disposition of surplus public lands, to maintain a comprehensive and updated inventory of publicly held lands. City agencies should continue to identify and make available underutilized sites within their jurisdiction. In some cases the air rights of these sites may be made available for housing without interfering with their current public use. Housing over public parking, transit facilities or water storage facilities are examples of such joint use. City property no longer needed for the purpose for which it was acquired or for some other public purpose, such as open space and recreation land, should be considered for rezoning, sale, or lease for development of permanently affordable housing. The City also owns several significant land holdings outside the City and County borders. Revenues generated from sale of surplus lands should be channeled into the City's Affordable Housing Fund. Similarly, federal or state lands acquired by the City should be considered directly as affordable housing resources. Development of publicly owned or controlled sites in redevelopment areas designated for housing should be expedited.

IMPLEMENTATION 1.5

- The City will require quarterly reporting of all publicly owned land to the Assessor's Office. The Planning Department will also work with the Department of Real Estate, which manages the disposition of surplus public lands to examine the feasibility of directing revenues generated from surplus land sales into the City's Affordable Housing Fund.

- The City will continue to evaluate surplus federal or state lands as an affordable housing resource.

- The Redevelopment Agency will continue to prioritize affordable housing on lands it controls.

- The City will promote joint development projects on surplus public lands with non-profit and for-profit developers, as well as encourage construction over air rights of existing public facilities.

- A separate list of State and Federally owned land should continue to be maintained for affordable housing development purposes.

- Construction over air rights and existing public facilities will be considered for affordable housing production on a case-by-case basis.

- The Planning Department will continue to work with other agencies, especially the San Francisco Unified School District and the Public Utilities Commission, to encourage the use of surplus land for the development of mixed-use affordable housing with a higher percentage of units affordable to people earning less than the Area Median Income.

POLICY 1.6
Create incentives for the inclusion of housing, particularly permanently affordable housing, in new commercial development projects.

Mixed commercial/residential building development in downtown areas provides needed housing and adds 24-hour vitality. Existing incentives should be maintained and new ones created to encourage housing and mixed-use projects in and near the downtown area. Housing in excess of the base floor-to-area ratio should continue to be encouraged in the Downtown General (C-3-G) and Downtown Support (C-3-S) Districts. Removing maximum dwelling unit density within a building envelope also offers the possibility of a variety of residential unit types and densities.

IMPLEMENTATION 1.6

- The Planning Department will review the following incentives for commercial project developments in the Downtown C-3 District: floor-to-area ratio (FAR) exemption for housing;~~ no residential parking requirement; and no density requirements for residential projects. ~~Housing in excess of the base FAR in the Downtown General (C-3-G) and

Downtown Support (C-3-S) Districts has also been proposed by the Board of Supervisors.

- ~~The Planning Department and the Redevelopment Agency will propose increasing height limits, eliminating density requirements and modifying off-street parking requirements in the Transbay/Rincon Hill redevelopment survey areas. The Mid-Market redevelopment survey area will be re-zoned to include mixed-use residential areas and reduced residential parking requirements.~~

- The Planning Department will continue to implement the Van Ness Avenue Plan which requires residential units over commercial uses.

- The Planning Department will update the Land Use Element to define areas for mixed-use development focused along transit corridors that are determined to be served by sufficient and reliable transit.

~~POLICY 1.7~~

~~Encourage and support the construction of quality, new family housing.~~

~~Children and families are very much part of the City's vitality and diversity. They bring life and transform even the City's least child-friendly downtown neighborhoods. But San Francisco's families with children are leaving as family-sized housing become scarce or prohibitive, outbid by more affluent and flexible non-family households that form as a response to the City's high rents and housing costs. The changing demographics of the City also hint at larger, extended families. Families with children and elderly members have few options as only 25% of the City's housing stock has three or more bedrooms. Much of the housing constructed in the last decade were of studios, and one- or two-bedroom units – too small to accommodate larger families. Single-family residential builders and contractors should be encouraged to develop the almost one thousand vacant lots in residential neighborhoods that can accommodate new single-family housing or duplexes.~~

~~New family housing, particularly affordable housing, need not be confined to the suburban residential neighborhoods. Children thrive in and can benefit from urban living. The compact nature of urban living can offer children proximity and access to various activities, especially those that appeal to their recreational and cultural interests. New residential development opportunities, including affordable family housing, have been identified in neighborhoods near downtown. Developments that include various unit sizes that can accommodate families with children should be supported and encouraged.~~

~~IMPLEMENTATION 1.7~~

- ~~In response to the increasing number of families in San Francisco, the Planning Department will develop zoning amendments to require a minimum percentage of larger family units, ranging from two to four bedrooms, in new major residential projects. The Planning Department will also propose eliminating density requirements within permitted building envelopes in downtown areas and areas subject to a Better Neighborhoods type planning process to maximize family units constructed.~~

- ~~The Mayor's Office of Housing and the San Francisco Redevelopment Agency will continue to administer programs for development of affordable family rental housing. Priority will continue to be given to projects that include affordable family units for the homeless and those at-risk of homelessness, and include supportive services for residents.~~

- ~~The Planning Department will study the feasibility of "flexible" development projects to accommodate family growth, shrinkage, expansion, and extension. Loft sleeping areas, family rooms and master bedrooms could be designed to ease future conversion to efficiency apartments for family members, or as an income unit.~~

POLICY 1.8

Allow new secondary units in areas where their effects can be dealt with and there is neighborhood support, especially if that housing is made permanently affordable to lower-income households.

Secondary units (in-law" or "granny units") are smaller dwelling units within a structure containing another much larger unit, frequently in basements, using space that is surplus to the primary dwelling. Secondary units represent a simple and cost-effective method of expanding the housing supply. Such units could be developed to meet the needs of seniors and others who, because of modest incomes or lifestyles, prefer or need small units at relatively low rents. Neighborhood acceptance of secondary units should be encouraged in areas where off-street parking can be provided (it could be tandem parking) and where the secondary unit can be installed without adversely affecting the exterior appearance of the building, or in the case of new construction, can be accommodated within the permitted building envelope. Secondary units should be limited in size to control their impact.

IMPLEMENTATION 1.8

- The Board of Supervisors has introduced Planning Code amendments to allow secondary units in new buildings that are in close proximity to neighborhood commercial districts and public transit.

- The Planning Department will support efforts and promote educational programs that will help residents in existing neighborhoods understand the advantages of incorporating some secondary units in their communities.

- The Planning Department will study the impacts of relaxing parking requirements for secondary units located in all neighborhoods.

- On-going planning will propose Planning Code amendments to encourage secondary units where appropriate.

POLICY 1.9

Require new commercial developments and higher educational institutions to meet the housing demand they generate, particularly the need for affordable housing for lower income workers and students.

New and expanding commercial activities increase the City's employment base. These new jobs are important to the residents of the City and the Bay Area and contribute to the continued economic vitality of the region. The workers filling these jobs also increase the City's need for housing. The City's Jobs-Housing Linkage Program, which exacts fees for affordable housing production from commercial developments, should be enforced and monitored. The fee structure should also be reviewed regularly to ensure fair burden on developers.

Similarly, institutions of higher education provide needed services and contribute to the intellectual and cultural life of the City. At the same time, their non-resident student body presents a housing need. Higher educational institutions should assist in meaningful ways in the provision of additional housing to meet this demand.

IMPLEMENTATION 1.9

- The Planning Department will continue to support the Jobs Housing Linkage Program, which requires that commercial development provide housing or pay an in-lieu fee.

- Institutions are required to have an Institutional Master Plan that conforms to the General Plan. The Planning Department will evaluate higher educational institutions' student housing programs through the required Institutional Master Plan.

HOUSING RETENTION

OBJECTIVE 2
RETAIN THE EXISTING SUPPLY OF HOUSING.

The existing housing stock is the City's major source of relatively affordable housing. It is very difficult to replace given the cost of new construction and the size of public budgets to support housing construction. Priority should be given to the retention of existing units as a primary means to provide affordable housing.

POLICY 2.1
Discourage the demolition of sound existing housing.

Demolition of existing housing often results in the loss of lower-cost rental housing units. Even if the existing housing is replaced, the new units are generally more costly. Demolition often results in displacement of residents, causing personal hardship and relocation problems.

In 1994, the Planning Commission adopted guidelines regarding housing demolition, for situations when such projects require conditional use approval. In addition to the criteria for demolition approval, the guidelines require replacement housing or in-lieu fees to the City's affordable housing fund as full or partial mitigation for each unit lost. The City should continue to discourage the demolition of existing housing that is sound or can be rehabilitated, particularly where those units provide an affordable housing resource.

IMPLEMENTATION 2.1

- The City will continue to implement the Proposition M policy that requires that existing housing and neighborhood character be conserved and protected in order to preserve the cultural and economic diversity of neighborhoods.

- The Planning Commission will continue to apply Section 311 of the Planning Code to deny residential demolition permits until approval of a new construction permit is obtained.

- The Department of Building Inspection in consultation with the Planning Department will develop and periodically update criteria and continue to evaluate the soundness of housing before granting demolition approval.

- The Planning Department will continue to require replacement housing or in-lieu fees paid to the City's affordable housing fund as mitigation for the demolition of sound housing units.

- The feasibility of expanding the demolition definition will continue to be evaluated in order to prevent the loss of housing classified as "alterations."

POLICY 2.2

Control the merger of residential units to retain existing housing.

The Planning Commission has adopted policies that require Discretionary Review for all dwelling unit merger applications. The Housing Element, General Plan Priority Policies (Planning Code Section 101.1), and other Planning Commission directives are used to consider merger proposals on a case-by-case basis. Specifically, these criteria state that when reviewing applications for the removal of a legal dwelling unit, the Planning Commission must consider the detrimental effects to the housing supply, landmark designations, and planned owner occupancy. The Planning Commission must also work to minimize displacement, and ensure code compliance and structural safety.

IMPLEMENTATION 2.2

- The Planning Department will continue to require Discretionary Review for all dwelling unit merger applications. Merger proposals will be considered on a case-by-case basis and approved or rejected on their individual merits as they pertain to policies of this Housing Element, the General Plan Priority Policies (Planning Code Section 101.1), and other Planning Commission directives. Detrimental effects to the housing supply, the minimization of displacement hardships, code compliance, structural safety, landmark designations, and planned owner occupancy will continue to be considered during Discretionary Review.

POLICY 2.3

Restrict the conversion of rental housing to other forms of tenure or occupancy.

Conversion of existing rental apartment buildings to condominiums, stock cooperatives or tenants-in-common ownership, depletes the supply of the City's more affordable housing stock. It also brings into conflict two desirable goals — expansion of homeownership opportunities and preservation of the existing rental housing stock. While conversions to condos, co-ops, and tenancy-in-common expand the number of units available for purchase, they do so by reducing the number of units available for rent. As a result, existing and future tenants who cannot buy at that time can be displaced. Similarly, the use of large, older apartment buildings for time-sharing or corporate suites can cause displacement of existing residents.

In general, conversions should not shift the balance between ownership and rental housing, and should protect potentially displaced tenants to the maximum extent possible. Closely evaluating proposed conversions and limiting the number of conversions annually, should achieve a reasonable balance between ownership and rental housing. Conversion of rental housing to time share or corporate suite use should be prohibited.

IMPLEMENTATION 2.3

- The City will continue to limit the conversion of rental housing with the Condominium Conversion Ordinance. This ordinance limits the annual number of units converted and allows only small projects with owner occupants to be considered for conversion. Conversion approval will continue to require a high degree of tenant intent to purchase their rental unit as a condition of approval. The conversion criteria include Tenant Rights Rules. Renters are given the right to purchase their unit at a price established by the owner or they can choose to rent the unit at their current rent for one year after the conversion is complete. Tenants who are 62 or older are entitled to a lifetime lease.

- The City will evaluate requiring sales price limitations on existing low and moderate-income housing units that are proposed for conversion.

- The City will study requiring a portion of any condominium conversion subdivision to remain permanently affordable and requiring developers to construct an equivalent number of similar units elsewhere or pay an equivalent in lieu fee to the City's Affordable Housing Development Fund.

- Conversions to uses other than housing should not be permitted unless a specific evaluation by the Planning Commission concludes that there is clear and convincing evidence that such conversion is the only recourse in the interest of the common weal.

POLICY 2.4

Retain sound existing housing in commercial and industrial areas.

Many parts of San Francisco were developed before there were zoning regulations that separated various types of land uses. As a result, thousands of housing units were built in areas that also contain industrial and commercial uses and have since been zoned industrial or commercial. Many of these housing units are sound or could be rehabilitated. They represent a significant portion of the City's affordable housing supply and would be very difficult to replace. Yet, in many of the areas that such housing is located, it could be profitable to convert to a non-residential use.

In many neighborhood shopping areas, conversions of upper floor housing units to non-residential use are subject to conditional use review. Under such review, the desirability of retaining the housing can be weighed against the public benefits to be gained by the alternative use. As a general rule, conversion should be considered only for needed neighborhood serving commercial activities that cannot reasonably locate elsewhere in the commercial district. Similarly, in downtown commercial districts, conversion to non-residential use should be subject to conditional use review.

Housing enclaves in industrial areas should be protected by residential or special use district zoning, so that conversion to non-residential uses cannot take place. However, the continuation of residential uses on scattered and isolated lots within developed industrial areas can cause conflict with legitimate industrial needs. Here, conversion should be a conditional use so that the specific industrial need can be weighed against the need to conserve housing.

IMPLEMENTATION 2.4

- The Planning Department will continue to support existing housing in commercial and industrial areas by regulating conversions as provided in the Planning Code.

- As part of the Planning Department's current citywide action plan, planning efforts in the eastern neighborhoods of the City, where housing exists in commercial and industrially zoned districts, should address housing retention as new policies and zoning are established. Mixed use should be encouraged where appropriate.

POLICY 2.5
Preserve the existing stock of residential hotels.

Residential or single-room occupancy hotels (SROs) represent a unique and often irreplaceable resource for thousands of lower income elderly, disabled, and single-person households. Most of these hotels are close to downtown and have been subject to strong economic pressures that led to conversion or demolition. As San Francisco grew as a tourist center, many of these hotels have been converted to permanent or seasonal tourist uses. Others have been demolished and replaced with other uses. Some of these SROs are being used as family housing. In the City's tight housing market, some downtown SROs have also become dormitories and efficiency apartments for nearby educational institutions. In the last five years, fires and other safety code violations have displaced hundreds of low-income residents.

The retention of remaining units housing permanent residents should be supported. Residential hotels located in predominantly residential areas should be protected by zoning that does not permit commercial or tourist use. In non-residential areas, conversion of units to other uses should not be permitted or be permitted only where a residential unit will be, or has been, replaced with a comparable unit elsewhere. For those hotels that are operated as mixed tourist/permanent resident hotels, strict enforcement is needed to ensure that the availability of the hotel for permanent residential occupancy is not diminished. The Residential Hotel

Ordinance currently regulates and protects the existing stock of residential hotels. This ordinance requires permits for conversion of residential hotel rooms, has a strong replacement provision, and requires 80% of cost of replacement to be provided to the City in the case of conversion or demolition. The City should facilitate the purchase and master lease of residential hotels by non-profit entities for the purpose of improving the quality of the housing and achieving long-term affordability.

IMPLEMENTATION 2.5

- The Department of Building Inspection and the San Francisco Fire Department will continue to regulate the safety of these buildings through annual inspections.

- The City will continue to facilitate the transfer of residential hotels to effective non-profit housing organizations to ensure permanent affordability, livability, and maintenance.

- The City will work to reauthorize the Single Room Occupancy Hotel Safety and Stabilization Task Force set to expire in 2003. This task force will continue to monitor, develop and present recommendations to San Francisco Mayor and Board of Supervisors regarding policies and procedures around fire prevention, investigations and prosecution of SRO violators, and stabilization of hotel tenants and residents.

POLICY 2.6
Consider legalization of existing illegal secondary units where there is is neighborhood support and the units can conform to minimum Code standards of safety and livability and the permanent affordability of the units is assured.

It is estimated that over 20,000 housing units in the City were built without a building permit. These units may exceed allowable densities, may not provide for current parking requirements, or may not meet minimum standards set forth in the San Francisco Building Code. However, these units constitute a major source of affordable housing in the City and their loss would dramatically increase pressure on the housing market.

Proposals to allow legalization of secondary units under certain conditions have been made over the years but have not been adopted because of neighborhood opposition. Some units have been eliminated through abatement proceedings, largely originated by complaints, while additional units continue to be created without permits. The City should develop procedures to legalize existing illegal secondary units and bring them into code compliance.

IMPLEMENTATION 2.6

- Consistent with Policy 2.6, study the legalization of existing secondary units. This study will examine: the reduction of permitting fees and elimination of additional penalties to make legalization an attractive option for owners; ways to address neighborhood concerns as to the legalization of secondary units; regulation which might be required to mitigate neighbors' concerns about off-street parking; and implementation mechanisms for keeping secondary units affordable.

HOUSING CONDITION

OBJECTIVE 3
ENHANCE THE PHYSICAL CONDITION AND SAFETY OF HOUSING WITHOUT JEOPARDIZING USE OR AFFORDABILITY.

Over one-half of San Francisco housing is more than 60 years old. As the City's housing stock ages, maintenance becomes increasingly important. Considerable private investment into the renovation of some of the City's older housing units has lessened the need for some types of direct public intervention used in the past. There is, however, a continuing housing rehabilitation need. The City should monitor those areas of the city particularly susceptible to a decline in housing quality, and take appropriate remedial steps where necessary.

POLICY 3.1
Ensure that existing housing is maintained in a decent, safe, and sanitary condition, without increasing rents or displacing low-income households.

The City should ensure that residential units meet building code standards by periodic inspection of apartments and hotels and prompt response to complaints. Code compliance activities should be designed to minimize any financial hardship for lower income households brought on by required rehabilitation. Low interest and deferred payment loan programs should be targeted to low and moderate-income tenants.

IMPLEMENTATION 3.1

- The San Francisco Department of Building Inspection will continue to ensure that residential units meet building code standards by responding to complaints and through periodic inspection of apartments and hotels.

- The Department of Building Inspection will continue to issue code violations for residential properties that are not decent, sanitary, or safe. If violations are repeatedly ignored and not corrected, the City Attorney's Office will continue to assist in abatement.

- The Mayor's Office of Housing will continue to offer low interest and deferred payment loan programs designed to target and benefit low-income homeowners including the Code Enforcement Rehabilitation Fund (CERF) and Community Housing Rehabilitation Program (CHRP).

- The Mayor's Office of Housing will continue to provide funds for rehabilitating existing housing with affordability restrictions in order to improve living conditions for tenants and extend the properties' useful life as affordable housing.

POLICY 3.2
Preserve at risk, privately owned assisted housing.

Privately owned and operated assisted housing is under continuing pressure to convert to market rate housing. Existing funding levels for some developments have either failed to keep pace with actual costs or have less than favorable returns, causing owners to convert units to market rate or sell their properties outright, and thereby removing units from the stock of assisted housing. Policies are needed to encourage the retention of the existing assisted housing stock wherever possible.

IMPLEMENTATION 3.2

- The San Francisco Redevelopment Agency will continue to support the acquisition and rehabilitation of multi-family and senior housing that is at risk of being converted to market rate due to the expiration of existing rental subsidy contracts or the prepayment of HUD-insured mortgages.

POLICY 3.3

Maintain and improve the condition of the existing supply of public housing.

The San Francisco Housing Authority is the largest landlord in San Francisco with over 6,200 units, and is one of the most important sources of permanently affordable housing for low-income households. Operating subsidies and modernization funds provided by the Federal government have not been adequate to keep this conventional public housing in sound condition. Increased Federal support, innovative local financing techniques, energy efficiency measures, and creative property management and customer service are all required to maintain and improve this valuable supply of affordable housing. Additionally, inter-agency collaboration and long-range plans for public housing are being developed, including identifying opportunities for potential mixed income in-fill development in underused lands and where consistent with overall social goals.

IMPLEMENTATION 3.3

- The San Francisco Housing Authority will continue to administer the HOPE VI grants. Recent grants will help revitalize five housing sites and provide 1,228 affordable housing units. Additional funds will add 137 accessible and 207 adaptable apartments to the SFHA stock.

- The San Francisco Housing Authority will continue to manage other publicly assisted projects. Capital Fund Program (CFP) and Community Development Block Grants (CDBG) will assist in sustaining comprehensive modernization and capital improvements at SFHA sites. The average annual operating funding is $15 million, and its focus is to stabilize living conditions in the current housing stock.

- The San Francisco Housing Authority will continue to maintain communication between housing organizations in the city through the CHAS Public Housing Subcommittee. The San Francisco Housing Authority has created the San Francisco Housing Corporation, a 501(c)3 non-profit corporation which leverages and maximizes resources and assists in the sustainability of programs for low-income households.

POLICY 3.4

Monitor the correction of serious continuing code violations to prevent the loss of housing.

Code enforcement on hardship cases can present particular housing challenges. In some cases, compliance with full requirements should be deferred to the extent legally permissible if all life safety hazards are abated. In particular, the City should extend the period allowed for code compliance to avoid displacement of low- or moderate-income households until replacement housing can be found.

Where there is a refusal to correct serious but remediable violations, the City should exercise its ability to make the repairs and recover the costs by putting a lien on the property. In aggravated cases, the buildings can be placed in City receivership. Public assistance should then be provided to maintain affordability levels.

IMPLEMENTATION 3.4

- The Mayor's Office of Housing will continue to administer and promote the Code Enforcement Rehabilitation Fund (CERF) program to correct building code violations in housing for low-income residents.

- The City will continue to abate serious, repeated, building code violators.

- The City Attorney's Code Enforcement Task Force will continue its activities.

POLICY 3.5

Improve the seismic stability of existing housing without reducing the supply of affordable housing.

Despite substantial retrofitting efforts in the last decade following the Loma Prieta earthquake, there are about 8,590 residential units in unreinforced masonry buildings in San Francisco that require structural strengthening. Because these buildings are not sufficiently reinforced and the floors are not adequately tied to the walls, they are vulnerable to damage or collapse in an earthquake. Residential hotels, which are predominantly occupied by persons of relatively low incomes, make up much of these buildings at risk. These remaining buildings are located in the South of Market, the Tenderloin, Chinatown, and along the Bush Street and Van Ness Avenue corridors. Retrofitting programs should safeguard affordability and minimize displacement of low-income residents.

In addition to unreinforced masonry buildings, there are other residential buildings that are also vulnerable to damage in an earthquake. In many cases, property owners can undertake relatively inexpensive measures such as bolting frames to foundations and installing shear walls where needed. The Office of Emergency Services has updated and improved the City's Emergency Preparedness Plans. The City should continue its building seismic safety informational programs and also pursue technical assistance programs targeting earthquake safety precautions. These issues are also addressed in the Community Safety Element of the General Plan.

IMPLEMENTATION 3.5

The Seismic Safety Bond Program will continue to fund the seismic rehabilitation of unreinforced masonry buildings to the extent that demand for funds continues to exist.

- The City Department of Building Inspection (DBI) will continue to mandate the seismic retrofit of unreinforced masonry buildings.

- The DBI is also developing a Community Action Plan for Seismic Safety (CAPSS) which is investigating the impacts of potential earthquakes and developing policies and programs to reduce these impacts.

POLICY 3.6

Preserve landmark and historic residential buildings.

The preservation of landmarks and historic buildings is a priority policy of the City's General Plan. Landmarks and historic buildings are important to the character and quality of the City's neighborhoods and are also important housing resources. A number of these structures contain housing units particularly suitable for larger households and families with children. More specific policies for these buildings will be contained in the Preservation Element, currently being prepared.

IMPLEMENTATION 3.6

- The Planning Commission will review and adopt the Preservation Element of the General Plan.

- The Planning Department and the Department of Building Inspection will continue to regulate the preservation and protection of landmark and historic buildings by monitoring use, alterations, and demolition.

- The City will continue to implement the Proposition M priority policy that landmarks and historic buildings be preserved.

- The Planning Department's Citywide Cultural Resource Survey program is a multi-year effort that will document resources in neighborhoods and commercial areas throughout San Francisco.

- The Mayor's Office of Housing and the Redevelopment Agency will continue to fund the acquisition and rehabilitation of landmark and historic buildings for use as affordable housing.

- The Planning Department will encourage property owners to use preservation incentives to repair, restore, or rehabilitate historic resources in lieu of demolition. These include federal tax credits for rehabilitation of qualified historical resources, Mills Act property tax abatement programs, the State Historic Building Code, and tax deductions for preservation easements.

- The Planning Department will continue to assist in federal environmental review and review under Section 106 of the National Historic Preservation Act for historically significant local buildings receiving federal assistance.

HOUSING AFFORDABILITY

OBJECTIVE 4
SUPPORT AFFORDABLE HOUSING PRODUCTION BY INCREASING SITE AVAILABILITY AND CAPACITY

POLICY 4.1
Actively identify and pursue opportunity sites for permanently affordable housing.

Publicly owned land represents one potential source of sites for affordable housing. Government agencies should actively maintain an inventory of land within their jurisdiction and, with the Planning Department, identify sites with the potential to support housing development. This evaluation could include options for joint development or relocation of current facilities to other sites. Such appropriate and available public land, along with other financial subsidies, should then be considered for the development of housing. Priority should be given to immediate development of those public sites where 100% permanently affordable housing is achievable.

Large and privately held land parcels should also be identified and actively promoted for affordable housing. New programs should be established to acquire land and appropriate buildings for land and building "banking" in advance of specific project proposals.

While housing development can be incompatible with certain industrial uses and threaten viable activities, housing opportunity areas may exist in the primarily non-residential areas on the eastern side of the City. Land use analyses should continue and identify housing opportunity areas in the five Eastern Neighborhoods of South of Market, the Mission, Potrero/Showplace Square, South Bayshore, and Visitacion Valley. Any rezoning of industrial land to residential use should include requirements, incentives and bonuses to encourage the development of attractive and affordable housing. Program Environmental Impact Reports (EIRs) should be developed for those areas with sufficient detail to eliminate need for subsequent project EIRs on residential projects.

IMPLEMENTATION 4.1

- The City's Affordable Housing Fund provides funds to the Mayor's Office of Housing (MOH) to respond to housing opportunities in areas of the City that are not in Redevelopment Agency Project or Survey Areas and outside Mission Bay. This fund, derived from payment of fees to the City by office, entertainment, hotel, retail, and research and development developers, will continue to be used to construct new affordable housing.

- The City's Housing Participation Policy provides for affordable housing to be developed as part of market-rate housing developments in all redevelopment project areas on-site or an in-lieu fee is imposed.

- The City will explore land banking in advance of specific project development proposals when possible.

- The City will work to identify underutilized, vacant, and brownfield sites that are publicly or privately owned and suitable for affordable housing development. The City will work with for profit and non-profit housing developers to acquire these sites for permanently affordable housing.

- Program EIRs will be developed for new planning areas included in the Citywide Action Plan with sufficient detail to eliminate the need for subsequent project EIRs on future permanently affordable housing. Wherever the capacity for development is increased through rezoning or other regulation changes, commensurate requirements for public benefits, including increased housing affordability and community amenities for livability should be required.

- Permanently affordable housing sites will be especially sought out in places where transportation and existing amenities are in place.

- The revised Land Use Element will identify appropriate sites for permanently affordable housing.

POLICY 4.2
Include affordable units in larger housing projects.

Inclusion of affordable housing is currently required of new housing projects containing 10 or more units. Although preference is given to on-site inclusionary housing to ensure economic integration in housing development, off-site construction should be considered if this results in significant numbers of new affordable housing. The City's inclusionary affordable housing program should be monitored and reviewed regularly to ensure fair burden and not constrain new housing production.

IMPLEMENTATION 4.2

- The Planning Department will implement its recently updated Inclusionary Affordable Housing requirement, which requires 10% to 17% of units in all projects with 10 units or more be made affordable.

- The Mayor's Office of Housing will continue to administer the sales and leasing of units created through the Inclusionary Affordable Housing program. MOH will develop proposals to ensure availability of adequate funding to administer the inclusionary program.

- The San Francisco Redevelopment Agency will implement its Housing Participation Policy to require affordable housing through its owner participation and land disposition process.

- If housing projects are built on city-owned property, the percentage of affordable housing units should be increased and the units should be affordable to less than 60% of the Area Median Income for renters and less than 100% of the Area Median Income for home owners.

POLICY 4.3

Encourage the construction of affordable units for single households in residential hotels and "efficiency" units.

San Francisco has a relatively large stock of older residential hotels. The 1995 Single Room Occupancy Guidelines and accompanying Planning Code changes affecting densities, provision of kitchen facilities and parking now regulate the creation of these types of units. The Yerba Buena Commons, completed in 1995, demonstrated that it is possible to provide small but good quality units for single persons. Appropriate sites and sponsors for both market rate and affordable residential hotels should be developed.

IMPLEMENTATION 4.3

- Restrictive regulations in the Building and Planning Code will be studied by the Planning Department for possible modification.

- Appropriate sites and sponsors for affordable residential hotels will be identified through a coordinated effort between the Planning Department, the Mayor's Office of Housing and the Redevelopment Agency.

- Affordable housing advocacy groups will be encouraged by the City to hold project specific neighborhood acceptance community meetings when SRO housing developments are proposed in particular neighborhoods.

- The City will require that qualified property management companies be responsible for operating newly constructed SROs so that the facilities and associated services will be properly maintained and suitable for occupancy in the future.

POLICY 4.4

Consider granting density bonuses ~~and parking requirement exemptions~~ for the construction of affordable housing or senior housing.

Current state law calls for adoption of an ordinance permitting a 25% density bonus for projects which provide 20% of the units for lower-income households, 10% of the units for very-low-income households, or 50% of the units for senior citizens. The City should allow higher density bonuses where such housing will not disrupt neighborhood character or scale. The current code allows a density bonus for units designed for seniors and/or disabled occupants in R and NC districts. The current Planning Code provision of establishing special use district overlays for projects that are 100% affordable should be reconsidered; density bonus standards and other requirements uniformly applied citywide. Density bonuses should be conferred only when public benefits are provided.

IMPLEMENTATION 4.4

- The Panning Department will look at establishing uniform density bonus standards and equal requirements for affordable and senior housing development. Until then, affordable and senior housing projects will continue to be granted density bonuses and reduced parking requirements on a case-by-case basis.

- The Planning Department will investigate appropriate parking requirements for all affordable or senior housing projects.

POLICY 4.5

Allow greater flexibility in the number and size of units within established building envelopes, potentially increasing the number of affordable units in multi-family structures.

In San Francisco, housing density standards have traditionally been set in terms of numbers of dwelling units in proportion to the size of the building lot. For example, in an RM-1 district, one dwelling unit is permitted for each 800 square feet of lot area. This limitation generally applies regardless of the size of the unit and the number of people likely to occupy it. Thus a small studio and a large four-bedroom apartment both count as a single unit. Setting density standards encourages larger units and is particularly tailored for lower density neighborhoods consisting primarily of one- or two-family dwellings.

However, in some areas which consist mostly of taller apartments and which are well served by transit, the volume of the building rather than number of units might more appropriately control the density. Here the building envelope, as established by height, bulk, set back, parking and other Code requirements, would set the maximum residential square footage which could be sub-divided into a greater number of smaller units or a smaller number of larger units.

IMPLEMENTATION 4.5

- The Planning Department will explore ways to promote flexibility within a given building envelope to build a variety of unit types, ranging from a greater number of smaller units to fewer larger family units.

POLICY 4.6

Support a greater range of housing types and building techniques to promote more economical housing construction and potentially achieve greater affordable housing production.

Prefabricated or manufactured homes can be a valuable source of low cost housing. At its best, manufactured housing uses high technology and mass production techniques to reduce costs without sacrificing quality of design. Industrialized wood construction techniques used in lower density housing and light-weight prefabricated, pre-stressed concrete construction in moderate and high density housing also have the potential of producing great savings in construction time and cost. The use of these and similar techniques should be encouraged. Their use as temporary, emergency or transitional shelter on otherwise unutilized sites should be explored.

IMPLEMENTATION 4.6

- A low cost housing construction task force will be formed between the Mayor's Office of Housing, Department of Building Inspection, the Planning Department and the housing design and construction industry.

- In order to lower cost, the building industry will be encouraged to investigate the use of industrialized wood construction techniques in lower density housing, and the use of lightweight prefabricated, pre-stressed concrete construction, in moderate and high density housing.

- Allow secondary units in conformance with Policy 1.8.

- The City will work to encourage manufactured home production, per California law (Government Code 65852.3) that permits all manufactured homes built under HUD guidelines and on a foundation to be placed on lots zoned for conventional single-family residential dwellings.

- The Planning Department will encourage industry representatives to develop a model site to showcase the manufactured home product. This site will be used to educate the public with good models and dispel negative attitudes and inaccurate perceptions of manufactured home production.

- The Planning Department will write architectural compatibility guidelines to ensure that manufactured homes will blend into existing neighborhoods and alleviate public concern over design compatibility.

- The Planning Department will continue to support developers constructing co-housing, shared housing and group housing.

- The City will work with housing advocates to educate residents about the misconceptions of shared housing.

- Design zoning controls that meet the specific needs of artists.

OBJECTIVE 5
INCREASE THE EFFECTIVENESS AND EFFICIENCY OF THE CITY'S AFFORDABLE HOUSING PRODUCTION SYSTEM.

POLICY 5.1

Prioritize affordable housing projects in the planning review and approval processes, and work with the development community to devise methods of streamlining housing projects.

The Planning Department's review and approval of affordable housing projects should be improved to reduce costly and significant delays. Without diminishing public participation, the administrative processing and approval of affordable housing should be expedited through administrative action, local and State legislation.

IMPLEMENTATION 5.1

- The City will advocate for the shortening of the time period for environmental review under the California Environmental Quality Act (CEQA) for affordable housing projects.

- City agencies will work to expedite affordable housing applications.

- The Planning Department will establish a program for preparing Area Plan Environmental Impact Reports (EIRs) for affordable housing project sites to eliminate the need for conditional use permits and subsequent EIRs.

- The Planning Department will develop a streamlining process to consolidate the public hearing process and avoid duplicative discretionary hearings and appeals.

- Affordable housing advocacy groups and project sponsors will be encouraged by the City to conduct project specific neighborhood workshops to foster neighborhood understanding and acceptance of affordable housing projects.

- The City Attorney's office will work to establish neighborhood dispute resolution methods to minimize administrative appeals and judicial challenges of projects.

POLICY 5.2

Support efforts of for-profit and non-profit organizations and other community-based groups and expand their capacity to produce and manage permanently affordable housing.

Non-profit housing development corporations have proven to be effective vehicles for the development of affordable housing. The City should continue to provide them with the technical and financial assistance to increase their production capacity and encourage and invite for-profit developers to build equivalent housing.

IMPLEMENTATION 5.2

- The Mayor's Office of Housing and the San Francisco Redevelopment Agency will continue to fund and provide technical support to non-profit housing corporations and invite and encourage for-profit builders to avail of the same opportunities.

POLICY 5.3

Create greater public awareness about the quality and character of affordable housing projects and generate community-wide support for new affordable housing.

Affordable housing projects are frequently delayed or withdrawn because of community opposition. Greater public awareness of affordable housing challenges and potential solutions is needed to gain broader, long-term support for housing strategies.

IMPLEMENTATION 5.3

- City agencies and housing advocacy groups will coordinate community outreach efforts that support neighborhood acceptance of permanently affordable housing developments.

- The City will continue to support affordable housing by publicizing permanently affordable developments with good design and effective management.

- Past affordable housing developments should be evaluated and their actual achievements documented and publicized.

- Continuing problems associated with these developments should be examined and rectified, and appropriate corrections made in future developments.

POLICY 5.4

Coordinate governmental activities related to affordable housing.

The City is required by federal Department of Housing and Urban Development (HUD) to prepare a five year Consolidated Plan to guide community development and housing assistance programs. The Consolidated Plan is the compilation of a coordinated effort between federal, state and local agencies that contribute to the production of housing and related services in San Francisco. This Plan was recently submitted to HUD in 2000.

IMPLEMENTATION 5.4

- The Mayor's Office of Community Development and the Mayor's Office of Housing will continue to draft and distribute the Consolidated Plan.

- The Planning Department will continue to work with the Redevelopment Agency and Mayor's Office of Housing to devise clear and consistent application procedures for homeownership programs.

OBJECTIVE 6
PROTECT THE AFFORDABILITY OF EXISTING HOUSING.

POLICY 6.1
Protect the affordability of units in existing buildings at risk of losing their subsidies or being converted to market rate housing.

A number of subsidized housing developments were created with federally supported mortgages and project-based rental assistance. Many of these projects have reached the 20-year mark and the owners of the developments have an option to prepay existing mortgages and terminate the project-based rental assistance contracts.

IMPLEMENTATION 6.1

- The City will continue to advocate at both the state and federal levels, for the preservation of housing subsidies. MOH and SFRA will continue to work with state and federal agencies to develop programs to assist HUD sponsored housing with expiring subsidies.

- The San Francisco Redevelopment Agency will continue to administer the Preservation of At-Risk Existing Affordable Housing program.

- In order to prevent the loss of affordable housing resulting from early termination of HUD mortgages, the City will explore the creation of a residents and/or non-profit ownership and management program to acquire existing "at risk" buildings.

- The City will work to prioritize relocation of tenants who lose Section 8 subsides.

- SFRA will continue to advocate for local, state, and federal legislation that supports local efforts to preserve at-risk developments.

- SFRA will continue to assist developers interested in preserving the affordability of at-risk housing.

- The City will continue to enforce the City's preservation ordinance that requires proper notification prior to transfer of an at-risk development.

POLICY 6.2
Ensure that housing developed to be affordable is kept affordable.

Affordable housing units that are created by various City actions should be required to remain affordable for as long a period as is legally permissible and financially practicable. The necessity of such requirement is underscored by the magnitude of the potential loss of existing HUD-financed affordable rental units that had a 20-year period for continuance of below market rents. In the past, locally assisted units have been required to remain at affordable rental rates or sales prices for periods as short as ten years. As the experience with expiring HUD contracts indicates, expiration dates arrive all too soon and a problem thought to be solved becomes a problem again. Most recently, the City has imposed 50- to 75-year terms. If legally permissible and financially practicable, an even longer term should be required. Sufficient evidence should be required from applicants to prevent affordable housing units from being occupied by unqualified parties.

IMPLEMENTATION 6.2

- Affordable housing funded by MOH and SFRA will be required to maintain affordability as long as legally permissible and financially practicable. This requirement will continue to be enforced by Regulatory Agreements and other legally binding instruments.

- The City will ensure all publicly supported affordable rental housing projects remain permanently affordable through the use of grant or financing restrictions that regulate rents and tenant incomes.

POLICY 6.3

Safeguard tenants from excessive rent increases.

In recent years the demand for the limited housing supply has resulted in substantial rent increases. Sometimes this has caused displacement or economic hardship. The regulatory process that stabilizes rent levels protects tenants from excessive rent increases and arbitrary eviction while at the same time allowing the landlord a fair rent and sufficient incentives to maintain housing quality should be maintained.

IMPLEMENTATION 6.3

- The Rent Control Board safeguards tenants from excessive rent increases under the Residential Rent Stabilization and Arbitration Ordinance.

POLICY 6.4

Achieve permanent affordability through community land trusts and limited equity housing ownership and management.

The American dream of homeownership is beyond the reach of many San Francisco households. First-time homebuyer programs sponsored by the City and private lending institutions should be encouraged and broadened to include second mortgage loan pools or other appropriate mechanisms to help buyers meet down-payment requirements. To stem speculation, such housing programs should include affordability restrictions. Conversion of buildings by their tenants to limited equity cooperatives and condominiums can stabilize prices and, as general home sales prices increase over time, can lower housing costs. The City should encourage these forms of ownership.

IMPLEMENTATION 6.4

- The Mayor's Office of Housing will continue to administer first time homebuyer programs, which includes the City Second Loans, the Condominium Conversion Program, and the Inclusionary Affordable Housing Program.

- The City will investigate the feasibility of community land trusts and other alternative ownership models.

- The City will continue to work to ensure that publicly funded homeownership projects remain affordable through deed and lease restrictions, and where practical, limit equity return so that homeownership remains affordable.

POLICY 6.5

Monitor and enforce the affordability of units provided as a condition of approval of housing projects.

Over the years, the city has in certain instances required the provision of affordable housing units as a condition of approval of a project. Monitoring and enforcement are needed to ensure the continued availability of these units. Stiff penalties for non-compliance should be created to provide strong economic disincentives against loss of required affordable housing units. Sufficient evidence should be required from applicants to prevent affordable housing units from being occupied by unqualified parties.

IMPLEMENTATION 6.5

- The Mayor's Office of Housing and the City Attorney's Office will continue to monitor compliance with affordability and occupancy restrictions.

- The Mayor's Office of Housing and the Planning Department will work to establish an adequate fee system to financially support the costs of a comprehensive affordable housing monitoring program.

OBJECTIVE 7
EXPAND THE FINANCIAL RESOURCES AVAILABLE FOR PERMANENTLY AFFORDABLE HOUSING.

POLICY 7.1
Enhance existing revenue sources for permanently affordable housing.

Existing financial programs, including Federal and State low-income tax credits and various HUD programs, should be maintained at maximum levels. Extensive lobbying efforts at State and Federal levels need to be carried out to protect the existing programs and create new ones. Joint metropolitan and statewide efforts to develop more creative revenue resources should be supported.

Incremental tax revenues in Redevelopment project areas can be used for affordable housing. The Redevelopment Agency has a policy of allocating at least 50% of its increment funds for low and moderate income housing construction or renovation.

IMPLEMENTATION 7.1

- The City supports efforts and advocate for the expansion of federal and state financing for affordable housing.

- The San Francisco Redevelopment Agency will continue to promote permanent affordable housing by approving the construction of housing in designated redevelopment areas and by providing financing for the development of affordable housing throughout the city.

- The Mayor's Office of Housing will continue to provide funding to increase and preserve the stock of affordable rental and ownership housing units for the City's very low to moderate income population. The Mayor's Office of Housing will continue to monitor projects on an annual basis that receive affordable housing funds to ensure on-going compliance.

- The Planning Department and the Mayor's Office of Housing will periodically reassess the fee levels of the Jobs-Housing Linkage Program, whereby new office developments are obligated to assist in the production of housing, to determine their adequacy and appropriate adjustments should be made.

- The Department of Human Services and the Department of Public Health will continue to offer operating subsidies for special needs housing through their supportive housing programs.

- The San Francisco Redevelopment Agency will continue to administer the Tax Increment Housing Program and the Housing Opportunities for People with AIDS Program (HOPWA).

POLICY 7.2

Create new sources of revenue for permanently affordable housing, including dedicated long-term financing for housing programs.

New revenue sources are needed if the City is to make a significant dent in the need for affordable housing. A major source of new revenue to the City that could be allocated to affordable housing is the real estate transfer tax. Increasing the current tax rate and devoting much of the increased revenue to preservation of affordable housing (see Objective 5) and to new affordable housing development should be given high priority.

IMPLEMENTATION 7.2

- The City will investigate an increase in the real estate transfer tax.

- To the extent feasible, the City will continue to periodically issue affordable housing development bonds.

- The Mayor's Office of Community Development programs will continue to address emergency shelter needs and the Mayor’s Office of Housing will continue to administer programs relating to transitional and permanent housing needs.

POLICY 7.3
Develop greater investments in and support for affordable housing programs by corporations, churches, unions, foundations, and financial institutions.

Greater corporate investment in and support for affordable housing should be encouraged. Churches are an untapped source of funding and land, as are dozens of local foundations and trade unions. The City should seek to better coordinate these efforts.

IMPLEMENTATION 7.3

- The City will continue to work with local financial institutions and non-profits to provide credit opportunities to low- and moderate-income individuals and households.

- The City will continue to work with local financial institutions to meet their community reinvestment obligation under the Community Reinvestment Act.

- The Mayor's Office of Housing will continue to work to better coordinate local affordable housing efforts through the Consolidated Plan process.

HOUSING CHOICE

OBJECTIVE 8
ENSURE EQUAL ACCESS TO HOUSING OPPORTUNITIES.

Population diversity is one of San Francisco's most important assets. To retain this diversity, a variety of housing opportunities should be available. Households should be able to choose the form of tenure most suitable to their needs, from either a rental or an ownership housing stock. A variety of unit sizes is also important, so that both larger and smaller households can be accommodated in adequate numbers. Units of varied costs are necessary to provide opportunities for households of different income levels. Finally, there should be units with special features and services suitable for households with special needs.

Social and economic factors can discriminate against certain population groups and limit their housing opportunities, leading to patterns of economic and racial segregation. Families with children are constrained by the types, sizes, and cost of units available to them. Access to units suitable for larger households tends to be limited by erosion of the older housing stock and discriminatory rental practices. Standard housing units with special features for elderly and handicapped persons are also in short supply. Housing that meets the needs and is affordable for artists is also lacking. If San Francisco is to retain its economic, racial, and cultural diversity, opportunities should be expanded for population groups for whom affordability and accessibility are crucial.

POLICY 8.1

Encourage sufficient and suitable rental housing opportunities and emphasize permanently affordable rental units wherever possible.

Since approximately two-thirds of San Francisco's residents are renters, the availability of sound and affordable rental housing is of major importance, especially for the young and elderly populations and low and moderate income families who tend to rent their residence. Low vacancy rates and high rents are indicators of a continuing demand for rental housing. The City should make a concerted effort to do what is within its control to encourage the development of permanently affordable rental housing.

IMPLEMENTATION 8.1

The Mayor's Office of Housing will continue to implement affordable rental housing programs for families, seniors, and households with special needs.

- City Agencies and non-profits will continue to implement subsidy, development and land use programs that preserve existing rental housing and encourage the development of new rental housing, particularly permanently affordable rental housing. The City will ensure that all newly constructed, publicly supported affordable rental housing projects remain permanently affordable through the use of grant or financing restrictions that regulate rents and tenant incomes

- Ensure that the First Source Hiring Program is fully implemented, thus aiding people's ability to afford housing.

POLICY 8.2

Employ uniform definitions of affordability that accurately reflect the demographics and housing needs of San Franciscans.

Median income figures are reported by the U.S. Department of Housing and Urban Development for the three county area comprised of San Francisco, Marin and San Mateo counties, referred to as the Primary Metropolitan Statistical Area (PMSA). Because average incomes are higher in Marin and San Mateo than they are in San Francisco, there is an upward bias to the numbers. For example, in 2000, the PMSA median family income was $74,900. The 2000 Census, however showed that the median family income for the City and County of San Francisco was $63,545 – about 85% of the area median income for the three county area covered by the PMSA.

<table>
<tr><th></th><th>Maximum HUD Income</th><th>Goal for Average SF Incomes</th></tr>
<tr><td colspan="3">Rental Programs</td></tr>
<tr><td>Low Income</td><td>80% of AMI</td><td rowspan="2">60% of AMI</td></tr>
<tr><td>Very Low Income</td><td>50% of AMI</td></tr>
<tr><td colspan="3">Ownership Programs</td></tr>
<tr><td>Moderate Income</td><td>120% of AMI</td><td>100% of AMI</td></tr>
</table>

In order to ensure that households at lower income levels are adequately served, the city's programming for affordable housing should target households at incomes lower than 85% of median. This has been done, for example, in rental projects in which the city is providing subsidy (land or financing or both) where the affordable rental units are required to be equal to or less than 60% of the PSMA median.

IMPLEMENTATION 8.2

- The Mayor's Office of Housing administers the annual affordability standards established by HUD to the various city agencies. The Planning Department will work with the Mayor's Office of Housing and the various City agencies to periodically review these standards for adequacy.

- The City will work to adopt income limits for affordable housing programs that target assistance to households who are low income by San Francisco standards, as well as meet the HUD area median requirements.

- The Mayor's Office of Housing and the San Francisco Redevelopment Agency will continue to establish goals for programs and individual projects to ensure that, to the maximum extent feasible, they serve households at a variety of income levels, rather than just households at the top of eligible income ranges.

POLICY 8.3
Ensure affirmative marketing of affordable housing.

Periodic reporting on the composition of resident populations in various publicly supported housing projects and affordable units required as a condition of permit approval should be required to facilitate compliance monitoring. Counseling and education to maintain housing rights should be promoted.

The State and Federal Housing requirements regarding displacement prohibitions, and other restrictions where affordable housing rehabilitation or construction might impact the community, should be adopted as City policy. Available affordable housing should be advertised in multi-lingual media to ensure fair marketing practice. The City should monitor and strictly enforce these requirements. The City's Human Rights Commission protects persons from housing discrimination on the basis of race, religion, color, ancestry, age, sex, sexual orientation, gender identity, disability, place of birth, HIV/AIDS status, weight or height, families with minor children, source of income, and economic discrimination. Community forums including the Human Rights Commission should be provided in order to diffuse unwarranted opposition to affordable housing.

IMPLEMENTATION 8.3

- The City's Human Rights Commission (HRC) will continue to support and monitor the Fair Housing Access laws and advise the Mayor's Office of Housing and the Mayor's Office on Disability on issues of accessibility and impediments to Fair Housing. The

HRC will investigate and mediate discrimination complaints. When appropriate, the HRC will provide referrals to other government agencies.

- The HRC will continue to assist in resolving landlord-tenant problems in rental housing, including single room occupancy hotels.

- The San Francisco Redevelopment Agency and the Mayor's Office of Housing will continue to monitor leasing and sales of assisted housing developments to ensure compliance with affirmative marketing goals and income and rent restrictions.

- The City will continue to require periodic reporting on the composition of resident populations in publicly supported housing projects and affordable units.

- The City will continue to support counseling and educational programs on housing rights for renters.

- The City's affirmative marketing programs for affordable housing shall continue to require outreach to minority communities, including advertising in multi-lingual media.

POLICY 8.4
Encourage greater economic integration within housing projects and throughout San Francisco.

Patterns of economic segregation are evident in San Francisco. Although housing opportunities for low- and moderate-income households are available in many areas of the city, these tend to be concentrated in a few areas. Special efforts should be made to expand housing opportunities for households of lower-income levels in other areas of the city.

The affordability of housing is a citywide problem. All neighborhoods of the city should be expected to accept their fair share of affordable housing. This can be effected through inclusionary affordable housing policies and consideration of secondary units in conformance with Policy 1.8.

Private reinvestment in many areas of the city, in a process of economic gentrification, can result in the displacement of low- and moderate-income households by higher income groups. Special efforts should be made to maintain the economic diversity of these areas.

IMPLEMENTATION 8.4

- The Planning Code's Inclusionary Affordable Housing Ordinance will require all residential and live/work developments of 10 units or more to provide inclusionary housing units, or to pay the required in-lieu fee.

- The City will encourage economic integration by locating new assisted housing opportunities outside existing areas of concentration of low-income households.

POLICY 8.5
Prevent housing discrimination.

To ensure housing opportunities for all people, the City should assist in the implementation of fair housing and anti-discrimination laws. The Human Rights Commission enforces the City's Fair Housing Law and handles complaints of housing discrimination. Residential apartment owners should also be prohibited from using arbitrary income and restrictive occupancy requirements that unnecessarily exclude lower income families.

IMPLEMENTATION 8.5

- The Human Rights Commission (HRC) will continue to support and monitor the U.S. Department of Housing and Urban Development's Fair Housing Access Laws. HRC will also continue to report to the Mayor's Office of Housing and the Mayor's Office on

Disability and the Board of Supervisors with findings and policy recommendations on issues of accessibility and discriminatory barriers.

- The HRC will continue to monitor fair housing practices at housing projects including homeless shelters and transitional housing that receive public assistance.

- SFRA and MOH will continue to monitor all projects for ongoing continued compliance with income and rent restrictions.

- The City will continue to provide funding to encourage equal access to housing for people with HIV/AIDS

- The Planning Department will advocate a mix of unit sizes and types to accommodate special users including senior citizens and physically disabled persons pursuant to Planning Code Section 209.1 during the design review phase of proposed housing projects.

- City and County of San Francisco Ordinances will continue to provide fair housing protection.

- The San Francisco City and County Department of Human Services' housing unit and the Human Rights Commission will continue to investigate and mediate complaints of housing discrimination.

POLICY 8.6
Increase the availability of units suitable for users with supportive housing needs.

The City should support efforts by potential sponsors to identify and develop sites for special users and work cooperatively with social service agencies and housing providers. The City should also seek to reduce institutional barriers to development of innovative forms of housing.

In addition to the disabled, other households with special needs have difficulty finding suitable housing in San Francisco. Many large families, especially those newly immigrated to the United States, are crowded into units designed for much smaller households. New housing construction, especially those including units to accommodate large families, should be encouraged. Many of the City's elderly citizens occupy housing that is not designed to meet their special needs. Shelters and transitional housing facilities are not available in sufficient numbers to meet the needs of the city's homeless population. The mentally disabled also need housing with additional support services.

The City should take an active role to encourage the expansion of the availability of housing units suited to needs of these groups including physical design features and ancillary social and medical service facilities. When units are constructed or rehabilitated to meet the needs of special user groups and have received City support or waivers, there should be monitoring to ensure that such units continue to be occupied by the intended group.

IMPLEMENTATION 8.6

- The City will continue to encourage and support the development of specialized housing types that meet the particular needs of various user groups. This housing will be especially encouraged in transit rich areas of the City, maximizing mobility and accessibility to services.

- To reduce institutional barriers to the development of innovative forms of housing, the City will continue to support efforts of potential sponsors to identify and develop sites for special users.

- The City will continue to promote cooperative efforts between social service agencies and housing providers to develop special user housing.

- Units that are constructed or rehabilitated to meet the needs of special user groups and receive City support or waivers will be monitored to ensure that such units continue to be occupied by the intended group.

POLICY 8.7

Eliminate discrimination against households with children.

Households with children often have difficulty finding suitable housing because many landlords do not want children as tenants. The City should prohibit discrimination against children and encourage the construction of units suitable for families with children. In assisted housing, households with dependent children should have preference in rental or resale of multiple bedroom units. The City should continue enforcement of the 1987 ordinance prohibiting residential apartment owners from discriminating against families based on household size unless the Building Code does not permit occupancy of the dwelling by a family of that size.

IMPLEMENTATION 8.7

- San Francisco's Municipal Police Code under Article 1.2 prohibits housing discrimination against families with minor children. This law prohibits the most common forms of discrimination, such as restrictive occupancy standards, rent surcharges and restrictive rules.

- The City will continue to promote access to housing by families by enforcing Section 503(d) of the City's Housing Code.

POLICY 8.8

Promote the adaptability and maximum accessibility of residential dwellings for disabled and elderly occupants.

Disabled and elderly San Franciscans are less able to compete for scarce housing units, in part because they often have lower than average incomes. Most housing units are also not physically accessible. The City should take an active role in expanding the availability of units suited to households with special needs. Congregate housing with central eating facilities is an appropriate form of housing for some elderly households. In accordance with local policy and applicable law, new housing should be made accessible or adaptable to the disabled or elderly. “Accessible” means that the housing presents no physical barriers to handicapped or elderly people. “Adaptable” means housing whose entry and circulation are designed and constructed so that making relatively minor adjustments and additions rather than structural changes can make the unit fully accessible. Federally assisted housing currently requires that at least 5% of all new units are made fully accessible.

IMPLEMENTATION 8.8

- The City will continue to provide protective services to help keep seniors and disabled adults of all circumstances and income levels safe in their own homes rather than in nursing homes through the new Department of Aging and Adult Services.

- The Planning Department will continue to implement Planning Code Section 209, which allows a density bonus of twice the number of dwelling units otherwise permitted as a principal use in the district, when the housing is specifically designed for and occupied by senior citizens, physically or mentally disabled persons.

- The Department of Building Inspection will continue to enforce the standards of accessibility and adaptability for commercial facilities and new residential construction including motels, apartment buildings containing three or more dwelling units, homeless shelter and other specified building types. (Chapter 11A and 11B of the California Building Code).

- The Mayor's Office on Disability (MOD) will continue to ensure access for people with disabilities to City programs and facilities.

- The Mayor’s Office of Housing will continue to review affordable housing development programs and projects to ensure that these projects provide not only the accessibility required by federal, state and local law, but also the greatest accessibility feasible.

POLICY 8.9

Encourage the provision of new home ownership opportunities through new construction so that increased owner occupancy does not diminish the supply of rental housing.

Since the demand for rental housing continues to significantly exceed supply and less than 8% of San Francisco residents can afford the median home cost, the development of new home ownership opportunities should rely primarily on new construction and not the conversion of rental housing to home ownership.

IMPLEMENTATION 8.9

- The City, through the Section 1302(c)2 of the San Francisco Subdivision Code, will continue to promote homeownership opportunities for existing tenants and prevent displacements by requiring a high degree of tenant intent to purchase their rental units as a condition of approval of applications for residential conversion.

POLICY 8.10

Ensure an equitable distribution of quality board and care centers, and adult day care facilities throughout the City.

Older, larger buildings, and vacant commercial spaces, may be suitable for conversion to group housing. Because of the availability of certain types of residential buildings and services in certain parts of the City, board and care and adult day care facilities have tended to become concentrated in those areas. Applications for new facilities may continue to reinforce these concentrations unless they are carefully reviewed. It is desirable that group housing and board and care homes be distributed throughout the City so that people are offered a choice of locations and over-concentration of facilities in particular neighborhoods is avoided. However, the Federal fair housing laws prohibit limitations on board and care facilities and group homes to the extent that these limitations diminish housing opportunities for disabled persons and families with children. Adult day care facilities that allow disabled or elderly persons to live at home but receive daily support should be located close to their clients. In reviewing applications for board and care homes and adult day care facilities, the following factors should be among those evaluated:

- In the case of day care facilities, proximity to clients' residences
- Accessibility to recreational facilities and open space.
- Proximity to commercial areas and shopping.
- Proximity to community services.

IMPLEMENTATION 8.10

- The Planning Department will continue monitoring group housing to ensure a distribution of quality board and care and adult day care facilities
- The Planning Department will explore the potential for expanding as-of-right group housing and group housing definitions in Sections 209.2 and 216 "Other Housing" in the neighborhood commercial district controls. The Mayor's Office of Housing will continue to investigate creation of a loan program to expand housing provided by board and care operators.

OBJECTIVE 9
AVOID OR MITIGATE HARDSHIPS IMPOSED BY DISPLACEMENT

POLICY 9.1
Minimize the hardships of displacement by providing essential relocation services.

Because of the economic and social hardships involved when a household is forced to move, and the difficulty of funding replacement housing at comparable rents, every effort should be made to minimize displacement.

Private demolition of housing can cause particular hardships because of the absence of relocation assistance programs for displaced households. Property owners should provide assistance in finding suitable relocation housing if any lower-income households are to be displaced. Property owners should inform tenants at the earliest possible date of any proposed demolition plans and should arrange for counseling assistance for the displaced households. Owners should not be permitted to demolish existing housing units until efforts have been made to assist tenants in obtaining relocation housing.

When displacement does occur as a result of public actions, uniform relocation services including counseling, locating replacement housing, and moving expenses, should be provided regardless of whether the displacement is caused by federal, state, or locally funded activities. In the case of privately funded developments where displacement occurs, the developer should be requested to provide such services.

IMPLEMENTATION 9.1

- When providing financial assistance for affordable housing development or rehabilitation, MOH and SFRA will continue to provide assistance required by the provisions of the federal Uniform Relocation Act (URA) or the California state relocation law.

- The City will continue to work for a minimum of one to one replacement of all housing lost, regardless of cause.

POLICY 9.2
Offer displaced households the right of first refusal to occupy replacement housing units that are comparable in size, location, cost, and rent control protection.

Persons in private or publicly owned housing displaced by fire and other acts should be restored to their previous residential position to the maximum extent feasible. Where existing units are converted to condominium or cooperative ownership, existing tenants should be given opportunities to purchase converted units.

IMPLEMENTATION 9.2

- The Mayor's Office of Housing (MOH) and the San Francisco Redevelopment Agency will continue to provide tenants displaced during rehabilitation financed by each agency with the right to return to the unit or a comparable unit after the work is completed if they meet applicable eligibility criteria.

- MOH will administer affordability restrictions on the stock of units made affordable under the Condominium Conversion Program.

HOMELESSNESS

OBJECTIVE 10

REDUCE HOMELESSNESS AND THE RISK OF HOMELESSNESS IN COORDINATION WITH RELEVANT AGENCIES AND SERVICE PROVIDERS.

Homelessness has grown to a scale unprecedented in the United States since the 1930s. The legacy of the 1980s that has regarded temporary shelter as an adequate response to homelessness should be overcome. Shelters are not an acceptable alternative to decent, affordable housing. While the City should not relax its commitment to offering shelter to anyone who would otherwise be forced to live in streets, parks and doorways, the vision and the overall direction should remain fixed on the goal of creating and preserving low-cost housing, jobs and job training programs, and the necessary health and social support services that enable people to live with the greatest degree of independence possible. Such services for the homeless should be provided in a multi-lingual and multicultural context where needed. It is critical that San Francisco and other cities begin to develop a regional approach to homelessness in the Bay Area. Increased state and federal support is needed for regional efforts to succeed.

POLICY 10.1

Focus efforts on the provision of permanent affordable and service-enriched housing to reduce the need for temporary homeless shelters.

For a permanent solution to homelessness, permanent affordable housing must be developed. Although shelters can provide an alternative to sleeping on the streets, these do little to address the underlying problem. The development of new housing connected to services will best address this need.

IMPLEMENTATION 10.1

- City agencies including the Mayor's Office of Housing, the Department of Human Services, the Department of Public Health, the San Francisco Housing Authority, and the San Francisco Redevelopment Agency will prioritize the development of permanent supportive housing.

- The Department of Human Services and the Department of Public Health will continue to partner with capital funding agencies to develop supportive housing.

- Existing low cost housing will be preserved wherever possible.

- The Residential Hotel Unit Conversion and Demolition Ordinance will continue to benefit the public by minimizing the loss of residential hotel units through conversion and demolition.

- The Department of Human Services (DHS) will continue to administer the Shelter Plus Care program, which provides rental subsidies to homeless individuals and families with disabilities so that they may access and maintain permanent supportive housing. The City should collaborate in efforts at the federal level to expand resources for this program.

- DHS will continue to fund non-profit agencies to provide on-site supportive services for formerly homeless individuals and families living in supportive housing. DHS will coordinate development of these programs with the Mayor's Office of Housing and the San Francisco Redevelopment Agency, which provide funding for construction and rehabilitation of affordable housing, including supportive housing. Additional programs will be developed as funding availability allows.

- DHS will continue to operate its Master Lease Program in order to provide low-cost, safe, permanent housing to homeless individuals leaving emergency shelters. The capacity of this program should be expanded.

- DHS will continue the collaboration started with the San Francisco Housing Authority in the formation of the Joint SFHA/DHS Workgroup to resolve priorities issues for clients of both agencies.

POLICY 10.2

Aggressively pursue other strategies to prevent homelessness and the risk of homelessness by addressing its contributory factors.

Measures that go beyond shelter are needed to address the root causes of homelessness. These include stable sources of income and health and social support services for short or long periods of time to assist people with special needs to live with the greatest degree of independence possible.

IMPLEMENTATION 10.2

- The Mayor's Office of Housing, the San Francisco Housing Authority and the San Francisco Redevelopment Agency will continue to integrate job training and other programs that support low- and moderate-income families into its affordable housing development.

- The Department of Human Services' Eviction Prevention and Rental Assistance program will continue to work cooperatively with non-profits to help low- and very low-income individuals and families at risk of homelessness to maintain their housing by paying past due rent to avoid eviction, and offering legal services, counseling, and other supportive services. The Rental Assistance Fund helps very low-income San Franciscans in a housing crisis. Eligible individuals and families can apply for grants to pay overdue rent to prevent eviction, or apply for a security deposit to move into permanent housing.

- DHS will continue to fund non-profit contractors to provide after-care services for homeless families once they are housed to help them maintain housing, become stable and prevent recurring episodes of homelessness.

POLICY 10.3

Improve coordination among emergency assistance efforts, existing shelter programs, and health care outreach services.

While the emphasis should be on provision of permanent housing, the City should provide an emergency shelter program that provides temporary shelter and links homeless people to more comprehensive services. The City should also continue to support the Department of Public Health's Direct Access to Housing Program, which has helped households transition from shelters into permanent homes.

Homeless people often have difficulty gaining access to the health care system, whether it is because the multiplicity of problems they experience overwhelms health care providers, their behavior or appearance makes them unwelcome, or they themselves regard health care as low on the survival priority list. There is need for outreach services and multi-service centers that provide health care and other services to the homeless, in a manner that gains their trust and with a goal of integrating them into the larger health care and services systems.

IMPLEMENTATION 10.3

- The City will continue to develop resource centers to provide information and survival needs for the homeless.

- The City will continue to operate its Homeless Services Team, which conducts outreach to homeless persons living on the street with the goal of assisting the most difficult-to-reach homeless persons to access available appropriate services, benefits, health care and housing. The Department of Human Services (DHS) will work to coordinate its street outreach efforts with other such outreach programs operated by the Department of Public Health.

- The City will develop and implement a Homeless Management Information System (HMIS) leading to improved coordination of services.

- The DHS's Division of Housing and Homeless Programs will continue to fund a wide range of services that are part of a comprehensive, inter-agency, citywide approach to help homeless individuals and families achieve the highest level of self-sufficiency of which they are capable.

- DHS will continue to operate their program Connecting Point as a centralized intake and service referral system for families.

POLICY 10.4
Facilitate childcare and educational opportunities for homeless families and children.

Homeless families, just like other families, require a broad variety of childcare programs to meet their particular needs. For some, the need is for developmentally appropriate, well-equipped spaces that offer privacy, enabling families an opportunity to interact and play with their children. For other parents, who may need time to participate in job training, or to look for work or run errands, the need is for convenient drop-in childcare program. In other instances, the need may be for licensed childcare programs that serve the special needs of these children.

IMPLEMENTATION 10.4

- The Department of Human Services will continue to implement the California Work Opportunity and Responsibility to Kids (CalWORKs) program to serve adults with dependent children where participants receive financial support and a full array of services for 18–24 months as they work with an Employment Specialist to follow an individualized Employment Plan.

HOUSING DENSITY, DESIGN, AND QUALITY OF LIFE

~~OBJECTIVE 11~~

~~IN INCREASING THE SUPPLY OF HOUSING, PURSUE PLACE MAKING AND NEIGHBORHOOD BUILDING PRINCIPLES AND PRACTICES TO MAINTAIN SAN FRANCISCO'S DESIRABLE URBAN FABRIC AND ENHANCE LIVABILITY IN ALL NEIGHBORHOODS.~~

~~Housing quality involves not only the physical condition of the housing structure itself but also the condition of the surrounding neighborhood and the adequacy of its amenities, facilities, and services. Quality urban housing can exist only in full service neighborhoods. New housing development must address these issues.~~

~~POLICY 11.1~~

~~Use new housing development as a means to enhance neighborhood vitality and diversity.~~

~~New in-fill housing development should be compact, mixed-use, mixed income, and have a mix of unit sizes. Major multi-family housing projects that accommodate non-residential uses such as neighborhood serving retail, childcare or after school facilities, or even institutional uses such as a public library, should be encouraged and supported. Minimum density requirements and~~

~~maximum parking standards should be used to encourage a mix of unit sizes in areas well served by transit and neighborhood retail.~~

~~IMPLEMENTATION 11.1~~

- ~~The new Land Use Element will identify in-fill sites appropriate for mixed-use residential projects. Appropriate neighborhood serving retail, public facilities and supportive amenities should be encouraged.~~

- ~~The City will continue to implement its policy that the design of all housing sites and related amenities make a positive contribution to surrounding public space and to overall neighborhood vitality.~~

- ~~The Planning Department will encourage historic preservation and adaptive reuse of older buildings to enhance neighborhood vibrancy.~~

POLICY 11.2
Ensure housing is provided with adequate public improvements, services, and amenities.

Many factors add to neighborhood livability, including the quality of schools, the availability of quality childcare at affordable prices, the effectiveness of police and fire services, access to open space and recreational opportunities, and access to transit. The large number of single parent and two working parent households makes the provision of childcare facilities an important component of family housing developments. Regular maintenance of streets and sidewalks, provision of street trees, and protection of residential areas from excessive traffic, are also important to neighborhood life. To provide its residents with a quality living environment, the City should address all of these factors.

IMPLEMENTATION 11.2

- All City of San Francisco departments and agencies will continue to contribute to the strengthening of neighborhood livability by providing and improving public amenities and services.

- Each City department will continue to seek funding from Federal, State, local and private sources in order to improve services.

POLICY 11.3

Encourage appropriate neighborhood-serving commercial activities in residential areas, without causing affordable housing displacement.

Certain non-residential uses are desirable and appropriate in residential areas. For example, small pedestrian-oriented grocery stores and other convenience shops can meet frequent and recurring needs of residents without disrupting the residential character of the area. On the other hand, other non-residential uses are noisy, unattractive, or generate excessive traffic and therefore would be undesirable in residential areas.

Commercial uses should be allowed in residential areas only if they meet the following criteria:

- The use is primarily pedestrian-oriented.

- The use serves the needs of the immediate residential neighborhood and does not draw significant trade from outside the neighborhood.

- The use does not displace a unit suitable for residential occupancy.

- The use does not disrupt or detract from the livability of the surrounding neighborhood.

- Suitable locations in immediately adjacent neighborhood commercial areas do not exist.

- The design of the building is in keeping with the established residential character of the area, and all signs are carefully regulated.

- Truck traffic servicing the use is minimized, and truck delivery hours are restricted.

Community services such as childcare centers are also particularly appropriate in residential areas, even though they may draw from a larger area and may not be primarily pedestrian-oriented. Non-residential uses, if essential to the preservation of a landmark building, could also be permitted if the specific use is compatible with the surrounding environment.

IMPLEMENTATION 11.3

- The Planning Department is studying the construction methods and design components of well-designed neighborhood serving commercial areas. This will result in revised Design Guidelines to further enhance these areas. Areas of particular interest will be: appropriateness of business type; building materials and design; public amenities; open space and public art; street, sidewalk and public transportation connections and circulation patterns; neighborhood safety; environmental considerations; and site design.

- Each project will be considered on its own merit and on its ability to make a positive contribution to the neighborhood and the City.

POLICY 11.4

Avoid or minimize disruption caused by expansion of institutions, large-scale uses and auto-oriented development into residential areas.

The expansion needs of institutions often conflict with efforts to preserve and protect the scale and character of residential neighborhoods. Large educational, religious, and medical institutions attract people from outside a neighborhood, aggravating traffic and parking problems. Institutional buildings also tend to be larger in scale and more intensely used than surrounding residential buildings. In addition, institutional expansion often requires removal of housing and displacement of residents.

To minimize the disruption caused by expansion of large institutions, the City should carefully review expansion plans. The needs of adjacent residential areas for housing, on-street parking and safe, quiet streets should be considered, in addition to the needs of the institution. Educational and medical institutions should be required to develop and submit master plans to the City, before the City reviews any specific expansion requests. Such a master plan should define long-term and short-range development plans of the institution. Early review of institutional development plans will permit exploration of alternate ways to address the needs of the institution in order to minimize potential conflicts with the residential area.

IMPLEMENTATION 11.4

- The City will continue to require large educational and medical institutions to develop and submit Institutional Master Plans as required by Section 304.5 of the Planning Code.

- The City will work to require institutions to provide housing for workers and students.

- Neighborhood impact will be reduced by building at the appropriate scale, addressing traffic and transportation impacts, and by carefully considering neighborhood design patterns.

~~**POLICY 11.5**~~

~~**Promote the construction of well-designed housing that enhances existing neighborhood character.**~~

~~Residents of San Francisco should be able to live in well-designed housing suited to their specific needs. To ensure that housing provides quality living environments and complements the character of the surrounding neighborhood, the following general design and amenity guidelines should be applied in evaluating new residential developments and alteration of existing buildings:~~

~~Exterior Appearance~~

- ~~Design new and substantially altered buildings in a manner that conserves and protects neighborhood character (See *Residential Design Guidelines*, Department of City Planning, 2003 for more specific guidelines and illustrations.)~~

~~Recreation/Open Space~~

- ~~Provide adequate on-site usable open space and relate the type, amount and location of open space to the types of households expected to occupy the building. (See Figure 9, "Residential Open Space Guidelines" in the Recreation and Open Space Element, for more specific guidelines.)~~

~~Facilities~~

- ~~In larger projects include needed amenities such as storage, laundry, community rooms, and recycling, and adopt green building practices to the maximum extent possible.~~

- ~~Provide sites for childcare facilities to serve residents of the immediate vicinity if such facilities do not exist nearby, or if nearby facilities are at or near capacity.~~

- ~~Provide sites for convenience shopping facilities to serve the immediate vicinity if such facilities do not exist nearby.~~

~~Security~~

- ~~Incorporate concepts of security in the design of the building, especially in the number of units per entrance, sense of personal space and ability of the residents to effect self-policing of the grounds and immediate surroundings. Also, provide adequately lit unit address numbers that are easily read from the street or walkways.~~

~~Art Work~~

- ~~Incorporate artwork in larger buildings.~~

~~Subdivisions and Planned Unit Developments~~

- ~~For larger subdivisions and planned unit developments, provide a lot layout and pattern that integrates well with the surrounding urban fabric and create a street pattern that ties into the surrounding streets.~~

- ~~Create a street pattern which ties into surrounding streets.~~

- ~~Avoid creating dead-end streets and cul-de-sacs where it is possible to create through streets.~~

- ~~On wide blocks, create mid-block lanes that function as public streets.~~

- ~~Create pedestrian passageways to provide convenient circulation within the project and convenient connections to areas outside the project.~~

- ~~Create lot or building patterns that orient the fronts of buildings to, and create multiple building entries from the street.~~

- ~~Avoid creating overly wide streets. Provide sidewalks wide enough to accommodate street trees.~~

- ~~Underground utilities.~~

~~IMPLEMENTATION 11.5~~

- ~~The Planning Department will continue to study the construction methods and design components of well-designed housing that enhances the existing urban fabric of San Francisco.~~

- ~~The Planning Department will continue to use the Residential Design Guidelines when reviewing projects.~~

- ~~Each project will be considered on its own merit and on its ability to make a positive contribution to the immediate neighborhood and the City.~~

~~POLICY 11.6~~

~~Employ flexible land use controls in residential areas that can regulate inappropriately sized development in new neighborhoods, in downtown areas and in other areas through a Better Neighborhoods type planning process while maximizing the opportunity for housing near transit.~~

~~Increased allowable densities should not detract from established neighborhood characteristics. In many cases, design and efficient site uses can make use of maximum housing densities while keeping resulting units affordable and compatible with neighboring structures.~~

~~IMPLEMENTATION 11.6~~

- ~~The City will continue to promote increased residential densities in areas well served by transit and neighborhood compatible development with the support and input from local neighborhoods.~~

~~POLICY 11.7~~

~~Where there is neighborhood support, reduce or remove minimum parking requirements for housing, increasing the amount of lot area available for housing units.~~

~~San Francisco first imposed residential parking requirements in the 1950s, when prevailing notions assumed that cars were becoming the primary way of getting around and automobile parking should be provided accordingly. This 1:1 parking requirement generated traffic and took up valuable space, but created a distinct neighborhood character in the western part of the City. One parking space reduces the amount of housing a parcel can accommodate by as much as 25%. Building parking space also adds $20,000 to $50,000 per parking space to the cost of housing construction.~~

~~Enforcing one off-street parking space for each new dwelling unit is essentially a suburban practice and diverges from the City's tradition of compact, urban, walkable places in the older neighborhoods. Much of San Francisco was built before the advent of the automobile and most places are easily accessible by foot or public transit.~~

~~IMPLEMENTATION 11.7~~

- ~~The Planning Department will work to reduce parking in older neighborhoods and in other areas through a Better Neighborhoods type planning process with the support and input from local neighborhoods.~~

~~POLICY 11.8~~

~~Strongly encourage housing project sponsors to take full advantage of allowable building densities in their housing developments while remaining consistent with neighborhood character.~~

~~The Planning Department, with housing project sponsors, should explore and encourage project configurations that take full advantage of allowable building densities. Department support~~

~~should go beyond technical assistance and include coordinated and timely neighborhood outreach and accelerated processing. The Department should strongly support projects that creatively address residential parking and open space requirements, resulting in higher densities with a full range of unit sizes.~~

~~IMPLEMENTATION 11.8~~

- ~~The Planning Department, with the support and input from local neighborhoods, study the impacts of reduced parking and private open space provisions and will consider revising the Planning Code accordingly.~~

- ~~The Planning Department will work with housing advocates to educate residents on the benefits of traditional urban neighborhood supporting housing densities.~~

~~POLICY 11.9~~

~~Set allowable densities and parking standards in residential areas at levels that promote the City's overall housing objectives while respecting neighborhood scale and character.~~

~~In setting allowable residential densities in established neighborhoods, consideration should be given to the prevailing building type in the surrounding area so that new development does not detract from existing character. Established architectural characteristics should be respected. Design and efficient site uses can make use of maximum allowable densities while keeping resulting units affordable and compatible with neighboring structures. In areas where an urban scale and character is yet not established, densities should be set at levels that support transit and neighborhood amenities that are enjoyed by the City's more established neighborhoods.~~

~~**IMPLEMENTATION 11.9**~~

- ~~The City, through a Better Neighborhoods type planning process, will continue to work to improve and enhance housing with the goal of more housing and vital, attractive transit served neighborhoods.~~

- ~~The Planning Department will continue to employ Residential Design Guidelines and implement the General Plan to ensure new projects are compatible with established neighborhoods.~~

- ~~The new Land Use Element will, within the framework of a comprehensive citywide action plan (CAP), identify areas where higher densities are appropriate.~~

- ~~The updated Urban Design Element will reconcile the City's established and well formulated urban design principles with the City's housing objectives.~~

POLICY 11.10

Include energy efficient features in new residential development and encourage weatherization in existing housing to reduce overall housing costs and the long-range cost of maintenance.

