Central Freeway and Octavia Circulation Study

Draft Final Report

June 2012

San Francisco County Transportation Authority

This project was funded by the Metropolitan Transportation Commission and the San Francisco County Transportation Authority.

1 Introduction

The San Francisco County Transportation Authority (Authority), in cooperation with partner agencies and the community, undertook a study of transportation needs and opportunities in the Market-Octavia district of San Francisco. The Central Freeway and Octavia Circulation Study (Circulation Study or Study) assessed transportation conditions and needs, advanced a multimodal improvement and policy strategy, and analyzed a number of potential circulation improvements in the Market-Octavia neighborhood and along key corridors that provide access to the neighborhood. The Study's recommendations include a set of near- to mid-term improvements, as well as a strategy for longer-term planning and policy development to address critical circulation issues within and beyond the Market-Octavia area. The Study was made possible by a grant from the Metropolitan Transportation Commission (MTC), through the Station Area Planning Program. The Study was developed with a technical consulting team led by CHS Consulting Group. Collectively the Authority staff team and consultant team formed the Study Team.

This Final Report (Report) summarizes and presents the Study process, technical activities, community input, and findings and recommendations. The Report is organized as follows. The first chapter provides Study Area context by briefly reviewing the neighborhood's historic role in traffic circulation, including initiatives in recent years that have sought to better balance transportation demands in the neighborhood. This chapter also discusses the goals and technical approach of the Study, and reviews the community involvement approach. Chapter 2 describes current transportation conditions in the Market-Octavia neighborhood. Chapter 3 presents the Study's goals and objectives framework and presents the Study's overall "circulation strategy," which was developed to provide high-level recommendations about the role and priorities of streets within the Study Area using a corridor-based approach. Chapter 4 summarizes technical analysis concerning transportation improvements prioritized for near-term project development. Chapter 5 closes the report by presenting the Study's findings and recommendations.

1.1 Project Background

The Circulation Study was conducted to assess the performance of the transportation system in the Market-Octavia neighborhood, recommend transportation improvements in the area, and consider other relevant local and regional transportation issues. The Study had a twin focus: examining local (neighborhood-level) needs to address livability, and considering the larger network level to address regional accessibility. To better understand the transportation context of the Market-Octavia neighborhood, this section summarizes the relevant history of the Central Freeway and Octavia Boulevard and reviews other planning initiatives that affect transportation in the Study Area.

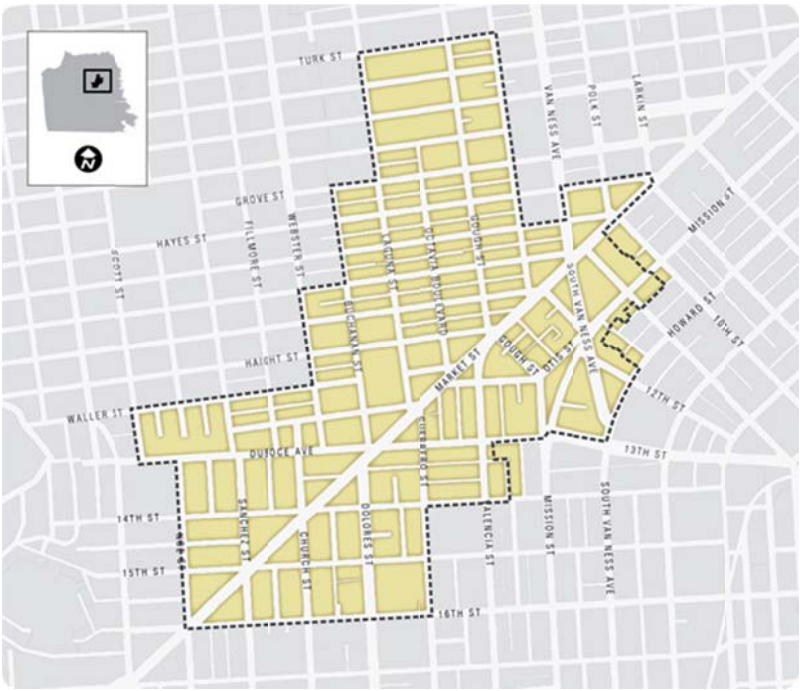
1.1.1 History

The Central Freeway is a vestige of a 1948 freeway plan for San Francisco that was never fully completed. Much of the initially envisioned Central Freeway was completed, however; and the

original facility connected the Bayshore Freeway/Skyway (US-101/I-80) to Van Ness Avenue and the Oak and Fell Street couplet. Like some other roadway facilities in the city, the Central Freeway was damaged by the 1989 Loma Prieta earthquake. Three successive ballot measures in the 1990s demonstrated the desire of San Francisco voters to rethink the role of the Central Freeway within the city's circulation system. Ultimately, the prevailing ballot measure deemed that the facility be rebuilt only as far north as Market Street, with a boulevard along Octavia Street and a touchdown ramp at Market and Octavia. Octavia Boulevard opened in 2005.

In parallel with planning, design, and construction of the new Central Freeway ramps and Octavia Boulevard, the City and County of San Francisco (City) undertook an area land use planning effort for the area in the vicinity of the new facilities, referred to as the Market-Octavia neighborhood/district (shown in Figure 1 below). After several years of work, the San Francisco Planning Department's "Better Neighborhood Plan" for the Market-Octavia neighborhood culminated in the 2007 adoption of the Market and Octavia Area Plan by the Planning Commission. Subsequently adopted by the Board of Supervisors, the Area Plan will result in the addition of approximately 6,000 households and 3,000 jobs in the plan area over the next 30 years. Some of this growth will be accommodated on sites adjacent to and north of the Boulevard, which were made available by the freeway's demolition. The Market and Octavia Area Plan also provides specific policies and design principles for the streets in the neighborhood.

Figure 1. Market and Octavia Area Plan – Plan Area



The Boulevard design relies upon the city's grid system of streets to serve traffic flowing to and from the new facility. After Octavia Boulevard and the new Central Freeway ramps opened, traffic patterns were redistributed with various effects to local and citywide circulation conditions.

As a result, the surrounding neighborhoods experience traffic, transit, pedestrian, and bicycle issues that vary from those present prior to the opening of the Boulevard. Table 1, below, present a number of these key issues. (Existing transportation conditions are discussed further in Chapter 2, below.) Some of these, issues are relatively modest in scale (particularly in comparison to the planning, funding, and implementation of the Octavia Boulevard project) and/or have not drawn the attention and/or priority of other planning efforts. Other issues are larger in scale—particularly given their relationship to citywide and regional travel patterns—such as crosstown transit services, regional transit connections, and regional commute patterns. As such, transportation issues in the Market-Octavia area require not only neighborhood-level analysis but also coordination with countywide planning and regional planning efforts.

Table 1. Selection of Circulation Issues in the Study Area

Mode	Circulation Issue
Traffic	• Chronically congested intersections and corridors • Cut through traffic • Poor motorist behavior
Transit	• Unreliable surface-running transit service to and through the study area • Long transit travel times, particularly for regional trips • Crowded conditions during peak periods
Pedestrians	• Various crosswalks and other facilities, such as curb ramps, are missing in key locations • High traffic volumes and speeding traffic diminish quality of pedestrian environment • Safety issues at certain intersections
Bicycles	• Need for better access to and through the area • Key bicycle route network links are absent or warrant improvement • Safety issues at certain locations

As the access point for the remaining freeway south of Market, the Market-Octavia neighborhood is subject to heavy local and regional circulation demands. Neighborhoods to the south and west have also expressed concerns that the incremental traffic that appeared during demolition and construction of the new facility was not subsequently reduced with the opening of the rebuilt touchdown ramps and Boulevard.

1.1.2 Related Studies

The Circulation Study was not undertaken in isolation. Analysis, recommendations, and outreach were conducted and developed in coordination with several other planning efforts that focus either primarily or in part on the Market-Octavia area, and/or which affect relevant corridors the provide access to and from the neighborhood. These include the policies and recommendations of the Market and Octavia Area Plan noted above, as well as other efforts. These plans, studies, and implementation projects include, but are not limited to:

- Study Area:
  - Hayes Street/Fell Street Two-Way Project
  - Haight Street Two-Way Project

  - Van Ness Avenue Bus Rapid Transit Project
  - Civic Center Sustainable District Plan
  - Better Market Street
- Access corridors and adjacent neighborhoods:
  - EN-TRIPS
  - Glen Park Community Plan
  - St. Francis Wood Traffic Calming Project
- Citywide/Countywide:
  - Muni Transit Effectiveness Project (TEP)
  - Citywide Bicycle Plan
  - Mobility, Access and Pricing Study (MAPS)
  - SFpark
  - San Francisco Transportation Plan

Coordination and relationship to these studies and projects is discussed throughout this report as relevant.

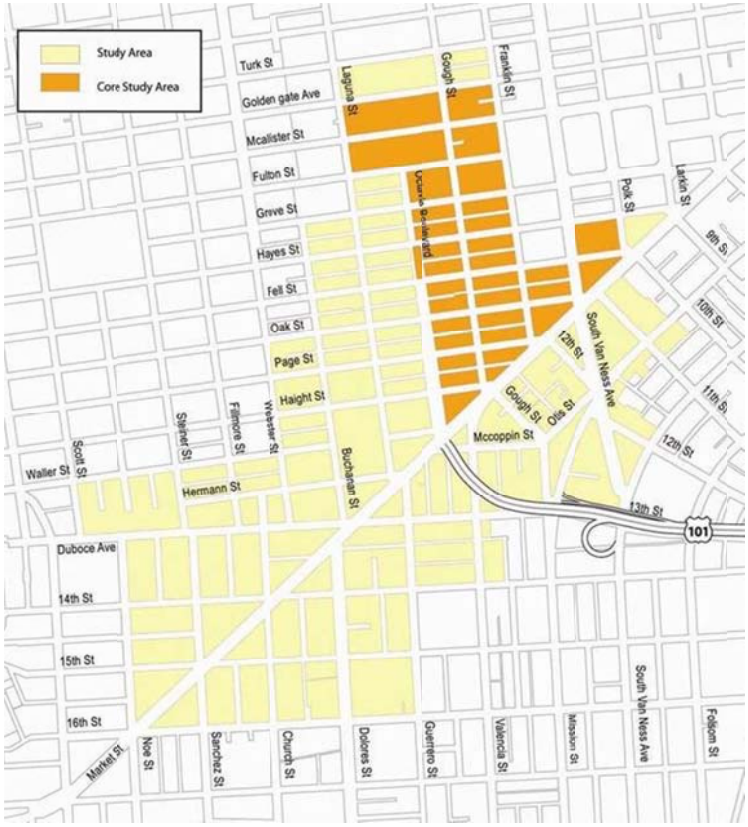
1.2 Study Area

The Study Area is based upon the Market and Octavia Neighborhood Plan area, which encompasses portions of the Western Addition, Civic Center, Western SoMa, Castro, and Duboce Triangle neighborhoods. The Study Area is roughly bounded by Turk Street to the north, Polk Street to the east, 16th Street to the south, and Noe Street to the west. A smaller core Study Area was defined for purposes of certain analyses, such as assessment of the condition of pedestrian infrastructure and amenities. Given the effect of various citywide and regional access corridors on the area, the Study also used a broader geographic lens as appropriate for certain analyses, such as the broad circulation strategy. In other words, the Study encompasses multiple levels in order to:

- Analyze local conditions and community needs;
- Assess major connections to the rest of San Francisco and the region; and
- Examine issues and opportunities at the inter-district, citywide, and regional levels.

The core Study Area and plan area defined by the limits of the Market & Octavia Areawide Plan are shown in Figure 2. The plan area encompasses 0.625 square miles, with approximately 28,000 residents, 14,000 households, and 29,700 jobs. The Study Area's population density, at more than 44,000 persons per square mile, is significantly higher than the citywide average.