Simple energy saving features such as site orientation and window placement can optimize passive solar heating and natural daylight at little or no additional cost. Often, features that add to the initial cost of a structure are highly cost-effective in terms of the life cycle or operating costs. For example, weatherization of existing housing can usually pay for itself in a short time, resulting in lower utility bills and housing costs. These approaches should be pursued.

IMPLEMENTATION 11.10

- The Department of Building Inspection, Pacific Gas and Electric Company (PG&E), and the Building Science industry will continue environmental education programs for the general public, project sponsors, and builders.

- The Mayor's Office of Housing will continue to provide funding for the physical and financial preservation of non-profit owned affordable rental housing that requires energy efficiency improvements in order to protect its affordability.

- The Department of Building Inspection will continue to enforce Title 24 energy code requirements. In addition to Title 24, residential buildings will be also required to comply with the Residential Energy Conservation Ordinance (RECO). RECO affects all residences at time of sale or at time of meter conversion, major improvement or condominium conversion.

REGIONAL AND STATE HOUSING NEEDS

OBJECTIVE 12
STRENGTHEN CITYWIDE AFFORDABLE HOUSING PROGRAMS THROUGH COORDINATED REGIONAL AND STATE EFFORTS.

Housing is a regional and state concern. Problems such as the inability of large numbers of people to afford decent housing, inequities and discrimination in the housing market, and the inadequacy of public resources cross the boundaries of local jurisdictions and cannot be addressed solely on a local level. Region-wide strategies are needed. Investment decisions made by the private sector are rarely confined to the limits of single governmental jurisdictions — broader housing market areas are considered. A strategy dealing with housing problems in the

Bay Area must therefore involve a regional approach. Effective solutions to housing problems in the Bay Area can be developed only if all local jurisdictions' agencies and organizations dealing with housing in the Bay Area coordinate their activities.

Although San Francisco will always maintain an overall jobs/housing imbalance because it has historically developed as an employment center, the City must undertake efforts to balance future employment growth and the supply of housing. In particular, City agencies should coordinate strategies to meet the housing goals set forth by the Association of Bay Area Governments (ABAG) and adopted as part of this Element, as well as to address housing needs already present even without job growth. To meet these goals, San Francisco will have to absorb a greater percentage of new workers and increase the housing opportunities for workers currently commuting to the City.

POLICY 12.1

Work with localities across the region to establish a better relationship between economic growth and increased housing needs.

San Francisco is part of the larger regional economy of the Bay Area and economic decisions made by one community often affect other communities in the region. Thus decisions made by some cities to limit commercial or residential growth impact other cities in the region. Efforts should be made to balance employment and housing growth within the region. Aggregated together, current local government development policies will not house the labor supply needed for jobs currently projected for the region. If these policies remain unchanged, housing must be provided outside the region. This would extend commutes, or regional job growth will be curtailed, or both.

The Association of Bay Area Governments has established a regional goal to house within the region up to 50% of the difference between the projected growth in Bay Area jobs and the growth in the region's labor supply. To reduce the jobs-housing imbalance in the region by that amount by 2006, almost 231,000 additional housing units are needed within the region.

IMPLEMENTATION 12.1

- The City will continue to work with the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) to shape an implementation plan that meets regional housing, transportation, and job needs.

- The City will continue to support new state and federal funding for projects that coordinate the region's need for jobs and housing well served by the transportation system.

- The State should offer incentives in the form of a larger allocation of a regional property tax sharing pool in exchange for building mixed use affordable residential near transit hubs.

POLICY 12.2

Support the production of well-planned housing regionwide that address regional housing needs and improve the overall quality of life in the Bay Area.

New residential development and rehabilitation of existing housing should be planned to conserve open space and to take advantage of the availability of employment opportunities, efficient transportation systems, and community services. San Francisco should take an active role in promoting quality new housing development in the Bay Area in areas where adverse impacts on the environment will not be generated and the use of public transit will be enhanced. The City should also play a greater role in ensuring local and regional growth management strategies are coordinated and complementary.

IMPLEMENTATION 12.2

- The San Francisco Redevelopment Agency (SFRA) will continue to serve as the lead agency and administrator of the HOPWA Program on behalf of the San Francisco

Eligible Metropolitan Statistical Area (EMSA), which includes San Francisco, San Mateo and Marin Counties.

- The City will continue to support the production of well planned affordable and market rate housing, improve the jobs/housing balance, and improve public transportation options.

- The City will continue to support efforts to make the California Environmental Quality Act (CEQA) more supportive of transit oriented and mixed use residential development.

- The City will continue to work with the Metropolitan Transportation Commission (MTC) to coordinate transportation information regionwide.

- The City will continue to support efforts for rail line extension funding based on zoning that requires regional mixed-use development and jobs/housing balance criterion.

- The City will continue to support Jobs-Housing Balance Incentive Grants awarded to cities that produce housing in areas with fast growing employment and support additional bonuses awarded for multi-family housing, affordable housing, and in-fill development.

- The City will continue to support congestion pricing bridge tolls during peak commute periods with additional fund generation allocated for public transportation improvements.

- The City will continue to support efforts to develop and improve transit to large surplus public land and redevelopment areas such as Treasure Island, Alameda Naval Air Station or Mare Island in Vallejo, where high-density housing and new jobs and services could be built.

- The City will continue to support efforts to use state or regional funds to give housing subsidies or income tax credits to employees who live close to their workplaces similar to subsidies for police and firefighters in some cities.

- The City will continue to support the use of State or regional funds for transit passes or to increase transit-related income tax credits to encourage employees to commute to work via transit.

- The City will continue to support efforts to charge consumers the full cost of parking to promote transit use. Additional funds, generated by employee parking fees, could be used to improve public transportation and fund incentive programs for non-driving employees.

- The City will continue to support the Metropolitan Transportation Commission's (MTC) Transportation for Livable Communities (TLC) program, which provides funding for planning and construction of projects that help create walkable, transit-oriented and livable communities.

POLICY 12.3

Encourage jurisdictions throughout the Bay Area to recognize their share in the responsibility to confront the regional affordable housing crisis.

Local communities throughout the Bay Area should accept responsibility for housing families of all income levels. At the present time, most of the region's subsidized housing for low- and moderate-income households is concentrated in the central cities, including San Francisco. Housing opportunities for low- and moderate-income households should be available throughout the region, and all localities in the Bay Area should provide their fair share of such housing. The public and the private sector should share responsibility.

State law allows joint exercise of powers between jurisdictions that enable entrepreneurial action at a larger-than-local scale. Cooperative efforts among localities, as well as joint efforts with state agencies, extend resources available for affordable housing.

IMPLEMENTATION 12.3

- The City will continue to support the following efforts: State and Federal funding allocations tied to individual communities' commitment to provide their fair share of affordable housing production, particularly in transit rich areas; linking State funds to a community's fulfillment of their fair share of regional affordable housing needs; and reducing fiscal incentives to produce uses other than housing by regional sales and property tax sharing.

- To take advantage of a city's ability to use Joint Power and other collective and cooperative arrangements to make more effective use of financial resources for housing production, the City will encourage joint powers approaches to housing finance where joint powers agreements will enhance the production of affordable housing.

POLICY 12.4
Foster educational programs across the region that increase public understanding of the need for affordable housing and generate support for quality housing projects.

The City should help develop and conduct region wide public awareness programs to generate greater public support for affordable housing production. Workshop modules could also be crafted to explain regional land use patterns and its impacts on livability and help demystify urban densities.

IMPLEMENTATION 12.4

- The City will continue to support the efforts of non-profits like Non-Profit Housing Association, Urban Ecology, Greenbelt Alliance, and Architects, Designers, and Planners for Social Responsibility, as well as regional government organization such as the Association of Bay Area Governments and the Metropolitan Transportation Commission to conduct community workshops, and research and publish information that promotes understanding of relationships between economic growth and increased housing needs.

- The City will continue to support public awareness programs of professional associations such as the Urban Land Institute, American Planning Association, the American Institute of Architects, and the American Society of Landscape Architects, in their efforts to underscore the importance of linking jobs, housing and other uses by efficient transportation throughout the region.

POLICY 12.5

Support the State of California in developing and implementing state affordable housing plans and programs.

With the decreasing level of Federal support for housing programs, the administrative and financial powers of the State become especially critical. The state legislature has placed an affordable housing bond proposal on the statewide ballot in 2002, but there also needs to be a long-range plan for affordable housing and a clearer articulation of the State's role in funding and facilitation of affordable housing programs.

IMPLEMENTATION 12.5

- The City will continue to support State and regional efforts to establish additional grant programs to aid in the preparation of plans and environmental documents for mixed-use residential and transit oriented projects responding to regional needs.

- The City will advocate for increased and equitable State and Federal fund allocations for affordable housing production.

Appendix A-5:

Alternative C- Additional Housing Element Concepts

Alternative C: Additional Housing Element Concepts

Alternative C includes concepts for housing strategies that more aggressively encourage attainment of the 2007-2014 RHNA. This alternative explores five concepts, as follows:

1. Allow for limited expansion of allowable building envelopes for those who provide family-size units in onsite affordable housing.
2. Requirement for development to fully build to the allowable building envelope under zoning in locations that are directly on the Rapid transit network lines identified in the Transit Effectiveness Project (TEP), as shown in Figure X.
3. Height and/or density bonus for development that exceeds affordable housing requirements in locations that are directly on the Rapid transit network lines identified in the TEP.
4. Height and/or density bonus for 100% affordable housing in all zoning districts except in RH-1 and RH-2 zones.
5. Granting of administrative variances (i.e. over-the-counter) that waive off-street parking requirements for additional units if the development is:
   a) In an RH-2 zoning district (or greater),
   b) In an area where additional curb cuts would further exacerbate on-street parking deficits, such as in Residential Parking Program areas, or
   c) On a Transit Preferential Street.

Appendix B – Traffic Study Scope of Work

SAN FRANCISCO
PLANNING DEPARTMENT

TRANSPORTATION STUDY
SCOPE OF WORK
ACKNOWLEDGEMENT AND APPROVAL

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Date: October 29, 2009

Transmittal To: TJKM Transportation Consultants

The proposed scope of work for the San Francisco Housing Element is herby:

☐ Approved as submitted

☒ Approved as revised and resubmitted

☐ Approved subject to comments below

☐ Not approved, pending modifications specified below and resubmitted

Signed: Greg Riessen ____________ Jessica Range ____________
Transportation Planner   Environmental Review Planner
Greg Riessen   Jessica Range

Note: A copy of this approval and the final scope of work are to be appended to the transportation study. The Department advises consultants and project sponsors that review of the draft transportation report may identify issues or concerns of other City agencies not addressed in the scope of work hereby approved, and that the scope of work may need to be modified to accommodate such additional issues.

San Francisco Housing Element

Transportation Impact Study Scope of Work

Task 1. Project Description

TJKM will describe the Proposed Project in the Project Description section of the transportation study report. This section will include a brief description of the Proposed Project, which consists of the following five scenarios:

- No Project Alternative
- 2004 Housing Element Alternative
    a. Abbreviated 2004 Housing Element Alternative Variant
- 2009 Housing Element Alternative
- Modified 2009 Housing Alternative

The Project Description will provide a table and/or a map depicting each of the above scenarios.

Task 2. Data Collection

TJKM will gather readily available information, including:

- Aerial photos and maps (in GIS format if available);
- All potentially useful previous transportation studies, including studies conducted for neighborhood plans for Balboa Park, Central Waterfront, Market and Octavia, South of Market, South Bayshore, Visitacion Valley, and Eastern Neighborhoods;
- Map of existing and proposed bicycle routes;
- Transit Schedule and Map, obtained from SFMTA; and
- Proposed City of San Francisco Housing Element amendments

Traffic: TJKM has worked closely with City staff to compile a list of 60 study intersections that will be included in the level of service (LOS) analysis. There are existing traffic counts at a number of the study intersection. TJKM will work with City staff to obtain counts for those intersections for which data is not available or that were counted before 2006. TJKM will conduct weekday (Tuesday, Wednesday, or Thursday) PM peak period (4:00 pm – 6:00 pm) intersection turning movement counts to complete the dataset. Turning movement counts will include pedestrian and bicycle volumes for the study intersections. TJKM will summarize the existing conditions LOS results in a table and figure, which will identify the critical movements at each intersection. The following 60 intersections in Table 1 have been identified for LOS analysis:

Table 1: Traffic Study Intersections	
1. Geary Blvd/25th Ave	2. Geary Blvd/Park Presidio Ave
3. Geary Blvd/Masonic Ave	4. Geary Blvd/Gough St
5. Geary Blvd/Franklin St	6. Geary Blvd/Van Ness Ave
7. Lombard St/Richardson St	8. Lombard St/Van Ness Ave
9. Stockton St/Broadway	10. The Embarcadero/Broadway
11. The Embarcadero/Washington St	12. The Embarcadero/Harrison St
13. 1st St/Market St	14. 1st St/Mission St
15. 1st St/Harrison St	16. 2nd St/Folsom St
17. 2nd St/Bryant St	18. 3rd St/King St
19. 4th St/King St	20. 4th St/Harrison St
21. 4th St/Bryant St	22. 6th St/Market St
23. 6th St/Mission St	24. 6th St/Brannan St
25. Market St/Van Ness Ave	26. Mission St/Van Ness Ave
27. 10th /Brannan/Potrero/Division	28. 9th St/Market St
29. 10th St/Howard St	30. 16th St/Mission St
31. 16th St/Potrero St	32. 16th St/3rd St
33. Market St/Octavia St	34. Market St/Guerrero St/Laguna St
35. Mission St/Otis St/Division St	36. Fell St/Divisadero St
37. 15th St/Market St/Sanchez St	38. Fulton St/Stanyan St
39. Lincoln St/19th Ave	40. Taraval St/19th Ave
41. Sloat Blvd/19th Ave	42. Winston St/19th Ave
43. Juniperro Serra Blvd/19th Ave	44. Juniperro Serra Blvd/Ocean Ave
45. Phelan Ave/Ocean Ave/Geneva St	46. Lake Merced Blvd/Brotherhood Way
47. Mission St/Geneva St	48. Mission St/Silver Avenue
49. Mission Street/Ocean Ave	50. Sunnydale Ave/Bayshore Blvd
51. Gilman St/Paul Ave/Third St	52. Industrial/Bayshore/Alemany
53. Third St/Palou Ave	54. Third St/Evans Ave
55. Third St/Cesar Chavez St	56. Evans Ave/Cesar Chavez St
57. Bryant St/Cesar Chavez St	58. Mission St/Cesar Chavez St
59. Mission St/24th St	60. San Jose Ave/Randall St

Transit: TJKM will use SFMTA maps to show bus routes within the City. TJKM will document existing local and regional transit service, including general service characteristics. A description of transit ridership and capacity at screenlines for Muni and regional transit carriers will be discussed and presented in a table format. Existing transit lane restrictions will also be discussed. The ridership and capacity data for the existing Muni routes within the study area will be based on the most recent Transit Effectiveness Program (TEP) data.

Bicycles: TJKM will prepare a map showing Class I, II and III existing and proposed bicycle facilities as described in the San Francisco Bicycle Plan, and summarize citywide bicycle statistics. TJKM will qualitatively describe bicycle conditions in the City.

Pedestrians: TJKM will describe existing pedestrian conditions and summarize proposed pedestrian improvements as described in the proposed San Francisco Better Streets Plan. TJKM will qualitatively describe pedestrian conditions in the City.

Parking: TJKM will describe the San Francisco Residential Parking Permit program, and will present a map showing the location of RPP zones in the city. TJKM will qualitatively describe existing parking conditions in the City.

Task 3. Determine Existing Conditions

Based on the findings from Task 2, TJKM will describe existing street traffic, transit, bicycle, pedestrian and parking conditions. This section will be sufficient in format and content to form the basis for the transportation section of the "Existing Setting" and "No Project Alternative" sections of the EIR. The Transportation Impact Study will include the following:

- A base map describing street designations, street names, and traffic flow directions for major thoroughfares;
- Intersection Level of Service (LOS) conditions for the weekday p.m. peak hour, using the *2000 Highway Capacity Manual* Operations methodology for the 60 study intersections;
- A figure showing the existing traffic volumes for each of the study intersections and identifying the critical lane groups (the lane groups that have a highest flow ratio for a given green signal phase) for each of the study intersections;
- A map and discussion of local and regional transit services;
- Discussion of general bicycle and pedestrian circulation conditions at the study intersections;
- A qualitative discussion of the on-street and off-street parking conditions.

Task 4. Determine Cumulative and Cumulative Plus Project Conditions

Traffic: For study intersections previously analyzed as part of separate planning efforts (after 2006), TJKM will review the previous analysis and determine if conditions or plans have substantially changed. If not, TJKM will report these traffic volumes and LOS analysis as Cumulative conditions. If conditions have substantially changed, TJKM will perform a new analysis.

For study intersections not previously analyzed, cumulative traffic volumes will be based on the existing traffic volumes and the San Francisco County Transportation Authority (SFCTA) CHAMP-SF travel demand model. TJKM will calculate the difference between 2005 and 2025 model link volumes to estimate a sixteen-year growth increment between the existing (2009) and 2025 analysis years. This increment will be added to existing turning movement volumes proportionately based on existing left, through, and right turn volumes at the study intersections to calculate 2025 turning movements.

Task 5. Transportation Impact Analysis

Traffic: TJKM will report intersection LOS for the weekday PM peak hour for the 60 study intersections.

Transit: TJKM will estimate the growth in transit ridership demand within the study area. Transit trips will be assigned to the both MUNI and regional carriers in accordance with the transit analysis methodology outlined in the *SF Guidelines*. Screenline analysis for both MUNI and regional routes will be conducted for all study scenarios. This analysis assumes changes to transit service as described within the TEP.

Bicycles and Pedestrians: TJKM will qualitatively assess the potential pedestrian and bicycle impacts. This analysis assumes changes to bicycle lanes as anticipated in the San Francisco Bike Plan.

Parking: The impacts associated with the proposed Housing Element policies that could affect parking will be qualitatively assessed. TJKM will include a discussion of any changes proposed to the *Planning Code* parking requirements.

Task 6. Develop Mitigation/Improvement Measures

TJKM will identify project-generated impacts to the transportation network. Existing applicable mitigation measures will be discussed or new mitigation measures will be recommended where significant project-related impacts are identified, and improvement measures will be proposed where non-significant impacts have been identified. If there are no impacts associated with the Proposed Project, this will be noted in this task.

Task 7. Prepare Transportation Report and Meeting Attendance

TJKM will prepare a Preliminary Draft Transportation report, incorporating the data, analysis and conclusions from the above tasks. Five hard copies and one electronic copy of this report will be submitted to the San Francisco Planning Department for review by Planning Department and SFMTA staff. Consultant will incorporate comments and prepare up to two additional Preliminary Draft reports, and then prepare a Final Report for the City's approval.

TJKM has allocated approximately 12 meetings to this study and will plan to attend any meeting as appropriate, including team meetings, meetings of the Planning Commission and Board of Supervisors. In all cases, TJKM staff will be prepared to make presentations of project progress or to present ideas and concepts for further discussions.

Appendix C – San Francisco General Plan Roadway Classification Definitions

CITY OF SAN FRANCISCO - VEHICLE CIRCULATION

OBJECTIVE 18
ESTABLISH A STREET HIERARCHY SYSTEM IN WHICH THE FUNCTION AND DESIGN OF EACH STREET ARE CONSISTENT WITH THE CHARACTER AND USE OF ADJACENT LAND.

There should be a hierarchical system of streets functioning in accordance with the planned movement of vehicles and the management of congestion. Street design, capacity and treatment should be a direct manifestation of the streets intended use in satisfying both present and prospective travel demand, and also its non-traffic purposes such as open space and pedestrian movement. It is recognized that in some cases it will be necessary to determine a maximum level of traffic for which street capacity will be provided, implying a tolerable level of congestion as a constraint, if other objectives of the city are to be attained.

Safety and livability along the city streets are primary concerns. This element seeks to balance the needs for vehicle circulation in the provision for through traffic on major arterials and discouragement of it on local streets, particularly residential streets. The following factors determine the selection of major and secondary arterials:

- The width of the right-of-way relative to traffic capacity required;
- The extent of transit use on the street;
- Land uses bordering the street;
- Safety of the street for moderate- and high-speed traffic, and the ability to "calm" traffic where appropriate;
- The relation of the street to the definition of the neighborhood by its residents;
- The presence or absence of conflicts caused by driveways, parking, and deliveries to commercial uses.

Certain streets, such as Geary Boulevard, Van Ness Avenue, Columbus Avenue and The Embarcadero, are important to more than one mode of transportation, and a balance of transportation systems must be maintained. Even with ample right-of-way width, the ability of these streets to be all things to all users is inherently compromised. Special attention, including the allocation of resources, the range of treatments and the long-term improvement strategies, should be given to achieve the desired balance on these streets.

TABLE 1: CLASSIFICATION OF ELEMENTS IN VEHICLE CIRCULATION PLAN *Pedestrian and bicyclist use will occur and need to be provided for on all street classifications except freeways.
Freeways Limited access, very high capacity facilities; primary function is to carry intercity traffic; they may, as a result of route location, also serve the secondary function of providing for travel between distant sections in the city.
Major Arterials Cross-town thoroughfares 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.

Transit Conflict Streets

Streets with a primary transit function which are not classified as major arterials but experience significant conflicts with automobile traffic.

Secondary Arterials

Primarily intra-district routes of varying capacity serving as collectors for the major thoroughfares; in some cases supplemental to the major arterial system.

Recreational Street

A special category of street whose major function is to provide for slow pleasure drives and cyclist and pedestrian use; more highly valued for recreational use than for traffic movement. The order of priority for these streets should be to accommodate: 1) pedestrians, hiking trails or wilderness routes, as appropriate; 2) cyclists; 3) equestrians; 4) automobile scenic driving. This should be slow and consistent with the topography and nature of the area. There should be adequate parking outside of natural areas.

Collector Streets

Relatively low-capacity streets serving local distribution functions primarily in large, low-density areas, connecting to major and secondary arterials. To be identified in area plans.

Local Streets

All other streets intended for access to abutting residential and other land uses, rather than for through traffic; generally of lowest capacity.

Living Streets

"Living streets" can include streets, alleys and other public rights-of-way. They serve as both an open space resource for residents and visitors as well as a thoroughfare for local traffic. Physical improvements to living streets should include traffic calming measures and consistent tree plantings to create a residential oriented open space amenity that co-exists with limited vehicular traffic. Living streets primarily serve pedestrians and bicyclists, but should also accommodate local automobile traffic and parking. On living streets, pedestrians take precedent over automobile traffic; programming may include pedestrian enclaves (see discussion following Policy 25.3).

Congestion Management (CMP) Network

The network of freeways, state highways and major arterials established in accordance with state Congestion F

Management legislation. Transit Conflict Streets are included in this network as well.

Metropolitan Transportation System (MTS) Streets, Highways and Freight Network

A regional network for San Francisco of freeways, major and secondary arterials, transit conflict and recreational streets meeting nine criteria developed by the Metropolitan Transportation Commission as part of the Regional Transportation Plan. The criteria identify facilities that provide relief to congested corridors, improve connectivity, accommodate travel demand and serve a regional transportation function. Due to the specific nature of the criteria, the MTS street and highway network is generally consistent with, but not identical to, the CMP network.

Relationship Between Function and Physical Design

No rigid design standards can be established on the basis of the functional categories established above, although higher capacities will generally be associated with freeways and major arterials. Capacities must be determined on the basis of the level of traffic demand, the space available for traffic and the nature of the surrounding environment.

Appendix D – Level of Service Methodology

APPENDIX D
LEVEL OF SERVICE

The description and procedures for calculating capacity and level of service (LOS) are found in Transportation Research Board, *Highway Capacity Manual 2000*. *Highway Capacity Manual 2000* represents the latest research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. LOS is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish service levels.

A general description of service levels for various types of facilities is shown in Table D-I.

Table D-I: Level of Service Description

	Uninterrupted Flow	***Interrupted Flow***
Facility Type	Freeways Multi-lane Highways Two-lane Highways Urban Streets	Signalized Intersections Unsignalized Intersections Two-way Stop Control All-way Stop Control
LOS		
A	Free-flow	Very low delay.
B	Stable flow. Presence of other users noticeable.	Low delay.
C	Stable flow. Comfort and convenience starts to decline.	Acceptable delay.
D	High-density stable flow.	Tolerable delay.
E	Unstable flow.	Limit of acceptable delay.
F	Forced or breakdown flow.	Unacceptable delay

Source: *Highway Capacity Manual 2000*

Urban Streets

The term "urban streets" refers to urban arterials and collectors, including those in downtown areas.

Arterial streets are roads that primarily serve longer through trips. However, providing access to abutting commercial and residential land uses is also an important function of arterials.
Collector streets provide both land access and traffic circulation within residential, commercial and industrial areas. Their access function is more important than that of arterials, and unlike arterials their operation is not always dominated by traffic signals.

Downtown streets are signalized facilities that often resemble arterials. They not only move through traffic but also provide access to local businesses for passenger cars, transit buses, and trucks.

Pedestrian conflicts and lane obstructions created by stopping or standing buses, trucks and parking vehicles that cause turbulence in the traffic flow are typical of downtown streets.

The speed of vehicles on urban streets is influenced by three main factors, street environment, interaction among vehicles and traffic control. As a result, these factors also affect quality of service.

The street environment includes the geometric characteristics of the facility, the character of roadside activity and adjacent land uses. Thus, the environment reflects the number and width of lanes, type of median, driveway density, spacing between signalized intersections, existence of parking, level of pedestrian activity and speed limit.

The interaction among vehicles is determined by traffic density, the proportion of trucks and buses, and turning movements. This interaction affects the operation of vehicles at intersections and, to a lesser extent, between signals.

Traffic control (including signals and signs) forces a portion of all vehicles to slow or stop. The delays and speed changes caused by traffic control devices reduce vehicle speeds, however, such controls are needed to establish right-of-way.

The average travel speed for through vehicles along an urban street is the determinant of the operating LOS. The travel speed along a segment, section or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections.

LOS A describes primarily free-flow operations. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal.

LOS B describes reasonably unimpeded operations. The ability to maneuver within the traffic stream is only slightly restricted, and control delays at signalized intersections are not significant.

LOS C describes stable operations, however, ability to maneuver and change lanes in midblock location may be more restricted than at LOS B. Longer queues, adverse signal coordination, or both may contribute to lower travel speeds.

LOS D borders on a range in which in which small increases in flow may cause substantial increases in delay and decreases in travel speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors.

LOS E is characterized by significant delays and lower travel speeds. Such operations are caused by a combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.

LOS F is characterized by urban street flow at extremely low speeds. Intersection congestion is likely at critical signalized locations, with high delays, high volumes, and extensive queuing.

The methodology to determine LOS stratifies urban streets into four classifications. The classifications are complex, and are related to functional and design categories. Table D-II describes the functional and design categories, while Table D-III relates these to the urban street classification.

Once classified, the urban street is divided into segments for analysis. An urban street segment is a one-way section of street encompassing a series of blocks or links terminating at a signalized intersection. Adjacent segments of urban streets may be combined to form larger street sections, provided that the segments have similar demand flows and characteristics.

Levels of service are related to the average travel speed of vehicles along the urban street segment or section.

Travel times for existing conditions are obtained by field measurements. The maximum-car technique is used. The vehicle is driven at the posted speed limit unless impeded by actual traffic conditions. In the maximum-car technique, a safe level of vehicular operation is maintained by observing proper following distances and by changing speeds at reasonable rates of acceleration and deceleration. The maximum-car technique provides the best base for measuring traffic performance.

An observer records the travel time and locations and duration of delay. The beginning and ending points are the centers of intersections. Delays include times waiting in queues at signalized intersections. The travel speed is determined by dividing the length of the segment by the travel time. Once the travel speed on the arterial is determined, the LOS is found by comparing the speed to the criteria in Table D-IV. LOS criteria vary for the different classifications of urban street, reflecting differences in driver expectations.

Table D-II: Functional and Design Categories for Urban Streets

Criterion	***Functional Category***			
	Principal Arterial		***Minor Arterial***	
Mobility function	Very important		Important	
Access function	Very minor		Substantial	
Points connected	Freeways, important activity centers, major traffic generators		Principal arterials	
Predominant trips served	Relatively long trips between major points and through trips entering, leaving, and passing through city		Trips of moderate length within relatively small geographical areas	
Criterion	***Design Category***			
	High-Speed	***Suburban***	***Intermediate***	***Urban***
Driveway access density	Very low density	Low density	Moderate density	High density
Arterial type	Multilane divided; undivided or two-lane with shoulders	Multilane divided: undivided or two-lane with shoulders	Multilane divided or undivided; one way, two lane	Undivided one way; two way, two or more lanes
Parking	No	No	Some	Usually
Separate left-turn lanes	Yes	Yes	Usually	Some
Signals per mile	0.5 to 2	1 to 5	4 to 10	6 to 12
Speed limits	45 to 55 mph	40 to 45 mph	30 to 40 mph	25 to 35 mph
Pedestrian activity	Very little	Little	Some	Usually
Roadside development	Low density	Low to medium density	Medium to moderate density	High density

Source: *Highway Capacity Manual 2000*

Table D-III: Urban Street Class based on Function and Design Categories

Design Category	Functional Category	
	Principal Arterial	*Minor Arterial*
High-Speed	I	Not applicable
Suburban	II	II
Intermediate	II	III or IV
Urban	III or IV	IV

Source: *Highway Capacity Manual 2000*

Table D-IV: Urban Street Levels of Service by Class

Urban Street Class	*I*	*II*	*III*	*IV*
Range of Free Flow Speeds (mph)	45 to 55	35 to 45	30 to 35	25 to 35
Typical Free Flow Speed (mph)	50	40	33	30
LOS	*Average Travel Speed (mph)*			
A	>42	>35	>30	>25
B	>34	>28	>24	>19
C	>27	>22	>18	>13
D	>21	>17	>14	>9
E	>16	>13	>10	>7
F	≤16	≤13	≤10	≤7

Source: *Highway Capacity Manual 2000*

Interrupted Flow
One of the more important elements limiting, and often interrupting the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals, stop and yield signs. These all operate quite differently and have differing impacts on overall flow.

Signalized Intersections
The capacity of a highway is related primarily to the geometric characteristics of the facility, as well as to the composition of the traffic stream on the facility. Geometrics are a fixed, or non-varying, characteristic of a facility.

At the signalized intersection, an additional element is introduced into the concept of capacity: time allocation. A traffic signal essentially allocates time among conflicting traffic movements seeking use of the same physical space. The way in which time is allocated has a significant impact on the operation of the intersection and on the capacity of the intersection and its approaches.

LOS for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Specifically, LOS criteria for traffic signals are stated in terms of average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the ratio of green time to cycle length and the volume to capacity ratio for the lane group.

For each intersection analyzed the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A LOS designation is given to the control delay to better describe the level of operation. A description of levels of service for signalized intersections can be found in Table D-V.

Table D-V: Description of Level of Service for Signalized Intersections

LOS	*Description*
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase doe not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestions becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: *Highway Capacity Manual 2000*

The use of control delay, which may also be referred to as signal delay, was introduced in the 1997 update to the *Highway Capacity Manual*, and represents a departure from previous updates. In the third edition, published in 1985 and the 1994 update to the third edition, delay only included stopped delay. Thus, the LOS criteria listed in Table D-V differs from earlier criteria.

Unsignalized Intersections

The current procedures on unsignalized intersections were first introduced in the 1997 update to the *Highway Capacity Manual* and represent a revision of the methodology published in the 1994 update to the 1985 *Highway Capacity Manual*. The revised procedures use control delay as a measure of effectiveness to determine LOS. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

Two-Way Stop Controlled Intersections

Two-way stop controlled intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At two-way stop-controlled intersections the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay are determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A LOS designation is given to the expected control delay for each minor movement. LOS is not defined for the intersection as a whole. Control delay is the increased time of travel for a vehicle approaching and passing through a stop-controlled intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection. A description of levels of service for two-way stop-controlled intersections is found in Table D-VI.

Table D-VI: Description of Level of Service for Two-Way Stop Controlled Intersections

LOS	*Description*
A	Very low control delay less than 10 seconds per vehicle for each movement subject to delay.
B	Low control delay greater than 10 and up to 15 seconds per vehicle for each movement subject to delay.
C	Acceptable control delay greater than 15 and up to 25 seconds per vehicle for each movement subject to delay.
D	Tolerable control delay greater than 25 and up to 35 seconds per vehicle for each movement subject to delay.
E	Limit of tolerable control delay greater than 35 and up to 50 seconds per vehicle for each movement subject to delay.
F	Unacceptable control delay in excess of 50 seconds per vehicle for each movement subject to delay.

Source: *Highway Capacity Manual 2000*

Appendix E – Level of Service Worksheets: Existing Conditions

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SF Housing EIR Project

Existing Conditions - Weekday PM Peak Hour

Scenario Report

Scenario:	Existing PM
Command:	Existing PM
Volume:	Existing PM
Geometry:	Existing PM
Impact Fee:	Default Impact Fee
Trip Generation:	None
Trip Distribution:	None
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

```
--------------------------------------------------------------------------------
                          SF Housing EIR Project
                 Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Geary/25th
********************************************************************************
Cycle (sec):          90                 Critical Vol./Cap.(X):        0.387
Loss Time (sec):       8                 Average Delay (sec/veh):       16.0
Optimal Cycle:        89                 Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    28   28    28   28   28    28   53   53    53   53   53    53
Y+R:          5.0  5.0   5.0  5.0  5.0   5.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  1  0  1  0    0  1  0  1  0    0  1  1  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2009 << 4:30 PM
Base Vol:      42  257    61   43  301    55    0  644    63    0  555    29
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   42  257    61   43  301    55    0  644    63    0  555    29
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.88 0.88  0.88 0.93 0.93  0.93 0.92 0.92  0.92 0.95 0.95  0.95
PHF Volume:    48  291    69   46  323    59    0  699    68    0  582    30
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   48  291    69   46  323    59    0  699    68    0  582    30
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   48  291    69   46  323    59    0  699    68    0  582    30
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.70 0.70  0.70 0.71 0.71  0.71 0.91 0.82  0.82 0.95 0.83  0.83
Lanes:       0.23 1.43  0.34 0.21 1.51  0.28 0.00 2.73  0.27 0.00 1.90  0.10
Final Sat.:   310 1897   450  291 2034   372    0 4265   417    0 3005   157
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.15 0.15  0.15 0.16 0.16  0.16 0.00 0.16  0.16 0.00 0.19  0.19
Crit Moves:                       ****                             ****
Green Time:  29.0 29.0  29.0 29.0 29.0  29.0  0.0 53.0  53.0  0.0 53.0  53.0
Volume/Cap:  0.48 0.48  0.48 0.49 0.49  0.49 0.00 0.28  0.28 0.00 0.33  0.33
Delay/Veh:   26.3 26.3  26.3 26.6 26.6  26.6  0.0  9.3   9.3  0.0  9.9   9.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  26.3 26.3  26.3 26.6 26.6  26.6  0.0  9.3   9.3  0.0  9.9   9.9
LOS by Move:    C    C     C    C    C     C    A    A     A    A    A     A
HCM2kAvgQ:      5    5     5    5    5     5    0    4     4    0    4     4
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

SF Housing EIR Project
Existing Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #2 Park Presidio/Geary

Cycle (sec):	90	Critical Vol./Cap.(X):	0.836
Loss Time (sec):	8	Average Delay (sec/veh):	22.9
Optimal Cycle:	86	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	50	50	50	50	50	50	28	28	28	28	28	28
Y+R:	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lanes:	0 1 1 1 0			1 0 2 1 0			0 1 1 1 0			0 1 2 0 1		
Volume Module: >> Count Date: 30 Sep 2009 << 4:30 PM												
Base Vol:	0	2020	261	7	2295	110	6	965	70	4	1239	222
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	2020	261	7	2295	110	6	965	70	4	1239	222
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.98	0.98	0.98	0.87	0.87	0.87	0.96	0.96	0.96
PHF Volume:	0	2093	270	7	2349	113	7	1109	80	4	1296	232
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	2093	270	7	2349	113	7	1109	80	4	1296	232
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	2093	270	7	2349	113	7	1109	80	4	1296	232
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	0.88	0.88	0.07	0.89	0.89	0.82	0.82	0.82	0.83	0.83	0.83
Lanes:	0.00	2.66	0.34	1.00	2.86	0.14	0.02	2.78	0.20	0.01	2.99	1.00
Final Sat.:	0	4425	572	142	4817	231	27	4310	313	15	4738	1583
Capacity Analysis Module:												
Vol/Sat:	0.00	0.47	0.47	0.05	0.49	0.49	0.26	0.26	0.26	0.27	0.27	0.15
Crit Moves:					****						****	
Green Time:	0.0	52.5	52.5	52.5	52.5	52.5	29.5	29.5	29.5	29.5	29.5	29.5
Volume/Cap:	0.00	0.81	0.81	0.09	0.84	0.84	0.79	0.79	0.79	0.84	0.84	0.45
Delay/Veh:	0.0	17.4	17.4	10.3	18.2	18.2	31.6	31.6	31.6	33.5	33.5	26.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	17.4	17.4	10.3	18.2	18.2	31.6	31.6	31.6	33.5	33.5	26.6
LOS by Move:	A	B	B	B	B	B	C	C	C	C	C	C
HCM2kAvgQ:	0	21	21	0	23	23	12	12	12	14	14	5

Note: Queue reported is the number of cars per lane.

```
-------------------------------------------------------------------------------
                         SF Housing EIR Project
                 Existing Conditions - Weekday PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #4 Geary/Gough
*******************************************************************************
Cycle (sec):          90               Critical Vol./Cap.(X):        0.702
Loss Time (sec):       8               Average Delay (sec/veh):       22.8
Optimal Cycle:        48               Level Of Service:                 C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  0  0  0   0  1  1  1  0   0  0  2  1  1   0  0  3  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 9 May 2007 << 5:00 PM
Base Vol:       0    0     0    21 1663   296     0 1035   322     0 1425     5
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    21 1663   296     0 1035   322     0 1425     5
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  0.96 0.96  0.96  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0    0     0    22 1738   309     0 1092   340     0 1498     5
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0    22 1738   309     0 1092   340     0 1498     5
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0    22 1738   309     0 1092   340     0 1498     5
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  0.87 0.87  0.87  1.00 0.86  0.86  1.00 0.89  0.89
Lanes:       0.00 0.00  0.00  0.03 2.52  0.45  0.00 3.00  1.00  0.00 3.99  0.01
Final Sat.:     0    0     0    53 4167   742     0 4900  1633     0 6754    24
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.42 0.42  0.42  0.00 0.22  0.21  0.00 0.22  0.22
Crit Moves:                               ****       ****
Green Time:   0.0  0.0   0.0  53.4 53.4  53.4   0.0 28.6  28.6   0.0 28.6  28.6
Volume/Cap:  0.00 0.00  0.00  0.70 0.70  0.70  0.00 0.70  0.66  0.00 0.70  0.70
Delay/Veh:    0.0  0.0   0.0  14.2 14.2  14.2   0.0 29.0  28.0   0.0 28.9  28.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  14.2 14.2  14.2   0.0 29.0  28.0   0.0 28.9  28.9
LOS by Move:    A    A     A     B    B     B     A    C     C     A    C     C
HCM2kAvgQ:      0    0     0    15   15    15     0   11    10     0   10    10
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                          SF Housing EIR Project
                 Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Geary/Franklin
********************************************************************************
Cycle (sec):           90               Critical Vol./Cap.(X):         0.817
Loss Time (sec):        8               Average Delay (sec/veh):        20.6
Optimal Cycle:         67               Level Of Service:                  C
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase      Split Phase      Split Phase
Rights:            Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  1  4  0  0    0  0  0  0  0    0  0  0  0  0    0  0  3  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 9 May 2007 << 5:00 PM
Base Vol:     498 2611     0     0     0     0    0     0     0     0  910   187
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  498 2611     0     0     0     0    0     0     0     0  910   187
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.99 0.99  0.99  1.00 1.00  1.00  1.00 1.00  1.00  0.93 0.93  0.93
PHF Volume:   504 2643     0     0     0     0    0     0     0     0  975   200
Reduct Vol:     0    0     0     0     0     0    0     0     0     0    0     0
Reduced Vol:  504 2643     0     0     0     0    0     0     0     0  975   200
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  504 2643     0     0     0     0    0     0     0     0  975   200
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.65 0.65  0.75  0.75 0.75  0.75  0.75 0.75  0.75  0.75 0.65  0.65
Lanes:       0.80 4.20  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 3.32  0.68
Final Sat.:   993 5208     0     0     0     0    0     0     0     0 4111   845
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.51 0.51  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.24  0.24
Crit Moves:       ****                                               ****
Green Time:  55.9 55.9   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 26.1  26.1
Volume/Cap:  0.82 0.82  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.82  0.82
Delay/Veh:   15.2 15.2   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 35.0  35.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  15.2 15.2   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 35.0  35.0
LOS by Move:    B    B     A     A    A     A     A    A     A     A    C     C
HCM2kAvgQ:     17   17     0     0    0     0     0    0     0     0   11    11
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

SF Housing EIR Project
Existing Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #6 Geary/Van Ness

Cycle (sec):	90	Critical Vol./Cap.(X):	1.158
Loss Time (sec):	8	Average Delay (sec/veh):	35.9
Optimal Cycle:	180	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	3 0	0	0 0	2 1	0	0 0	0 0	0	0 1	2 0	1
Volume Module: >> Count Date: 9 May 2007 << 5:00 PM												
Base Vol:	157	1383	0	0	1469	211	0	0	0	94	784	153
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	157	1383	0	0	1469	211	0	0	0	94	784	153
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00	0.98	0.98	0.98
PHF Volume:	158	1390	0	0	1511	217	0	0	0	96	803	157
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	158	1390	0	0	1511	217	0	0	0	96	803	157
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	158	1390	0	0	1511	217	0	0	0	96	803	157
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.10	0.80	0.90	0.90	0.79	0.79	0.90	0.90	0.90	0.79	0.79	0.75
Lanes:	1.00	3.00	0.00	0.00	2.62	0.38	0.00	0.00	0.00	0.32	2.68	1.00
Final Sat.:	184	4575	0	0	3924	564	0	0	0	483	4028	1424
Capacity Analysis Module:												
Vol/Sat:	0.86	0.30	0.00	0.00	0.39	0.39	0.00	0.00	0.00	0.20	0.20	0.11
Crit Moves:	****									****		
Green Time:	66.5	66.5	0.0	0.0	66.5	66.5	0.0	0.0	0.0	15.5	15.5	15.5
Volume/Cap:	1.16	0.41	0.00	0.00	0.52	0.52	0.00	0.00	0.00	1.16	1.16	0.64
Delay/Veh:	137.7	4.8	0.0	0.0	5.6	5.6	0.0	0.0	0.0	122.7	123	46.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	137.7	4.8	0.0	0.0	5.6	5.6	0.0	0.0	0.0	122.7	123	46.8
LOS by Move:	F	A	A	A	A	A	A	A	A	F	F	D
HCM2kAvgQ:	10	5	0	0	8	8	0	0	0	18	18	5

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                           SF Housing EIR Project
                 Existing Conditions - Weekday PM Peak Hour
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                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #7 Richardson/Lombard
********************************************************************************
Cycle (sec):          90              Critical Vol./Cap.(X):         0.809
Loss Time (sec):      36              Average Delay (sec/veh):        45.1
Optimal Cycle:       127              Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include           Ovl             Include
Min. Green:    37   53     0     0   43    43     0     0     0     0     0     0
Y+R:          5.0  5.0   0.0   0.0  5.0   5.0   0.0  0.0   0.0   0.0  0.0   0.0
Lanes:        1  0  3  0  0    0  0  2  1  0    0  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 30 Sep 2009 << 5:00 PM
Base Vol:     254 2290     0     0 1834    13     0     0   311     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  254 2290     0     0 1834    13     0     0   311     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.90 0.90  0.90  0.88 0.88  0.88  1.00 1.00  1.00
PHF Volume:   269 2426     0     0 2045    14     0     0   352     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:  269 2426     0     0 2045    14     0     0   352     0     0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  269 2426     0     0 2045    14     0     0   352     0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.93 0.89  1.00  1.00 0.89  0.89  1.00 1.00  0.85  1.00 1.00  1.00
Lanes:       1.00 3.00  0.00  0.00 2.98  0.02  0.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:  1769 5083     0     0 5042    36     0     0  1611     0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.15 0.48  0.00  0.00 0.41  0.41  0.00 0.00  0.22  0.00 0.00  0.00
Crit Moves:  ****                   ****                  ****
Green Time:  28.7 62.1   0.0   0.0 33.4  33.4   0.0  0.0  28.7   0.0  0.0   0.0
Volume/Cap:  0.48 0.69  0.00  0.00 1.09  1.09  0.00 0.00  0.68  0.00 0.00  0.00
Delay/Veh:   32.4 11.3   0.0   0.0 87.9  87.9   0.0  0.0  38.2   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  32.4 11.3   0.0   0.0 87.9  87.9   0.0  0.0  38.2   0.0  0.0   0.0
LOS by Move:    C    B     A     A    F     F     A    A     D     A    A     A
HCM2kAvgQ:      8   19     0     0   39    39     0    0    12     0    0     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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SF Housing EIR Project
Existing Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #8 Lombard/Van Ness

Cycle (sec):	90	Critical Vol./Cap.(X):	0.609
Loss Time (sec):	8	Average Delay (sec/veh):	22.7
Optimal Cycle:	39	Level Of Service:	C

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Split Phase	Split Phase	Permitted	Permitted
Rights:	Include	Include	Ovl	Include
Lanes:	3 0 0 1 0	0 0 2 0 1	0 1 0 0 2	0 0 0 1 0

	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module: >> Count Date: 31 May 2007 << 5:00 PM												
Base Vol:	1130	308	53	0	462	156	122	138	825	0	104	14
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1130	308	53	0	462	156	122	138	825	0	104	14
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.90	0.90	0.90	0.95	0.95	0.95	0.87	0.87	0.87
PHF Volume:	1197	326	56	0	514	174	128	145	867	0	120	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1197	326	56	0	514	174	128	145	867	0	120	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1197	326	56	0	514	174	128	145	867	0	120	16
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.96	0.96	1.00	0.93	0.83	0.81	0.81	0.73	1.00	0.96	0.96
Lanes:	3.00	0.85	0.15	0.00	2.00	1.00	0.47	0.53	2.00	0.00	0.88	0.12
Final Sat.:	5147	1554	267	0	3538	1583	725	820	2786	0	1615	217
Capacity Analysis Module:												
Vol/Sat:	0.23	0.21	0.21	0.00	0.15	0.11	0.18	0.18	0.31	0.00	0.07	0.07
Crit Moves:	****				****			****				
Green Time:	34.4	34.4	34.4	0.0	21.5	21.5	26.1	26.1	60.5	0.0	26.1	26.1
Volume/Cap:	0.61	0.55	0.55	0.00	0.61	0.46	0.61	0.61	0.46	0.00	0.26	0.26
Delay/Veh:	23.8	24.9	24.9	0.0	33.8	33.3	33.6	33.6	7.8	0.0	25.6	25.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	23.8	24.9	24.9	0.0	33.8	33.3	33.6	33.6	7.8	0.0	25.6	25.6
LOS by Move:	C	C	C	A	C	C	C	C	A	A	C	C
HCM2kAvgQ:	9	8	8	0	7	5	7	7	7	0	3	3

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                          SF Housing EIR Project
                  Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #9 Stockton/Broadway
********************************************************************************
Cycle (sec):          80                Critical Vol./Cap.(X):         0.742
Loss Time (sec):       8                Average Delay (sec/veh):        16.0
Optimal Cycle:        52                Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          5.5  5.5   5.5  5.5  5.5   5.5  5.5  5.5   5.5  5.5  5.5   5.5
Lanes:        0  1  0  0  1    0  1  0  0  1    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 30 Sep 2009 << 5:00 PM
Base Vol:       2  105    27    2  254    86    1  691   143    6 1134    27
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    2  105    27    2  254    86    1  691   143    6 1134    27
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91 0.89 0.89  0.89 0.93 0.93  0.93 0.98 0.98  0.98
PHF Volume:     2  116    30    2  285    97    1  741   153    6 1158    28
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    2  116    30    2  285    97    1  741   153    6 1158    28
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    2  116    30    2  285    97    1  741   153    6 1158    28
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.85 0.85  0.38 0.85 0.85  0.38 0.63 0.63  0.61 0.64 0.64  0.64
Lanes:       0.02 0.98  1.00 0.01 0.99  1.00 0.01 1.64  0.35 0.01 1.94  0.05
Final Sat.:    30 1581   713   13 1605   713    3 1965   407   13 2363    56
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.07  0.04 0.18 0.18  0.14 0.38 0.38  0.38 0.49 0.49  0.49
Crit Moves:                       ****                             ****
Green Time:  19.2 19.2  19.2 19.2 19.2  19.2 52.8 52.8  52.8 52.8 52.8  52.8
Volume/Cap:  0.31 0.31  0.17 0.74 0.74  0.57 0.57 0.57  0.57 0.74 0.74  0.74
Delay/Veh:   27.0 27.0  26.4 40.3 40.3  39.6  8.9  8.9   8.9 12.2 12.2  12.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  27.0 27.0  26.4 40.3 40.3  39.6  8.9  8.9   8.9 12.2 12.2  12.2
LOS by Move:    C    C     C    D    D     D    A    A     A    B    B     B
HCM2kAvgQ:      3    3     1    8    8     3    7    7     7   12   12    12
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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SF Housing EIR Project
Existing Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #10 Embarcadero/Broadway

Cycle (sec):	90	Critical Vol./Cap.(X):	0.696
Loss Time (sec):	14	Average Delay (sec/veh):	53.5
Optimal Cycle:	88	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Ovl			Include		
Min. Green:	16	38	38	7	28	28	29	0	29	0	0	0
Y+R:	6.0	5.0	5.0	6.0	6.0	6.0	5.0	0.0	6.0	0.0	0.0	0.0
Lanes:	2 0 2 0 0			1 0 1 1 0			1 0 0 0 1			0 0 0 0 0		
Volume Module: >> Count Date: 30 Sep 2009 << 5:00 PM												
Base Vol:	532	1341	0	2	1180	22	68	0	401	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	532	1341	0	2	1180	22	68	0	401	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.92	0.92	0.92	0.89	0.89	0.89	1.00	1.00	1.00
PHF Volume:	591	1490	0	2	1290	24	77	0	452	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	591	1490	0	2	1290	24	77	0	452	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	591	1490	0	2	1290	24	77	0	452	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.93	1.00	0.93	0.93	0.93	0.93	1.00	0.83	1.00	1.00	1.00
Lanes:	2.00	2.00	0.00	1.00	1.96	0.04	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	3432	3538	0	1769	3463	65	1769	0	1583	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.17	0.42	0.00	0.00	0.37	0.37	0.04	0.00	0.29	0.00	0.00	0.00
Crit Moves:	****				****		****					
Green Time:	16.0	39.7	0.0	7.3	31.0	31.0	29.0	0.0	45.0	0.0	0.0	0.0
Volume/Cap:	0.97	0.96	0.00	0.02	1.08	1.08	0.13	0.00	0.57	0.00	0.00	0.00
Delay/Veh:	65.4	37.9	0.0	38.1	80.3	80.3	21.7	0.0	16.7	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	65.4	37.9	0.0	38.1	80.3	80.3	21.7	0.0	16.7	0.0	0.0	0.0
LOS by Move:	E	D	A	D	F	F	C	A	B	A	A	A
HCM2kAvgQ:	8	20	0	0	30	30	1	0	9	0	0	0

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                            SF Housing EIR Project
                   Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #11 Embarcadero/Washington
********************************************************************************
Cycle (sec):          90                 Critical Vol./Cap.(X):         0.538
Loss Time (sec):      14                 Average Delay (sec/veh):        42.5
Optimal Cycle:        87                 Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:    12   30    0    10   28    28    33    0    33    0    0     0
Y+R:          6.0  6.0   0.0  6.0  6.0   6.0   5.0  0.0   5.0  0.0  0.0   0.0
Lanes:        2  0  3  0  0   1  0  2  1  0   1  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 30 Sep 2009 << 5:00 PM
Base Vol:     336 1697    0    10 1397    85   132    0   261    0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  336 1697    0    10 1397    85   132    0   261    0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.93 0.93  0.93  0.91 0.91  0.91  1.00 1.00  1.00
PHF Volume:   369 1863    0    11 1505    92   145    0   287    0    0     0
Reduct Vol:     0    0    0     0    0     0     0    0     0    0    0     0
Reduced Vol:  369 1863    0    11 1505    92   145    0   287    0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  369 1863    0    11 1505    92   145    0   287    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.90 0.89  1.00  0.93 0.88  0.88  0.93 1.00  0.83  1.00 1.00  1.00
Lanes:       2.00 3.00  0.00  1.00 2.83  0.17  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:  3432 5083     0  1769 4749   289  1769    0  1583     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.37  0.00  0.01 0.32  0.32  0.08 0.00  0.18  0.00 0.00  0.00
Crit Moves:       ****        ****             ****
Green Time:  12.7 33.0   0.0  10.0 30.3  30.3  33.0  0.0  33.0   0.0  0.0   0.0
Volume/Cap:  0.76 1.00  0.00  0.05 0.94  0.94  0.22 0.00  0.49  0.00 0.00  0.00
Delay/Veh:   44.0 49.2   0.0  35.9 40.1  40.1  19.8  0.0  22.7   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  44.0 49.2   0.0  35.9 40.1  40.1  19.8  0.0  22.7   0.0  0.0   0.0
LOS by Move:    D    D     A     D    D     D     B    A     C     A    A     A
HCM2kAvgQ:      5   23     0     0   15    15     3    0     6     0    0     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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SF Housing EIR Project
Existing Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #12 Embarcadero/Harrison

Cycle (sec):	100	Critical Vol./Cap.(X):	0.814
Loss Time (sec):	8	Average Delay (sec/veh):	24.2
Optimal Cycle:	98	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	63	0	0	63	63	27	0	27	0	0	0
Y+R:	0.0	5.0	0.0	0.0	5.0	5.0	5.0	0.0	5.0	0.0	0.0	0.0
Lanes:	0 0 2 0 0			0 0 1 1 0			1 0 0 0 1			0 0 0 0 0		
Volume Module: >> Count Date: 29 Sep 2009 << 4:45 PM												
Base Vol:	0	1079	0	0	1250	277	147	0	194	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1079	0	0	1250	277	147	0	194	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.99	0.99	0.99	0.92	0.92	0.92	1.00	1.00	1.00
PHF Volume:	0	1156	0	0	1264	280	160	0	212	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1156	0	0	1264	280	160	0	212	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1156	0	0	1264	280	160	0	212	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.80	0.67	0.80	0.80	0.65	0.65	0.67	0.80	0.60	0.80	0.80	0.80
Lanes:	0.00	2.00	0.00	0.00	1.64	0.36	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	2547	0	0	2029	450	1274	0	1140	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.45	0.00	0.00	0.62	0.62	0.13	0.00	0.19	0.00	0.00	0.00
Crit Moves:	****				****		****					
Green Time:	0.0	65.0	0.0	0.0	65.0	65.0	27.0	0.0	27.0	0.0	0.0	0.0
Volume/Cap:	0.00	0.70	0.00	0.00	0.96	0.96	0.47	0.00	0.69	0.00	0.00	0.00
Delay/Veh:	0.0	12.6	0.0	0.0	30.1	30.1	31.5	0.0	39.1	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	12.6	0.0	0.0	30.1	30.1	31.5	0.0	39.1	0.0	0.0	0.0
LOS by Move:	A	B	A	A	C	C	C	A	D	A	A	A
HCM2kAvgQ:	0	13	0	0	23	23	5	0	7	0	0	0

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                            SF Housing EIR Project
                   Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #13 1st/Market
********************************************************************************
Cycle (sec):           60                  Critical Vol./Cap.(X):        0.716
Loss Time (sec):       10                  Average Delay (sec/veh):       67.7
Optimal Cycle:         62                  Level Of Service:                 E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0   18   18    18    0   34    34   34   34     0
Y+R:          0.0  0.0   0.0  4.0  4.0   4.0  0.0  4.0   4.0  4.0  4.0   0.0
Lanes:        0  0  0  0  0   1  0  2  1  0   0  0  1  0  1   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 29 Sep 2009 << 5:00 PM
Base Vol:       0    0     0   93  965   243    0  242   203    1  329     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0   93  965   243    0  242   203    1  329     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 0.95 0.95  0.95 0.87 0.87  0.87 0.83 0.83  0.83
PHF Volume:     0    0     0   98 1015   256    0  278   234    1  396     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0   98 1015   256    0  278   234    1  396     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0     0   98 1015   256    0  278   234    1  396     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.85 0.85  0.85 0.64 0.66  0.61 0.85 0.75  0.48 0.67 0.67  0.85
Lanes:       0.00 0.00  0.00 1.00 2.35  0.65 0.00 1.00  1.00 0.01 1.99  0.00
Final Sat.:     0    0     0 1211 2960   745    0 1424   908    8 2523     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.08 0.34  0.34 0.00 0.20  0.26 0.16 0.16  0.00
Crit Moves:                             ****              ****
Green Time:   0.0  0.0   0.0 17.4 17.4  17.4  0.0 32.9  32.9 32.9 32.9   0.0
Volume/Cap:  0.00 0.00  0.00 0.28 1.18  1.18 0.00 0.36  0.47 0.29 0.29  0.00
Delay/Veh:    0.0  0.0   0.0 18.9  113 113.2  0.0  9.1  11.7  8.0  8.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 18.9  113 113.2  0.0  9.1  11.7  8.0  8.0   0.0
LOS by Move:    A    A     A    B    F     F    A    A     B    A    A     A
HCM2kAvgQ:      0    0     0    2   22    20    0    3     3    2    2     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                            SF Housing EIR Project
                  Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #14 1st/Mission
********************************************************************************
Cycle (sec):          60              Critical Vol./Cap.(X):         1.253
Loss Time (sec):      10              Average Delay (sec/veh):        83.6
Optimal Cycle:       180              Level Of Service:                  F
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase        Permitted        Permitted
Rights:            Include          Include          Include          Include
Min. Green:     0     0     0    23    23    23     0    29    29    29    29     0
Y+R:          0.0   0.0   0.0   4.0   4.0   4.0   0.0   4.0   4.0   4.0   4.0   0.0
Lanes:        0  0  0  0  0    0  1  2  1  0    0  1  0  0  1    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 29 Sep 2009 << 5:00 PM
Base Vol:       0     0     0    36  1101   171     0   649   167     9   465     0
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:    0     0     0    36  1101   171     0   649   167     9   465     0
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00  0.94  0.94  0.94  0.86  0.86  0.86  0.75  0.75  0.75
PHF Volume:     0     0     0    38  1175   182     0   751   193    12   624     0
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:    0     0     0    38  1175   182     0   751   193    12   624     0
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:    0     0     0    38  1175   182     0   751   193    12   624     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  0.65  0.65  0.65  0.51  0.51  0.50  0.65  0.57  0.36  0.48  0.48  0.62
Lanes:       0.00  0.00  0.00  0.11  3.36  0.53  0.00  1.00  1.00  0.04  1.96  0.00
Final Sat.:     0     0     0   106  3254   505     0  1089   688    35  1801     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00  0.36  0.36  0.36  0.00  0.69  0.28  0.35  0.35  0.00
Crit Moves:                    ****                    ****
Green Time:   0.0   0.0   0.0  22.3  22.3  22.3   0.0  28.1  28.1  28.1  28.1   0.0
Volume/Cap:  0.00  0.00  0.00  0.97  0.97  0.97  0.00  1.47  0.60  0.74  0.74  0.00
Delay/Veh:    0.0   0.0   0.0  37.4  37.4  37.4   0.0   240  20.2  19.2  19.2   0.0
User DelAdj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:   0.0   0.0   0.0  37.4  37.4  37.4   0.0   240  20.2  19.2  19.2   0.0
LOS by Move:    A     A     A     D     D     D     A     F     C     B     B     A
HCM2kAvgQ:      0     0     0     7     7     7     0    46     4     7     7     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                         SF Housing EIR Project
                 Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #15 1st/Harrison
********************************************************************************
Cycle (sec):         60               Critical Vol./Cap.(X):        1.204
Loss Time (sec):      8               Average Delay (sec/veh):       83.4
Optimal Cycle:      180               Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted      Permit+Prot
Rights:            Ovl             Include          Include          Include
Min. Green:     0    0     0   26   26    26    0    8     8   11   24     0
Y+R:          0.0  0.0   5.0  5.0  5.0   5.0  0.0  5.0   5.0  5.0  5.0   0.0
Lanes:        0  0  0  0  1   1  0  2  0  1   0  0  0  1  0   1  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 29 Sep 2009 << 5:00 PM
Base Vol:       0    0    29   31  999   427    0   60    42  832  580     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0    29   31  999   427    0   60    42  832  580     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.81 0.81  0.81 0.95 0.95  0.95 0.77 0.77  0.77 0.86 0.86  0.86
PHF Volume:     0    0    36   33 1056   451    0   78    54  973  678     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0    36   33 1056   451    0   78    54  973  678     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0    36   33 1056   451    0   78    54  973  678     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.70 0.70  0.53 0.59 0.59  0.52 0.70 0.58  0.58 0.57 0.57  0.70
Lanes:       0.00 0.00  1.00 1.00 2.00  1.00 0.00 0.59  0.41 1.77 1.23  0.00
Final Sat.:     0    0  1015 1114 2229   997    0  651   456 1904 1333     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.04 0.03 0.47  0.45 0.00 0.12  0.12 0.51 0.51  0.00
Crit Moves:       ****             ****              ****       ****
Green Time:   0.0  0.0  18.0 26.0 26.0  26.0  0.0  8.0   8.0 26.0 26.0   0.0
Volume/Cap:  0.00 0.00  0.12 0.07 1.09  1.04 0.00 0.89  0.89 1.18 1.17  0.00
Delay/Veh:    0.0  0.0  16.0 10.2 74.9  72.4  0.0 75.7  75.7 89.8  103   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0  16.0 10.2 74.9  72.4  0.0 75.7  75.7 89.8  103   0.0
LOS by Move:    A    A     B    B    E     E    A    E     E    F    F     A
HCM2kAvgQ:      0    0     1    0   21    16    0    3     3   25   25     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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-------------------------------------------------------------------------------
                            SF Housing EIR Project
                 Existing Conditions - Weekday PM Peak Hour
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #19 4th/King
*******************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.778
Loss Time (sec):      12               Average Delay (sec/veh):       35.0
Optimal Cycle:        95               Level Of Service:                 D
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    27   27    27   27   27    27   10   42    42   14   45    45
Y+R:          6.0  6.0   6.0  6.0  6.0   6.0  6.0  5.0   5.0  6.0  6.0   6.0
Lanes:        0  1  0  0  1   1  0  1  1  1   1  0  2  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 29 Sep 2009 << 5:00 PM
Base Vol:      20  102    87  115  471   414  176 1696    64   36 1163    54
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   20  102    87  115  471   414  176 1696    64   36 1163    54
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.78 0.78  0.78 0.90 0.90  0.90 0.88 0.88  0.88 0.97 0.97  0.97
PHF Volume:    26  131   112  127  522   458  200 1932    73   37 1203    56
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   26  131   112  127  522   458  200 1932    73   37 1203    56
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   26  131   112  127  522   458  200 1932    73   37 1203    56
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.78 0.78  0.75 0.50 0.78  0.78 0.84 0.80  0.80 0.84 0.83  0.83
Lanes:       0.16 0.84  1.00 1.00 1.60  1.40 1.00 2.89  0.11 1.00 1.91  0.09
Final Sat.:   241 1232  1424  950 2364  2078 1592 4387   166 1592 3021   140
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.11  0.08 0.13 0.22  0.22 0.13 0.44  0.44 0.02 0.40  0.40
Crit Moves:                       ****                    ****  ****
Green Time:  27.0 27.0  27.0 27.0 27.0  27.0 13.3 47.0  47.0 14.0 47.7  47.7
Volume/Cap:  0.39 0.39  0.29 0.50 0.82  0.82 0.94 0.94  0.94 0.17 0.84  0.84
Delay/Veh:   30.5 30.5  29.3 32.3 38.7  38.7 89.0 33.7  33.7 38.2 27.0  27.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  30.5 30.5  29.3 32.3 38.7  38.7 89.0 33.7  33.7 38.2 27.0  27.0
LOS by Move:    C    C     C    C    D     D    F    C     C    D    C     C
HCM2kAvgQ:      4    4     3    3   10    10   10   26    26    1   16    16
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```

SF Housing EIR Project
Existing Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #21 4th/Bryant

Cycle (sec):	60	Critical Vol./Cap.(X):	0.492
Loss Time (sec):	12	Average Delay (sec/veh):	20.9
Optimal Cycle:	58	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Split Phase			Split Phase			Split Phase			Split Phase	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	16	16	0	0	16	16	14	14	14
Y+R:	0.0	0.0	0.0	4.0	4.0	0.0	0.0	4.0	4.0	6.0	6.0	6.0
Lanes:	0 0 0 0 0			1 0 3 0 0			0 0 4 1 0			0 0 2 1 1		
Volume Module: >> Count Date: 29 Sep 2009 << 5:00 PM												
Base Vol:	0	0	0	168	742	0	0	985	147	0	79	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	168	742	0	0	985	147	0	79	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	0.83	0.83	0.83	0.86	0.86	0.86	0.74	0.74	0.74
PHF Volume:	0	0	0	202	891	0	0	1143	171	0	106	13
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	202	891	0	0	1143	171	0	106	13
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	202	891	0	0	1143	171	0	106	13
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.75	0.80	1.00	1.00	0.79	0.79	1.00	0.79	0.79
Lanes:	0.00	0.00	0.00	1.00	3.00	0.00	0.00	4.35	0.65	0.00	3.00	1.00
Final Sat.:	0	0	0	1424	4575	0	0	6509	971	0	4497	1499
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.14	0.19	0.00	0.00	0.18	0.18	0.00	0.02	0.01
Crit Moves:					****			****			****	
Green Time:	0.0	0.0	0.0	17.9	17.9	0.0	0.0	16.1	16.1	0.0	14.0	14.0
Volume/Cap:	0.00	0.00	0.00	0.48	0.65	0.00	0.00	0.65	0.65	0.00	0.10	0.04
Delay/Veh:	0.0	0.0	0.0	21.0	20.8	0.0	0.0	21.1	21.1	0.0	18.2	17.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	21.0	20.8	0.0	0.0	21.1	21.1	0.0	18.2	17.8
LOS by Move:	A	A	A	C	C	A	A	C	C	A	B	B
HCM2kAvgQ:	0	0	0	3	5	0	0	4	4	0	1	0

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                            SF Housing EIR Project
                  Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #28 9th/Market
********************************************************************************
Cycle (sec):           60                 Critical Vol./Cap.(X):         0.692
Loss Time (sec):       10                 Average Delay (sec/veh):        15.1
Optimal Cycle:         60                 Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    28   28    28    0    0     0   22   22     0    0   22    22
Y+R:          5.0  5.0   5.0  0.0  0.0   0.0  5.0  5.0   0.0  0.0  5.0   5.0
Lanes:        0  1  4  1  0   0  0  0  0  0   0  1  1  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 29 Sep 2009 << 5:00 PM
Base Vol:     165 2730   108    0    0     0    2  260     0    0  409   137
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  165 2730   108    0    0     0    2  260     0    0  409   137
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93 1.00 1.00  1.00 0.76 0.76  0.76 0.81 0.81  0.81
PHF Volume:   177 2923   116    0    0     0    3  341     0    0  506   170
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  177 2923   116    0    0     0    3  341     0    0  506   170
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  177 2923   116    0    0     0    3  341     0    0  506   170
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.79 0.79  0.79 1.00 1.00  1.00 0.80 0.80  1.00 1.00 0.81  0.81
Lanes:       0.33 5.45  0.22 0.00 0.00  0.00 0.02 1.98  0.00 0.00 1.50  0.50
Final Sat.:   496 8210   325    0    0     0   23 2999     0    0 2294   769
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.36 0.36  0.36 0.00 0.00  0.00 0.11 0.11  0.00 0.00 0.22  0.22
Crit Moves:  ****                                                ****
Green Time:  28.0 28.0  28.0  0.0  0.0   0.0 22.0 22.0   0.0  0.0 22.0  22.0
Volume/Cap:  0.76 0.76  0.76 0.00 0.00  0.00 0.31 0.31  0.00 0.00 0.60  0.60
Delay/Veh:   14.6 14.6  14.6  0.0  0.0   0.0 14.3 14.3   0.0  0.0 17.8  17.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  14.6 14.6  14.6  0.0  0.0   0.0 14.3 14.3   0.0  0.0 17.8  17.8
LOS by Move:    B    B     B    A    A     A    B    B     A    A    B     B
HCM2kAvgQ:     11   11    11    0    0     0    2    2     0    0    5     5
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

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-------------------------------------------------------------------------------
                          SF Housing EIR Project
                 Existing Conditions - Weekday PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #29 10th/Howard
*******************************************************************************
Cycle (sec):         90              Critical Vol./Cap.(X):        0.663
Loss Time (sec):      8              Average Delay (sec/veh):       18.9
Optimal Cycle:       90              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase      Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0   47    47     0    0     0    35   35     0
Y+R:          0.0  0.0   0.0   0.0  4.0   4.0   0.0  0.0   0.0   4.0  4.0   0.0
Lanes:        0  0  0  0  0    0  0  3  1  0    0  0  0  0  0    1  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 29 Sep 2009 << 5:00 PM
Base Vol:       0    0     0     0 1863    64     0    0     0   353  546     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0     0 1863    64     0    0     0   353  546     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  0.96 0.96  0.96  1.00 1.00  1.00  0.90 0.90  0.90
PHF Volume:     0    0     0     0 1937    67     0    0     0   391  605     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0     0 1937    67     0    0     0   391  605     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0     0 1937    67     0    0     0   391  605     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  1.00 0.80  0.80  1.00 1.00  1.00  0.75 0.80  1.00
Lanes:       0.00 0.00  0.00  0.00 3.87  0.13  0.00 0.00  0.00  1.00 3.00  0.00
Final Sat.:     0    0     0     0 5868   202     0    0     0  1424 4575     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.00 0.33  0.33  0.00 0.00  0.00  0.27 0.13  0.00
Crit Moves:                        ****                          ****
Green Time:   0.0  0.0   0.0   0.0 47.0  47.0   0.0  0.0   0.0  35.0 35.0   0.0
Volume/Cap:  0.00 0.00  0.00  0.00 0.63  0.63  0.00 0.00  0.00  0.71 0.34  0.00
Delay/Veh:    0.0  0.0   0.0   0.0 16.3  16.3   0.0  0.0   0.0  30.5 19.9   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0   0.0 16.3  16.3   0.0  0.0   0.0  30.5 19.9   0.0
LOS by Move:    A    A     A     A    B     B     A    A     A     C    B     A
HCM2kAvgQ:      0    0     0     0   11    11     0    0     0    10    4     0
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```

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--------------------------------------------------------------------------------
                           SF Housing EIR Project
                  Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #36 Divisadero/Fell
********************************************************************************
Cycle (sec):          90                  Critical Vol./Cap.(X):         0.758
Loss Time (sec):       6                  Average Delay (sec/veh):        20.1
Optimal Cycle:        86                  Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted      Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:    25   25    0    0   25    25    0    0     0   55   55    55
Y+R:          5.0  5.0   0.0  0.0  5.0   5.0  0.0  0.0   0.0  5.0  5.0   5.0
Lanes:        0  1  1  0  0   0  0  2  0  1   0  0  0  0  0   0  1  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 30 Sep 2009 << 4:45 PM
Base Vol:       2  727    0     0  789    54    0    0     0   108 2713   100
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    2  727    0     0  789    54    0    0     0   108 2713   100
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.90 0.90  0.90  1.00 1.00  1.00  0.95 0.95  0.95
PHF Volume:     2  770    0     0  876    60    0    0     0   114 2865   106
Reduct Vol:     0    0    0     0    0     0    0    0     0     0    0     0
Reduced Vol:    2  770    0     0  876    60    0    0     0   114 2865   106
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    2  770    0     0  876    60    0    0     0   114 2865   106
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.89 0.89  1.00  1.00 0.93  0.83  1.00 1.00  1.00  0.88 0.88  0.88
Lanes:       0.01 1.99  0.00  0.00 2.00  1.00  0.00 0.00  0.00  0.15 3.71  0.14
Final Sat.:     9 3359    0     0 3538  1583    0    0     0   248 6226   229
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.23 0.23  0.00  0.00 0.25  0.04  0.00 0.00  0.00  0.46 0.46  0.46
Crit Moves:                        ****                         ****
Green Time:  29.0 29.0   0.0   0.0 29.0  29.0   0.0  0.0   0.0  55.0 55.0  55.0
Volume/Cap:  0.71 0.71  0.00  0.00 0.77  0.12  0.00 0.00  0.00  0.75 0.75  0.75
Delay/Veh:   30.8 30.8   0.0   0.0 32.5  22.0   0.0  0.0   0.0  13.9 13.9  13.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  30.8 30.8   0.0   0.0 32.5  22.0   0.0  0.0   0.0  13.9 13.9  13.9
LOS by Move:    C    C     A     A    C     C     A    A     A     B    B     B
HCM2kAvgQ:     11   11     0     0   13     1     0    0     0    18   18    18
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                         SF Housing EIR Project
                Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #38 Stanyan/Fulton
********************************************************************************
Cycle (sec):          90              Critical Vol./Cap.(X):        1.045
Loss Time (sec):      12              Average Delay (sec/veh):       47.8
Optimal Cycle:       180              Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted        Permitted
Rights:           Include          Include            Ovl              Include
Min. Green:    30   30    30   17   17    17   30   30    30   30   30    30
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  5.0  5.0   5.0  5.0  5.0   5.0
Lanes:        1  0  1  1  0    0  1  0  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 30 Sep 2009 << 5:00 PM
Base Vol:     532  442    47   33  426    33    3  471   641    1  512    38
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  532  442    47   33  426    33    3  471   641    1  512    38
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96 0.90 0.90  0.90 0.97 0.97  0.97 0.87 0.87  0.87
PHF Volume:   554  460    49   37  474    37    3  488   664    1  587    44
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  554  460    49   37  474    37    3  488   664    1  587    44
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  554  460    49   37  474    37    3  488   664    1  587    44
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.84 0.92  0.73 0.74 0.92  0.92 0.81 0.65  0.73 0.85 0.85  0.85
Lanes:       1.00 1.77  0.23 0.16 1.71  0.13 0.01 0.99  1.00 0.01 1.86  0.13
Final Sat.:  1592 3079   327  230 2974   230    8 1226  1387    6 2997   222
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.35 0.15  0.15 0.16 0.16  0.16 0.40 0.40  0.48 0.20 0.20  0.20
Crit Moves:  ****                 ****                   ****
Green Time:  30.0 30.0  30.0 17.0 17.0  17.0 31.0 31.0  61.0 31.0 31.0  31.0
Volume/Cap:  1.04 0.45  0.45 0.84 0.84  0.84 1.16 1.16  0.71 0.57 0.57  0.57
Delay/Veh:   81.1 24.8  24.8 48.0 48.0  48.0 110.9  111  11.6 26.2 26.2  26.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  81.1 24.8  24.8 48.0 48.0  48.0 110.9  111  11.6 26.2 26.2  26.2
LOS by Move:    F    C     C    D    D     D    F    F     B    C    C     C
HCM2kAvgQ:     24    6     5    9   11    11   32   26    13    8    8     8
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

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--------------------------------------------------------------------------------
                          SF Housing EIR Project
                 Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #39 19th/Lincoln
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        1.243
Loss Time (sec):        8               Average Delay (sec/veh):       93.0
Optimal Cycle:        180               Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    57   57    57   63   63    63   26   26    26   26   26    26
Y+R:         11.0 11.0  11.0   5.0  5.0   5.0   6.0  6.0   6.0   6.0  6.0   6.0
Lanes:        0  0  2  1  0    0  0  2  1  0    0  0  2  0  1    0  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 30 Sep 2009 << 5:00 PM
Base Vol:        0 2406   235     0 2934   332     0  832    58     0 1407   130
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0 2406   235     0 2934   332     0  832    58     0 1407   130
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.85 0.85  0.85  0.86 0.86  0.86  0.82 0.82  0.82
PHF Volume:      0 2601   254     0 3468   392     0  969    68     0 1710   158
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:     0 2601   254     0 3468   392     0  969    68     0 1710   158
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:     0 2601   254     0 3468   392     0  969    68     0 1710   158
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.88  0.88  1.00 0.88  0.88  1.00 0.93  0.83  1.00 0.88  0.88
Lanes:       0.00 2.73  0.27  0.00 2.70  0.30  0.00 2.00  1.00  0.00 2.75  0.25
Final Sat.:      0 4571   446     0 4498   509     0 3538  1583     0 4593   424
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.57  0.57  0.00 0.77  0.77  0.00 0.27  0.04  0.00 0.37  0.37
Crit Moves:                        ****                              ****
Green Time:   0.0 63.0  63.0   0.0 63.0  63.0   0.0 29.0  29.0   0.0 29.0  29.0
Volume/Cap:  0.00 0.90  0.90  0.00 1.22  1.22  0.00 0.94  0.15  0.00 1.28  1.28
Delay/Veh:    0.0 20.0  20.0   0.0  122 122.3   0.0 51.1  26.5   0.0  168 168.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 20.0  20.0   0.0  122 122.3   0.0 51.1  26.5   0.0  168 168.5
LOS by Move:    A    B     B     A    F     F     A    D     C     A    F     F
HCM2kAvgQ:      0   31    31     0   76    76     0   20     2     0   42    42
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                            SF Housing EIR Project
                  Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #40 19th/Taraval
********************************************************************************
Cycle (sec):          100             Critical Vol./Cap.(X):         0.736
Loss Time (sec):        8             Average Delay (sec/veh):        18.3
Optimal Cycle:         98             Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    62   62    62   62   62    62   28   28    28   28   28    28
Y+R:          5.0  5.0   5.0  5.0  5.0   5.0  5.0  5.0   5.0  5.0  5.0   5.0
Lanes:        0  1  1  1  0    0  1  1  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 1 Oct 2009 << 4:45 PM
Base Vol:        0 2316   105     0 2521   113     7  247    81    11  310    41
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0 2316   105     0 2521   113     7  247    81    11  310    41
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.95 0.95  0.95  0.95 0.95  0.95  0.80 0.80  0.80  0.91 0.91  0.91
PHF Volume:      0 2438   111     0 2645   119     9  310   102    12  339    45
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:     0 2438   111     0 2645   119     9  310   102    12  339    45
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:     0 2438   111     0 2645   119     9  310   102    12  339    45
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   0.91 0.89  0.89  0.91 0.89  0.89  0.85 0.85  0.85  0.86 0.86  0.86
Lanes:        0.00 2.87  0.13  0.00 2.87  0.13  0.04 1.48  0.48  0.06 1.71  0.23
Final Sat.:      0 4834   219     0 4836   217    67 2376   779    99 2793   369
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00 0.50  0.50  0.00 0.55  0.55  0.13 0.13  0.13  0.12 0.12  0.12
Crit Moves:                         ****              ****
Green Time:    0.0 64.0  64.0   0.0 64.0  64.0  28.0 28.0  28.0  28.0 28.0  28.0
Volume/Cap:   0.00 0.79  0.79  0.00 0.85  0.85  0.47 0.47  0.47  0.43 0.43  0.43
Delay/Veh:     0.0 15.1  15.1   0.0 17.4  17.4  31.5 31.5  31.5  31.0 31.0  31.0
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:    0.0 15.1  15.1   0.0 17.4  17.4  31.5 31.5  31.5  31.0 31.0  31.0
LOS by Move:     A    B     B     A    B     B     C    C     C     C    C     C
HCM2kAvgQ:       0   19    19     0   27    27     6    6     6     5    5     5
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                           SF Housing EIR Project
                  Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #41 19th/Sloat
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):        1.346
Loss Time (sec):      12              Average Delay (sec/veh):       82.2
Optimal Cycle:       180              Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Permit+Prot       Protected
Rights:           Include          Include          Include          Include
Min. Green:     0   43    43   11   58    58    4   33    33    0   24    24
Y+R:          0.0  5.0   5.0  4.0  5.0   5.0  4.0  4.0   4.0  0.0  5.0   5.0
Lanes:        0  0  2  1  0   1  0  2  1  0   1  1  1  1  0   0  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 30 Sep 2009 << 5:00 PM
Base Vol:       0 2209    56  220 2311   412  248  887    63    0 1116   333
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0 2209    56  220 2311   412  248  887    63    0 1116   333
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92 0.96 0.96  0.96 0.96 0.96  0.96 0.88 0.88  0.88
PHF Volume:     0 2412    61  228 2400   428  258  924    66    0 1275   381
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0 2412    61  228 2400   428  258  924    66    0 1275   381
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0 2412    61  228 2400   428  258  924    66    0 1275   381
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.89  0.89 0.93 0.87  0.87 0.60 0.88  0.88 1.00 0.89  0.83
Lanes:       0.00 2.93  0.07 1.00 2.55  0.45 1.00 2.80  0.20 0.00 3.00  1.00
Final Sat.:     0 4938   125 1769 4215   751 1141 4661   331    0 5083  1583
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.49  0.49 0.13 0.57  0.57 0.23 0.20  0.20 0.00 0.25  0.24
Crit Moves:       ****       ****            ****                  ****
Green Time:   0.0 41.7  41.7 10.7 52.4  52.4 41.7 35.9  35.9  0.0 23.3  23.3
Volume/Cap:  0.00 1.17  1.17 1.21 1.09  1.09 0.60 0.55  0.55 0.00 1.08  1.03
Delay/Veh:    0.0  112 111.9 179.1 70.5  70.5  0.5 26.7  26.7  0.0 89.0  94.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  112 111.9 179.1 70.5  70.5  0.5 26.7  26.7  0.0 89.0  94.8
LOS by Move:    A    F     F    F    E     E    A    C     C    A    F     F
HCM2kAvgQ:      0   44    44   12   43    43    8    9     9    0   23    19
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                           SF Housing EIR Project
                  Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #42 19th/Winston
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):        1.214
Loss Time (sec):      12                Average Delay (sec/veh):       62.7
Optimal Cycle:       180                Level Of Service:                 E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected         Permitted        Permitted
Rights:           Include          Include           Ignore           Include
Min. Green:    15   43    43   43   43    43   25   25    25   25   25    25
Y+R:          6.0  5.0   5.0  5.0  5.0   5.0  6.0  6.0   6.0  6.0  6.0   6.0
Lanes:        2  0  2  1  0   0  0  3  0  1   1  1  1  0  1   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 30 Sep 2009 << 4:45 PM
Base Vol:     379 2080     3     0 2204    73   141  309   314    29  345    30
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  379 2080     3     0 2204    73   141  309   314    29  345    30
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.97  0.99 0.99  0.99  0.96 0.96  0.00  0.84 0.84  0.84
PHF Volume:   392 2149     3     0 2233    74   148  324     0    35  413    36
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  392 2149     3     0 2233    74   148  324     0    35  413    36
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  1.00
FinalVolume:  392 2149     3     0 2233    74   148  324     0    35  413    36
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.72 0.71  0.89  1.00 0.89  0.83  0.18 0.18  1.00  0.83 0.67  0.67
Lanes:       2.00 2.99  0.01  0.00 3.00  1.00  1.00 2.00  1.00  0.12 1.73  0.15
Final Sat.:  2745 4062     6     0 5083  1583   333  665  1900   184 2195   191
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.14 0.53  0.53  0.00 0.44  0.05  0.44 0.49  0.00  0.19 0.19  0.19
Crit Moves:  ****                    ****                ****
Green Time:  15.0 58.0  58.0   0.0 43.0  43.0  30.0 30.0   0.0  30.0 30.0  30.0
Volume/Cap:  0.95 0.91  0.91  0.00 1.02  0.11  1.48 1.62  0.00  0.63 0.63  0.63
Delay/Veh:   74.0 24.6  24.6   0.0 53.4  17.1 267.2  330   0.0  31.8 31.8  31.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  74.0 24.6  24.6   0.0 53.4  17.1 267.2  330   0.0  31.8 31.8  31.8
LOS by Move:    E    C     C     A    D     B     F    F     A     C    C     C
HCM2kAvgQ:      6   20    25     0   26     1    13   15     0     9    8     8
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                           SF Housing EIR Project
                  Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #43 19th/Junipero Serra
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        1.126
Loss Time (sec):       12                Average Delay (sec/veh):       75.9
Optimal Cycle:        180                Level Of Service:                 E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted        Permitted
Rights:         WideBypass       WideBypass          Ovl              Include
Min. Green:    51   51    51    18   18    18     6    6     6     6    6     6
Y+R:          8.0  8.0   8.0   8.0  8.0   8.0   9.0  9.0   9.0   9.0  9.0   9.0
Lanes:        2  1  0  1  0    0  1  3  0  1    0  0  1  0  3    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 1 Oct 2009 << 4:15 PM
Base Vol:     1975 1552    10    21 1261    14     0  105  2711    31   37    48
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse: 1975 1552    10    21 1261    14     0  105  2711    31   37    48
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.97 0.97  0.97  0.91 0.91  0.91  0.97 0.97  0.97  0.85 0.85  0.85
PHF Volume:   2036 1600    10    23 1381    15     0  108  2795    36   43    56
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 2036 1600    10    23 1381    15     0  108  2795    36   43    56
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume: 2036 1600    10    23 1381    15     0  108  2795    36   43    56
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   0.70 0.72  0.91  0.71 0.71  0.83  1.00 0.98  0.73  0.52 0.90  0.90
Lanes:        2.26 1.73  0.01  0.07 3.93  1.00  0.00 1.00  3.00  1.00 0.44  0.56
Final Sat.:   3025 2377    15    89 5328  1583     0 1862  4178   994  742   962
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.67 0.67  0.67  0.26 0.26  0.01  0.00 0.06  0.67  0.04 0.06  0.06
Crit Moves:   ****             ****                                    ****
Green Time:   59.2 59.2  59.2  22.8 22.8  22.8   0.0  6.0  65.2   6.0  6.0   6.0
Volume/Cap:   1.14 1.14  1.14  1.14 1.14  0.04  0.00 0.97  1.03  0.50 0.97  0.97
Delay/Veh:    86.4 86.4  86.4 110.6  111  30.1   0.0  122  41.6  51.2  128 127.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   86.4 86.4  86.4 110.6  111  30.1   0.0  122  41.6  51.2  128 127.5
LOS by Move:     F    F     F     F    F     C     A    F     D     D    F     F
HCM2kAvgQ:      48   48    58    18   18     0     0    3    34     2    6     6
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                            SF Housing EIR Project
                  Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #46 Lake Merced/Brotherhood
********************************************************************************
Cycle (sec):          107                Critical Vol./Cap.(X):         0.760
Loss Time (sec):       12                Average Delay (sec/veh):        49.2
Optimal Cycle:        109                Level Of Service:                  D
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Ignore
Min. Green:     0   22    22   46   73     0    0    0     0   24    0    24
Y+R:          0.0  5.0   5.0  5.0  5.0   0.0  0.0  0.0   0.0  5.0  0.0   5.0
Lanes:        0  0  2  0  1   2  0  1  0  0   0  0  0  0  0   1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 1 Oct 2009 << 4:30 PM
Base Vol:       0  628   300  1429  794     0    0    0     0  380    0  1206
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  628   300  1429  794     0    0    0     0  380    0  1206
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.00
PHF Adj:     0.91 0.91  0.91  0.96 0.96  0.96 1.00 1.00  1.00 0.93 0.93  0.00
PHF Volume:     0  688   329  1492  829     0    0    0     0  409    0     0
Reduct Vol:     0    0     0     0    0     0    0    0     0    0    0     0
Reduced Vol:    0  688   329  1492  829     0    0    0     0  409    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.00
FinalVolume:    0  688   329  1492  829     0    0    0     0  409    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.93  0.83  0.90 0.98  1.00 1.00 1.00  1.00 0.93 1.00  1.00
Lanes:       0.00 2.00  1.00  2.00 1.00  0.00 0.00 0.00  0.00 1.00 0.00  1.00
Final Sat.:     0 3538  1583  3432 1862     0    0    0     0 1769    0  1900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.19  0.21  0.43 0.45  0.00 0.00 0.00  0.00 0.23 0.00  0.00
Crit Moves:  ****                    ****                        ****
Green Time:   0.0 23.2  23.2  48.5 71.7   0.0  0.0  0.0   0.0 23.6  0.0   0.0
Volume/Cap:  0.00 0.90  0.96  0.96 0.66  0.00 0.00 0.00  0.00 1.05 0.00  0.00
Delay/Veh:    0.0 57.0  81.5  43.8 13.5   0.0  0.0  0.0   0.0 101.9  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 57.0  81.5  43.8 13.5   0.0  0.0  0.0   0.0 101.9  0.0   0.0
LOS by Move:    A    E     F     D    B     A    A    A     A    F    A     A
HCM2kAvgQ:      0   15    15    30   17     0    0    0     0   21    0     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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-------------------------------------------------------------------------------
                          SF Housing EIR Project
                 Existing Conditions - Weekday PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #47 Mission/Geneva
*******************************************************************************
Cycle (sec):          60              Critical Vol./Cap.(X):        0.783
Loss Time (sec):       8              Average Delay (sec/veh):       28.9
Optimal Cycle:        59              Level Of Service:                 C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    27   27    27    27   27    27    24   24    24    24   24    24
Y+R:          4.5  4.5   4.5   4.5  4.5   4.5   4.5  4.5   4.5   4.5  4.5   4.5
Lanes:        0  1  0  1  0    0  1  1  0  1    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 1 Oct 2009 << 4:30 PM
Base Vol:      85  333   129    67  468   173     8  991   180     0  874    94
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   85  333   129    67  468   173     8  991   180     0  874    94
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.93 0.93  0.93  0.93 0.93  0.93  0.90 0.90  0.90
PHF Volume:    94  368   142    72  502   186     9 1069   194     0  968   104
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   94  368   142    72  502   186     9 1069   194     0  968   104
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   94  368   142    72  502   186     9 1069   194     0  968   104
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.64 0.64  0.64  0.77 0.77  0.67  0.78 0.78  0.78  0.95 0.83  0.83
Lanes:       0.31 1.22  0.47  0.25 1.75  1.00  0.01 1.68  0.31  0.00 1.81  0.19
Final Sat.:   379 1485   575   365 2550  1266    20 2481   451     0 2832   305
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.25 0.25  0.25  0.20 0.20  0.15  0.43 0.43  0.43  0.00 0.34  0.34
Crit Moves:       ****                              ****
Green Time:  27.0 27.0  27.0  27.0 27.0  27.0  25.0 25.0  25.0   0.0 25.0  25.0
Volume/Cap:  0.55 0.55  0.55  0.44 0.44  0.33  1.03 1.03  1.03  0.00 0.82  0.82
Delay/Veh:   14.0 14.0  14.0  12.4 12.4  12.2  52.3 52.3  52.3   0.0 21.4  21.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  14.0 14.0  14.0  12.4 12.4  12.2  52.3 52.3  52.3   0.0 21.4  21.4
LOS by Move:    B    B     B     B    B     B     D    D     D     A    C     C
HCM2kAvgQ:      5    5     5     4    4     2    22   22    22     0   12    12
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                            SF Housing EIR Project
                  Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #48 Mission/Silver
********************************************************************************
Cycle (sec):          60                 Critical Vol./Cap.(X):        0.633
Loss Time (sec):       8                 Average Delay (sec/veh):       15.7
Optimal Cycle:        59                 Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    26   26    26   26   26    26   25   25    25   25   25    25
Y+R:          4.5  4.5   4.5  4.5  4.5   4.5  4.5  4.5   4.5  4.5  4.5   4.5
Lanes:        0  1  0  1  0    0  1  0  1  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 1 Oct 2009 << 4:45 PM
Base Vol:      27  443    57   88  531    68   79  216    64   49  237   103
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   27  443    57   88  531    68   79  216    64   49  237   103
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.80 0.80  0.80 0.95 0.95  0.95 0.83 0.83  0.83 0.91 0.91  0.91
PHF Volume:    34  555    71   93  560    72   95  260    77   54  261   113
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   34  555    71   93  560    72   95  260    77   54  261   113
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   34  555    71   93  560    72   95  260    77   54  261   113
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.82 0.82  0.82 0.72 0.72  0.72 0.80 0.80  0.80 0.86 0.86  0.86
Lanes:       0.10 1.68  0.22 0.26 1.54  0.20 0.22 0.60  0.18 0.13 0.61  0.26
Final Sat.:   160 2625   338  351 2120   271  334  913   271  206  997   433
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.21 0.21  0.21 0.26 0.26  0.26 0.28 0.28  0.28 0.26 0.26  0.26
Crit Moves:                       ****              ****
Green Time:  26.0 26.0  26.0 26.0 26.0  26.0 26.0 26.0  26.0 26.0 26.0  26.0
Volume/Cap:  0.49 0.49  0.49 0.61 0.61  0.61 0.66 0.66  0.66 0.60 0.60  0.60
Delay/Veh:   13.5 13.5  13.5 15.4 15.4  15.4 18.5 18.5  18.5 16.8 16.8  16.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  13.5 13.5  13.5 15.4 15.4  15.4 18.5 18.5  18.5 16.8 16.8  16.8
LOS by Move:    B    B     B    B    B     B    B    B     B    B    B     B
HCM2kAvgQ:      5    5     5    6    6     6    8    8     8    7    7     7
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

```
--------------------------------------------------------------------------------
                          SF Housing EIR Project
                 Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #49 Mission/Ocean
********************************************************************************
Cycle (sec):         60              Critical Vol./Cap.(X):        0.385
Loss Time (sec):      8              Average Delay (sec/veh):        8.2
Optimal Cycle:       55              Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted      Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:    32   32    0     0   32   32    15    0   15     0    0    0
Y+R:          9.0  9.0  0.0   0.0  9.0  9.0   4.0  0.0  4.0   0.0  0.0  0.0
Lanes:        0  1  1  0  0   0  0  1  1  0   1  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 1 Oct 2009 << 4:15 PM
Base Vol:      31  450    0     0  521  249   161    0   44     0    0    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   31  450    0     0  521  249   161    0   44     0    0    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.93 0.93 0.93  0.97 0.97 0.97  0.93 0.93 0.93  1.00 1.00 1.00
PHF Volume:    34  486    0     0  539  257   173    0   47     0    0    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   34  486    0     0  539  257   173    0   47     0    0    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:   34  486    0     0  539  257   173    0   47     0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.81 0.81 1.00  1.00 0.89 0.89  0.93 1.00 0.83  1.00 1.00 1.00
Lanes:       0.13 1.87 0.00  0.00 1.35 0.65  1.00 0.00 1.00  0.00 0.00 0.00
Final Sat.:   199 2889    0     0 2279 1089  1769    0 1583     0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.17 0.17 0.00  0.00 0.24 0.24  0.10 0.00 0.03  0.00 0.00 0.00
Crit Moves:                       ****       ****
Green Time:  36.8 36.8  0.0   0.0 36.8 36.8  15.2  0.0 15.2   0.0  0.0  0.0
Volume/Cap:  0.27 0.27 0.00  0.00 0.39 0.39  0.39 0.00 0.12  0.00 0.00 0.00
Delay/Veh:    5.8  5.8  0.0   0.0  6.4  6.4  21.0  0.0 17.8   0.0  0.0  0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   5.8  5.8  0.0   0.0  6.4  6.4  21.0  0.0 17.8   0.0  0.0  0.0
LOS by Move:    A    A    A     A    A    A     C    A    B     A    A    A
HCM2kAvgQ:      2    2    0     0    4    4     3    0    1     0    0    0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

SF Housing EIR Project
Existing Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #53 3rd/Palou

Cycle (sec):	100	Critical Vol./Cap.(X):	0.483
Loss Time (sec):	12	Average Delay (sec/veh):	30.1
Optimal Cycle:	102	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	15	69	69	49	49	49	21	21	21	21	21	21
Y+R:	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lanes:	1 0 1 1 0			0 1 0 1 0			0 0 1! 0 0			0 1 0 1 0		
Volume Module: >> Count Date: 1 Oct 2009 << 4:15 PM												
Base Vol:	154	621	52	1	721	53	41	183	74	28	178	44
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	154	621	52	1	721	53	41	183	74	28	178	44
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.78	0.78	0.78	0.87	0.87	0.87	0.85	0.85	0.85
PHF Volume:	171	688	58	1	920	68	47	211	85	33	211	52
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	171	688	58	1	920	68	47	211	85	33	211	52
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	171	688	58	1	920	68	47	211	85	33	211	52
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.93	0.92	0.92	0.88	0.88	0.88	0.85	0.85	0.85	0.68	0.68	0.68
Lanes:	1.00	1.85	0.15	0.01	1.86	0.13	0.14	0.61	0.25	0.22	1.43	0.35
Final Sat.:	1769	3225	270	4	3112	229	223	994	402	290	1845	456
Capacity Analysis Module:												
Vol/Sat:	0.10	0.21	0.21	0.30	0.30	0.30	0.21	0.21	0.21	0.11	0.11	0.11
Crit Moves:		****						****				
Green Time:	19.6	67.7	67.7	48.0	48.0	48.0	20.6	20.6	20.6	20.6	20.6	20.6
Volume/Cap:	0.49	0.32	0.32	0.62	0.62	0.62	1.03	1.03	1.03	0.55	0.55	0.55
Delay/Veh:	37.6	6.9	6.9	20.3	20.3	20.3	98.4	98.4	98.4	37.6	37.6	37.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	37.6	6.9	6.9	20.3	20.3	20.3	98.4	98.4	98.4	37.6	37.6	37.6
LOS by Move:	D	A	A	C	C	C	F	F	F	D	D	D
HCM2kAvgQ:	5	5	5	12	12	12	17	17	17	5	5	5

Note: Queue reported is the number of cars per lane.

```
--------------------------------------------------------------------------------
                           SF Housing EIR Project
                  Existing Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #60 San Jose/Randall
********************************************************************************
Cycle (sec):         90                 Critical Vol./Cap.(X):         0.846
Loss Time (sec):      6                 Average Delay (sec/veh):        25.8
Optimal Cycle:       81                 Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:    45   45    45    45   45    45     9    9     9    21   21    21
Y+R:          5.0  5.0   5.0   5.0  5.0   5.0   5.0  5.0   5.0   5.0  5.0   5.0
Lanes:        0  0  2  1  0    0  0  2  1  0    0  0  1! 0  0    0  1  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 1 Oct 2009 << 5:00 PM
Base Vol:       0 1899   214     0 1864   124    60   69   118   282   49   124
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1899   214     0 1864   124    60   69   118   282   49   124
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.91 0.91  0.91  0.89 0.89  0.89
PHF Volume:     0 1999   225     0 1958   130    66   76   130   317   55   139
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1999   225     0 1958   130    66   76   130   317   55   139
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1999   225     0 1958   130    66   76   130   317   55   139
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.88  0.88  1.00 0.88  0.88  0.91 0.91  0.91  0.89 0.89  0.83
Lanes:       0.00 2.70  0.30  0.00 2.81  0.19  0.24 0.28  0.48  1.00 1.00  1.00
Final Sat.:     0 4500   507     0 4723   314   418  481   822  1696 1696  1583
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.44  0.44  0.00 0.41  0.41  0.16 0.16  0.16  0.19 0.03  0.09
Crit Moves:       ****                                    ****  ****
Green Time:   0.0 46.5  46.5   0.0 46.5  46.5  16.5 16.5  16.5  21.0 21.0  21.0
Volume/Cap:  0.00 0.86  0.86  0.00 0.80  0.80  0.86 0.86  0.86  0.80 0.14  0.38
Delay/Veh:    0.0 23.0  23.0   0.0 20.7  20.7  60.7 60.7  60.7  46.1 27.4  31.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 23.0  23.0   0.0 20.7  20.7  60.7 60.7  60.7  46.1 27.4  31.9
LOS by Move:    A    C     C     A    C     C     E    E     E     D    C     C
HCM2kAvgQ:      0   23    23     0   19    19    10   10    10    11    1     4
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

Appendix F – Level of Service Worksheets: Cumulative (2025) Conditions

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SF Housing EIR Project
Cumulative 2025 Conditions - Weekday PM Peak Hour

Scenario Report

Scenario:	Cumulative 2025 PM
Command:	Cumulative PM
Volume:	Cumulative 2025 PM
Geometry:	Existing PM
Impact Fee:	Default Impact Fee
Trip Generation:	None
Trip Distribution:	None
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

```
----------------------------------------------------------------------------
                          SF Housing EIR Project
             Cumulative 2025 Conditions - Weekday PM Peak Hour
----------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
****************************************************************************
Intersection #1 Geary/25th
****************************************************************************
Cycle (sec):          90                Critical Vol./Cap.(X):        0.429
Loss Time (sec):       8                Average Delay (sec/veh):       15.9
Optimal Cycle:        89                Level Of Service:                 B
****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    28   28    28    28   28    28    53   53    53    53   53    53
Y+R:          5.0  5.0   5.0   5.0  5.0   5.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  1  0  1  0    0  1  0  1  0    0  1  1  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      48  292    69    45  313    57     0  766    75     0  651    34
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   48  292    69    45  313    57     0  766    75     0  651    34
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   48  292    69    45  313    57     0  766    75     0  651    34
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    51  307    73    47  329    60     0  806    79     0  685    36
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   51  307    73    47  329    60     0  806    79     0  685    36
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   51  307    73    47  329    60     0  806    79     0  685    36
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.70 0.70  0.70  0.71 0.71  0.71  0.91 0.82  0.82  0.95 0.83  0.83
Lanes:       0.23 1.43  0.34  0.22 1.51  0.27  0.00 2.73  0.27  0.00 1.90  0.10
Final Sat.:   311 1891   447   291 2027   369     0 4265   418     0 3005   157
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 0.16  0.16  0.16 0.16  0.16  0.00 0.19  0.19  0.00 0.23  0.23
Crit Moves:       ****                                               ****
Green Time:  29.0 29.0  29.0  29.0 29.0  29.0   0.0 53.0  53.0   0.0 53.0  53.0
Volume/Cap:  0.50 0.50  0.50  0.50 0.50  0.50  0.00 0.32  0.32  0.00 0.39  0.39
Delay/Veh:   26.8 26.8  26.8  26.8 26.8  26.8   0.0  9.7   9.7   0.0 10.5  10.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  26.8 26.8  26.8  26.8 26.8  26.8   0.0  9.7   9.7   0.0 10.5  10.5
LOS by Move:    C    C     C     C    C     C     A    A     A     A    B     B
HCM2kAvgQ:      6    6     6     6    6     6     0    5     5     0    5     5
****************************************************************************
Note: Queue reported is the number of cars per lane.
****************************************************************************
```

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--------------------------------------------------------------------------------
                           SF Housing EIR Project
               Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Park Presidio/Geary
********************************************************************************
Cycle (sec):         90               Critical Vol./Cap.(X):        0.923
Loss Time (sec):      8               Average Delay (sec/veh):       26.8
Optimal Cycle:      108               Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    50   50    50    50   50    50    28   28    28    28   28    28
Y+R:          6.0  6.0   6.0   6.0  6.0   6.0   6.0  6.0   6.0   6.0  6.0   6.0
Lanes:        0  1  1  1  0    1  0  2  1  0    0  1  1  1  0    0  1  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 2207   285     8 2471   118     6 1020    74     4 1356   243
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 2207   285     8 2471   118     6 1020    74     4 1356   243
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 2207   285     8 2471   118     6 1020    74     4 1356   243
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0 2323   300     8 2601   124     6 1074    78     4 1427   256
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 2323   300     8 2601   124     6 1074    78     4 1427   256
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 2323   300     8 2601   124     6 1074    78     4 1427   256
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.91 0.88  0.88  0.07 0.89  0.89  0.79 0.79  0.79  0.83 0.83  0.83
Lanes:       0.00 2.66  0.34  1.00 2.86  0.14  0.02 2.78  0.20  0.01 2.99  1.00
Final Sat.:     0 4425   571   142 4818   230    25 4167   302    14 4744  1583
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.52  0.52  0.06 0.54  0.54  0.26 0.26  0.26  0.30 0.30  0.16
Crit Moves:                        ****                               ****
Green Time:   0.0 52.7  52.7  52.7 52.7  52.7  29.3 29.3  29.3  29.3 29.3  29.3
Volume/Cap:  0.00 0.90  0.90  0.10 0.92  0.92  0.79 0.79  0.79  0.92 0.92  0.50
Delay/Veh:    0.0 21.2  21.2  10.7 23.0  23.0  32.0 32.0  32.0  39.9 39.9  27.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 21.2  21.2  10.7 23.0  23.0  32.0 32.0  32.0  39.9 39.9  27.8
LOS by Move:    A    C     C     B    C     C     C    C     C     D    D     C
HCM2kAvgQ:      0   27    27     0   30    30    12   12    12    17   17     6
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                           SF Housing EIR Project
             Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #4 Geary/Gough
********************************************************************************
Cycle (sec):          90               Critical Vol./Cap.(X):        0.976
Loss Time (sec):       8               Average Delay (sec/veh):       38.0
Optimal Cycle:       155               Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  0  0  0  0    0  1  1  1  0    0  0  2  1  1    0  0  3  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 9 May 2007 << 5:00 PM
Base Vol:       0    0     0    22 1769   315     0 1182   368     0 1724     6
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    22 1769   315     0 1182   368     0 1724     6
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  0.96 0.96  0.96  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0    0     0    23 1848   329     0 1247   388     0 1813     6
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0    23 1848   329     0 1247   388     0 1813     6
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0    23 1848   329     0 1247   388     0 1813     6
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.80 0.80  0.80  0.70 0.70  0.70  0.80 0.69  0.69  0.80 0.71  0.71
Lanes:       0.00 0.00  0.00  0.03 2.52  0.45  0.00 3.00  1.00  0.00 3.99  0.01
Final Sat.:     0    0     0    42 3337   594     0 3920  1307     0 5403    19
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.55 0.55  0.55  0.00 0.32  0.30  0.00 0.34  0.34
Crit Moves:                               ****                       ****
Green Time:   0.0  0.0   0.0  51.1 51.1  51.1   0.0 30.9  30.9   0.0 30.9  30.9
Volume/Cap:  0.00 0.00  0.00  0.98 0.98  0.98  0.00 0.93  0.86  0.00 0.98  0.98
Delay/Veh:    0.0  0.0   0.0  33.0 33.0  33.0   0.0 38.2  33.1   0.0 45.1  45.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  33.0 33.0  33.0   0.0 38.2  33.1   0.0 45.1  45.1
LOS by Move:    A    A     A     C    C     C     A    D     C     A    D     D
HCM2kAvgQ:      0    0     0    28   28    28     0   17    14     0   20    20
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                           SF Housing EIR Project
             Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Geary/Franklin
********************************************************************************
Cycle (sec):         90               Critical Vol./Cap.(X):        1.031
Loss Time (sec):      8               Average Delay (sec/veh):       47.1
Optimal Cycle:      180               Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase      Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  1  4  0  0    0  0  0  0  0    0  0  0  0  0    0  0  3  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 9 May 2007 << 5:00 PM
Base Vol:     574 3011     0     0    0     0     0    0     0     0  975   200
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  574 3011     0     0    0     0     0    0     0     0  975   200
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.99 0.99  0.99  1.00 1.00  1.00  1.00 1.00  1.00  0.93 0.93  0.93
PHF Volume:   581 3048     0     0    0     0     0    0     0     0 1045   214
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  581 3048     0     0    0     0     0    0     0     0 1045   214
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  581 3048     0     0    0     0     0    0     0     0 1045   214
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.58 0.58  0.67  0.67 0.67  0.67  0.67 0.67  0.67  0.67 0.58  0.58
Lanes:       0.80 4.20  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 3.32  0.68
Final Sat.:   887 4653     0     0    0     0     0    0     0     0 3674   754
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.65 0.65  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.28  0.28
Crit Moves:  ****                                                    ****
Green Time:  57.2 57.2   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 24.8  24.8
Volume/Cap:  1.03 1.03  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 1.03  1.03
Delay/Veh:   40.3 40.3   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 66.6  66.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  40.3 40.3   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 66.6  66.6
LOS by Move:    D    D     A     A    A     A     A    A     A     A    E     E
HCM2kAvgQ:     32   32     0     0    0     0     0    0     0     0   16    16
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                          SF Housing EIR Project
               Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #6 Geary/Van Ness
********************************************************************************
Cycle (sec):         90               Critical Vol./Cap.(X):        1.465
Loss Time (sec):      8               Average Delay (sec/veh):       67.2
Optimal Cycle:      180               Level Of Service:                 E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted       Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  3  0  0   0  0  2  1  0   0  0  0  0  0   0  1  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 9 May 2007 << 5:00 PM
Base Vol:     191 1680     0     0 1623   233    0    0     0  106  883   172
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  191 1680     0     0 1623   233    0    0     0  106  883   172
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  0.97 0.97  0.97 1.00 1.00  1.00 0.98 0.98  0.98
PHF Volume:   192 1688     0     0 1670   240    0    0     0  109  905   176
Reduct Vol:     0    0     0     0    0     0    0    0     0    0    0     0
Reduced Vol:  192 1688     0     0 1670   240    0    0     0  109  905   176
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  192 1688     0     0 1670   240    0    0     0  109  905   176
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.09 0.89  1.00  1.00 0.87  0.87 1.00 1.00  1.00 0.88 0.88  0.83
Lanes:       1.00 3.00  0.00  0.00 2.62  0.38 0.00 0.00  0.00 0.32 2.68  1.00
Final Sat.:   169 5083     0     0 4361   626    0    0     0  537 4475  1583
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     1.13 0.33  0.00  0.00 0.38  0.38 0.00 0.00  0.00 0.20 0.20  0.11
Crit Moves:  ****                                                ****
Green Time:  69.6 69.6   0.0   0.0 69.6  69.6  0.0  0.0   0.0 12.4 12.4  12.4
Volume/Cap:  1.47 0.43  0.00  0.00 0.50  0.50 0.00 0.00  0.00 1.47 1.47  0.81
Delay/Veh:  256.4  3.8   0.0   0.0  4.2   4.2  0.0  0.0   0.0 256.1  256  64.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 256.4  3.8   0.0   0.0  4.2   4.2  0.0  0.0   0.0 256.1  256  64.1
LOS by Move:    F    A     A     A    A     A    A    A     A    F    F     E
HCM2kAvgQ:     15    6     0     0    8     8    0    0     0   27   27     7
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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SF Housing EIR Project
Cumulative 2025 Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #7 Richardson/Lombard

Cycle (sec):	90	Critical Vol./Cap.(X):	0.862
Loss Time (sec):	36	Average Delay (sec/veh):	61.5
Optimal Cycle:	139	Level Of Service:	E

Approach:	North Bound	South Bound	East Bound	West Bound
Control:	Protected	Protected	Split Phase	Split Phase
Rights:	Include	Include	Ovl	Include
Lanes:	1 0 3 0 0	0 0 2 1 0	0 0 0 0 1	0 0 0 0 0

Movement:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Min. Green:	37	53	0	0	43	43	0	0	0	0	0	0
Y+R:	5.0	5.0	0.0	0.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Volume Module:												
Base Vol:	262	2361	0	0	2100	15	0	0	347	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	262	2361	0	0	2100	15	0	0	347	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	262	2361	0	0	2100	15	0	0	347	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	276	2485	0	0	2211	16	0	0	365	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	276	2485	0	0	2211	16	0	0	365	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	276	2485	0	0	2211	16	0	0	365	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.93	0.89	1.00	1.00	0.89	0.89	1.00	1.00	0.85	1.00	1.00	1.00
Lanes:	1.00	3.00	0.00	0.00	2.98	0.02	0.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	1769	5083	0	0	5042	36	0	0	1611	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.16	0.49	0.00	0.00	0.44	0.44	0.00	0.00	0.23	0.00	0.00	0.00
Crit Moves:	****				****			****				
Green Time:	28.7	62.1	0.0	0.0	33.4	33.4	0.0	0.0	28.7	0.0	0.0	0.0
Volume/Cap:	0.49	0.71	0.00	0.00	1.18	1.18	0.00	0.00	0.71	0.00	0.00	0.00
Delay/Veh:	32.5	11.6	0.0	0.0	124	124.5	0.0	0.0	39.4	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	32.5	11.6	0.0	0.0	124	124.5	0.0	0.0	39.4	0.0	0.0	0.0
LOS by Move:	C	B	A	A	F	F	A	A	D	A	A	A
HCM2kAvgQ:	8	20	0	0	47	47	0	0	13	0	0	0

Note: Queue reported is the number of cars per lane.

SF Housing EIR Project
Cumulative 2025 Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 Lombard/Van Ness

Cycle (sec):	90	Critical Vol./Cap.(X):	0.666
Loss Time (sec):	8	Average Delay (sec/veh):	23.5
Optimal Cycle:	44	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Permitted		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	3 0 0 1 0			0 0 2 0 1			0 1 0 0 2			0 0 0 1 0		
Volume Module:												
Base Vol:	1203	328	56	0	495	167	146	165	985	0	114	15
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1203	328	56	0	495	167	146	165	985	0	114	15
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1203	328	56	0	495	167	146	165	985	0	114	15
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	1266	345	59	0	521	176	154	174	1037	0	120	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1266	345	59	0	521	176	154	174	1037	0	120	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1266	345	59	0	521	176	154	174	1037	0	120	16
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.96	0.96	1.00	0.93	0.83	0.81	0.81	0.73	1.00	0.96	0.96
Lanes:	3.00	0.85	0.15	0.00	2.00	1.00	0.47	0.53	2.00	0.00	0.88	0.12
Final Sat.:	5147	1555	266	0	3538	1583	719	812	2786	0	1619	213
Capacity Analysis Module:												
Vol/Sat:	0.25	0.22	0.22	0.00	0.15	0.11	0.21	0.21	0.37	0.00	0.07	0.07
Crit Moves:	****				****			****				
Green Time:	33.2	33.2	33.2	0.0	19.9	19.9	28.9	28.9	62.1	0.0	28.9	28.9
Volume/Cap:	0.67	0.60	0.60	0.00	0.67	0.50	0.67	0.67	0.54	0.00	0.23	0.23
Delay/Veh:	25.6	27.0	27.0	0.0	36.5	35.8	33.4	33.4	8.0	0.0	23.3	23.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.6	27.0	27.0	0.0	36.5	35.8	33.4	33.4	8.0	0.0	23.3	23.3
LOS by Move:	C	C	C	A	D	D	C	C	A	A	C	C
HCM2kAvgQ:	10	9	9	0	8	5	8	8	9	0	3	3

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                        SF Housing EIR Project
             Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #9 Stockton/Broadway
********************************************************************************
Cycle (sec):          80               Critical Vol./Cap.(X):        0.780
Loss Time (sec):       8               Average Delay (sec/veh):       15.7
Optimal Cycle:        58               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          5.5  5.5   5.5   5.5  5.5   5.5   5.5  5.5   5.5   5.5  5.5   5.5
Lanes:        0  1  0  0  1    0  1  0  0  1    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       2  114    29     2  254    86     1  759   157     6 1201    29
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    2  114    29     2  254    86     1  759   157     6 1201    29
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    2  114    29     2  254    86     1  759   157     6 1201    29
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     2  120    31     2  267    91     1  799   165     6 1264    31
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    2  120    31     2  267    91     1  799   165     6 1264    31
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    2  120    31     2  267    91     1  799   165     6 1264    31
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.85 0.85  0.49  0.85 0.85  0.49  0.63 0.63  0.63  0.64 0.64  0.64
Lanes:       0.02 0.98  1.00  0.01 0.99  1.00  0.01 1.65  0.34  0.01 1.94  0.05
Final Sat.:    28 1581   926    13 1605   926     3 1975   408    12 2363    57
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.08  0.03  0.17 0.17  0.10  0.40 0.40  0.40  0.54 0.54  0.54
Crit Moves:                        ****                               ****
Green Time:  17.1 17.1  17.1  17.1 17.1  17.1  54.9 54.9  54.9  54.9 54.9  54.9
Volume/Cap:  0.36 0.36  0.15  0.78 0.78  0.46  0.59 0.59  0.59  0.78 0.78  0.78
Delay/Veh:   29.6 29.6  27.2  45.6 45.6  34.9   8.2  8.2   8.2  12.1 12.1  12.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  29.6 29.6  27.2  45.6 45.6  34.9   8.2  8.2   8.2  12.1 12.1  12.1
LOS by Move:    C    C     C     D    D     C     A    A     A     B    B     B
HCM2kAvgQ:      3    3     1     8    8     3     7    7     7    13   13    13
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                           SF Housing EIR Project
              Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Embarcadero/Broadway
********************************************************************************
Cycle (sec):         90                 Critical Vol./Cap.(X):        0.768
Loss Time (sec):     14                 Average Delay (sec/veh):       85.3
Optimal Cycle:       88                 Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include           Ovl             Include
Min. Green:    16   38    38    7   28    28    29    0    29    0    0     0
Y+R:          6.0  5.0   5.0   6.0  6.0   6.0   5.0  0.0   6.0  0.0  0.0   0.0
Lanes:        2  0  2  0  0    1  0  1  1  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     630 1588     0     2 1354    25    74    0   435    0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  630 1588     0     2 1354    25    74    0   435    0    0     0
Added Vol:      0    0     0     0    0     0     0    0     0    0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0    0    0     0
Initial Fut:  630 1588     0     2 1354    25    74    0   435    0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:   663 1672     0     2 1425    26    78    0   458    0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0    0    0     0
Reduced Vol:  663 1672     0     2 1425    26    78    0   458    0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  663 1672     0     2 1425    26    78    0   458    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.90 0.93  1.00  0.93 0.93  0.93  0.93 1.00  0.83  1.00 1.00  1.00
Lanes:       2.00 2.00  0.00  1.00 1.96  0.04  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:  3432 3538     0  1769 3463    64  1769    0  1583    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.47  0.00  0.00 0.41  0.41  0.04 0.00  0.29  0.00 0.00  0.00
Crit Moves:  ****                  ****        ****
Green Time:  16.0 40.0   0.0   7.0 31.0  31.0  29.0  0.0  45.0   0.0  0.0   0.0
Volume/Cap:  1.09 1.06  0.00  0.02 1.19  1.19  0.14 0.00  0.58  0.00 0.00  0.00
Delay/Veh:   99.3 66.6   0.0  38.4  125 125.5  21.7  0.0  16.9   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  99.3 66.6   0.0  38.4  125 125.5  21.7  0.0  16.9   0.0  0.0   0.0
LOS by Move:    F    E     A     D    F     F     C    A     B     A    A     A
HCM2kAvgQ:     12   29     0     0   39    39     1    0     9     0    0     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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SF Housing EIR Project
Cumulative 2025 Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Embarcadero/Washington

Cycle (sec):	90	Critical Vol./Cap.(X):	0.604
Loss Time (sec):	14	Average Delay (sec/veh):	69.1
Optimal Cycle:	87	Level Of Service:	E

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	12	30	0	10	28	28	33	0	33	0	0	0
Y+R:	6.0	6.0	0.0	6.0	6.0	6.0	5.0	0.0	5.0	0.0	0.0	0.0
Lanes:	2 0	3 0	0	1 0	2 1	0	1 0	0 0	1	0 0	0 0	0
Volume Module:												
Base Vol:	396	1999	0	11	1572	96	151	0	298	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	396	1999	0	11	1572	96	151	0	298	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	396	1999	0	11	1572	96	151	0	298	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	417	2104	0	12	1655	101	159	0	314	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	417	2104	0	12	1655	101	159	0	314	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	417	2104	0	12	1655	101	159	0	314	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.89	1.00	0.93	0.88	0.88	0.93	1.00	0.83	1.00	1.00	1.00
Lanes:	2.00	3.00	0.00	1.00	2.83	0.17	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	3432	5083	0	1769	4748	290	1769	0	1583	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.12	0.41	0.00	0.01	0.35	0.35	0.09	0.00	0.20	0.00	0.00	0.00
Crit Moves:		****		****			****					
Green Time:	12.0	33.0	0.0	10.0	31.0	31.0	33.0	0.0	33.0	0.0	0.0	0.0
Volume/Cap:	0.91	1.13	0.00	0.06	1.01	1.01	0.25	0.00	0.54	0.00	0.00	0.00
Delay/Veh:	60.7	94.0	0.0	35.9	54.1	54.1	20.0	0.0	23.5	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	60.7	94.0	0.0	35.9	54.1	54.1	20.0	0.0	23.5	0.0	0.0	0.0
LOS by Move:	E	F	A	D	D	D	C	A	C	A	A	A
HCM2kAvgQ:	6	32	0	0	19	19	3	0	7	0	0	0

Note: Queue reported is the number of cars per lane.

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                           SF Housing EIR Project
              Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Embarcadero/Harrison
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        1.099
Loss Time (sec):        8               Average Delay (sec/veh):       55.0
Optimal Cycle:        180               Level Of Service:                 E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include         Include          Include
Min. Green:     0   63     0    0   63    63   27    0    27    0    0     0
Y+R:          0.0  5.0   0.0  0.0  5.0   5.0  5.0  0.0   5.0  0.0  0.0   0.0
Lanes:        0  0  2  0  0   0  0  1  1  0   1  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1329     0     0 1332   295  262    0   346    0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0 1329     0     0 1332   295  262    0   346    0    0     0
Added Vol:      0    0     0     0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0     0    0     0    0    0     0    0    0     0
Initial Fut:    0 1329     0     0 1332   295  262    0   346    0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:     0 1399     0     0 1402   311  276    0   364    0    0     0
Reduct Vol:     0    0     0     0    0     0    0    0     0    0    0     0
Reduced Vol:    0 1399     0     0 1402   311  276    0   364    0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0 1399     0     0 1402   311  276    0   364    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.80 0.67  0.80  0.80 0.65  0.65 0.67 0.80  0.60 0.80 0.80  0.80
Lanes:       0.00 2.00  0.00  0.00 1.64  0.36 1.00 0.00  1.00 0.00 0.00  0.00
Final Sat.:     0 2547     0     0 2029   449 1274    0  1140    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.55  0.00  0.00 0.69  0.69 0.22 0.00  0.32 0.00 0.00  0.00
Crit Moves:  ****                  ****                   ****
Green Time:   0.0 63.0   0.0   0.0 63.0  63.0 29.0  0.0  29.0  0.0  0.0   0.0
Volume/Cap:  0.00 0.87  0.00  0.00 1.10  1.10 0.75 0.00  1.10 0.00 0.00  0.00
Delay/Veh:    0.0 20.7   0.0   0.0 72.6  72.6 40.3  0.0 115.3  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 20.7   0.0   0.0 72.6  72.6 40.3  0.0 115.3  0.0  0.0   0.0
LOS by Move:    A    C     A     A    E     E    D    A     F    A    A     A
HCM2kAvgQ:      0   22     0     0   36    36    9    0    19    0    0     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                           SF Housing EIR Project
              Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #13 1st/Market
********************************************************************************
Cycle (sec):          60                Critical Vol./Cap.(X):        0.750
Loss Time (sec):      10                Average Delay (sec/veh):      129.9
Optimal Cycle:        62                Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0   18   18    18    0   34    34   34   34     0
Y+R:          0.0  0.0   0.0  4.0  4.0   4.0  0.0  4.0   4.0  4.0  4.0   0.0
Lanes:        0  0  0  0  0   1  0  2  1  0   0  0  1  0  1   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0  114 1178   297    0  294   247    1  399     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0  114 1178   297    0  294   247    1  399     0
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0  114 1178   297    0  294   247    1  399     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:     0    0     0  120 1240   313    0  309   260    1  420     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  120 1240   313    0  309   260    1  420     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0     0  120 1240   313    0  309   260    1  420     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.85 0.85  0.85 0.64 0.66  0.66 0.85 0.75  0.61 0.67 0.67  0.85
Lanes:       0.00 0.00  0.00 1.00 2.40  0.60 0.00 1.00  1.00 0.01 1.99  0.00
Final Sat.:     0    0     0 1211 3013   760    0 1424  1162    6 2527     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.10 0.41  0.41 0.00 0.22  0.22 0.17 0.17  0.00
Crit Moves:                       ****                ****
Green Time:   0.0  0.0   0.0 17.4 17.4  17.4  0.0 32.9  32.9 32.9 32.9   0.0
Volume/Cap:  0.00 0.00  0.00 0.34 1.42  1.42 0.00 0.40  0.41 0.30 0.30  0.00
Delay/Veh:    0.0  0.0   0.0 20.0  215 215.4  0.0  9.6  10.1  8.1  8.1   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 20.0  215 215.4  0.0  9.6  10.1  8.1  8.1   0.0
LOS by Move:    A    A     A    B    F     F    A    A     B    A    A     A
HCM2kAvgQ:      0    0     0    2   34    34    0    4     3    2    2     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

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--------------------------------------------------------------------------------
                            SF Housing EIR Project
               Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #14 1st/Mission
********************************************************************************
Cycle (sec):          60                 Critical Vol./Cap.(X):        1.307
Loss Time (sec):      10                 Average Delay (sec/veh):      109.3
Optimal Cycle:       180                 Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    23   23    23     0   29    29    29   29     0
Y+R:          0.0  0.0   0.0   4.0  4.0   4.0   0.0  4.0   4.0   4.0  4.0   0.0
Lanes:        0  0  0  0  0    0  1  2  1  0    0  1  0  0  1    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0    44 1347   209     0  684   176    10  501     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    44 1347   209     0  684   176    10  501     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0    44 1347   209     0  684   176    10  501     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0    0     0    46 1418   220     0  720   185    11  527     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0    46 1418   220     0  720   185    11  527     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0    46 1418   220     0  720   185    11  527     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.65 0.65  0.65  0.51 0.51  0.51  0.65 0.57  0.49  0.51 0.51  0.62
Lanes:       0.00 0.00  0.00  0.11 3.37  0.52  0.00 1.00  1.00  0.04 1.96  0.00
Final Sat.:     0    0     0   106 3258   506     0 1089   926    38 1883     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.44 0.44  0.44  0.00 0.66  0.20  0.28 0.28  0.00
Crit Moves:                               ****       ****
Green Time:   0.0  0.0   0.0  22.3 22.3  22.3   0.0 28.1  28.1  28.1 28.1   0.0
Volume/Cap:  0.00 0.00  0.00  1.17 1.17  1.17  0.00 1.41  0.43  0.60 0.60  0.00
Delay/Veh:    0.0  0.0   0.0 105.1  105 105.1   0.0  214  14.0  15.1 15.1   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 105.1  105 105.1   0.0  214  14.0  15.1 15.1   0.0
LOS by Move:    A    A     A     F    F     F     A    F     B     B    B     A
HCM2kAvgQ:      0    0     0    17   17    17     0   42     3     5    5     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                            SF Housing EIR Project
               Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #15 1st/Harrison
********************************************************************************
Cycle (sec):          60               Critical Vol./Cap.(X):        1.403
Loss Time (sec):       8               Average Delay (sec/veh):      136.1
Optimal Cycle:       180               Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Permitted       Permit+Prot
Rights:            Ovl             Include          Include          Include
Min. Green:     0    0     0    26   26    26    0    8     8    11   24     0
Y+R:          0.0  0.0   5.0   5.0  5.0   5.0   0.0  5.0   5.0   5.0  5.0   0.0
Lanes:        0  0  0  0  1    1  0  2  0  1    0  0  0  1  0    1  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0    67    36 1150   492    0  131    92   968  675     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0    67    36 1150   492    0  131    92   968  675     0
Added Vol:      0    0     0     0    0     0    0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0    0    0     0     0    0     0
Initial Fut:    0    0    67    36 1150   492    0  131    92   968  675     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0    0    71    38 1211   518    0  138    97  1019  711     0
Reduct Vol:     0    0     0     0    0     0    0    0     0     0    0     0
Reduced Vol:    0    0    71    38 1211   518    0  138    97  1019  711     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0    71    38 1211   518    0  138    97  1019  711     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.70 0.70  0.53  0.59 0.59  0.52  0.70 0.58  0.58  0.57 0.57  0.70
Lanes:       0.00 0.00  1.00  1.00 2.00  1.00  0.00 0.59  0.41  1.77 1.23  0.00
Final Sat.:     0    0  1015  1114 2229   997    0  651   457  1904 1334     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.07  0.03 0.54  0.52  0.00 0.21  0.21  0.54 0.53  0.00
Crit Moves:       ****             ****              ****        ****
Green Time:   0.0  0.0  18.0  26.0 26.0  26.0   0.0  8.0   8.0  26.0 26.0   0.0
Volume/Cap:  0.00 0.00  0.23  0.08 1.25  1.20  0.00 1.59  1.59  1.24 1.23  0.00
Delay/Veh:    0.0  0.0  17.6  10.3  140 126.8   0.0  321 321.0 113.7  127   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0  17.6  10.3  140 126.8   0.0  321 321.0 113.7  127   0.0
LOS by Move:    A    A     B     B    F     F    A    F     F     F    F     A
HCM2kAvgQ:      0    0     1     0   31    24    0   15    15    29   28     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                      SF Housing EIR Project
             Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #19 4th/King
********************************************************************************
Cycle (sec):        100                Critical Vol./Cap.(X):        1.038
Loss Time (sec):     12                Average Delay (sec/veh):       57.3
Optimal Cycle:      180                Level Of Service:                 E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    27   27    27   27   27    27   10   42    42   14   45    45
Y+R:          6.0  6.0   6.0  6.0  6.0   6.0  6.0  5.0   5.0  6.0  6.0   6.0
Lanes:        0  1  0  0  1    1  0  1  1  1    1  0  2  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      23  116    99  170  696   612  188 1815    69   43 1374    64
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   23  116    99  170  696   612  188 1815    69   43 1374    64
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   23  116    99  170  696   612  188 1815    69   43 1374    64
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:    24  122   104  179  733   644  198 1911    73   45 1446    67
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   24  122   104  179  733   644  198 1911    73   45 1446    67
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   24  122   104  179  733   644  198 1911    73   45 1446    67
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.66 0.66  0.75 0.53 0.78  0.78 0.84 0.80  0.80 0.84 0.83  0.83
Lanes:       0.17 0.83  1.00 1.00 1.60  1.40 1.00 2.89  0.11 1.00 1.91  0.09
Final Sat.:   208 1049  1424 1000 2363  2078 1592 4381   167 1592 3021   141
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.12  0.07 0.18 0.31  0.31 0.12 0.44  0.44 0.03 0.48  0.48
Crit Moves:                       ****         ****                  ****
Green Time:  29.9 29.9  29.9 29.9 29.9  29.9 12.0 44.0  44.0 14.1 46.1  46.1
Volume/Cap:  0.39 0.39  0.24 0.60 1.04  1.04 1.04 0.99  0.99 0.20 1.04  1.04
Delay/Veh:   28.5 28.5  26.8 33.3 70.1  70.1 119.4 45.8  45.8 38.4 60.8  60.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  28.5 28.5  26.8 33.3 70.1  70.1 119.4 45.8  45.8 38.4 60.8  60.8
LOS by Move:    C    C     C    C    E     E    F    D     D    D    E     E
HCM2kAvgQ:      4    4     3    5   19    19   11   29    29    1   27    27
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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                         SF Housing EIR Project
              Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #21 4th/Bryant
********************************************************************************
Cycle (sec):          60                 Critical Vol./Cap.(X):        0.646
Loss Time (sec):      12                 Average Delay (sec/veh):       23.8
Optimal Cycle:        58                 Level Of Service:                 C
********************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Split Phase      Split Phase      Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0   16   16     0    0   16    16   14   14    14
Y+R:          0.0  0.0   0.0  4.0  4.0   0.0  0.0  4.0   4.0  6.0  6.0   6.0
Lanes:        0  0  0  0  0   1  0  3  0  0   0  0  4  1  0   0  0  2  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0  230 1015     0    0 1392   208    0  249    32
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0  230 1015     0    0 1392   208    0  249    32
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0  230 1015     0    0 1392   208    0  249    32
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:     0    0     0  242 1068     0    0 1465   219    0  262    34
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  242 1068     0    0 1465   219    0  262    34
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0     0  242 1068     0    0 1465   219    0  262    34
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 0.75 0.80  1.00 1.00 0.79  0.79 1.00 0.79  0.79
Lanes:       0.00 0.00  0.00 1.00 3.00  0.00 0.00 4.35  0.65 0.00 3.00  1.00
Final Sat.:     0    0     0 1424 4575     0    0 6508   972    0 4497  1499
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.17 0.23  0.00 0.00 0.23  0.23 0.00 0.06  0.02
Crit Moves:                       ****             ****             ****
Green Time:   0.0  0.0   0.0 17.3 17.3   0.0  0.0 16.7  16.7  0.0 14.0  14.0
Volume/Cap:  0.00 0.00  0.00 0.59 0.81  0.00 0.00 0.81  0.81 0.00 0.25  0.10
Delay/Veh:    0.0  0.0   0.0 24.4 25.3   0.0  0.0 23.7  23.7  0.0 19.2  18.1
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 24.4 25.3   0.0  0.0 23.7  23.7  0.0 19.2  18.1
LOS by Move:    A    A     A    C    C     A    A    C     C    A    B     B
HCM2kAvgQ:      0    0     0    4    6     0    0    6     6    0    2     1
********************************************************************************
Note: Queue reported is the number of cars per lane.
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--------------------------------------------------------------------------------
                         SF Housing EIR Project
             Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #28 9th/Market
********************************************************************************
Cycle (sec):           60               Critical Vol./Cap.(X):         0.745
Loss Time (sec):       10               Average Delay (sec/veh):        17.9
Optimal Cycle:         60               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Permitted         Permitted
Rights:           Include          Include          Include          Include
Min. Green:    28   28    28    0    0     0   22   22     0    0   22    22
Y+R:          5.0  5.0   5.0  0.0  0.0   0.0  5.0  5.0   0.0  0.0  5.0   5.0
Lanes:        0  1  4  1  0   0  0  0  0  0   0  1  1  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     199 3286   130    0    0     0    2  299     0    0  435   146
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  199 3286   130    0    0     0    2  299     0    0  435   146
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  199 3286   130    0    0     0    2  299     0    0  435   146
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:   209 3459   137    0    0     0    2  315     0    0  458   154
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  209 3459   137    0    0     0    2  315     0    0  458   154
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  209 3459   137    0    0     0    2  315     0    0  458   154
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.79 0.79  0.79 1.00 1.00  1.00 0.80 0.80  1.00 1.00 0.81  0.81
Lanes:       0.33 5.45  0.22 0.00 0.00  0.00 0.01 1.99  0.00 0.00 1.50  0.50
Final Sat.:   497 8209   325    0    0     0   20 3014     0    0 2293   770
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.42 0.42  0.42 0.00 0.00  0.00 0.10 0.10  0.00 0.00 0.20  0.20
Crit Moves:  ****                                                  ****
Green Time:  28.0 28.0  28.0  0.0  0.0   0.0 22.0 22.0   0.0  0.0 22.0  22.0
Volume/Cap:  0.90 0.90  0.90 0.00 0.00  0.00 0.28 0.28  0.00 0.00 0.54  0.54
Delay/Veh:   18.4 18.4  18.4  0.0  0.0   0.0 14.1 14.1   0.0  0.0 16.9  16.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  18.4 18.4  18.4  0.0  0.0   0.0 14.1 14.1   0.0  0.0 16.9  16.9
LOS by Move:    B    B     B    A    A     A    B    B     A    A    B     B
HCM2kAvgQ:     16   16    16    0    0     0    2    2     0    0    5     5
********************************************************************************
Note: Queue reported is the number of cars per lane.
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-------------------------------------------------------------------------------
                           SF Housing EIR Project
              Cumulative 2025 Conditions - Weekday PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #29 10th/Howard
*******************************************************************************
Cycle (sec):         90                 Critical Vol./Cap.(X):        0.876
Loss Time (sec):      8                 Average Delay (sec/veh):       24.9
Optimal Cycle:       90                 Level Of Service:                 C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase      Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0   47    47    0    0     0   35   35     0
Y+R:          0.0  0.0   0.0  0.0  4.0   4.0  0.0  0.0   0.0  4.0  4.0   0.0
Lanes:        0  0  0  0  0   0  0  3  1  0   0  0  0  0  0   1  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0    0 2420    83    0    0     0  492  761     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0    0 2420    83    0    0     0  492  761     0
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0    0 2420    83    0    0     0  492  761     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:     0    0     0    0 2547    87    0    0     0  518  801     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0    0 2547    87    0    0     0  518  801     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0     0    0 2547    87    0    0     0  518  801     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 1.00 0.80  0.80 1.00 1.00  1.00 0.75 0.80  1.00
Lanes:       0.00 0.00  0.00 0.00 3.87  0.13 0.00 0.00  0.00 1.00 3.00  0.00
Final Sat.:     0    0     0    0 5868   201    0    0     0 1424 4575     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.00 0.43  0.43 0.00 0.00  0.00 0.36 0.18  0.00
Crit Moves:                       ****                         ****
Green Time:   0.0  0.0   0.0  0.0 47.0  47.0  0.0  0.0   0.0 35.0 35.0   0.0
Volume/Cap:  0.00 0.00  0.00 0.00 0.83  0.83 0.00 0.00  0.00 0.93 0.45  0.00
Delay/Veh:    0.0  0.0   0.0  0.0 20.9  20.9  0.0  0.0   0.0 51.5 21.2   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  0.0 20.9  20.9  0.0  0.0   0.0 51.5 21.2   0.0
LOS by Move:    A    A     A    A    C     C    A    A     A    D    C     A
HCM2kAvgQ:      0    0     0    0   19    19    0    0     0   19    6     0
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
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--------------------------------------------------------------------------------
                          SF Housing EIR Project
             Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #36 Divisadero/Fell
********************************************************************************
Cycle (sec):          90               Critical Vol./Cap.(X):        0.848
Loss Time (sec):       6               Average Delay (sec/veh):       25.4
Optimal Cycle:        86               Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted       Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:    25   25    0     0   25    25    0    0     0    55   55    55
Y+R:          5.0  5.0   0.0   0.0  5.0   5.0  0.0  0.0   0.0  5.0  5.0   5.0
Lanes:        0  1  1  0  0    0  0  2  0  1    0  0  0  0  0    0  1  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       2  891    0     0  995    68    0    0     0   117 2932   108
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    2  891    0     0  995    68    0    0     0   117 2932   108
Added Vol:      0    0    0     0    0     0    0    0     0     0    0     0
PasserByVol:    0    0    0     0    0     0    0    0     0     0    0     0
Initial Fut:    2  891    0     0  995    68    0    0     0   117 2932   108
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     2  938    0     0 1047    72    0    0     0   123 3086   114
Reduct Vol:     0    0    0     0    0     0    0    0     0     0    0     0
Reduced Vol:    2  938    0     0 1047    72    0    0     0   123 3086   114
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    2  938    0     0 1047    72    0    0     0   123 3086   114
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.85 0.85  1.00  1.00 0.93  0.83  1.00 1.00  1.00  0.88 0.88  0.88
Lanes:       0.01 1.99  0.00  0.00 2.00  1.00  0.00 0.00  0.00  0.15 3.71  0.14
Final Sat.:     7 3209    0     0 3538  1583    0    0     0   248 6226   229
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.29 0.29  0.00  0.00 0.30  0.05  0.00 0.00  0.00  0.50 0.50  0.50
Crit Moves:                        ****                         ****
Green Time:  29.0 29.0   0.0   0.0 29.0  29.0   0.0  0.0   0.0  55.0 55.0  55.0
Volume/Cap:  0.91 0.91  0.00  0.00 0.92  0.14  0.00 0.00  0.00  0.81 0.81  0.81
Delay/Veh:   42.2 42.2   0.0   0.0 42.5  22.2   0.0  0.0   0.0  15.3 15.3  15.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  42.2 42.2   0.0   0.0 42.5  22.2   0.0  0.0   0.0  15.3 15.3  15.3
LOS by Move:    D    D     A     A    D     C     A    A     A     B    B     B
HCM2kAvgQ:     17   17     0     0   19     1     0    0     0    21   21    21
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                          SF Housing EIR Project
              Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #38 Stanyan/Fulton
********************************************************************************
Cycle (sec):          90                Critical Vol./Cap.(X):         1.185
Loss Time (sec):      12                Average Delay (sec/veh):        70.3
Optimal Cycle:       180                Level Of Service:                  E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted        Permitted
Rights:           Include          Include            Ovl            Include
Min. Green:    30   30    30   17   17    17   30   30    30   30   30    30
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  5.0  5.0   5.0  5.0  5.0   5.0
Lanes:        1  0  1  1  0   0  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     573  476    51   38  485    38    4  554   754    1  657    49
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  573  476    51   38  485    38    4  554   754    1  657    49
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  573  476    51   38  485    38    4  554   754    1  657    49
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:   603  501    54   40  511    40    4  583   794    1  692    52
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  603  501    54   40  511    40    4  583   794    1  692    52
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  603  501    54   40  511    40    4  583   794    1  692    52
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.84 0.92  0.73 0.74 0.92  0.92 0.81 0.65  0.73 0.78 0.78  0.78
Lanes:       1.00 1.76  0.24 0.17 1.70  0.13 0.01 0.99  1.00 0.01 1.85  0.14
Final Sat.:  1592 3073   329  233 2969   233    9 1224  1385    4 2747   205
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.38 0.16  0.16 0.17 0.17  0.17 0.48 0.48  0.57 0.25 0.25  0.25
Crit Moves:  ****                  ****              ****
Green Time:  30.0 30.0  30.0 17.0 17.0  17.0 31.0 31.0  61.0 31.0 31.0  31.0
Volume/Cap:  1.14 0.49  0.49 0.91 0.91  0.91 1.38 1.38  0.85 0.73 0.73  0.73
Delay/Veh:  112.5 25.4  25.4 54.9 54.9  54.9 208.1  208  16.5 30.5 30.5  30.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 112.5 25.4  25.4 54.9 54.9  54.9 208.1  208  16.5 30.5 30.5  30.5
LOS by Move:    F    C     C    D    D     D    F    F     B    C    C     C
HCM2kAvgQ:     29    7     6   10   12    12   49   40    20    9    9     9
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                            SF Housing EIR Project
               Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #39 19th/Lincoln
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        1.229
Loss Time (sec):        8               Average Delay (sec/veh):       89.0
Optimal Cycle:        180               Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    57   57    57   63   63    63   26   26    26   26   26    26
Y+R:         11.0 11.0  11.0   5.0  5.0   5.0   6.0  6.0   6.0   6.0  6.0   6.0
Lanes:        0  0  2  1  0    0  0  2  1  0    0  0  2  0  1    0  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 2533   247     0 3367   381     0  913    64     0 1497   138
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 2533   247     0 3367   381     0  913    64     0 1497   138
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 2533   247     0 3367   381     0  913    64     0 1497   138
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0 2666   260     0 3544   401     0  961    67     0 1576   145
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 2666   260     0 3544   401     0  961    67     0 1576   145
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 2666   260     0 3544   401     0  961    67     0 1576   145
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.88  0.88  1.00 0.88  0.88  1.00 0.93  0.83  1.00 0.88  0.88
Lanes:       0.00 2.73  0.27  0.00 2.70  0.30  0.00 2.00  1.00  0.00 2.75  0.25
Final Sat.:     0 4571   446     0 4498   509     0 3538  1583     0 4594   423
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.58  0.58  0.00 0.79  0.79  0.00 0.27  0.04  0.00 0.34  0.34
Crit Moves:                        ****                                ****
Green Time:   0.0 64.1  64.1   0.0 64.1  64.1   0.0 27.9  27.9   0.0 27.9  27.9
Volume/Cap:  0.00 0.91  0.91  0.00 1.23  1.23  0.00 0.97  0.15  0.00 1.23  1.23
Delay/Veh:    0.0 19.8  19.8   0.0  124 124.1   0.0 58.0  27.3   0.0  146 145.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 19.8  19.8   0.0  124 124.1   0.0 58.0  27.3   0.0  146 145.7
LOS by Move:    A    B     B     A    F     F     A    E     C     A    F     F
HCM2kAvgQ:      0   32    32     0   79    79     0   21     2     0   36    36
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                          SF Housing EIR Project
             Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #40 19th/Taraval
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.784
Loss Time (sec):       8               Average Delay (sec/veh):       21.8
Optimal Cycle:        98               Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    62   62    62   62   62    62   28   28    28   28   28    28
Y+R:          5.0  5.0   5.0  5.0  5.0   5.0  5.0  5.0   5.0  5.0  5.0   5.0
Lanes:        0  1  1  1  0    0  1  1  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 2535   115     0 2767   124     7  247    81    11  318    42
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 2535   115     0 2767   124     7  247    81    11  318    42
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 2535   115     0 2767   124     7  247    81    11  318    42
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0 2668   121     0 2913   131     7  260    85    12  335    44
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 2668   121     0 2913   131     7  260    85    12  335    44
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 2668   121     0 2913   131     7  260    85    12  335    44
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.91 0.89  0.89  0.91 0.89  0.89  0.85 0.85  0.85  0.86 0.86  0.86
Lanes:       0.00 2.87  0.13  0.00 2.87  0.13  0.04 1.48  0.48  0.06 1.71  0.23
Final Sat.:     0 4833   219     0 4836   217    67 2379   780    97 2805   370
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.55  0.55  0.00 0.60  0.60  0.11 0.11  0.11  0.12 0.12  0.12
Crit Moves:                        ****                                ****
Green Time:   0.0 64.0  64.0   0.0 64.0  64.0  28.0 28.0  28.0  28.0 28.0  28.0
Volume/Cap:  0.00 0.86  0.86  0.00 0.94  0.94  0.39 0.39  0.39  0.43 0.43  0.43
Delay/Veh:    0.0 17.8  17.8   0.0 23.3  23.3  30.4 30.4  30.4  30.9 30.9  30.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 17.8  17.8   0.0 23.3  23.3  30.4 30.4  30.4  30.9 30.9  30.9
LOS by Move:    A    B     B     A    C     C     C    C     C     C    C     C
HCM2kAvgQ:      0   24    24     0   36    36     5    5     5     5    5     5
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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-------------------------------------------------------------------------------
                        SF Housing EIR Project
             Cumulative 2025 Conditions - Weekday PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #41 19th/Sloat
*******************************************************************************
Cycle (sec):        100                Critical Vol./Cap.(X):        1.411
Loss Time (sec):     12                Average Delay (sec/veh):       92.8
Optimal Cycle:      180                Level Of Service:                 F
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permit+Prot       Protected
Rights:           Include          Include          Include          Include
Min. Green:    0   43    43   11   58    58    4   33    33    0   24    24
Y+R:          0.0  5.0   5.0  4.0  5.0   5.0  4.0  4.0   4.0  0.0  5.0   5.0
Lanes:        0  0  2  1  0   1  0  2  1  0   1  1  1  1  0   0  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 2285    58  250 2621   467  270  967    69    0 1310   391
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0 2285    58  250 2621   467  270  967    69    0 1310   391
Added Vol:     0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   0 2285    58  250 2621   467  270  967    69    0 1310   391
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:    0 2405    61  263 2759   492  284 1018    73    0 1379   412
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0 2405    61  263 2759   492  284 1018    73    0 1379   412
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   0 2405    61  263 2759   492  284 1018    73    0 1379   412
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.89  0.89 0.93 0.87  0.87 0.62 0.88  0.88 1.00 0.89  0.83
Lanes:       0.00 2.93  0.07 1.00 2.55  0.45 1.00 2.80  0.20 0.00 3.00  1.00
Final Sat.:    0 4938   125 1769 4215   751 1175 4660   332    0 5083  1583
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.49  0.49 0.15 0.65  0.65 0.24 0.22  0.22 0.00 0.27  0.26
Crit Moves:  ****                 ****       ****                  ****
Green Time:   0.0 43.1  43.1 13.2 56.3  56.3 37.9 32.0  32.0  0.0 23.3  23.3
Volume/Cap:  0.00 1.13  1.13 1.13 1.16  1.16 0.77 0.68  0.68 0.00 1.16  1.12
Delay/Veh:    0.0 93.9  93.9 142.9 99.9  99.9  2.2 31.4  31.4  0.0  123 121.6
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 93.9  93.9 142.9 99.9  99.9  2.2 31.4  31.4  0.0  123 121.6
LOS by Move:    A    F     F    F    F     F    A    C     C    A    F     F
HCM2kAvgQ:      0   40    40   12   56    56   11   12    12    0   28    22
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```

SF Housing EIR Project
Cumulative 2025 Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #42 19th/Winston

Cycle (sec):	100	Critical Vol./Cap.(X):	1.373
Loss Time (sec):	12	Average Delay (sec/veh):	97.4
Optimal Cycle:	180	Level Of Service:	F

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Permitted	Permitted
Rights:	Include	Include	Ignore	Include
Lanes:	2 0 2 1 0	0 0 3 0 1	1 1 1 0 1	0 1 0 1 0

Movement:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Min. Green:	15	43	43	43	43	43	25	25	25	25	25	25
Y+R:	6.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0
Volume Module:												
Base Vol:	399	2188	3	0	2350	78	175	384	390	32	375	33
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	399	2188	3	0	2350	78	175	384	390	32	375	33
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	399	2188	3	0	2350	78	175	384	390	32	375	33
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.00	0.95	0.95	0.95
PHF Volume:	420	2303	3	0	2474	82	184	404	0	34	395	35
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	420	2303	3	0	2474	82	184	404	0	34	395	35
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	420	2303	3	0	2474	82	184	404	0	34	395	35
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.72	0.71	0.89	1.00	0.89	0.83	0.19	0.19	1.00	0.82	0.66	0.66
Lanes:	2.00	2.99	0.01	0.00	3.00	1.00	1.00	2.00	1.00	0.12	1.73	0.15
Final Sat.:	2745	4062	6	0	5083	1583	355	710	1900	185	2167	191
Capacity Analysis Module:												
Vol/Sat:	0.15	0.57	0.57	0.00	0.49	0.05	0.52	0.57	0.00	0.18	0.18	0.18
Crit Moves:	****				****			****				
Green Time:	15.0	58.0	58.0	0.0	43.0	43.0	30.0	30.0	0.0	30.0	30.0	30.0
Volume/Cap:	1.02	0.98	0.98	0.00	1.13	0.12	1.73	1.90	0.00	0.61	0.61	0.61
Delay/Veh:	92.0	34.0	34.0	0.0	94.2	17.2	375.0	450	0.0	31.4	31.4	31.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	92.0	34.0	34.0	0.0	94.2	17.2	375.0	450	0.0	31.4	31.4	31.4
LOS by Move:	F	C	C	A	F	B	F	F	A	C	C	C
HCM2kAvgQ:	7	24	30	0	39	1	18	20	0	9	7	7