Figure 2: Circulation Study Area and Core Study Area



1.3 Study Purpose and Approach

The purpose of the Circulation Study is to:

- **Conduct an analysis of circulation in the Study Area.** This analysis will lead to a better understanding of travel behavior to, from, within, and through the area, to support the development of the medium- to long-term transportation strategy for the area.
- **Recommend a framework for planning and project development in the Study Area.** The framework will guide future planning improvements and will serve as an input into the Authority's current San Francisco Transportation Plan (SFTP) effort, the update to San Francisco's countywide transportation plan.
- **Develop a small set of projects for near- and medium-term grant opportunities.** These projects may build on planned improvements currently being developed and/or lay the groundwork for future planning work.

As existing transportation conditions and needs in the Study Area were assessed during the initial phase of the Study (as discussed in Chapter 2), a set of transportation goals and objectives were developed to guide the development of the Study's recommendations. These goals and objectives are discussed below in Chapter 3.

1.4 Outreach and Agency Coordination

Throughout the Study process, the Study team solicited input from a variety of sources, including community stakeholders, partner agency staff, institutional representatives, and the general public. The Study effort included a Technical Advisory Committee (TAC), composed of partner agency staff, which provided technical oversight and facilitated coordination with related projects. Community residents and stakeholders provided input regarding transportation needs, review of preliminary analyses and designs, and guidance on Study findings and recommendations.

The interagency TAC included representatives from the SFMTA, the San Francisco Planning Department, the San Francisco Department of Public Works (DPW), the MTC, and the California Department of Transportation (Caltrans). TAC members provided technical input and review throughout the Study process.

The Circulation Study reflects the involvement of an array of stakeholders including residents, businesses, civic organizations, and community leaders from Hayes Valley, South of Market (SoMa), Civic Center, Duboce Triangle, and Glen Park and Bernal Heights.

Community involvement activities were conducted on an ongoing basis throughout the Study. At key points during the Study, outreach events were held to seek public input. Organized by Study phase, these activities included:

- Existing Conditions and Needs Assessment
  - Study area walking tour with community stakeholders
  - Presentations to community groups and advisory bodies, including the Hayes Valley Neighborhood Association (HVNA) and the Market-Octavia Citizens Advisory Committee (MO-CAC)
  - Direct outreach meetings / stakeholder interviews
- Multimodal Strategy Development and Solutions Brainstorming
  - Daytime public open house hosted at the Authority
  - Evening public workshop/charrette hosted at the Authority
  - Presentations to community groups and advisory bodies including the HVNA
- Project Analysis and Study Recommendations
  - Direct outreach meetings / stakeholder focus groups
  - Presentations to community organizations including the MO-CAC

Public, stakeholder, and partner agency input is reflected and discussed throughout this report in relevant sections. Specifically, public outreach was critical to the Study's prioritization of Study area transportation needs, development of the goals framework, refinement of project analyses and designs, and formulation of Study recommendations.

2 Existing Conditions

This chapter summarizes existing transportation conditions in the Study area, including travel demand patterns and information for each mode of travel. The existing conditions analysis, along with community and agency input and planned improvements, guided the Study team toward an overall understanding of transportation needs in the Study Area. From this understanding of needs, a set of goals and objectives for improving transportation within and through the study area was developed (discussed in Chapter 3).

A full existing conditions analysis was prepared for the Study and is available as a separate technical report.

2.1 Travel Demand Patterns

The highly-utilized arterial network in the Study Area is the central transportation challenge confronting the community, both presently and in the future. Traffic congestion is significant during both AM and PM peak periods, impairing surface transit operations and degrading conditions for pedestrians and bicyclists. Congestion also frequently manifests itself during some weekend periods (such as Sunday afternoons) reflecting the area's role in accommodating citywide and regional travel to recreational destinations such as Golden Gate Park and Fort Mason. In particular the set of one-way couplet pairs providing connections to Octavia Boulevard from the west (Oak and Fell streets) and the north (Franklin and Gough streets) experience significant traffic demand.

High traffic levels in the neighborhood are a reflection of the unique set of roles that the area's transportation network plays. The Study Area hosts junctures of all of the following: the regional freeway system; high-capacity arterials that serve crosstown and radial functions; minor arterials/collectors; and local-serving, neighborhood streets and alleys. In addition, the Study Area hosts key links of the city's major bus lines, portals for the rail trunk lines and connections to key bicycle routes. The origin and destination pattern of motorist traffic in the neighborhood is highly varied. Traffic represents a wide range of local and regional trips, to and from all San Francisco districts and parts of the Bay Area.

2.1.1 Origin-Destination Survey

To better understand and illustrate the trip patterns of motorists using key facilities in the neighborhood, an origin-destination survey was conducted as part of the Study, with paper mailback surveys distributed to motorists at various locations. Several hundred completed surveys were returned.

Surveys were distributed at the locations shown in Figure 3, below, to gauge the share of traffic with an origin or destination (or both) outside of San Francisco (referred to as "regional" traffic). As shown in Table 2, below, the share of regional traffic versus intra-San Francisco traffic varies

widely across these facilities. On southbound Octavia at the freeway on-ramp, 80 percent of motorists have an origin and/or destination outside of San Francisco. By comparison, on eastbound Oak Street before Gough Street, approximately two-thirds of traffic is internal to San Francisco.

Figure 3. Survey Distribution Locations

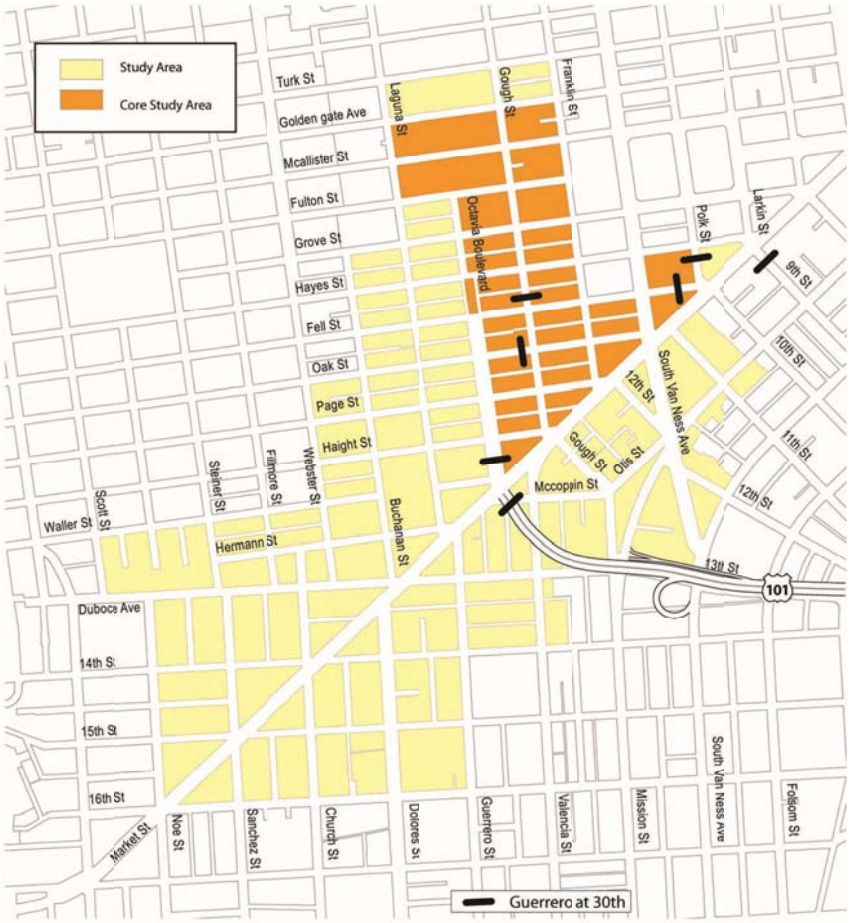


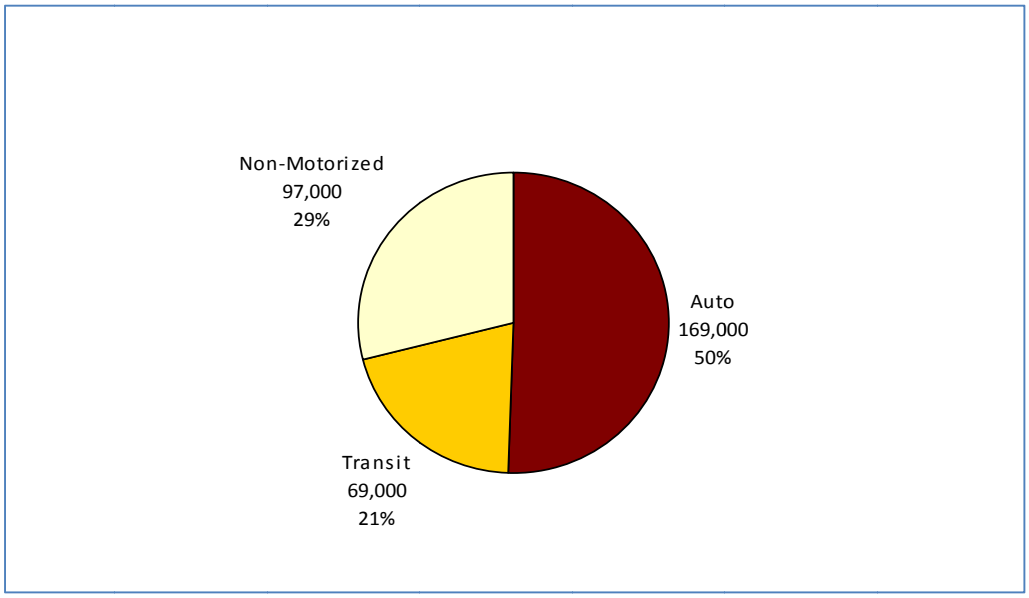
Table 2. Share of Regional Traffic by Survey Location

	Intra-SF	Regional
Octavia at Market (SB)	20%	80%
San Jose at 30th (NB)	43%	57%
9th at Market (NB)	44%	56%
Polk/Fell at Market (SB)	50%	50%
Gough at Fell (SB)	62%	38%
Oak at Gough (EB)	68%	32%

2.1.2 Study Area Travel Demand

Each weekday, approximately 340,000 trips are made with an origin or destination (or both) within the Market-Octavia neighborhood. Figure 4, below, illustrates the modal composition of these trips. Fifty percent of trips are made by automobile. This is slightly smaller than the share of trips made by automobiles citywide (59%). While only 21% of trips are made by transit (somewhat lower than the citywide transit mode share of 32%), a greater share of trips to and from the Study Area are non-motorized (walking or cycling) than the city as a whole.

Figure 4 – Mode Share of Daily Trips to, from, and within the Study Area (2010), 340,000 total trips

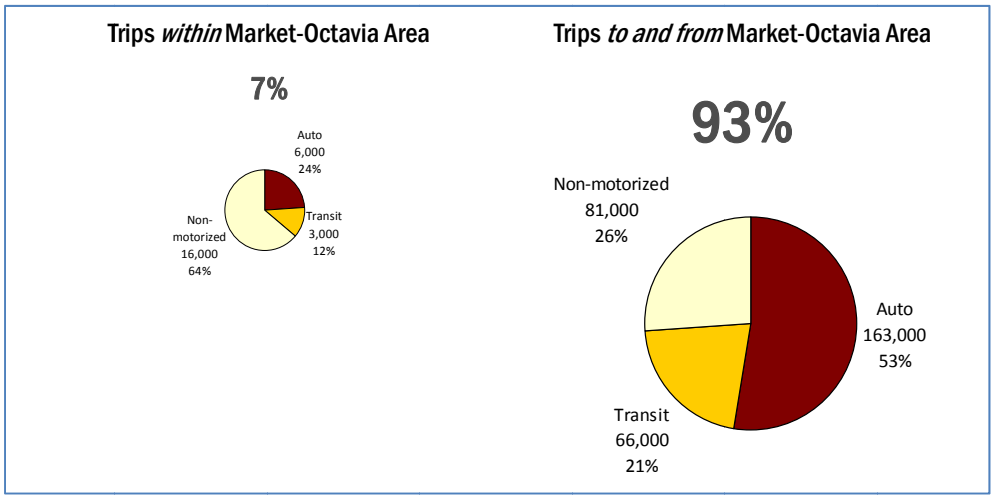


Source: SFCTA SF-CHAMP 4, 2010

A more subtle picture of tripmaking in the Study Area—and its effect on transportation conditions within the Study Area—emerges upon examining more closely two factors: the mode split of trips made wholly within the neighborhood; and the extent to which motorized travel in the neighborhood is composed of "through" trips.

For trips **wholly within** the Study Area, 64% of trips are made via walking or cycling. (These trips represent seven percent of total travel to, from, and within the neighborhood.) The Market-Octavia area benefits from a diverse mix of land uses, including a mix of residential centers, a major employment node (Civic Center), and multiple local commercial corridors. These and other area characteristics, such as density and parking price, encourage transportation system users to make the majority of trips local to the Study Area via a non-motorized mode. In short, as shown in Figure 5, below, whereas intra-Market-Octavia trips are majority pedestrian and bicycle, trips to and from the area are majority automobile.

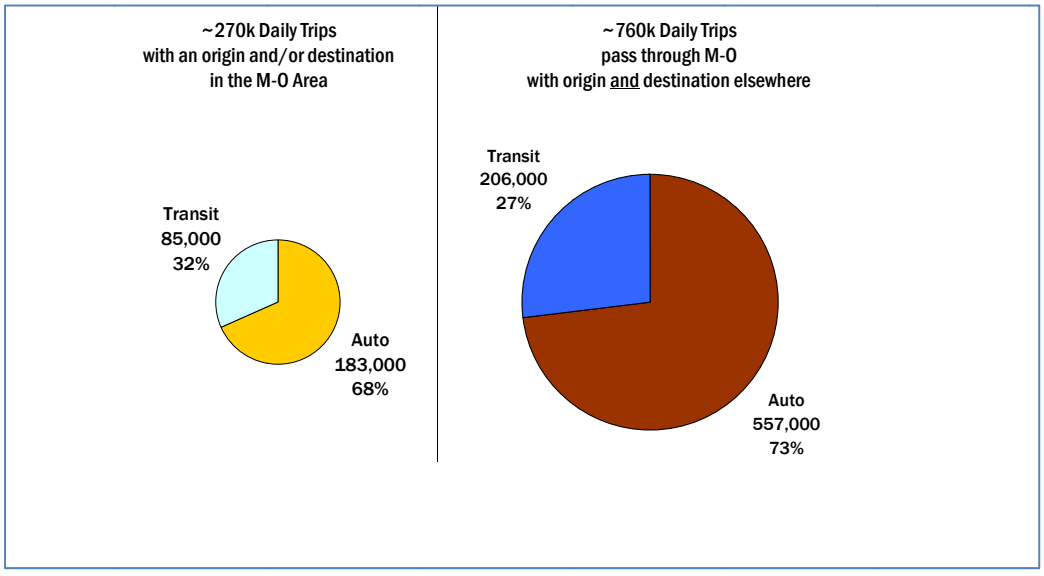
Figure 5 – Intra-Market Octavia Area Trips; To and From Trips



Source: SFCTA SF-CHAMP 4, 2010

Of the 340,000 daily trips with an origin and/or destination in the Study Area, approximately 270,000 are "motorized" trips—either automobile or transit. This, however, is an incomplete picture of motorized travel as it affects the transportation network in the area. As shown in Figure 6, below, an additional 760,000 motorized trips pass through the Study Area daily with both an origin and destination elsewhere. This reflects the citywide and regional function of the roadway and transit network in the Study Area.

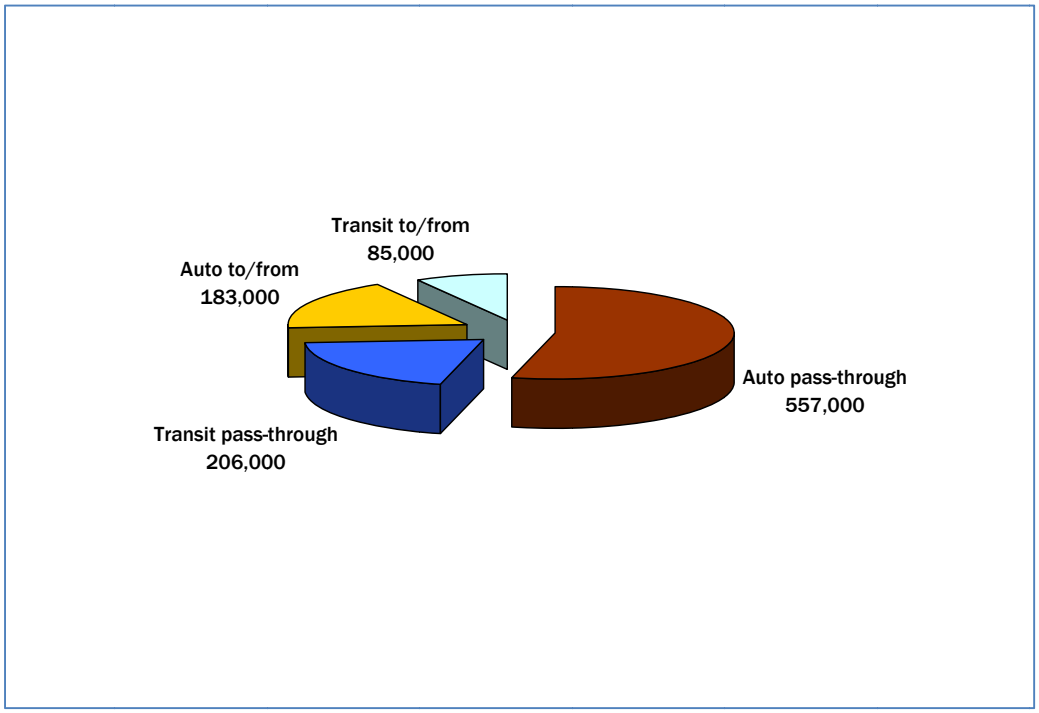
Figure 6 – Motorized Travel in the Market-Octavia Area (2010)



Source: SFCTA SF-CHAMP 4, 2010

As shown in Figure 7, below, about three-quarters of motorized travel in the Study Area is composed of pass-through trips. As discussed throughout this Report, this means that efforts to address transportation demand in the Study Area must consider the diversity of trip patterns that affect the area's network.

Figure 7. Motorized Travel in the Market-Octavia Area (2010)



Source: SFCTA SF-CHAMP 4, 2010

2.2 Traffic Circulation

Table 3 shows the change in north-south traffic volumes between 1996 (with Central Freeway extending north of Market Street) and 2006 (after Octavia Boulevard replaced Central Freeway north of Market Street).

Table 3: Octavia Boulevard compared to Central Freeway, Weekday traffic between Oak and Market Streets

	1996 Central Freeway	2006 Octavia Blvd
Northbound	45,000	24,000
Southbound	48,000	21,000
Daily Totals	93,000	45,000

Source: SFMTA (DPT), 2006

Although freeway/boulevard volumes have clearly changed, of perhaps greater interest to Study Area residents has been the shift in freeway access routes. During removal of Central Freeway and construction of Octavia Boulevard, drivers were forced to use alternate routes for east-west trips and accessing the regional freeway system. Some of these detours became lasting habits.

Tables 4 through 7 present traffic volume data for three time periods: with the original Central Freeway; during the Boulevard construction period; and following the new facility's opening. When the original Central Freeway connected directly to Oak and Fell streets, these arterials each served average daily traffic volume of approximately 45,000 vehicles. When Oak and Fell access was removed but prior to the opening of the Boulevard, traffic on Oak and Fell dropped to 25,000 and 18,000 daily vehicles, respectively. With the new Octavia Boulevard, the Central Freeway functions again as a primary access route to and from the west side of San Francisco and traffic levels have risen—though not as high as with the original Central Freeway facility.

Table 4: Westbound weekday traffic (Fell Street, west of Laguna Street)

	1996 Central Fwy	2005 Before Octavia Blvd	2006 Octavia Blvd	Percent Change 2005 to 2006	Percent Change 1996 to 2006
AM Peak	4,368	1,763	3,379	+ 92 %	- 23 %
PM Peak	5,970	3,169	4,526	+ 42 %	- 24 %
Daily Totals	42,730	18,323	32,677	+ 78 %	- 24 %

Table 5: Eastbound weekday traffic (Oak Street, west of Laguna Street)

	1996 Central Fwy	2005 Before Octavia Blvd	2006 Octavia Blvd	Percent Change 2005 to 2006	Percent Change 1996 to 2006
AM Peak	7,003	4,245	4,893	+ 15 %	- 30 %
PM Peak	4,863	3,029	4,624	+ 53 %	- 5 %
Daily Totals	47,137	25,462	41,434	+ 63 %	- 12 %

Table 6: Eastbound weekday traffic (Page Street, west of Octavia Boulevard)

	2003 Before Octavia Blvd	2006 Octavia Blvd	Percent Change 2003 to 2006
AM Peak	603	714	+ 18 %
PM Peak	261	512	+ 96 %
Daily Totals	2,313	3,260	+ 41 %

Table 7: Eastbound weekday traffic (Haight Street, west of Octavia Boulevard)

	2003 Before Octavia Blvd	2006 Octavia Blvd	Percent Change 2005 to 2006
AM Peak	241	891	+ 270 %
PM Peak	312	509	+ 63 %
Daily Totals	1,945	4,114	+ 112 %

Source (Tables 4-7): SFMTA (DPT), 2006

2.2.1 Community issues

In public outreach meetings, stakeholders raised several issues related to traffic circulation. Most comments concerned the volume and speed of automobiles in a growing neighborhood with high levels of pedestrian activity. Commonly heard concerns were:

- High traffic speeds on Fell and Oak Streets
- Conflicts between drivers and non-motorized travelers at various intersections of concern, including Market/Gough/Haight, Oak/Laguna, Market/Octavia, Oak/Octavia, Page/Octavia, and other intersections.
- Automobile behavior at the intersection of Oak and Octavia. The heavy right turn volume from eastbound Oak to southbound Octavia creates conflicts and erratic driver behavior such as red light running and "cutting in" to the turn lane at or near the intersection.
- Long vehicle queues on Oak Street that spill over from Octavia Boulevard.
- Increased traffic volumes along Laguna Street in recent years. Traffic backs up, in particular, between Haight and Market streets, impacting transit performance on those streets as well as motorist behavior in the Study Area.
- Increased traffic volumes in other corridors feeding to, or diverting around, the Central Freeway and Octavia Boulevard, including the San Jose Avenue-Guerrero Street corridor and the Monterey Boulevard corridor.

2.3 Pedestrian Conditions

All surface streets in the core study area have public sidewalks along both sides of the roadway. Sidewalks are in generally good condition, with few major cracks or other obstacles; however, some pedestrian features are absent various locations. Certain streets have significant pedestrian amenities, including street trees, benches. A small but well-used park was developed at the terminus of Octavia Boulevard (between Fell and Hayes streets). The one-way couplets of Oak/Fell and Franklin/Gough, which carry high traffic volumes, have fewer design elements to buffer pedestrians from adjacent vehicular movements. As such, these streets may feel less desirable for some pedestrians.

There are also seven alleyways in the core study area running in the east-west direction: Redwood Street; Ash Street; Ivy Street; Linden Street; Hickory Street; Lily Street; and Rose Street. These alleys, too, have sidewalks on both sides, although they are more frequently blocked with obstacles such as trash receptacles and parked cars. With low traffic volumes and speeds, the Study Area's alleyways are a public realm resource. Specifically, the eastern portion of the block of Linden between Octavia and Gough is a small scale example of a "shared street" where vehicles must operate at-grade with pedestrians, encouraging slower speeds and more careful movements with yielding to pedestrians. The overall effect is a sense that the street is prioritized for pedestrians.

The study team conducted an inventory of pedestrian infrastructure at major intersections in the core Study Area. Most strikingly, some crosswalks have been closed in order to accommodate

high levels of vehicular turning movements to and from Fell and Oak streets, thus requiring pedestrians to negotiate three crossings to continue on a straight path at certain locations. Full results of the pedestrian infrastructure inventory are available as an appendix to this Report. In addition to closed crosswalks, pedestrian issues in the neighborhood include instances of missing accessible curb ramps, poorly marked or faded crosswalks, extended wait times for "walk" signal phases, and recurrent vehicle incursion into crosswalks at congested intersections.