Note: Queue reported is the number of cars per lane.

```
--------------------------------------------------------------------------------
                         SF Housing EIR Project
               Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #43 19th/Junipero Serra
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):        1.269
Loss Time (sec):       12                 Average Delay (sec/veh):      125.7
Optimal Cycle:        180                 Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted        Permitted
Rights:         WideBypass       WideBypass           Ovl            Include
Min. Green:    51   51    51   18   18    18    6    6     6    6    6     6
Y+R:          8.0  8.0   8.0  8.0  8.0   8.0  9.0  9.0   9.0  9.0  9.0   9.0
Lanes:        2  1  0  1  0    0  1  3  0  1    0  0  1  0  3    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:    2150 1690    11    26 1561    17     0  106  2738    35   41    54
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse: 2150 1690    11    26 1561    17     0  106  2738    35   41    54
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut: 2150 1690    11    26 1561    17     0  106  2738    35   41    54
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:  2263 1779    12    27 1643    18     0  112  2882    37   43    57
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 2263 1779    12    27 1643    18     0  112  2882    37   43    57
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume: 2263 1779    12    27 1643    18     0  112  2882    37   43    57
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.70 0.72  0.91  0.71 0.71  0.83  1.00 0.98  0.73  0.52 0.90  0.90
Lanes:       2.26 1.73  0.01  0.07 3.93  1.00  0.00 1.00  3.00  1.00 0.43  0.57
Final Sat.:  3024 2377    15    89 5328  1583     0 1862  4178   994  735   968
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.75 0.75  0.75  0.31 0.31  0.01  0.00 0.06  0.69  0.04 0.06  0.06
Crit Moves:  ****              ****                  ****
Green Time:  58.1 58.1  58.1  23.9 23.9  23.9   0.0  6.0  64.1   6.0  6.0   6.0
Volume/Cap:  1.29 1.29  1.29  1.29 1.29  0.05  0.00 1.00  1.08  0.51 0.98  0.98
Delay/Veh:  153.4  153 153.4 173.9  174  29.3   0.0  132  60.2  51.7  129 128.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 153.4  153 153.4 173.9  174  29.3   0.0  132  60.2  51.7  129 128.7
LOS by Move:    F    F     F     F    F     C     A    F     E     D    F     F
HCM2kAvgQ:     64   64    80    27   27     0     0    4    41     2    6     6
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                            SF Housing EIR Project
               Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #46 Lake Merced/Brotherhood
********************************************************************************
Cycle (sec):         107                Critical Vol./Cap.(X):        1.158
Loss Time (sec):      12                Average Delay (sec/veh):       95.6
Optimal Cycle:       180                Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Ignore
Min. Green:     0   22    22   46   73     0    0    0     0   24    0    24
Y+R:          0.0  5.0   5.0  5.0  5.0   0.0  0.0  0.0   0.0  5.0  0.0   5.0
Lanes:        0  0  2  0  1    2  0  1  0  0    0  0  0  0  0    1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  767   367 1776  987     0    0    0     0  406    0  1288
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  767   367 1776  987     0    0    0     0  406    0  1288
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0  767   367 1776  987     0    0    0     0  406    0  1288
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.00
PHF Volume:     0  807   386 1869 1039     0    0    0     0  427    0     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0  807   386 1869 1039     0    0    0     0  427    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.00
FinalVolume:    0  807   386 1869 1039     0    0    0     0  427    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.93  0.83 0.90 0.98  1.00 1.00 1.00  1.00 0.93 1.00  1.00
Lanes:       0.00 2.00  1.00 2.00 1.00  0.00 0.00 0.00  0.00 1.00 0.00  1.00
Final Sat.:     0 3538  1583 3432 1862     0    0    0     0 1769    0  1900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.23  0.24 0.54 0.56  0.00 0.00 0.00  0.00 0.24 0.00  0.00
Crit Moves:             **** ****                             ****
Green Time:   0.0 22.2  22.2 49.5 71.7   0.0  0.0  0.0   0.0 23.6  0.0   0.0
Volume/Cap:  0.00 1.10  1.18 1.18 0.83  0.00 0.00 0.00  0.00 1.10 0.00  0.00
Delay/Veh:    0.0  108 150.4 116.3 20.1  0.0  0.0  0.0   0.0 116.9  0.0  0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  108 150.4 116.3 20.1  0.0  0.0  0.0   0.0 116.9  0.0  0.0
LOS by Move:    A    F     F    F    C     A    A    A     A    F    A     A
HCM2kAvgQ:      0   23    23   53   28     0    0    0     0   23    0     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                            SF Housing EIR Project
             Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #47 Mission/Geneva
********************************************************************************
Cycle (sec):          60                Critical Vol./Cap.(X):        0.888
Loss Time (sec):       8                Average Delay (sec/veh):       33.9
Optimal Cycle:        75                Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    27   27    27   27   27    27   24   24    24   24   24    24
Y+R:          4.5  4.5   4.5  4.5  4.5   4.5  4.5  4.5   4.5  4.5  4.5   4.5
Lanes:        0  1  0  1  0   0  1  1  0  1   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     107  418   162   87  609   225    8 1033   188    0 1049   113
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  107  418   162   87  609   225    8 1033   188    0 1049   113
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  107  418   162   87  609   225    8 1033   188    0 1049   113
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:   113  440   171   92  641   237    8 1087   198    0 1104   119
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  113  440   171   92  641   237    8 1087   198    0 1104   119
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  113  440   171   92  641   237    8 1087   198    0 1104   119
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.58 0.58  0.58 0.72 0.72  0.67 0.77 0.77  0.77 0.95 0.83  0.83
Lanes:       0.31 1.22  0.47 0.25 1.75  1.00 0.01 1.68  0.31 0.00 1.81  0.19
Final Sat.:   343 1340   519  343 2399  1266   19 2463   448    0 2831   305
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.33 0.33  0.33 0.27 0.27  0.19 0.44 0.44  0.44 0.00 0.39  0.39
Crit Moves:       ****                             ****
Green Time:  27.0 27.0  27.0 27.0 27.0  27.0 25.0 25.0  25.0  0.0 25.0  25.0
Volume/Cap:  0.73 0.73  0.73 0.59 0.59  0.42 1.06 1.06  1.06 0.00 0.94  0.94
Delay/Veh:   18.2 18.2  18.2 14.5 14.5  13.4 60.6 60.6  60.6  0.0 30.4  30.4
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  18.2 18.2  18.2 14.5 14.5  13.4 60.6 60.6  60.6  0.0 30.4  30.4
LOS by Move:    B    B     B    B    B     B    E    E     E    A    C     C
HCM2kAvgQ:      8    8     8    6    6     3   23   23    23    0   17    17
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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SF Housing EIR Project
Cumulative 2025 Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #48 Mission/Silver

Cycle (sec):	60	Critical Vol./Cap.(X):	0.834
Loss Time (sec):	8	Average Delay (sec/veh):	20.9
Optimal Cycle:	62	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	26	26	26	26	26	26	25	25	25	25	25	25
Y+R:	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lanes:	0 1	0	1 0	0 1	0	1 0	0 0	1!	0 0	0 0	1!	0 0
Volume Module:												
Base Vol:	42	696	90	113	684	88	83	226	67	65	313	136
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	42	696	90	113	684	88	83	226	67	65	313	136
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	42	696	90	113	684	88	83	226	67	65	313	136
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	44	733	95	119	720	93	87	238	71	68	329	143
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	44	733	95	119	720	93	87	238	71	68	329	143
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	44	733	95	119	720	93	87	238	71	68	329	143
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.80	0.80	0.80	0.62	0.62	0.62	0.76	0.76	0.76	0.87	0.87	0.87
Lanes:	0.10	1.68	0.22	0.25	1.55	0.20	0.22	0.60	0.18	0.13	0.61	0.26
Final Sat.:	154	2546	329	302	1829	235	317	863	256	208	1001	435
Capacity Analysis Module:												
Vol/Sat:	0.29	0.29	0.29	0.39	0.39	0.39	0.28	0.28	0.28	0.33	0.33	0.33
Crit Moves:					****						****	
Green Time:	27.0	27.0	27.0	27.0	27.0	27.0	25.0	25.0	25.0	25.0	25.0	25.0
Volume/Cap:	0.64	0.64	0.64	0.87	0.87	0.87	0.66	0.66	0.66	0.79	0.79	0.79
Delay/Veh:	15.1	15.1	15.1	25.0	25.0	25.0	19.8	19.8	19.8	24.2	24.2	24.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	15.1	15.1	15.1	25.0	25.0	25.0	19.8	19.8	19.8	24.2	24.2	24.2
LOS by Move:	B	B	B	C	C	C	B	B	B	C	C	C
HCM2kAvgQ:	7	7	7	12	12	12	7	7	7	11	11	11

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                           SF Housing EIR Project
              Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #49 Mission/Ocean
********************************************************************************
Cycle (sec):          60                Critical Vol./Cap.(X):        0.506
Loss Time (sec):       8                Average Delay (sec/veh):        8.9
Optimal Cycle:        55                Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:    32   32    0     0   32    32    15    0    15     0    0     0
Y+R:          9.0  9.0  0.0   0.0  9.0   9.0   4.0  0.0   4.0   0.0  0.0   0.0
Lanes:        0  1  1  0  0    0  0  1  1  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      40  579    0     0  699   334   194    0    53     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   40  579    0     0  699   334   194    0    53     0    0     0
Added Vol:      0    0    0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0    0     0    0     0     0    0     0     0    0     0
Initial Fut:   40  579    0     0  699   334   194    0    53     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    42  609    0     0  736   352   204    0    56     0    0     0
Reduct Vol:     0    0    0     0    0     0     0    0     0     0    0     0
Reduced Vol:   42  609    0     0  736   352   204    0    56     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   42  609    0     0  736   352   204    0    56     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.78 0.78  1.00  1.00 0.89  0.89  0.93 1.00  0.83  1.00 1.00  1.00
Lanes:       0.13 1.87  0.00  0.00 1.35  0.65  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:   191 2763    0     0 2279  1089  1769    0  1583     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.22 0.22  0.00  0.00 0.32  0.32  0.12 0.00  0.04  0.00 0.00  0.00
Crit Moves:                        ****        ****
Green Time:  37.0 37.0   0.0   0.0 37.0  37.0  15.0  0.0  15.0   0.0  0.0   0.0
Volume/Cap:  0.36 0.36  0.00  0.00 0.52  0.52  0.46 0.00  0.14  0.00 0.00  0.00
Delay/Veh:    6.2  6.2   0.0   0.0  7.5   7.5  22.5  0.0  18.2   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   6.2  6.2   0.0   0.0  7.5   7.5  22.5  0.0  18.2   0.0  0.0   0.0
LOS by Move:    A    A     A     A    A     A     C    A     B     A    A     A
HCM2kAvgQ:      3    3     0     0    6     6     3    0     1     0    0     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

SF Housing EIR Project
Cumulative 2025 Conditions - Weekday PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #53 3rd/Palou

Cycle (sec):	100	Critical Vol./Cap.(X):	0.629
Loss Time (sec):	12	Average Delay (sec/veh):	57.1
Optimal Cycle:	180	Level Of Service:	E

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	15	69	69	49	49	49	21	21	21	21	21	21
Y+R:	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lanes:	1 0 1 1 0			0 1 0 1 0			0 0 1! 0 0			0 1 0 1 0		
Volume Module:												
Base Vol:	190	765	64	2	1148	84	53	235	95	43	276	68
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	190	765	64	2	1148	84	53	235	95	43	276	68
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	190	765	64	2	1148	84	53	235	95	43	276	68
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	200	805	67	2	1208	88	56	247	100	45	291	72
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	200	805	67	2	1208	88	56	247	100	45	291	72
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	200	805	67	2	1208	88	56	247	100	45	291	72
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.93	0.92	0.92	0.88	0.88	0.88	0.70	0.70	0.70	0.59	0.59	0.59
Lanes:	1.00	1.85	0.15	0.01	1.86	0.13	0.14	0.61	0.25	0.22	1.43	0.35
Final Sat.:	1769	3226	270	5	3112	228	183	811	328	251	1612	397
Capacity Analysis Module:												
Vol/Sat:	0.11	0.25	0.25	0.39	0.39	0.39	0.31	0.31	0.31	0.18	0.18	0.18
Crit Moves:		****						****				
Green Time:	19.6	67.7	67.7	48.0	48.0	48.0	20.6	20.6	20.6	20.6	20.6	20.6
Volume/Cap:	0.58	0.37	0.37	0.81	0.81	0.81	1.48	1.48	1.48	0.88	0.88	0.88
Delay/Veh:	39.6	7.2	7.2	25.7	25.7	25.7	275.9	276	275.9	56.0	56.0	56.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.6	7.2	7.2	25.7	25.7	25.7	275.9	276	275.9	56.0	56.0	56.0
LOS by Move:	D	A	A	C	C	C	F	F	F	E	E	E
HCM2kAvgQ:	6	6	6	18	18	18	30	30	30	9	9	9

Note: Queue reported is the number of cars per lane.

```
--------------------------------------------------------------------------------
                         SF Housing EIR Project
              Cumulative 2025 Conditions - Weekday PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #60 San Jose/Randall
********************************************************************************
Cycle (sec):          90                Critical Vol./Cap.(X):        1.001
Loss Time (sec):       6                Average Delay (sec/veh):       52.9
Optimal Cycle:       180                Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted       Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:    45   45    45    45   45    45     9    9     9    21   21    21
Y+R:          5.0  5.0   5.0   5.0  5.0   5.0   5.0  5.0   5.0   5.0  5.0   5.0
Lanes:        0  0  2  1  0    0  0  2  1  0    0  0  1! 0  0    0  1  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 2326   262     0 2499   166    72   83   141   316   55   139
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 2326   262     0 2499   166    72   83   141   316   55   139
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 2326   262     0 2499   166    72   83   141   316   55   139
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0 2448   276     0 2631   175    76   87   148   333   58   146
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 2448   276     0 2631   175    76   87   148   333   58   146
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 2448   276     0 2631   175    76   87   148   333   58   146
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.88  0.88  1.00 0.88  0.88  0.91 0.91  0.91  0.89 0.89  0.83
Lanes:       0.00 2.70  0.30  0.00 2.81  0.19  0.24 0.28  0.48  1.00 1.00  1.00
Final Sat.:     0 4500   507     0 4724   314   419  483   820  1696 1696  1583
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.54  0.54  0.00 0.56  0.56  0.18 0.18  0.18  0.20 0.03  0.09
Crit Moves:                        ****                  ****        ****
Green Time:   0.0 47.5  47.5   0.0 47.5  47.5  15.5 15.5  15.5  21.0 21.0  21.0
Volume/Cap:  0.00 1.03  1.03  0.00 1.05  1.05  1.05 1.05  1.05  0.84 0.15  0.40
Delay/Veh:    0.0 46.9  46.9   0.0 55.0  55.0 104.5  105 104.5  49.5 27.5  32.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 46.9  46.9   0.0 55.0  55.0 104.5  105 104.5  49.5 27.5  32.3
LOS by Move:    A    D     D     A    E     E     F    F     F     D    C     C
HCM2kAvgQ:      0   38    38     0   41    41    15   15    15    12    1     4
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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Appendix G – Transit Screenline Analysis

AECOM

Muni Screenline

Muni Screenlines.cdr

Figure 2

MUNI SCREENLINES

Regional Screenline

SAN FRANCISCO TRANSIT CENTER DISTRICT PLAN - TRANSIT NETWORK

Figure 3

REGIONAL TRANSIT SCREENLINES

Appendix H – Transportation Study Sources for Housing Element Study Intersections

Appendix H: Transportation Study Sources for Housing Element Study Intersections

ID	*Intersection*	*Source*
1	Geary Blvd / 25th Ave	TJKM
2	Geary Blvd / Park Presidio Ave	TJKM
3	Geary Blvd / Masonic Ave	SF Bicycle Plan[1]
4	Geary Blvd / Gough St	TJKM
5	Geary Blvd / Franklin St	TJKM
6	Geary Blvd / Van Ness Ave	TJKM
7	Lombard St / Richardson Ave	TJKM
8	Lombard St / Van Ness Ave	TJKM
9	Stockton St / Broadway	TJKM
10	The Embarcadero / Broadway	TJKM
11	The Embarcadero / Washington St	TJKM
12	The Embarcadero / Harrison St	TJKM
13	1st St / Market St	TJKM
14	1st St / Mission St	TJKM
15	1st St / Harrison St	TJKM
16	2nd St / Folsom St	SF Bicycle Plan[1]
17	2nd St / Bryant St	SF Bicycle Plan[1]
18	3rd St / King St	Eastern Neighborhoods[2]
19	4th St / King St	TJKM
20	4th St / Harrison St	SF Bicycle Plan[1]
21	4th St / Bryant St	TJKM
22	6th St / Market St	935-965 Market[3]
23	6th St / Mission St	935-965 Market[3]
24	6th St / Brannan St	SF Bicycle Plan[1]
25	Market St / Van Ness Ave	Market & Octavia[4]
26	Mission St / South Van Ness Ave	Market & Octavia[4]
27	10th St / Brannan St / Potrero St / Division St	SF Bicycle Plan[1]
28	9th St / Market St	TJKM
29	10th St / Howard St	TJKM
30	16th St / Mission St	Eastern Neighborhoods[2]
31	16th St / Potrero St	SF Bicycle Plan[1]
32	16th St / 3rd St	Eastern Neighborhoods[2]
33	Market St / Octavia St	SF Bicycle Plan[1]
34	Market St / Guerrero St / Laguna St	Market & Octavia[4]
35	Mission St / Otis St / Division St	Eastern Neighborhoods[2]
36	Fell St / Divisadero St	TJKM

Table continued next page.

Table continued from previous page.

ID	***Intersection***	***Source***
37	15th St / Market St / Sanchez St	Market & Octavia[4]
38	Fulton St / Stanyan St	TJKM
39	Lincoln Way / 19th Ave	TJKM
40	Taraval St / 19th Ave	TJKM
41	Sloat Blvd / 19th Ave	TJKM
42	Winston Dr / 19th Ave	TJKM
43	Junipero Serra Blvd / 19th Ave	TJKM
44	Junipero Serra Blvd / Ocean Ave	Balboa Park[5]
45	Phelan Ave / Ocean Ave / Geneva St	SF Bicycle Plan[1]
46	Lake Merced Blvd / Brotherhood Way	TJKM
47	Mission St / Geneva St	TJKM
48	Mission St / Silver Ave	TJKM
49	Mission Street / Ocean Ave	TJKM
50	Sunnydale Ave / Bayshore Blvd	Visitacion Valley[6]
51	Gilman St / Paul Ave / 3rd St	Bayview[7]
52	Industrial St / Bayshore Blvd / Alemany Blvd	SF Bicycle Plan[1]
53	3rd St / Palou Ave	TJKM
54	3rd St / Evans Ave	227-229 West Point[8]
55	3rd St / Cesar Chavez St	227-229 West Point[8]
56	Evans Ave / Cesar Chavez St	SF Bicycle Plan[1]
57	Bryant St / Cesar Chavez St	SF Bicycle Plan[1]
58	Mission St / Cesar Chavez St	SF Bicycle Plan[1]
59	Mission St / 24th St	Eastern Neighborhoods[2]
60	San Jose Ave / Randall St	TJKM

Notes: [1] San Francisco Bicycle Plan Update Transportation Impact Study
[2] Eastern Neighborhood Rezoning and Area Plan Transportation Study Final Report
[3] 935-965 Market Street Transportation Study
[4] Market and Octavia Plan EIR Transportation Study
[5] Balboa Park Station Transportation Study
[6] Visitacion Valley Redevelopment Plan EIR
[7] Bayview Transportation Improvements Plan Transportation Study
[8] 227-229 West Point Road Transportation Study

Appendix G

Greenhouse Gas Memo

CHRISTOPHER A. JOSEPH & ASSOCIATES
Environmental Planning and Research

MEMORANDUM

To: Jessica Range, San Francisco Planning Department

From: Bryan Chen, Christopher A. Joseph & Associates (CAJA)

Date: June 16, 2010

Subject: *Approach to Evaluating Greenhouse Gas Impacts in the 2004 and 2009 Housing Element EIR*

This memorandum outlines CAJA's approach to the greenhouse gas (GHG) emissions analysis that was used in the 2004 and 2009 Housing Element EIR. CAJA's measurement and analysis approach for GHG emissions associated with construction and operational activities is described in detail below. Estimated GHG emissions associated with the 2004 and 2009 Housing Elements are presented in Tables 1 through 5. GHG emissions for construction and operations were calculated for the years 2020, California’s interim target year for GHG reductions as codified by AB 32 and 2025, the buildout year. In addition, operational emissions were calculated for the year 2009 to represent a baseline of existing conditions. For construction emissions, the projected number of new housing units were calculated to be 28,634 housing units[1] between 2009 and 2020 and 41,650 housing units between 2009 and 2025. For operational emissions, the GHG emissions associated with the projected households (occupied dwellings) in 2009, 2020 and 2025 were estimated to be 351,370, 378,573 and 390,938, respectively.[2] For both households and housing units, it was assumed that 1.7 percent were single-family dwelling with the balance being multifamily dwellings.[3] Calculation sheets used in evaluating greenhouse gas emissions are attached.

Construction

During construction activities at individual development sites, the consumption of fuel by on-site construction equipment would generate GHG emissions. URBEMIS 2007 v.9.2.4 was used to model the annual amount of carbon dioxide (CO_2) emissions generated by on-site equipment during construction activities resulting from a projected increase of 22,066 new housing units by 2020 and 32,198 new housing units by 2025. Methane and nitrous oxide emissions for construction were obtained from the California Climate Action Registry (CCAR) Protocol, as URBEMIS provides only CO_2 emissions. The emissions accounted for include the use of construction equipment during grading, construction and paving, haul truck trips associated with construction, construction worker trips, and construction vendor trips and were scaled based on the number of new housing units in each scenario. The construction schedule and specific building types of potential future new construction are unknown.

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[1] *The estimate of the number of housing units includes a 5 percent vacancy rate and is different than households which represent the number of occupied dwellings.*

[2] *Development projections provided by John Rahaim, Director of City Planning, to Michael Carlin, Deputy General Manager at the San Francisco Public Utilities Commissions, July 9, 2009.*

[3] *This assumption is based on the current ratios of single-family homes and multi-family homes as compared to land available to accommodate new single-family and multi-family homes (housing capacity).*

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For computational simplicity, construction emissions for all projected future housing units were calculated within a one-year timeframe and averaged over the total period for this projection to determine average construction emissions of new housing units over the projection period (11 years for 2020 and 16 years for 2025).

Operations

During operation of the future projected housing, the consumption of fossil fuels is necessary to generate electricity, provide heating and hot water for residential uses, propel landscaping equipment, convey, transport, and treat water, and operate on-road motor vehicles. The consumption of these fossil fuels creates GHG emissions. Additionally, solid waste generation will result in GHG emissions from landfill operations.

Natural Gas Use

CO_2 emissions resulting from residential natural gas use can be modeled using URBEMIS 2007 v.9.2.4. However, the default consumption rates are based on data from the South Coast Air Quality Management District. Therefore, natural gas use by census tract for the City and County of San Francisco was obtained from Pacific Gas and Electric (PG&E)[4]. Mean annual natural gas use was obtained for both single-family units (518 therms per year) and multifamily units (163 therms per year). The GHG emission factors from the CCAR Protocol for natural gas were then applied to the respective consumption rates, to calculate annual GHG emissions in metric tons.

Electricity Use

Electricity use data was obtained from the same source as for natural gas use. Mean annual electricity use was obtained for both single-family units (4,804 kilowatt hours/year) and multifamily units (1,974 kilowatt hours/year). The CO_2 emission factor was based on the 2007 PG&E Power/Utility Reporting Protocol report obtained from the CCAR database. Methane and nitrous oxide emissions for electricity were obtained from the CCAR Protocol, as no PG&E-specific emission factors for these GHGs were available.

Water Use

Water consumption was based on data from the SFPUC, *City and County of San Francisco Retail Water Demands and Conservation Potential* report[5]. Daily water use was calculated for single-family units and multifamily units for the years 2010 (for baseline estimates)[6], 2020 (for interim target) and 2025 (for project buildout). For baseline estimates, single-family units were estimated to use 160 gallons per day and multifamily units to use 116 gallons per day. For the interim target, single-family units were estimated to use 150 gallons per day and multifamily units to use 107 gallons per day. For project buildout, single-family units were estimated to use 147 gallons per day and multifamily units to use 104 gallons per day. A water-related energy intensity relationship value of 4,000 kilowatt hours per million gallons was used as identified in the CEC's California's Water-Energy Relationship document for Northern California.[7] This energy intensity factor accounts for the energy required to convey, pump and treat water

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[4] *PG&E data provided by San Francisco Planning Department, March 16, 2010.*

[5] *SFPUC. City and County of San Francisco Retail Water Demands and Conservation Potential. November 2004.*

[6] *Daily water use was reported in 5-year increments. Since the baseline year is 2009, the daily water use for the closest year (2010) was used.*

[7] *CEC. California's Water-Energy Relationship, November 2005.*

and wastewater. The GHG emission factors associated with the energy required for the conveyance, treatment, and distribution of the water are the same as those used for electricity use.

Waste Generation

Residential waste disposal rates were based on a per capita value of 0.42 tons of waste per resident per year based on disposal information for San Francisco County obtained from the California Integrated Waste Management Board's Residential Waste Disposal Rates. A diversion rate of 72 percent was used to estimate the amount of solid waste diverted to landfills. GHG emissions from the Altamont Landfill were obtained from the BAAQMD for the year 2005.

Vehicle Travel

The on-road mobile vehicle miles per day and vehicle fleet mix from future residential development were estimated using the URBEMIS 2007 v.9.2.4 computer model. The assumed fuel efficiency was based upon the Bureau of Transportation Statistics for passenger cars and light trucks and the CCAR Protocol for medium- and heavy-duty trucks. The GHG emission factors from the CCAR Protocol for motor vehicles were applied to calculate annual GHG emissions in metric tons.

Landscaping Equipment

GHG emissions from landscape equipment use were estimated using the URBEMIS 2007 v.9.2.4 computer model. Results were converted to metric tons for reporting consistency.

Table 1, below, presents the GHG emissions form operational sources associated with the 2004 and 2009 Housing Elements for the baseline year, 2009.

Table 1
Baseline Greenhouse Gas Emissions from Residential Development (2009)

Emissions Source		GHG Emissions (MT CO_2e per year)
Operational Emissions	Natural Gas Consumption	324,452
	Electricity Use	207,709
	Water Consumption	17,435
	Waste Generation	9,961
	Motor Vehicle Use	3,791,396
	Landscape Equipment Use	36
	Total Operational	4,350,988

Source: Christopher A. Joseph & Associates, May 2010. Calculation data and results provided in Appendix A.

As shown in Table 1, the vast majority of GHG emissions are associated with motor vehicle use, with energy consumption (natural gas and electricity) the second largest source of GHG emissions.

Table 2 presents the GHG emissions for construction and operational sources for the years 2020 and 2025.

Table 2
Projected Greenhouse Gas Emissions from Residential Development (2020 and 2025)

Emission Source		GHG Emissions ($MT\ CO_2e$ per year) 2020	2025
Construction Emissions		3,670	3,702
Operational Emissions	Natural Gas Consumption	349,572	360,989
	Electricity Use	223,790	231,099
	Water Consumption	17,378	17,499
	Waste Generation	10,687	11,017
	Motor Vehicle Use	4,088,369	4,219,837
	Landscape Equipment Use	39	40
	Total Operational	4,689,835	4,840,481

Note: Construction emissions include housing units constructed between 2009-2020 and 2009-2025 and are annualized over the projection period (11 years and 16 years, respectively).
Source: Christopher A. Joseph & Associates, May 2010. Calculation data and results provided in Appendix A.

As shown in Table 2, annual construction GHG emissions were estimated to be 3,670 MT CO_2e per year for 2020 and 3,702 MT MT CO_2e per year for 2025. The construction emissions are substantially less than those estimated for operational emissions. Annual operation GHG emissions would result in 4,689,835 MT MT CO_2e in 2020 and 4,840,481 MT CO_2e in 2025. As with the baseline emissions, the vast majority of operational GHG emissions are associated with motor vehicle use.

Reductions from AB 32 Scoping Plan Measures

The estimates presented in Table 2 do not account for anticipated State measures that would further reduce greenhouse gas emissions. The BAAQMD estimated the GHG emission reductions within the land use-driven sectors that are anticipated to occur from statewide implementation of the AB 32 Scoping Plan measures. GHG emission reductions associated with key AB 32 measures quantified by the BAAQMD include measures such as the Renewable Portfolio Standard, improvements in energy efficiency through periodic updates to Title 24, AB 1493 (Pavley), and the Low Carbon Fuel Standard (LCFS). Table 3 presents the percent reduction for each measure as estimated by the Bay Area Air Quality Management District (BAAQMD). Tables 4 and 5 present the reduction in GHG emissions from future residential development with implementation of AB 32 reduction measures.

Table 3

GHG Emission Reductions from AB 32 Scoping Plan Measures

Category	Affected Emission Sources	Measure	Reduction from 2020 GHG Sector Inventory (%)
Mobile	On-road passenger vehicles	AB 1493 Pavley	19.7%
		LCFS	7.2%
		Passenger Vehicle Efficiency	2.8%
	Heavy/Medium Duty Vehicles	LCFS	7.2%
		Heavy Duty Vehicle Efficiency	2.9%
Area	Natural Gas	Energy Efficiency Measures	9.5%
Indirect	Electricity	RPS	21.0%
		Energy Efficiency Measures	15.7%

Notes: AB = Assembly Bill; LCFS = Low Carbon Fuel Standard; RPS = Renewable Portfolio Standard

Sources: Bay Area Air Quality Management District. California Environmental Quality Act Guidelines Update, Proposed Thresholds of Significance. May 2010. Data compiled by ICF Jones & Stokes

Table 4
Predicted Greenhouse Gas Emissions from Future Residential Development (2020)

Emissions Source	CO_2e Emissions in Metric Tons per Year ($MTCO_2e$/yr)		
	Project without Reduction Measures	Project with Reduction Measures	Reduction Percentage
Construction	3,670	3,670	0%
Natural Gas Consumption	349,572	316,363	9.5%
Electricity Generation	223,790	146,802	34%
Water Consumption	17,378	13,729	21%
Waste Generation	10,687	10,687	0%
Motor Vehicles	4,088,369	3,142,497	23%
Landscape Equipment	39	39	0%
Total Emissions	4,693,505	3,633,786	23%
Population	863,457		
Per Service Population Emissions	***5.44***	***4.21***	

Note: Per service population value is calculated by dividing the total annual construction and operational emissions by future residential population.

Source: Christopher A. Joseph & Associates, May 2010. Calculation data and results provided in Appendix A.

As shown in Table 4, with implementation of state regulations and AB 32 GHG reduction measures, the construction and operational emissions would decrease 23 percent from 4,693,505 MT CO_2e per year to 3,633,786 MT CO_2e per year. On a per service population basis, emissions would be reduced from 5.44 MT CO_2e per year to 4.21 MT CO_2e per year.

Table 5
Predicted Greenhouse Gas Emissions from Future Residential Development (2025)

Emissions Source	CO_2e Emissions in Metric Tons per Year ($MTCO_2e/yr$)		
	Project without Reduction Measures	Project with Reduction Measures	Reduction Percentage
Construction	3,702	3,702	0%
Natural Gas Consumption	360,989	326,695	9.5%
Electricity Generation	231,099	151,597	34%
Water Consumption	17,499	13,824	21%
Waste Generation	11,017	11,017	0%
Motor Vehicles	4,219,837	3,243,641	23%
Landscape Equipment	40	40	0%
Total Emissions	4,844,183	3,750,516	23%
Population	890,129		
Per Capita Emissions	***5.44***	***4.21***	

Note: Per service population value is calculated by dividing the total annual construction and operational emissions by future residential population.

Source: Christopher A. Joseph & Associates, May 2010. Calculation data and results provided in Appendix A.

As shown in Table 5, with implementation of state regulations and AB 32 GHG reduction measures, the construction and operational emissions would decrease 23 percent from 4,844,183 MT CO_2e per year to 3,750,516 MT CO_2e per year. On a per service population basis, emissions would be reduced from 5.44 MT CO_2e per year to 4.21 MT CO_2e per year.

APPENDIX A

GHG WORKSHEETS

CHRISTOPHER A. JOSEPH & ASSOCIATES
Environmental Planning and Research

MEMORANDUM

To: *Jessica Range, MEA*

From: *Jessica Viramontes and Bryan Chen, CAJA*

Date: *May 28, 2010*

Subject: *San Francisco Population and Household Projections*

For the 2004 and 2009 Housing Element EIR, the planning period is 2009 to 2025. To derive the households for this period, this analysis used the development projections provided by John Rahaim, Director of City Planning, to Michael Carlin, Deputy General Manager at the San Francisco Public Utilities Commission, on July 9, 2009 to satisfy mandates in connection with assessing water supply and demand in the years to come. Projections of households, household population and jobs were provided for 2000, 2005, and 2030. Linear regression was used to derive development projections for 2009, 2010, 2015, 2020, and 2025. The following discussion explains the process for calculating the population and housing unit projections used for the 2004 and 2009 Housing Element EIR. Table 1 shows the trends and projections for San Francisco's housing units, households, citywide household population, and persons per household.

2009 Households

The total growth between 2005 and 2030 is 61,814 households, which equates to average growth of 2,473 households per year. Using this information, 351,370 households are projected for 2009 (growth of 9,892 households over 4 years [2005-2009]).

2009 – 2020 Households and Housing Units

It also stands that 378,573 households are projected for 2020 (growth of 37,095 households over 15 years [2005-2020]). The growth projected from 2009 to 2020 is 27,203 households. It is assumed that there are more housing units that are developed than households. Therefore, projected housing units are calculated by dividing households by 0.95. This calculation results in a projection of 28,635 housing units for the period 2009 to 2020.

2009 – 2025 Households and Housing Units

It also stands that 390,938 households are projected for 2025 (growth of 49,460 households over 20 years [2005-2025]). The growth projected from 2009 to 2025 is 39,568 households. Projected housing units are calculated by dividing households by 0.95. This calculation results in a projection of 41,651 housing units for the period 2009 to 2025.

Table 1
San Francisco Household Trends and Projections

	2000	2005	2009	2010	2015	2020	2025	2030
Housing Units	347,053	359,451	369,864	372,467	385,483	398,498	411,514	424,518
Household	329,700	341,478	351,370	353,843	366,208	378,573	390,938	403,292
Household Population	756,976	783,441	804,779	810,113	836,785	863,457	890,129	916,800
Persons per Household	2.30	2.29	2.29	2.29	2.28	2.28	2.28	2.27

Note: The projections for 2009, 2010, 2015, 2020, and 2025 were calculated using linear regression.

Source: John Rahaim, Director of Planning, San Francisco Planning Department, correspondence with Michael P. Carlin, Deputy General Manager at the San Francisco Public Utilities Commission, July 9, 2009.

	Population and Housing Projects				
	2009	2020	2025	2009-2020	2009-2025
Population	804,779	863,457	890,129	58,678	85,350
Households	351,370	378,573	390,938	27,203	39,568
Single Family	5,973	6,436	6,646	462	673
Multifamily	345,397	372,137	384,292	26,741	38,895
Housing Units	369,864	398,498	411,514	28,634	41,650
Single Family	6,288	6,774	6,996	487	708
Multifamily	363,576	391,724	404,518	28,147	40,942

Notes
Housing Units include a 5 percent vacancy rate and will be used in the construction emissions calculations
Assumes 1.7 percent of households and housing units are single family dwellings.

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM NATURAL GAS CONSUMPTION

Project Name:	SF Housing Element
Analysis Year:	2009
Analysis Scenario:	Existing

NATURAL GAS DEMAND

Land Use	Units	Consumption Rate (therms/ unit/year)	Natural Gas Demand (therms/ year)
Single Residential Units:	5,973	517.8	3,092,819.4
Multi-Family Residential Units:	345,397	162.8	56,230,631.6
Natural Gas Demand (therms/year)		59,323,451.0	
Monthly Million Btu (MMBtu):		5,932,345.1	

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (kg/MMBtu)	Emissions (metric tons/year)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	53.06	314,770.23	1	314,770.23
Methane	0.00500	355.941	21	7,474.75
Nitrous Oxide	0.00010	7.119	310	2,206.83
	Total Emissions:	315,133.29		324,451.82

Source of natural gas consumption rates: Census Track PG&E 2003 study for City and County of San Francisco.
Source of greenhouse gas emission factors: *California Climate Action Registry General Reporting Protocol*, v.3.1 January 2009.

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM ELECTRICITY GENERATION

Project Name: SF Housing Element
Analysis Year: 2009
Analysis Scenario: Existing

ELECTRICITY DEMAND

Land Use	Units	Usage Rate (KWh/ unit/year)	Electricity Demand (KWh/ year)
Single Residential Units:	5,973	4804	28,694,292.0
Multi-Family Residential Units:	345,397	1974	681,813,678.0
		Total Electricity Demand:	710,507,970.0

Total Megawatt Hours (MWh) per Year: 710,508.0

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (lbs/MWh)	Emissions (metric tons)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	641.35	206,695.16	1	206,695.16
Methane	0.030	9.733	21	204.39
Nitrous Oxide	0.008	2.610	310	809.25
	Total Emissions:	206,707.50		207,708.80

Source of usage rates: Census Track PG&E 2003 study for City and County of San Francisco.
Source of greenhouse gas emission factors: *California Climate Action Registry General Reporting Protocol v 3.1,* January 2009.
Carbon dioxide emission factor for electricity provided by PG&E, obtained from the California Climate Action Registry Database.
Methane and nitrous oxide emission factor for electricity from California Climate Action Registry General Reporting Protocol v 3.1, January 2009. Table C. PG&E-specific methane and nitrous oxide emission factors were not available.

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM WATER USE

Project Name: SF Housing Element
Analysis Year: 2009
Analysis Scenario: Existing

WATER USE

Land Use	Units	Water Use Rate (gal/ unit/day)	Expected Water Use (gal/ year)
Single Residential Units:	5,973	160	348,322,242
Multi-Family Residential Units:	345,397	116	14,561,351,180
		Total Daily Water Use:	14,909,673,423

Water Use Intensities (kwh/MG) 4000

Total Megawatt Hours (MWh) per Year: 59,638.69

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (lbs/MWh)	Emissions (metric tons)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	641.35	17,349.60	1	17,349.60
Methane	0.03	0.82	21	17.16
Nitrous Oxide	0.01	0.22	310	67.93
	Total Emissions:	17,350.64		17,434.68

Water Use Rate: San Francisco Public Utilities Commission, *City and County of San Francisco Retail Water Demands and Conservation Potential*. November 2004

Source of Water Use Intensity: California Energy Commission. Water-Energy Relationship 2005. Value of 4,000 kwh/MG is specific to Northern California and includes water supply conveyance, water treatment, water distribution, and wastewater treatment.

Source of greenhouse gas emission factors: See electrical use.

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM SOLID WASTE GENERATION

Project Name: SF Housing Element
Analysis Year: 2009
Analysis Scenario: Existing

WASTE

Per Capita Disposal Rate (metric tons/yr)	0.42
Project Population	804,779
Total Garbage Generated/Year (metric tons)	338,007
Diversion Rate	0.72
Total Garbage Disposed/Year (metric tons)	94,642

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (lbs/MWh)	Emissions (metric tons)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	0.05	4,595.82	1	4,595.82
Methane	0.003	255.15	21	5,358.25
Nitrous Oxide	2.20E-07	0.02	310	6.45
	Total Emissions:	4,850.99		9,960.52

Source: Waste per resident per year based on disposal information for San Francisco County obtained from the California Integrated Waste Management Board's Residential Waste Disposal Rates.

San Francisco currently divers 72 percent of its waste from landfills to recycling and composting.

GHG emissions from the Altamont Landfill was obtained from the Bay Area Air Quality Management District (BAAQMD) for the year 2005.

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Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: \\vmware-host\Shared Folders\MacShare\Desktop\Current Projects\SF Housing\URBEMIS\Operations 2009.urb924

Project Name: SF Housing Element Housing Operation 2009

Project Location: San Francisco County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source
Single family housing
Apartments low rise
Apartments mid rise
Apartments high rise
Condo/townhouse general
Condo/townhouse high rise
TOTALS (tons/year, unmitigated)

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2009 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	1,991.00	9.57	dwelling units	5,973.00	57,161.61	488,714.61
Apartments low rise	4,317.44	6.90	dwelling units	69,079.00	476,645.11	4,075,172.74
Apartments mid rise	1,817.87	6.90	dwelling units	69,079.00	476,645.11	4,075,172.74
Apartments high rise	1,114.18	6.90	dwelling units	69,079.00	476,645.11	4,075,172.74
Condo/townhouse general	4,317.44	6.90	dwelling units	69,079.00	476,645.11	4,075,172.74
Condo/townhouse high rise	1,079.36	6.90	dwelling units	69,079.00	476,645.11	4,075,172.74
					2,440,387.16	20,864,578.31

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	61.0	1.5	98.2	0.3
Light Truck < 3750 lbs	11.1	1.8	96.4	1.8
Light Truck 3751-5750 lbs	16.3	0.6	99.4	0.0
Med Truck 5751-8500 lbs	4.7	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	0.1	0.0	0.0	100.0
Other Bus	0.1	0.0	100.0	0.0
Urban Bus	0.3	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Motorcycle	3.5	74.3	25.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.2	0.0	100.0	0.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						

Operational Changes to Defaults

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM MOTOR VEHICLES

Project Name:	SF Housing Element
Analysis Year:	2009
Analysis Scenario:	Existing

Vehicle Miles Per Day:	20,864,578.31
Days of Operation Per Year:	365

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel	Assumed mpg
Light Auto	61.00%	1.50%	98.20%	0.30%	22.5
Light Truck <3,750 lbs	11.10%	1.80%	96.40%	1.80%	18.0
Light Truck 3,751-5,750	16.30%	0.60%	99.40%	0.00%	18.0
Medium Truck 5,751-8,500	4.70%	0.00%	100.00%	0.00%	7.0
Light Heavy 8,501-10,000	0.50%	0.00%	80.00%	20.00%	6.8
Light Heavy 10,001-14,000	0.50%	0.00%	60.00%	40.00%	6.6
Med-Heavy 14,001-33,000	1.60%	0.00%	18.80%	81.20%	6.2
Heavy-Heavy 33,001-60,000	0.10%	0.00%	0.00%	100.00%	6.0
Line Haul >60,000 lbs	0.10%	0.00%	100.00%	0.00%	7.0
Urban Bus	0.30%	0.00%	0.00%	100.00%	6.0
Motorcycle	3.50%	74.30%	25.70%	0.00%	22.5
School Bus	0.10%	0.00%	0.00%	100.00%	6.0
Motor Home	0.20%	0.00%	100.00%	0.00%	7.0

Mobile Source Emission Factors

	Carbon Dioxide (kg/gallon)		Methane (g/mile)		Nitrous Oxide (g/mile)	
Vehicle Type	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel
Light Auto	8.81	10.15	0.0147	0.0005	0.0079	0.0010
Light Truck <3,750 lbs	8.81	10.15	0.0157	0.0010	0.0101	0.0015
Light Truck 3,751-5,750	8.81	10.15	0.0157	0.0010	0.0101	0.0015
Medium Truck 5,751-8,500	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Light Heavy 8,501-10,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Light Heavy 10,001-14,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Med-Heavy 14,001-33,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Heavy-Heavy 33,001-60,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Line Haul >60,000 lbs	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Urban Bus	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Motorcycle	8.81	10.15	0.0900	0.0000	0.0100	0.0000
School Bus	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Motor Home	8.81	10.15	0.0326	0.0051	0.0177	0.0051

Greenhouse Gas Emissions (metric tons per year)

	Carbon Dioxide		Methane		Nitrous Oxide	
Vehicle Type	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel
Light Auto	1,813,513.78	6,286.91	3.0260	0.0003	1.6262	0.0006
Light Truck <3,750 lbs	406,293.94	8,580.08	0.7240	0.0008	0.4658	0.0013
Light Truck 3,751-5,750	607,566.03	-	1.0827	-	0.6965	-
Medium Truck 5,751-8,500	450,482.79	-	1.6669	-	0.9051	-
Light Heavy 8,501-10,000	39,466.58	11,367.36	0.1460	0.0057	0.0793	0.0057
Light Heavy 10,001-14,000	30,496.90	23,423.65	0.1128	0.0118	0.0613	0.0118
Med-Heavy 14,001-33,000	32,614.14	162,290.92	0.1207	0.0815	0.0655	0.0815
Heavy-Heavy 33,001-60,000	-	12,883.01	-	0.0065	-	0.0065
Line Haul >60,000 lbs	9,584.74	-	0.0355	-	0.0193	-
Urban Bus	-	38,649.02	-	0.0194	-	0.0194
Motorcycle	104,367.17	-	1.0662	-	0.1185	-
School Bus	-	12,883.01	-	0.0065	-	0.0065
Motor Home	19,169.48	-	0.0709	-	0.0385	-
Total Emissions Passenger/Light Truck	2842240.74		4.83		2.79	
Total Emissions Heavy/Medium duty	947678.77		3.35		1.42	
CO_2 Equivalency Factors	1.00		21.00		310.00	
CO_2 Equivalent Emissions Passenger/Light Truck:	2842240.74		101.51		865.02	
CO_2 Equivalent Emissions Heavy/Medium Truck:	947678.77		70.36		439.82	
Total CO2 Equivalent Emissions						3791396

Source of vehicle miles per day and vehicle fleet mix: URBEMIS 2007 model results for this analysis.
Sources of fuel economy: California Climate Action Registry General Reporting Protocol, v.3.1. January 2009.
Source of greenhouse gas emission factors: *California Climate Action Registry General Reporting Protocol*, v.3.1. January 2009.

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Area Source Unmitigated Emissions (Tons/Year)

File Name: \\vmware-host\Shared Folders\MacShare\Desktop\Current Projects\SF Housing\URBEMIS\Operations 2009.urb924

Project Name: SF Housing Element Housing Operation 2009

Project Location: San Francisco County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	CO_2
Natural Gas	
Hearth	
Landscape	39.80
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, unmitigated)	39.80

Area Source Changes to Defaults

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM NATURAL GAS CONSUMPTION

Project Name:	SF Housing Element
Analysis Year:	2020
Analysis Scenario:	Proposed Project

NATURAL GAS DEMAND

Land Use	Units	Consumption Rate (therms/ unit/year)	Natural Gas Demand (therms/ year)
Single Residential Units:	6,436	517.8	3,332,560.8
Multi-Family Residential Units:	372,137	162.8	60,583,903.6

Natural Gas Demand (therms/year)	63,916,464.4
Monthly Million Btu (MMBtu):	6,391,646.4

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (kg/MMBtu)	Emissions (metric tons/year)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	53.06	339,140.76	1	339,140.76
Methane	0.00500	383.499	21	8,053.47
Nitrous Oxide	0.00010	7.670	310	2,377.69
	Total Emissions:	339,531.93		349,571.93
		Natural Gas Reduction	Energy Efficiency Measures	9.5%
			Emissions w/ Measures	316,362.59

Source of natural gas consumption rates: Census Track PG&E 2003 study for City and County of San Francisco.
Source of greenhouse gas emission factors: *California Climate Action Registry General Reporting Protocol*, v.3.1 January 2009.
Natural gas reductions based on estimates in BAAQMD's Proposed Thresholds of Significance,May 2010.

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM ELECTRICITY GENERATION

Project Name: SF Housing Element
Analysis Year: 2020
Analysis Scenario: Proposed Project

ELECTRICITY DEMAND

Land Use	Units	Usage Rate (KWh/ unit/year)	Electricity Demand (KWh/ year)
Single Residential Units:	6,436	4804	30,918,544.0
Multi-Family Residential Units:	372,137	1974	734,598,438.0
		Total Electricity Demand:	765,516,982.0

Total Megawatt Hours (MWh) per Year: 765,517.0

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (lbs/MWh)	Emissions (metric tons)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	641.35	222,697.93	1	222,697.93
Methane	0.030	10.486	21	220.22
Nitrous Oxide	0.008	2.813	310	871.90
	Total Emissions:	222,711.23		223,790.05

Electricity Reduction	Energy Efficiency Measures	15.7%
	RPS	21.0%
	Solar Roofs	1.5%
	Emissions w/ Measures	146,801.90

Source of usage rates: Census Track PG&E 2003 study for City and County of San Francisco.
Source of greenhouse gas emission factors: *California Climate Action Registry General Reporting Protocol v 3.1,* January 2009.
Carbon dioxide emission factor for electricity provided by PG&E, obtained from the California Climate Action Registry Database.
Methane and nitrous oxide emission factor for electricity from California Climate Action Registry General Reporting Protocol v 3.1, January 2009. Table C. PG&E-specific methane and nitrous oxide emission factors were not available.
Electricity reductions based on estimates in BAAQMD's Proposed Thresholds of Significance, May 2010.

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM WATER USE

Project Name: SF Housing Element
Analysis Year: 2020
Analysis Scenario: Proposed Project

WATER USE

Land Use	Units	Water Use Rate (gal/ unit/day)	Expected Water Use (gal/ year)
Single Residential Units:	6,436	150	353,175,104
Multi-Family Residential Units:	372,137	107	14,508,229,888
		Total Daily Water Use:	14,861,404,992
Water Use Intensities (kwh/MG)	4,000		
Total Megawatt Hours (MWh) per Year:	59,445.62		

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (lbs/MWh)	Emissions (metric tons)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	641.35	17,293.43	1	17,293.43
Methane	0.03	0.81	21	17.10
Nitrous Oxide	0.01	0.22	310	67.71
	Total Emissions:	17,294.47		17,378.24
		Electricity Reduction	RPS	21.0%
			Emissions w/ Measures	13728.81005

Water Use Rate: San Francisco Public Utilities Commission, *City and County of San Francisco Retail Water Demands and Conservation Potential*. November 2004

Source of Water Use Intensity: California Energy Commission. Water-Energy Relationship 2005. Value of 4,000 kwh/MG is specific to Northern California and includes water supply conveyance, water treatment, water distribution, and wastewater treatment.

Source of greenhouse gas emission factors: See electrical use.

Electricity reduction based on estimates in BAAQMD's Proposed Thresholds of Significance, May 2010.

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM SOLID WASTE GENERATION

Project Name: SF Housing Element
Analysis Year: 2020
Analysis Scenario: Proposed Project

WASTE

Per Capita Disposal Rate (metric tons/yr)	0.42
Project Population	863,457
Total Garbage Generated/Year (metric tons)	362,652
Diversion Rate	0.72
Total Garbage Disposed/Year (metric tons)	101,543

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (lbs/MWh)	Emissions (metric tons)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	0.05	4,930.91	1	4,930.91
Methane	0.003	273.76	21	5,748.93
Nitrous Oxide	2.20E-07	0.02	310	6.93
	Total Emissions:	5,204.69		10,686.76
				10,686.76

Source: Waste per resident per year based on disposal information for San Francisco County obtained from the California Integrated Waste Management Board's Residential Waste Disposal Rates.

San Francisco currently divers 72 percent of its waste from landfills to recycling and composting.

GHG emissions from the Altamont Landfill was obtained from the Bay Area Air Quality Management District (BAAQMD) for the year 2005.

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: \\vmware-host\Shared Folders\MacShare\Desktop\Current Projects\SF Housing\URBEMIS\Operations 2020.urb924

Project Name: SF Housing Element Housing Operation 2020

Project Location: San Francisco County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source
Single family housing
Apartments low rise
Apartments mid rise
Apartments high rise
Condo/townhouse general
Condo/townhouse high rise
TOTALS (tons/year, unmitigated)

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2020 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	2,145.33	9.57	dwelling units	6,436.00	61,592.52	526,597.56
Apartments low rise	4,651.69	6.90	dwelling units	74,427.00	513,546.31	4,390,666.94
Apartments mid rise	1,958.61	6.90	dwelling units	74,427.00	513,546.31	4,390,666.94
Apartments high rise	1,200.44	6.90	dwelling units	74,427.00	513,546.31	4,390,666.94
Condo/townhouse general	4,651.69	6.90	dwelling units	74,427.00	513,546.31	4,390,666.94
Condo/townhouse high rise	1,162.92	6.90	dwelling units	74,427.00	513,546.31	4,390,666.94
					2,629,324.07	22,479,932.26

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	60.9	0.0	99.8	0.2
Light Truck < 3750 lbs	11.0	0.0	99.1	0.9
Light Truck 3751-5750 lbs	16.5	0.0	100.0	0.0
Med Truck 5751-8500 lbs	4.7	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	0.1	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.3	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Motorcycle	3.5	40.0	60.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.2	0.0	100.0	0.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						

Operational Changes to Defaults

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM MOTOR VEHICLES

Project Name:	SF Housing Element
Analysis Year:	2020
Analysis Scenario:	Proposed Project

Vehicle Miles Per Day:	22,479,932.26
Days of Operation Per Year:	365

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel	Assumed mpg
Light Auto	60.90%	0.00%	99.80%	0.20%	22.5
Light Truck <3,750 lbs	11.00%	0.00%	99.10%	0.90%	18.0
Light Truck 3,751-5,750	16.50%	0.00%	100.00%	0.00%	18.0
Medium Truck 5,751-8,500	4.70%	0.00%	100.00%	0.00%	7.0
Light Heavy 8,501-10,000	0.50%	0.00%	80.00%	20.00%	6.8
Light Heavy 10,001-14,000	0.50%	0.00%	60.00%	40.00%	6.6
Med-Heavy 14,001-33,000	1.60%	0.00%	18.80%	81.20%	6.2
Heavy-Heavy 33,001-60,000	0.10%	0.00%	0.00%	100.00%	6.0
Line Haul >60,000 lbs	0.10%	0.00%	0.00%	100.00%	6.0
Urban Bus	0.30%	0.00%	0.00%	100.00%	6.0
Motorcycle	3.50%	40.00%	60.00%	0.00%	22.5
School Bus	0.10%	0.00%	0.00%	100.00%	6.0
Motor Home	0.20%	0.00%	100.00%	0.00%	7.0

Mobile Source Emission Factors

	Carbon Dioxide (kg/gallon)		Methane (g/mile)		Nitrous Oxide (g/mile)	
Vehicle Type	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel
Light Auto	8.81	10.15	0.0147	0.0005	0.0079	0.0010
Light Truck <3,750 lbs	8.81	10.15	0.0157	0.0010	0.0101	0.0015
Light Truck 3,751-5,750	8.81	10.15	0.0157	0.0010	0.0101	0.0015
Medium Truck 5,751-8,500	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Light Heavy 8,501-10,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Light Heavy 10,001-14,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Med-Heavy 14,001-33,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Heavy-Heavy 33,001-60,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Line Haul >60,000 lbs	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Urban Bus	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Motorcycle	8.81	10.15	0.0900	0.0000	0.0100	0.0000
School Bus	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Motor Home	8.81	10.15	0.0326	0.0051	0.0177	0.0051

Greenhouse Gas Emissions (metric tons per year)

	Carbon Dioxide		Methane		Nitrous Oxide	
Vehicle Type	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel
Light Auto	1,952,671.05	4,508.36	3.2581	0.0002	1.7510	0.0004
Light Truck <3,750 lbs	437,781.70	4,580.54	0.7802	0.0005	0.5019	0.0007
Light Truck 3,751-5,750	662,636.28	-	1.1809	-	0.7597	-
Medium Truck 5,751-8,500	485,359.56	-	1.7960	-	0.9751	-
Light Heavy 8,501-10,000	42,522.11	12,247.43	0.1573	0.0062	0.0854	0.0062
Light Heavy 10,001-14,000	32,858.00	25,237.13	0.1216	0.0127	0.0660	0.0127
Med-Heavy 14,001-33,000	35,139.15	174,855.63	0.1300	0.0879	0.0706	0.0879
Heavy-Heavy 33,001-60,000	-	13,880.42	-	0.0070	-	0.0070
Line Haul >60,000 lbs	-	13,880.42	-	0.0070	-	0.0070
Urban Bus	-	41,641.26	-	0.0209	-	0.0209
Motorcycle	112,447.37	-	1.1487	-	0.1276	-
School Bus	-	13,880.42	-	0.0070	-	0.0070
Motor Home	20,653.60	-	0.0764	-	0.0415	-
Total Emissions Passenger/Light Truck	3062177.93		5.22		3.01	
Total Emissions Heavy/Medium duty	1024602.51		3.58		1.51	
CO_2 Equivalency Factors	1.00		21.00		310.00	
CO_2 Equivalent Emissions Passenger/Light Truck:	3062177.93		109.62		934.23	
CO_2 Equivalent Emissions Heavy/Medium Truck:	1024602.51		75.15		469.60	
Total CO2 Equivalent Emissions						4088369

Reduction Measures	Pavley	LCFS	Efficiency	TOTAL
Passenger/Light Trucks	19.7%	7.2%	2.8%	2218749
Heavy/Medium Trucks		7.2%	2.9%	923748
Total CO2 Equivalent Emissions w/ Measures				3142497

Source of vehicle miles per day and vehicle fleet mix: URBEMIS 2007 model results for this analysis.
Sources of fuel economy: California Climate Action Registry General Reporting Protocol, v.3.1. January 2009.
Source of greenhouse gas emission factors: *California Climate Action Registry General Reporting Protocol*, v.3.1. January 2009.
Motor vehicle emission reductions based on estimates in BAAQMD's Proposed Thresholds of Significance,May 2010.

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Area Source Unmitigated Emissions (Tons/Year)

File Name: \\vmware-host\Shared Folders\MacShare\Desktop\Current Projects\SF Housing\URBEMIS\Operations 2020.urb924

Project Name: SF Housing Element Housing Operation 2020

Project Location: San Francisco County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	CO_2
Natural Gas	
Hearth	
Landscape	42.78
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, unmitigated)	42.78

Area Source Changes to Defaults

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Construction Unmitigated Emissions (Tons/Year)

File Name: \\vmware-host\Shared Folders\MacShare\Desktop\Current Projects\SF Housing\URBEMIS\Construction 2020.urb924

Project Name: SF Housing Element Housing Unit Construction 2020

Project Location: San Francisco County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

CO2

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2011	44,108.90
Demolition 01/05/2011-02/05/2011	3,859.97
Fugitive Dust	0.00
Demo Off Road Diesel	2,545.64
Demo On Road Diesel	1,235.61
Demo Worker Trips	78.72
Fine Grading 03/28/2011-05/11/2011	3,067.20
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	2,621.39
Fine Grading On Road Diesel	386.80
Fine Grading Worker Trips	59.01
Asphalt 04/28/2011-05/11/2011	963.58
Paving Off-Gas	0.00
Paving Off Road Diesel	622.12
Paving On Road Diesel	286.67
Paving Worker Trips	54.79
Building 05/11/2011-12/22/2011	35,790.52
Building Off Road Diesel	9,848.29
Building Vendor Trips	8,589.73
Building Worker Trips	17,352.50
Coating 12/08/2011-12/31/2011	427.62
Architectural Coating	0.00
Coating Worker Trips	427.62

Phase Assumptions

Phase: Demolition 1/5/2011 - 2/5/2011 - Type Your Description Here

Building Volume Total (cubic feet): 1921500

Building Volume Daily (cubic feet): 1921500

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On Road Truck Travel (VMT): 26687.5

Off-Road Equipment:

161 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

107 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

Phase: Fine Grading 3/28/2011 - 5/11/2011 - Default Fine Site Grading Description

Total Acres Disturbed: 1921.52

Maximum Daily Acreage Disturbed: 480.38

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 5822.79

Off-Road Equipment:

20 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

10 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

30 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

60 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

20 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 4/28/2011 - 5/11/2011 - Default Paving Description

Acres to be Paved: 480.38

Off-Road Equipment:

107 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

161 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

161 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 5/11/2011 - 12/22/2011 - Default Building Construction Description

Off-Road Equipment:

54 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

161 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

54 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

161 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

54 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 12/8/2011 - 12/31/2011 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM CONSTRUCTION

Project Name:	SF Housing Element
Analysis Year:	2020
Analysis Scenario:	Proposed Project
Housing Units	398,498
Years of Construction	11

	CO2 short tons/yr	CO2 tons/yr
URBEMIS	44,108.90	40,006.77

Emissions	Fuel Emission Factor	Fraction of CO_2 factor	CO_2 Equivalency Factors	CO_2 Ratio	CO_2 Equivalent Emissions (tons)
Carbon Dioxide	10150	1	1	1	40,007
Methane	0.58	5.7E-05	21	0.0012	48
Nitrous Oxide	0.26	2.6E-05	310	0.0079	318
					40,372
				Annualized Construction	3,670

CH_4 and N_2O emission factors associated from fuel emissions obtained from CCAR Protocol v3.1, Table C.6.

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM NATURAL GAS CONSUMPTION

Project Name:	SF Housing Element
Analysis Year:	2025
Analysis Scenario:	Proposed Project

NATURAL GAS DEMAND

Land Use	Units	Consumption Rate (therms/ unit/year)	Natural Gas Demand (therms/ year)
Single Residential Units:	6,646	517.8	3,441,298.8
Multi-Family Residential Units:	384,292	162.8	62,562,737.6
Natural Gas Demand (therms/year)		66,004,036.4	
Monthly Million Btu (MMBtu):		6,600,403.6	

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (kg/MMBtu)	Emissions (metric tons/year)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	53.06	350,217.42	1	350,217.42
Methane	0.00500	396.024	21	8,316.51
Nitrous Oxide	0.00010	7.920	310	2,455.35
	Total Emissions:	350,621.36		360,989.28
		Natural Gas Reduction	Energy Efficiency Measures	9.5%
			Emissions w/ Measures	326,695.29

Source of natural gas consumption rates: Census Track PG&E 2003 study for City and County of San Francisco.
Source of greenhouse gas emission factors: *California Climate Action Registry General Reporting Protocol*, v.3.1 January 2009.
Natural gas reductions based on estimates in BAAQMD's Proposed Thresholds of Significance, May 2010.

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM ELECTRICITY GENERATION

Project Name: SF Housing Element
Analysis Year: 2025
Analysis Scenario: Proposed Project

ELECTRICITY DEMAND

Land Use	Units	Usage Rate (KWh/ unit/year)	Electricity Demand (KWh/ year)
Single Residential Units:	6,646	4804	31,927,384.0
Multi-Family Residential Units:	384,292	1974	758,592,408.0
		Total Electricity Demand:	790,519,792.0

Total Megawatt Hours (MWh) per Year: 790,519.8

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (lbs/MWh)	Emissions (metric tons)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	641.35	229,971.55	1	229,971.55
Methane	0.030	10.829	21	227.41
Nitrous Oxide	0.008	2.904	310	900.38
	Total Emissions:	229,985.28		231,099.33

Electricity Reduction	Energy Efficiency Measures	15.7%
	RPS	21.0%
	Solar Roofs	1.5%
	Emissions w/ Measures	151,596.64

Source of usage rates: Census Track PG&E 2003 study for City and County of San Francisco.
Source of greenhouse gas emission factors: *California Climate Action Registry General Reporting Protocol v 3.1,* January 2009.
Carbon dioxide emission factor for electricity provided by PG&E, obtained from the California Climate Action Registry Database.
Methane and nitrous oxide emission factor for electricity from California Climate Action Registry General Reporting Protocol v 3.1, January 2009. Table C. PG&E-specific methane and nitrous oxide emission factors were not available.
Electricity reductions based on estimates in BAAQMD's Proposed Thresholds of Significance, May 2010.

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM SOLID WASTE GENERATION

Project Name: SF Housing Element
Analysis Year: 2025
Analysis Scenario: Proposed Project

WASTE

Per Capita Disposal Rate (metric tons/yr)	0.42
Project Population	890,129
Total Garbage Generated/Year (metric tons)	373,854
Diversion Rate	0.72
Total Garbage Disposed/Year (metric tons)	104,679

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (lbs/MWh)	Emissions (metric tons)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	0.05	5,083.22	1	5,083.22
Methane	0.003	282.22	21	5,926.52
Nitrous Oxide	0.000	0.02	310	7.14
	Total Emissions:	5,365.46		11,016.88
				11,016.88

Source: Waste per resident per year based on disposal information for San Francisco County obtained from the California Integrated Waste Management Board's Residential Waste Disposal Rates.

San Francisco currently divers 72 percent of its waste from landfills to recycling and composting.

GHG emissions from the Altamont Landfill was obtained from the Bay Area Air Quality Management District (BAAQMD) for the year 2005.

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM WATER USE

Project Name: SF Housing Element
Analysis Year: 2025
Analysis Scenario: Proposed Project

WATER USE

Land Use	Units	Water Use Rate (gal/ unit/day)	Expected Water Use (gal/ year)
Single Residential Units:	6,646	147	355,951,827
Multi-Family Residential Units:	384,292	104	14,608,460,616
		Total Daily Water Use:	14,964,412,444

Water Use Intensities (kwh/MG)	4,000
Total Megawatt Hours (MWh) per Year:	59,857.65

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (lbs/MWh)	Emissions (metric tons)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	641.35	17,413.30	1	17,413.30
Methane	0.03	0.82	21	17.22
Nitrous Oxide	0.01	0.22	310	68.18
	Total Emissions:	17,414.34		17,498.69

Electricity Reduction	RPS	21.0%
	Emissions w/ Measures	13824

Water Use Rate: San Francisco Public Utilities Commission, *City and County of San Francisco Retail Water Demands and Conservation Potential*. November 2004

Source of Water Use Intensity: California Energy Commission. Water-Energy Relationship 2005. Value of 4,000 kwh/MG is specific to Northern California and includes water supply conveyance, water treatment, water distribution, and wastewater treatment.

Source of greenhouse gas emission factors: See electrical use.

Electricity reduction based on estimates in BAAQMD's Proposed Thresholds of Significance, May 2010.

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Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: \\vmware-host\Shared Folders\MacShare\Desktop\Current Projects\SF Housing\URBEMIS\Operations 2025.urb924

Project Name: SF Housing Element Housing Operation 2025

Project Location: San Francisco County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source
Single family housing
Apartments low rise
Apartments mid rise
Apartments high rise
Condo/townhouse general
Condo/townhouse high rise
TOTALS (tons/year, unmitigated)

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2025 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	2,215.33	9.57	dwelling units	6,646.00	63,602.22	543,779.89
Apartments low rise	4,803.62	6.90	dwelling units	76,858.00	530,320.21	4,534,078.75
Apartments mid rise	2,022.58	6.90	dwelling units	76,858.00	530,320.21	4,534,078.75
Apartments high rise	1,239.65	6.90	dwelling units	76,858.00	530,320.21	4,534,078.75
Condo/townhouse general	4,803.62	6.90	dwelling units	76,858.00	530,320.21	4,534,078.75
Condo/townhouse high rise	1,200.91	6.90	dwelling units	76,858.00	530,320.21	4,534,078.75
					2,715,203.27	23,214,173.64

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	61.0	0.0	100.0	0.0
Light Truck < 3750 lbs	10.9	0.0	100.0	0.0
Light Truck 3751-5750 lbs	16.5	0.0	100.0	0.0
Med Truck 5751-8500 lbs	4.7	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	0.1	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.3	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Motorcycle	3.5	34.3	65.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.2	0.0	100.0	0.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						

Operational Changes to Defaults

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM MOTOR VEHICLES

Project Name:	SF Housing Element
Analysis Year:	2025
Analysis Scenario:	Proposed Project

Vehicle Miles Per Day:	23,214,173.64
Days of Operation Per Year:	365

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel	Assumed mpg
Light Auto	61.00%	0.00%	100.00%	0.00%	22.5
Light Truck <3,750 lbs	10.90%	0.00%	100.00%	0.00%	18.0
Light Truck 3,751-5,750	16.50%	0.00%	100.00%	0.00%	18.0
Medium Truck 5,751-8,500	4.70%	0.00%	100.00%	0.00%	7.0
Light Heavy 8,501-10,000	0.50%	0.00%	80.00%	20.00%	6.8
Light Heavy 10,001-14,000	0.50%	0.00%	60.00%	40.00%	6.6
Med-Heavy 14,001-33,000	1.60%	0.00%	18.80%	81.20%	6.2
Heavy-Heavy 33,001-60,000	0.10%	0.00%	0.00%	100.00%	6.0
Line Haul >60,000 lbs	0.10%	0.00%	0.00%	100.00%	6.0
Urban Bus	0.30%	0.00%	0.00%	100.00%	6.0
Motorcycle	3.50%	34.30%	65.70%	0.00%	22.5
School Bus	0.10%	0.00%	0.00%	100.00%	6.0
Motor Home	0.20%	0.00%	100.00%	0.00%	7.0

Mobile Source Emission Factors

	Carbon Dioxide (kg/gallon)		Methane (g/mile)		Nitrous Oxide (g/mile)	
Vehicle Type	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel
Light Auto	8.81	10.15	0.0147	0.0005	0.0079	0.0010
Light Truck <3,750 lbs	8.81	10.15	0.0157	0.0010	0.0101	0.0015
Light Truck 3,751-5,750	8.81	10.15	0.0157	0.0010	0.0101	0.0015
Medium Truck 5,751-8,500	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Light Heavy 8,501-10,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Light Heavy 10,001-14,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Med-Heavy 14,001-33,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Heavy-Heavy 33,001-60,000	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Line Haul >60,000 lbs	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Urban Bus	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Motorcycle	8.81	10.15	0.0900	0.0000	0.0100	0.0000
School Bus	8.81	10.15	0.0326	0.0051	0.0177	0.0051
Motor Home	8.81	10.15	0.0326	0.0051	0.0177	0.0051

Greenhouse Gas Emissions (metric tons per year)

	Carbon Dioxide		Methane		Nitrous Oxide	
Vehicle Type	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel
Light Auto	2,023,808.05	-	3.3768	-	1.8148	-
Light Truck <3,750 lbs	452,039.09	-	0.8056	-	0.5182	-
Light Truck 3,751-5,750	684,279.36	-	1.2194	-	0.7845	-
Medium Truck 5,751-8,500	501,212.41	-	1.8547	-	1.0070	-
Light Heavy 8,501-10,000	43,910.97	12,647.46	0.1625	0.0064	0.0882	0.0064
Light Heavy 10,001-14,000	33,931.21	26,061.43	0.1256	0.0131	0.0682	0.0131
Med-Heavy 14,001-33,000	36,286.87	180,566.78	0.1343	0.0907	0.0729	0.0907
Heavy-Heavy 33,001-60,000	-	14,333.78	-	0.0072	-	0.0072
Line Haul >60,000 lbs	-	14,333.78	-	0.0072	-	0.0072
Urban Bus	-	43,001.35	-	0.0216	-	0.0216
Motorcycle	116,120.13	-	1.1862	-	0.1318	-
School Bus	-	14,333.78	-	0.0072	-	0.0072
Motor Home	21,328.19	-	0.0789	-	0.0429	-
Total Emissions Passenger/Light Truck	3160126.50		5.40		3.12	
Total Emissions Heavy/Medium duty	1058068.16		3.70		1.56	
CO_2 Equivalency Factors	1.00		21.00		310.00	
CO_2 Equivalent Emissions Passenger/Light Truck:	3160126.50		113.44		966.42	
CO_2 Equivalent Emissions Heavy/Medium Truck:	1058068.16		77.61		484.94	
Total CO2 Equivalent Emissions						4,219,837

Reduction Measures	Pavley	LCFS	Efficiency	TOTAL
Passenger/Light Trucks	19.7%	7.2%	2.8%	2,289,721
Heavy/Medium Trucks		7.2%	2.9%	953,919
Total CO2 Equivalent Emissions w/ Measures				3,243,641

Source of vehicle miles per day and vehicle fleet mix: URBEMIS 2007 model results for this analysis.
Sources of fuel economy: California Climate Action Registry General Reporting Protocol, v.3.1. January 2009.
Source of greenhouse gas emission factors: *California Climate Action Registry General Reporting Protocol*, v.3.1. January 2009.
Motor vehicle emission reductions based on estimates in BAAQMD's Proposed Thresholds of Significance, May 2010.

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Area Source Unmitigated Emissions (Tons/Year)

File Name: \\vmware-host\Shared Folders\MacShare\Desktop\Current Projects\SF Housing\URBEMIS\Operations 2025.urb924

Project Name: SF Housing Element Housing Operation 2025

Project Location: San Francisco County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	CO_2
Natural Gas	
Hearth	
Landscape	44.14
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, unmitigated)	44.14

Area Source Changes to Defaults

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Construction Unmitigated Emissions (Tons/Year)

File Name: \\vmware-host\Shared Folders\MacShare\Desktop\Current Projects\SF Housing\GHG\URBEMIS\Construction 2025.urb924

Project Name: SF Housing Element Housing Unit Construction 2025

Project Location: San Francisco County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

CO2

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2011	64,715.45
Demolition 01/05/2011-02/05/2011	5,814.58
Fugitive Dust	0.00
Demo Off Road Diesel	3,896.90
Demo On Road Diesel	1,797.24
Demo Worker Trips	120.44
Fine Grading 03/28/2011-05/11/2011	4,487.26
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	3,838.25
Fine Grading On Road Diesel	562.61
Fine Grading Worker Trips	86.40
Asphalt 04/28/2011-05/11/2011	1,051.04
Paving Off-Gas	0.00
Paving Off Road Diesel	581.71
Paving On Road Diesel	416.96
Paving Worker Trips	52.36
Building 05/11/2011-12/22/2011	52,740.57
Building Off Road Diesel	15,006.14
Building Vendor Trips	12,494.32
Building Worker Trips	25,240.11
Coating 12/08/2011-12/31/2011	622.00
Architectural Coating	0.00
Coating Worker Trips	622.00

Phase Assumptions

Phase: Demolition 1/5/2011 - 2/5/2011 - Type Your Description Here

Building Volume Total (cubic feet): 2794900

Building Volume Daily (cubic feet): 2794900

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On Road Truck Travel (VMT): 38818.05

Off-Road Equipment:

246 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

164 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

Phase: Fine Grading 3/28/2011 - 5/11/2011 - Default Fine Site Grading Description

Total Acres Disturbed: 2794.88

Maximum Daily Acreage Disturbed: 698.72

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 8469.33

Off-Road Equipment:

29 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

15 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

44 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

88 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

29 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 4/28/2011 - 5/11/2011 - Default Paving Description

Acres to be Paved: 698.72

Off-Road Equipment:

82 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

164 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

164 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 5/11/2011 - 12/22/2011 - Default Building Construction Description

Off-Road Equipment:

82 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

246 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

82 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

246 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

82 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 12/8/2011 - 12/31/2011 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM CONSTRUCTION

Project Name:	SF Housing Element
Analysis Year:	2025
Analysis Scenario:	Proposed Project
Housing Units	411514
Years of Construction	16

	CO2 short tons/yr	CO2 tons/yr
URBEMIS	64,715.45	58,696.91

Emissions	Fuel Emission Factor	Fraction of CO_2 factor	CO_2 Equivalency Factors	CO_2 Ratio	CO_2 Equivalent Emissions (tons)
Carbon Dioxide	10150	1	1	1	58,697
Methane	0.58	5.7E-05	21	0.0012	70
Nitrous Oxide	0.26	2.6E-05	310	0.0079	466
					59,233
				Annualized Construction	3,702

CH_4 and N_2O emission factors associated from fuel emissions obtained from CCAR Protocol v3.1, Table C.6.

Appendix H

Service Response Letters
(Including Water Supply Availability Study)

Appendix H-1

Service Response Letter from San Francisco Recreation and Parks

Mayor Gavin Newsom
Philip A. Ginsburg, General Manager

Date: December 21, 2009

To: Jessica Viramontes

From: Daniel LaForte

Re: Response to Request
Housing Element Update EIR

Please see the below responses to the questions contained in your letter dated December 18, 2009.

1) See attached "Facility and Park Info."

2. We expect to meet current demand for soccer fields with the renovation of the Beach Chalet Soccer Fields, expected to begin in spring 2010. The 2004 Recreation Assessment maps found on the below link provided capacity analysis for each for our facilities.

http://www.parks.sfgov.org/site/recpark_index.asp?id=27310

3. The Department has identified open space gaps within the City. See attached "Gap Analysis." More detailed analysis is needed, however, to determine whether these areas have the potential to meet the proposed project's demand for park and recreational facilities.

4. The Recreation and Park Department has one planned park once funds have been identified for park improvements: 4-8 Guy Place, a 3,500 square foot lot in Rincon Hill Planning Area.

5. The City has not implemented Quimby fees for Open Space/recreation facility upgrade or acquisition.

6. The City Planning Department has been working on open space planning concepts for the Eastern Neighborhoods Planning Areas, and many open space acquisitions/expansion have been identified as part of that process. Sue Exline is the lead project planner, and should be contacted regarding potential open space acquisitions. In addition, Kearstin Dischinger, lead planner for the Balboa Park Station Area Plan, would have information on potential open space acquisitions for that Plan.

Thank you for the opportunity to participate in the Housing Element Update EIR. Please contact me at 415-831-2742 if you have any questions.