A more complete analysis of potential alternative signal configurations and traffic operations at intersections with closed crosswalks is presented in Chapter 4 of this report.

Even where facilities are provided, pedestrian safety concerns are present in the neighborhood. Collision patterns reveal that multiples intersections in the Study Area have elevated numbers of collisions involving automobiles and non-motorized travelers (pedestrians or cyclists). Some of the intersections with the highest incidence of such collisions in the city have historically included the intersections of Market Street and Octavia Boulevard (particularly bicycle collisions) and Market and Gough streets.

2.3.1 Community issues

Participants in public outreach discussions were conscious and vocal about pedestrian conditions in the Study Area. Most input reflected a desire to reduce conflicts between automobiles and non-motorized travelers. Specific comments included:

- Several intersections are perceived as having poor conditions for pedestrians and bicyclists due to congestion and driver behavior, including Page/Market/Franklin, Oak/Octavia, Market/Gough/Haight, Laguna/Oak, and Laguna/Fell.
- Missing crosswalks and other substandard pedestrian facilities hampers non-motorized travel access, especially for the injured, handicapped, or elderly.
- Traffic signal cycle time devoted to the "Walk" phase should be increased, particularly along and across Octavia.
- Actuated pedestrian signals (such as at the west side of Fell/Octavia) are undesirable, particularly given high overall pedestrian activity in the neighborhood.
- Certain intersections are not ADA compliant, such as the Gough/Hayes intersection.
- Crosswalks are currently not provided at intersections with alleys (across primary streets).
- Sidewalk width is insufficient in various locations. At the southeast corner of Franklin/Grove, high pedestrian volume before and after events at Davies Hall sometimes results in insufficient room for pedestrian circulation.

2.4 Bicycle conditions

Despite hills to the north and west, the Study Area has several bicycle facilities and high levels of bicycle activity. Five designated bicycle routes pass through or along the boundaries of the Study Area. Together, these bike facilities compose more than 18 miles of bike paths, lanes, sharrows, and signed routes within the Study Area. Key bicycle network routes in the Study

Area include Market Street, Page Street, Webster Street, Polk Street, and the "Wiggle" through the Lower Haight district.

Despite the relative density of existing bicycle routes and facilities, there are several opportunities to improve the bicycle network within the Study Area.

Perhaps the most significant challenge for bicyclists in the Study Area is east-west connectivity. San Francisco's hilly topography places major impediments in the way of cyclists wishing to travel west from the Study Area. Currently, many cyclists utilize the Wiggle through the Lower Haight neighborhood to connect from Market Street (at Buchanan) to the Panhandle cycle path and points west. For bicyclists not using the Wiggle, Page Street serves as another key east-west bicycle facility, although traffic queuing at Octavia during peak periods creates conflicts with eastbound cyclists.

2.4.1 Community issues

As with pedestrian issues, the community was knowledgeable and vocal about shortcomings in bicycle connectivity and safety. Frequent comments were as follows:

- Several intersections are perceived as having poor conditions for cyclists, especially the intersections of Page/Market/Franklin, Page/Octavia, Market/Valencia, Market/Gough.
- The intersection of Page Street and Octavia Boulevard is particularly challenging for bicyclists to navigate. Eastbound cyclists are coasting downhill and have difficulty stopping in time if a car suddenly turns right.
- Key connection points have inadequate infrastructure for pedestrians, such as at Market and Buchanan (connection to the Duboce bikeway and the Wiggle) and Market and Polk (connection to north-south bicycle route on Polk).

Since the lifting of the injunction on making bicycle improvements in the city, various recent improvements to the bicycle network have been made in the Study Area, including painting of sharrows on various Class III facilities, and a suite of improvements to Market Street bicycle facilities, including green colored pavement, bicycle boxes, and safe hit posts where feasible. The SFMTA is currently planning for improvements to provide a bicycle connection from Market Street to northbound Polk Street, where a facility is currently absent.

2.5 Transit

The primary transit service in the area is provided by Muni, San Francisco's local bus and rail system, operated by the SFMTA. Key Muni issues in the study area generally relate to Muni speed and reliability. Stop-level features are also an area of community priority. Owing in part to the residential nature of much of the study area and the limited sidewalk space throughout, fewer than half the Muni bus stops in the study area have a shelter. Where shelters are provided, some stops provide real-time information about transit arrivals via LED screens.

Aside from lacking physical amenities, stops also suffer from placements that hinder travel speeds. For example, there are several far-side bus stops at stop sign-controlled intersections.

At these intersections, Muni buses must stop twice in short succession (once for the stop sign and once at the bus stop). There are also a number of near-side bus stops at signalized intersections. Near-side bus stops do not allow Muni buses to take the advantage of signal priority systems. While there may be location-specific reasons for bus stops, those reasons should be weighed against improved travel times.

Stop amenities aside, the central transit issue and challenge in the neighborhood is crowding. The study area includes the Market Street and/or Van Ness Avenue stop for many routes, which is the maximum load point for most Muni radial lines. Traffic conditions hinder bus operations because buses must operate in the same lanes as automobiles.

Finally, regional transit access is limited in the Study Area. The closest BART stations are at the outskirts of the Study Area, at Civic Center and 16th Street. As the travel demand discussion above documents, much of the travel in the area is regional in nature. However, in order to access regional transit, many travelers walk, bicycle, or utilize a local transit service to get to a BART or Caltrain station.

2.5.1 Community issues

At public meetings, participants noted various issues with transit:

- Transit is crowded and unreliable during peak periods.
- Muni bus services are adversely affected by traffic congestion along east-west streets within the neighborhood. For example, Routes 6 and 71 along Haight Street are affected by the congestion on Octavia Boulevard.
- Muni buses, along with the F line streetcar, are often delayed at the intersection at Page/Market/Franklin Streets.

These concerns are in line with the key technical finding that the density (i.e., number of routes) of transit service is not the primary issue with transit in the Study Area. Rather, the speed, reliability, and capacity of transit are the key needs. In addition, transit connectivity (particularly to regional services) is an area of need.

2.6 Parking

Most of the streets within the Study Area feature on-street parking parallel to the curb. Much of this parking is metered, particularly in the Hayes Valley commercial core, Civic Center, and other high-activity and commercial streets. In some locations, such as the south side of Fell Street between Van Ness and Gough, curbside parking lanes are subject to peak-period “tow-away” regulations that allow them to be utilized as traffic lanes during commute hours.

In addition to on-street supply, the Study Area includes numerous off-street lots garages accessible to the public, including large City-owned garages such as the Performing Arts garage. Additional off-street supplies are owned and managed by the private sector.

The Hayes Valley and Civic Center area within the Study Area is one of the SFpark pilot program areas. The SFpark program pilot will assess the effectiveness of using pricing and

complementary strategies as a way to manage demand for parking at on-street locations and off-street facilities managed by SFMTA. Within SFpark pilot areas, meters accept multiple forms of payment, including credit cards, and rates adjusted periodically based on demand with the goal of meeting occupancy targets.

In 2010, SFMTA replaced old meters in the Hayes Valley/Civic Center with new meters to support the SFpark program. In 2011, SFpark implemented the first price adjustment since installing meters in the neighborhood. The SFpark pilots are the subject of a comprehensive evaluation, which may result in expansion of the program to other metered parking supply in the city, including other portions of the Study Area, such as Upper Market.

The Study Area is also home to another pilot program related to parking. The "Pavement to Parks" program converts parking spaces to public space suitable for non-automotive uses like bike parking and seating. On Hayes Street, near the intersection of Hayes and Gough Street, one parklet, as shown in Figure 8, offers an outdoor seating option for people dining, shopping, or walking through the neighborhood. Parklets are privately-maintained but publicly accessible.

Figure 8: Before and After pictures of Parklet in Hayes Valley

2.6.1 Community issues

Parking was not frequently raised by the community as a key issue, at least not in the context of the Circulation Study. This is perhaps because parked vehicles are not frequently thought of as having an impact on the circulation of other travelers, despite recent research regarding the impact of circling for spaces or parking movements on cyclist and pedestrian safety, as well as transit performance. Although the topic was not championed by Study stakeholders, parking supply and price are central considerations for circulation in any area.

In general, underpriced parking causes excess demand. This has the dual effect of encouraging people to travel by automobile (because the price of parking is lower than the real and/or perceived price of using other modes) and to circle popular blocks in search of an open parking

space. Both factors contribute to higher levels of traffic, lower travel speeds, and impaired conditions for pedestrians and cyclists.

The SFpark program will assess the effects of demand-responsive variable pricing on the demand for parking and on traffic levels in the area.

2.7 Planned improvements

Some circulation-related improvements in the Study Area are already in various stages of the planning or implementation. Segments of Hayes and Fell streets were recently converted from one-way to two-way operation, and two-way conversion of the easternmost segment of Haight Street has been funded.

Where directionality has changed to two-way operations access is open to all vehicles, although operation of the 21-Hayes Muni trolleycoach service remains split along Hayes (westbound) and Grove (eastbound) streets through the Study Area. Haight, from Octavia to Market/Gough will soon be converted from one-way westbound operation to allow for two-way transit operation. The new eastbound lane on Haight Street will be exclusively for transit vehicles headed to Market Street. Transit travel time and reliability will be improved for the 6-Parnassus and 71-Haight Muni services that traverse the corridor.

In addition to these projects that have been recently completed or are underway currently, other key planned improvements in the Study Area include:

- **Van Ness BRT:** implementation of a full-featured bus rapid transit (BRT) service on Van Ness Avenue between Lombard and Mission Streets, providing a key north-south link in the city's rapid transit network.
- **Better Market Street:** planning and design for a more balanced and effective Market Street between Octavia Boulevard and the Bay, including goals to improve transit performance and bicycle features.
- **Bicycle network improvements**, including a facility on Polk Street connecting from Market to McAllister and upgrades to bicycle facilities along Market Street west of Octavia

3 Transportation Goals and Circulation Strategy

Following the assessment of existing transportation conditions as summarized above, the Study Team developed a set of transportation goals and objectives for the Study. This strategic framework responds to the key transportation needs in the Study Area. The transportation goals and objectives guided two processes: first, the development of an overall Circulation Strategy for the broad Study Area; and, second, the analysis and prioritization of specific potential transportation projects.

The Circulation Strategy was developed to explore and define modal needs and priorities across key groups of streets within the Study Area. The assessment of specific project opportunities was undertaken both to advance a limited set of projects for further advancement in the near term and to identify/confirm other projects for implementation over the medium to long term.

This chapter first discusses the Study's goals and objectives framework and then presents the Circulation Strategy. Chapter 4, which follows, presents the outcomes of the project prioritization and development process.

3.1 Goals and objectives

The Study's goals framework is three-pronged, organized by the following goals:

- **Improve circulation and the multimodal network.** The first goal area is to improve circulation and traffic management in the Market-Octavia neighborhood for all modes, with a focus on improving conditions for surface-running transit, bicycles, and pedestrians.
- **Shift travel to transit and non-motorized modes.** Improved traffic circulation will—in isolation—tend to encourage more automobile travel as automobile commutes become faster, easier, and more reliable. As a crucial companion to addressing traffic circulation, the second goal is to shift some motorists from their automobiles to other forms of transportation. Since improved circulation will also benefit surface-running transit services, transit will become a more attractive alternative for some trips.
- **Improve Safety and Walkability.** To encourage travelers to use sidewalks and bicycle facilities as central elements of the transportation network, the third goal focuses on improved safety and walkability in the Market-Octavia neighborhood.

The above three categories, or "goal areas," encompass a set of more specific objectives to address transportation needs in the Study Area. These objectives are displayed below in Table 8, below, including their relationship to one or more of the goal areas.

Table 8. Transportation Objectives

Objective	Circulation/Traffic Management	Mode Shift	Safety and Walkability
Support local and regional mobility	◆		
Balance multimodal needs	◆	◆	◆
Improve traffic circulation in the Market-Octavia area	◆		◆
Manage demand in key corridors to/from Market-Octavia	◆	◆	◆
Improve San Francisco's rapid transit network	◆	◆	◆
Shift more regional travel to transit	◆	◆	
Improve pedestrian and bicycle conditions/network	◆	◆	◆
Enhance safety for all system users	◆		◆

3.2 Study Area Circulation Strategy – Approach

One of the central purposes of the Study is to examine circulation issues and needs in the overall Study Area, in order to develop a high-level circulation strategy that guides the development of future improvements and programs. This Circulation Strategy considers issues such as modal priorities, design and service opportunities, physical and other constraints, policy coordination, and other factors.

The approach for development of the circulation strategy was as follows:

1. *Assess areawide travel demand patterns, the configuration of the current transit and bicycle networks (and relevant planned improvements), and existing on-street transportation conditions such as congestion and transit demand.*
2. *Identify opportunities—across broadly-defined travel corridors—to improve person-capacity and safety, particularly through improvements to transit service, transit priority, and bicycle network facilities and connectivity.*
3. *Consider key design constraints and implications at the individual street level, as well areas of coordination and opportunity within and beyond the study area.*
4. *Recommend policies and/or programmatic strategies, such as demand management measures, to support identified circulation improvements.*

This section summarizes the development of the circulation strategy and discusses the recommendations stemming from this analysis.

3.2.1 Key Travel Patterns and Corridors

Chapter 2 of this Report presented detailed information concerning existing travel demand patterns within the Study Area. The data and findings from that analysis provided a foundation for development of the Circulation Strategy.

The area of primary analysis for the Circulation Strategy is bounded by the Turk Street and Golden Gate Avenue couplet pair to the north; Leavenworth Street and 7th Street to the east; 16th Street to the south; and Church and Fillmore streets to the west.

For purposes of the Circulation Strategy, "corridor" is **broadly-defined** and refers to a group of adjacent streets serving similar travel demands. The following four major travel corridors were defined for purposes of the developing the Circulation Strategy:

1. **North-South – west of Van Ness.** Collectively these streets serve north-south travel flows, and in particular connect neighborhoods in the central and western portions of the City to the Study Area and to one another. They also serve access to and/from the Central Freeway ramps at Octavia, and other freeway access points to the south (beyond the Study Area). Generally this corridor includes the following streets (from west to east):
    - Fillmore and Church streets
    - Webster Street
    - Dolores Street
    - Buchanan Street
    - Laguna and Guerrero streets
    - Octavia Boulevard
    - Valencia Street
    - Franklin Street (northbound)
    - Gough Street (southbound)
    - Mission Street (Mission District)

2. **North-South – east of Van Ness.** These streets collectively serve north-south travel flows, and in particular connect the I-80/US-101 freeway system to City streets serving the Civic Center area (and points north) via ramps at 7th, 8th, 9th, and 10th streets in the South of Market (SoMa) District. Generally this corridor includes the following streets (from west to east):
    - 11th Street
    - Polk Street to 10th Street (southbound)
    - 9th Street to Larkin Street (northbound)
    - Hyde Street to 8th Street (southbound)
    - 7th Street to Leavenworth Street (northbound)

3. **East-West – north of Market.** These streets serve east-west travelers, providing key connections between the city's western neighborhoods and high-activity areas in the greater downtown, including SoMa, Civic Center, and the Financial District. They provide connections to and from the regional freeway system both via Octavia and via connections across Market to ramps in SoMa, particularly at 9th (off-ramp) and 10th (on-ramp). For purposes of the Study's analysis, this corridor was considered to contain the following streets:
    - Turk Street
    - Golden Gate Avenue
    - McAllister Street
    - Fulton Street

- Grove Street
- Hayes Street
- Fell Street (westbound)
- Oak Street (eastbound)
- Page Street
- Haight Street

4. East-West – south of Market. These streets serve east-west travelers, in particular those traveling between the Upper Market, Ashbury Heights, and Twin Peaks districts to the Showplace Square, Mission, Potrero, and Mission Bay districts. They also connect to the freeway system, particularly at the South Van Ness/Mission interchange along the Central Freeway. For purposes of the Study's analysis, this corridor was defined as including the following streets:
   - Duboce Avenue / 13th Street
   - 14th Street
   - 16th Street

As is made evident by the above groupings, both Van Ness and Market play key roles in the Study Area's circulation network. Both are currently the subject of separate, but coordinated, intensive design efforts. As such, the Circulation Strategy does not provide an extended analysis of these two streets. However, it is important to keep the role and function of the two routes in mind throughout the analysis.

- **Van Ness Avenue**, part of the state highway system, is a multi-lane, bidirectional primary arterial that serves heavy volumes of pedestrians, transit, traffic, and trucks. It is a key local, regional, and interregional route. The corridor is currently the subject of advanced planning and design efforts to develop a bus rapid transit facility from Mission Street to Lombard Street. The project will improve transit travel time and reliability for key routes in Muni's Rapid Network. If BRT is implemented, Van Ness will continue to serve significant volumes of mixed traffic; however, transit will be much better protected from traffic congestion.

- **Market Street** serves as San Francisco's transit and bicycle spine. Within and east of the Study Area, the street is home to several surface Muni transit routes and the BART and Muni Metro subways below grade. The current Better Market Street planning process is developing design alternatives to further improve transit and bicycle conditions on Market. East of Franklin Street, Market is not a primary route for through traffic, and there are existing circulation restrictions (e.g., required right turns) that seek to reduce traffic levels on Market and shift drivers away from the street as a crosstown route.

Finally, the following streets were not included in the analysis: alleys or alley-like streets (such as Linden and Hickory in the Hayes Valley neighborhood); streets that are significantly discontinuous or serve nearly entirely a local function (such as 12th Street); and east-west streets within the SoMa grid. (For the lattermost category, the rationale was that circulation in

these streets was only minimally affected by the implementation of the Octavia Boulevard/Central Freeway replacement project. Circulation analysis of these streets has been underway both as part of the EN-TRIPS process and the Authority's Core Circulation Study.) These streets or locations are considered in this analysis where directly relevant or appropriate, but are not the focus of recommendations.

3.2.2 Modal Conditions, Priorities, and Opportunities

As a first step in the development of the Circulation Strategy, the broadly defined corridors were considered in terms of modal conditions and priorities, in order to identify opportunities for circulation changes and improvements aligned with the Study's overall goals framework as presented above.

Along the corridors described above, there are significant differences in circulation patterns and street configuration depending on location. In particular there are differences north versus south of Market Street—where various street grid networks (Mission, Western Addition, Downtown, and SoMa) intersect and interact. This effectively divides the consideration of individual streets into four groupings:

1. North-South Streets: North of Market
    - *West of Van Ness*
    - *East of Van Ness*
2. North-South Streets: South of Market
    - *Mission District street grid*
    - *SoMa street grid*
3. East-West Streets: North of Market
4. East-West Streets: South of Market

The following sections describe individual streets within each of these groupings, and makes high-level circulation recommendations for each street. For each grouping a summary table illustrates key modal roles/opportunities with the symbols shown in Table 9, below.

Table 9. Modal Roles Legend

Symbol	
–	Not applicable / mode minimally present
◆	Minimize/reduce mode's role on this street
◆	Maintain/provide for basic accessibility/circulation for this mode
◆◆	Ensure/improve circulation for this mode
◆◆◆	Prioritize this mode's conditions and features

This symbology is not intended to reflect either existing conditions or projected future conditions. Rather it seeks to assess modal priorities and opportunities across broadly-defined corridors. In developing and interpreting the recommended modal roles, the following principles apply:

- **All surface streets should provide for complete and safe pedestrian access.** Pedestrians should and must have access along all surface streets. In areas with an especial opportunity or need to address pedestrian conditions (such as a safety need or links to transit, open space, or neighborhood commercial corridors), a higher-level of priority may be recommended; however, this does not diminish the need to accommodate pedestrians safely on other streets.
- **Streets which are recommended to play a critical traffic circulation function often warrant features to improve safety and conditions for other modes.** As detailed below, certain high-volume arterials, such as the Oak/Fell and Franklin/Gough couplet pairs, will continue serve as important routes for mixed traffic in the future. However, this does not mean that future improvements should seek to solely benefit automobiles. Rather, it highlights the circulation function of the street. In many cases, this means that future improvements and programs should focus on effective management of traffic volumes and speeds and on amenities and safety features for pedestrians and other vulnerable street users.
- **Multiple modal priorities are possible and important on many routes; however, each individual street need not serve all modes.** Given the multitude of users within the Study Area, and the limited right-of-way on many streets, the concept of "complete streets" is applied across groups of streets functioning collectively as corridors. The Circulation Strategy seeks to strike an informed middle ground between dedicating individual streets wholly to particular users and designing streets that function for all modes poorly but for no mode effectively.
- **Market and Van Ness are not treated at length as part of this analysis, but are acknowledged as crucial multimodal routes.** As described elsewhere in this Report, Van Ness Avenue and Market Street play a critical role in the circulation of the Study Area. Both streets are currently the subjects of intensive planning and design processes. For Van Ness, the focus of this effort is on significantly improving transit performance through the introduction of BRT service. With BRT, the remaining mixed traffic lanes will continue to play an important local and regional circulation function. On Market, although the planning and design process is at a more preliminary stage, the focus is on improving transit and bicycle conditions along the city's central transit and bicycle spine. These key modal roles for both streets are assumed as such throughout this analysis.

In some cases, the *current* configuration of a street is highly-aligned with one or more of the entries in the summary table. For example, in the Circulation Strategy as described below, the bicycle mode on Valencia Street is assessed as highly prioritized (◆◆◆). This reflects both the high existing level of bicycle amenities and features on the street and the need to maintain or improve bicycle priority as any future design or operational changes are undertaken. In contrast,

the transit mode on Fillmore Street is also assessed as highly-prioritized (◆◆◆). However, existing transit performance on Fillmore is affected by delays and unreliable service; in order to improve conditions for the 22-Fillmore trolleycoach service, additional improvements and operational strategies are warranted.

In addition to the tables presented in this section, a table is available as an appendix to this Report that presents a more detailed tabular inventory of existing conditions across all of the individual streets considered in this analysis.

3.3 North-South Corridor Streets – North of Market

This section presents modal priorities and opportunities for north-south streets north of Market. These streets share a common grid; however, as discussed above, streets west and east of Van Ness serve somewhat different travel patterns. Table 10, below, summarizes the Circulation Strategy for this group of streets. Following the table, each street is discussed in turn, including consideration of existing conditions and description of street-level issues, constraints, and opportunities.