Sincerely,

Daniel LaForte

c. Dawn Kamalanathan

ParkName	ParkType
10TH AVE/CLEMENT MINI PARK	Mini Park
15TH AVENUE STEPS	Mini Park
24TH/YORK MINI PARK	Mini Park
29TH/DIAMOND OPEN SPACE	Neighborhood Park or Playground
ADAM ROGERS PARK	Neighborhood Park or Playground
ALAMO SQUARE	Neighborhood Park or Playground
ALICE CHALMERS PLAYGROUND	Neighborhood Park or Playground
ALICE MARBLE TENNIS COURTS	Neighborhood Park or Playground
ALIOTO MINI PARK	Mini Park
ALLYNE PARK	Neighborhood Park or Playground
ALTA PLAZA	Neighborhood Park or Playground
ANGELO J. ROSSI PLAYGROUND	Neighborhood Park or Playground
APTOS PLAYGROUND	Neighborhood Park or Playground
ARGONNE PLAYGROUND	Neighborhood Park or Playground
Arkansas Friendship Garden	Community Garden
Arlington Community Garden	Community Garden
BALBOA NATURAL AREA	Neighborhood Park or Playground
BALBOA PARK	Neighborhood Park or Playground
BAY VIEW PARK	Regional Park
BAY VIEW PLAYGROUND	Neighborhood Park or Playground
BEIDEMAN/O'FARRELL MINI PARK	Mini Park
BERKELEY WAY OPEN SPACE	Neighborhood Park or Playground
BERNAL HEIGHTS PARK	Neighborhood Park or Playground
BERNAL HEIGHTS RECREATION CENTER	Neighborhood Park or Playground
BILLY GOAT HILL	Neighborhood Park or Playground
BROADWAY TUNNEL EAST MINI PARK	Mini Park
BROADWAY TUNNEL WEST MINI PARK	Mini Park
BROOKS PARK	Neighborhood Park or Playground
BROTHERHOOD/CHESTER MINI PARK	Mini Park
BUCHANAN STREET MALL	Neighborhood Park or Playground
BUENA VISTA PARK	Regional Park
BUSH/BRODERICK MINI PARK	Mini Park
CABRILLO PLAYGROUND	Neighborhood Park or Playground
CANDLESTICK PARK	Concession
CARL LARSEN PARK	Neighborhood Park or Playground
CAYUGA PLAYGROUND	Neighborhood Park or Playground
CAYUGA/LAMARTINE MINI PARK	Mini Park
CHESTNUT/KEARNY OPEN SPACE	Mini Park
CHINESE RECREATION CENTER	Neighborhood Park or Playground
Clipper Terrace Community Garden	Community Garden
COLERIDGE MINI PARK	Mini Park
COLLIS P. HUNTINGTON PARK	Civic Plaza or Square
Connecticut Friendship Garden	Community Garden
CORONA HEIGHTS	Neighborhood Park or Playground
Corwin Community Garden	Community Garden
COSO/PRECITA MINI PARK	Mini Park
COTTAGE ROW MINI PARK	Mini Park
COW HOLLOW PLAYGROUND	Neighborhood Park or Playground
CRAGS COURT GARDEN	Community Garden
CROCKER AMAZON PLAYGROUND	Neighborhood Park or Playground
Dearborn Community Garden	Community Garden

DIAMOND/FARNUM OPEN SPACE	Neighborhood Park or Playground
Dog Patch-Miller Memorial Comm. Garden	Community Garden
DOROTHY ERSKINE PARK	Neighborhood Park or Playground
DOUGLASS PLAYGROUND	Neighborhood Park or Playground
DUBOCE PARK	Neighborhood Park or Playground
DUNCAN/CASTRO OPEN SPACE	Neighborhood Park or Playground
DUPONT COURTS	Neighborhood Park or Playground
EDGEHILL MOUNTAIN	Neighborhood Park or Playground
ESPRIT PARK	Neighborhood Park or Playground
EUREKA VALLEY REC CENTER	Neighborhood Park or Playground
EVERSON/DIGBY LOTS	Neighborhood Park or Playground
EXCELSIOR PLAYGROUND	Neighborhood Park or Playground
FAIRMOUNT PLAZA	Neighborhood Park or Playground
FATHER ALFRED E. BOEDDEKER PARK	Neighborhood Park or Playground
FAY PARK	Neighborhood Park or Playground
FILLMORE/TURK MINI PARK	Mini Park
FRANKLIN SQUARE	Neighborhood Park or Playground
FULTON PLAYGROUND	Neighborhood Park or Playground
Garden for the Environment	Community Garden
GARFIELD SQUARE	Neighborhood Park or Playground
GENE FRIEND REC CENTER	Neighborhood Park or Playground
GENEVA AVENUE STRIP	Mini Park
GEORGE CHRISTOPHER PLAYGROUND	Neighborhood Park or Playground
GILMAN PLAYGROUND	Neighborhood Park or Playground
GLEN PARK	Regional Park
GOLDEN GATE HEIGHTS PARK	Neighborhood Park or Playground
GOLDEN GATE PARK	Regional Park
GOLDEN GATE/STEINER MINI PARK	Mini Park
Good Prospect Community Garden	Community Garden
GRAND VIEW OPEN SPACE	Neighborhood Park or Playground
GRAND VIEW PARK	Neighborhood Park or Playground
GRATTAN PLAYGROUND	Neighborhood Park or Playground
HAMILTON REC CENTER	Neighborhood Park or Playground
HAWK HILL	Neighborhood Park or Playground
HAYES VALLEY PLAYGROUND	Neighborhood Park or Playground
HEAD/BROTHERHOOD MINI PARK	Mini Park
HELEN WILLS PLAYGROUND	Neighborhood Park or Playground
HERZ PLAYGROUND	Neighborhood Park or Playground
HILLTOP PARK	Neighborhood Park or Playground
HOLLY PARK	Neighborhood Park or Playground
Hooker Alley Community Garden	Community Garden
HOWARD/LANGTON MINI PARK	Community Garden
HYDE/VALLEJO MINI PARK	Mini Park
INA COOLBRITH MINI PARK	Mini Park
INDIA BASIN SHORELINE PARK	Neighborhood Park or Playground
INTERIOR GREEN BELT	Neighborhood Park or Playground
J. P. MURPHY PLAYGROUND	Neighborhood Park or Playground
JACKSON PLAYGROUND	Neighborhood Park or Playground
JAMES ROLPH JR PLAYGROUND	Neighborhood Park or Playground
JAPANTOWN PEACE PLAZA	Civic Plaza or Square
JEFFERSON SQUARE	Neighborhood Park or Playground
JOE DIMAGGIO PLAYGROUND	Neighborhood Park or Playground

JOHN MCLAREN PARK	Regional Park
JOOST/BADEN MINI PARK	Mini Park
JOSE CORONADO PLAYGROUND	Neighborhood Park or Playground
JOSEPH CONRAD MINI PARK	Mini Park
JOSEPH L. ALIOTO PERFORMING ARTS PIAZZA	Civic Plaza or Square
JOSEPH LEE RECREATION CENTER	Neighborhood Park or Playground
JULIUS KAHN PLAYGROUND	Neighborhood Park or Playground
JUNIPERO SERRA PLAYGROUND	Neighborhood Park or Playground
JURI COMMONS	Mini Park
JUSTIN HERMAN/EMBARCADERO PLAZA	Civic Plaza or Square
KELLOCH VELASCO MINI PARK	Mini Park
KID POWER PARK	Neighborhood Park or Playground
KITE HILL	Neighborhood Park or Playground
KOSHLAND PARK	Neighborhood Park or Playground
LAFAYETTE PARK	Neighborhood Park or Playground
LAKE MERCED PARK	Regional Park
LAKEVIEW/ASHTON MINI PARK	Mini Park
LAUREL HILL PLAYGROUND	Neighborhood Park or Playground
LECONTE MINI PARK	Mini Park
LESSING/SEARS MINI PARK	Mini Park
LINCOLN PARK	Regional Park
LITTLE HOLLYWOOD PARK	Neighborhood Park or Playground
LOUIS SUTTER PLAYGROUND	Neighborhood Park or Playground
LOWER GREAT HIGHWAY	Parkway
MARGARET S HAYWARD PLAYGROUND	Neighborhood Park or Playground
MARITIME PLAZA	Civic Plaza or Square
MCCOPPIN SQUARE	Neighborhood Park or Playground
MCKINLEY SQUARE	Neighborhood Park or Playground
MERCED HEIGHTS PLAYGROUND	Neighborhood Park or Playground
MICHELANGELO PLAYGROUND	Neighborhood Park or Playground
MIDTOWN TERRACE PLAYGROUND	Neighborhood Park or Playground
MINNIE & LOVIE WARD REC CENTER	Neighborhood Park or Playground
MIRALOMA PLAYGROUND	Neighborhood Park or Playground
MISSION DOLORES PARK	Neighborhood Park or Playground
MISSION PLAYGROUND	Neighborhood Park or Playground
MISSION REC CENTER	Neighborhood Park or Playground
MOSCONE RECREATION CENTER	Neighborhood Park or Playground
MOUNTAIN LAKE PARK	Neighborhood Park or Playground
MT DAVIDSON PARK	Regional Park
MT OLYMPUS	Neighborhood Park or Playground
MULLEN/PERALTA MINI PARK	Mini Park
MURIEL LEFF MINI PARK	Mini Park
NOE VALLEY COURTS	Neighborhood Park or Playground
NOE/BEAVER COMMUNITY GARDEN	Community Garden
Ogden Terrace Community Garden	Community Garden
O'SHAUGHNESSY HOLLOW	Neighborhood Park or Playground
PAGE ST. COMMUNITY GARDEN	Community Garden
PAGE/LAGUNA MINI PARK	Mini Park
PALACE OF FINE ARTS	Civic Plaza or Square
PALEGA RECREATION CENTER	Neighborhood Park or Playground
PALOU/PHELPS PARK	Neighborhood Park or Playground
PARK PRESIDIO BLVD	Parkway

Park St Community Garden	Community Garden
PARKSIDE SQUARE	Neighborhood Park or Playground
PARQUE NINOS UNIDOS	Neighborhood Park or Playground
PATRICIAS GREEN IN HAYES VALLEY	Mini Park
PEIXOTTO PLAYGROUND	Neighborhood Park or Playground
PINE LAKE PARK	Regional Park
PORTOLA OPEN SPACE	Mini Park
PORTSMOUTH SQUARE	Neighborhood Park or Playground
POTRERO DEL SOL PARK	Neighborhood Park or Playground
POTRERO HILL MINI PARK	Mini Park
POTRERO HILL RECREATION CENTER	Neighborhood Park or Playground
PRECITA PARK	Neighborhood Park or Playground
PRENTISS MINI PARK	Mini Park
PRESIDIO HEIGHTS PLAYGROUND	Neighborhood Park or Playground
RANDOLPH/BRIGHT MINI PARK	Mini Park
RAYMOND KIMBELL PLAYGROUND	Neighborhood Park or Playground
RICHMOND PLAYGROUND	Neighborhood Park or Playground
RICHMOND RECREATION CENTER	Neighborhood Park or Playground
RIDGETOP PLAZA	Neighborhood Park or Playground
ROCHAMBEAU PLAYGROUND	Neighborhood Park or Playground
ROCK OUTCROPPING	Neighborhood Park or Playground
ROLPH NICOL PLAYGROUND	Neighborhood Park or Playground
ROOSEVELT/HENRY STEPS	Mini Park
RUSSIAN HILL OPEN SPACE	Neighborhood Park or Playground
SAN FRANCISCO ZOO	Zoological Garden
SATURN STREET STEPS	Mini Park
SELBY/PALOU MINI PARK	Mini Park
SEWARD MINI PARK	Mini Park
SGT. JOHN MACAULAY PARK	Mini Park
SHARP PARK	Regional Park
SIGMUND STERN RECREATION GROVE	Regional Park
SILVER TERRACE PLAYGROUND	Neighborhood Park or Playground
SOUTH END ROWING/DOLPHIN CLUB	Concession
SOUTH PARK	Neighborhood Park or Playground
SOUTH SUNSET PLAYGROUND	Neighborhood Park or Playground
ST MARY'S REC CENTER	Neighborhood Park or Playground
ST MARY'S SQUARE	Civic Plaza or Square
STATES STREET PLAYGROUND	Neighborhood Park or Playground
SUE BIERMAN PARK	Neighborhood Park or Playground
SUNNYSIDE CONSERVATORY	Mini Park
SUNNYSIDE PLAYGROUND	Neighborhood Park or Playground
SUNSET PLAYGROUND	Neighborhood Park or Playground
TANK HILL	Neighborhood Park or Playground
TELEGRAPH HILL/PIONEER PARK	Civic Plaza or Square
TENDERLOIN CHILDREN'S REC CENTER	Neighborhood Park or Playground
TOPAZ OPEN SPACE	Neighborhood Park or Playground
TURK/HYDE MINI PARK	Mini Park
TWIN PEAKS	Regional Park
UNION SQUARE	Civic Plaza or Square
UPPER NOE RECREATION CENTER	Neighborhood Park or Playground
UTAH/18TH MINI PARK	Mini Park
VICTORIA MANALO DRAVES PARK	Neighborhood Park or Playground

VISITACION VALLEY GREENWAY	Neighborhood Park or Playground
VISITACION VALLEY PLAYGROUND	Neighborhood Park or Playground
WALTER HAAS PLAYGROUND	Neighborhood Park or Playground
WASHINGTON SQUARE	Civic Plaza or Square
WASHINGTON/HYDE MINI PARK	Mini Park
WEST PORTAL PLAYGROUND	Neighborhood Park or Playground
WEST SUNSET PLAYGROUND	Neighborhood Park or Playground
White Crane Springs Community Garden	Community Garden
WILLIE WOO WOO WONG PLAYGROUND	Neighborhood Park or Playground
WOH HEI YUEN PARK	Neighborhood Park or Playground
Wolfe Lane Community Garden	Community Garden
YACHT HARBOR AND MARINA GREEN	Regional Park
YOUNGBLOOD COLEMAN PLAYGROUND	Neighborhood Park or Playground

ParkAddress	Zipcode	Acreage
351 9th Ave	94118	0.880788
15th Ave b/w Kirkham & Lawton	94122	0.50801113
24th & York St	94110	0.13315177
Diamond & 29th St	94131	0.93126861
Ingalls & Oakdale	94124	2.76816126
Hayes & Steiner	94117	13.64716481
670 Brunswick & Lowell Roemer	94112	1.7740326
Greenwich & Hyde	94109	0.73293557
20th & Capp	94110	0.209045
2609 Gough St	94109	0.88326128
Jackson & Steiner	94115	12.93682572
2 Willard North St	94118	7.0548727
Aptos & Ocean Ave	94127	4.98573549
18th Ave & Geary Blvd	94121	0.91599424
22nd/Arkansas	94107	0.14944465
Arlington & Richland	94131	0.12967928
N.E. Balboa & Great Highway	94121	1.84296253
Ocean & San Jose	94112	24.86035188
LeConte Ave	94124	46.63450025
3rd & Armstrong	94124	3.90817622
O'Farrell & Beideman	94115	0.08770628
298 Berkeley Wy	94131	0.83109494
Bernal Heights Blvd	94110	26.33871351
500 Moultrie	94110	0.83305783
30th & Castro	94131	3.66832262
BRdway & Himmelman	94133	0.03261185
1201 Broadway	94109	0.1241013
373 Ramsell St	94132	3.77582286
501 Brotherhood Wy	94132	0.58829986
Buchanan & Grove	94102	1.93655544
Buena Vista & Haight	94117	38.31312452
Baker & Bush	94115	0.19455469
858 38th Ave	94121	1.005509
Jamestown Ave & Harney Wy	94124	86.13233126
19th Ave & Vicente	94116	7.01603729
301 Naglee Ave	94112	2.68768241
Cayuga & Lamartine St	94112	0.13516712
Chestnut & Kearny	94133	0.1282506
1101 Washington St	94108	0.75063877
855 Clipper Terrace		0.34970202
Coleridge & Esmeralda St	94110	0.22766899
California & Taylor	94108	1.29595298
22nd/Connecticut	94107	0.15359774
Roosevelt & Museum Wy	94114	13.39177821
410 Douglass St	94114	0.0926541
Coso & Precita	94110	0.15048712
Sutter & Fillmore	94115	0.17036938
1 Miley St	94123	0.14946212
Crags Ct	94131	0.41179565
Moscow & Geneva	94112	57.52878798
59 Dearborn St	94110	0.1542701

Diamond & Farnum	94131	0.069507
Brewster/Rutledge St	94110	0.26024121
Martha & Baden	94131	1.59721844
26th & Douglass St	94114	7.90093579
Duboce & Scott St	94117	4.67212103
Duncan & Castro	94131	0.57950566
336 31st Ave	94121	0.92670555
Edgehill & Garcia	94127	2.33017311
Minnesota St	94107	2.22914463
100 Collingwood St	94114	2.26223584
61 Everson St	94131	1.26907225
Russia Ave & Madrid	94112	1.86388787
Miquel & Bemis St	94131	0.76810823
295 Eddy St	94102	1.09322101
2366 Leavenworth St	94133	0.3297728
Fillmore & Turk St	94115	0.23255166
16th & Bryant Streets	94103	5.56224209
855 27th Ave	94121	0.81996719
7th Ave North of Lawton		0.50720701
26th & Harrison St	94110	3.45620418
270 6th St	94103	1.16247839
600 Geneva & Delano	94112	0.23197565
5210 Diamond Heights Blvd	94131	6.85953835
Gilman Ave & Griffith	94124	4.53292299
Elk St & O'Shaughnessy Blvd	94131	77.93628812
12th Ave (off Pacheco) & Rockridge	94127	6.95
Stanyan & Great Highway	94117	1031.977305
Golden Gate & Steiner	94115	0.1151293
100 Cortland Ave	9411	0.11385786
15th Ave & Noriega (Sheldon)		0.65
Moraga & 14th Ave (Noriega)	94122	3.99
1180 Stanyan St	94117	1.87067415
1900 Geary Blvd	94115	3.65368823
14th Ave Rivera & San Marcos	94116	4.84987949
Hayes & Buchanan St	94102	0.75313903
Head St & Brotherhood Wy	94112	0.55233203
BRdway & Larkin	94109	0.91666459
Hahn & Visitacion	94134	6.67541098
La Salle & Whitney Young Cir	94124	3.82814169
Holly Park Cir	94110	8.14544251
Hooker Aly	94108	0.05516185
Howard & Langton	94103	0.23457619
Hyde & Vallejo	94109	0.11117234
Vallejo & Taylor	94133	0.8629662
Evans & Army	94124	11.5654928
Belmont & Woodland	94131	21.34565545
1960 9th Ave	94116	1.32913336
17th & Arkansas St	94107	4.93815251
Potrero & Cesar Chavez St	94110	3.2076631
Post & Buchanan	94115	0.83593963
Eddy & Gough	94109	6.42910962
651 Lombard St	94133	2.95660392

Mansell & Visitacion	94134	312.5354036
Joost & West of Baden	94131	0.14133443
21st & Folsom St	94110	0.97139963
601 Beach St	94133	0.15425181
Grove & Larkin	94102	5.38328505
1395 Mendell St	94124	1.98586769
West Pacific Ave & Spruce St	94118	12.38109456
300 Stonecrest Dr	94132	1.75070333
Guerrero and 26th	94110	0.36333873
Clay & Embarcadero	94111	4.32858508
Kelloch & Velasco St	94134	1.95880258
45 Hoff St	94110	0.25951768
Yukon & 19th St	94114	2.87302477
Page & Buchanan	94102	0.96146886
Gough & Washington St	94115	12.48051749
Lake Merced Blvd	94132	608.4860961
Ashton & Lakeview St	94112	0.51484362
251 Euclid Ave	94118	1.61007585
845 Meade St	94124	0.10242413
Sickles & Sears	94112	0.14567292
34th Ave & Clement	94121	112.0290377
Lathrop & Tocoloma	94134	1.47116692
Wayland & University	94134	13.92100435
Great Highway & Noriega	94122	21.09807312
1016 Laguna	94102	5.59302131
285 Washington St	94111	2.01276212
24th & Taraval	94116	7.98870334
20th St & Vermont	94107	2.81337137
Byxbee & Shields St	94132	1.23296612
Greenwich & Jones	94133	0.48376308
Clarendon & Olympia Wy	94131	1.57432669
650 Capitol	94112	11.13523843
Omar & Sequoia Wy	94127	2.42877216
19th & Dolores St	94110	15.94159618
19th & Linda	94110	2.13977288
2450 Harrison St	94110	0.7199292
1800 Chestnut St	94123	12.72983516
1 11th Ave	94118	13.35347093
Myra Wy	94127	40.71180909
Upper Terrace	94117	0.20515277
Mullen & Peralta	94110	0.45038472
7th Ave between Geary & Anza	94118	0.23804995
24th & Douglass St	94114	1.10419823
Noe & Beaver	94114	0.10641444
700 Ogden Ave		0.15427023
O'Shaughnessy Blvd	94127	3.74925879
438 Page St	94102	0.07575755
Page & Laguna St	94102	0.16024382
3601 Lyon St & Marina Blvd	94123	19.37083657
500 Felton St	94134	5.40538227
Palou & Phelps St	94124	2.65910891
Park Presidio Blvd	94118	20.38312853

Park & San Jose	94110	0.04693421
28th Ave & Vicente	94116	8.8617811
23rd & Treat St	94110	0.69964674
Octavia Blvd,btw Hayes & Fell		0.4534892
15th St & Roosevelt	94114	0.82006097
Sloat Blvd & Vale St	94116	30.7668365
201 Portola & Clipper	94108	0.81268655
Washington & Walter Lum Place	94111	1.48340412
Potrero & Army	94110	4.72484517
22nd & Connecticut St	94107	0.30366328
801 Arkansas St	94107	10.07009838
3200 Folsom St	94110	2.21142598
Prentiss & Eugenia	94110	0.05048019
Clay & Walnut St	94118	0.48582109
Randolph & Bright	94132	0.13027799
Geary Blvd & Steiner St	94115	6.11670352
18th Ave & Lake	94121	0.92836218
251 18th Ave	94121	0.92837847
Whitney Young Cire	94124	0.27836781
238 25th Ave	94121	0.82610504
Ortega & 14th Ave Ortega	94122	1.60840933
Eucalyptus Dr & 25th Ave	94132	3.13894051
299 Henry St		0.34306958
Hyde & Bay	94109	0.96201581
1 Zoo Rd	94132	131.5164655
Saturn & Ord	94117	0.10756655
Palou & Selby	94124	0.41996165
Seward & Acme	94114	0.39212059
Larkin & O Farrell	94102	0.27770725
Route 1 & Sharp Park Rd	94044	409.6909028
19th Ave & Sloat Blvd	94116	34.78455864
Thornton & Bayshore	94124	5.59888381
500 Jefferson St	94109	1.11289256
64 South Park Ave	94107	1.1176965
40th Ave & Vicente St	94116	4.10554975
Murray & Justin Dr	94112	13.67189897
California St & Grant St	94108	0.9270905
86 States St	94114	2.91086541
Clay St & The Embarcadero	94111	4.68779254
Monterey & Baden	94131	0.28515736
Teresita Ave & Melrose	94127	2.35065001
2201 Lawton St	94122	3.87890431
Clarendon & Twin Peaks	94114	3.02340945
Telegraph Hill Blvd	94133	4.89055555
570 Ellis St	94102	0.65904619
Diamond Heights	94131	0.9161143
Hyde & Vallejo	94102	0.15396308
Twin Peaks Blvd	94114	54.58818622
Post & Stockton	94108	2.59970675
Day & Sanchez St	94131	2.91763987
18th & Utah Steets	94110	0.13382415
Folsom & Sherman St	94103	2.69595256

Lel& & Peabody St	94134	2.42707226
251 Lel& St	94134	2.29674827
Addison & Farnum	94131	4.627863
Filbert & Stockton	94133	2.75410106
Washington & Hyde	94109	0.16132928
Ulloa & Lenox St	94127	1.97772041
3223 Ortega St & 39th Ave	94116	17.68182275
South of 7th & Lawton	94131	2.67598131
Sacramento St	94108	0.64223492
922 Jackson St	94133	0.34922594
90 Rutledge St	94110	0.05453306
Marina Blvd	94123	78.0266905
1398 Hudson St	94124	6.29209327

Facility	FacilityType	Facility Address
Alice Chalmers Clubhouse	Clubhouse	670 Brunswick & Lowell Roemer
Anglers Lodge	Activity Center	Stanyan & Great Hwy
Aptos Clubhouse	Clubhouse	Aptos & Ocean Ave
Argonne Clubhouse	Clubhouse	18th Ave & Geary Blvd
Balboa Park Community Pool	Swimming Pool	San Jose Ave & Havelock
Bernal Heights Rec Center	Rec Center	500 Moultrie St
Birch Lake Swimming Pool	Swimming Pool	
Boeddeker Park Clubhouse	Clubhouse	295 Eddy St
Bowling Green Clubhouse	Activity Center	Stanyan & Great Hwy
Cabrillo Clubhouse	Clubhouse	38th Ave & Cabrillo
Cayuga Clubhouse	Clubhouse	Cayuga & Naglee St
Charlie Sava Community Pool	Swimming Pool	19th Ave & Wawona St
Chinese Rec Center	Rec Center	1199 Mason St
Christopher Clubhouse	Clubhouse	5210 Diamond Heights Blvd
Coffman Community Pool	Swimming Pool	1701 Visitacion Ave
County Fair Bldg	Activity Center	Stanyan & Great Hwy
Cow Hollow Clubhouse	Clubhouse	Baker & Filbert St
Crocker Amazon Clubhouse	Clubhouse	Moscow & Italy St
Douglass Clubhouse	Clubhouse	26th & Douglass St
Ella Hill Hutch Community Center	Rec Center	1050 McAllister St
Eureka Valley Rec Center	Rec Center	100 Collingwood
Excelsior Clubhouse	Clubhouse	Russia Ave & Madrid
Fleishhacker Pool	Swimming Pool	
Fulton Clubhouse	Clubhouse	27th Ave & Fulton St
Funston Senior Center	Activity Center	
Garfield Square Clubhouse	Clubhouse	26th & Harrison St
Garfield Square Community Pool	Swimming Pool	26th & Harrison St
GGP Golf Course Clubhouse	Activity Center	Stanyan & Great Hwy
Gilman Clubhouse	Clubhouse	Gilman Ave & Griffith
Glen Park Rec Center	Rec Center	Bosworth & O'Shaughnessy
Gleneagles Golf Course Clubhouse	Clubhouse	Mansell & Visitacion
Golden Gate Park Senior Center	Activity Center	6101 Fulton St & 37th Ave
Grattan Clubhouse	Clubhouse	1180 Stanyan St
Hamilton Community Pool	Swimming Pool	Geary & Steiner St
Hamilton Rec Center	Rec Center	1900 Geary Blvd
Harvey Milk Recreational Arts Bldg	Activity Center	50 Scott St
Hayes Valley Rec Center	Clubhouse	Hayes & Buchanan St
Hayward PG Computer Learning Center	Activity Center	
Helen Crocker Russel Hort Library	Activity Center	
Helen Wills Clubhouse	Clubhouse	Broadway & Larkin St
Herz Clubhouse	Clubhouse	1700 Visitacion & Hahn Sts
Hunters Point Gym	Rec Center	200 Middle Point Rd
J. P. Murphy Clubhouse	Clubhouse	1960 9th Ave
Jackson Clubhouse	Clubhouse	17th & Arkansas St
James Rolph Jr Clubhouse	Clubhouse	Potrero & Cesar Chavez St
Joe Dimaggio Clubhouse	Clubhouse	651 Lombard St
Jose Coronado Clubhouse	Clubhouse	21st & Folsom
Joseph Lee Rec Center	Rec Center	1395 Mendell St
Julius Kahn Clubhouse	Clubhouse	West Pacific Ave & Spruce St
Junipero Serra Clubhouse	Clubhouse	300 Stonecrest Dr
Kezar Pavilion	Activity Center	755 Stanyan

Laurel Hill Clubhouse	Clubhouse	Euclid & Collins St
Lincoln Park Golf Course Clubhouse	Clubhouse	34th Ave & Clement
Louis Sutter Clubhouse	Clubhouse	Wayland & Yale St
Martin Luther King Jr Pool	Swimming Pool	3rd & Armstrong
Mccoppin Square Clubhouse	Clubhouse	24th & Taraval
Mclaren Park Mansell Clubhouse	Clubhouse	Mansell & Visitacion
Merced Heights Clubhouse	Clubhouse	Byxbee & Shields St
Midtown Terrace Clubhouse	Clubhouse	Clarendon & Olympia Way
Milton Meyers Rec Center	Rec Center	200 Middle Point Rd
Minnie & Lovie Ward Rec Center	Rec Center	650 Capitol Ave
Miraloma Clubhouse	Clubhouse	Omar & Sequoia Way
Mission Community Pool	Swimming Pool	19th & Linda
Mission Dolores Park Clubhouse	Clubhouse	19th & Dolores St
Mission PG Clubhouse	Clubhouse	19th & Linda
Mission Rec Center	Rec Center	2450 Harrison St
Model Yacht Clubhouse	Activity Center	Stanyan & Great Hwy
Moscone Rec Center	Rec Center	1800 Chestnut St
MS Hayward Clubhouse	Clubhouse	1016 Laguna
MS Hayward Historic Clubhouse	Clubhouse	1016 Laguna
North Beach Swimming Pool	Swimming Pool	651 Lombard St
OTHER FACILITY/AGENCY	Activity Center	NON RECPARK FACILITY/AGENCY
Palega Rec Center	Rec Center	500 Felton
Parque Ninos Unidos Clubhouse	Clubhouse	23rd & Treat St
Peixotto Clubhouse	Clubhouse	15th St & Roosevelt
Pine Lake Park Clubhouse	Clubhouse	Sloat Blvd & Vale St
Portsmouth Square Clubhouse	Clubhouse	Washington & Kearny St
Potrero Hill Rec Center	Rec Center	801 Arkansas St
Presidio Heights Clubhouse	Clubhouse	Clay & Walnut St
Randall Museum	Activity Center	Roosevelt & Museum Way
Richmond PG Clubhouse	Clubhouse	149 18th Ave
Richmond Rec Center	Rec Center	251 18th Ave
Rochambeau Clubhouse	Clubhouse	24th Ave & Lake
Rosa Parks Senior Center	Activity Center	1111 Buchanan St
Rossi Community Pool	Swimming Pool	Arguello & Anza
Sandy Tatum Clubhouse	Activity Center	Lake Merced Blvd
Sharon Arts Studio	Activity Center	Sharon Meadow
Sharp Park Golf Course Clubhouse	Clubhouse	Route 1 & Sharp Park Rd
Silver Terrace Clubhouse	Clubhouse	Thornton & Bayshore
SOMA Eugene Friend Rec Center	Rec Center	270 6th St
South End Rowing Club	Activity Center	500 Jefferson St
South Sunset Clubhouse	Clubhouse	40th Ave & Vicente St
St Mary's Rec Center	Rec Center	Murray & Justin Dr
Sunnydale Rec Center	Rec Center	1652 Sunnydale
Sunnyside Clubhouse	Clubhouse	Teresita Ave & Melrose
Sunset Rec Center	Rec Center	2201 Lawton
Tenderloin Rec Center	Rec Center	570 Ellis St
Tennis & Pro Shop	Activity Center	Stanyan & Great Hwy
Treat Street Building	Clubhouse	745 Treat St
Trocadero Clubhouse	Clubhouse	19th Ave & Sloat Blvd
Upper Noe Rec Center	Rec Center	Day & Sanchez St
Vis Valley Community Ctr Rec Ctr	Rec Center	50 Raymond Ave
Visitacion Valley Clubhouse	Clubhouse	251 Leland St

Wawona Clubhouse	Clubhouse	19th Ave & Sloat Blvd
West Portal Clubhouse	Clubhouse	Ulloa & Lenox St
West Sunset Rec Center	Rec Center	3223 Ortega St
Willie Woo Woo Wong Clubhouse	Clubhouse	850 Sacramento St
Woh Hei Yuen Rec Center	Rec Center	922 Jackson St
Youngblood Coleman Clubhouse	Clubhouse	Mendell & Galvez

Facility Zip	Facility Size (Sq Ft)
94112	3156.823104
94117	2013.007187
94127	1500
94121	1502.474119
94112	15628.23499
94110	5008.943318
95321-9717	0
94102	3737.62042
94117	2741.281335
94121	1358.876259
94112	3211.771167
94116	11582.8008
94108	15595.73414
94131	3493.573286
94134	15344.53321
94117	24719.8212
94123	980.1438995
94112	3051.155037
94114	1125.833864
94115	0
94114	17880.45844
94112	2747.36686
	0
94121	1339.814973
94123	1024.387402
94110	2217.021331
94110	14599.20953
94117	1893.027113
94124	3479.975023
94131	14819.71048
94134	5788.100847
94117	8881.759417
94117	2468.967853
94115	12176.06422
94115	16987.65673
94117	9944.335504
94102	3070.412756
	351.4364959
94117	3469.496679
94109	2949.749521
94134	2940.812442
94124	13200
94116	2599.024636
94107	4817.991588
94110	3197.352248
94133	2431.066537
94110	1718.682345
94124	17449.91575
94118	1443.447881
94132	1809.033537
94117	34772.74671

94118	1340.128919
94121	8288.526753
94134	2487.209041
94124	24527.6014
94116	1315.661632
94134	2290.638422
94132	1203.000357
94131	2250.306099
94124	0
94112	19461.0584
94127	1137.773197
94110	8372.759268
94110	1172.459132
94110	4735.611565
94110	9873.470586
94117	5217.456704
94123	8451.449151
94102	2382
94102	0
94133	8230.564723
	0
94134	18397.43143
94110	2043.338534
94114	2206.770487
94116	1707.807476
94111	2363.610708
94107	18804.4972
94118	1101.765987
94114	18081.16863
94121	1665.654656
94121	18470.08718
94121	1329.723696
94115	0
94118	12639.22857
94132	31007.35173
94117	8482.911647
94044	0
94124	1146.697333
94103	16353.84922
94109	32221.46053
94116	2609.298211
94112	22053.46152
94134	0
94127	2863.448037
94122	16424.09497
94102	10132.78038
94117	4415.62438
94110	5033.853973
94116	2258.317456
94131	16446.89314
94134	4147
94134	2481.861643

94116	2836.014438
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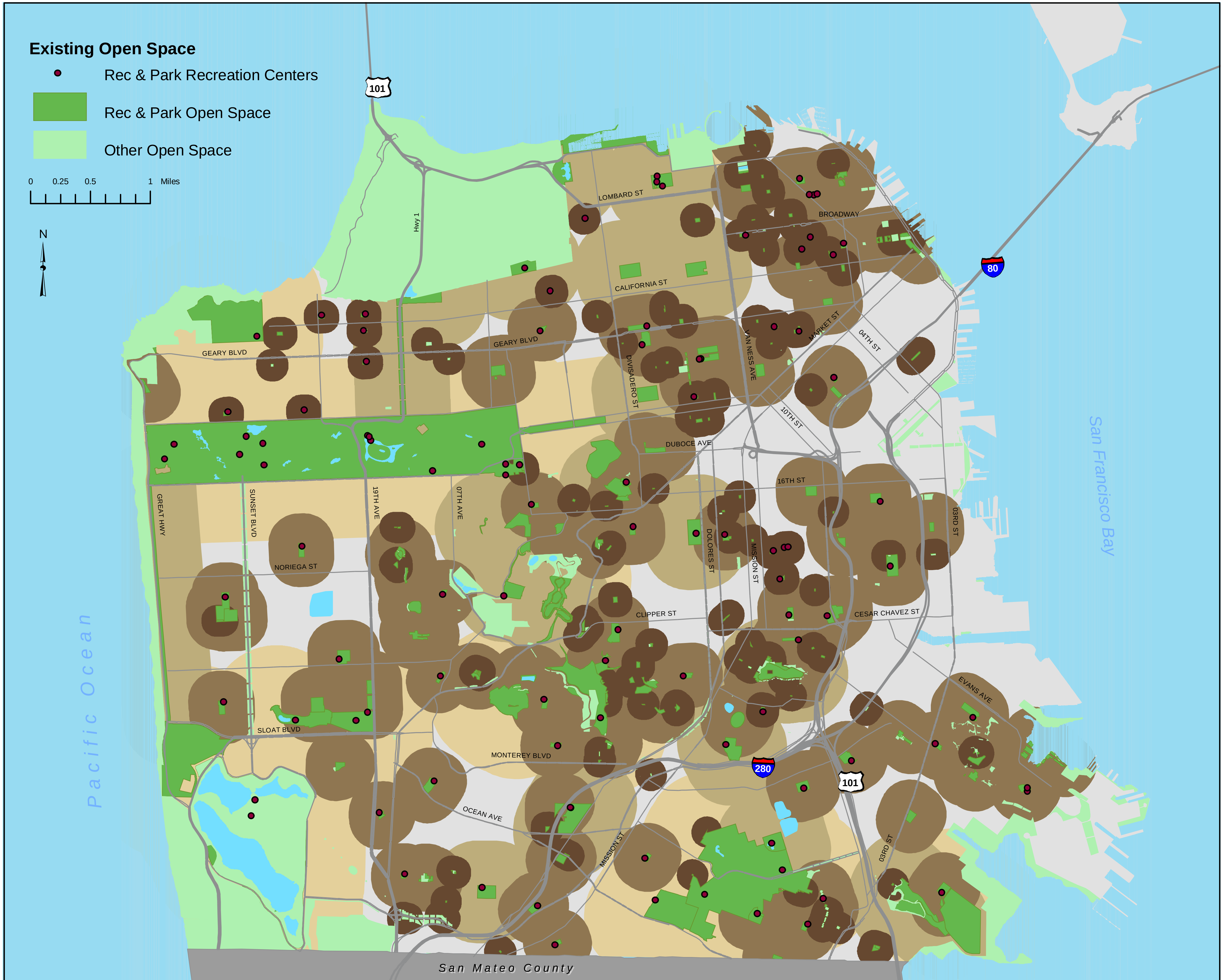
94124	3453.639663



Public Open Space Service Areas

Managed by Recreation and Park Department, City and County by San Francisco

Service Areas by Category

- Subneighborhood
- Neighborhood
- District
- Citywide

Service Areas by Distance

Service Area Category	Radius in Miles	Park Size in Acres
Subneighborhood	1/8	less than 1
Neighborhood	1/4	1-10
District	3/8	over 10 & less than 30
Citywide	1/2	30 & over

Methodology: According to SF General Plan's Recreation & Open Space Element, open space service areas are "within acceptable walking distance." They are defined by radii varying from 1/8 to 1/4 miles and from 3/8 to 1/2 miles from park's edge. The walking distance, hence the length of each radius, is dependent on park's size. Smaller parks serve subneighborhoods or neighborhoods. Therefore, residents shall be able to access them at least within a 1/4 mile walking distance from their home. The service areas on this map are modeled on the methodology in the General Plan. An exception is the Rec & Park definition of citywide park of 30 acres in size & over.

Data: SF Rec & Park open space and recreation centers layers developed by the SF Rec & Park Planning Division; other open space layer developed by the Rec & Park Planning Division with input from the Neighborhood Parks Council; all other basemap layers provided by the SF Department of Telecommunication and Information Services (DTIS). All data are in California Zone III, State Plane Projection, NAD 1983. This map created in ArcView 8.2, an ESRI product, by Svetlana Karasyova, October 2005.

San Francisco Recreation & Parks

Public Open Space Service Areas

Managed by City & County, State and Federal Agencies, and Private Parks Accessible to Public in San Francisco, California

Service Areas by Category

- Subneighborhood
- Neighborhood
- District
- Citywide

Service Areas by Distance

Service Area Category	Radius in Miles	Park Size in Acres
Subneighborhood	1/8	less than 1
Neighborhood	1/4	1-10
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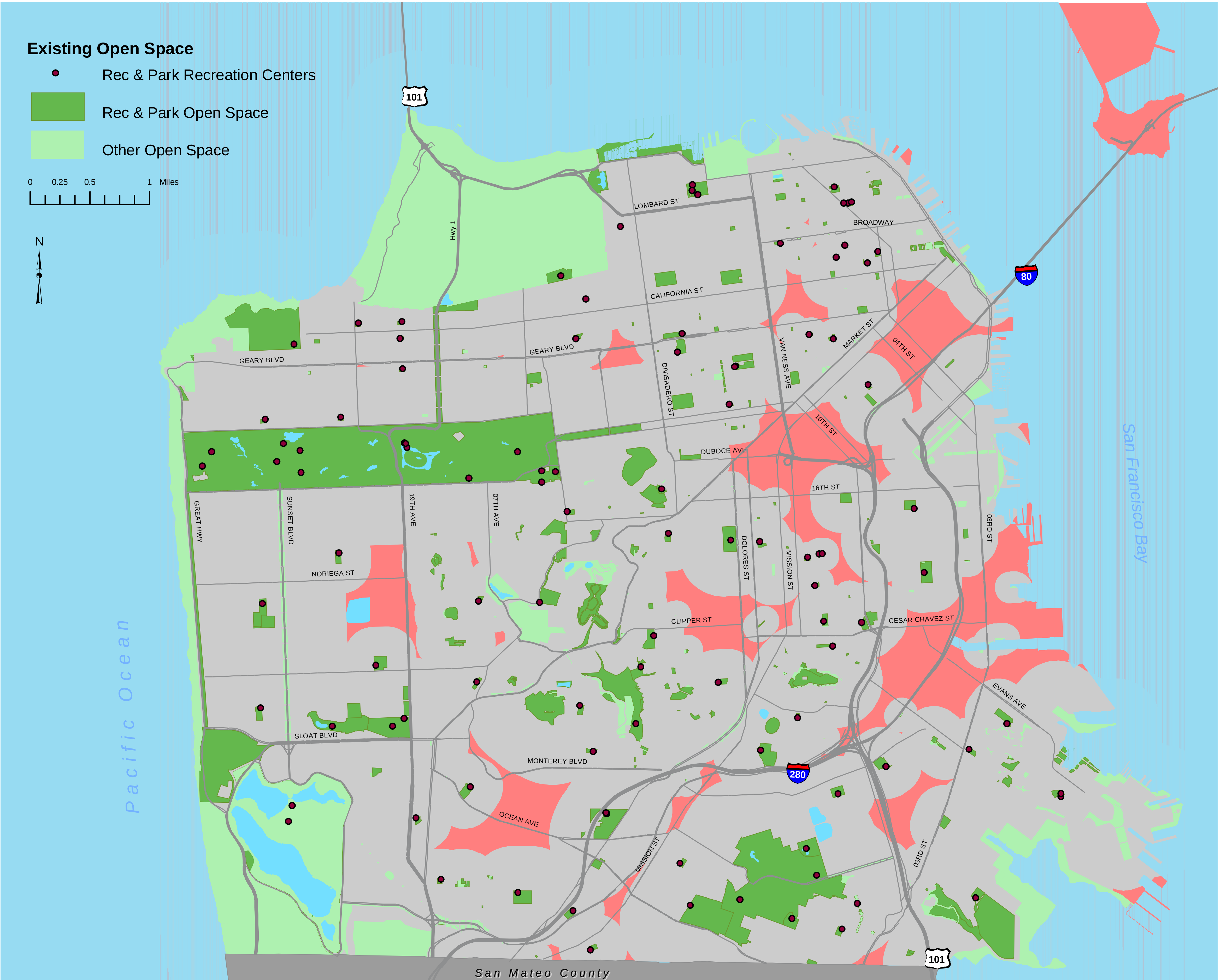
Methodology: According to SF General Plan's Recreation & Open Space Element, open space service areas are "within acceptable walking distance." They are defined by radii varying from 1/8 to 1/4 miles and from 3/8 to 1/2 miles from park's edge. The walking distance, hence the length of each radius, is dependent on park's size. Smaller parks serve subneighborhoods or neighborhoods. Therefore, residents shall be able to access them at least within a 1/4 mile walking distance from their home. The service areas on this map are modeled on the methodology in the General Plan. An exception is the Rec & Park definition of citywide park of 30 acres in size & over.

Data: SF Rec & Park open space and recreation centers layers developed by the SF Rec & Park Planning Division; other open space layer developed by the SF Rec & Park Planning Division with input from the Neighborhood Parks Council; all other basemap layers provided by the SF Department of Telecommunication and Information Services (DTIS). All data are in California Zone III, State Plane Projection, NAD 1983. This map created in ArcView 8.2, an ESRI product, by Svetlana Karasyova, October 2005.

SEAL OF THE CITY AND COUNTY OF SAN FRANCISCO

San Francisco
Recreation & Parks



Public Open Space Service Areas

Managed by City & County, State and Federal Agencies, and Private Parks Accessible to Public in San Francisco, California

Service Areas

Not Served by Public Open Space

Served by Public Open Space

Service Areas by Distance

Service Area Category	Radius in Miles	Park Size in Acres
Subneighborhood	1/8	less than 1
Neighborhood	1/4	1-10
District	3/8	over 10 & less than 30
Citywide	1/2	30 & over

Methodology: This map is modeled after Figure 3: "Service Areas: Areas Not Served by Public Open Space" in the Recreation and Open Space Element of the SF General Plan (p. I.3.45). According to the General Plan, areas served by public open space are "within acceptable walking distance." They are defined by radii varying from 1/8 to 1/4 miles and from 3/8 to 1/2 miles from park's edge. The walking distance, hence the length of each radius, is dependent on park's size (see Table above). The service areas on this map are modeled on the methodology in the General Plan. An exception is the Rec & Park definition of citywide park of 30 acres in size & over. The service area buffers were drawn first. Then the areas not served by public open space were highlighted.

Data: SF Rec & Park open space and recreation centers layers developed by the SF Rec & Park Planning Division; other open space layer developed by the Rec & Park Planning Division with input from the Neighborhood Parks Council; all other basemap layers provided by the SF Department of Telecommunication and Information Services (DTIS). All data are in California Zone III, State Plane Projection, NAD 1983. This map created in ArcView 8.2, an ESRI product, by Svetlana Karasyova, October 2005.

Seal of the City and County of San Francisco

San Francisco Recreation & Parks

Appendix H-2

Service Response Letters and Water Supply Availability Study from San Francisco Public Utilities Commission

From:	Petrick, Molly
To:	Jessica Viramontes;
Subject:	Housing Element Comments/Information
Date:	Friday, October 23, 2009 5:06:46 PM
Attachments:	SFPUC_WSAS_Final October 16 2009.pdf

Jessica,

I'm responding to your request to the SFPUC, Water Enterprise for information related to the Housing Element EIR. We recently completed a Water Supply Availability Study for the PUC that updates the 2005 UWMP with the most recent housing and employment projections from the SF Panning Department (as of July 2009), and compares it to available supplies through 2030. The Study is modeled after a Water Supply Assessment, and should hopefully have a lot of the information you need for your analysis. The Study is currently serving as the basis for 3 Water Supply Assessment in SF (Treasure Island, Parkmerced, and Candlestick Point-Hunter Point Shipyard Phase II). Our Study concludes that we have sufficient supplies to meet projected retail demands through 2030 (so there wouldn't be any water-related impacts). This is good news. However, it looks like we used more recent numbers than you did in your study. Our housing and employment projections came from SF Planning department, but are based on ABAG 2009 projections. It looks like the Housing Element is using ABAG 2007. I'm not sure if this matters too much, except that we have a higher number of units projected in 2030, but a lower number of jobs. We assume 403,292 housing units in 2030, and 748,100 jobs.

I'm happy to discuss further if you have any questions or need additional information. I'm not quite sure how to resolve the difference in our housing/employment projections. We clearly have enough water for your housing number (since it's lower than ours), but if we used the higher employment number, we would likely have a shortfall (but maybe that doesn't matter since you are just asking if there is enough water for the housing)? Is there anyway to use ABAG 2009 numbers?

Again – definitely let me know if you want to talk further once you've had a chance to review.

Thanks,
Molly

Molly Petrick
SFPUC
1145 Market St., 4th Floor
San Francisco, CA 94103
phone: 415.934.5767
fax: 415.934.5770
mpetrick@sfwater.org

FINAL

Water Supply Availability Study

for

City and County of San Francisco

Prepared for:

San Francisco Public Utilities Commission
Water Enterprise

October 2009

Prepared by:

PBS&J

1410 Rocky Ridge Drive, Suite 190
Roseville, CA 95661
916.782.7275

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SUMMARY AND FINDINGS

Summary

In an effort to streamline the water supply planning process within the City and County of San Francisco (San Francisco or City), the San Francisco Public Utilities Commission (SFPUC) adopted a resolution in 2002 and 2006 to allow for all development projects requiring a Water Supply Assessment (WSA) under Water Code Section 10910 et seq. to rely solely on the adopted Urban Water Management Plan (UWMP) without having to go through the process of preparing individual WSAs. SB 610 provides a nexus between the regional land use planning process and the environmental review process. The core of this law is an assessment of whether available water supplies are sufficient to serve the demand generated by a project, as well as the reasonably foreseeable cumulative demand in the region over the next 20 years under a range of hydrologic conditions.

The San Francisco Planning Department (SF Planning) and the San Francisco Redevelopment Agency are currently engaged in planning for various proposed land development projects throughout San Francisco that go beyond those future developments considered in the 2005 UWMP update. As a result of these new developments, the SFPUC concluded that its 2005 UWMP no longer accounted for every project requiring a WSA (qualifying project) within San Francisco. Therefore, during this interim period until the 2010 UWMP is prepared, any qualifying projects not accounted in the 2005 UWMP will require preparation of a WSA per Water Code Sections 10910 – 10915 that considers the SFPUC's current and projected supplies when compared to projected demands associated with new growth not covered in the 2005 UWMP.

This Water Supply Availability Study (Study) was developed as an interim period study and follows the format of a WSA. The Study captures the most current water supply planning and demand information, analyzes the various projected change in water demands associated with each qualifying project within San Francisco, evaluates overall supply and demand, assesses the sufficiency of supply, and prepares a conclusion based on the analysis. Upon completion of the Study, a WSA for each qualifying project can rely on the information and conclusions of this Study.

Findings

The 2009 SF Planning projections result in a Retail demand in 2030 of 93.42 mgd (Section 5.0), which is only slightly greater than the 2030 demand estimates projected in the 2005 UWMP. This increase, however, does not change the results of the 2005 UWMP. The SFPUC can still meet the current and future demand of its Retail customers in years of average or above-average precipitation. During a multiple dry year event;[1] however, it is possible that the SPFUC will not be able to meet 100 percent of the Retail demand in 2030. This Study shows the results of implementation of SFPUC's local supply reliability improvements under all hydrologic

[1] Multiple dry-year event is defined as a three-year hydrologic condition of below-normal rainfall per the Urban Water Management Planning Act.

conditions beginning in 2010 and extending to 2030. The ability to meet the demand of the Retail customers is in large part due to the development of 10 mgd of local supplies in the City through implementation of the Water Supply Improvement Program (WSIP). These addition sources of groundwater, recycled water, and conservation supplies are essential to provide the City with adequate supply in dry year periods, as well as improving supply reliability during years with normal precipitation.

In years with normal or above-normal precipitation, the City has sufficient supplies to serve its Retail customers. As shown in Table 6-1 (Section 6.0), the supply shortfall shown in 2010 is the result of reducing the Regional Water System (RWS) supply to 81 mgd per the condition of the Phased WSIP Variant, without full development of the additional 10 mgd of additional local supplies available in 2015. However, Retail demand is currently lower than projected 2010 demand of 91.81 mgd – demand in Fiscal Year 2007-2008 was 83.9 mgd.

During a multiple dry-year event as shown in Table 6-1, it is possible that the SFPUC will not be able to meet the full demands of its Retail customers in 2030, and will therefore have to impose reductions on its Retail supply. Under the Water Supply Allocation Plan (WSAP), Retail customers would experience no reduction in RWS deliveries within a 10 percent RWS shortage. However, during a 20 percent system-wide shortage, the Retail customers would experience a 1.9 percent reduction in Retail deliveries. This difference is due to the development of the additional 10 mgd of local supplies in the Retail service area. These additional local supplies are not subject to a reduction under the WSAP, as the WSAP only allocates water from the RWS.

The qualifying projects (Candlestick Point-Hunters Point Shipyard Phase II (CP-HPS II), Treasure Island-Yerba Buena Island (TI-YBI), and Parkmerced) anticipate developing new recycled water projects to help offset potable demand. These new projects could produce up to 1.5 mgd of recycled water. By reducing potable water demand through the use of recycled water, these projects have the ability to eliminate the City's overall water shortage during multiple dry year periods.

Regarding the availability of water supplies to serve the City, beginning in 2015 the SFPUC finds as follows:

- In years of average and above-average precipitation, and including development of SFPUC's local WSIP water supply sources the SFPUC has adequate supplies to serve 100 percent of normal, single dry and multiple dry year demand up to 2030.[2]
- In multiple-dry-year events after 2030, when the SFPUC imposes reductions in its supply, the SFPUC has in place the WSAP and RWSAP to balance supply and demand.

[2] The deficit shown in 2010 is the result of reducing the RWS supply to 81 mgd as per the Phased WSIP Variant, without full development of the additional 10 mgd of new supplies. 10 mgd of new sources will be developed and available for use in SF by 2015. San Francisco Retail demand is currently lower than projected (FY07/08 use was 82.6 mgd). If San Francisco retail demands exceed the available supply of 84.5 mgd between 2010 and 2015, the Water Sales Agreement allows the SFPUC to purchase additional water with the payment of an Environmental Surcharge as long as total deliveries from the RWS do not exceed 265 mgd (Total RWS deliveries in FY07/08 were 255.5 mgd).

- If recycled water is implemented as proposed at each of the major development project sites, then it is assumed that potable water demands for the City can decrease by up to 1.5 mgd; thereby, eliminating potential multiple dry-year deficit after 2030.
- With the WSAP and Retail Water Supply Allocation Plan (Section 4)in place, and the addition of local WSIP supplies, the SFPUC finds it has sufficient water available to serve the Retail customers including the demand of the proposed project, and existing and planned future uses.

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1.0 INTRODUCTION

1.1 Purpose

In an effort to streamline the water supply planning process within the City and County of San Francisco (San Francisco or City), the San Francisco Public Utilities Commission (SFPUC) adopted a resolution in 2002 and 2006 to allow for all development projects requiring a Water Supply Assessment (WSA) under SB 610 to rely solely on the adopted Urban Water Management Plan (UWMP)[3] without having to go through the process of preparing individual WSAs. SB 610 Water Code Section 10910 et seq. provides a nexus between the regional land use planning process and the environmental review process. The law also reflects the growing awareness of the need to incorporate water supply and demand analysis at the earliest possible stage in the land use planning process. The core of this law is an assessment of whether available water supplies are sufficient to serve the demand generated by a project, as well as the reasonably foreseeable cumulative demand in the region over the next 20 years under a range of hydrologic conditions.

The City of San Francisco Planning Department (SF Planning) and the San Francisco Redevelopment Agency are currently engaged in planning for various proposed land development projects that go beyond those future developments considered in the 2005 UWMP update. These developments, which include the Candlestick Point-Hunters Point Shipyard Phase II project (CP-HPS II), the Treasure Island-Yerba Island project (TI-TBI) and the Parkmerced project, hereinafter referred to as Projects, along with additional development throughout San Francisco account for 29,787 new dwelling units in 2030. As proposed, the Projects would contribute 27,400 new dwelling units to San Francisco's housing inventory. Additional development throughout the City accounts for the remaining 2,387 new dwelling units hereinafter referred to as Incremental Growth.

As a result of these new developments, the SFPUC concluded that its 2005 UWMP no longer accounted for every project requiring a WSA (qualifying project) within San Francisco. The SFPUC will not be preparing an updated UWMP until 2010. Therefore, during this interim period, any qualifying projects not accounted in the 2005 UWMP will require preparation of a WSA per Water Code Sections 10910 – 10915 that documents the SFPUC's current and projected supplies when compared to projected demands associated with new growth not covered in the 2005 UWMP.

The SFPUC determined that a WSA for the entire City and County service area, prepared pursuant to Water Code Sections 10910-10915, is the preferred method to evaluate supply and demands over a 20-year planning horizon. However, the Water Code Sections pertain to WSAs for qualifying projects, whereas the SFPUC needs a report to document its current and

[3] California law requires that UWMPs be prepared and submitted in years ending with fives (5) and zeros (0). Pursuant to Water Code Section 10644(a), the SFPUC prepared and adopted its UWMP in 2005. The next UWMP is due prior to December 31, 2010.

projected supplies when compared to projected demands associated with new growth not covered in the 2005 UWMP. Therefore, this Water Supply Availability Study (Study) was developed and modeled on the format of a WSA. The Study captures the most current water supply planning and demand information, analyzes the various projected change in water demands associated with each qualifying project within San Francisco, evaluates overall supply and demand, assesses the sufficiency of supply, and prepares a conclusion based on the analysis. Upon completion of the Study, a WSA for each qualifying project can rely on the information and conclusions of this Study.

1.2 Previous SFPUC Water Resource Studies

In recent years, the SFPUC has been engaged in numerous water resource planning efforts focused on regional and local supplies options and demand management measures, which could potentially reduce the amount of water the SFPUC imports through the Regional Water System (RWS) to meet its Retail water demands. The current status of major local water supply planning efforts is summarized below:

- **San Francisco Retail Water Demands and Conservation Potential**: In November 2004, the SFPUC prepared the "City and County of San Francisco Retail Water Demands and Conservation Potential" study (Demand Report) to project SFPUC future Retail water demands through the year 2030. The study employed a disaggregated water use forecasting procedure, drawing from actual water use data, and reflects current and projected demographics and employment data, changes in use due to existing plumbing codes, and water use trends. The study also identified water savings and implementation costs associated with a number of water conservation measures. Much of the methodologies in the Demand Report became the backbone of the demand analysis used in the SFPUC's 2005 UWMP.

- **Groundwater Planning**: In April 2005, the SFPUC completed the Final Draft North Westside Basin Groundwater Management Plan (GWMP), which identified opportunities for increasing groundwater production in San Francisco.

- **Recycled Water Master Plan Update**: The SFPUC prepared the 2006 Recycled Water Master Plan for the City and County of San Francisco (RWMP). The plan provided guidance for San Francisco in the development of recycled water projects within the City and County. The 2006 RWMP included an assessment of potential recycled water users City-wide and focused on identifying future recycled water projects in the City.

- **Urban Water Management Plan**: The 2005 UWMP addressed SFPUC's Retail water needs and evaluated sources of water supply, described efficient uses of water, demand management measures, and implementation strategies. The projections in the UWMP employed the demand and conservation estimates contained in the Demand Report, and the potential for groundwater and recycled water developed in the aforementioned studies to help in meeting projected demands. For consistency with the UWMP demand analysis, this Study used some of the same demand methodologies as presented in Section 5.2 of this Study.

- **Sewer Master Plan**: The SFPUC is preparing a Sewer System Master Plan (SSMP). The SSMP will present a long-term strategy for the management of the City's wastewater and storm water and identify capital improvements to be implemented over the next 25 to 30 years. The development of the SSMP will also incorporate proposed recycled water projects in the area. The identification and evaluation of potential wastewater management alternatives include an assessment of opportunities to implement recycled water projects to supply potential recycled water users identified in the 2006 RWMP. Environmental review of the Draft SSMP is anticipated to be complete in 2011.

- **Diversifying Retail Water Supply Portfolios**: In May 2006, the SFPUC prepared the "Diversifying San Francisco's Retail Water Supply Portfolio: Technical Memorandum". The study brought together planning data from existing planning projects, such as the North Westside Basin Groundwater Management Plan and the Recycled Water Master Plan, and summarized the potential local water supply options for San Francisco (including recycled water, groundwater, conservation and desalination projects). The memo also presented the implications of implementing different combinations of these local supply options, in terms of costs, ratepayer impacts and drought impact.

- **Water System Improvement Program (WSIP)**: On October 30, 2008, SFPUC certified the Final PEIR for the WSIP, a multiple year, system-wide capital improvements program. Many aspects of the WSIP are rooted in the 2000 Water Supply Master Plan and various water system vulnerability studies. The WSIP investigated the potential options of developing local water resources such as water recycling, groundwater, desalination and improved conservation to meet SFPUC purchase requests or demands.

1.3 Study Outline

This Study is an assessment of whether available water supplies are sufficient to serve the SFPUC's existing and planned Retail water system future uses within San Francisco, including agricultural and manufacturing uses, over the next 20 years under a range of hydrologic conditions. This Study employs the same disaggregated water use forecasting procedures as the Demand Report but incorporates an update of the end-use numbers presented in the Demand Report based on updated housing and employment projections.

This document is divided into six sections as follows:

1. Introduction

2. Water Supply

3. Potential Impact of Climate Change on SFPUC Supply

4. Drought Planning and Water Supply Reliability

5. San Francisco Growth Projections and Water Demand Analysis

6. Supply and Demand Comparison and Conclusion

2.0 WATER SUPPLY

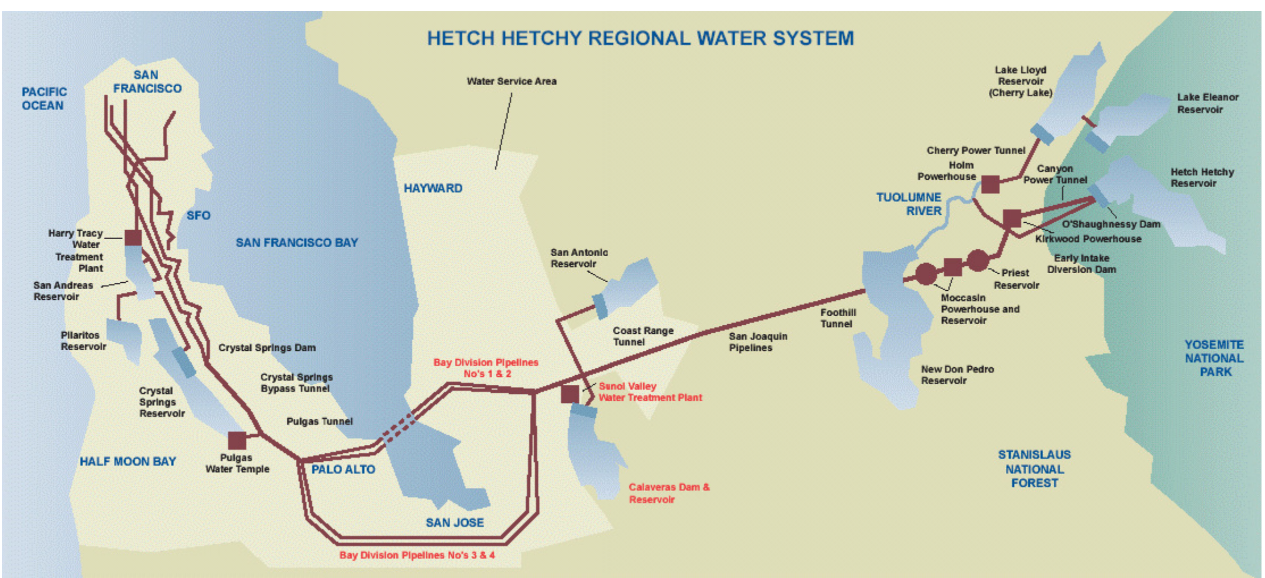
This section reviews San Francisco's existing and projected water supplies. The Regional Water System (RWS) is owned and operated by the City and County of San Francisco, under direction of the SFPUC. Historically, approximately 96 percent of the SFPUC's Retail water demands have been met through deliveries from the RWS. A small portion of San Francisco's water supply portfolio is produced through local groundwater and secondary treated recycled water. The groundwater is used primarily for irrigation at local parks and on highway medians. The recycled water is used mostly at municipal facilities for wastewater treatment process water, sewer box flushing and similar wash down operations.

In 1934, San Francisco combined the Hetch Hetchy system and Spring Valley system to create the SFPUC RWS. The rights to local diversions were originally held by the Spring Valley Water Company, which was formed in 1862.

The RWS currently delivers an annual average of approximately 265 mgd to 2.5 million users in Tuolumne, Alameda, Santa Clara, San Mateo, and San Francisco counties. The RWS is a complex system, shown in Figure 2-1, and supplies water from two primary sources:

- Tuolumne River through the Hetch Hetchy Reservoir, and
- Local runoff into reservoirs in Bay Area reservoirs in the Alameda and Peninsula watersheds.

Figure 2-1: Regional Water Supply System



Water from Hetch Hetchy Reservoir, through the Hetch Hetchy facilities represents the majority of the water supply available to the SFPUC. On average, the Hetch Hetchy Project provides over 85 percent of the water delivered to the Bay Area. During droughts the water received from the Hetch Hetchy system can amount to over 93 percent of the total water delivered.

Bay Area reservoirs provide on average approximately 15 percent of the water delivered by the SFPUC RWS. The local watershed facilities are operated to conserve local runoff for delivery. On the San Francisco Peninsula, the SFPUC utilizes Crystal Springs Reservoir, San Andreas Reservoir, and Pilarcitos Reservoir to capture local watershed runoff. In the Alameda Creek watershed, the SFPUC constructed the Calaveras Reservoir and San Antonio Reservoir. In addition to capturing runoff, San Antonio, Crystal Springs, and San Andreas reservoirs also provide storage for Hetch Hetchy diversions. The local watershed facilities also serve as an emergency water supply in the event of an interruption to Hetch Hetchy diversions.

2.1 Water Rights

The City and County hold pre-1914 appropriative water rights to store and deliver water from the Tuolumne River in the Sierra Nevada and locally from the Alameda and Peninsula watersheds. The City and County also divert and store water in the San Antonio Reservoir under an appropriative water right license granted by the State Water Resources Control Board (SWRCB) in 1959.

Appropriative water rights allow the holder to divert water from a source to a place of use not connected to the water source. These rights are based on seniority and use of water must be reasonable, beneficial, and not wasteful. In 1914, California established a formal water rights permit system, which is administered by the SWRCB. The SWRCB has sole authority to issue new appropriative water rights but cannot define property rights created under a pre-1914 appropriative water right.

The 1912 Freeman Report identified the ultimate diversion rate from the Tuolumne River to the Bay Area as 400 mgd and the City used this as the basis for designing the export capacity of the Hetch Hetchy project. The City has sufficient water rights for current diversions and the ultimate planned diversion rate of the Hetch Hetchy Project.

The federal Raker Act, enacted on December 19, 1913, grants to the City certain rights-of-way and public land use on federal property in the Sierra Nevada Mountains to construct, operate and maintain reservoirs, dams, conduits and other structures necessary or incidental to developing and using water and power. It also imposes restrictions on the City's use of the Hetch Hetchy Reservoir, including (among others) the requirement that the City recognize the senior water rights of the Turlock and Modesto Irrigation Districts (TID and MID) to divert water from the Tuolumne River. Specifically, the Raker Act requires the City to bypass certain flows through its Tuolumne River reservoirs to TID and MID for beneficial use. By agreement, the City, TID and MID have supplemented these Raker Act obligations to increase the TID and MID entitlements to account for other senior Tuolumne River water rights and allow the City to "pre-pay" TID and MID their entitlement by storing water in the Don Pedro water bank. The City is required to bypass inflow to TID and MID sufficient to allow them to divert 2,416 cfs or natural daily flow, whichever is less, at all times (as measured at La Grange), except for April 15 to June 13, when the requirement is 4,066 cfs or natural daily flow as measured at La Grange, whichever is less.

2.2 Current Water Supply Sources

2.2.1 The Regional Water System

The RWS, as described above, provides nearly 96% of San Francisco's Retail water supplies from the Hetch Hetchy Reservoir and local Bay Area reservoirs in the Alameda and Peninsula watersheds. On average, the Hetch Hetchy Reservoir provides over 85 percent of the water delivered and Bay Area reservoirs provide approximately 15 percent of the water delivered. The RWS delivers an annual average of 265 mgd – 81 mgd serves the Retail customers within the City and County of San Francisco and the other 184 mgd is delivered to the Wholesale suburban customers on the San Francisco Bay Peninsula.

2.2.2 Local Groundwater

San Francisco overlies all or part of seven groundwater basins. These groundwater basins include the Westside, Lobos, Marina, Downtown, Islais Valley, South and Visitation Valley basins. The Lobos, Marina, Downtown and South basins are located wholly within the City limits, while the remaining three extend south into San Mateo County. The portion of the Westside Basin aquifer located within San Francisco is commonly referred to as the North Westside Basin. With the exception of the Westside and Lobos basins, all of the basins are generally inadequate to supply a significant amount of groundwater for municipal supply due to low yield.

Early in its history, San Francisco made significant use of local groundwater, springs, and spring-fed surface water. However, after the development of surface water supplies in the Peninsula and Alameda watersheds by Spring Valley Water Company and the subsequent completion of the Hetch Hetchy Reservoir and aqueduct in the 1930's, the municipal water supply system has relied almost exclusively on surface water from local runoff, the Alameda and Peninsula watersheds, and the Tuolumne River watershed. Local groundwater use, however, has continued in the City primarily for irrigation purposes. The San Francisco Zoo and Golden Gate Park use groundwater for non-potable purposes.

About one mgd of groundwater is delivered to Castlewood Country Club from well fields operated by the SFPUC in Pleasanton and drawn from the Central Groundwater Sub Basin in the Livermore/Amador Valley. These wells are metered and have been in operation for several decades. For purposes of water accounting and billing, these deliveries to Castlewood are accounted for as part of San Francisco's Retail Customer base.

2.2.3 Local Recycled Water

From 1932 to 1981, San Francisco's McQueen Treatment Plant provided recycled water to Golden Gate Park for irrigation purposes. Due to changes in regulations the City closed the McQueen plant and discontinued use of recycled water in Golden Gate Park. Currently in San Francisco, disinfected secondary-treated recycled water from the SFPUC's Southeast Water

Pollution Control Plant is used on a limited basis for wash-down operations and is provided to construction contractors for dust control and other nonessential construction purposes. Current use of recycled water for these purposes in San Francisco is less than one mgd.

2.2.4 Local Water Conservation

The SFPUC is committed to demand-side management programs and San Francisco's per capita water use has dropped by about one-third since 1977 in part due to these programs. The first substantial decrease came following the 1976-77 drought in which gross per capita water use dropped from 160 to 130 gpcd. Despite continuous growth in San Francisco since then, water demands have remained lower than pre-drought levels.

A second substantial decrease in water use within San Francisco occurred as a result of the 1987-1992 drought when a new level of conservation activities resulted in further water use savings. It is anticipated that through the continuation and expansion of these programs, per capita water use will continue to decrease into the future. Current gross per capita water use within San Francisco is 91.5 gallons per capita per day (gpcd) with residential water use calculated to be approximately 57 gpcd, the lowest use of any major urban area in California.

The SFPUC's demand management programs range from financial incentives for plumbing devices to improvements in the distribution efficiency of the system. The conservation programs implemented by the SFPUC are based on the California Urban Water Conservation Council's list of fourteen Best Management Practices identified by signatories of the Memorandum of Understanding Regarding Urban Water Conservation in California, executed in 1991.

2.3 Water System Improvements and New Supply Reliability

To ensure that the future water needs of its Retail and wholesale customers will be met in a more reliable and sustainable manner, the SFPUC has undertaken water supply projects in the Water System Improvement Program (WSIP) to improve dry-year supplies, and is diversifying San Francisco's water supply portfolio through the development of local water supplies such as increasing recycled water and groundwater production, and bolstering water conservation. Many of the water supply and reliability projects evaluated in the WSIP were originally put forth in SFPUC's Water Master Plan (2000), then summarized in the 2005 UWMP and then investigated further in a Technical Memorandum Diversifying San Francisco's Retail Water Supply Portfolio (May 2006). In addition, specific water resource reports were prepared and released as well. Specifically, in 2005, SFPUC prepared a Recycled Water Master Plan, which updated the 1996 Recycled Water Master Plan and also prepared the North Westside Basin Groundwater Management Plan. Water supply elements of the WSIP are summarized below. The WSIP and its Program Environmental Impact Report are available for review at www.sfwater.org and www.sfgov.org. Sections of the WSIP Phased Variant to support the summaries in this Study are appended hereto.

2.3.1 Water System Improvement Program and the Phased WSIP Variant

The WSIP is a multi-billion dollar, multi-year, capital program to upgrade the RWS. The program will deliver improvements that enhance the SFPUC's ability to provide reliable, affordable, high quality drinking water to its 27 wholesale customers and regional Retail customers in Alameda, Santa Clara, and San Mateo counties, and to 800,000 Retail customers in San Francisco, in an environmentally sustainable manner.

As required under CEQA, SF Planning prepared a Program Environmental Impact Report (PEIR) for the WSIP. The PEIR evaluated the potential environmental impacts of the proposed WSIP and identified potential mitigations to those impacts. The PEIR also evaluated several alternatives to meet the SFPUC service area's projected increase in water demand between now and 2030. The water supply improvement options investigated included 10 alternatives using various water supply combinations from the local watersheds; the Tuolumne and Lower Tuolumne; ocean desalination; and additional recycled water, groundwater, and conservation.

The PEIR was certified by the SF Planning Commission on October 30, 2008. On the same day the SFPUC adopted the Phased WSIP Variant option.

2.3.1.1. Phased WSIP Variant

At the request of the SFPUC, SF Planning studied the Phased WSIP Variant as part of the environmental analysis. The SFPUC identified this variant in order to consider a program scenario that involved full implementation of all proposed WSIP facility improvement projects to insure that the public health, seismic safety, and delivery reliability goals were achieved as soon possible, but phased implementation of a water supply program to meet projected water purchases through 2030. Deferring the 2030 water supply element of the WSIP until 2018 would allow the SFPUC and its wholesale customers to focus first on implementing additional local recycled water, groundwater, and demand management actions while minimizing additional diversions from the Tuolumne River.

The Phased WSIP Variant establishes a mid-term planning milestone in 2018 when the SFPUC would reevaluate water demands through 2030 in the context of then-current information, analysis and available water resources. The SFPUC currently delivers on an annual average approximately 265 million gallons of water per day from local watersheds (Peninsula and Alameda Creek) and the Tuolumne River Watershed. By 2030, demand on the SFPUC system is expected to increase to an annual average of 300 million gallons of water per day. The Phased WSIP Variant would meet the projected 2018 purchase requests of 285 mgd from the RWS by capping purchases from the watersheds at 265 mgd; the remaining 20 mgd would be met through water efficiencies and conservation, water recycling and local groundwater use—10 mgd by Wholesale Customers and 10 mgd in the City and County. Before 2018, the SFPUC and the Wholesale Customers will engage in a new planning process to reevaluate water system demands and supply options, including conducting additional studies and environmental reviews necessary to address water supply needs after 2018.

The Phased WSIP Variant includes the following key program elements:

- Full implementation of all WSIP facility improvement projects.
- Water supply delivery to RWS customers through 2018 only of 265 mgd average annual target delivery originating from the watersheds. This includes 184 mgd for the Wholesale Customers and 81 mgd for the Retail Customers.
- Water supply sources include: 265 mgd average annual from the Tuolumne River and local watersheds and 20 mgd of water conservation, recycled water and local groundwater developed within SFPUC's service area (10 mgd Retail; 10 mgd wholesale).
- Dry-year water transfers of 2 mgd coupled with the Westside Groundwater Basin Conjunctive Use Project.
- Re-evaluation of 2030 demand projections, potential RWS purchase requests and water supply options by December 31, 2018 and a separate SFPUC decision in 2018 regarding RWS water deliveries after 2018.
- The ability to impose financial penalties is included in the new Water Supply Agreement to limit water sales to an average annual of 265 mgd from the watersheds.

The additional 10 mgd of supplies produced in San Francisco by implementation of the WSIP are considered secure and have been included in this Study. This Study assumes the WSIP local supplies will be in place in the timeframes stated in the SFPUC WSIP, with this assumption total Retail supplies increase to 94.50 mgd in 2015 and remain constant over the 20-year planning horizon. Projects related to these efforts are detailed below.

2.3.2 Local Groundwater Projects

2.3.2.1. San Francisco Groundwater Supply Project

The San Francisco Groundwater Supply Project would provide up to 4 mgd of local groundwater water to improve reliability during drought or maintenance conditions, as well as ensure that a reliable, high-quality source of water is available in the case of an earthquake or other emergency. The project proposes the construction of up to six wells and associated facilities in the western part of San Francisco to extract up to 4 mgd of groundwater water from the Westside Groundwater Basin for distribution in the City. The extracted groundwater, which would be used both for regular and emergency water supply purposes, would be disinfected and blended in small quantities with imported surface water before entering the municipal drinking water system. The environmental review for this project will begin in November 2009.