Table 10 – North of Market: North South Corridor Streets

Street	Mixed Traffic	Transit	Bicycle	Pedestrian	Opportunities and Priorities
West of Van Ness					
Fillmore	◆	◆◆◆	◆	◆◆	Provide signalized intersections equipped with transit signal priority at all intersections Discourage "through" vehicular traffic and reduce excess circulation through parking management
Webster	◆	–	◆◆	◆	Bicycle facility (northern portion) Maintain traffic circulation function
Buchanan	◆	–	◆	◆◆	Key pedestrian route, especially to adjacent open space

Street	Mixed Traffic	Transit	Bicycle	Pedestrian	Opportunities and Priorities
Laguna	◆◆	–	◆	◆◆	Improve circulation and streetscape through integrated improvements, potentially including signalization/TSP
Octavia	◆◆◆	–	◆◆	◆◆	Channelize/calm intersection operations Improve pedestrian crossings
Gough	◆◆◆	–	–	◆	Manage and smooth traffic with operational improvements Upgrade pedestrian facilities and amenities, particularly at crossings
Franklin	◆◆◆	–	–	◆	Manage and smooth traffic with operational improvements Upgrade pedestrian facilities and amenities, particularly at crossings
Van Ness	◆◆	◆◆◆	–	◆◆	
East of Van Ness					
Polk	◆	–	◆◆◆	◆◆	Complete northbound bicycle facility to Market
Larkin	◆	◆◆	◆	◆	Manage traffic speed and demand, especially to improve pedestrian conditions Maintain link from SoMa (via 10th) but explore potential for road diet (from 3 to 2 lanes)

Street	Mixed Traffic	Transit	Bicycle	Pedestrian	Opportunities and Priorities
Hyde	◆◆	◆◆	◆	◆◆	Manage traffic speed and demand, especially to improve pedestrian conditions Maintain as key circulation route from SoMa Explore configuration changes as relevant SoMa designs are advanced (e.g., 7th and 8th streets)
Leavenworth	◆◆	–	◆	◆◆	Manage traffic as needed, especially to improve pedestrian safety Maintain as circulation route from SoMa Explore configuration changes as relevant SoMa designs are advanced (e.g., 7th and 8th streets)

3.3.1 West of Van Ness

- **Fillmore.** Fillmore Street is an active (but right-of-way constrained) street that passes through multiple commercial corridors within and beyond the Study Area. Fronted by a diversity of land uses and featuring on-street parking on both curb faces, the street has one lane of mixed traffic per direction and serves the 22-Fillmore trolleycoach line. The 22 is one of Muni's most heavily-utilized lines, but it is also one of the slowest and least reliable. Intersections are a mix of signal- and stop-controlled. Recommendations for Fillmore, primarily focused on improving transit speed and reliability, are as follows:
    - Deploy parking management strategies to reduce excess vehicular circulation and facilitate local business access (underway presently)
    - De-emphasize corridor as a "through" route for private automobiles
    - Upgrades to intersection controls to facilitate transit signal priority
    - Pedestrian realm improvements to support active land uses
    - Other transit performance improvements per the Transit Effectiveness Project (TEP)
- **Webster.** Webster Street is a street that varies in cross-section throughout the Study Area. North of Grove Street, Webster features two-lanes of traffic per direction, divided by a median, with Class 2 bicycle lanes adjacent to each parking lane. Transit is minimal—Golden Gate Transit's Geary corridor service runs on Webster between Geary and McAllister/Golden Gate. In the southern section, Webster is one lane per direction. The street serves as a key circulation route, although connectivity is constrained by the street's southern terminus location at Hermann rather than at Market. Recommendations for Webster are as follows:

  - Explore improvements to the bicycle route/facility at the northern portion of Webster
  - Maintain as a vehicular circulation route, particularly to connect the Oak/Fell and Turk/Golden Gate couplets north to the Geary corridor.
- **Buchanan.** Buchanan Street is a primarily residential street that is discontinuous in the Study Area, featuring a pedestrian-oriented plaza/green space north of Grove Street. Buchanan serves a primarily local function and is one lane per direction, with the exception of the southernmost block (Market to Hermann), which is two lanes northbound in a one-way configuration. At this southern location, bicycle activity is high due to the connection here between Market Street bicycle lanes and the Duboce bikeway. Recommendations for Buchanan are as follows:
  - Prioritize local access and maintain slow traffic speeds
  - Develop as a key pedestrian corridor, connecting neighborhoods, with significant concentration of public housing sites, to multiple adjacent parks
  - Improve the bicycle connection (Market to/from the Wiggle) at Buchanan/Market/Duboce.
- **Laguna.** Laguna Street begins at an intersection with Market Street where Guerrero Street (to the south) terminates. Given Guerrero's higher capacity (two lanes per direction versus Laguna's one), the corridor is subject to some peak-period traffic congestion, particularly queuing at un-signalized intersections such as Laguna/Haight and Laguna/Page. The street has been identified (in conjunction with Guerrero) as a potential border for a congestion pricing cordon of the city's greater downtown. Recommendations for Laguna function as an integrated set of corridor improvements focused on three areas: 1) overall circulation; 2) pedestrian amenities and safety features; and 3) urban design/public realm improvements. The deployment of these strategies has the potential to relieve traffic congestion, address pedestrian needs, and improve the overall streetscape:
  - Upgrade intersection control to signals to better manage peak period traffic volumes and turning movements, and to facilitate the installation of pedestrian countdown signals
  - Provide a high-quality and safe pedestrian environment including high-quality sidewalks, accessible curb ramps, clearly-delineated crosswalk markings, aforementioned countdown signals, and other amenities as appropriate
  - Enhance the urban design and public realm features of the street, including enhancements such as pedestrian scale lighting, flexible curb use, landscaping, and other improvements
- **Octavia.** The configuration and challenges of the new Octavia Boulevard facility are discussed at length throughout this report, including intersection-level design and operational recommendations for the Fell/Octavia and Oak/Octavia intersections (see Chapter 4). Within the context of the high-level Circulation Strategy analysis and recommendations, the Boulevard is recognized to serve an essential vehicular circulation role in the local and regional network. In particular, the Boulevard connects the freeway system to and from the city's western neighborhoods. The corridor-level analysis and associated recommendations for other signalized intersections along the Boulevard–at Page and Haight—call for further prioritizing and improving operations at these locations for bicycles (at Page) and transit (at Haight). This reinforces the need to better manage heavy peak traffic demands where the Boulevard intersects with the Oak and Fell couplet through design, operations, and demand management. Recommendations for Octavia are as follows:
  - Pursue demand management strategies, including road and parking pricing, particularly in relevant corridors and zones, to reduce peak-period traffic flows
  - Implement design improvements at the Oak/Octavia and Fell/Octavia intersections, particularly to improve pedestrian conditions and address poor motorist behavior

  - Improve conditions for bicyclists crossing Octavia at Page
  - Provide transit priority treatments at Haight/Octavia to improve the speed and reliability of Muni bus service (6 and 71) crossing the Boulevard
- **Franklin and Gough.** Franklin and Gough streets, as a one-way couplet pair, serve as a circulation route for regional and local travelers traveling north-south in the center of the Study Area. Each street has three-lanes of one-way traffic flow for most of its length, and feature synchronized signals (Gough has less capacity and stop-controlled intersections at its northern portion—beyond the Study Area). The Study makes intersection-level recommendations regarding pedestrian design features (e.g., crosswalks) at specific locations within the core of the Study Area. From the higher-level circulation analysis perspective, recommendations for the couplet are as follows:
  - Maintain as key circulation route
  - Focus improvements on pedestrian conditions to ensure safe and accessible crossings and to manage traffic speeds
  - Pursue demand management strategies, including road and parking pricing, particularly in relevant corridors and zones, to reduce peak-period traffic flows

3.3.2 East of Van Ness

- **Polk.** Polk connects residential neighborhoods to the north to the Civic Center and Market Street. It is generally two-way in configuration with one lane of traffic per direction. South of Grove Street it operates one-way southbound, connecting to 10th Street (and ultimately to the freeway). Within the Study Area, there is no transit operating on Polk, as the 19-Polk operates in the Tenderloin via Larkin (northbound) and Hyde (southbound) to the east of Polk, connecting to the 7th-8th couplet in SoMa. Polk functions as a key pedestrian and bicycle route. There are existing bike lanes north of McAllister, and many cyclists traverse the street all the way to and from Market Street. Recommendations for Polk in the Study Area are as follows:
  - De-emphasize corridor as a "through" route for private automobiles
  - Complete bicycle facility between McAllister and Market, including connection to Market Street bicycle facilities
- **Larkin.** Larkin Street serves three lanes of northbound mixed traffic and connects to Market at 9th Street. Other than the block fronting Civic Center Plaza, Larkin is one-way in configuration. Larkin receives a significant flow of traffic from 9th Street (which in turn receives traffic from the freeway off-ramp at Bryant). Larkin serves the inbound 19-Polk transit service in the Study Area. The street plays a key circulation function; however, there is a need to manage traffic and reduce vehicular speeding to reduce collisions, particularly those involving pedestrians. Recommendations for Larkin are as follows:
  - Maintain as key circulation route from SoMa, but explore road diet to reduce flow and manage speeds
  - Manage traffic speeds, especially to address pedestrian safety needs
  - Enhance transit priority measures and transit rider amenities
- **Hyde and Leavenworth.** Hyde (southbound) and Leavenworth (northbound) act as a one-way couplet pair, connecting across Market to the 7th-8th pair in SoMa. (Leavenworth's connection at Market is accommodated via a "jog" on McAllister.) Hyde serves the outbound 19-Polk Muni service through the Study Area. This pair of streets plays a key circulation function; however, there is a need to manage traffic and reduce vehicular speeding to reduce

collisions, particularly those involving pedestrians. Recommendations for Hyde and Leavenworth are as follows:

- Maintain as key circulation route
- Manage traffic volumes and speeds, especially to address pedestrian safety needs
- Enhance transit priority measures and transit rider amenities (Hyde)
- As circulation changes in SoMa are pursued that affect 7th and 8th streets, consider the opportunities and impacts that such changes present for redesign or reconfiguration of Hyde and Leavenworth (e.g., directionality, capacity, transit priority).

3.4 North-South Corridor Streets – South of Market

This section presents modal priorities and opportunities for north-south streets south of Market. This includes both streets west of Van Ness Avenue, which are part of the Mission District street grid, and the numbered streets within the Western SoMa District, which have a different street grid (aligned northwest/southeast). Table 11, below, summarizes the Circulation Strategy for this group of streets. Discussion of individual streets follows.

Table 11 – South of Market: North South Corridor Streets

Street	Mixed Traffic	Transit	Bicycle	Pedestrian	Opportunities and Priorities
Mission District Street Grid					
Church	◆	◆◆	◆	◆◆	Improve transit performance through strategies such as signal priority and parking management
Dolores	◆	–	◆	◆◆◆	Already one of the city's great "promenade" streets; maintain as key circulation route
Guerrero	◆◆	◆◆ (if utilized by future transit service)	–	◆	Improve pedestrian conditions (including lighting) Opportunity to develop as a transit route in future, potentially for regional service

Street	Mixed Traffic	Transit	Bicycle	Pedestrian	Opportunities and Priorities
Valencia	◆	–	◆◆◆	◆◆	Prioritize local vehicular access and loading needs Maintain high level of pedestrian and bicycle amenities; extend these features in the future
Mission	◆	◆◆◆	–	◆◆	Provide transit priority upgrades in corridor and develop as future Muni Rapid corridor south of Van Ness Discourage "through" vehicular traffic and reduce excess circulation through parking management
South Van Ness	◆◆	– (except in northernmost segment (BRT))	◆	◆◆	Maintain as key circulation role Improve pedestrian realm
SoMa Street Grid					
11th Street	◆	◆◆	◆◆	◆	Broad right-of-way and relatively low traffic volumes present opportunities for bicycle, pedestrian, and transit rider enhancements
10th Street	◆◆◆	–	◆	◆◆	Manage traffic as needed, especially to improve pedestrian conditions Maintain as key circulation route to SoMa Explore traffic calming and/or road diet (from 4 to 3 lanes), especially north of Folsom

Street	Mixed Traffic	Transit	Bicycle	Pedestrian	Opportunities and Priorities
9th Street	◆◆◆	–	◆	◆◆	Manage traffic as needed, especially to improve pedestrian safety Maintain as key circulation route to SoMa Explore traffic calming and/or road diet (from 4 to 3 lanes), especially north of Folsom
8th Street	◆◆	◆◆	◆◆◆	◆◆	Redesign options as developed through EN-TRIPS and Core Circulation Study
7th Street	◆◆	◆◆	◆◆◆	◆◆	Redesign options as developed through EN-TRIPS and Core Circulation Study