2.3.2.2. Lake Merced Water Level Restoration Project

The goal of the Lake Merced Water Level Restoration Project is to protect and balance the beneficial uses of Lake Merced by providing a more stable water level regime using groundwater and stormwater, rather than supplies provided through the RWS.

2.3.3 Local Recycled Water Projects

The proposed Westside, Harding Park and Eastside Recycled Water Projects would provide up to 4 mgd of recycled water to a variety of users in San Francisco. Recycled water will primarily be used for landscape irrigation, toilet flushing and industrial purposes. The Harding Park Project has completed environmental review, and the Westside Project will begin environmental review in late 2009 or early 2010.

The proposed Westside Project would bring recycled water from the proposed recycled water treatment facility in Golden Gate Park to the San Francisco Zoo, Golden Gate Park, and Lincoln Park Golf Course. Recycled water would be used for irrigation at all three sites; additionally, it would be used for non-potable uses in Golden Gate Park at the California Academy of Sciences. The proposed Harding Park Recycled Water Project would use available recycled water from the North San Mateo County Sanitation District (NSMCSD) located in Daly City, to irrigate Harding Park and Fleming Park golf courses in San Francisco. The SFPUC has partnered with the NSMCSD for this proposed project.

Currently, the SFPUC is conducting a recycled water demand assessment on the Eastside of San Francisco. The assessment examines the potential uses of recycled water for irrigation, toilet flushing, and commercial applications. The WSIP contains funding for planning, design, and environmental review for the San Francisco Eastside Recycled Water Project.

2.3.4 Local Water Conservation

The SFPUC has also increased its water conservation programs in an effort to achieve new water savings by 2018. The SFPUC's conservation program is based on the Demand Study (Section 1.2) that identified water savings and implementation costs associated with a number of water conservation and efficiency measures. The Demand Study evaluated the costs and benefits of implementing 48 different conservation measures using an end-use model. The results indicated that local conservation programs implemented through 2030 could cumulatively reduce Retail purchases from the SFPUC RWS by 4.5 mgd in year 2030. These new conservation programs include high-efficiency toilet replacement in low-income communities, plumbing retrofits in compliance with the 1992 California plumbing code and water efficient irrigation systems in municipal parks. Through its conservation program, the SFPUC anticipates reducing gross per capita consumption from 91.5 gpcd to 87.4 gpcd by 2018 for an average daily savings of nearly 4.0 mgd.

2.3.5 Summary of Local WSIP Water Supply Programs

As previously discussed, SFPUC anticipates that the expanded groundwater and recycled water production, and increased conservation programs will provide the City with an additional 10 mgd of local water supplies. As quantified in Table 2-1 with implementation of the WSIP, SFPUC expects to have in these local supplies in place by 2015. These programs and projects are reliable in all hydrologic conditions and are not subject to RWSAP reductions or curtailments.

Table 2-1: WSIP Water Supply Sources (mgd)

WSIP Water Supplies	2010	2015	2020	2025	2030
Groundwater	0.0	2.0	2.0	2.0	2.0
Recycled Water	0.0	4.0	4.0	4.0	4.0
Conservation	0.0	4.0	4.0	4.0	4.0
Total WSIP Local Supplies	**0.0**	**10.0**	**10.0**	**10.0**	**10.0**

2.3.6 Total SFPUC Retail Water Supplies

Table 2-2 summarizes SFPUC's total water supplies now and over the 20-year planning period. In 2010, prior to the development of the 10 mgd of local supplies, SFPUC can access an annual average 84.50 mgd from all sources discussed above. Beginning in 2015, when the WSIP water supply sources are readily available, the SFPUC's Retail water supplies increase to 94.5 mgd. These supplies are assumed to be available in the quantities listed in Table 2-2. SFPUC intends to use these supplies to meet its Retail customer demands.

Table 2-2: SFPUC Water Supplies 2010 - 2030

Current Water Supply Sources	2010	2015	2020	2025	2030
SFPUC RWS (Surface water: Tuolumne River, Alameda & Peninsula) (1)	81.0	81.0	81.0	81.0	81.0
Groundwater Sources					
Groundwater (In-City Irrigation Purposes)	2.5(2)	0.5(3)	0.5(3)	0.5(3)	0.5(3)
Groundwater at Castlewood(4)	1.0(4)	1.0(4)	1.0(4)	1.0(4)	1.0(4)
Groundwater: Treated for Potable – Previously used for In-City Irrigation purposes(5)	0.0	2.0	2.0	2.0	2.0
Groundwater Subtotal	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**
Current Water Supply Subtotal	**84.5**	**84.5**	**84.5**	**84.5**	**84.5**
WSIP Water Supply Sources					
Groundwater Development: Potable from SF GWSP (Westside Groundwater Basin)(6)	0.0	2.0	2.0	2.0	2.0
Recycled Water Expansion Irrigation(7)	0.0	4.0	4.0	4.0	4.0
Supply Conservation Program	0.0	4.0	4.0	4.0	4.0
WSIP Supply Subtotal	**0.0**	**10.0**	**10.0**	**10.0**	**10.0**
Total Retail Supply (Current and WSIP Supplies)	**84.5**	**94.5**	**94.5**	**94.5**	**94.5**

(1) RWS surface water supplies are subject to reductions due to below-normal precipitation. This may affect dry year supplies - model shows supply reduction occurs in year 2 of multiple dry year event. (Source: SFPUC 2008 WSIP Phase Variant Supply limitation)

(2) Groundwater serves irrigation to Golden Gate Park, SF Zoo, and Great Highway Median. (Source: 2005 SFPUC UWMP Table 8B page 43)

(3) A Groundwater reserve of 0.5 mgd for irrigation purposes will remain as part of SFPUC's non-potable groundwater supply. (Source: SFPUC 2008 WSIP Phase Variant)

(4) Castlewood current and projected use remains unchanged over 20 year planning horizon. (Source: 2005 SFPUC UWMP Table 8B page 43)

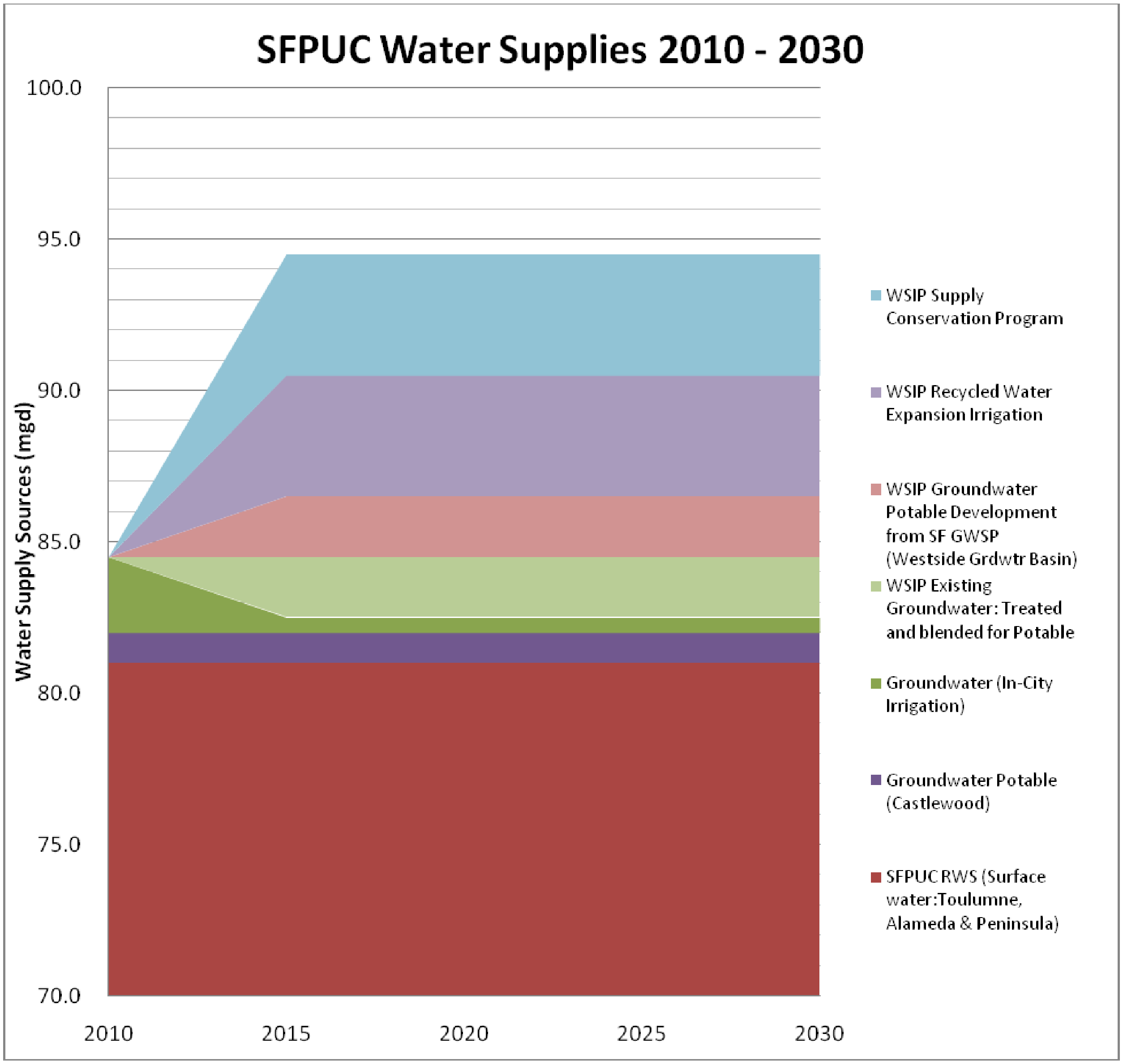
(5) 2.0 mgd of groundwater treated and blended for Potable water supply purposes. (Source: 2005 SFPUC UWMP Table 8B page 43)

(6) 2.0 mgd of new groundwater developed as part of the new local supply target. (Source: SFPUC 2008 WSIP Phase Variant Supply Target)

(7) 2.0 mgd of Recycled used for irrigation at Golden Gate Park, SF Zoo, Great Highway Median, and 2.0 mgd for other non-potable purposes. (Source: SFPUC 2008 WSIP Phase Variant Supply Target)

Figure 2-1 is a graphical representation of the SFPUC's current supply sources and the WSIP local supply sources. As shown in Figure 2-2, the supplies grow from 84.5 mgd in 2010 to 94.5 mgd as the WSIP local supplies are brought into the SFPUC Retail supply system. The figure shows the total supplies increasing in 2015 and holding constant over the 20-year planning horizon.

Figure 2-2: SFPUC Water Supplies



2.3.7 Dry Year Water Supply Projects

The WSIP water supply program includes development of dry-year supplies for the RWS. The PEIR included an analysis of dry-year water supply transfers from the senior water rights holders on the Tuolumne River (MID and TID); a groundwater conjunctive use project; and a regional desalination project. The latter two projects are described below. The SFPUC is investigating the possibility of a dry-year water transfer with MID and TID for 2 mgd in 2018. The WSIP provides funding for the Groundwater Storage and Recovery Project.

2.3.7.1. Groundwater Storage and Recovery Project

The proposed Regional Groundwater Storage and Recovery Project would balance the use of both groundwater and surface water to increase water supply reliability during dry years or in emergencies. The proposed project is located in San Mateo County and is sponsored by the SFPUC in coordination with its partner agencies, the California Water Service Company, City of Daly City and City of San Bruno. The partner agencies currently purchase wholesale surface water from the SFPUC and also independently operate groundwater production wells for drinking water and irrigation.

The proposed Regional Groundwater Storage and Recovery Project would extract groundwater from the South Westside Basin groundwater aquifer in San Mateo County. The project would consist of installing up to sixteen new recovery well facilities in northern San Mateo County to pump stored groundwater during a drought. During years of normal or heavy precipitation, the proposed project would provide surface water to the partner agencies in order to reduce the amount of groundwater pumped. Over time, the reduced pumping would result in the storage of approximately 61,000 acre-feet of water (more than the supply contained in the Crystal Springs Reservoir on the SFPUC Peninsula Watershed.) This would allow recovery of this stored water at a rate of up to 7.2 million gallons per day for a 7.5-year dry period. The water would be in compliance with the California Department of Public Health requirements for drinking water supplies. The proposed project would include construction of well pump stations, disinfection units, and piping. The proposed project is currently undergoing environmental review.

2.3.7.2. Desalination

The SFPUC's investigations of desalination as a water supply source have focused primarily on the potential for regional facilities. The proposed Bay Area Regional Desalination Project is a joint venture between the SFPUC, Contra Costa Water District, East Bay Municipal Utility District, and the Santa Clara Valley Water District.

The regional desalination project would provide an additional source of water during emergencies, provide a supplemental water supply source during extended droughts, allow other major water facilities to be taken out of service for maintenance or repairs, and increase supply reliability by providing water supply from a regional facility. The Bay Area Regional Desalination Project would have an ultimate total capacity of up to 65 mgd.[4]

[4] EBMUD, “Desalination Project”, http://www.ebmud.com/water_&_environment/water_supply/current_projects/ desalination_project/default.htm, accessed July 30, 2009.

3.0 POTENTIAL IMPACT OF CLIMATE CHANGE ON SFPUC SUPPLY AVAILABILITY

The issue of climate change has become an important factor in water resources planning in the State, and it is being considered during planning for the RWS. There is evidence that increasing concentrations of greenhouse gases have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, there is evidence that a warming trend occurred during the latter part of the 20th century and will likely continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies on climate change have been conducted to determine the potential impacts water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the RWS and associated watersheds:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low- and medium-elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year,
- Changes in the timing, intensity, and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow,
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality,
- Sea level rise and an increase in saltwater intrusion,
- Increased water temperatures with accompanying adverse effects on some fisheries,
- Increases in evaporation and concomitant increased irrigation need, and
- Changes in urban and agricultural water demand.

However, other than the general trends listed above, there is no clear scientific consensus on exactly how global warming will quantitatively affect State water supplies, and current models of State water systems generally do not reflect the potential effects of global warming.

The SFPUC staff performed an initial evaluation of the effect on the Regional Water System of a 1.5-degree Celsius (°C) temperature rise between 2000 and 2025. The temperature rise of 1.5°C is based on a consensus among many climatologists that current global climate modeling suggests a 3°C rise will occur between 2000 and 2050 and a rise of 6°C will occur by 2100. The evaluation predicts that an increase in temperature of 1.5°C will raise the snowline approximately 500 feet every twenty-five years. The elevation of the watershed draining into Hetch Hetchy Reservoir ranges from 3,800 to 12,000 feet above mean sea level, with about 87 percent of the watershed area above 6,000 feet. In 2000 (a normal hydrologic year in the 82-year period of historical record), the average snowline in this watershed was approximately 6,000 feet during the winter months. Therefore, the SFPUC evaluation indicates that a rise in temperature of 1.5°C between 2000 and 2025 will result in less or no snowpack between 6,000 and 6,500 feet and faster melting of the snowpack above 6,500 feet. Similarly, a temperature rise of 1.5°C between 2025 and 2050 will result in less or no snowpack between 6,500 and 7,000 feet and faster melting of the snowpack above 7,000 feet.

The SFPUC climate change modeling indicates that about 7 percent of the runoff currently draining into Hetch Hetchy Reservoir will shift from the spring and summer seasons to the fall and winter seasons in the Hetch Hetchy basin by 2025. This percentage is within the current interannual variation in runoff and is within the range accounted for during normal runoff forecasting and existing reservoir management practices. The additional change between 2025 and 2030 is not expected to be detectible. The predicted shift in runoff timing is similar to the results found by other researchers modeling water resource impacts in the Sierra Nevada due to warming trends associated with climate change.

Based on these preliminary studies and the results of literature reviews, the potential impacts of global warming on the RWS are not expected to affect the water system operations through 2030. SFPUC hydrologists are involved in ongoing monitoring and research regarding climate change trends and will continue to monitor the changes and predictions, particularly as these changes relate to water system operations and management of the RWS. The SFPUC has developed a workplan to further advance its research on the effects of climate change on the RWS.

4.0 DROUGHT PLANNING AND WATER SUPPLY RELIABILITY

The SFPUC water supply system reliability is expressed in terms of its ability to deliver water during droughts. Reliability is defined by the amount and frequency of water delivery reductions required to balance customer demands with available supplies in droughts. The SFPUC has a reliability goal of meeting dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts.

The total amount of water the SFPUC has available to deliver to its Retail and wholesale customers during a defined period of time is dependent on several factors. These include the amount of water that is available to the SFPUC from natural runoff, the amount of water in reservoir storage, and the amount of water that must be released from the SFPUC's system for commitments to purposes other than customer deliveries, such as releases below Hetch Hetchy reservoir to meet the Raker Act and fishery purposes.

The SFPUC operates its system to optimize the reliability and quality of its water deliveries. Hetch Hetchy Reservoir operations are guided by two principal objectives: collection of Tuolumne River water runoff for diversion to the Bay Area; and fulfillment of the SFPUC's downstream release obligations. To conserve runoff, Hetch Hetchy Project reservoirs are drawn down beginning in early winter, relying on the recurrence and forecast of snow melt to guide drawdown releases. Similarly, the Regional Water System Bay Area reservoirs are operated to conserve watershed runoff. As such, reservoirs are drawn down during the winter period to capture storms and reduce the potential for spilling water out of the reservoirs. In the spring, excess Hetch Hetchy water supply (snowmelt) is transferred to three of the Bay Area reservoirs, capable of receiving the water, to fill any unused reservoir storage.

Prior to the late 1970's, droughts did not seriously affect the ability of the SFPUC to sustain full deliveries to its customers. However, as the 1987-1992 droughts progressed and reservoir storage continued to decline, it became apparent that continued full deliveries could not be sustained without the risk of running out of water before the drought ended.

To provide some level of assurance that water could be delivered continuously throughout a drought (although at reduced levels), the SFPUC adopted a drought planning sequence and associated operating procedures that trigger different levels of water delivery reduction rationing relative to the volume of water actually stored in SFPUC reservoirs. Each year, during the snowmelt period, the SFPUC evaluates the amount of total water storage expected to occur throughout the RWS. If this evaluation finds the projected total water storage to be less than an identified level sufficient to provide sustained deliveries during drought, the SFPUC may impose delivery reductions or rationing.

4.1 *Water Shortage Allocation Plan (WSAP)*

During a drought, it is expected that the Retail and wholesale customers would experience a reduction in the amount of water received from the RWS. The amount of this reduction has been dictated by existing contractual agreements between the SFPUC and the Wholesale Customers, as detailed in the existing WSAP. The WSAP provides specific allocations of available water between the Retail and wholesale customers collectively associated with different levels of system-wide shortages, as shown in Table 4-1.

Table 4-1: WSAP Allocation

Level of System-Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share (collectively)
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

In addition to providing an allocation method, the plan also includes provisions for transfers, banking and excess use charges.

Under the WSAP, SFPUC Retail customers would experience no reduction in deliveries at a 10 percent shortage. However, during a 20 percent system-wide shortage, the Retail customers would experience a 1.9 percent reduction in Retail deliveries. This assumes the full development of the additional 10 mgd of local WSIP supplies in the Retail service area. These 10 mgd of local supplies are not subject to reduction under the WSAP as the WSAP only allocates water supplies from the RWS. Table 4-2 shows SFPUC RWS Retail supply schedule during normal, single dry year, and multiple dry year periods.

The WSAP has been carried forward in the new Water Supply Agreement for system-wide shortages of up to 20 percent. For shortages in excess of this amount, the Water Supply Agreement provides that the SFPUC may allocate water in its discretion.

4.2 *Retail Water Shortage Allocation Plan*

San Francisco's Retail Water Shortage Allocation Plan (RWSAP) was adopted to formalize a three-stage program of action to be taken in San Francisco to reduce water use during a drought. In accordance with the RWSAP, prior to the initiation of any water delivery reductions in San Francisco, whether it be initial implementation of reduction delivery or increasing the severity of water shortage, the SFPUC would outline a drought response plan that would address the following: the water supply situation; proposed water use reduction objectives; alternatives to water use reductions; methods to calculate water use allocations and adjustments; compliance methodology and enforcement measures; and budget considerations.

Table 4-2: 2005 – 2030 SFPUC Retail Allocations in Normal, Dry and Multiple Dry Years

	Normal Year		Single Dry Year		Multiple Dry Year Event[2] Year 1		Year 2		Year 3	
	mgd	%	mgd	%	mgd	%	mgd	%	mgd	%
2010[1]	81.0	100	81.0	100.0	81.0	100.0	79.5	98.1	79.5	98.1
2015	81.0	100	81.0	100.0	81.0	100.0	79.5	98.1	79.5	98.1
2020	81.0	100	81.0	100.0	81.0	100.0	79.5	98.1	79.5	98.1
2025	81.0	100	81.0	100.0	81.0	100.0	79.5	98.1	79.5	98.1
2030	81.0	100	81.0	100.0	81.0	100.0	79.5	98.1	79.5	98.1

(1) In 2010 the Retail allocation of RWS supply is reduced to 81 mgd to reflect the Retail allocation under the 2018 Phased WSIP Variant. 10 mgd of recycled water, groundwater, and conservation will be implemented by 2015 to make up for the loss in RWS supply. The 10 mgd of local supply is not subject to reduction under the WSAP.

(2) Under the WSAP, the SFUPC Retail allocations at a 10 percent shortage are 85.86 mgd. However, due to the Phased WSIP Variant, only 81 mgd of RWS supply is shown. The remaining supply can be transferred from or to the Wholesale Customers under the terms of the Water Supply Agreement.

Source: San Francisco Public Utilities Commission. 2005. Urban Water Management Plan for the City and County of San Francisco. p. 54-57 and discussions with SFPUC staff.

This drought response will be presented at a regularly scheduled SFPUC Commission meeting for public input. The meeting will be advertised in accordance with the requirements of California Water Code Section 6066 of the Government Code, and the public will be invited to comment on the SFPUC's intent to reduce deliveries.

Depending on the level of water demand and the desired objective for water use reduction, one, two or all three stages of the RWSAP may be required.

Stage 1 (Voluntary)

- System-wide demand reductions of 5-10 percent experienced
- Voluntary rationing request of customers
- Customers are alerted to water supply conditions
- Remind customers of existing water use prohibitions
- Education on, and possible acceleration of, incentive programs

Stage 2 (Mandatory)

- System-wide demand reductions of 11-20 percent experienced
- All Stage 1 actions implemented
- All customers receive an "allotment" of water based on the Inside/Outside allocation method (based on base year water usages for each account)
- Water use above the "allocation" level will be subject to excess use of flow restrictor devices and shut-off of water

Stage 3 (Mandatory)

- System-wide demand reductions of 20 percent or greater experienced
- Same actions as in Stage 2 with further reduced allocations

5.0 SAN FRANCISCO GROWTH PROJECTIONS AND WATER DEMAND ANALYSIS

This section shows the calculated water demand projections for San Francisco based on recent housing and employment forecasts.

5.1 Revised City of San Francisco Growth Projections

The SFPUC has recently evaluated projected demands and incorporated the updated San Francisco Planning projections for residential and non-residential growth contained in a memorandum from SF Planning to SFPUC dated July 9, 2009 (Appendix A). This analysis results in a 2030 growth projection that differs from the 2005 UWMP. Table 5-1 compares 2030 growth projections between the 2005 UWMP and the 2009 growth projections developed by the SF Planning department. As shown in Table 5-1 new residential growth is expected to increase by 29,787 units. The 27,400 new residential units proposed in three Projects account for the majority of new residential growth in 2030. In contrast, the 2009 employment projections result in net loss of 47,300 new employment opportunities in 2030.

Table 5-1: 2030 SF Planning Projections for Households and Employment

Residential Units		**2030 Projection**
2005 UWMP(1)		373,513
2009 SF Planning Projections(2)		403,300
	Net Change	**29,787**(3)
Non-Residential Population		**2030 Projection**
2005 UWMP(4)		795,400
2009 SF Planning Projections(5)		748,100
	Net Change	**-47,300**

(1) 2005 Urban Water Management Plan residential projections were based on ABAG Projections 2002 and Citywide Policy Analysis and Planning, San Francisco Planning Department, Land Use Allocations 2002.

(2) 2009 Residential Projections were developed by the San Francisco Planning Department and designed to closely match the recently adopted ABAG Projections 2009 target, but taking into account local knowledge of projects currently in various stages of the entitlement process, commonly referred to as the Development Pipeline. (Appendix A)

(3) Of the new residential units the Projects account for 27,700 units and new incremental growth accounts for 2,387 units.

(4) 2005 Urban Water Management Plan non-residential projections were based on ABAG 2030 employment projections and linearly extrapolated for 2020 and 2030.

(5) Revised 2009 Non-Residential Projections were developed by the San Francisco Planning Department and based on ABAG 2009 Employment projections for 2030. (Appendix A)

5.1.1 2009 Residential Projections

As stated previously, the SF Planning and the San Francisco Redevelopment Agency are currently engaged in planning for various proposed land development projects. These Projects, as well as Incremental Growth throughout San Francisco, account for 29,787 new dwelling units in 2030. As proposed, the Projects would contribute 27,400 new dwelling units to San Francisco's housing inventory. The Incremental Growth throughout the City accounts for the remaining 2,387 new dwelling units (Appendix B).

The updated 2030 City growth projection shown in Table 5-1 reflects an increase in residential households from the 2005 UWMP forecast but an overall decrease in non-residential (employment) population. As shown in Table 5-2, the residential growth at the Projects commences in 2015 with 6,850 new dwelling units and continues to grow to 27,400 in 2030, essentially growing by 6,850 over each five-year period. In addition, this Study also assumes that the incremental growth throughout San Francisco would occur in the same manner. As shown in Table 5-2, the incremental growth commences in 2015 with 597 new dwelling units and continues to grow to 2,387 in 2030, essentially growing by 597 over each five-year period.

Table 5-2: Projects and Incremental Growth within San Francisco

Residential Units	2010	2015	2020	2025	2030
Residential Units [1]	344,306	351,608	358,910	366,211	373,513
Residential Units for Projects[2]	0	6,850	13,700	20,550	27,400
Residential Units for Incremental Growth[3]	0	597	1,194	1,790	2,387
Subtotal (Projects and Incremental Growth)		***7,447***	***14,894***	***22,340***	***29,787***
Total New Residential Units	**344,306**	**359,055**	**373,803**	**388,552**	**403,300**

[1] 2005 UWMP residential unit projections shown in Table 5-1. Source: 2005 SFPUC UWMP Table 2, page 7
[2] Residential Units of Projects (CP-HPS II 10,500 units); (TI-YBI 8,000 units); (Parkmerced 8,900 total units)
[3] Incremental Growth accounts for 2,387 new units.

5.1.2 2009 Employment Projections

The updated 2030 City growth projection shown in Table 5-1 reflects an increase in residential households from the 2005 UWMP forecast but an overall decrease in non-residential (employment) population. These changes mirror the changes in the Association of Bay Area Governments (ABAG) projections. ABAG projections are used for various planning purposes by many of the cities in the nine-county area covered by ABAG. ABAG publishes regional projections and employment and growth every two years. Projections developed after 2002 incorporate a fundamental shift in ABAG's projection methodology. Rather than taking existing local land use policy as a given (as had previously been the case), in the projections following the 2002 projections, ABAG assumes that local policy will be amended in the future to adopt "smart growth" principles. Specifically, the projections assume that higher density growth will be focused in urban core areas, and that more housing will be produced in those areas, compared to that previously assumed. The result of these assumptions is to increase the expected population in already developed areas. Another difference reflected in the later projections is a more current and accurate reflection of the internet industry (dot com era), as well as the effect of the current recession on employment projections.

Table 5-3 shows the progression of growth in employment opportunities forecasted in San Francisco based on SF Planning's 2009 Employment Projections (Appendix B). Beginning in 2015 employment is projected to increase to 719,145 jobs, and then by 2025 employment is expected to grow to 734,050 jobs. As projected, and shown in Table 5-3 employment in San Francisco is expected to reach 748,100 jobs.

Table 5-3: Non-Residential Employment Projections

Non-Residential Employment Projections	2010	2015	2020	2025	2030
SF Planning Employment Total(1) (jobs)	712,145	719,447	726,749	734,050	748,100

(1) Table 5-1 2009 SF Planning Projections based on ABAG 2030 Employment projections

5.2 City of San Francisco Retail Water Demand Analysis

Retail water demands in the 2005 UWMP were based on the findings of the Demand Report. The Demand Report analyzed water demand associated with each Retail customer sector and then forecasted demand over a 25-year planning horizon using data provided by the City, and the SFPUC. The demand projections were developed using a water use model, which initially established a base-year water demand at the end-use level (such as toilets, showerheads, other lavatory hardware and household fixtures), calibrated the model to initial conditions, and forecasted future water demand based on projected demand of existing water service accounts and future population growth.

This Study updates the 2005 UWMP water demand forecasts in 2010 through 2030 to reflect San Francisco's three major development Projects (CP-HPS II, TI-YBI, and Parkmerced) and incremental growth projected to occur throughout the City, and the 2009 San Francisco non-residential planning projections (based on ABAG 2009 Employment Projections) for 2030. Tables 5-4 and 5-5 show the results of the demand forecasts at the Project sites; anticipated incremental growth expected to occur throughout the City and growth in demand generated through employment opportunities (jobs).

5.2.1 Water Demand of Projects and Incremental Growth

The Projects are proposed as mixed-use residential redevelopment projects within San Francisco. Each project sponsor provided land use plans or reports to the City that include residential unit counts, commercial spaces, and public facilities. These same plans and reports estimated potable water demand along with other land use information. Residential water demands for the Projects were provided to the City by the Project developers, and were developed using an end use model on a per-unit or per-employee basis. The Project demands were independently reviewed by PBS&J and the SFPUC as part of this Study, and appear consistent with the SFPUC demand estimates. See Appendix B for the methodology used in the Project demand estimates.

Upon buildout in 2030, these Projects represent the majority of new growth in San Francisco above the 2030 growth projected in the 2005 UWMP. As shown in Table 5-4, overall water demand at each of the Project sites is estimated at 1.99 mgd (CP-HPS II); 1.70 mgd (TI-YBI) and 0.98 mgd at Parkmerced. The CP-HPS II includes a number of different development scenarios, the estimated water demands of the three main CP-HPS II development scenarios are also shown in Table 5-2.

The Demand Report (see Section 1.2) analyzed water demands associated with each Retail customer sector and established per unit-use rates. As such, between 2010 and 2030, SFPUC used a per-unit use rate average of 98.7 gpd per household for multi-family residential demands. As shown in Table 5-4, the 98.7 gpd per household rate was applied to the incremental growth of 2,387 new dwelling units throughout the City resulting in a demand of 0.24 mgd in 2030.

Table 5-4: 2030 Water Demand of the Projects and Incremental Growth within SF City and County (mgd)

Projects and Incremental Growth[(1)]	Water Demand (mgd)					
	Stadium		R&D Variant		Housing Variant	
	Project Water Demand	Non-Residential Adjustment (1.18)[(7)]	Project Water Demand	Non-Residential Adjustment (1.40)[(7)]	Project Water Demand	Non-Residential Adjustment (1.15)[(7)]
CP-HPS II[(2)]	1.67	1.04	1.99	1.05	1.66	1.04
TI – YBI[(3)]	1.70	1.17	1.70	1.17	1.70	1.17
Parkmerced[(4)]	0.98	0.94	0.98	0.94	0.98	0.94
Projects Subtotal	**4.38**	**3.16**	**4.67**	**3.16**	**4.34**	**3.16**
Existing Demand at Project Sites[(5)]	-1.51	-1.51	-1.51	-1.51	-1.51	-1.51
Net Development Subtotal	**2.87**	1.64	**3.16**	1.65	**2.83**	1.64
Other Growth in SF (City and County)[(6)]	0.24	0.24	0.24	0.24	0.24	0.24
Net Change in Water Demand with Non-Residential Adjustment[(7)]		**1.88**[(7)]		**1.89**[(7)]		**1.88**[(7)]

(1) Average annual demands. Residential water demands for the proposed projects were provided to the City by project developer. They were also developed using an end use model on a per unit or per employee basis. The developer demands were independently reviewed by PBS&J and the SFPUC as part of this Study, and appear consistent with the SFPUC demand estimates. (Appendix B)
(2) CP-HPS Phase II Arup – Winzler & Kelly Water Demand Memo September 25, 2009 Appendix B
(3) Treasure Island Technical Memo Section 7 August 2009. Appendix B
(4) Parkmerced Water Demand Spreadsheet from August 2009 Appendix B
(5) Existing demand provided by SFPUC from current billing records
(6) Derived by SFPUC staff based on approximately 2,387 dwelling units at 98.7 gpd. August 2009 Appendix X
(7) To avoid double-counting the water demand associated with the 2009 SF Planning Non-Residential Employment Projections and the non-residential demand calculated in the developer estimates at each of the Project sites, the total water demand at each of the developments was adjusted to remove the non-residential demands. This study assumes all non-residential demand is accounted for in the 2009 SF Planning Non-Residential Employment Projections.

For conservative water supply planning purposes, this Study uses the highest total water demand adjusted for non-residential uses[5] of 1.89 mgd associated with the R&D Variant at CP-HPS II. The net change in demand accounts for existing uses at the project site and a non-residential demand adjustment.

5.2.2 Water Demand of Non-Residential Employment Projections

As shown above in Table 5-1, the SF Planning and ABAG projected new job growth in the San Francisco based on the employment changes in the San Francisco Bay Area as described in Section 5.1.1 above.

Demand projections for overall City growth were based on 2010-2030 average per-unit use factors of the Demand Report. The Demand Report analyzed water demands associated with each Retail customer sector and established per unit-use rates. As such, between 2010 and 2030, SFPUC used an average of 42.42 gallons per day (gpd) per employee for non-residential water demands. In an effort to represent the employment opportunities over the 20-year planning horizon this Study assumes that the non-residential employment sector would grow at a linear rate over the same planning period without accounting for market force influences and changes in local economics. As shown in Table 5-5, the 42.42 gpd per employee water demand rate was applied to the growth in jobs over the 20-year planning horizon. In 2015, demand is expected to be 30.52 mgd and by 2030, water demand generated through employment is expected to reach 31.73 mgd.

Table 5-5: Water Demand for Non-Residential Employment Projections

Employment Projections and Non-Residential Demand	2010	2015	2020	2025	2030
SF Planning Employment Total(1) (jobs)	712,145	719,447	726,749	734,050	748,100
Non-Residential - Business/Industrial Demand(2) (mgd)	30.21	30.52	30.83	31.14	31.73

(1) Table 5-1 2009 SF Planning Projections
(2) Average of 42.42 gallons per day (gpd) per employee for non-residential water demands.

5.2.3 SFPUC Total Retail System Demand

The SFPUC incorporated the 2009 SF Planning projections for residential and non-residential growth in San Francisco into this Study to assess the results of the SF Planning projections and its effects on the City's water demand. The previous tables (5-3 and 5-4) along with demand data from the 2005 UWMP is incorporated in the City's total Retail demand. The results of these 2009 demand forecasts are shown in Table 5-6. The table represents the anticipated growth in demand commencing in 2010 and extending over the 20-year planning horizon to 2030.

5 To avoid double-counting the water demand associated with the 2009 Non-Residential Planning Projections and the non-residential demand calculated in the developer estimates at each of the Project sites, the total water demand at each of the developments was adjusted to remove the non-residential demands. This study assumes all non-residential demand is accounted for in the 2009 Non-Residential SF Planning Projections. Table 5-2 shows the net change in water demand at the Project sites and the adjusted change in water demand without non-residential demand.

As shown in Table 5-6, incremental residential growth demand and demand at the Project sites commences in 2015 at 0.47 mgd and progresses to 1.89 mgd in 2030. In 2015, demand drops slightly due to a reduction in total residential demand. The non-residential demand commences in 2010 at 30.21 mgd, increases to 30.83 mgd and culminates at 31.73 in 2030.

Table 5-6 shows total Retail demands for SFPUC beginning in 2010 at 91.81, and then drops slightly in 2015 because of a drop in residential demand and then increases to 91.87 mgd in 2020. By 2030, Retail demand will be approximately 93.42 mgd.

Table 5-6: SFPUC Retail Demand (mgd)

Users, Facilities and Entities	Projected Water Demand (mgd)				
	2010	**2015**	**2020**	**2025**	**2030**
Residential Demand (Single & Multiple Family)(1)	44.70	43.80	43.20	42.90	42.90
New Residential Demand generated by Projects and Incremental Growth(2)(4)	-	0.47	0.95	1.42	1.89
Subtotal	44.70	44.27	44.15	44.32	44.79
Non-Residential - Business/Industrial Demands(3,4)	30.21	30.52	30.83	31.14	31.73
Subtotal	**74.91**	**74.79**	**74.97**	**75.46**	**76.52**
Unaccounted-for System Losses	7.30	7.30	7.30	7.30	7.30
Subtotal	**82.21**	**82.09**	**82.27**	**82.76**	**83.82**
Other Retail Demands(5)	4.90	4.90	4.90	4.90	4.90
Lawrence Livermore Laboratory; Groveland CSD(6)	1.20	1.20	1.20	1.20	1.20
City Irrigation Demand(7)	2.5	2.5	2.5	2.5	2.5
Castlewood Community Demand(8)	1.0	1.0	1.0	1.0	1.0
Total Retail Demand	**91.81**	**91.69**	**91.87**	**92.36**	**93.42**

(1) Residential Demands (Source: 2005 SFPUC UWMP Table 8B, page 43)

(2) See Table 5-4. Multiple Family – [In 2030 Incremental Growth of 0.24 mgd + (CP-HPS II 10,500 DU) 1.04 mgd + (TI-YBI 8,000 DU) 1.17 mgd + (Parkmerced 8,900 total DU) 0.94 mgd = 3.40 mgd] Existing Demand is 1.51 mgd at all sites. [3.40 mgd – 1.51 = 1.89 mgd] as shown in Table 4-2 (Sources: ARUP Water Demand Memo for CP-HPS Phase II September 25, 2009; Parkmerced Water Demand Spreadsheet June 30, 2009; Treasure Island Water Technical Report December 2008 Updated August 2009)

(3) See Table 5-5. Agriculture, Mining, Construction, Manufacturing, Transportation, Wholesale & Retail Trade, F.I.R.E., Services, Gov't including Builders – Contractors and Docks – Shipping. (Source: Adapted from 2009 ABAG Employment Projections in conjunction with SF Planning, July 2009) As developed in the Demand Study, SFPUC derived the employment water demands by taking the ABAG employment projections and multiplying by 42.42 gallons per employee per day and is consistent with SFPUC's demand projection methodology.

(4) See Table 5-5. Non-residential (jobs/employment) demands at major project sites were assumed to be contained in the 2009 ABAG Employment projections. Growth in demand is incrementally increased to reflect the growth in jobs over the 20-year planning horizon. To avoid double-counting the water demand associated with the 2009 SF Planning Non-Residential Employment Projections and the non-residential demand calculated in the developer estimates at each of the Project sites, the total water demand at each of the developments was adjusted to remove the non-residential demands. This study assumes all non-residential demand is accounted for in the 2009 SF Planning Non-Residential Employment Projections. Table 5-4 shows the net change in water demand at the Project sites and the adjusted change in water demand without non-residential demand. Adapted by PBS&J and SFPUC September 2009 from ARUP Water Demand Memo for CP-HPS Phase II September 25, 2009; Parkmerced Water Demand Spreadsheet June 30, 2009; Treasure Island Water Technical Report December 2008 Updated August 2009

(5) US Navy, SF International Airport, and other suburban/municipal accounts. (Source: 2005 SFPUC UWMP Table 8B, page 43)

(6) Lawrence Livermore Laboratories (0.8 mgd); Groveland CSD (0.4 mgd) (Source: 2005 SFPUC UWMP Table 8B, page 43)

(7) City Irrigation at Golden Gate Park, Great Highway Median and SF Zoo. (Source: 2005 SFPUC UWMP Table 8B, page 43)

(8) Castlewood Community demand served by wells in the Pleasanton well field. (Source: 2005 SFPUC UWMP Table 8B, page 43)

5.2.4 Major Potential Recycle Water Demand

In addition to providing estimated potable water demands, each of the Projects also provided the City with estimated recycled water demands. Each of the Projects anticipates developing new recycled water projects to help offset potable demand. As shown in Table 5-7, the Projects may produce up to 1.49 or 1.5 mgd of recycled water.

Table 5-7: Major Project Recycled Water Demand (mgd)

Development	Recycled Water Demand[(1)] (mgd)
CP-HPS II	0.89
TI-YBI	0.38
Parkmerced	0.22
Total	**1.49**

Notes: Average annual recycled water demand.

(1) Sources: ARUP Water Demand Memo for CP-HPS Phase II September 25, 2009; Parkmerced Water Demand Spreadsheet June 30, 2009; Treasure Island Water Technical Report December 2008 Updated August 2009. Appendix B

The recycled water potential shown in Table 5-7 is considered additional recycled water sources and have not been included as part of SFPUC's local WSIP supplies. In the event that recycled water is produced at the Project sites, recycled water could offset as much as 1.5 mgd in total City potable demand. This Study provides a conservative analysis of SFPUC's Retail supplies and demands and, as such, evaluates the City's demands to include the proposed projects without recycled water.

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6.0 SUPPLY AND DEMAND COMPARISON

This section compares the SFPUC's Retail water supplies and demands through year 2030.

6.1 Supply and Demand Comparison

Table 6-1 compares SFPUC Retail supplies and demand during normal, single dry year, and multiple dry year periods. Section 2.3.6 discusses SFPUC's total water supplies now and over the 20-year planning period. In 2010, prior to the development of the 10 mgd of local supplies, SFPUC can access an annual average 84.50 mgd from all water supply sources. Beginning in 2015, when the WSIP water supply sources are readily available, the SFPUC's Retail water supplies increase to 94.5 mgd. These supplies are assumed to be available in the quantities listed in Table 6-1. SFPUC intends to use these supplies to meet its Retail customer demands.

The demand estimates in this Study show that the 2009 SF Planning projections result in an increase in City Retail demand. As stated previously, by 2030 Retail demand is estimated at 93.42 mgd. This increase, however, does not change the findings in the 2005 UWMP, which estimated demand at 93.4 mgd in 2030.[6] As shown in Table 6-1, the SFPUC can meet the current and future demands of its Retail customers in normal years, single dry-years and nearly all multiple dry-year events with the exception of years 2 and 3 in 2030.

As modeled in Table 6-1, the deficit shown in 2010 is the result of reducing the RWS supply to 81 mgd as per the Phased WSIP Variant, without full development of the additional 10 mgd of new supplies. It is expected that 10 mgd of new sources will be developed and available for use in San Francisco by 2015. However, Retail demand is currently lower than the 2010 projected demand (Fiscal Year 2007-2008 use was 83.9 mgd). If Retail demand exceeds the available RWS supply of 81.0 mgd between 2010 and 2015, and total RWS deliveries exceed 265 mgd between 2010 and 2015, the Water Supply Agreement allows the SFPUC to purchase additional water with the payment of an Environmental Surcharge. Notably, total RWS deliveries in Fiscal Year 2007-2008 were 256.7 mgd, which is 8.3 mgd below the 265 mgd watershed delivery goal.

As shown in Table 6-1, during a multiple dry-year event[7] commencing in 2030, it is possible that the SFPUC will not be able to meet 100 percent of Retail demand in 2030. As modeled, a supply shortfall of 0.42 mgd is anticipated to occur in the second and third year of a multiple dry-year event. To overcome the potential 0.42 mgd supply deficit during multiple dry-years in 2030, the SFPUC will implement their adopted drought planning sequence and associated operating procedures that trigger different levels of water delivery reduction rationing relative to the volume of water actually stored in SFPUC reservoirs. If the SFPUC determines the projected total water storage to be less than an identified level sufficient to provide sustained deliveries during drought, the SFPUC may impose delivery reductions or rationing. The WSAP and RWSAP allow the SFPUC to reduce water deliveries to customers during periods of water shortage to

[6] SFPUC 2005 Urban Water Management Plan Table 8B, page 43

[7] Multiple dry-year events are defined as a three-year event per UWMP requirements. SFPUC determined that a multiple dry-year event is years 2-4 of SFPUC's 8.5 year design drought. SFPUC can meet 100 percent of deliveries in the first year of such an event.

achieve a positive balance of supplies and demands. Under WSAP, the RWS supply curtailment in multiple dry years of 1.5 mgd to 79.5 mgd, results in a 1.9 percent reduction as shown in Table 4-2. The SFPUC, as part of the WSIP, adopted a water reliability objective of no greater than 20 percent rationing in any one year of a drought.

Table 6-1: Projected Supply and Demand Comparison - Normal, Dry, and Multiple Dry Years (mgd)

				Multiple Dry Year Event		
	Retail Supply and Demand	**Normal Year**	**Single Dry Year**	**Year 1**	**Year 2**	**Year 3**
2010	RWS Supply[1]	81.00	81.00	81.00	79.50	79.50
	Groundwater Supply[2]	3.50	3.50	3.50	3.50	3.50
	Total Retail Supply[3]	84.50	84.50	84.50	83.00	83.00
	Total Retail Demand[4]	91.81	91.81	91.81	91.81	91.81
	Surplus/(Deficit)[5]	-7.31	-7.31	-7.31	-8.81	-8.81
2015	RWS Supply[1]	81.00	81.00	81.00	79.50	79.50
	Groundwater[6]	3.50	3.50	3.50	3.50	3.50
	WSIP Supply Sources[7]	10.00	10.00	10.00	10.00	10.00
	Total City Supply[3]	94.50	94.50	94.50	93.00	93.00
	Total Retail Demand[4]	91.69	91.69	91.69	91.69	91.69
	Surplus/(Deficit)	2.81	2.81	2.81	1.31	1.31
2020	RWS Supply[1]	81.00	81.00	81.00	79.50	79.50
	Groundwater[6]	3.50	3.50	3.50	3.50	3.50
	WSIP Supply Sources[7]	10.00	10.00	10.00	10.00	10.00
	Total City Supply[3]	94.50	94.50	94.50	93.00	93.00
	Total Retail Demand[4]	91.87	91.87	91.87	91.87	91.87
	Surplus/(Deficit)	2.63	2.63	2.63	1.13	1.13
2025	RWS Supply[1]	81.00	81.00	81.00	79.50	79.50
	Groundwater[6]	3.50	3.50	3.50	3.50	3.50
	WSIP Supply Sources[7]	10.00	10.00	10.00	10.00	10.00
	Total City Supply[3]	94.50	94.50	94.50	93.00	93.00
	Total Retail Demand[4]	92.36	92.36	92.36	92.36	92.36
	Surplus/(Deficit)	2.14	2.14	2.14	0.64	0.64
2030	RWS Supply[1]	81.00	81.00	81.00	79.50	79.50
	Groundwater[6]	3.50	3.50	3.50	3.50	3.50
	WSIP Supply Sources[7]	10.00	10.00	10.00	10.00	10.00
	Total City Supply[3]	94.50	94.50	94.50	93.00	93.00
	Total Retail Demand[4]	93.42	93.42	93.42	93.42	93.42
	Surplus/(Deficit)	1.08	1.08	1.08	-0.42[8]	-0.42[8]

(1) RWS Supply SFPUC Water Supplies Table 2-2
(2) Groundwater Uses for In-City Irrigation and Castlewood (Water Supplies Table 2-2)
(3) Total Retail Supply from SFPUC Water Supplies Table 2-2
(4) SFPUC Retail Demand from Table 5-6
(5) The deficit shown in 2010 is the result of reducing the RWS supply to 81 mgd as per the Phased WSIP Variant, without full development of the additional 10 mgd of new supplies. 10 mgd of new sources will be developed and available for use in SF by 2015. However, SF Retail demand is currently lower than projected (FY07/08 use was 83.9 mgd). If SF Retail demands exceed the available supply of 84.5 mgd between 2010 and 2015, the Water Supply Agreement allows the SFPUC to purchase additional water from the RWS. If combined Retail and wholesale deliveries exceed 265 mgd, the SFPUC Retail customers would be required to pay an Environmental Surcharge for deliveries over 81 mgd (Total RWS deliveries in FY07/08 were 256.7 mgd).
(6) Groundwater Supplies at Castlewood and In-City Irrigation (SFPUC Water Supplies Table 2-2)
(7) WSIP Supply Sources (Recycled Water (4.0 mgd; Groundwater (2.0 mgd Existing and 2.0 from NWGWP, and WSIP Water Efficiency and Conservation (4.0 mgd) (see SFPUC Water Supplies Table 2-2)
(8) Deficit occurs in year 2 and 3 of multiple dry year event, SFPUC implements its Drought Year Water Shortage Contingency Plans - RWSAP and WSAP to balance supply and demand under this projected shortfall as described in Section 4.0

6.2 Conclusion and Findings

The updated 2009 SF Planning projections results in a Retail demand in 2030 of 93.42 mgd, which is only slightly greater than the 2030 demand projections estimated in the 2005 UWMP. This increase, however, does not change the results of the 2005 UWMP. In years with normal or above-normal precipitation, the City has sufficient supplies to serve their Retail customers.[8] The ability to meet the demands of the Retail customers is in large part due to the development of 10 mgd of local WSIP supplies in the Retail service area. These new sources of groundwater, recycled water, and water conservation are essential to provide the City with adequate supply in dry year periods, as well as improving supply reliability during years with normal precipitation. Although the 2005 UWMP considered the 10 mgd of new WSIP sources in terms of system-wide drought-planning, the WSIP supplies were not assigned to either the Retail or Wholesale Customers directly as it was not known how the resources would be used. As presented in this Study, with the adoption of the Phased WSIP Variant, the WSIP supplies can now be applied to meet Retail demands. In addition, due to the nature and development of the local supplies, these WSIP supply sources are not subject to reduction under the WSAP.

During a multiple dry-year event, however, it is possible that the SFPUC will not be able to meet 100 percent of demand from its Retail customers in 2030, and will therefore have to impose reductions on its Retail supplies. Under the WSAP, SFPUC Retail customers would experience no reduction in deliveries at a 10 percent RWS shortage. However, during a 20 percent system-wide shortage, the Retail customers would experience a 1.9 percent reduction in Retail deliveries. Table 6-1 compared SFPUC Retail supplies during normal, single dry year, and multiple dry year periods. The main difference between 2010 and subsequent planning years (2015–2030) is due to the development of the additional 10 mgd of local WSIP supplies in the Retail service area. These WSIP local supplies are not subject to a reduction under the WSAP, as the WSAP only allocates water from the RWS, which is subject to reductions.

The Projects anticipate developing new recycled water projects to help offset potable demand. These new projects may produce up to 1.5 mgd of recycled water. By reducing their potable water demands through the use of recycled water, these projects have the ability to eliminate the City's overall water shortage during multiple dry year periods.

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8 As modeled in this Study the deficit shown in 2010 is the result of reducing the RWS supply to 81 mgd as per the Phased WSIP Variant, without full development of the additional 10 mgd of new supplies. 10 mgd of new sources will be developed and available for use in SF by 2015; however, SF Retail demand is currently lower than projected (FY07/08 use was 83.9 mgd). If SF Retail demands exceed the available supply of 84.5 mgd between 2010 and 2015, the Water Supply Agreement allows the SFPUC to purchase additional water from the RWS. If combined Retail and wholesale deliveries exceed 265 mgd, the SFPUC Retail customers would be required to pay an Environmental Surcharge for deliveries over 81 mgd (Total RWS deliveries in FY07/08 were 256.7 mgd).

Regarding the availability of water supplies to serve the City, beginning in 2015 the SFPUC finds as follows:

- In years of average and above-average precipitation, and including development of SFPUC's local WSIP water supply sources the SFPUC has adequate supplies to serve 100 percent of normal, single dry and multiple dry year demand up to 2030.[9]
- In multiple-dry-year events after 2030, when the SFPUC imposes reductions in its supply, the SFPUC has in place the WSAP and RWSAP to balance supply and demand.
- If recycled water is implemented as proposed at each of the major development project sites, then it is assumed that potable water demands for the City can decrease by up to 1.5 mgd; thereby, eliminating potential multiple dry-year deficit after 2030.
- With the WSAP and RWSAP in place, and the addition of local WSIP supplies, the SFPUC finds it has sufficient water available to serve the Retail customers including the demand of the proposed project, and existing and planned future uses.

[9] The deficit shown in 2010 is the result of reducing the RWS supply to 81 mgd as per the Phased WSIP Variant, without full development of the additional 10 mgd of new supplies. 10 mgd of new sources will be developed and available for use in SF by 2015. San Francisco Retail demand is currently lower than projected (FY07/08 use was 82.6 mgd). If San Francisco retail demands exceed the available supply of 84.5 mgd between 2010 and 2015, the Water Sales Agreement allows the SFPUC to purchase additional water with the payment of an Environmental Surcharge as long as total deliveries from the RWS do not exceed 265 mgd (Total RWS deliveries in FY07/08 were 255.5 mgd).

7.0 REFERENCES

Department of Water Resources. *Groundwater Management – Court Adjudications. http://www.water.ca.gov/groundwater/gwmanagement/court_adjudications.cfm*

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APPENDICES

A Growth Projections Letter from San Francisco Planning Department
B Major Projects Water Demand Estimates from Project Sponsors

APPENDIX A

Growth Projections Letter from San Francisco Planning Department

SAN FRANCISCO
PLANNING DEPARTMENT

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

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July 9, 2009

Michael P. Carlin
Deputy General Manager, SFPUC
1155 Market St, 11th Floor
San Francisco, CA 94103

Subject: Projections of growth by 2030

Dear Michael:

Thank you for your letter dated March 11, 2009 requesting the Planning Department's projections of growth by 2030 in order to satisfy your mandates in connection with assessing water supply and demand in the years to come, and more specifically for preparing water supply assessments for individual projects moving forward.

The Planning Department routinely prepares projections for the purposes of analyzing impacts of plans and projects undergoing the environmental review process. While the assumptions of these sets may vary depending on the circumstances surrounding a specific project, the Department recently completed a citywide projection capturing citywide growth expectations by 2030 designed to closely match the recently adopted ABAG Projections 2009 target, but taking into account local knowledge of projects currently in various stages of the entitlement process, commonly referred to as the development pipeline. Table 1 shows the projections for 2030.

Table 1 Development Projections

	2000	2005	2030	Growth 2000-2030	Growth 2005-2030
Households	329,700	341,478	403,292	73,592	61,814
HH Population	756,976	783,441	916,800	159,824	133,359
Jobs	642,500	553,090	748,100	105,600	195,010

Source: ABAG, San Francisco Planning Department

As the question may arise whether particular projects were included, the Planning Department for the purposes of these numbers assumed full buildout over the course of the forecast period of three large development programs currently undergoing environmental review, namely Treasure Island, Bayview Waterfront, and Park Merced projects.

More generally, we included entitled pipeline projects, and projects larger than 500 units, or large commercial projects per criteria set forth in California Water Code §10912(a) as these are the projects for which individual water supply assessments would otherwise need to be made in the near future.

We are looking forward to continuing the larger regional growth dialogue with PUC and other regional stakeholders.

Sincerely,

John Rahaim
Director of Planning

CC: Aksel Olsen
Teresa Ojeda
File

APPENDIX B

Major Projects Water Demand Estimates from Project Sponsors

[Candlestick Point/Hunter's Point Shipyard; Parkmerced; Treasure Island-Yerba Buena Island]

To	Lennar -	Reference number	131878/RRJ
cc		File reference	
From	Rowan Roderick-Jones/Manish Dalia x 27222 (San Francisco)	Date	October 15, 2009
Subject	**Candlestick Point / Hunters Point Shipyard Phase II Water Demand Memorandum Revision # 16**		

1 Purpose

This Water Demand Memorandum (Memo) presents a summary approach, references, assumptions, and results of calculations undertaken by Arup to estimate a range of potential water demands and sanitary sewer flows for the Candlestick Point/Hunters Point Shipyard (CP/HPS) Development including the Proposed Project as well as the R&D and Housing Variants.

The Memo establishes a historical baseline condition and makes adjustments to account for current California building code requirements as well as the San Francisco Green Building Ordinance. The basis for these analyses and the results are presented herein.

Arup worked in conjunction with Winzler & Kelly to develop water demand and sanitary sewer flow values appropriate for use in engineering design.

2 Approach

To develop reasonable water demand estimates for the CP/HPS development the following steps were taken.

1) The Proposed Project was divided into land uses as identified in Table 1. Two project variants exclude the stadium. The R&D Variant also includes an additional 2,500,000 square feet of research and development space, as shown in Table 2. The Housing Variant does not include any additional program but shifts 1,350 housing units from Candlestick Point to Hunters Point, as shown in Table 4. The methodology for developing water demands was the same for the Proposed Project and Project Variants.
2) A **Historical Benchmark** demand was estimated for each land use based on a series of assumptions and references. Key references used were:
    a. The Urban Water Management Plan for the City of San Francisco
    b. The SFPUC Wholesale Customer Demand Projections Technical Report (URS, 2004)
    c. The City of Los Angeles CEQA Threshold Guide, 2006
    d. The EPA, Onsite Wastewater Treatment Systems Manual, 2002

A number of other references were also used and these are provided at the end of this memorandum. Arup collected information from a number of sources and selected a method of estimating demands that we believed to be appropriate and reasonable for the area. Assumptions and references are provided in Section 4.

3) The demands were then distributed between indoor and outdoor end uses which were estimated based on published data in the SFPUC Wholesale Customer Demand Projections Report (URS 2004). End use distributions for the stadium and performance venues were assumed rather than taken directly from the SFPUC's projections. The distribution ratios are provided in Table 23 and Table 25.

4) Next, the Historical Benchmark was adjusted to an **Adjusted to California Codes** scenario using new fixture flow rates from California and Federal Buildings standards as well as the International Plumbing Code.

5) The Adjusted to California Codes demand estimate does not include the requirements of the **San Francisco Green Building Ordinance (SFGBO)**. The SFGBO is based on LEED for New Construction (LEED NC) and requires a 50% reduction in landscape irrigation demands. The SFGBO does not specify what code is to be used as the baseline for irrigation demands. Therefore the current code was assumed to be equivalent to the irrigation amount allowed under the California Water Efficient Landscape Ordinance. This rule was assumed to be applicable to both private and public landscape irrigation. In addition, the SFGBO requires a 30% reduction in potable water demand. The SFGBO does not provide specific language as to which portions of demand are to be included in the 30% reduction. However, the intention of the similar LEED NC credit (Water Efficiency Credit 3) is to reduce building water demand by 30%. The total 30% reduction in building water efficiency may be achieved by any number of means including improved fixture efficiency, mechanical building efficiency, or by providing an alternative water supply. The demand estimates, when adjusted for the SFGBO represent the final demands for the Proposed Project and Project Variants.

   The SFGBO demand was developed by using the California code as a baseline and using a trajectory or possible means of water saving strategies and/or alternative water supplies to achieve the SFGBO. The assumptions and references used to make these adjustments are provided in Table 27.

6) Potential reclaimed water demands as well as sewage generation were determined based on end use distributions.

The results of the study are presented at the beginning of this report. References and Assumptions used for making the demand estimations are provided after the results in Section 3.

Table 1: CP/HPS Land Use Program (Proposed Project)

		Hunters Point Shipyard	Candlestick Point	Project Total
Land Use				
Residential				
	Density, 15-75 units per acre (units)	680	750	1,430
	Density, 50-125 units per acre (units)	1,415	3,215	4,630
	Density, 100-175 units per acre (units)	265	2,445	2,710
	Density, 175-285 units per acre (units)	290	1,440	1,730
	Total Project (units)	**2,650**	**7,850**	**10,500**
Retail				
	Regional Retail (sqft))	0	635,000	635,000
	Neighborhood Retail (sqft)	125,000	125,000	250,000
	Total (sqft)	**125,000**	**760,000**	**885,000**
Office (sqft)		0	150,000	150,000
Community Uses (sqft)		50,000	50,000	100,000
Research & Development (sqft)		2,500,000	0	2,500,000
Hotel (sqft)		0	150,000	150,000
Artist's Studios				
	1:1 Studio Renovation & Replacement (sqft)	225,000	0	225,000
	New Artist Center (sqft)	30,000	0	30,000
	Total (sqft)	**255,000**	**0**	**255,000**
Parks & Open Space				
	New City Parks (acres)	140	8.1	148.1
	New Sports Fields & Active Recreation (acres)	91.6	0	91.6
	New Open Space and Restored State Parkland (acres)	0	96.7	96.7
	Total (acres)	**231.6**	**104.8**	**336.4**
Football Stadium (seats)		69,000	0	69,000
Performance Venue (seats)		0	10,000	10,000
Source: Lennar, 2009				

Table 2: CP/HPS Land Use Program (R&D Variant)

		Hunters Point Shipyard	Candlestick Point	Project Total
Land Use				
Residential				
	Density, 15-75 units per acre (units)	680	750	1,430
	Density, 50-125 units per acre (units)	1,415	3,215	4,630
	Density, 100-175 units per acre (units)	265	2,445	2,710
	Density, 175-285 units per acre (units)	290	1,440	1,730
	Total Project (units)	**2,650**	**7,850**	**10,500**
Retail				
	Regional Retail (sqft))	0	635,000	635,000
	Neighborhood Retail (sqft)	125,000	125,000	250,000
	Total (sqft)	**125,000**	**760,000**	**885,000**
Office (sqft)		0	150,000	150,000
Community Uses (sqft)		50,000	50,000	100,000
Research & Development (sqft)		5,000,000	0	5,000,000
Hotel (sqft)		0	150,000	150,000
Artist's Studios				
	1:1 Studio Renovation & Replacement (sqft)	225,000	0	225,000
	New Artist Center (sqft)	30,000	0	30,000
	Total (sqft)	**255,000**	**0**	**255,000**
Parks & Open Space				
	New City Parks (acres)	152.4	8.1	160.5
	New Sports Fields & Active Recreation (acres)	69.8	0	69.8
	New Open Space and Restored State Parkland (acres)	0	96.7	96.7
	Total (acres)	**222.2**	**104.8**	**327**
Football Stadium (seats)		0	0	0
Performance Venue (seats)		0	10,000	10,000
Source: Lennar, 2009				

.

Table 4: CP/HPS Land Use Program (Housing Variant)

	Hunters Point Shipyard	Candlestick Point	Project Total
Land Use			
Residential			
Density, 15-75 units per acre (units)	1,540	970	2,510
Density, 50-125 units per acre (units)	1,905	3,670	5,575
Density, 100-175 units per acre (units)	265	1,220	1,485
Density, 175-285 units per acre (units)	290	640	930
Total Project (units)	**4,000**	**6,500**	**10,500**
Retail			
Regional Retail (sqft))	0	635,000	635,000
Neighborhood Retail (sqft)	125,000	125,000	250,000
Total (sqft)	**125,000**	**760,000**	**885,000**
Office (sqft)	0	150,000	150,000
Community Uses (sqft)	50,000	50,000	100,000
Research & Development (sqft)	2,500,000	0	2,500,000
Hotel (sqft)	0	150,000	150,000
Artist's Studios			
1:1 Studio Renovation & Replacement (sqft)	225,000	0	225,000
New Artist Center (sqft)	30,000	0	30,000
Total (sqft)	**255,000**	**0**	**255,000**
Parks & Open Space			
New City Parks (acres)	149.9	8.1	158
New Sports Fields & Active Recreation (acres)	94.7	0	94.7
New Open Space and Restored State Parkland (acres)	0	96.7	96.7
Total (acres)	**244.6**	**104.8**	**349.4**
Football Stadium (seats)	69,000	0	69,000
Performance Venue (seats)	0	10,000	10,000
Source: Lennar, 2009			

3 Results

This section provides the results of the water demand assessment. The results are provided by land use as well as by end use (fixture type). The overall results for the proposed project are summarized by Figure 1. Similar summaries for the two project variants are provided in Figure 3and Figure 5.

Table 4: Potable water demands for Proposed Project and Project Variants.

	Proposed Project Demand (MGD)	R&D Variant Demand (MGD)	Housing Variant Demand (MGD)
Historical Baseline	2.95	3.47	2.92
Adjusted to California Codes	2.46	2.92	2.44
Adjusted to San Francisco Green Building Ordinance	1.67	1.99	1.66

The above table indicates that the R&D Variant will have the highest potable water demands under the requirements of the SFGBO of 1.99 MGD.

Figures 1 through 3 provide the Proposed Project and Project Variant demands for the Historical Benchmark, the Adjusted to California Codes and the San Francisco Green Building Ordinance cases. They also illustrate the Sustainable Case trajectory defined by the step down line. The first five steps in the “sustainable Case” step-down graph are demand reduction strategies while the later five steps are achieved by utilizing alternative water supplies. Additional demand breakdowns by land use and end use are provided in Table 5 through Table 14 for the Proposed Project and Project Variants. Reclaimed water demands and sanitary flows by end use for the Proposed Project are provided in Table 16 through Table 22.

Please note that in all reported annual water demand and sanitary flow data in Table 5 through Table 22 are in million gallons per day (MGD) and are rounded to the nearest 0.01 millionth gallon. When reporting the calculations within the tables slight rounding errors on the order of 0.01 MGD may occur.

Figure 1: Water demand results summary step down graph- Proposed Project

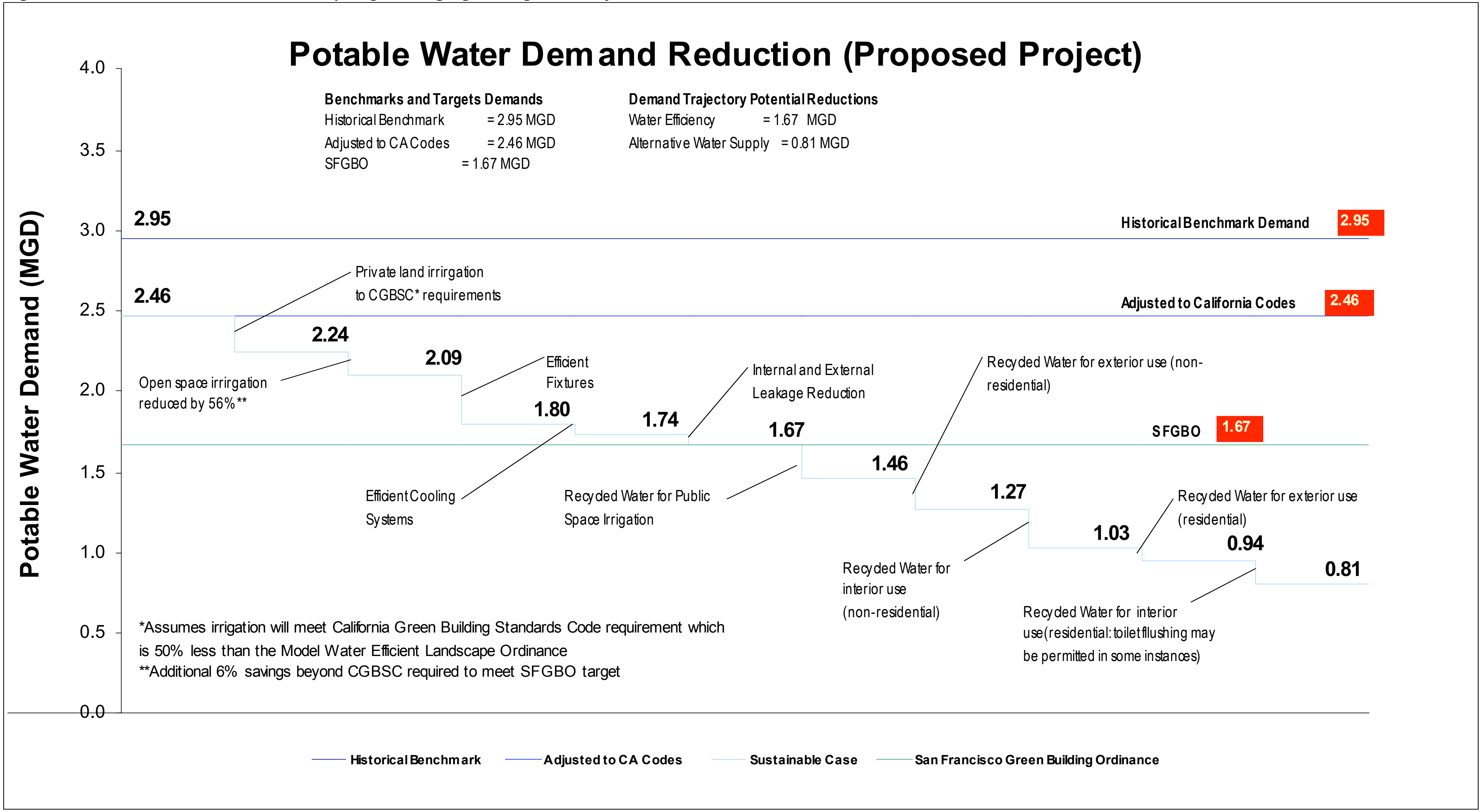

Figure 3: Water demand results summary (R&D Variant)

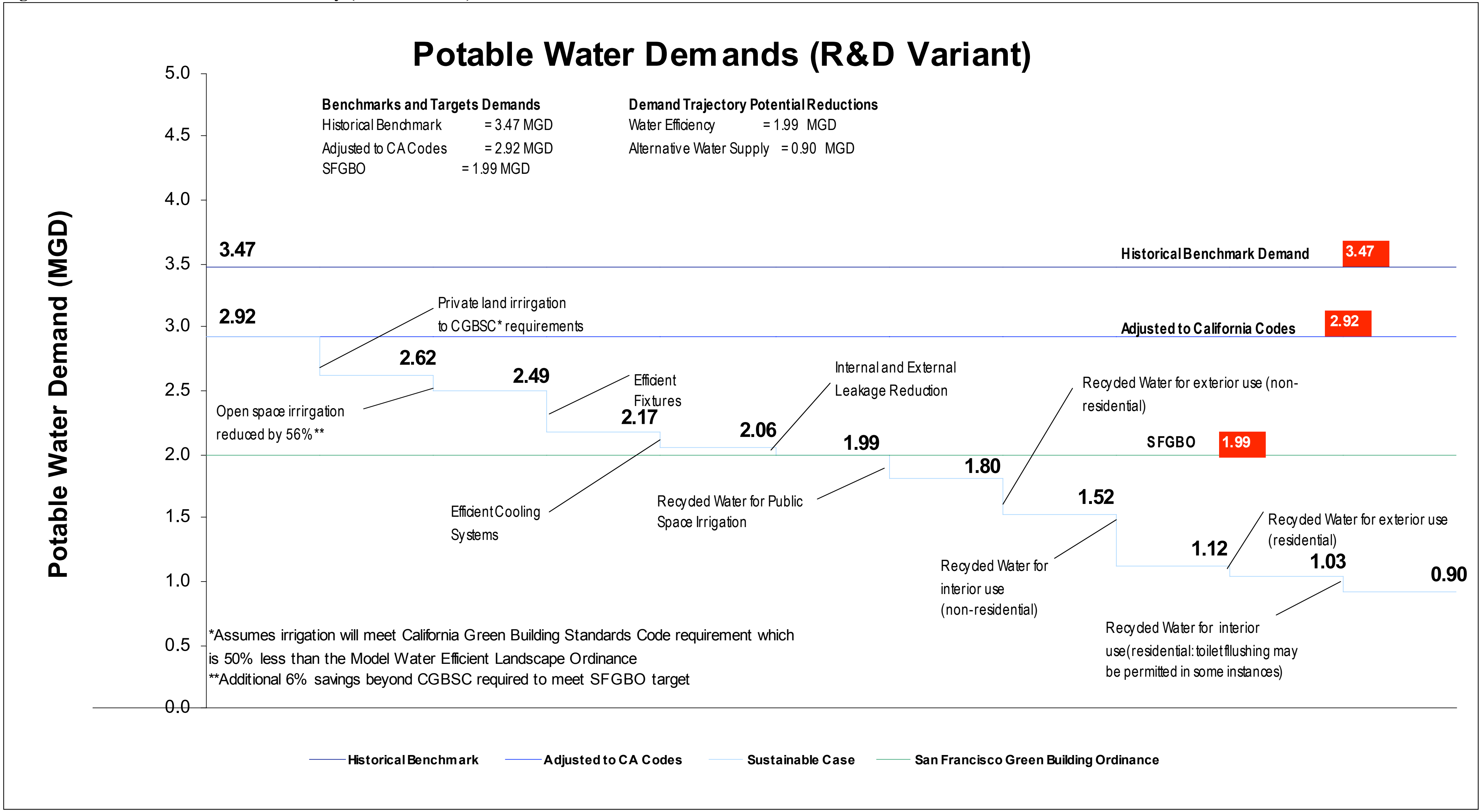

Figure 5: Water demand results summary (Housing Variant)

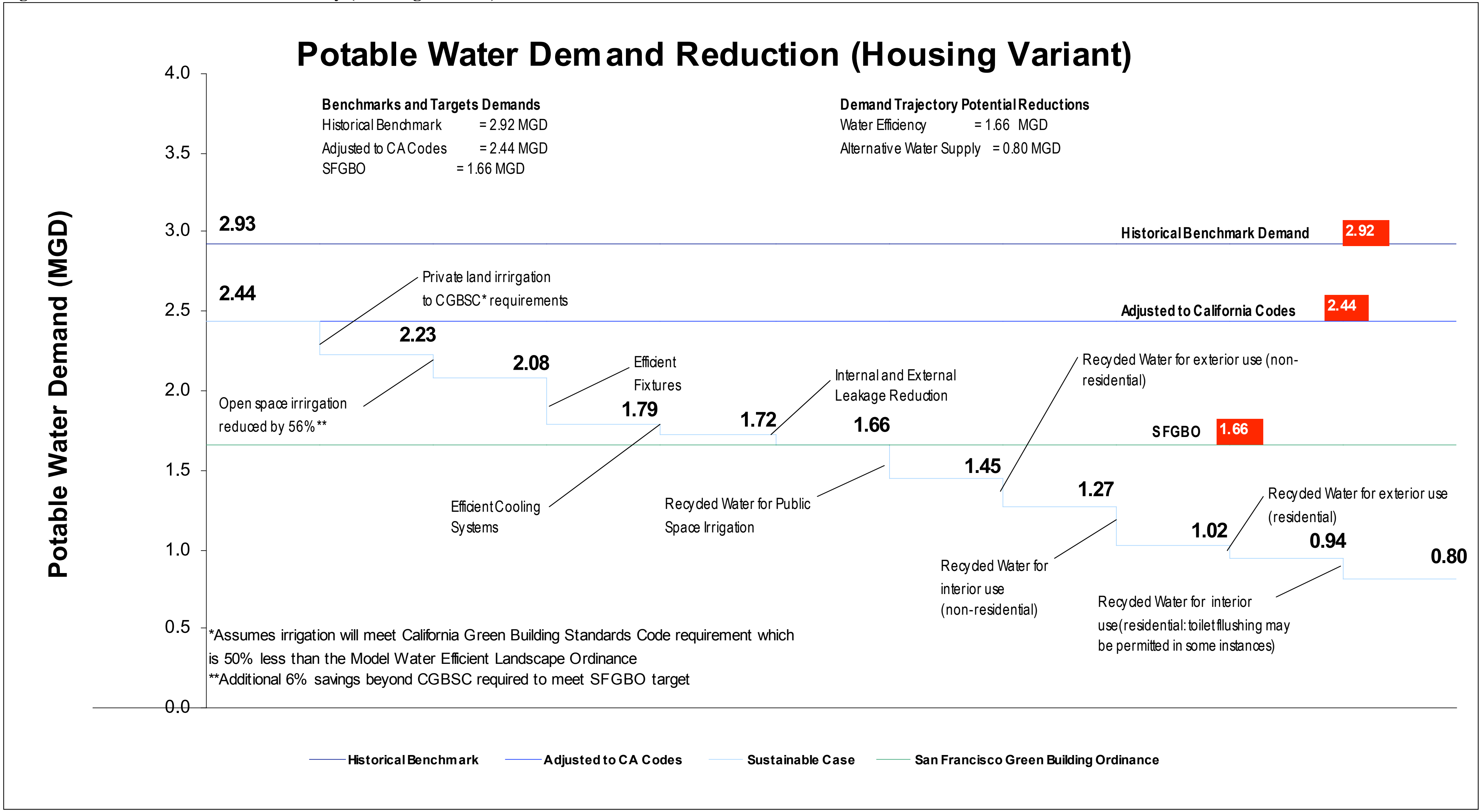

Table 5: Historical Benchmark demand by land use and end use – Proposed Project

	Historical Benchmark Demand (MGD)		
Land Use	**Candlestick Point**	**Hunters Point**	**Total Development**
Residential	1.13	0.38	1.52
Hotel	0.08	0.00	0.08
Office	0.07	0.01	0.08
Artist Studios	0.00	0.03	0.03
Research and Development	0.00	0.61	0.61
Neighborhood Retail	0.03	0.03	0.06
Regional Retail	0.13	0.00	0.13
Community Uses	0.02	0.02	0.03
Football Stadium	0.00	0.05	0.05
Performance Venue	0.03	0.00	0.03
Total demand excluding Parks and Open Space	**1.49**	**1.11**	**2.60**
Parks and Open Space	0.10	0.25	0.35
Total Demand	**1.59**	**1.36**	**2.95**
End Use	**Candlestick Point**	**Hunters Point**	**Total Development**
Indoor Uses			
Toilets (low density residential)	0.03	0.01	0.04
Toilets (med-high density Residential)	0.25	0.08	0.32
Toilets (all other uses)	0.05	0.10	0.15
Urinals	0.01	0.02	0.02
Laundry (low density residential)	0.02	0.01	0.03
Laundry (medium and high density residential)	0.20	0.06	0.26
Laundry (all other uses)	0.02	0.03	0.04
Shower	0.19	0.08	0.27
Bath	0.02	0.01	0.02
Faucets	0.19	0.10	0.29
Process Water	0.05	0.13	0.18
Dishwashers	0.03	0.03	0.06
Internal Leakage	0.16	0.09	0.25
Other domestic	0.03	0.01	0.04
Subtotal	**1.24**	**0.76**	**2.00**
Outdoor Uses			
Irrigation and landscaping	0.18	0.27	0.45
Pools and Fountains	0.01	0.01	0.02
Wash down of houses and facilities	0.01	0.01	0.02
Car Washing	0.01	0.00	0.01
Cooling	0.02	0.05	0.07
External Leakage	0.01	0.02	0.03
Subtotal	**0.24**	**0.36**	**0.60**
Total excluding Parks and Open Space	**1.49**	**1.11**	**2.60**
Parks and Open Space	0.10	0.25	0.35
Total Demand	**1.59**	**1.36**	**2.95**

*Note: Rounding errors may occur.

Table 6: Adjusted to CA Codes demand by land use and end use- Proposed Project

Land Use	Adjusted to CA Codes Demand (MGD)		
	Candlestick Point	Hunters Point	Total Development
Residential	0.87	0.29	1.16
Hotel	0.07	0.00	0.07
Office	0.06	0.01	0.07
Artist Studios	0.00	0.02	0.02
Research and Development	0.00	0.54	0.54
Neighborhood Retail	0.02	0.02	0.05
Regional Retail	0.12	0.00	0.12
Community Uses	0.01	0.01	0.03
Football Stadium	0.00	0.04	0.04
Performance Venue	0.02	0.00	0.02
Total demand excluding Parks and Open Space	**1.18**	**0.94**	**2.11**
Parks and Open Space	0.10	0.25	0.35
Total Demand	**1.28**	**1.19**	**2.46**
End Use	**Candlestick Point**	**Hunters Point**	**Total Development**
Indoor Uses			
Toilets (low density residential)	0.01	0.01	0.02
Toilets (med-high density Residential)	0.11	0.04	0.15
Toilets (all other uses)	0.02	0.05	0.07
Urinals	0.00	0.01	0.01
Laundry (low density residential)	0.02	0.01	0.02
Laundry (medium and high density residential)	0.14	0.05	0.19
Laundry (all other uses)	0.01	0.02	0.03
Shower	0.15	0.06	0.21
Bath	0.02	0.01	0.02
Faucets	0.16	0.09	0.25
Process Water	0.05	0.13	0.18
Dishwashers	0.03	0.03	0.06
Internal Leakage	0.16	0.09	0.25
Other domestic	0.03	0.01	0.04
Subtotal	**0.93**	**0.58**	**1.51**
Outdoor Uses			
Irrigation and landscaping	0.18	0.27	0.45
Pools and Fountains	0.01	0.01	0.02
Wash down of houses and facilities	0.01	0.01	0.02
Car Washing	0.01	0.00	0.01
Cooling	0.02	0.05	0.07
External Leakage	0.01	0.02	0.03
Subtotal	**0.24**	**0.36**	**0.60**
Total excluding Parks and Open Space	**1.18**	**0.94**	**2.11**
Parks and Open Space	0.10	0.25	0.35
Total Demand	**1.28**	**1.19**	**2.46**

*Note: Rounding errors may occur.

Table 7: SFGBO demands by land use and end use – Proposed Project

Land Use	SFGBO Demand (MGD)		
	Candlestick Point	Hunters Point	Total Development
Residential	0.61	0.22	0.83
Hotel	0.05	0.00	0.05
Office	0.04	0.00	0.04
Artist Studios	0.00	0.01	0.01
Research and Development	0.00	0.36	0.36
Neighborhood Retail	0.02	0.02	0.03
Regional Retail	0.08	0.00	0.08
Community Uses	0.01	0.01	0.02
Football Stadium	0.00	0.02	0.02
Performance Venue	0.01	0.00	0.01
Total demand excluding Parks and Open Space	**0.82**	**0.64**	**1.47**
Parks and Open Space	0.06	0.15	0.21
Total Demand	**0.88**	**0.79**	**1.67**
End Use	**Candlestick Point**	**Hunters Point**	**Total Development**
Indoor Uses			
Toilets (low density residential)	0.01	0.01	0.02
Toilets (med-high density Residential)	0.09	0.03	0.12
Toilets (all other uses)	0.02	0.04	0.06
Urinals	0.00	0.00	0.00
Laundry (low density residential)	0.01	0.01	0.02
Laundry (medium and high density residential)	0.10	0.03	0.13
Laundry (all other uses)	0.01	0.01	0.02
Shower	0.10	0.04	0.15
Bath	0.02	0.01	0.02
Faucets	0.11	0.06	0.18
Process Water	0.04	0.10	0.14
Dishwashers	0.02	0.02	0.04
Internal Leakage	0.12	0.07	0.19
Other domestic	0.02	0.01	0.03
Subtotal	**0.68**	**0.42**	**1.11**
Outdoor Uses			
Irrigation and landscaping	0.09	0.14	0.24
Pools and Fountains	0.01	0.01	0.02
Wash down of houses and facilities	0.01	0.01	0.02
Car Washing	0.01	0.00	0.01
Cooling	0.01	0.04	0.05
External Leakage	0.01	0.01	0.02
Subtotal	**0.14**	**0.22**	**0.36**
Total excluding Parks and Open Space	**0.82**	**0.64**	**1.47**
Parks and Open Space	0.06	0.15	0.21
Total Demand	**0.88**	**0.79**	**1.67**

*Note: Rounding errors may occur.

Table 8: Historical Benchmark demand by land use and end use – R&D Variant

Land Use	Historical Benchmark Demand (MGD)		
	Candlestick Point	Hunters Point	Total Development
Residential	1.13	0.38	1.52
Hotel	0.08	0.00	0.08
Office	0.07	0.01	0.08
Artist Studios	0.00	0.03	0.03
Research and Development	0.00	1.21	1.21
Neighborhood Retail	0.03	0.03	0.06
Regional Retail	0.13	0.00	0.13
Community Uses	0.02	0.02	0.03
Football Stadium	0.00	0.00	0.00
Performance Venue	0.04	0.00	0.04
Total demand excluding Parks and Open Space	**1.49**	**1.67**	**3.16**
Parks and Open Space	0.09	0.22	0.31
Total Demand	**1.58**	**1.89**	**3.47**
End Use	**Candlestick Point**	**Hunters Point**	**Total Development**
Indoor Uses			
Toilets (low density residential)	0.03	0.01	0.04
Toilets (med-high density Residential)	0.25	0.08	0.32
Toilets (all other uses)	0.05	0.18	0.23
Urinals	0.01	0.02	0.03
Laundry (low density residential)	0.02	0.01	0.03
Laundry (medium and high density residential)	0.20	0.06	0.26
Laundry (all other uses)	0.02	0.05	0.07
Shower	0.19	0.09	0.28
Bath	0.02	0.01	0.02
Faucets	0.19	0.14	0.33
Process Water	0.05	0.24	0.29
Dishwashers	0.03	0.06	0.09
Internal Leakage	0.16	0.12	0.28
Other domestic	0.03	0.01	0.04
Subtotal	**1.25**	**1.08**	**2.33**
Outdoor Uses			
Irrigation and landscaping	0.18	0.43	0.61
Pools and Fountains	0.01	0.02	0.03
Wash down of houses and facilities	0.01	0.01	0.02
Car Washing	0.01	0.00	0.01
Cooling	0.02	0.10	0.12
External Leakage	0.01	0.03	0.04
Subtotal	**0.24**	**0.59**	**0.83**
Total excluding Parks and Open Space	**1.49**	**1.67**	**3.16**
Parks and Open Space	0.09	0.22	0.31
Total Demand	**1.58**	**1.89**	**3.47**

*Note: Rounding errors may occur.

Table 9: Adjusted to CA Codes demand by land use and end use- R&D Variant

Land Use	Adjusted to Codes BAU Demand (MGD) Candlestick Point	Hunters Point	Total Development
Residential	0.87	0.29	1.16
Hotel	0.07	0.00	0.07
Office	0.06	0.01	0.07
Artist Studios	0.00	0.02	0.02
Research and Development	0.00	1.08	1.08
Neighborhood Retail	0.02	0.02	0.05
Regional Retail	0.12	0.00	0.12
Community Uses	0.01	0.01	0.03
Football Stadium	0.00	0.00	0.00
Performance Venue	0.02	0.00	0.02
Total demand excluding Parks and Open Space	**1.18**	**1.43**	**2.61**
Parks and Open Space	0.09	0.22	0.31
Total Demand	**1.27**	**1.66**	**2.92**
End Use	**Candlestick Point**	**Hunters Point**	**Total Development**
	Indoor Uses		
Toilets (low density residential)	0.01	0.01	0.02
Toilets (med-high density Residential)	0.11	0.04	0.15
Toilets (all other uses)	0.02	0.08	0.11
Urinals	0.01	0.01	0.01
Laundry (low density residential)	0.02	0.01	0.02
Laundry (medium and high density residential)	0.14	0.05	0.19
Laundry (all other uses)	0.01	0.04	0.05
Shower	0.15	0.08	0.23
Bath	0.02	0.01	0.02
Faucets	0.17	0.12	0.29
Process Water	0.05	0.24	0.29
Dishwashers	0.03	0.05	0.08
Internal Leakage	0.16	0.12	0.28
Other domestic	0.03	0.01	0.04
Subtotal	**0.93**	**0.84**	**1.78**
	Outdoor Uses		
Irrigation and landscaping	0.18	0.43	0.61
Pools and Fountains	0.01	0.02	0.03
Wash down of houses and facilities	0.01	0.01	0.02
Car Washing	0.01	0.00	0.01
Cooling	0.02	0.10	0.12
External Leakage	0.01	0.03	0.04
Subtotal	**0.24**	**0.59**	**0.83**
Total excluding Parks and Open Space	**1.18**	**1.43**	**2.61**
Parks and Open Space	0.09	0.22	0.31
Total Demand	**1.27**	**1.66**	**2.92**

*Note: Rounding errors may occur.

Table 10: SFGBO demands by land use and end use – R&D Variant

Land Use	SFGBO (MGD)		
	Candlestick Point	Hunters Point	Total Development
Residential	0.62	0.21	0.83
Hotel	0.05	0.00	0.05
Office	0.04	0.00	0.04
Artist Studios	0.00	0.01	0.01
Research and Development	0.00	0.71	0.71
Neighborhood Retail	0.02	0.02	0.03
Regional Retail	0.08	0.00	0.08
Community Uses	0.01	0.01	0.02
Football Stadium	0.00	0.00	0.00
Performance Venue	0.01	0.00	0.01
Total demand excluding Parks and Open Space	**0.83**	**0.96**	**1.80**
Parks and Open Space	0.05	0.14	0.19
Total Demand	**0.89**	**1.11**	**1.99**
End Use	**Candlestick Point**	**Hunters Point**	**Total Development**
Indoor Uses			
Toilets (low density residential)	0.01	0.01	0.02
Toilets (med-high density Residential)	0.09	0.03	0.12
Toilets (all other uses)	0.02	0.07	0.09
Urinals	0.00	0.00	0.00
Laundry (low density residential)	0.01	0.01	0.02
Laundry (medium and high density residential)	0.10	0.03	0.13
Laundry (all other uses)	0.01	0.03	0.03
Shower	0.10	0.05	0.16
Bath	0.02	0.01	0.02
Faucets	0.11	0.08	0.20
Process Water	0.04	0.18	0.22
Dishwashers	0.02	0.03	0.05
Internal Leakage	0.12	0.09	0.21
Other domestic	0.02	0.01	0.03
Subtotal	**0.68**	**0.62**	**1.31**
Outdoor Uses			
Irrigation and landscaping	0.09	0.22	0.32
Pools and Fountains	0.01	0.02	0.03
Wash down of houses and facilities	0.01	0.01	0.02
Car Washing	0.01	0.00	0.01
Cooling	0.01	0.08	0.09
External Leakage	0.01	0.02	0.03
Subtotal	**0.14**	**0.36**	**0.50**
Total excluding Parks and Open Space	**0.83**	**0.96**	**1.80**
Parks and Open Space	0.05	0.14	0.19
Total Demand	**0.89**	**1.11**	**1.99**

*Note: Rounding errors may occur.

Table 11: Historical Benchmark demand by land use and end use – Housing Variant

Land Use	Historical Benchmark Demand (MGD)		
	Candlestick Point	Hunters Point	Total Development
Residential	0.94	0.58	1.52
Hotel	0.08	0.00	0.08
Office	0.07	0.01	0.08
Artist Studios	0.00	0.03	0.03
Research and Development	0.00	0.61	0.61
Neighborhood Retail	0.03	0.03	0.06
Regional Retail	0.13	0.00	0.13
Community Uses	0.02	0.02	0.03
Football Stadium	0.00	0.00	0.00
Performance Venue	0.04	0.00	0.04
Total demand excluding Parks and Open Space	**1.29**	**1.26**	**2.56**
Parks and Open Space	0.11	0.25	0.36
Total Demand	**1.40**	**1.51**	**2.92**
End Use	**Candlestick Point**	**Hunters Point**	**Total Development**
Indoor Uses			
Toilets (low density residential)	0.05	0.05	0.10
Toilets (med-high density Residential)	0.18	0.09	0.26
Toilets (all other uses)	0.05	0.10	0.15
Urinals	0.01	0.01	0.02
Laundry (low density residential)	0.04	0.04	0.08
Laundry (medium and high density residential)	0.14	0.07	0.21
Laundry (all other uses)	0.02	0.03	0.04
Shower	0.16	0.11	0.26
Bath	0.01	0.01	0.02
Faucets	0.16	0.13	0.29
Process Water	0.05	0.13	0.18
Dishwashers	0.03	0.03	0.06
Internal Leakage	0.14	0.11	0.25
Other domestic	0.03	0.01	0.04
Subtotal	**1.07**	**0.91**	**1.98**
Outdoor Uses			
Irrigation and landscaping	0.17	0.26	0.43
Pools and Fountains	0.01	0.01	0.02
Wash down of houses and facilities	0.01	0.01	0.02
Car Washing	0.00	0.00	0.01
Cooling	0.02	0.05	0.07
External Leakage	0.01	0.02	0.03
Subtotal	**0.22**	**0.35**	**0.57**
Total excluding Parks and Open Space	**1.29**	**1.26**	**2.56**
Parks and Open Space	0.11	0.25	0.36
Total Demand	**1.40**	**1.51**	**2.92**

*Note: Rounding errors may occur.

Table 12: Adjusted to CA Codes demand by land use and end use- Housing Variant

Land Use	Adjusted to Codes BAU Demand (MGD)		
	Candlestick Point	Hunters Point	Total Development
Residential	0.72	0.44	1.16
Hotel	0.07	0.00	0.07
Office	0.06	0.01	0.07
Artist Studios	0.00	0.02	0.02
Research and Development	0.00	0.54	0.54
Neighborhood Retail	0.02	0.02	0.05
Regional Retail	0.12	0.00	0.12
Community Uses	0.01	0.01	0.03
Football Stadium	0.00	0.00	0.00
Performance Venue	0.02	0.00	0.02
Total demand excluding Parks and Open Space	**1.03**	**1.05**	**2.08**
Parks and Open Space	0.11	0.25	0.36
Total Demand	**1.14**	**1.30**	**2.44**
End Use	**Candlestick Point**	**Hunters Point**	**Total Development**
Indoor Uses			
Toilets (low density residential)	0.02	0.02	0.05
Toilets (med-high density Residential)	0.08	0.04	0.12
Toilets (all other uses)	0.02	0.04	0.07
Urinals	0.01	0.00	0.01
Laundry (low density residential)	0.03	0.03	0.06
Laundry (medium and high density residential)	0.10	0.05	0.15
Laundry (all other uses)	0.01	0.02	0.03
Shower	0.13	0.09	0.21
Bath	0.01	0.01	0.02
Faucets	0.14	0.11	0.25
Process Water	0.05	0.13	0.18
Dishwashers	0.03	0.03	0.06
Internal Leakage	0.14	0.11	0.25
Other domestic	0.03	0.01	0.04
Subtotal	**0.80**	**0.70**	**1.50**
Outdoor Uses			
Irrigation and landscaping	0.17	0.26	0.43
Pools and Fountains	0.01	0.01	0.02
Wash down of houses and facilities	0.01	0.01	0.02
Car Washing	0.00	0.00	0.01
Cooling	0.02	0.05	0.07
External Leakage	0.01	0.02	0.03
Subtotal	**0.22**	**0.35**	**0.57**
Total excluding Parks and Open Space	**1.03**	**1.05**	**2.08**
Parks and Open Space	0.11	0.25	0.36
Total Demand	**1.14**	**1.31**	**2.44**

*Note: Rounding errors may occur.

Table 14: SFGBO demands by land use and end use – Housing Variant

Land Use	SFGBO (MGD)		
	Candlestick Point	Hunters Point	Total Development
Residential	0.51	0.33	0.83
Hotel	0.05	0.00	0.05
Office	0.04	0.00	0.04
Artist Studios	0.00	0.01	0.01
Research and Development	0.00	0.36	0.36
Neighborhood Retail	0.02	0.02	0.03
Regional Retail	0.08	0.00	0.08
Community Uses	0.01	0.01	0.02
Football Stadium	0.00	0.00	0.00
Performance Venue	0.01	0.00	0.01
Total demand excluding Parks and Open Space	**0.72**	**0.73**	**1.45**
Parks and Open Space	0.06	0.15	0.22
Total Demand	**0.78**	**0.88**	**1.66**
End Use	**Candlestick Point**	**Hunters Point**	**Total Development**
	Indoor Uses		
Toilets (low density residential)	0.02	0.02	0.04
Toilets (med-high density Residential)	0.06	0.03	0.10
Toilets (all other uses)	0.02	0.03	0.05
Urinals	0.00	0.00	0.00
Laundry (low density residential)	0.02	0.02	0.04
Laundry (medium and high density residential)	0.07	0.03	0.11
Laundry (all other uses)	0.01	0.01	0.02
Shower	0.09	0.06	0.15
Bath	0.01	0.01	0.02
Faucets	0.10	0.08	0.18
Process Water	0.04	0.10	0.14
Dishwashers	0.02	0.02	0.04
Internal Leakage	0.10	0.08	0.19
Other domestic	0.02	0.01	0.03
Subtotal	**0.58**	**0.51**	**1.10**
	Outdoor Uses		
Irrigation and landscaping	0.08	0.14	0.22
Pools and Fountains	0.01	0.01	0.02
Wash down of houses and facilities	0.01	0.01	0.02
Car Washing	0.00	0.00	0.01
Cooling	0.01	0.04	0.05
External Leakage	0.01	0.01	0.02
Subtotal	**0.13**	**0.22**	**0.34**
Total excluding Parks and Open Space	**0.72**	**0.73**	**1.45**
Parks and Open Space	0.06	0.15	0.22
Total Demand	**0.78**	**0.88**	**1.66**

*Note: Rounding errors may occur.

Potential reclaimed water demands and sanitary flows by end use were estimated for the Proposed Project and Project Variants. These are provided below in Table 16 through Table 22.

Table 16: Reclaimed water demands by end use – Proposed Project

End Use	Reclaimed Water Demands by End Use (MGD)		
	Historical Benchmark	Adjusted to CA Codes	SFGBO
Toilets (residential)	0.36	0.17	0.14
Toilets (non-residential))	0.15	0.07	0.06
Urinals	0.02	0.01	0.00
Process Water (non-residential)	0.18	0.18	0.14
Irrigation and landscaping (residential)	0.12	0.12	0.06
Irrigation and Landscaping (non-residential)	0.33	0.33	0.16
Pools and Fountains (residential)	0.01	0.01	0.01
Pools and Fountains (non-residential)	0.01	0.01	0.01
Wash down (residential)	0.01	0.01	0.01
Wash down (non-residential)	0.01	0.01	0.01
Car Washing (residential)	0.01	0.01	0.01
Car Washing (non-residential)	0.00	0.00	0.00
Cooling (non-residential)	0.07	0.07	0.05
Total flow excluding Parks and Open Space	**1.30**	**1.00**	**0.66**
Parks and Open Space	0.35	0.35	0.21
Total Demand	**1.65**	**1.35**	**0.87**

*Note: Rounding errors may occur.

Table 15: Sanitary flows by end use – Proposed Project

End Use	Sanitary Flows by End Use (MGD)		
	Historical Benchmark	Adjusted to CA Codes	SFGBO
Toilets	0.52	0.24	0.19
Urinals	0.02	0.01	0.00
Laundry	0.34	0.24	0.17
Shower	0.27	0.21	0.15
Bath	0.02	0.02	0.02
Faucets	0.29	0.25	0.18
Process Water	0.18	0.18	0.14
Dishwashers	0.06	0.06	0.04
Other domestic	0.04	0.04	0.03
Cooling	0.07	0.07	0.05
Total	**1.82**	**1.33**	**0.98**

*Note: Rounding errors may occur.

Table 16: Reclaimed water demands by end use – R&D Variant

End Use	Reclaimed Water Demands by End Use (MGD)		
	Historical Benchmark	Adjusted to Codes BAU	SFGBO
Toilets (residential)	0.36	0.17	0.14
Toilets (non-residential))	0.23	0.11	0.09
Urinals	0.03	0.01	0.00
Process Water (non-residential)	0.29	0.29	0.22
Irrigation and landscaping (residential)	0.12	0.12	0.06
Irrigation and Landscaping (non-residential)	0.49	0.49	0.25
Pools and Fountains (residential)	0.01	0.01	0.01
Pools and Fountains (non-residential)	0.02	0.02	0.02
Wash down (residential)	0.01	0.01	0.01
Wash down (non-residential)	0.02	0.02	0.02
Car Washing (residential)	0.01	0.01	0.01
Car Washing (non-residential)	0.00	0.00	0.00
Cooling (non-residential)	0.12	0.12	0.09
Total flow excluding Parks and Open Space	**1.71**	**1.37**	**0.90**
Parks and Open Space	0.31	0.31	0.19
Total Demand	**2.02**	**1.69**	**1.09**

*Note: Rounding errors may occur.

Table 17: Sanitary flows by end use – R&D Variant

End Use	Sanitary Flows by End Use (MGD)		
	Historical Benchmark	Adjusted to CA Codes	SFGBO
Toilets	0.60	0.27	0.22
Urinals	0.03	0.01	0.00
Laundry	0.36	0.26	0.18
Shower	0.28	0.23	0.16
Bath	0.02	0.02	0.02
Faucets	0.33	0.29	0.20
Process Water	0.29	0.29	0.22
Dishwashers	0.09	0.08	0.05
Other domestic	0.04	0.04	0.03
Cooling	0.12	0.12	0.09
Total	**2.16**	**1.61**	**1.18**

*Note: Rounding errors may occur.

Table 18: Reclaimed water demands by end use – Housing Variant

End Use	Reclaimed Water Demands by End Use (MGD)		
	Historical Benchmark	Adjusted to Codes BAU	SFGBO
Toilets (residential)	0.36	0.17	0.14
Toilets (non-residential))	0.15	0.07	0.05
Urinals	0.02	0.01	0.00
Process Water (non-residential)	0.18	0.18	0.14
Irrigation and landscaping (residential)	0.12	0.12	0.06
Irrigation and Landscaping (non-residential)	0.30	0.30	0.15
Pools and Fountains (residential)	0.01	0.01	0.01
Pools and Fountains (non-residential)	0.01	0.01	0.01
Wash down (residential)	0.01	0.01	0.01
Wash down (non-residential)	0.01	0.01	0.01
Car Washing (residential)	0.01	0.01	0.01
Car Washing (non-residential)	0.00	0.00	0.00
Cooling (non-residential)	0.07	0.07	0.05
Total flow excluding Parks and Open Space	**1.26**	**0.97**	**0.64**
Parks and Open Space	0.37	0.37	0.22
Total Demand	**1.63**	**1.34**	**0.86**

*Note: Rounding errors may occur.

Table 22: Sanitary flows by end use – Housing Variant

End Use	Sanitary Flows by End Use (MGD)		
	Historical Benchmark	Adjusted to CA Codes	SFGBO
Toilets	0.51	0.23	0.19
Urinals	0.02	0.01	0.00
Laundry	0.34	0.24	0.17
Shower	0.26	0.21	0.15
Bath	0.02	0.02	0.02
Faucets	0.29	0.25	0.18
Process Water	0.18	0.18	0.14
Dishwashers	0.06	0.06	0.04
Other domestic	0.04	0.04	0.03
Cooling (50% flow to sewer)	0.07	0.07	0.05
Total	**1.80**	**1.32**	**0.97**

*Note: Rounding errors may occur.

4 Assumptions and References

This section describes assumptions used to:

1) Estimate historical baseline demands;
2) Distribute the historical baseline demands to specific end uses such as toilets, showers, irrigation etc…;
3) Adjust the historical baseline demands to current California code; and
4) Adjust the to-code demands to a sustainable case wherein efficiency measures such as efficient fixturesare applied. The efficiency measures applied in the Sustainable Case have been tailored to meet the demand reduction requirements of the SFGBO.

Table 20: Assumptions for estimating water demands by land use for the Historical Benchmark case .

Assumptions Summary for Historical Benchmark Demand Estimation						
Land use	**ID#**	**Description**	**Value**	**Unit**	**Reference or Assumption**	**Notes**
Residential						
	1	No. of residents per unit - low density	2.33	residents	Mundie & Associates, 2009	
	2	No. of residents per unit - medium density	2.33	residents	Mundie & Associates, 2009	
	3	No. of residents per unit - high density	2.33	residents	Mundie & Associates, 2009	
	4	Average consumption per capita	62	gallons per day (gp)	SFPUC, 2005	
	5	Average outdoor water use for single family residences	10	%	SFPUC, 2005	Note reference states that average demand is less than 10%
Regional Retail						
	1	Regional Retail jobs creation	350	Square feet (sqft)/job	Economic and Planning Systems, 2009.	
	2	Area of retail space per customer	22	sqft/customer	British Standards Institution. 2006	
	3	Sewage generation per employee	10	gpd	EPA, 2002	Sewage generation is only a fraction of overall consumption
	4	Sewage generation per visitor	2	gpd	EPA, 2002	EPA sites 2 gpd / parking spot. Sewage generation is only a fraction of overall consumption
	5	Average outdoor water use for non-residential customers	43	percent	URS, 2004.	
	6	Ratio of sewage generation to total water consumed on site	57	percent	Assumed based on URS 2004.	Required to convert sewage generation to total water consumption. Conservative in that a small portion of water consumed indoors would not go to sanitary sewer

Neighborhood Retail						
	1	Neighborhood retail jobs creation	270	sqft/job	Economic and Planning Systems, 2009.	
	2	Area of retail space per customer	22	sqft/customer	British Standards Institution. 2006	
	3	Sewage generation per employee	10	gpd	EPA, 2002	Sewage generation is only a fraction of overall consumption
	4	Water generation per visitor	2	gpd	EPA, 2002	EPA sites 2 gpd / parking spot. Sewage generation is only a fraction of overall consumption
	5	Average outdoor water use for non-residential customers	43	percent	URS, 2004.	Sewage generation is only a fraction of overall consumption
	6	Ratio of sewage generation to total water consumed on site	57	percent	Assumed based on URS 2004.	Required to convert sewage generation to total water consumption. Conservative in that a small portion of water consumed indoors would not go to sanitary sewer
Office						
	1	Office job creation	276	sqft/job	Economic and Planning Systems, 2009.	
	2	Residential jobs creation	25	Units/job	Economic and Planning Systems, 2009.	
	3	Water consumption per employee	85	gpd	URS, 2004.	
	4	Average outdoor water use for non-residential customers	43	percent	URS, 2004.	
	5	Ratio of sewage generation to total water consumed on site	57	percent	Assumed based on URS 2004.	Required to convert sewage generation to total water consumption. Conservative in that a small portion of water consumed indoors would not go to sanitary sewer
Community Uses						

	1	Community use job creation	276	sqft/job	Assumed similar to office	Actual Community uses are not finalized therefore community use water demands have been estimated in a similar manner as office land use.
	2	Water consumption per employee	85	gpd	Assumed similar to office	
	3	Average outdoor water use for non-residential customers	43	percent	Assumed similar to office	
	4	Ratio of sewage generation to total water consumed on site	57	percent	Assumed similar to office	Required to convert sewage generation to total water consumption. Conservative in that a small portion of water consumed indoors would not go to sanitary sewer
Research and Development						
	1	R&D jobs creation (office)	267	sqft/job	Economic and Planning Systems, 2009.	
	2	Sewage generation per employee for office R&D space	85	gpd	URS, 2004.	Sewage generation is only a fraction of overall consumption
	3	Average outdoor water use for non-residential customers for all R&D	43	percent	URS, 2004.	Sewage generation is only a fraction of overall consumption
	4	Ratio of sewage generation to total water consumed on site	57	percent	Assumed based on URS 2004.	Assumption is conservative in that some water consumed indoors would not go to sanitary sewer
	5	Type of R&D Spaces	1/3,1/3, and 1/3	Fraction	Email from Lennar	From email correspondence with Lennar it has been assumed that 1/3 of the R&D space will be office, 1/3 will be wet laboratory, and the remaining 1/3 will be light production which is similar to industrial.
	6	Water Usage for Wet Laboratory R&D Space	0.547	gpsfd	2020 UC Berkeley LRDP Draft EIR (http://www.cp.berkeley.edu/LRDP_2020 draft.htm) - Table 4.13-1	Source provided by Winzler & Kelly. The report states that 0.32 is for sustainable lab case with efficient fixtures built in, and calculations were worked backwards to calculate the BAU.
	7	Water usage profile for	Varies	%	URS, 2004	The water usage profile for wet lab

		Wet Lab Space				space has been assumed to be the average of the commercial and industrial usage profile.
	8	Water Usage for Light Projection R&D Space	0.1	gpsfd	City of Los Angeles, L.A. CEQA Threshold Guide, 2006, Exhibit M.2. - 12 Sewage Generation Factors	
Hotel						
	1	Hotel job creation	700	sqft/job	Economic and Planning Systems, 2009	
	2	Average guest room size	600	sqft	Assumed	This includes the space for reception, kitchens and conference facilities
	3	Average guests / room	1.9	guests	Assumed	
	4	Sewage generation per guest	50	gpd	EPA, 2002	Sewage generation is only a fraction of overall consumption
	5	Sewage generation per employee	10	gpd	EPA, 2002	Sewage generation is only a fraction of overall consumption
	6	Average outdoor water use for non-residential customers	43	percent	URS, 2004.	Sewage generation is only a fraction of overall consumption
	7	Ratio of sewage generation to total water consumed on site	57	percent	Assumed based on URS 2004.	Required to convert sewage generation to total water consumption. Conservative in that a small portion of water consumed indoors would not go to sanitary sewer
Artist Studios						
	1	# of artists	252	people	Lennar, 2009	
	2	Consumption per artist	85	gpd	URS, 2004.	
Parks and Open Space						
	1	Total irrigation demand from landscape architect	350,180	gpd	Per landscape irrigation prepared by RHAA 7/31/08	
Football Stadium						
	1	Football games / year	10	Home games	Economic and Planning Systems, 2009.	
	2	Attendance at football games	69000	people	Economic and Planning Systems, 2009.	

	3	Other venues per year	20	Other venues	Economic and Planning Systems, 2009.	
	4	Attendance at other venues	37500	people	Lennar, 2009	
	5	Employees (football day)	3625	people	Stadium Staffing Numbers from SF 49ers, (Lennar, 2009)	Includes 2900 employees and 725 media personnel
	6	Employees (event day)	1,922	people	Pro-rated using football day attendance and employees on football days	
	7	Employee (nonevent days)	48	people	Stadium Staffing Numbers from SF 49ers, (Lennar, 2009)	
	8	No. of players/performers (event day)	200	people	Assumed	100 people per team for players and staff. Assumed same number for other event days
	9	Stadium average daily irrigation	23979	gpd	Marty Laporte, 2009	
	10	Sewage generation per seat and employee on game days	4	gpd	EPA, 2002.	EPA value is for "auditorium" Sewage generation is only a fraction of overall consumption
	11	Ratio of sewage generation to indoor water consumption	95	percent	Assumed based on URS 2004.	Required to convert sewage generation to total water consumption. Conservative in that a small portion of water consumed indoors would not go to sanitary sewer
	12	Water consumption per permanent employee per day	85	gpd	URS, 2004.	
Performance Venue						
	1	Performance venue job creation	40	seats/job	Economic and Planning Systems, 2009.	
	2	Performance events per year	250	events	Economic and Planning Systems, 2009.	
	3	Employees - typical day	7	people	Assumed	Prorated to be similar to stadium
	4	Visitors per performance	10,000	people	Per CP/HPS development program, 2009	

	6	Water consumption per permanent employee per day	85	gpd	URS, 2004.	
	7	Sewage generation per seat and employee on event days	4	gpd	EPA, 2002.	EPA value is for "auditorium". Sewage generation is only a fraction of overall consumption
	12	Ratio of sewage generation to indoor water consumption	95	percent	Assumed based on URS 2004.	Required to convert sewage generation to total water consumption. Conservative in that a small portion of water consumed indoors would not go to sanitary sewer
Sanitary Sewer						
	1	Percent of indoor consumption to sanitary sewer	100%	Percent	Assumed per URS 2004 and conversations with W&K	
	2	Cooling demands assumed to contribute to sanitary sewer. (Non Res)			Assumed per conversations with W&K	Though some losses may occur, 100% of cooling demand is assumed to go to sanitary sewer

Table 23: End use demand distributions by land use (URS 2004)

Table 3-3
End-Use Data - Initial Percentage Assumptions

End Use	Initial Percentages by Customer-Billing Category				
	Single-Family Residential	Multi-Family Residential	Commercial	Industrial	Institutional
Indoor Usage					
Toilets (indoor)	26.7%	26.7%	25%	23%	20%
Urinals (indoor)	NA	NA	0%	7%	0%
Laundry (indoor)	21.7%	21.7%	8%	5%	10%
Showers (indoor)	16.8%	16.8%	5%	5%	16%
Bath (indoor)	1.7%	1.7%	NA	NA	NA
Faucets (indoor)	15.7%	15.7%	10%	15%	19%
Process (indoor)	NA	NA	34%	30%	5%
Dishwashers (indoor)	1.4%	1.4%	8%	5%	15%
Internal Leakage (indoor)	13.7%	13.7%	10%	10%	15%
Other Domestic (indoor)	2.2%	2.2%	NA	NA	NA
Outdoor Usage					
Irrigation and Landscaping (outdoor)	80%	80%	75%	65%	70%
Pools and Fountains (outdoor)	5%	5%	2%	5%	5%
Wash-down of house/facilities (outdoor)	5%	5%	3%	0%	5%
Car Washing (outdoor)	5%	5%	0%	0%	0%
Cooling (outdoor)	0%	0%	15%	25%	15%
External Leakage (outdoor)	5%	5%	5%	5%	5%

NA – Not Applicable

Sources: AWWARF, Konen (1986), Behling et al. (1992)

Table 25: Assumed end use distributions for the stadium and performance venue

Indoor Usage	%	95%
Outdoor Usage	%	5%
Indoor Uses		
Toilets	%	30%
Urinals	%	30%
Laundry	%	0%
Shower	%	5%
Bath	%	0%
Faucets	%	15%
Process Water	%	10%
Dishwashers	%	0%
Internal Leakage	%	10%
Other domestic	%	0%
Outdoor Uses		
Irrigation and landscaping	%	20%
Pools and Fountains	%	0%
Wash down of houses and facilities	%	20%
Car Washing	%	0%
Cooling	%	50%
External Leakage	%	10%

Table 27: Assumptions used to adjust between water demand scenarios

	Historical Benchmark		Adjusted to CA Code		SFGBO		
	Max Flow or Quantity	Note / Reference	Max Flow or Quantity	Note / Reference	Max Flow or Quantity	Note/Reference	Unit
Plumbing Fixture							
Lavatory faucet, private	2.5		2.2	2007 California Plumbing Code	1.5	EPA WaterSense	gpm at 60 psi
Lavatory faucet, public, (metering)	0.25		0.25	2006 International Plumbing Code	0.2	CA Green Building Standard 2008	gallon per metering cycle
(not metering)	0.6		0.5	IPC	0.5	n.a.	gpm at 60 psi
Shower head	3.125	URS 2004*	2.5	2007 California Plumbing Code	1.75	EPA WaterSense	gpm at 80 psi
Sink faucet	2.5		2.2	Plumbing Code	1.5	EPA WaterSense	gpm at 60 psi
Urinal	2	URS 2004*	1	2007 California Plumbing Code	0.125	EPA Water Sense	gallon per flushing cycle
Water closet	3.5	URS 2004*	1.6	2007 California Plumbing Code	1.28	EPA Water Sense and CA Green Building Standard 2008	gallon per flushing cycle
Other Appliances							
Dishwasher (Residential)	7		6	US Department of Energy 2007	4	Energy Star	gallons/cy capacity
Dishwasher (Commercial)	1.75		1.46	Energy Star	0.92	Energy Star	gallons per rack
Laundry	36.4	URS 2004	26	(US Federal Standard by 2011)	18	n.a. (calc)	gal/load
Laundry	13.2		8.5	CA Green Building Standard 2008	6	EPA Water Sense	gal/load-cf (Water Factor)
Irrigation							
Private Lands		Based on water demand distribution		California Water Efficient Landscape Ordinance (CWELO)	50%	CA Green Building Standard 2008	Fractional reduction compared to CWELO
Public Open Space		Per Landscape Architect Estimates		Per Landscape Architect Estimates - Note that this is less than CWELO	50%	CA Green Building Standard 2008	Fractional reduction compared to CWELO

Table 24: Other assumptions used to adjust the CA code demand to the SFGBO

Improved Cooling Efficiency		
Total fraction demand reductiont due to building envelope improvement measures and improved cooling technologies	0.25	
Reduced Losses		
Fractional demand reduction due to new piping and metering	0.25	

5 References

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FUTURE DEMANDS

Residential (Indoor) New Unit

# of persons per new unit	2.3
# of new units	7248
leaks	5%

	gal/person/day	gal/unit/day	Annual Demand (MG/yr)	Annual Demand (mgd)	Peak Month Demand (mgd)
Toilet Flushing	6.46	14.87	39.3	0.108	0.108
Laundry	6.29	14.47	38.3	0.105	0.105
Shower	10.13	23.29	61.6	0.169	0.169
Bathtub	4.0	9.20	24.3	0.067	0.067
Dishwashing	0.96	2.21	5.8	0.016	0.016
Bath Faucet	1.95	4.49	11.9	0.033	0.033
Kitchen Faucet	9.90	22.77	60.2	0.165	0.165
Leaks		4.56	12.1	0.033	0.033
Subtotal Residential New Tower	39.7	95.85	254	0.69	0.69

Residential (Indoor) Existing Tower Unit

# of persons per ex tower unit	2.3
# of ex tower units	1638
leaks	10%

	gal/person/day	gal/unit/day	Annual Demand (MG/yr)	Annual Demand (mgd)	Peak Month Demand (mgd)
Toilet Flushing	8.08	18.58	11.1	0.030	0.030
Laundry	5.85	13.46	8.0	0.022	0.022
Shower	8.00	18.39	11.0	0.030	0.030
Bathtub	4.0	9.20	5.5	0.015	0.015
Bath Faucet	1.95	4.49	2.7	0.007	0.007
Kitchen Faucet	11.30	25.98	15.5	0.043	0.043
Leaks		9.01	5.4	0.015	0.015
Subtotal Residential Ex. Tower	39.2	99.10	59	0.16	0.16

Non-Residential

	square feet	g/sf/yr	Annual Demand (MG/yr)	Annual Demand (mgd)	Peak Month Demand (mgd)
Retail	203,900	15	3.059	0.008	0.008
Office	120,100	8	0.961	0.003	0.003
Educational	21,600	10	0.216	0.001	0.001
Maintenance	15,000	20	0.300	0.001	0.001
Fitness Club	54,700	130	7.111	0.019	0.019
Structured Parking	2,917,400	0.1	0.292	0.001	0.001
		Subtotal Non-Residential	11.9	0.03	0.033

Irrigation

	acres	Annual Demand (MG/yr)	Annual Demand (mgd)	Peak Month Demand (mgd)
Public Open Space	49	22.72	0.06	0.16
Courtyards	12.3	5.70	0.02	0.04
Farm	3	1.71	0.005	0.011
Playing Fields	1.8	1.13	0.003	0.008
Pond	0.8	0.12	0.0003	0.004
	Subtotal Irrigation	31.4	0.09	0.22
	TOTAL	297	0.98	1.11

Parkmerced Water Demands September 2009

EXISTING UNITS

Base Case (existing code)

	Shower	Bath Faucet	WC	Bathtub	Kitchen	Dishwasher	Laundry	Total Per Person
gpm/gpf/gpl	2.5	1.5	3.5	40	2.2		40.9	
uses/person/day	0.65	1.5	5.05	0.1	1.0		0.37	
minutes	8.2				7.5			
gallons/day	13.33	2.25	17.68	4.0	16.57		15.13	68.95

Efficient Fixtures

	Shower	Bath Faucet	WC	Bathtub	Kitchen	Dishwasher	Laundry	Total Per Person
gpm/gpf/gpl	1.5	1.3	1.6	40	1.5		15	
uses/person/day	0.65	1.5	5.05	0.1	1.0		0.39	
minutes	8.2				7.5			
gallons/day	8.0	2.0	8.08	4.0	11.30		5.9	39.17

Super Efficient Fixtures

	Shower	Bath Faucet	WC	Bathtub	Kitchen	Dishwasher	Laundry	Total Per Person
gpm/gpf/gpl	1.5	1.0	1.1	40	1.34		15	
uses/person/day	0.65	1.5	5.05	0.1	1.0		0.39	
minutes	8.2				7.5			
gallons/day	8.00	1.50	5.56	4.00	10.09		5.9	34.99

NEW UNITS

Base Case (existing code)

	Shower	Bath Faucet	WC	Bathtub	Kitchen	Dishwasher	Laundry	Total Per Person
gpm/gpf/gpl	1.9	1.5	1.6	40	2.2	12.5	26	
uses/person/day	0.65	1.5	5.05	0.1	1.0	0.10	0.37	
minutes	8.2				6.6			
gallons/day	10.13	2.25	8.08	4.00	14.52	1.25	9.62	49.85

Efficient Fixtures

	Shower	Bath Faucet	WC	Bathtub	Kitchen	Dishwasher	Laundry	Total Per Person
gpm/gpf/gpl	1.9	1.3	1.28	40	1.5	9.6	17	
uses/person/day	0.65	1.5	5.05	0.1	1.0	0.10	0.37	
minutes	8.2				6.6			
gallons/day	10.1	1.95	6.46	4.0	9.9	1.0	6.29	39.69

Super Efficient Fixtures

	Shower	Bath Faucet	WC	Bathtub	Kitchen	Dishwasher	Laundry	Total Per Person
gpm/gpf/gpl	1.5	0.5	1.1	40	1.3	4	9.9	
uses/person/day	0.65	1.5	5.05	0.1	1.0	0.13	0.39	
minutes	8.2				6.6			
gallons/day	8.00	0.75	5.56	4.00	8.6	0.52	3.9	31.26

TOTALS BY UNIT

Existing Units to Remain

# of units	persons per unit	leaks
1638	2.3	10%

	gpcd	gal/unit/day	total (mgd)	total (MG/yr)
code	75.8	174.4	0.286	104.3
efficient	43.09	99.1	0.162	59.2
super efficient	38.49	88.5	0.145	52.9

New Units

# of units	persons per unit	leaks
7248	2.3	5%

	gpcd	gal/unit/day	total (mgd)	total (MG/yr)
code	52.3	120.4	0.873	318.5
efficient	41.68	95.9	0.695	253.6
super efficient	32.82	75.5	0.547	199.7

Weighted Average

	gpcd	gal/unit/day	total (mgd)	total (MG/yr)
code	56.7	130.3	0.945	344.8
efficient	41.9	96.5	0.699	255.2
super efficient	33.9	77.9	0.565	206.1

TOTALS BY SITE

TOTAL RESIDENTIAL

	MGD	MG/YR
code	1.158	422.8
efficient	0.857	312.8
super efficient	0.692	252.7

NON-POTABLE RESIDENTIAL toilet flushing new units, plus all laundry

	MGD	MG/YR
code	0.352	128.5
efficient	0.235	85.6
super efficient	0.179	65.3

POTABLE RESIDENTIAL

	MGD	MG/YR
code	0.806	294.3
efficient	0.622	227.2
super efficient	0.513	187.3

current retrofit
find cut sheet or reference

model numbers for cut sheets:

bath faucet	2.2 gpm	
	1.5 gpm	EPA WaterSense
	1.3 gpm	SFPUC Conservation Model
	1.0 gpm	*Niagara_**faucet**_aerator_N3210-SAW*
	0.5 gpm	Kohler K-15597-P-CP
toilets	1.6 gpf	
	1.28 gpf	Green Building Standard (2008)
	1.1 gpf	Kohler K-3519
kitchen faucet	2.2 gpm	
	1.5 gpm	1.5 *GPM* Niagara Dual-Spray *Kitchen* Aerator
	1.3 gpm	SFPUC Conservation Model
laundry (commercial)		
	40.9 gpl	SFPUC Conservation Model
	15 gpl	Maytag MAH21PD

laundry (private)		
	26 gpl	US Federal Standard (2011)
	17 gpl	SFPUC Conservation Model
	9.9 gpl	Asko
dishwasher		
	12.5 gpl	SFPUC Conservation Model
	9.6 gpl	
	4 gpl	
shower	2.5 gpm	CA Plumbing Code (2007)
	1.9 gpm	SFPUC Conservation Model
	1.75 gpm	EPA WaterSense
	1.5 gpm	

Parkmerced Existing Demand Backup documentation – June 25, 2009
Beth Goldstein, P.E. Hydroconsult Engineers, Inc.

EXISTING:

	POTABLE		NON-POTABLE		TOTAL	
	MG/yr	mgd	MG/yr	mgd	MG/yr	mgd
Residential (Indoor)	202	0.55	-	-	202	0.55
Non-Residential	-	-	-	-	-	-
Irrigation	58	0.16	-	-	0	0.16
	260	0.71	-	-	202	0.71

FULL BUILD-OUT: (previously reported)

	POTABLE		NON-POTABLE		TOTAL	
	MG/yr	mgd	MG/yr	mgd	MG/yr	mgd
Residential (Indoor)	272	0.74	50.1	0.14	322	0.88
Non-Residential	12	0.03	-	-	12	0.03
Irrigation	-	-	31	0.09	31	0.09
	284	0.78	82	0.22	365	1.00

FULL BUILD-OUT: (w/efficient fixtures)

	POTABLE		NON-POTABLE		TOTAL	
	MG/yr	mgd	MG/yr	mgd	MG/yr	mgd
Residential (Indoor)	227	0.62	85.6	0.23	313	0.86
Non-Residential	8	0.02	3.6	0.01	12	0.03
Irrigation	-	-	31	0.09	31	0.09
	236	0.65	121	0.33	356	0.98

Notes: Existing demands calculated from residential billing records 2006-7 and irrigation billing records 2005-2006.

Future non-potable demand includes toilet flushing in new units, all laundry, and all irrigation.

7. WATER SYSTEM

7.1 Existing System

7.1.1 Existing Water Supply

There are two existing sources of water supply serving Treasure Island. The primary supply is provided by the San Francisco Public Utilities Commission (SFPUC) through an existing 10-inch diameter steel pipe attached to the western span of the Bay Bridge. Water is pumped across the bridge by a pumping station located at 475 Spear Street in San Francisco. The station contains four pumps each rated at 900 gpm. The station can run a maximum of two pumps at a time for a maximum station output of 1,800 gpm.

The existing back up supply of water is provided by the East Bay Municipal Utility District (EBMUD) through a 12-inch diameter ductile iron main connected to an EBMUD water meter at Beach Street in Emeryville. From this location, water is delivered to a pump station located at Pier E23 of the existing Bay Bridge in Oakland. Water is then pumped through a 12-inch diameter steel pipe attached to the eastern span of the Bay Bridge. This water supply charges the fire hydrants on the Bridge and is connected to the existing water tanks on YBI for an emergency backup water supply. The maximum flow rate for this system is reported to be 1,500 gpm. There is currently an agreement in place between EBMUD and the Navy that limits the average annual flow 61 gallons per minute to maintain water quality in the line on the bridge. Actual average annual flows are well below that limit, at approximately 35 gpm.

7.1.2 Existing Water Storage

There are currently four existing concrete reservoirs on Yerba Buena Island that service both Yerba Buena Island and Treasure Island. Combined they have a total design capacity of approximately 6.5 million gallons to serve as both the potable and fire protection water supplies for Treasure Island and Yerba Buena Island. However, all of the tanks are in varying states of disrepair and cannot operate to their full design capacity. The actual operating storage capacity is approximately 1.9 million gallons with another 0.5 million gallons dedicated for fire protection. The design capacities, operating capacities, and operating elevations of the existing reservoirs are shown in Table 7.1.

Table 7.1 – Existing Reservoir Data

Reservoir Number	Design Capacity (million gallons)	Current Operating Capacity (million gallons)	Operating Elevation Range (NAVD88)	Primary Service
227	3.0	0.0	252.5 to 255.5	TI
162	2.0	1.3	322.0 to 327.0	YBI
168	0.5	0.5	356.0 to 359.0	Fire Reserve
242	1.0	0.6	247.0 to 251.0	TI/YBI

The elevations of the existing reservoirs provide an operating pressure of approximately 100-115 psi on TI and 80 psi on YBI (pressures at the higher areas of YBI are achieved with booster pumps).

The existing water storage tanks range in age from 60 to 85 years, and studies indicate that they are all in poor condition and will require either major rehabilitation or replacement.

7.1.3 Existing Water Distribution System

The original piping systems for a separate potable water and fire protection system for the Islands was constructed in 1939 out of copper, galvanized steel, and asbestos cement pipe. In 1990, the two systems were combined and the pipe material replaced with PVC pipe. Many of the individual building services and irrigation services originally constructed out of galvanized steel, however, have not been replaced. The relatively new PVC pipe system will be utilized on an interim basis during the initial phases of construction, but will eventually be replaced at the full build out of the project.

7.2 Proposed Domestic Water System

7.2.1 Proposed Water Demand

The estimated water demand for the proposed Land Use Plan is presented on Table 7.2. This estimate includes demand for the new development as well as the existing demand for the Department of Labor and the Coast Guard. The demand factors for the various facilities are indicated in the notes at the bottom of the table. The project will include the use of recycled water for irrigation and appropriate plumbing in the commercial use buildings. The potable demand factors included in Table 7.2 account for the use of water conserving fixtures in all buildings, the use of recycled water for toilet flushing and other non potable water uses in commercial buildings, and the use of recycled water for irrigation uses where appropriate. Recycled water demands are shown in Table 9.1 and 9.2A of Section 9, Recycled Water System.

As shown on Table 7.2, the average daily demand is estimated to be 1.08 millions gallons per day, or 753 gallons per minute (gpm). Because of the size of the proposed development, the relatively homogeneous use, and the use of recycled water for the irrigation needs, the project will use a maximum day demand factor of 1.2 times the average daily demand. Therefore, the maximum daily demand is 1.3 million gallons per day or 904 gpm.

The project will be designed to provide fire flow of 3,500 gallons per minute. This will be adequate to accommodate new construction. The existing Buildings 2 and 3 are designated to remain and will be retrofitted with appropriate supplemental fire protection systems when they are remodeled for commercial use. The fire protection systems designs for these structures will need to consider the building construction, use, and available fire flow.

7.2.2 Proposed Water Supply

7.2.2.1 Primary Water Supply

The existing SFPUC pump station in San Francisco and 10-inch line on the western span of the Bay Bridge is adequate to provide the required water supply to the project at full buildout and will continue to be the primary supply of water to Treasure Island. As with other water systems in the City, the SFPUC will need to monitor the condition of the pump station and supply line and perform routine maintenance and repairs to ensure reliable service to the islands.

7.2.2.2 Secondary Water Supply Source

The proposed secondary water supply to Treasure Island will continue to be from the EBMUD service in Oakland. Caltrans' construction of the new eastern span of the Bay Bridge, the Eastern Span Seismic Safety Project (ESSSP), is requiring modifications to the EBMUD service near the bridge abutment in Oakland and across the bridge. The new improvements will include:

- Relocation of the water main to the new Bay Bridge abutment.
- New pump station near the new bridge abutment in Oakland.
- New stub and shut off valve on YBI near column line XXX of the new bridge structure.

All of these items will be constructed as part of the ESSSP in cooperation with the SFPUC, and are not considered part of this project.

In addition to the secondary water source improvements associated with the new Bay Bridge project, the alignment of the secondary water source on YBI will be revised to as shown on Figure 7.1. The new alignment will follow North Gate Drive and Macalla Road to the new water tank locations.

The EBMUD back-up system will be capable of delivering approximately 1,800 gpm during emergency conditions. The system will continue to operate within the existing limit of 61 gallons per minute in average annual flow. This modest routine use is needed to maintain the water quality in the line across the Bay Bridge.

Table 7.2 Treasure Island Redevelopment Project Water Demand (8,000 Residential Units +100,000 sf office)

DESCRIPTION OF USE			POTABLE WATER DEMAND			RECYCLED WATER DEMAND	TOTAL WATER DEMAND	SEWER DEMAND	NOTES
Land Use	No.	Unit	Average Daily Demand (gpd)	Average Daily Demand (gpm)	Maximum Daily Demand (gpm) (Note 12)	Average Daily Demand (gpd)	Average Daily Demand (gpd)	Average Daily Demand (gpd)	
Residential	8,000	Units	932,000	647	777	30,000	962,000	885,400	1
Hotel	500	Rooms	132,500	92	110	3,500	136,000	129,375	2
Office	100,000	sf	7,000	5	6	3,500	10,500	10,150	3
Retail	140,000	sf	9,800	7	8	4,900	14,700	14,210	3
Adaptive Reuse, General	244,000	sf	17,080	12	14	8,540	25,620	24,766	3
Adaptive Reuse, Retail	67,000	sf	4,690	3	4	2,345	7,035	6,801	3
Open Space	300	ac	30,000	21	25	180,000	210,000	28,500	10
Miscellaneous Structures	75,000	sf	5,625	4	5	1,875	7,500	7,219	4
Marina	400	Slips	20,000	14	17	0	20,000	19,000	14
Treasure Island School	105,000	sf	21,000	15	18	0	21,000	19,950	7
Police/Fire	30,000	sf	4,000	3	3	2,000	6,000	5,800	6
Misc. Small Community Facilities	13,500	sf	945	1	1	473	1,418	1,370	3
Pier 1 Community Center	35,000	sf	2,450	2	2	1,225	3,675	3,553	3
TI Sailing Center	15,000	sf	1,050	1	1	525	1,575	1,523	3
Museum	75,000	sf	5,250	4	4	2,625	7,875	7,613	3
Department of Labor (DOL)	900	Rooms	111,542	77	93	0	111,542	105,965	8
Coast Guard Facility			17,000	12	14	0	17,000	16,150	9
Utility Facilities	14,000	sf	980	1	1	490	1,470	1,421	3
Urban Farm	20	ac	2,000	1	2	60,000	62,000	1,900	11
Totals			**1,324,912**	**920**	**1,104**	**301,998**	**1,626,910**	**1,290,664**	

Notes:

1 50 gallons per capita per day (gpcd), based on water conserving projections for 2030, based on 8000 units at 2.33 residents per dwelling unit. Population per dwelling unit based on City average from Demands Report Includes 30,000 gpd irrigation (CMG 8/7/09 spreadsheet)

2 Potable use based on 265 gpd/room; this includes all uses within the hotel. Recycled use based on 7 gallons recycled water per room per day (toilet flushing). Assumes no grounds for irrigation. Water demand based on AWWA standards.

3 Potable water demand based on 0.07 gpd/sf. Recycled water demand based on 0.375 gpd/sf. Reference : CCSF Retail Demands Rept Nov 2004

4 4 Allowance for misc. open space buildings not included elsewhere, including the YBI Historic Buildings, kiosks, warming hut, etc. Estimated potable use is based on 1 person per 200 SF, 20 gpcd total water use, minus 5 gpcd recycled water for toilets.

6 Potable use based on 400 persons per day at 15 gpcd total water use, minus recycled water use (toilets) at 5 gpcd

7 1 Student per 100 SF, 20 gpd per students

8 Value based on 2007 monthly demand provided by S. Larano, SFPUC.

9 Value provided by S. Larano, SFPUC.

10 Potable demand at 100 gpd/acre. Irrigation demand at 180,000 gpd for TI (CMG 8/7/09 spreadsheet).

11 Potable demand at 100 gpd/acre. Irrigation demand at 60,000 gpd (CMG 8/7/09 spreadsheet).

12 Maximum daily demand 120% of average daily demand

14 Based on 400 slips, day use only (no live aboard). 50 gpd per slip

7.2.3 Proposed Water Storage

The existing water tanks that serve YBI and TI are in poor condition and need major repair or replacement in order to serve the proposed project. To meet current SFPUC requirements, the Project will replace the existing water storage tanks in phases. The new water storage tanks will be sized to serve both the proposed new uses, as well as the existing uses that will remain.

The SFPUC water storage requirements for Treasure Island will be 2 days of maximum daily demand plus 4 hours of fire flow, or approximately 3.4 million gallons of storage.

The redundant water source from EBMUD provides an equal, compatible, and reliable back up water source to Treasure Island. If either SFPUC or EBMUD system is taken off line for maintenance, power interruptions, or damage due to earthquake, the other source will continue to supply 1,800 gpm, sufficient to meet the peak daily demands for the development. In the extremely unlikely event that both water supplies are taken down at the same time, then 2 days of maximum daily demand plus four 4 hours of fire storage should be sufficient to bridge the time for repairs or evacuation of the Island. It should also be noted that in such an event of extreme emergency, the consumption of potable water would likely be much lower than the calculated average demand shown in Table 7.2. Assuming reasonable reductions in retail, hotel, public and cultural uses that would naturally result following events of dire emergency the potable emergency demand would be significantly less than the average demand under normal conditions.

In addition to the normal operational storage requirements described above, the storage design will also need the ability to accommodate the maintenance of storage tanks. During maintenance, one tank, or portions of a tank, will need to taken out of service. During these regularly scheduled maintenance periods the SFPUC requires that the Treasure Island project maintain a minimum storage of 1 day maximum daily demand plus 4 hours of fire storage, or approximately 2.1 million gallons, at all times.

In order to meet the emergency and maintenance storage requirements, the water storage will be provided in two tanks. The existing 1.0 million gallon, circular, steel water storage tank adjacent to Macalla Road will be replaced with a new 1.0 million gallon, above grade, circular, steel water storage tank in the existing location. The remainder of the storage will be in a 2.4 million gallon water storage tank located at a higher elevation on YBI. Two locations are being considered for this tank as shown on Figure 7.2. The final location of this tank will be determined during the Master Planning phase of the project. The 2.4 million gallon tank will be divided into two 1.2 million gallon cells to accommodate maintenance and provide a minimum of 2.2 million gallons of storage at all times during maintenance. Together, the two tanks will provide 3.4 million gallons of storage. The final sizes, configuration and locations of the water storage tanks are described in more detail in the "Treasure Island and Yerba Buena Island Water Service Area Master Plan and Tank Siting Study" (Appendix E)

The upper storage tank (2.4 million gallons) will be supplied by water pumped directly from the 10-inch supply line from San Francisco, and the back up supply from EBMUD during emergencies. Supply to the lower, 1.0 million gallon tank will flow from the 2.4 million gallon tank by gravity. Because of the elevation of the 1.0 million gallon tank, it is likely that there will need to be a pressure reducing valve between the tank and the Treasure Island service area. The 2.4 million gallon tank is not high enough to provide service with adequate pressure to the upper portions of YBI. Fire flow and domestic demands to these YBI areas will be provided by an adjacent booster pump station with multiple pumps and emergency generator.

7.2.4 Proposed Domestic Water Distribution System

Through phased development of YBI and Treasure Island the existing PVC water distribution system will be replaced with a new ductile iron water system installed to SFPUC standards. Based on preliminary calculation, we anticipate that new water mains will range in size from 8 inches at minimum to a maximum size of 24 inches. A conceptual layout of the proposed domestic water distribution system is shown on Figure 7.1.

The California Code of Regulations, Title 22, requires that the water distribution system be capable of delivering the maximum daily demand coincident with the required fire flow. Based on the preliminary demand calculations described above, the proposed water system will be designed to deliver the maximum daily demand of 882 gpm along with the design fire flow of 3,500 gpm with a minimum residual pressure of 20 pounds per square inch to the fire hydrants on the Island.

7.3 Proposed Bay Water Auxiliary Water Supply System (AWSS)

Treasure Island and YBI do not currently have an AWSS system for fire protection. The project proposes to construct a new bay water AWSS system on TI as a backup fire protection system in the unlikely event of an extended total disruption of water supplies to Treasure Island. AWSS is not planned for Yerba Buena Island due to its steep topography, smaller size and development, and proximity to storage tanks and water supply lines on the Bay Bridge. The exact nature of the AWSS system is still being discussed with the San Francisco Fire Department (SFFD). It is expected that TI's AWSS may provide the following:

- A pump station with a salt-water intake pipe
- Two pipe manifolds for connection to fireboats
- Up to twenty-nine fire hydrants
- A main trunk pipe connecting the pump station, manifolds, and fire hydrants
- Three suction hydrants

The proposed bay water AWSS system discussed with TIDA, SFPUC and SFFD is shown on Figure 7.3. A brief description of the main elements of the AWSS system are as follows:

Pump Station and Intake Structure
The AWSS pump station and intake structure will be capable of continually charging the system and delivering 3,500 gpm of bay water at a maximum pressure of 125 psi. The pump station will include a diesel emergency power generator and additional pumps to provide redundancy during emergencies.

The water is drawn through a horizontal, large diameter draft tube (steel or concrete pipe) with a trash rack on the end to prevent uptake of debris. The draft tube connects to the vertical pump pit (precast concrete box or large diameter manhole), in which the pump intake pipe is located. A retractable fish screen may be included at the interface of the draft tube and the pump pit to prevent fish from entering into the pump system. Portions of the pump station will be contained in a pump house, for protection from weather and damage. See Figure 7.3.1.

Distribution Piping
A dedicated underground piping system will distribute the bay water within the developed areas of TI; dedicated bay water AWSS hydrants will be provided along the distribution route.

Fireboat Manifolds
The fireboat manifolds will be located near the ferry quay and near Pier 1. The manifolds will allow the fireboats to connect to the AWSS system and charge the lines in the unlikely event the pump station fails or additional flow/pressure is required in the system. When connected to the pipe manifold, the fireboat will draw salt water via its on-board pumps which may have a minor effect on the natural environment; this is assumed to be inherent to the operation of the fireboat and is beyond the scope of the AWSS.

Suction Hydrants
Three suction hydrants will be located around the perimeter of Treasure Island that will allow fire trucks to draft water directly from the Bay. Suction hydrants, also called Bay Suction connections, allow fire engines to draft water directly from the Bay. The hydrant is similar to typical fire hydrants, however there is no connection to a pressurized, piped water supply – the hydrant is connected to an intake pipe leading into the Bay. To prevent debris from entering the intake pipes, the end of the pipe may be fitted with a screen. See Figure 7.3.1.

Potential Bay Regulatory Issues
Construction and operation of the AWSS may potentially affect the Bay environment. Descriptions of the potential temporary and permanent effects on the environment, as well as ways in which those effects could possibly be reduced, are described below:

1. Temporary Construction Effects:
   Construction of the draft tube and suction hydrant pipes will require temporary shoreline excavation in the vicinity of the intakes, construction of temporary shoring,

and backfill/replacement of existing shoreline revetment. See Figure 7.3.2 – 4 for approximate areas of potential effect. Measures to reduce the possible temporary environmental effects of this work could include:

- Limit the amount of disturbed area below the mean high water mark as much as feasible.
- Prohibit the use of materials that may reduce water quality
- Follow erosion control plans to keep sediment from entering the Bay
- Follow site maintenance plans to eliminate construction debris from entering the Bay

2. Permanent Construction Effects
   The pump station draft tube and suction hydrant intake pipes will permanently extend through the shoreline revetment into the bay (below low water). This will be similar to other pipe penetrations through the shoreline for storm drain outfalls. Measures to reduce the possible permanent effects on the environmental from this work, could include:
   - Limit the amount of permanent improvements below the mean high water mark as much as feasible.
   - Prohibit the use of materials that may reduce water quality

3. AWSS Operational Effects
   The intake structures have the potential to create a vortex at the end of intakes (pump station draft tube and suction hydrant intake pipes) which could constitute a hazard at the water surface if not addressed. To prevent this, the end of the intakes could be enlarged or otherwise designed to prevent vortex formation.

a. There may be potential effects on fish during the regular testing of the AWSS system. The effect will depend largely on the anticipated usage of the AWSS, which will depend on the frequency and duration of scheduled tests of the system. For short-duration tests to verify the operational functionality of the system, measures – such as fish screens – to prevent fish uptake may not be necessary. If fish screens are required, the affect on fish in the Bay will depend on the design of the fish screen in accordance with the following parameters:
   - Size of openings (based on species and size of fish to be protected);
   - Porosity (percent open area of screen face);
   - Approach velocity (perpendicular to screen face);
   - Sweeping velocity (parallel to screen face).

   In the event that the AWSS is operated to suppress actual fires, the system will be used for a longer duration than that used for periodic testing; consequently, the effect on the environment could be greater. However, it is assumed that any effects that occur as a result of an actual emergency will be acceptable as a unique, singular event, and that the emergency needs will govern.

The final designs for the AWSS intake structures will be submitted to the appropriate agencies for review and approval prior to construction. The permitting agencies will include the Bay Conservation and Development Commission (BCDC), Army Corps of Engineers, Regional Water Quality Control Board, California Department of Fish and Game, and United States Fish and Wildlife Service.

7.4 Phases for Water System Construction

The new water infrastructure to support development of the project will be installed in phases to match development of the project. The existing land uses on Treasure Island will continue to utilize the existing water distribution system with temporary connections to the new system and temporary water infrastructure where required to maintain the existing uses until they are demolished or permanent connections can be made. Water storage will be brought on-line as required to support the water demands of the project as it develops.

7.5 Master Utility System Plans and Master Fire Protection Plan

A Water System Master Plan will be prepared in coordination with the SFPUC and the SFFD during the development of the DDA. The Water System Master Plan will include detailed calculation to size pipes, domestic water system layout, proposed water tank locations and project phasing. The Master Plan is not expected to substantially change the supply, storage and distribution of water described here.

7.6 Sustainability Goals

The construction of the secondary water source from EBMUD, combined with the reconstruction of the entire water storage and delivery system on Yerba Buena and Treasure Islands will provide a robust water supply to sustain and protect the island community. This new system combined with water conserving fixtures within the new buildings, and the maximum feasible use of recycled water for the landscape areas and commercial buildings within the core development area (see below) will meet, or exceed, the goals described in the Sustainability Plan.

May 25, 2010

Ms. Jessica Viramontes
Christopher A. Joseph & Associates
115 Sansome Street, Suite 1002
San Francisco, CA 94104

RE: San Francisco Housing Element Update EIR – Responses to Wastewater Service Questions

Dear Ms. Viramontes:

Thank you for your wastewater services inquiries related to the San Francisco Housing Element EIR on behalf of the San Francisco Planning Department. Please find below our responses to your questions.

1. Q: *Are there any existing sewer service problems/ deficiencies in the City? If so please describe.*

   R: The existing City sewer system is operational and all discharges, treatment plants, combined sewer discharges and outfalls are currently in full compliance with permit requirements. As such, the system is currently considered to be without deficiencies. However, the existing system is facing certain challenges, including 1) aging infrastructure (structural integrity and seismic reliability), 2) readiness for climate change (e.g. rising sea levels, changes in storm intensity and frequency), 3) operational efficiency related to changes in land use conditions, subsidence and reduction in pipe capacity, and 4) public nuisances and safety hazards related to flood and order control. Many elements of the system, though currently functional, are reaching the end of their useful life and will need to be replaced or repaired to maintain a high level of service.

   To address these concerns, the SFPUC is currently developing a capital improvement plan, the Sewer System Improvement Program (SSIP). The SSIP will assess the current and future needs of sewer system of the City of San Francisco. Development of the SSIP was initiated in 2005, with public input (collected through meetings, home mailings, and the SFPUC website) central to its development. The SSIP will propose a long-term vision for improvement of the sewer system and for sustainable sewer system management. Specifically, it will propose the replacement of the sewers and related facilities, and make other recommendations to address the system challenges noted above.

2. Q: *If sewer service problems/ deficiencies exist, how would they affect the proposed project, and how would you suggest those effects be mitigated?*

   R: Affects on the proposed project are not be anticipated, as the existing sewer system is considered functional to meet current needs. Further, per the SFPUC's understanding, the proposed project does not propose any specific development or planned growth that requires analysis relative to the existing sewer system capacity.

3. Q: *Would the San Francisco Public Utilities Commission (SFPUC) be able to accommodate the proposed project's demand for sewer service with the existing infrastructure in the City? If not, what new infrastructure or upgrades to infrastructure would be needed to meet the proposed project's demand for sewer service?*

   R: As noted above, it is the SFPUC's understanding that the proposed project as described does not include an increased demand for sewer service. While the Existing Capacity section of the Project Description discusses the potential for an increase in housing to be developed under existing and updated zoning regimes, no specific growth is proposed as a part of the San Francisco Housing Element Update EIR. Rather, the project proposes housing policies, objectives, and strategies. To analyze whether the sewer system could accommodate housing development(s), the SFPUC would need to analyze available capacity of the system relative to the specific location and residential unit increase associated with the development.

4. Q: *Which treatment plants(s) serve the City?*

   Three wastewater treatment plans serve the City of San Francisco: the Southeast Wastewater Treatment Plant, the North Point Facility, and the Oceanside Wastewater Treatment Plant.

   The Southeast Wastewater Treatment Plant was built in 1952 and expanded several times subsequently. The plant is located on Phelps Street near Evans Avenue in the Bayview District. The Plant is an oxygen-activated sludge plant that provides secondary treatment for the wastewater from the east side of San Francisco (Bayside Watershed) plus some flow from other agencies. The Southeast Plant treats approximately 80 percent of the City's total wastewater flow. Treated wastewater is discharged out a 900-foot-long pipe from the Plant into the San Francisco Bay.

   The North Point Facility is a primary treatment plant for wet-weather flows from the northeast portion of the Bayside Watershed. The North Point Facility has been in operation since 1951. It is located on Bay Street in lower Telegraph Hill and the North Waterfront. The facility provides primary-level treatment of wastewater collected in the north part of the City during rainstorms. Treated wastewater is discharged from the Plant through a pipe 900 feet into the San Francisco Bay.

   Oceanside Water Pollution Control Plant was built in 1993, and is located off Great Highway near the San Francisco Zoo, and serves the west side of the City. Treated wastewater is discharged from the Plant via a 4.5 mile pipeline in the Pacific Ocean.

5. Q: *What are the current designed treatment capacity and current peak flow of sewage at the plant(s)?*

   When the three treatment facilities and all pump stations and transport and storage structures are operating at capacity, the sewer system can treat up to 575 mgd of combined wastewater and stormwater, with 193 mgd receiving secondary treatment, 272 mgd receiving primary treatment, and 110 mgd receiving decant treatment.

The Southeast Wastewater Plant has a current daily average dry-weather flow of approximately 67 mgd. During wet weather, the SEP wet- weather facilities can provide full secondary treatment for up to 150 mgd and primary treatment for an additional 100 mgd of combined wastewater flow for a total wet-weather flow rate of 250 mgd.

The North Point Facility has a peak hourly treatment capacity of 150 mgd. On average it operates 30 times per year treating an annual average total flow of 0.7 billion gallons.

The Oceanside Wastewater Treatment Plant was designed for an average dry-weather flow of 21 mgd and currently treats approximately 16 mgd. It has a peak dry-weather flow capacity of 43 mgd and can treat up to 65 mgd during wet weather periods.

6. Q: *Would the SFPUC be able to accommodate the proposed projects demand for sewer service with the existing capacity of the treatment plant(s)?*

   R: As noted above, the project description provided did not discuss projected demands in terms of specific projects/developments, but rather describes potential for growth in the City. Therefore, the SFPUC is not able to make a determination as to whether or not its sewer system could accommodate the potential growth discussed. A developer or customer requesting a new connection to the system or requiring additional collection or a change in capacity would need to complete a permit application ("Water and Wastewater Capacity Charge Checklist") and submit to the Department of Building Inspection Central Permit Bureau for review and approval.

7. Q: *What sewage generation rates does SFPUC use for different types of residential development? (e.g., single-family residential development, multi-family residential development)?*

   Wastewater rates are described in the publication, *Rate Schedules for Water Service and Wastewater Service*. Enclosed is a copy of the booklet, which is also published on the SFPUC website at the following location: http://sfwater.org/Files/FactSheets/RateSchedBooklet_0609_v4.pdf.

8. Q: *How does your agency address the growing demand for sewer services?*

   As noted above in the response to Question 1, the SFPUC is currently developing a Sewer System Master Plan to address anticipated infrastructure issues, to meet anticipated regulatory requirements, as well as to accommodate planned growth. Projections for sewer service demand were assessed to 2030 to determine future population, flows, and loads based on 1) population information provided by the Association of Bay Area Governments and accepted by San Francisco's Planning Department; 2) flows projected by the SFPUC based on water usage within the city; and 3) flows projected by the outside agencies that are discharging into San Francisco's sewer system based on agreements made with the U.S. EPA during the grants programs of the 1970s and 1980s.

9. Q: *Please provide any recommendations that might reduce any potential sewer distribution and treatment impacts associated with the proposed project.*

   Please refer to the *San Francisco Stormwater Design Guidelines*, published by the SFPUC and the Port of San Francisco in November 2009, for recommendations on reducing potential impacts of development on the sewer system. The guidelines can be found on the SFPUC website at the following location: http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/361/MTO_ID/543

Thank you for your interest, and please let me know if any further information is required for your analysis.

Best Regards,

Marla A. Jurosek, Manager
Planning & Regulatory Compliance Division
Wastewater Enterprise

cc: T. Moala
J. Loiacono
K. Kubick
J. Roddy

Appendix H-3

Service Response Letter from Recology

SAN FRANCISCO HOUSING ELEMENT UPDATE EIR
Solid Waste Service Information

Response to October 7, 2009 questions from Christopher A. Joseph & Associates:

1. Collection services are provided by Recology Sunset Scavenger and Recology Golden Gate. Recycling and transfer services are provided by Recology San Francisco.

2. Additional collection trucks and personnel would be required to provide services to the project. The project may possibly add further strain to space-constrained corporation yards and waste processing and recycling facilities. Additional trucks require additional space to park. At some increment of additional trucks, additional bays are needed at vehicle maintenance facilities. The additional tonnage generated by the project increases throughput at the waste processing and recycling facilities. At some increment of additional tonnage, additional processing lines are needed at waste processing and recycling facilities.

   Ultimately, the impacts on solid waste services depend on the magnitude of increased demand on the system, which in turn depends on how much and what type of housing is added to the City. It may be noted that multi-family housing is significantly more challenging with regard to successful separation of recyclables and compostables than it is at single-family residences. As a consequence, multi-family housing generally places greater demands on waste processing and recycling infrastructure.