3.4.1 Mission District Street Grid

- **Church.** Church Street acts as a functional continuation of Fillmore Street by way of a jog at Hermann Street, two blocks north of Market. In the Study Area, Church serves the 22-Fillmore trolleycoach service and J-Church light rail transit (LRT) service. The Church and Duboce rail replacement project is upgrading rail infrastructure and providing additional design amenities along the street. Mixed traffic volumes are relatively light. Although right-of-way is wider than on Fillmore, recommendations for Church mirror those for Fillmore, and are as follows:
    - Deploy parking management strategies to reduce excess vehicular circulation and facilitate local business access
    - De-emphasize corridor as a "through" route for private automobiles
    - Develop transit priority measures to improve transit travel time and reliability
    - Explore long-term strategies such as grade separation to improve travel time and reliability for the J-Church LRT service
- **Dolores.** Dolores Street is one of the City's grand "promenade" streets, traversing the center of the City from San Jose Avenue in the south to Market Street at the north. The street has a consistent right-of-way, featuring wide sidewalks, two lanes of traffic per direction, on-street parking, and a signature landscaped median featuring palm trees. Signalization varies; in general, fewer intersections are signal controlled in the southern portion of the route. North of the street's highest elevation (at 21st), about half of the major intersections are signalized. The street plays an important local and "through" circulation function within the study area, although neighboring Guerrero Street has generally higher automobile volumes and capacity. At the northernmost block of Dolores (between Market and 14th), plans are under

consideration to reduce traffic capacity to one lane per direction in association with the development of the site to the west of this segment. This has not be forecast to cause traffic impacts, as demand is relatively light in this block given upstream and downstream traffic connections (e.g., only one turn lane is provided from westbound Market to southbound Dolores). Circulation recommendations for Dolores are as follows:

  - Maintain high level of urban design, and continue to prioritize pedestrian conditions and amenities
  - Maintain connectivity and circulation role, particularly if Guerrero is developed as a regional transit route in the future

- **Guerrero.** Guerrero Street parallels Dolores Street and also connects from San Jose Avenue to Market Street (at Laguna). Guerrero plays a critical circulation function, connecting (via San Jose Avenue) to the I-280 freeway to the south and to neighborhoods to the north of the study area. Together, San Jose Avenue and Guerrero street serve as an alternate route for many regional travelers who might otherwise utilize the Central Freeway. Much of the traffic bound to and from Guerrero is served north of Market Street by either Laguna Street (direct connection at Market) or the higher-capacity Franklin/Gough couplet (by traversing Market for a small number of blocks). Beyond vehicular circulation, other modes are not highly-prioritized. Transit is not present, the street does not have dedicated bicycle facilities, and pedestrian amenities, such as pedestrian-scale lighting, are generally absent. Circulation recommendations for Guerrero are as follows:
  - Maintain as a key circulation route
  - Improve urban design and the pedestrian environment through such treatments as pedestrian countdown signals, corner bulbs, and pedestrian-scale lighting
  - Consider the route in countywide planning as an opportunity for future regional transit service (e.g., connecting the Peninsula to/from Civic Center)
- **Valencia.** Valencia Street has seen various improvements over the past several years, including road diet that reduced vehicular capacity to two lanes per direction and provide a Class 2 bicycle facility in each direction. More recently, an extensive streetscape improvement, featuring wide sidewalks and other amenities, was completed between 15th and 19th Streets, the heart of an active commercial corridor. Muni transit no longer operates on the street. Although the street is fully continuous between Market Street and (Outer) Mission Street, it does not serve a key vehicular circulation function. Circulation recommendations for Valencia are as follows:
  - Maintain and extend pedestrian-friendly and bicycle-friendly design and features
  - De-emphasize as a “through” circulation route
  - Explore design options to further improve bicycle facility over time, as demand and funding availability/priority permit
- **Mission.** At the north end of the Study Area, Mission Street is one-way northbound, where it functions as the companion to one-way Otis Street southbound. The circulation analysis focuses on high-level recommendations for the portion of Mission south of this location, where Mission Street features two lanes of traffic per direction. Intersections are signalized. Muni buses operate at high-frequency and high ridership along Mission. Parking and loading activity are extensive, as is pedestrian activity associated with the active commercial land uses that front the street. Circulation recommendations for the corridor are as follows:
  - Provide transit priority treatments (operational and capital) along the entire corridor, including consideration of eventual BRT extending south from Van Ness Avenue
  - Actively manage parking supply to reduce double parking and excess vehicle circulation
- **South Van Ness.** South Van Ness Avenue parallels Mission Street to the east, but generally has fewer travel demands placed upon it. Muni transit service is not present, and fronting land

uses are not as dense or as active. Still, the street plays a key circulation role, with two lanes of traffic per direction. Circulation recommendations include:

- Maintain key circulation function, particularly as transit priority improvements are implemented on Mission Street
- Improve the pedestrian realm over time, especially as adjacent land uses become more active and pedestrian-focused over time

3.4.2 SoMa Street Grid

- **11th Street.** 11th Street is the westernmost of the major north-south (truly, northwest-southeast) streets within the SoMa street. (12th Street, further to the west, is not parallel to either the SoMa or Mission grids, and its minimal connectivity limits its circulation function.) 11th Street has relatively low traffic volumes (particularly considering its broad right-of-way) in large part due to the lack of connectivity across Market Street. Muni transit (9-San Bruno, 47-Van Ness, and 27-Bryant) service operates along 11th. Class 2 bicycle facilities are provided. Fronting land uses are a mix of businesses, residences, and more active commercial uses (restaurants, bars). Circulation recommendations for 11th are as follows:
  - Maintain and improve design features for transit and bicyclists
  - Explore opportunities for further pedestrian and public realm improvements facilitated by broad right-of-way
  - De-emphasize "through" circulation role
- **10th and 9th.** 10th and 9th streets function as a one-way couplet connecting to the I-80/US-101 elevated freeway at Bryant Street. The streets have typical cross-section of four lanes of one-way traffic routes (10th southbound; 9th northbound) and on-street parking on both sides of the street. Congestion is often present during peak periods, but traffic speeds are often high when conditions are less congested. Sidewalks are relatively narrow and pedestrian crossing distances are long. Circulation recommendations for 10th and 9th are as follows:
  - Focus improvements on pedestrian conditions to ensure safe and accessible crossings and to manage traffic speeds, particularly north of Folsom
  - Maintain key circulation function
  - Explore potential to reduce capacity from four to three lanes, with a focus on the northern segment (north of Folsom), particularly as demand management strategies and bicycle and transit network improvements are implemented within the broader corridor/area
- **8th and 7th.** 8th and 7th Streets also function as a one-way couplet pair, with 8th flowing southbound from Hyde, and 7th flowing northbound to Leavenworth (via a jog at McAllister). Unlike 9th and 10th, however, 7th and 8th do not provide access for all freeway on- and off-movements at the interchange between Bryant and Harrison streets. (For example, southbound traffic on 8th cannot access southbound 101 directly from 8th.) Both 7th and 8th feature Class 2 bicycle lanes in their respective traffic flow direction. The 19-Polk transit line travels on the couplet pair. The EN-TRIPS study process has considered various reconfigurations for 7th and 8th that would help to re-balance overall street usage among modes and better prioritize local access. Circulation recommendations for 7th and 8th are as follows:
  - Advance redesign options as developed and prioritized through the EN-TRIPS and Core Circulation Study processes, to re-balance the streets' modal usage and improve conditions for transit riders, pedestrians, and bicyclists

3.5 East-West Corridor Streets – North of Market

This section presents modal priorities and opportunities for east-west streets north of Market. As discussed above, these streets provide key connections to and from western neighborhoods and areas to the east and south, both within and beyond the city. Table 12, below, summarizes the Circulation Strategy for this group of streets.

Table 12 – North of Market: East-West Corridor Streets

Street	Mixed Traffic	Transit	Bicycle	Pedestrian	Opportunities and Priorities
Turk	◆	◆◆ (where present)	◆◆	◆	Manage traffic as needed Maintain as key circulation route from SoMa (via Taylor/6th) Develop as potential transit and/or bicycle priority corridor
Golden Gate	◆	◆◆ (where present)	◆◆	◆	Manage traffic as needed (explore road diet from 3 to 2 lanes to match Turk's capacity) Maintain as key circulation route to SoMa Develop as potential transit and/or bicycle priority corridor
McAllister	◆	◆◆◆	◆◆	◆	Improve transit performance and streetscape through integrated improvements, including signalization/TSP Develop as potential future BRT corridor for 5-Fulton service.
Fulton	◆	–	◆◆	◆	Explore future improvements to

Street	Mixed Traffic	Transit	Bicycle	Pedestrian	Opportunities and Priorities
			(west of Franklin)		existing Class II bicycle facility
Grove	◆	◆	◆◆	◆◆◆	Develop as key pedestrian link, especially in Civic Center District, connecting to/from BART station Consider broad right-of-way within Civic Center area as opportunity to develop an improved bicycle facility
Hayes	◆	◆◆	–	◆◆	Eventually continue 2-way operation east of Van Ness to allow for bidirectional transit service (requires new overhead lines)
Fell	◆◆◆	◆	–	◆	Manage traffic to provide sufficient circulation Focus improvements on speed management and pedestrian conditions
Oak	◆◆◆	◆	–	◆	Manage traffic to provide sufficient circulation Focus improvements on speed management and pedestrian conditions
Page	◆	–	◆◆◆	◆	Protect/improve as a bicycle facility as much as possible, and develop potential future bicycle boulevard design options Discourage through traffic

Street	Mixed Traffic	Transit	Bicycle	Pedestrian	Opportunities and Priorities
Haight	◆	◆◆	◆	◆	Improve transit performance, streetscape, and pedestrian conditions through strategies such as signalization
Duboce (west of Market)	◆	◆◆	◆◆	◆◆	Explore long-term strategies to improve transit (LRT) travel time through this segment
Market	◆	◆◆◆	◆◆◆	◆◆	

- **Turk.** Turk Street is a continuous crosstown circulation route that connects from Market Street at 6th Street (via Taylor) all the way to the Richmond District (where it feeds into Balboa). 6th Street connects to the I-280 off-ramp, and thus Turk is serves both local and regional travelers and passes both through the highly-dense Tenderloin District and the medium-density Western Addition. Within the Study Area, the street provides two lanes of westbound capacity. In the Tenderloin and Civic Center, the outbound 31-Balboa and 16-AX/BX are routed via Turk. Turk recommendations are:
  - Maintain as key circulation route
  - Manage traffic volumes and speeds, especially to address pedestrian safety needs
  - Enhance transit priority measures and transit rider amenities
  - Consider dedicated bicycle and/or transit facility
- **Golden Gate.** Golden Gate Avenue acts as the one-way eastbound companion to Turk, although it presently has higher capacity (three lanes of mixed traffic versus two on Turk). Similar to Turk, Golden Gate provides a connection to 6th Street, and serves inbound 31 and 16AX/BX Muni service. Golden Gate recommendations are as follows:
  - Maintain as key circulation route
  - Manage traffic volumes and speeds, especially to address pedestrian safety needs
  - Enhance transit priority measures and transit rider amenities
  - Explore a road diet to align Golden Gate's capacity with that of Turk (2 mixed traffic lanes)
  - Consider dedicated bicycle and/or transit facility
- **McAllister.** McAllister provides two-way circulation and is served by the 5-Fulton in both directions through the Study Area. A circulation change at McAllister's eastern extent was implemented recently to provide two-way circulation in what had previously been a short one-way westbound segment. Signal control varies, with some intersections west of Van Ness controlled with stop signs. The 5-Fulton has been identified through both the TEP and the SFTP as a key high-ridership Muni service. Recommendations for McAllister are as follows:
  - Improve streetscape and circulation through a set of improvements to improve transit performance and enhance the pedestrian realm.
  - Provide transit signal priority at signalized intersections and consider signalizing currently non-signalized locations.
- **Fulton.** Within the Study Area, Fulton Street is discontinuous east of Franklin Street (War Memorial, City Hall, and Civic Center Plaza). As such, the route serves a primarily local

function and features a combination of stop and signal controls. The 5-Fulton transit service is not routed via Fulton in the Study Area. The street does act as a key bicycle route, with existing Class 2 facilities in both directions. Recommendations for Fulton are as follows:

- Prioritize local access over through traffic
- Consider further improvements to the existing bicycle facility