3. Wastes are currently disposed of at the Altamont landfill in Alameda County. The remaining capacity in the disposal contract is about 2,000,000 tons. The City is in the process of contracting for 5,000,000 tons of additional disposal capacity with another service provider for the period after conclusion of the Altamont contract.

4. Recology San Francisco operates the transfer station and recycling facilities serving the City.

5. Yes, existing landfills are able to accommodate the proposed project's demands.

6. We recommend utilization of existing City programs.

7. We do not have any waste generation rates that we use. Service is established in conformance with the City's laws, programs, and minimum service requirements. Service volume is adjusted in keeping with customers' needs.

8. Additional land and larger waste processing and recycling facilities are needed to achieve the City's goal of zero waste. Operations are currently space-constrained, so additional tonnage handled and additional requirements for vehicles, as a consequence of the proposed project, only add to the challenge.

9. Require provision of adequate space, conveniently located, for refuse, recycling, and composting containers. If chutes are installed in buildings, require three separate chutes to accommodate refuse, recycling, and composting streams.

Appendix H-4

Service Response Letter from San Francisco Fire Department

From: Barbara Schultheis
To: Jessica Viramontes;
cc: Patrick Gardner; Michael I Thompson;
Gary Massetani;
Subject: SF Housing Element Service Request
Date: Monday, November 09, 2009 3:57:22 PM
Attachments: Fire Station Staffing.xls
Ambulance Response Times.xls
fireflow and hydrant requirements.pdf

Dear Jessica:

SFFD's responses to your inquiry:

1. We have adequate staffing to meet the City's current demand for Fire Service. The table is attached. Where the table specifies 1:3, this signifies one officer and 3 firefighters per shift (engines), 1:4, one officer and 4 firefighters per shift (trucks).

(See attached file: Fire Station Staffing.xls)

2. See the attachment above for firefighting equipment inventories. There are additional specialized firefighting apparatus located at various firehouses. If you want that information, please let me know and I will get it to you. The ambulance information is on the attached schedule.
(See attached file: Ambulance Response Times.xls)

3. See both of the above attachments for the information on response times. For each table, the columns represent the following: The station number, the total number of responses, the average response time, and the standard deviation. The only goal that is not met is that of the EMS service response time at Treasure Island.

4. The proposed project will ultimately result in the expansion of existing or the construction of new fire stations. Current expansion plans include the construction of three new fire facilities in within the next ten years: Hunter's Point station, Mission Bay station, and Yerba Buena Island station. Those facilities were designated as part of a previous housing development plan, to meet the fire service needs of a larger population. As development ensues the fire department will constantly be analyzing and evaluating housing levels, occupant load, response times, and other operational objectives in able to insure adequate fire protection. Given the "phased in " components of the housing general plan, fire department staffing and deployment will be under constant re-evaluation as

needs and situations dictate.

5. The fireflow and hydrant requirements are as specified in the California Fire Code. The vary depending on the number of units in the building and the type of construction. See the appropriate code sections which are attached for your convenience.
(See attached file: fireflow and hydrant requirements.pdf)

6. As demand for fire department facilities grows, the fire department grows. As part of a general plan for urban development, the fire department becomes involved in early stage in discussions that will allow for an assessment of necessary emergency services. These discussions include, but are not limited to: building type and height; building construction; occupancy type and load; proximity to other emergency services; topographical challenges; ingress/egress concerns; and so on. Results of these discussions guide policy recommendations for future fire facilities, types of apparatus utilized, and proposed staffing levels at each facility.

7. Recommendation: involve the fire department early and often in the master plan for housing. Fire department concerns include: access for fire department emergency response crews and vehicles (bulb outs, blisters, one ways, traffic calming all significantly negatively impact fire response); response times becoming altered by proposed street changes and detours; hydrant and under ground fire pipeline access, placement, loss of service, and repairs, etc.

The above info was gathered by ADC Michael Thompson (Support Services Chief), Michelle Mallick (Planning and Research), and myself. If you have further questions, please let me know.

Barbara Schultheis
Fire Marshal
San Francisco Fire Department
698 2nd St.
San Francisco, CA 94107
(415) 558-3320 ph.
(415) 558-3322 fax

Station Area	N	Average	Stdev	Staffing						
City Wide	43,356	0:03:23	0:01:34	Engine	Truck	Rescue Squad	Battalion Chief	Division Chief	Rescue Captain	Fire Boat
1	6,875	0:03:20	0:01:44	1:3	1:4	1:3				
2	709	0:03:05	0:01:19	1:3	1:4		1			
3	4,239	0:03:04	0:01:27	1:3	1:4					
5	1,363	0:02:46	0:01:07	1:3	1:4			1		
6	1,466	0:02:56	0:01:15	1:3	1:4					
7	2,561	0:03:04	0:01:23	1:3	1:4	1:3		1		
8	1,297	0:03:32	0:01:24	1:3	1:4		1			
9	396	0:03:39	0:01:31	1:3	1:4		1			
10	808	0:03:22	0:01:39	1:3	1:4					
11	976	0:03:04	0:01:26	1:3	1:4		1		1	
12	634	0:03:17	0:01:30	1:3	1:4					
13	1,089	0:03:15	0:01:28	1:3	1:4				1	
14	562	0:03:19	0:01:37	1:3	1:4					
15	789	0:03:33	0:01:19	1:3	1:4		1			
16	688	0:03:23	0:01:32	1:3	1:4					
17	1,317	0:03:33	0:01:14	1:3	1:4					
18	640	0:04:08	0:02:51	1:3	1:4					
19	677	0:04:15	0:01:50	1:3	1:4					
20	200	0:03:50	0:01:45	1:3						
21	922	0:03:04	0:01:09	1:3			1			
22	656	0:03:31	0:01:16	1:3						
23	506	0:03:41	0:01:24	1:3						
24	217	0:03:52	0:01:29	1:3						
25	376	0:03:42	0:02:17	1:3						
26	289	0:04:02	0:01:51	1:3						
28	971	0:03:21	0:01:21	1:3						
29	549	0:03:14	0:01:15	1:3						
31	808	0:03:21	0:01:25	1:3			1		1	
32	778	0:03:55	0:01:40	1:3						
33	822	0:04:01	0:01:26	1:3						
34	469	0:03:49	0:01:30	1:3						
35	518	0:03:50	0:01:37	1:3						1
36	2,240	0:03:18	0:01:18	1:3			1			
37	404	0:03:14	0:01:08	1:3						
38	778	0:03:04	0:01:13	1:3			1			
39	341	0:03:52	0:01:27	1:3						
40	529	0:03:28	0:01:08	1:3			1			
41	1,022	0:02:54	0:01:16	1:3						
42	733	0:03:42	0:01:38	1:3						
43	1,184	0:03:50	0:01:26	1:3					1	
44	647	0:04:27	0:01:31	1:3						
48	195	0:04:45	0:03:27	1:3	1:4					

Time Period: 11/9/08 - 11/8/09

Transport Units

Station Area	N	Average	Stdev
City Wide	37,378	0:05:20	0:02:57
1	6,173	0:04:20	0:02:31
2	586	0:05:22	0:03:03
3	3,716	0:04:13	0:02:16
5	1,133	0:05:24	0:02:26
6	1,254	0:04:30	0:02:40
7	2,266	0:04:30	0:02:34
8	1,141	0:05:19	0:02:35
9	333	0:05:39	0:02:47
10	625	0:05:17	0:03:02
11	844	0:04:40	0:02:24
12	512	0:05:46	0:02:55
13	931	0:05:21	0:02:42
14	481	0:06:21	0:03:09
15	689	0:05:33	0:02:57
16	550	0:05:49	0:03:06
17	1,167	0:05:42	0:02:52
18	564	0:06:54	0:03:44
19	597	0:06:45	0:03:28
20	165	0:07:05	0:03:22
21	749	0:05:31	0:02:38
22	556	0:05:42	0:02:52
23	409	0:07:26	0:03:00
24	186	0:06:17	0:02:36
25	337	0:05:41	0:02:33
26	265	0:07:29	0:02:57
28	783	0:06:05	0:02:50
29	467	0:05:13	0:02:36
31	664	0:05:22	0:03:00
32	684	0:06:43	0:02:41
33	716	0:07:20	0:03:02
34	372	0:07:30	0:02:57
35	458	0:05:31	0:02:45
36	1,920	0:04:33	0:02:20
37	351	0:06:03	0:02:25
38	621	0:05:01	0:03:26
39	300	0:06:44	0:02:55
40	460	0:05:58	0:02:43
41	851	0:04:15	0:02:28
42	636	0:06:59	0:02:54
43	1,023	0:07:06	0:02:47
44	561	0:08:00	0:03:08

** Ambulances are staff*

** The Goal for Transport Units for a code*

* On Average the Transport Units arrives o

* Note Station 48 is s

48	169	0:11:52	0:04:40

Time Period: 11/9/08 - 11/8/09

** The SFFD has a Dynamically Deployed Ambulance System*

ed to meet the demand of the city. The Total number of Ambulances vary throughout day

3 potentially life threatening incident is to arrive on scene from the time of dispatch to scene i

n scene from the time of dispatch for each station area within the desired performance standa

lightly over the goal; This is due to the fact that Station 48 is located at Treasure Island

n 10 minutes.
ɩrd of the SFFD.

SECTION 505
PREMISES IDENTIFICATION

505.1 Address numbers. New and existing buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numerals or alphabet letters. Numbers shall be a minimum of 4 inches (102 mm) high with a minimum stroke width of 0.5 inch (12.7 mm).

505.2 Street or road signs. Streets and roads shall be identified with approved signs. Temporary signs shall be installed at each street intersection when construction of new roadways allows passage by vehicles. Signs shall be of an approved size, weather resistant and be maintained until replaced by permanent signs.

SECTION 506
KEY BOXES

506.1 Where required. Where access to or within a structure or an area is restricted because of secured openings or where immediate access is necessary for life-saving or fire-fighting purposes, the fire code official is authorized to require a key box to be installed in an approved location. The key box shall be of an approved type and shall contain keys to gain necessary access as required by the fire code official.

506.1.1 Locks. An approved lock shall be installed on gates or similar barriers when required by the fire code official.

506.2 Key box maintenance. The operator of the building shall immediately notify the fire code official and provide the new key when a lock is changed or rekeyed. The key to such lock shall be secured in the key box.

SECTION 507
HAZARDS TO FIRE FIGHTERS

507.1 Trapdoors to be closed. Trapdoors and scuttle covers, other than those that are within a dwelling unit or automatically operated, shall be kept closed at all times except when in use.

507.2 Shaftway markings. Vertical shafts shall be identified as required by this section.

507.2.1 Exterior access to shaftways. Outside openings accessible to the fire department and which open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

507.2.2 Interior access to shaftways. Door or window openings to a hoistway or shaftway from the interior of the building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible.

Exception: Marking shall not be required on shaftway openings which are readily discernible as openings onto a shaftway by the construction or arrangement.

507.3 Pitfalls. The intentional design or alteration of buildings to disable, injure, maim or kill intruders is prohibited. No person shall install and use firearms, sharp or pointed objects, razor wire, explosives, flammable or combustible liquid containers, or dispensers containing highly toxic, toxic, irritant or other hazardous materials in a manner which may passively or actively disable, injure, maim or kill a fire fighter who forcibly enters a building for the purpose of controlling or extinguishing a fire, rescuing trapped occupants or rendering other emergency assistance.

SECTION 508
FIRE PROTECTION WATER SUPPLIES

508.1 Required water supply. An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction.

508.2 Type of water supply. A water supply shall consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow.

508.2.1 Private fire service mains. Private fire service mains and appurtenances shall be installed in accordance with NFPA 24.

508.2.2 Water tanks. Water tanks for private fire protection shall be installed in accordance with NFPA 22.

508.3 Fire flow. Fire flow requirements for buildings or portions of buildings and facilities shall be determined by an approved method *or Appendix B.*

508.4 Water supply test. The fire code official shall be notified prior to the water supply test. Water supply tests shall be witnessed by the fire code official or approved documentation of the test shall be provided to the fire code official prior to final approval of the water supply system.

508.5 Fire hydrant systems. Fire hydrant systems shall comply with Sections 508.5.1 through 508.5.6 *and Appendix C or by an approved method.*

508.5.1 Where required. Where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 400 feet (122 m) from a hydrant on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains shall be provided where required by the fire code official.

Exceptions:

1. For Group R-3 and Group U occupancies, the distance requirement shall be 600 feet (183 m).

2. For buildings equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the distance requirement shall be 600 feet (183 m).

508.5.2 Inspection, testing and maintenance. Fire hydrant systems shall be subject to periodic tests as required by the fire code official. Fire hydrant systems shall be maintained in an operative condition at all times and shall be repaired where defective. Additions, repairs, alterations and servicing shall comply with approved standards.

508.5.3 Private fire service mains and water tanks. Private fire service mains and water tanks shall be periodically inspected, tested and maintained in accordance with *Title 19 California Code of Regulations Chapter 5.*

508.5.4 Obstruction. Posts, fences, vehicles, growth, trash, storage and other materials or objects shall not be placed or kept near fire hydrants, fire department inlet connections or fire protection system control valves in a manner that would prevent such equipment or fire hydrants from being immediately discernible. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment or fire hydrants.

508.5.5 Clear space around hydrants. A 3-foot (914 mm) clear space shall be maintained around the circumference of fire hydrants except as otherwise required or approved.

508.5.6 Physical protection. Where fire hydrants are subject to impact by a motor vehicle, guard posts or other approved means shall comply with Section 312.

SECTION 509 FIRE COMMAND CENTER

509.1 Features. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *California Building Code and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access,* a fire command center for fire department operations shall be provided. The location and accessibility of the fire command center shall be approved by the fire department. The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 706 of the *California Building Code* or horizontal assembly constructed in accordance with Section 711 of the *California Building Code,* or both. The room shall be a minimum of 96 square feet (9 m^2) with a minimum dimension of 8 feet (2438 mm). A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation. The fire command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system unit.
2. The fire department communications system.
3. Fire-detection and alarm system annunciator system.
4. Annunciator visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air-handling systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment and fire department access.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. *Fire command centers shall not be used for the housing of any boiler, heating unit, generator, combustible storage, or similar hazardous equipment or storage.*

SECTION 510 FIRE DEPARTMENT ACCESS TO EQUIPMENT

510.1 Identification. Fire protection equipment shall be identified in an approved manner. Rooms containing controls for air-conditioning systems, sprinkler risers and valves, or other fire detection, suppression or control elements shall be identified for the use of the fire department. Approved signs required to identify fire protection equipment and equipment location, shall be constructed of durable materials, permanently installed and readily visible.

APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

SECTION B101 GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

SECTION B102 DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE-FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m^2), used to determine the required fire flow.

SECTION B103 MODIFICATIONS

B103.1 Decreases. The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

B103.2 Increases. The fire chief is authorized to increase the fire-flow requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall not be more than twice that required for the building under consideration.

B103.3 Areas without water supply systems. For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the fire code official is authorized to utilize NFPA 1142 or the *International Wildland-Urban Interface Code.*

SECTION B104 FIRE-FLOW CALCULATION AREA

B104.1 General. The fire-flow calculation area shall be the total floor area of all floor levels within the exterior walls, and under the horizontal projections of the roof of a building, except as modified in Section B104.3.

B104.2 Area separation. Portions of buildings which are separated by fire walls without openings, constructed in accordance with the *California Building Code,* are allowed to be considered as separate fire-flow calculation areas.

B104.3 Type IA and Type IB construction. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

> **Exception:** Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

SECTION B105 FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings. The minimum fire-flow requirements for one- and two-family dwellings having a fire-flow calculation area which does not exceed 3,600 square feet (344.5 m^2) shall be 1,000 gallons per minute (3785.4 L/min). Fire-flow and flow duration for dwellings having a fire-flow calculation area in excess of 3,600 square feet (344.5 m^2) shall not be less than that specified in Table B105.1.

> **Exception:** A reduction in required fire flow of 50 percent, as approved, is allowed when the building is provided with an approved automatic sprinkler system.

B105.2 Buildings other than one- and two-family dwellings. The minimum fire-flow and flow duration for buildings other than one- and two-family dwellings shall be as specified in Table B105.1.

> **Exception:** A reduction in required fire-flow of up to 75 percent, as approved, is allowed when the building is provided with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. The resulting fire-flow shall not be less than 1,500 gallons per minute (5678 L/min) for the prescribed duration as specified in Table B105.1.

SECTION B106 REFERENCED STANDARDS

	CBC-07	California Building Code	B104.2, Table B105.1
ICC	IWUIC-06	International Wildland-Urban Interface Code	B103.3
NFPA	1142-01	Standard on Water Supplies for Suburban and Rural Fire Fighting	B103.3

TABLE B105.1
MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS[a]

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[c]	FLOW DURATION (hours)
Type IA and IB[b]	Type IIA and IIIA[b]	Type IV and V-A[b]	Type IIB and IIIB[b]	Type V-B[b]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.
a. The minimum required fire flow shall be allowed to be reduced by 25 percent for Group R.
b. Types of construction are based on the *California Building Code*.
c. Measured at 20 psi.

APPENDIX C

FIRE HYDRANT LOCATIONS AND DISTRIBUTION

SECTION C101
GENERAL

C101.1 Scope. Fire hydrants shall be provided in accordance with this appendix for the protection of buildings, or portions of buildings, hereafter constructed.

SECTION C102
LOCATION

C102.1 Fire hydrant locations. Fire hydrants shall be provided along required fire apparatus access roads and adjacent public streets.

SECTION C103
NUMBER OF FIRE HYDRANTS

C103.1 Fire hydrants available. The minimum number of fire hydrants available to a building shall not be less than that listed in Table C105.1. The number of fire hydrants available to a complex or subdivision shall not be less than that determined by spacing requirements listed in Table C105.1 when applied to fire apparatus access roads and perimeter public streets from which fire operations could be conducted.

SECTION C104
CONSIDERATION OF EXISTING FIRE HYDRANTS

C104.1 Existing fire hydrants. Existing fire hydrants on public streets are allowed to be considered as available. Existing fire hydrants on adjacent properties shall not be considered available unless fire apparatus access roads extend between properties and easements are established to prevent obstruction of such roads.

SECTION C105
DISTRIBUTION OF FIRE HYDRANTS

C105.1 Hydrant spacing. The average spacing between fire hydrants shall not exceed that listed in Table C105.1.

> **Exception:** The fire chief is authorized to accept a deficiency of up to 10 percent where existing fire hydrants provide all or a portion of the required fire hydrant service.

Regardless of the average spacing, fire hydrants shall be located such that all points on streets and access roads adjacent to a building are within the distances listed in Table C105.1.

TABLE C105.1
NUMBER AND DISTRIBUTION OF FIRE HYDRANTS

FIRE-FLOW REQUIREMENT (gpm)	MINIMUM NUMBER OF HYDRANTS	AVERAGE SPACING BETWEEN HYDRANTS[a, b, c] (feet)	MAXIMUM DISTANCE FROM ANY POINT ON STREET OR ROAD FRONTAGE TO A HYDRANT[d]
1,750 or less	1	500	250
2,000-2,250	2	450	225
2,500	3	450	225
3,000	3	400	225
3,500-4,000	4	350	210
4,500-5,000	5	300	180
5,500	6	300	180
6,000	6	250	150
6,500-7,000	7	250	150
7,500 or more	8 or more[e]	200	120

For SI: 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

a. Reduce by 100 feet for dead-end streets or roads.

b. Where streets are provided with median dividers which can be crossed by fire fighters pulling hose lines, or where arterial streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, hydrant spacing shall average 500 feet on each side of the street and be arranged on an alternating basis up to a fire-flow requirement of 7,000 gallons per minute and 400 feet for higher fire-flow requirements.

c. Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.

d. Reduce by 50 feet for dead-end streets or roads.

e. One hydrant for each 1,000 gallons per minute or fraction thereof.

Appendix H-5

Service Response Letter from San Francisco Police Department

Response to request for information

Requestor: Christopher A. Joseph and Associates (CAJA)

1. What are the City's Crime Statistics for the current year and the previous two years?

   See attached : Part I Crimes Calendar Year Totals and COMPSTAT profile cover pages YTD

2. What are the average response times for each police station in the City?

   See attached data from the current COMPSTAT profile

3. Does the SFPD have a response time goal?

   Yes; the goals currently set in the Performance Metrics are:

   The goal for Priority A Calls is 240 seconds

   The goal for Priority B Calls is 450 seconds

   The goal for Priority C Calls is 600 seconds

4. Does each station's response time meet the desired performance standard of the SFPD? There is some variation – see attached data from the current COMPSTAT profile

5. What is the officer to citizen ratio for each police station in the City? Not Available

6. Does the SFPD have an officer to citizen ratio goal? Not at this time.

7. If so, what is it? N/A

Prepared January 25, 2010 by Crime Analysis Unit of COMPSTAT Division

San Francisco Police Department

Select Crime Rates

2008 and 2009

Select Crime Rates

2008

(Based on Population of 829,848)

	Cases Reported	Per 100,000 Population
Homicide	98	**11.81**
Auto theft	5,230	**630.24**
Other Theft	25142	**3029.71**
Agg Assault	2,372	**285.84**
Simple Assault	5,130	**618.19**
Rape	166	**20.00**
Narcotics*	7,073	**852.32**

	2008 Per 100,000 Population	2009 Per 100,000 Population	Change in Rate
Homicide	11.81	5.34	**-54.8%**
Auto theft	630.24	583.06	**-7.5%**
Other Theft	3029.71	2895.59	**-4.4%**
Agg Assault	285.84	274.14	**-4.1%**
Simple Assault	618.19	590.89	**-4.4%**
Rape	20.00	21.24	**6.2%**
Narcotics*	852.32	888.53	**4.2%**

Select Crime Rates

2009

(Based on Population of 842,625)

	Cases Reported	Per 100,000 Population
Homicide	45	**5.34**
Auto theft	4,913	**583.06**
Other Theft	24,399	**2895.59**
Agg Assault	2,310	**274.14**
Simple Assault	4,979	**590.89**
Rape	179	**21.24**
Narcotics*	7,487	**888.53**

2008	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Homicide	8	7	13	9	8	7	7	8	16	9	5	1	**98**
Auto theft	489	422	534	530	444	419	466	468	542	15	428	473	**5230**
Other Theft	2,151	1863	2140	2299	2153	1941	1991	2228	2124	2461	1938	1853	**25142**
Agg Assault	208	172	226	178	202	215	193	199	214	212	187	166	**2372**
Simple Assault	457	390	453	371	496	428	366	452	443	476	398	400	**5130**
Rape	10	16	25	10	13	13	22	14	12	15	10	6	**166**
Narcotics*													**7073**

2009	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Homicide	5	3	2	5	4	5	5	3	4	3	5	1	**45**
Auto theft	506	384	450	381	351	357	458	414	442	300	489	381	**4913**
Other Theft	1,825	1717	2053	1967	2074	1685	2148	2056	2411	2602	1852	2009	**24399**
Agg Assault	181	154	180	191	214	185	190	210	182	240	208	175	**2310**
Simple Assault	389	359	427	422	482	410	339	425	469	510	412	335	**4979**
Rape	15	13	12	13	17	12	12	17	16	21	17	14	**179**
Narcotics*													**7487**

* Narcotics include marijuana, opiates, dangerous drugs, and other drugs

Source:

Homicide: SFPD Homicide Detail

Rape: SFPD Sex Crimes Detail

Drugs: CABLE report PCA664C

All other: CABLE report POL0216E

Population: California Department of Finance

RESPONSE TIME			
Average Citizen Response Times Year-to-Date			
	01/01/10 TO 01/16/10		
	A Priority	B Priority	C Priority
City	03:35	07:19	10:30

RESPONSE TIME			
Average Citizen Response Times Year-to-Date			
	01/01/10 TO 01/16/10		
	A Priority	B Priority	C Priority
Central	03:40	07:58	08:43
City	03:35	07:19	10:30

RESPONSE TIME			
Average Citizen Response Times Year-to-Date			
	01/01/10 TO 01/16/10		
	A Priority	B Priority	C Priority
Southern	03:32	07:46	09:50
City	03:35	07:19	10:30

RESPONSE TIME			
Average Citizen Response Times Year-to-Date			
	01/01/10 TO 01/16/10		
	A Priority	B Priority	C Priority
Bayview	03:29	09:10	13:42
City	03:35	07:19	10:30

RESPONSE TIME			
Average Citizen Response Times Year-to-Date			
	01/01/10 TO 01/16/10		
	A Priority	B Priority	C Priority
Mission	03:11	06:27	08:56
City	03:35	07:19	10:30

RESPONSE TIME			
Average Citizen Response Times Year-to-Date			
	01/01/10 TO 01/16/10		
	A Priority	B Priority	C Priority
Northern	03:50	06:19	08:39
City	03:35	07:19	10:30

RESPONSE TIME			
Average Citizen Response Times Year-to-Date			
	01/01/10 TO 01/16/10		
	A Priority	B Priority	C Priority
Park	04:09	06:11	07:50
City	03:35	07:19	10:30

RESPONSE TIME			
Average Citizen Response Times Year-to-Date			
	01/01/10 TO 01/16/10		
	A Priority	B Priority	C Priority
Richmond	03:36	05:41	11:10
City	03:35	07:19	10:30

RESPONSE TIME			
Average Citizen Response Times Year-to-Date			
	01/01/10 TO 01/16/10		
	A Priority	B Priority	C Priority
Ingleside	03:38	08:20	12:07
City	03:35	07:19	10:30

RESPONSE TIME			
Average Citizen Response Times Year-to-Date			
	01/01/10 TO 01/16/10		
	A Priority	**B Priority**	**C Priority**
Taraval	04:30	07:12	10:50
City	03:35	07:19	10:30

RESPONSE TIME			
Average Citizen Response Times Year-to-Date			
	01/01/10 TO 01/16/10		
	A Priority	**B Priority**	**C Priority**
Tenderloin	02:34	07:22	06:07
City	03:35	07:19	10:30

COMPSTAT
CITY WIDE PROFILE
2009 vs. 2008
Chief of Police

Population: 843,402
Area: 48.1 square miles
Total Sworn: 2,339

George Gascón

Crime Statistics for year ending 12/31

Administration: Assistant Chief Tabak
Field Operations: Assistant Chief Cashman
Investigations: Commander Loftus
MTA: Deputy Chief Murphy
Airport: Deputy Chief Shinn

Part 1 Violent Crime Rate /per 1000: 8.8 *Part 1 Property Crime Rate/per 1000: 41.7* *Total Part 1 Crime Rate/per 1000: 50.5*

CRIME STATISTICS

VIOLENT CRIMES	2009	2008	% Change
HOMICIDE	45	97	-54%
RAPE	160	174	-8%
ROBBERY	3546	4115	-14%
AGGRAVATED ASSAULT	3670	3839	-4%
TOTAL VIOLENT	7421	8128	-9%

PROPERTY CRIMES	2009	2008	% Change
BURGLARY	5232	5496	-5%
AUTO THEFT	5090	6202	-18%
BURGLARY THEFT FROM VEHICLE	11360	12343	-8%
ARSON	217	224	-3%
PERSONAL/OTHER THEFT	13295	13113	1%
TOTAL PROPERTY	35194	37378	-6%
TOTAL PART 1	42615	45506	-6%

ARREST STATISTICS

ARRESTS	2009	2008	% Change
HOMICIDE	30	38	-21%
RAPE	56	54	4%
ROBBERY	977	1078	-9%
AGGRAVATED ASSAULT	1945	2011	-3%
BURGLARY	775	657	18%
ARSON	24	32	-25%
LARCENY	3066	3215	-5%
AUTO THEFT	134	268	-50%
TOTAL VIOLENT	3008	3181	-5%
TOTAL PROPERTY	3999	4172	-4%
TOTAL PART 1	7007	7353	-5%

Incident Data Source: Crime Analysis CABLE/IRS

Statistics based on date of occurrence

Prepared by: COMPSTAT

Statistics are preliminary and subject to further analysis and revision

Print date: 1/13/2010

COMPSTAT

CITY WIDE PROFILE

12/27/09 TO 1/23/10

Chief of Police

George Gascón

Population:	843,402
Area:	48.1 square miles
Total Sworn:	2,339

Administration:	Assistant Chief Tabak
Field Operations:	Assistant Chief Cashman
Investigations:	Commander Loftus
MTA:	Deputy Chief Murphy
Airport:	Deputy Chief Shinn

Crime Statistics for week ending *01/23/10*

Part 1 Violent Crime Rate /per 1000: .48 *Part 1 Property Crime Rate/per 1000: 1.95* *Total Part 1 Crime Rate/per 1000: 2.43*

CRIME STATISTICS

VIOLENT CRIMES	12/27/09 TO 1/23/10	11/29/09 TO 12/26/09	% Change	11/29/09 TO 12/26/09	11/1/09 TO 11/28/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	4	2	100%	2	4	-50%	4	3	33%
RAPE	13	12	8%	12	13	-8%	12	16	-25%
ROBBERY	242	242	0%	242	285	-15%	202	212	-5%
AGGRAVATED ASSAULT	220	253	-13%	253	286	-12%	189	234	-19%
TOTAL VIOLENT	479	509	-6%	509	588	-13%	407	465	-12%

PROPERTY CRIMES	12/27/09 TO 1/23/10	11/29/09 TO 12/26/09	% Change	11/29/09 TO 12/26/09	11/1/09 TO 11/28/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	335	423	-21%	423	377	12%	271	316	-14%
AUTO THEFT	251	335	-25%	335	378	-11%	208	404	-49%
BURGLARY THEFT FROM VEHICLE	719	848	-15%	848	877	-3%	530	621	-15%
ARSON	17	13	31%	13	20	-35%	16	15	7%
PERSONAL/OTHER THEFT	775	961	-19%	961	1067	-10%	621	732	-15%
TOTAL PROPERTY	2097	2580	-19%	2580	2719	-5%	1646	2088	-21%
TOTAL PART 1	2576	3089	-17%	3089	3307	-7%	2053	2553	-20%
SHOOTING VICTIMS	19	26	-27%	26	17	53%	18	12	50%

ARREST STATISTICS

ARRESTS	12/27/09 TO 1/23/10	11/29/09 TO 12/26/09	% Change	11/29/09 TO 12/26/09	11/1/09 TO 11/28/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	1	1	0%	1	4	-75%	1	2	-50%
RAPE	4	5	-20%	5	5	0%	3	5	-40%
ROBBERY	50	51	-2%	51	93	-45%	41	48	-15%
AGGRAVATED ASSAULT	116	92	26%	92	167	-45%	100	144	-31%
BURGLARY	48	40	20%	40	60	-33%	39	38	3%
ARSON	2	1	100%	1	3	-67%	2	4	-50%
LARCENY	213	180	18%	180	213	-15%	172	202	-15%
AUTO THEFT	12	19	-37%	19	5	280%	11	9	22%
TOTAL VIOLENT	171	149	15%	149	269	-45%	145	199	-27%
TOTAL PROPERTY	275	240	15%	240	281	-15%	224	253	-11%
TOTAL PART 1	446	389	15%	389	550	-29%	369	452	-18%

Incident Data Source: Crime Analysis CABLE/IRS

Statistics based on date of occurrence

COMPSTAT

CITY WIDE PROFILE

12/20/09 TO 1/16/10

Chief of Police

George Gascón

Population: 843,402
Area: 48.1 square miles
Total Sworn: 2,339

Administration: Assistant Chief Tabak
Field Operations: Assistant Chief Cashman
Investigations: Commander Loftus
MTA: Deputy Chief Murphy
Airport: Deputy Chief Shinn

Crime Statistics for week ending 01/16/10

Part 1 Violent Crime Rate /per 1000: .33 *Part 1 Property Crime Rate/per 1000: 1.24* *Total Part 1 Crime Rate/per 1000: 1.57*

CRIME STATISTICS

VIOLENT CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	3	4	-25%	4	3	33%	3	2	50%
RAPE	14	11	27%	11	16	-31%	10	10	0%
ROBBERY	236	239	-1%	239	297	-20%	133	125	6%
AGGRAVATED ASSAULT	217	269	-19%	269	282	-5%	133	165	-19%
TOTAL VIOLENT	470	529	-10%	528	598	[illegible]	279	302	-8%

PROPERTY CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	346	432	-20%	432	359	20%	180	222	-19%
AUTO THEFT	259	340	-24%	340	393	-13%	136	281	-52%
BURGLARY THEFT FROM VEHICLE	709	801	-11%	801	899	-11%	307	454	-32%
ARSON	19	14	36%	14	21	-33%	14	10	40%
PERSONAL/OTHER THEFT	782	979	-20%	979	1104	-11%	410	506	-19%
TOTAL PROPERTY	2115	2566	-18%	2566	2776	-8%	1047	1473	-29%
TOTAL PART 1	2585	3089	-16%	3089	3374	-8%	1326	1775	-25%
DOMESTIC VIOLENCE (DV) ABUSE	64	58	10%	58	63	-8%	50	47	6%
CHILD ABUSE	21	16	31%	16	17	-6%	8	14	-43%
DV RELATED ORDER VIOLATIONS	37	41	-10%	41	73	-44%	23	48	-52%
STAY AWAY/COURT ORDER VIOLATIONS (NON-DV RELATED)	6	0	not cal	0	0	0%	6	0	not cal
SHOTS FIRED	28	16	75%	16	11	45%	19	15	27%
SHOOTING VICTIMS	23	16	44%	16	12	33%	13	8	63%

ARREST STATISTICS

ARRESTS	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	3	-100%	3	2	50%	0	2	-100%
RAPE	4	4	0%	4	6	-33%	2	3	-33%
ROBBERY	52	60	-13%	60	87	-31%	31	34	-9%
AGGRAVATED ASSAULT	101	104	-3%	104	168	-38%	68	107	-36%
BURGLARY	41	48	-15%	48	52	-8%	24	25	-4%
ARSON	2	0	not cal	0	3	-100%	1	3	-67%
LARCENY	210	176	19%	176	236	-25%	117	137	-15%
AUTO THEFT	13	15	-13%	15	8	88%	7	4	75%
TOTAL VIOLENT	157	171	-8%	171	263	-35%	101	146	-31%
TOTAL PROPERTY	266	239	11%	239	299	-20%	149	169	-12%
TOTAL PART 1	423	410	3%	410	562	-27%	250	315	-21%

Prepared by: COMPSTAT

Statistics are preliminary and subject to further analysis and revision

Print date: 1/20/10 08:30

COMPSTAT
CENTRAL PROFILE
12/20/09 TO 1/16/10

Population: 75,063
Area: 1.8 Square Miles

Captain Anna Brown

DISTRICT SUPERVISORS
District 2: Michela Alioto-Pier
District 3: David Chiu
District 6: Chris Daly

Crime Statistics for week ending 01/16/10

Part 1 Violent Crime Rate /per 1000: .17 *Part 1 Property Crime Rate/per 1000: 1.73* *Total Part 1 Crime Rate/per 1000: 1.90*

CRIME STATISTICS

VIOLENT CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	2	-100%	2	0	not cal	0	0	0%
RAPE	0	0	0%	0	0	0%	0	0	0%
ROBBERY	22	9	144%	9	27	-67%	10	9	11%
AGGRAVATED ASSAULT	10	19	-47%	19	23	-17%	3	13	-77%
TOTAL VIOLENT	32	30	7%	30	50	-40%	13	22	-41%

PROPERTY CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	32	45	-29%	45	35	29%	18	29	-38%
AUTO THEFT	17	24	-29%	24	22	9%	6	39	-85%
BURGLARY THEFT FROM VEHICLE	112	104	8%	104	129	-19%	36	83	-57%
ARSON	2	0	not cal	0	1	-100%	2	1	100%
PERSONAL/OTHER THEFT	130	149	-13%	149	173	-14%	68	77	-12%
TOTAL PROPERTY	293	322	-9%	322	360	-11%	130	229	-43%
TOTAL PART 1	325	352	-8%	352	410	-14%	143	251	-43%
DOMESTIC VIOLENCE (DV) ABUSE	1	3	-67%	3	8	-63%	1	2	-50%
CHILD ABUSE	0	0	0%	0	0	0%	0	1	-100%
DV RELATED ORDER VIOLATIONS	1	0	not cal	0	2	-100%	1	3	-67%
STAY AWAY/COURT ORDER VIOLATIONS (NON-DV RELATED)	0	0	0%	0	0	0%	0	0	0%
SHOTS FIRED	0	0	0%	0	0	0%	0	0	0%
SHOOTING VICTIMS	0	0	0%	0	0	0%	0	0	0%

ARREST STATISTICS

ARRESTS	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	2	-100%	2	0	not cal	0	0	0%
RAPE	0	0	0%	0	0	0%	0	0	0%
ROBBERY	1	1	0%	1	13	-92%	0	1	-100%
AGGRAVATED ASSAULT	4	10	-60%	10	16	-38%	2	4	-50%
BURGLARY	5	6	-17%	6	4	50%	4	6	-33%
ARSON	0	0	0%	0	1	-100%	0	0	0%
LARCENY	17	17	0%	17	21	-19%	8	13	-38%
AUTO THEFT	0	0	0%	0	1	-100%	0	0	0%
TOTAL VIOLENT	5	13	-62%	13	29	-55%	2	5	-60%
TOTAL PROPERTY	22	23	-4%	23	27	-15%	12	19	-37%
TOTAL PART 1	27	36	-25%	36	56	-36%	14	24	-42%

COMPSTAT
SOUTHERN PROFILE
12/20/09 TO 1/16/10

Population: 26,145
Area: 2.9 Square Miles

Captain Daniel A. McDonagh

DISTRICT SUPERVISORS
District 3: David Chiu
District 6: Chris Daly

Crime Statistics for week ending 01/16/10

Part 1 Violent Crime Rate /per 1000: 1.37 *Part 1 Property Crime Rate/per 1000: 7.84* *Total Part 1 Crime Rate/per 1000: 9.21*

CRIME STATISTICS

VIOLENT CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	1	-100%	0	0	0%
RAPE	2	2	0%	2	3	-33%	2	1	100%
ROBBERY	35	37	-5%	37	43	-14%	19	26	-27%
AGGRAVATED ASSAULT	25	30	-17%	30	40	-25%	15	19	-21%
TOTAL VIOLENT	62	69	-10%	69	87	-21%	36	46	-22%

ARRESTS	12/20/09 TO 1/16/10	12/20/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	41	70	-41%	70	66	6%	22	21	5%
AUTO THEFT	27	35	-23%	35	30	17%	13	30	-57%
BURGLARY THEFT FROM VEHICLE	156	173	-10%	173	211	-18%	76	87	-13%
ARSON	0	2	-100%	2	5	-60%	0	0	0%
PERSONAL/OTHER THEFT	169	220	-23%	220	291	-24%	94	140	-33%
TOTAL PROPERTY	393	500	-21%	500	603	-17%	205	278	-26%
TOTAL PART 1	455	569	-20%	569	690	-18%	241	324	-26%
DOMESTIC VIOLENCE (DV) ABUSE	7	4	75%	4	6	-33%	5	4	25%
CHILD ABUSE	1	0	not cal	0	4	-100%	1	3	-67%
DV RELATED ORDER VIOLATIONS	3	9	-67%	9	9	0%	2	10	-80%
STAY AWAY/COURT ORDER VIOLATIONS (NON-DV RELATED)	0	0	0%	0	0	0%	0	0	0%
SHOTS FIRED	1	0	not cal	0	3	-100%	0	1	-100%
SHOOTING VICTIMS	6	3	100%	3	2	50%	2	0	not cal

ARREST STATISTICS

ARRESTS	12/20/09 TO 1/16/10	12/20/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	1	-100%	0	0	0%
RAPE	0	1	-100%	1	1	0%	0	0	0%
ROBBERY	11	10	10%	10	20	-50%	5	4	25%
AGGRAVATED ASSAULT	7	15	-53%	15	29	-48%	5	13	-62%
BURGLARY	8	9	-11%	9	13	-31%	5	4	25%
ARSON	0	0	0%	0	0	0%	0	0	0%
LARCENY	50	50	0%	50	84	-40%	23	43	-47%
AUTO THEFT	3	6	-50%	6	0	not cal	0	0	0%
TOTAL VIOLENT	18	26	-31%	26	51	-49%	10	17	-41%
TOTAL PROPERTY	61	65	-6%	65	97	-33%	28	47	-40%
TOTAL PART 1	79	91	-13%	91	148	-39%	38	64	-41%

Incident Data Source: Crime Analysis CABLE/IRS

Statistics based on date of occurrence

COMPSTAT

BAYVIEW PROFILE

12/20/09 TO 1/16/10

Population: 79,280
Area: 9.1 Square Miles

Captain Gregory Suhr

DISTRICT SUPERVISORS
District 6: Chris Daly
District 10: Sophie Maxwell
District 11: John Avalos

Crime Statistics for week ending 1/16/10

Part 1 Violent Crime Rate /per 1000: .52 *Part 1 Property Crime Rate/per 1000: .87* *Total Part 1 Crime Rate/per 1000: 1.39*

CRIME STATISTICS

VIOLENT CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	1	0	not cal	0	1	-100%	1	0	not cal
RAPE	0	1	-100%	1	2	-50%	0	1	-100%
ROBBERY	31	27	15%	27	37	-27%	17	13	31%
AGGRAVATED ASSAULT	34	45	-24%	45	53	-15%	23	22	5%
TOTAL VIOLENT	66	73	-10%	73	93	-22%	41	36	14%

PROPERTY CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	46	59	-22%	59	46	28%	26	21	24%
AUTO THEFT	28	44	-36%	44	44	0%	12	30	-60%
BURGLARY THEFT FROM VEHICLE	41	38	8%	38	63	-40%	14	20	-30%
ARSON	2	4	-50%	4	4	0%	1	2	-50%
PERSONAL/OTHER THEFT	33	41	-20%	41	45	-9%	16	16	0%
TOTAL PROPERTY	150	186	-19%	186	202	-8%	69	89	-22%
TOTAL PART 1	216	259	-17%	259	295	-12%	110	125	-12%
DOMESTIC VIOLENCE (DV) ABUSE	10	14	-29%	14	11	27%	9	6	50%
CHILD ABUSE	4	1	300%	1	1	0%	2	4	-50%
DV RELATED ORDER VIOLATIONS	7	4	75%	4	4	0%	4	5	-20%
STAY AWAY/COURT ORDER VIOLATIONS (NON-DV RELATED)	0	0	0%	0	0	0%	0	0	0%
SHOTS FIRED	16	4	300%	4	4	0%	10	5	100%
SHOOTING VICTIMS	9	9	0%	9	5	80%	7	1	600%

ARREST STATISTICS

ARRESTS	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	0	0%	0	0	0%
RAPE	0	0	0%	0	2	-100%	0	0	0%
ROBBERY	2	3	-33%	3	6	-50%	1	2	-50%
AGGRAVATED ASSAULT	11	15	-27%	15	29	-48%	9	15	-40%
BURGLARY	8	1	700%	1	1	0%	5	6	-17%
ARSON	0	0	0%	0	0	0%	0	0	0%
LARCENY	3	5	-40%	5	3	67%	0	15	-100%
AUTO THEFT	3	3	0%	3	3	0%	3	2	50%
TOTAL VIOLENT	13	18	-28%	18	37	-51%	10	17	-41%
TOTAL PROPERTY	14	9	56%	9	7	29%	8	23	-65%
TOTAL PART 1	27	27	0%	27	44	-39%	18	40	-55%

Incident Data Source: Crime Analysis CABLE/IRS

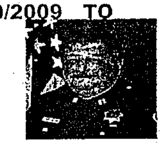
Statistics based on date of occurrence

COMPSTAT

MISSION PROFILE

12/20/2009 TO 1/16/10

Population: 91,087
Area: 2.7 Square Miles



Captain Gregory Corrales

DISTRICT SUPERVISORS
District 6: Chris Daly
District 8: Bevan Dufty
District 9: David Campos

Crime Statistics for week ending 01/16/10

Part 1 Violent Crime Rate /per 1000: .45 *Part 1 Property Crime Rate/per 1000: 1.54* *Total Part 1 Crime Rate/per 1000: 1.99*

CRIME STATISTICS

VIOLENT CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	1	1	0%	1	0	not cal	1	0	not cal
RAPE	3	1	200%	1	1	0%	2	4	-50%
ROBBERY	31	32	-3%	32	36	-11%	19	13	46%
AGGRAVATED ASSAULT	34	45	-24%	45	41	10%	19	30	-37%
TOTAL VIOLENT	69	79	-13%	79	78	1%	41	47	-13%

PROPERTY CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	38	41	-7%	41	30	37%	24	18	33%
AUTO THEFT	45	63	-29%	63	93	-32%	21	49	-57%
BURGLARY THEFT FROM VEHICLE	58	72	-19%	72	71	1%	30	45	-33%
ARSON	1	2	-50%	2	0	not cal	1	3	-67%
PERSONAL/OTHER THEFT	115	130	-12%	130	150	-13%	64	56	14%
TOTAL PROPERTY	257	308	-17%	308	344	-10%	140	171	-18%
TOTAL PART 1	326	387	-16%	387	422	-8%	181	218	-17%
DOMESTIC VIOLENCE (DV) ABUSE	9	5	80%	5	10	-50%	6	1	500%
CHILD ABUSE	3	5	-40%	5	4	25%	2	0	not cal
DV RELATED ORDER VIOLATIONS	5	5	0%	5	15	-67%	3	10	-70%
STAY AWAY/COURT ORDER VIOLATIONS (NON-DV RELATED)	3	0	not cal	0	0	0%	3	0	not cal
SHOTS FIRED	2	1	100%	1	1	0%	2	1	100%
SHOOTING VICTIMS	4	1	300%	1	0	not cal	3	1	200%

ARREST STATISTICS

ARRESTS	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	0	0%	0	0	0%
RAPE	1	1	0%	1	0	not cal	1	1	0%
ROBBERY	8	8	0%	8	10	-20%	7	5	40%
AGGRAVATED ASSAULT	15	17	-12%	17	30	-43%	10	13	-23%
BURGLARY	6	6	0%	6	6	0%	3	0	not cal
ARSON	0	0	0%	0	0	0%	0	2	-100%
LARCENY	28	19	47%	19	27	-30%	15	19	-21%
AUTO THEFT	4	2	100%	2	0	not cal	3	0	not cal
TOTAL VIOLENT	24	26	-8%	26	40	-35%	18	19	-5%
TOTAL PROPERTY	38	27	41%	27	33	-18%	21	21	0%
TOTAL PART 1	62	53	17%	53	73	-27%	39	40	-3%

Incident Data Source: Crime Analysis CABLE/IRS

Statistics based on date of occurrence

COMPSTAT

NORTHERN STATION PROFILE

12/20/09 TO 1/16/10

Population: 96,148
Area: 5.3 Square Miles

Captain Ann Mannix

DISTRICT SUPERVISORS
District 2: Michela Alioto-Pier
District 3: David Chiu
District 5: Ross Mirkarimi
District 6: Chris Daly
District 8: Bevan Dufty

Crime Statistics for week ending 1/16/10

Part 1 Violent Crime Rate /per 1000: .25 *Part 1 Property Crime Rate/per 1000: 1.41* *Total Part 1 Crime Rate/per 1000: 1.66*

CRIME STATISTICS

VIOLENT CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	0	0%	0	0	0%
RAPE	1	0	not cal	0	2	-100%	0	1	-100%
ROBBERY	21	33	-36%	33	46	-28%	13	19	-32%
AGGRAVATED ASSAULT	20	24	-17%	24	25	-4%	11	15	-27%
TOTAL VIOLENT	42	57	-26%	57	71	-22%	24	35	-31%

PROPERTY CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	54	72	-25%	72	63	14%	29	42	-31%
AUTO THEFT	21	47	-55%	47	36	31%	12	30	-60%
BURGLARY THEFT FROM VEHICLE	105	148	-29%	148	128	16%	52	101	-49%
ARSON	2	1	100%	1	2	-50%	2	2	0%
PERSONAL/OTHER THEFT	84	116	-28%	116	128	-9%	41	49	-16%
TOTAL PROPERTY	266	384	-31%	384	357	8%	136	224	-39%
TOTAL PART 1	308	441	-30%	441	430	3%	160	259	-38%
DOMESTIC VIOLENCE (DV) ABUSE	5	6	-17%	6	2	200%	5	2	150%
CHILD ABUSE	2	0	not cal	0	1	-100%	1	2	-50%
DV RELATED ORDER VIOLATIONS	0	2	-100%	2	7	-71%	0	6	-100%
STAY AWAY/COURT ORDER VIOLATIONS (NON-DV RELATED)	0	0	0%	0	0	0%	0	0	0%
SHOTS FIRED	1	5	-80%	5	0	not cal	1	1	0%
SHOOTING VICTIMS	0	1	-100%	1	4	-75%	0	2	-100%

ARREST STATISTICS

ARRESTS	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	0	0%	0	0	0%
RAPE	1	0	not cal	0	2	-100%	0	0	0%
ROBBERY	9	6	50%	6	10	-40%	4	9	-56%
AGGRAVATED ASSAULT	7	11	-36%	11	12	-8%	5	13	-62%
BURGLARY	5	2	150%	2	4	-50%	2	3	-33%
ARSON	1	0	not cal	0	0	0%	1	0	not cal
LARCENY	17	7	143%	7	29	-76%	10	12	-17%
AUTO THEFT	1	0	not cal	0	1	-100%	0	0	0%
TOTAL VIOLENT	17	17	0%	17	24	-29%	9	22	-59%
TOTAL PROPERTY	24	9	167%	9	34	-74%	13	15	-13%
TOTAL PART 1	41	26	58%	26	58	-55%	22	37	-41%

Incident Data Source: Crime Analysis CABLE/IRS Statistics based on date of occurrence

COMPSTAT
PARK PROFILE
12/20/09 TO 1/16/10

Population: 67,472
Area: 3.0 Square Miles

Captain Teresa Barrett

DISTRICT SUPERVISORS
District 1: Eric Mar
District 2: Michela Alioto-Pier
District 4: Carmen Chu
District 5: Ross Mirkarimi
District 8: Bevan Dufty

Crime Statistics for week ending 1/16/10

Part 1 Violent Crime Rate /per 1000: .16 *Part 1 Property Crime Rate/per 1000: .61* *Total Part 1 Crime Rate/per 1000: .77*

CRIME STATISTICS

VIOLENT CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	0	0%	0	0	0%
RAPE	0	1	-100%	1	1	0%	0	1	-100%
ROBBERY	11	14	-21%	14	18	-22%	8	3	167%
AGGRAVATED ASSAULT	5	8	-38%	8	10	-20%	3	4	-25%
TOTAL VIOLENT	16	23	-30%	23	29	-21%	11	8	38%

PROPERTY CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	28	16	75%	16	17	-6%	11	18	-39%
AUTO THEFT	9	25	-64%	25	37	-32%	3	21	-86%
BURGLARY THEFT FROM VEHICLE	36	55	-35%	55	31	77%	12	25	-52%
ARSON	1	3	-67%	3	1	200%	0	0	0%
PERSONAL/OTHER THEFT	32	45	-29%	45	46	-2%	15	24	-38%
TOTAL PROPERTY	106	144	-26%	144	132	9%	41	88	-53%
TOTAL PART 1	122	167	-27%	167	161	4%	52	96	-46%
DOMESTIC VIOLENCE (DV) ABUSE	2	3	-33%	3	1	200%	1	1	0%
CHILD ABUSE	0	0	0%	0	1	-100%	0	0	0%
DV RELATED ORDER VIOLATIONS	2	3	-33%	3	7	-57%	1	1	0%
STAY AWAY/COURT ORDER VIOLATIONS (NON-DV RELATED)	1	0	not cal	0	0	0%	1	0	not cal
SHOTS FIRED	0	0	0%	0	0	0%	0	1	-100%
SHOOTING VICTIMS	0	0	0%	0	0	0%	0	0	0%

ARREST STATISTICS

ARRESTS	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	0	0%	0	0	0%
RAPE	0	0	0%	0	0	0%	0	0	0%
ROBBERY	2	12	-83%	12	0	not cal	1	1	0%
AGGRAVATED ASSAULT	3	4	-25%	4	6	-33%	1	4	-75%
BURGLARY	2	2	0%	2	3	-33%	2	1	100%
ARSON	1	0	not cal	0	0	0%	0	0	0%
LARCENY	7	6	17%	6	5	20%	3	2	50%
AUTO THEFT	0	1	-100%	1	0	not cal	0	0	0%
TOTAL VIOLENT	5	16	-69%	16	6	167%	2	5	-60%
TOTAL PROPERTY	10	9	11%	9	8	13%	5	3	67%
TOTAL PART 1	15	25	-40%	25	14	79%	7	8	-13%

Incident Data Source: Crime Analysis CABLE/IRS

Statistics based on date of occurrence

COMPSTAT

RICHMOND STATION PROFILE

12/20/09 TO 1/16/10

Population: 101,208
Area: 5.7 Square Miles

Captain Richard Corriea

DISTRICT SUPERVISORS
District 1: Eric Mar
District 2: Michela Alioto-Pier
District 5: Ross Mirkarimi

Crime Statistics for week ending 1/16/10

Part 1 Violent Crime Rate /per 1000: .09 *Part 1 Property Crime Rate/per 1000: .66* *Total Part 1 Crime Rate/per 1000: .75*

CRIME STATISTICS

VIOLENT CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	0	0%	0	1	-100%
RAPE	2	0	not cal	0	2	-100%	2	0	not cal
ROBBERY	8	12	-33%	12	17	-29%	2	2	0%
AGGRAVATED ASSAULT	8	15	-47%	15	10	50%	5	3	67%
TOTAL VIOLENT	18	27	-33%	27	29	-7%	9	6	50%

PROPERTY CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	32	35	-9%	35	19	84%	15	20	-25%
AUTO THEFT	13	12	8%	12	15	-20%	10	24	-58%
BURGLARY THEFT FROM VEHICLE	51	69	-26%	69	46	50%	20	44	-55%
ARSON	3	0	not cal	0	0	0%	2	1	100%
PERSONAL/OTHER THEFT	41	30	37%	30	42	-29%	20	23	-13%
TOTAL PROPERTY	140	146	-4%	146	122	20%	67	112	-40%
TOTAL PART 1	158	173	-9%	173	151	15%	76	118	-36%
DOMESTIC VIOLENCE (DV) ABUSE	5	3	67%	3	2	50%	4	1	300%
CHILD ABUSE	0	0	0%	0	1	-100%	0	0	0%
DV RELATED ORDER VIOLATIONS	5	2	150%	2	5	-60%	3	1	200%
STAY AWAY/COURT ORDER VIOLATIONS (NON-DV RELATED)	0	0	0%	0	0	0%	0	0	0%
SHOTS FIRED	1	0	not cal	0	0	0%	0	1	-100%
SHOOTING VICTIMS	1	0	not cal	0	0	0%	0	1	-100%

ARREST STATISTICS

ARRESTS	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	0	0%	0	1	-100%
RAPE	0	0	0%	0	0	0%	0	0	0%
ROBBERY	0	5	-100%	5	2	150%	0	4	-100%
AGGRAVATED ASSAULT	4	4	0%	4	4	0%	3	1	200%
BURGLARY	3	2	50%	2	2	0%	1	0	not cal
ARSON	0	0	0%	0	0	0%	0	0	0%
LARCENY	5	3	67%	3	3	0%	4	1	300%
AUTO THEFT	0	0	0%	0	0	0%	0	1	-100%
TOTAL VIOLENT	4	9	-56%	9	6	50%	3	6	-50%
TOTAL PROPERTY	8	5	60%	5	5	0%	5	2	150%
TOTAL PART 1	12	14	-14%	14	11	27%	8	8	0%

Incident Data Source: Crime Analysis CABLE/IRS

Statistics based on date of occurrence

Prepared by: COMPSTAT

Statistics are preliminary and subject to further analysis and revision

Print date: 1/20/10

COMPSTAT
INGLESIDE PROFILE
12/20/09 TO 1/16/10

Population: 123,980
Area: 6.5 Square Miles

Captain David Lazar

DISTRICT SUPERVISORS
District 7: Sean Elsbernd
District 8: Bevan Dufty
District 9: David Campos
District 10: Sophie Maxwell
District 11: John Avalos

Crime Statistics for week ending 1/16/10

Part 1 Violent Crime Rate /per 1000: .35 *Part 1 Property Crime Rate/per 1000: .74* *Total Part 1 Crime Rate/per 1000: 1.09*

CRIME STATISTICS

VIOLENT CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	1	0	not cal	0	1	-100%	1	0	not cal
RAPE	2	3	-33%	3	0	not cal	2	1	100%
ROBBERY	40	35	14%	35	33	6%	22	17	29%
AGGRAVATED ASSAULT	29	42	-31%	42	31	35%	18	16	13%
TOTAL VIOLENT	72	80	-10%	80	65	23%	43	34	26%

PROPERTY CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	20	32	-38%	32	29	10%	12	23	-48%
AUTO THEFT	63	57	11%	57	55	4%	43	27	59%
BURGLARY THEFT FROM VEHICLE	46	46	0%	46	66	-30%	20	20	0%
ARSON	0	1	-100%	1	2	-50%	0	0	0%
PERSONAL/OTHER THEFT	38	57	-33%	57	61	-7%	17	34	-50%
TOTAL PROPERTY	167	193	-13%	193	213	-9%	92	104	-12%
TOTAL PART 1	239	273	-12%	273	278	-2%	135	138	-2%
DOMESTIC VIOLENCE (DV) ABUSE	9	10	-10%	10	11	-9%	6	9	-33%
CHILD ABUSE	3	4	-25%	4	3	33%	0	2	-100%
DV RELATED ORDER VIOLATIONS	4	3	33%	3	5	-40%	2	3	-33%
STAY AWAY/COURT ORDER VIOLATIONS (NON-DV RELATED)	0	0	0%	0	0	0%	0	0	0%
SHOTS FIRED	5	6	-17%	6	3	100%	4	2	100%
SHOOTING VICTIMS	1	1	0%	1	1	0%	1	1	0%

ARREST STATISTICS

ARRESTS	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	1	-100%	0	0	0%
RAPE	1	1	0%	1	0	not cal	1	2	-50%
ROBBERY	12	4	200%	4	8	-50%	8	0	not cal
AGGRAVATED ASSAULT	14	12	17%	12	14	-14%	10	8	25%
BURGLARY	1	0	not cal	0	6	-100%	1	2	-50%
ARSON	0	0	0%	0	1	-100%	0	0	0%
LARCENY	12	5	140%	5	7	-29%	7	0	not cal
AUTO THEFT	0	1	-100%	1	2	-50%	0	0	0%
TOTAL VIOLENT	27	17	59%	17	23	-26%	19	10	90%
TOTAL PROPERTY	13	6	117%	6	16	-63%	8	2	300%
TOTAL PART 1	40	23	74%	23	39	-41%	27	12	125%

Incident Data Source: Crime Analysis CABLE/IRS

Statistics based on date of occurrence

Prepared by: COMPSTAT

Statistics are preliminary and subject to further analysis and revision

Print date: 1/20/10

COMPSTAT
TARAVAL PROFILE
12/20/09 TO 1/16/10

Population: 162,777
Area: 10.8 Square Miles

Captain Denise Schmitt

DISTRICT SUPERVISORS
District 4: Carmen Chu
District 5: Ross Mirkarimi
District 7: Sean Elsbernd
District 11: John Avalos

Crime Statistics for week ending 1/16/10

Part 1 Violent Crime Rate /per 1000: .12 | *Part 1 Property Crime Rate/per 1000: .52* | *Total Part 1 Crime Rate/per 1000: .64*

CRIME STATISTICS

VIOLENT CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	0	0%	0	0	0%
RAPE	1	2	-50%	2	3	-33%	1	1	0%
ROBBERY	13	22	-41%	22	18	22%	9	8	13%
AGGRAVATED ASSAULT	16	14	14%	14	12	17%	9	9	0%
TOTAL VIOLENT	30	38	-21%	38	33	15%	19	18	6%

PROPERTY CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	36	34	6%	34	31	10%	16	21	-24%
AUTO THEFT	23	25	-8%	25	40	-38%	10	22	-55%
BURGLARY THEFT FROM VEHICLE	68	67	1%	67	130	-48%	32	18	78%
ARSON	5	1	400%	1	4	-75%	4	0	not cal
PERSONAL/OTHER THEFT	42	65	-35%	65	65	0%	23	33	-30%
TOTAL PROPERTY	174	192	-9%	192	270	-29%	85	94	-10%
TOTAL PART 1	204	230	-11%	230	308	-24%	104	112	-7%
DOMESTIC VIOLENCE (DV) ABUSE	7	6	17%	6	3	100%	5	1	400%
CHILD ABUSE	4	0	not cal	0	1	-100%	2	1	100%
DV RELATED ORDER VIOLATIONS	4	2	100%	2	6	-67%	3	1	200%
STAY AWAY/COURT ORDER VIOLATIONS (NON-DV RELATED)	1	0	not cal	0	0	0%	1	0	not cal
SHOTS FIRED	3	0	not cal	0	0	0%	2	1	100%
SHOOTING VICTIMS	2	0	not cal	0	0	0%	0	1	-100%

ARREST STATISTICS

ARRESTS	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	0	0%	0	0	0%	0	0	0%
RAPE	0	1	-100%	1	1	0%	0	0	0%
ROBBERY	0	4	-100%	4	5	-20%	0	4	-100%
AGGRAVATED ASSAULT	12	3	300%	3	6	-50%	6	8	-25%
BURGLARY	1	4	-75%	4	3	33%	0	1	-100%
ARSON	0	0	0%	0	0	0%	0	0	0%
LARCENY	23	19	21%	19	14	36%	14	9	56%
AUTO THEFT	1	0	not cal	0	0	0%	1	1	0%
TOTAL VIOLENT	12	8	50%	8	12	-33%	6	12	-50%
TOTAL PROPERTY	25	23	9%	23	17	35%	15	11	36%
TOTAL PART 1	37	31	19%	31	29	7%	21	23	-9%

Incident Data Source: Crime Analysis CABLE/IRS

Statistics based on date of occurrence

COMPSTAT

TENDERLOIN PROFILE

12/20/09 TO 1/16/10

Population: 20,242
Area: 0.3 Square Miles

DISTRICT SUPERVISOR
District 6: Chris Daly

Captain Dominic Celaya

Crime Statistics for week ending 1/16/10

Part 1 Violent Crime Rate /per 1000: 1.78 | *Part 1 Property Crime Rate/per 1000: 3.21* | *Total Part 1 Crime Rate/per 1000: 4.99*

CRIME STATISTICS

VIOLENT CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	1	-100%	1	0	not cal	0	1	-100%
RAPE	2	1	100%	1	0	not cal	1	0	not cal
ROBBERY	21	16	31%	16	17	-6%	12	14	-14%
AGGRAVATED ASSAULT	31	20	55%	20	32	-38%	23	29	-21%
TOTAL VIOLENT	54	38	42%	38	49	-22%	36	44	-18%

PROPERTY CRIMES	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
BURGLARY	12	20	-40%	20	21	-5%	4	7	-43%
AUTO THEFT	7	2	250%	2	7	-71%	4	4	0%
BURGLARY THEFT FROM VEHICLE	20	17	18%	17	22	-23%	10	9	11%
ARSON	2	0	not cal	0	2	-100%	2	1	100%
PERSONAL/OTHER THEFT	77	109	-29%	109	89	22%	45	49	-8%
TOTAL PROPERTY	118	148	-20%	148	141	5%	65	70	-7%
TOTAL PART 1	172	186	-8%	186	190	-2%	101	114	-11%
DOMESTIC VIOLENCE (DV) ABUSE	9	2	350%	2	5	-60%	8	7	14%
CHILD ABUSE	2	4	-50%	4	0	not cal	1	0	not cal
DV RELATED ORDER VIOLATIONS	6	9	-33%	9	12	-25%	4	7	-43%
STAY AWAY/COURT ORDER VIOLATIONS (NON-DV RELATED)	1	0	not cal	0	0	0%	1	0	not cal
SHOTS FIRED	0	1	-100%	0	0	0%	0	1	-100%
SHOOTING VICTIMS	0	1	-100%	1	0	not cal	0	1	-100%

ARREST STATISTICS

ARRESTS	12/20/09 TO 1/16/10	11/22/09 TO 12/19/09	% Change	11/22/09 TO 12/19/09	10/25/09 TO 11/21/09	% Change	YTD 2010	YTD 2009	% Change
HOMICIDE	0	1	-100%	1	0	not cal	0	1	-100%
RAPE	1	0	not cal	0	0	0%	0	0	0%
ROBBERY	5	5	0%	5	7	-29%	3	4	-25%
AGGRAVATED ASSAULT	19	12	58%	12	19	-37%	13	27	-52%
BURGLARY	2	11	-82%	11	9	22%	1	1	0%
ARSON	0	0	0%	0	1	-100%	0	1	-100%
LARCENY	45	41	10%	41	38	8%	32	23	39%
AUTO THEFT	0	1	-100%	1	1	0%	0	0	0%
TOTAL VIOLENT	25	18	39%	18	26	-31%	16	32	-50%
TOTAL PROPERTY	47	53	-11%	53	49	8%	33	25	32%
TOTAL PART 1	72	71	1%	71	75	-5%	49	57	-14%

Incident Data Source: Crime Analysis CABLE/IRS

Statistics based on date of occurrence

Appendix H-6

Service Response Letter from San Francisco Public Library

HOUSING ELEMENT SURVEY RESPONSES
San Francisco Public Library
December 19, 2009

1. **What are the sizes (in square feet) of each library in the City, and are they adequate to meet the City's current demand for library services?**

FY 2008-09

Branch	Size of Outlet, in sq. ft.
Anza	7,332
Bayview	7,287
Bernal Heights	8,747
Chinatown	19,200
Eureka Valley	5,610
Excelsior	8,322
Glen Park	7,185
Golden Gate Valley	6,259
Ingleside	4,800
Main	376,000
Marina	7,633
Merced	5,140
Mission	10,479
Mission Bay	7,500
Noe Valley	6,096
North Beach	5,530
Ocean View	4,794
Ortega	5,057
Park	8,825
Parkside	5,824
Portola	6,427
Potrero	5,557
Presidio	10,205
Richmond	13,900
Sunset	9,434
Visitacion	2,300
West Portal	6,786
Western Addition	8,000
Total	**580,229**

2. How many volumes of books are in each library in the City, and are they adequate to meet the City's current demand for library services?

FY 2008-09

Branch	Number of volumes
Anza	30,357
Bayview	40,382
Bernal Heights	21,217
Chinatown	147,330
Eureka Valley	25,958
Excelsior	70,998
Glen Park	42,314
Golden Gate Valley	27,663
Ingleside	29,601
Main	1,359,463
Marina	45,526
Merced	26,292
Mission	88,259
Mission Bay	43,608
Noe Valley	30,543
North Beach	39,789
Ocean View	15,463
Ortega	30,922
Park	29,971
Parkside	35,167
Portola	30,207
Potrero	14,339
Presidio	34,483
Richmond	86,553
Sunset	69,974
Visitacion	23,545
West Portal	76,700
Western Addition	57,584
Total	**2,574,208**

3. What is the estimated population served by each library in the City?

FY 2008-09

Branch	Population
Anza	23,313
Bayview	34,043
Bernal Heights	24,952
Chinatown	49,438
Eureka Valley	26,370
Excelsior	49,297
Glen Park	14,863
Golden Gate Valley	18,619
Ingleside	12,845
Main	845,559
Marina	20,471
Merced	17,283
Mission	63,620
Mission Bay	14,163
Noe Valley	22,142
North Beach	21,487
Ocean View	22,494
Ortega	30,328
Park	29,696
Parkside	20,555
Portola	11,360
Potrero	10,542
Presidio	15,962
Richmond	47,405
Sunset	44,906
Visitacion	18,493
West Portal	26,414
Western Addition	42,526

NOTE: Service population areas overlap between neighborhood branch libraries

4. What are the staffing levels of each library in the City?

FY 2008-09

Branch	FTE
Anza	7.25
Bayview	6.87
Bernal Heights	4.87
Chinatown	21.72
Eureka Valley	5.37
Excelsior	12.1
Glen Park	6.3
Golden Gate Valley	4.45
Ingleside	5.37
Main	186.73
Marina	8.9
Merced	8.37
Mission	16.25
Mission Bay	6.5
Noe Valley	5.72
North Beach	7.25
Ocean View	4.2
Ortega	9.87
Park	6.02
Parkside	7.82
Portola	5.3
Potrero	4.37
Presidio	5.8
Richmond	17
Sunset	15.72
Visitacion	5.32
West Portal	11.25
Western Addition	8.1
Public Services Staff/Main & Branches	**414.79**
Other Support/System-wide	**230.24**
Total	**645.03**

5. **Generally, are the libraries in the City adequately meeting the City's current demand for library facilities? If not, please state why.**

   SFPL has reached 50% completion of the Branch Library Improvement Program (BLIP), the largest capital program for libraries in the city's history. When completed, the BLIP will result in updated and expanded facilities, with increased resources, technology, seating, and community space, to meet the service needs identified in each neighborhood.

6. **Does the San Francisco Public Library (SFPL) have any plans to develop new libraries or expand existing libraries? If so, please describe the plans.**

   Please see the Branch Library Improvement Program (BLIP) at http://sfpl.org/news/blip/improvementprogram.htm for a full description of city-wide library capital building projects being completed to renovate 16 branch libraries, replace 4 leased facilities with new city-owned library buildings, replace 3 branch libraries with greatly expanded new facilities, and build one brand new branch library in the growing Mission Bay neighborhood.

7. **Does the SFPL implement fee-based assessments (i.e., mitigation fees) to new development projects? If so, how are the fees calculated for residential uses?**

   Library operations are currently funded through tax-based revenue and therefore should increase respective to population increases. Additional library facilities are needed to accommodate significant population growth. Previously assessed mitigation fees for development projects were developed prior to the current library capital program (see #6). Updated developer fees would be based upon a comparison of library facility square footage per capita (post Branch Library Improvement Program) to the construction/development costs of library construction projects in 2008/2009, calculated per square foot. At 0.69 square feet per person and a cost in today's dollars of $1,213 per square foot, the library projects a mitigation fee of $837 per additional resident.

8. **How does the SFPL address the growing demand for library services?**

   SFPL measures use and demand in several key areas and adjusts resources accordingly to meet areas of growing need. Public computer usage and demand is measured and technology enhancements are provided as feasible through annual budget. Collection usage and demand (same). SFPL has increased public operating hours in 2007, 2008, and 2009, in response to needs (Sunday, Monday, kids, families, multigenerational, etc.)

9. **Would the libraries in the City be able to meet the proposed project's demand for library facilities?**

   The Branch Library Improvement Program will result in expanded and updated services in each neighborhood currently served by a branch library, plus a brand new facility in Mission Bay for the growing community in that area. The Library does not project these facilities reaching capacity, though expanded demand could necessitate extended public service hours for branch libraries. Currently, fifteen (15) branch libraries are open six (6) days per week, allowing the library to respond to increased population growth citywide by increasing service hours to seven (7) days per week. The Library recognizes that, currently, the southeast neighborhoods have fewer library facilities per geographic area. To accommodate growth and needed services anticipated in this area of the city, additional library facilities or service points should be considered, in accordance with the fee-based assessment in #7.

10. Please provide any recommendations that would eliminate or lessen the proposed project's impacts on the SFPL (e.g., developer fees, etc.)

Library operations are currently funded through tax-based revenue and therefore should increase respective to population increases. Additional library facilities are needed to accommodate significant population growth. Updated developer fees would be based upon a comparison of library facility square footage per capita (post Branch Library Improvement Program) to the construction/development costs of library construction projects in 2008/2009, calculated per square foot. At 0.69 square feet per person and a cost in today's dollars of $1,213 per square foot, the library projects a mitigation fee of $837 per additional resident.

Appendix I

Population Projections

MEMORANDUM

To: *Jessica Range, MEA*

From: *Jessica Viramontes and Bryan Chen, CAJA*

Date: *May 28, 2010*

Subject: *San Francisco Population and Household Projections*

For the 2004 and 2009 Housing Element EIR, the planning period is 2009 to 2025. To derive the households for this period, this analysis used the development projections provided by John Rahaim, Director of City Planning, to Michael Carlin, Deputy General Manager at the San Francisco Public Utilities Commission, on July 9, 2009 to satisfy mandates in connection with assessing water supply and demand in the years to come. Projections of households, household population and jobs were provided for 2000, 2005, and 2030. Linear regression was used to derive development projections for 2009, 2010, 2015, 2020, and 2025. The following discussion explains the process for calculating the population and housing unit projections used for the 2004 and 2009 Housing Element EIR. Table 1 shows the trends and projections for San Francisco's housing units, households, citywide household population, and persons per household.

2009 Households

The total growth between 2005 and 2030 is 61,814 households, which equates to average growth of 2,473 households per year. Using this information, 351,370 households are projected for 2009 (growth of 9,892 households over 4 years [2005-2009]).

2009 – 2020 Households and Housing Units

It also stands that 378,573 households are projected for 2020 (growth of 37,095 households over 15 years [2005-2020]). The growth projected from 2009 to 2020 is 27,203 households. It is assumed that there are more housing units that are developed than households. Therefore, projected housing units are calculated by dividing households by 0.95. This calculation results in a projection of 28,635 housing units for the period 2009 to 2020.

2009 – 2025 Households and Housing Units

It also stands that 390,938 households are projected for 2025 (growth of 49,460 households over 20 years [2005-2025]). The growth projected from 2009 to 2025 is 39,568 households. Projected housing units are calculated by dividing households by 0.95. This calculation results in a projection of 41,651 housing units for the period 2009 to 2025.

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Los Angeles • San Francisco • Santa Clarita • Agoura Hills • Mammoth Lakes

Table 1
San Francisco Household Trends and Projections

	2000	2005	2009	2010	2015	2020	2025	2030
Housing Units	347,053	359,451	369,864	372,467	385,483	398,498	411,514	424,518
Household	329,700	341,478	351,370	353,843	366,208	378,573	390,938	403,292
Household Population	756,976	783,441	804,779	810,113	836,785	863,457	890,129	916,800
Persons per Household	2.30	2.29	2.29	2.29	2.28	2.28	2.28	2.27

Note: The projections for 2009, 2010, 2015, 2020, and 2025 were calculated using linear regression.

Source: John Rahaim, Director of Planning, San Francisco Planning Department, correspondence with Michael P. Carlin, Deputy General Manager at the San Francisco Public Utilities Commission, July 9, 2009.

Appendix C2 Rahaim, John, SF Planning Director to Carlin, Michael, SFPUC: Projections of Growth by 2030, July 9, 2009

SAN FRANCISCO
PLANNING DEPARTMENT

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

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
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July 9, 2009

Michael P. Carlin
Deputy General Manager, SFPUC
1155 Market St, 11th Floor
San Francisco, CA 94103

Subject: Projections of growth by 2030

Dear Michael:

Thank you for your letter dated March 11, 2009 requesting the Planning Department's projections of growth by 2030 in order to satisfy your mandates in connection with assessing water supply and demand in the years to come, and more specifically for preparing water supply assessments for individual projects moving forward.

The Planning Department routinely prepares projections for the purposes of analyzing impacts of plans and projects undergoing the environmental review process. While the assumptions of these sets may vary depending on the circumstances surrounding a specific project, the Department recently completed a citywide projection capturing citywide growth expectations by 2030 designed to closely match the recently adopted ABAG Projections 2009 target, but taking into account local knowledge of projects currently in various stages of the entitlement process, commonly referred to as the development pipeline. Table 1 shows the projections for 2030.

Table 1 Development Projections

	2000	2005	2030	Growth 2000-2030	Growth 2005-2030
Households	329,700	341,478	403,292	73,592	61,814
HH Population	756,976	783,441	916,800	159,824	133,359
Jobs	642,500	553,090	748,100	105,600	195,010

Source: ABAG, San Francisco Planning Department

As the question may arise whether particular projects were included, the Planning Department for the purposes of these numbers assumed full buildout over the course of the forecast period of three large development programs currently undergoing environmental review, namely Treasure Island, Bayview Waterfront, and Park Merced projects.

More generally, we included entitled pipeline projects, and projects larger than 500 units, or large commercial projects per criteria set forth in California Water Code §10912(a) as these are the projects for which individual water supply assessments would otherwise need to be made in the near future.

We are looking forward to continuing the larger regional growth dialogue with PUC and other regional stakeholders.

Sincerely,

John Rahaim
Director of Planning

CC: Aksel Olsen
Teresa Ojeda
File