- **Grove.** Grove Street serves a primarily local function, particularly in the western portion of the Study Area, where the street is discontinuous at Steiner (Alamo Square). Currently, the inbound 21-Hayes service operates on Grove between Laguna and Polk, but eventual plans call for re-routing this service via a two-way Hayes Street. Between Gough and Larkin (the Civic Center area), Grove's right-of-way is significantly broader than to the west. This right-of-way, which provides capacity that generally exceeds even peak-period traffic demands, presents an opportunity for redesign of street. Recommendations for Grove are as follows:
  - Develop the corridor as a key pedestrian link connecting the Civic Center BART station (at Hyde and Grove) to Civic Center destinations, including Symphony Hall between Van Ness and Franklin.
  - Develop redesign of broad right-of-way between in the Civic Center to improve urban design and the pedestrian environment, including consideration of a high-quality bicycle facility
- **Hayes.** Hayes Street traverses the Study Area connecting the Western Addition to the west and the SoMa street grid to the east (at 9th and Larkin). Historically two-way to the west, the two-way configuration was recently extended from Gough and Van Ness, which had previously been one-way westbound. Within Hayes Valley, the street is an active commercial corridor, and is served by the outbound (westbound) 21-Hayes transit service. East of Van Ness (where Hayes remains one-way westbound), the street sees much heavier traffic flows as local and regional traffic (particularly from 9th Street and the freeway) disperse to routes such as Van Ness and Franklin. Hayes Street recommendations include:
  - Minimize automobile traffic role west of Franklin
  - Eventually continue two-way operation east of Van Ness to allow for bidirectional transit routing (requires installation of new overhead catenary lines to power 21-Hayes trolleycoach service)
- **Fell and Oak.** As discussed throughout this report, Fell and Oak streets carry significant volumes of mixed traffic, in particularly connecting Octavia to and from neighborhoods to the west. In addition, the one-way couplet provides connections to the north via the Franklin and Gough just to the east of Octavia, and connections across Market Street via a number of routes. Generally, each street features three lanes of mixed traffic in a one-way configuration: Fell headed west, and Oak headed east. (East of Gough, directionality changes somewhat; notably, Fell provides a high-capacity *eastbound* connection to Market Street from Franklin to 10th Street.) Transit does not make stops on the couplet; however, the 16AX/BX service operates on the two streets during the express portion of the route, and as such is subject to the traffic congestion that is typically present during peak periods. The corridor is signalized with synchronized signals. Specific design and operational recommendations for intersections at Octavia are presented elsewhere in this report. Overall circulation recommendations for Oak and Octavia are as follows:
  - Focus future improvements on pedestrian conditions and traffic/speed management
  - Manage traffic provide sufficient circulation and performance for 16AX/BX service
  - Pursue demand management strategies, including road and parking pricing, particularly in relevant corridors and zones, to reduce peak-period traffic flows
  - Assess effects of any design changes to the west of the Study Area (to the west of the Study Area, where auto capacity is generally four lanes per direction, the SFMTA

is studying new bicycle designs to better connect the Panhandle Path to the "wiggle" bicycle route through the Lower Haight)

- **Page.** Page Street serves a primarily local function through the Study Area. It is a designated bicycle route, and the Class 3 sharrowed route sees a great deal of bicycle traffic, particularly during commute periods. Page also currently serves inbound (eastbound) Haight Street buses between Laguna and Market; however, these routes will soon be re-routed via Haight Street upon implementation of the planned Haight two-way project between Octavia and Market. Largely due to congested conditions on Oak, Page Street experiences eastbound peak-period traffic congestion as motorists seek alternate access routes to Octavia Boulevard. This gives rise to conflicts with other users, particularly the heavy volume of bicyclists. Circulation recommendations for Page are as follows:
    - Accommodate and protect bicyclists as much as possible along the route, through design and operational improvements, including development of design options for a bicycle boulevard treatment
    - Explore strategies to discourage non-local traffic from utilizing the corridor, such as turn restrictions, traffic calming, and other design features
- **Haight.** Haight Street is a multimodal route that connects to the busy Lower Haight neighborhood. The 6-Parnassus and 71-Haight services travel on Haight Street in both directions for most of its length, and, as noted above, the Two-Way Haight project will provide for bidirectional transit service east of Laguna. Signalization varies in the corridor, with some intersections west of Octavia being stop-controlled. Recommendations for Haight are as follows:
    - Improve transit performance and pedestrian conditions through signalization, pedestrian signals, and transit priority
    - Deploy parking management to reduce excess vehicular circulation and facilitate local business access
    - De-emphasize corridor as a "through" route for private automobiles
- **Duboce.** North of Market, Duboce Street is discontinuous for mixed traffic, with the eastern segment acting as the Duboce Bikeway, a Class 1 facility at the start of the "wiggle." Between Church and Noe streets, the corridor features surface-running light rail transit (N-Judah) service, high pedestrian and bicycle volumes, and low levels of automobile traffic. Intersections are stop-controlled. The Church and Duboce rail replacement project is upgrading rail infrastructure and providing additional design amenities. Although the N-Judah provides substantial local access in the area, the service is heavily delayed during this surface-running segment. Recommendations for Duboce are as follows:
    - Enhance urban design and transit rider amenities (underway presently)
    - Explore long-term strategies such as signalization and grade separation to improve travel time and reliability for the N-Judah LRT service

3.6 East-West Corridor Streets – South of Market

There are a limited number of east-west streets in the Study Area south of Market Street. These streets share a common grid. Table 13, below, summarizes the Circulation Strategy for this group of streets.

Table 13 – South of Market: East-West Corridor Streets

Street	Mixed Traffic	Transit	Bicycle	Pedestrian	Opportunities and Priorities
Duboce/13th Street	◆◆	–	◆	◆	Explore extension of bike facilities westward from Division Street Improve pedestrian conditions west of Van Ness
14th Street	◆	–	◆◆◆	◆	Provide design features to improve conditions for non-motorized travelers
15th Street	◆	–	◆◆	◆◆	Develop a bicycle facility and improve connections to the east
16th Street	◆	◆◆◆	◆	◆◆◆	Redesign options as developed through EN-TRIPS Improve intersection safety and design at Market/Noe/16th

- **Duboce/13th.** 13th Street is directly below the Central Freeway and provides connections between Showplace Square and Market Street—via Duboce Avenue, which connects directly to 13th at its western terminus (at Mission). On the 13th Street portion, three lanes of traffic capacity are provided in each direction. To the west, Duboce features three lanes of westbound capacity and one lane eastbound. The pedestrian realm is relatively poor, both underneath the freeway along 13th Street and along Duboce—where sidewalks are narrow and traffic moves relatively quickly to and from the freeway on- and off-ramps at South Van Ness/Mission. Dedicated bike lanes do not currenly exist, although bike lanes are present along Division Street, which connects directly to 13th at its eastern terminus (at Bryant/11th). Circulation recommendations for Duboce/13th are as follows:
    - Improve pedestrian conditions, particularly west of South Van Ness along Duboce
    - Explore extension of bicycle facilities westward from Division Street
- **14th.** Within the Study Area, 14th Street serves to connect the Corona Heights/Ashbury Heights area down across Market Street and into the Mission. West of Market street, the street operates in a two-way configuration with a mix of stop and signal controls. East of Market, the street is one-way eastbound and features a Class 2 bike lane. The unidirectional eastbound configuration helps neighboring Duboce Avenue to provide only one lane of eastbound traffic flow between Market and Mission. Within the corridor, many bicyclists utilize 15th Street (which lacks a bicycle lane) to accommodate the westbound portion of a round-trip journey for which 14th serves the eastbound leg. Circulation recommendations for 14th are as follows:

    - Provide pedestrian safety features in the two-way segment west of Market Street, particularly to manage eastbound traffic that is traveling downhill.
- **15th.** 15th Street serves a primarily local function in the Study Area. Many bicyclists currently use the street as the westbound companion to 14th Street. Designs are currently underway to calm traffic along 15th in the vicinity of Valencia and Mission Streets as part of a Home Zone traffic calming project. To the eastern portion of the Study Area, 15th Street is discontinuous at Harrison Street. Recommendations for 15th Street are as follows:
    - Implement traffic calming as part of the Home Zone project
    - Explore the potential to provide a bicycle network connection at the eastern portion of 15th Street, potentially utilizing a re-gridded Alameda Street
- **16th.** 16th Street is one of the city's important multimodal corridors. In the Study Area, 16th provides 1 lane of eastbound capacity and 2 lanes westbound, both in mixed traffic. The 22-Fillmore operates in both directions along 16th. Pedestrian activity is high. Bike lanes are provided one street to the south on 17th Street. The EN-TRIPS study process has developed reconfiguration design options for 16th that seek to improve transit performance and the pedestrian realm. The circulation analysis recommendations for 16th Street are as follows:
    - Improve transit travel time and reliability through any design or operational improvement to the street
    - Advance redesign options as developed and prioritized through the EN-TRIPS process
    - Implement design improvements at the Market/16th/Noe intersection in the Castro District to improve pedestrian safety

3.7 Areawide/Programmatic Recommendations

In addition to the individual street-level recommendations as presented above, the Circulation Strategy analysis illustrates the need for capital, operational, and programmatic improvements at other locations within the city and the region to help address circulation issues in the neighborhood and along important corridors leading to, from, and/or through the Study Area.

These recommendations are reiterated in Chapter 5, below, but are summarized here given their link to the Circulation Strategy. The recommended projects, strategies, and programs are as follows:

- Demand Management and Pricing Strategies. Demand management approaches, in particular congestion pricing, are a crucial component of the overall strategy to address circulation needs in the neighborhood. Potential demand management measures include:
    - Road pricing strategies for the greater downtown (assessed in the Authority's Mobility, Access, and Pricing Study)
    - Enhanced parking management strategies, to effectively manage and appropriately price off- and on-street parking supplies both publicly and privately owned (currently being explored through SFpark program development and through the Authority's pending Parking Pricing and Regulation Study)
    - Expanded programmatic TDM approaches, such as commuter benefits and ridesharing, at multiple levels, including through neighborhoods, networks of

institutions, schools, and employers (TDM working groups currently being piloted through the Authority-led TDM Public-Private Partnership Project)

- System Management Programs. In addition to managing travel demand to ease peak-period traffic and reduce emissions, there are various programmatic approaches that help to better manage existing street space more efficiently and equitably that warrant development in and beyond the Study Area. These concepts include:
    - Bicycle Sharing (pilot phase in the greater downtown and Caltrain corridor beginning later in 2012)
    - Management and planning support for the private shuttles sector (Muni Partners pilot program currently being developed at the SFMTA)
    - Support for carsharing, such as through availability of on- and off-street parking spaces for carshare vehicles

- Capital Transit Investments. Various major capital transit investments under consideration for the city have the potential to shift some motorists traveling through the Study Area to alternative modes. Development and prioritization of these investments is under consideration through the SFTP update. Two relevant examples, from opposite sides of San Francisco, are as follows:
    - Caltrain Corridor Upgrades – electrification and improvement of service in the Caltrain corridor and the downtown extension of Caltrain to the rebuilt Transbay Terminal
    - Muni M-Line extension to Daly City – extension of Muni LRT transit service south from 19th Avenue to connect with the regional transit hub at the Daly City BART station

- Rapid Transit Service. As noted further in Chapter 4, below, there is a need to improve both local and regional transit speed and reliability through the Study Area. In addition to developing further full-featured BRT corridors, such as for the 14/49-Mission and 5-Fulton routes, the expansion and improvement of transit services through the neighborhood should seek also to serve trips that pass wholly through the Study Area without stopping in the neighborhood. This highlights the need to explore new express services, particularly from outlying neighborhoods to the south and west, to employment nodes in Civic Center and downtown. For trips generated closer to the neighborhood, “short” line service may be warranted in certain corridors, such as the Haight corridor, to alleviate peak-period crowding conditions. Finally, new regional transit services may be warranted, particularly in conjunction within congestion pricing, and have the opportunity to use specific routes and streets as preliminarily identified in the above corridor-level analysis. These transit service issues are under further consideration and assessment as part of the SFTP process.

- Regional Corridor Demand and Access Management. One of the central challenges in the Study Area is the heavy volume of traffic that passes through the neighborhood traveling to and from the regional freeway system. Although the Circulation Study did not assess in detail the potential opportunities or options to reduce this impact, various strategies are under

consideration through parallel efforts, including the Authority's Core Circulation Study and SFTP. In addition to areawide congestion pricing strategies (which reduce demand from freeways as well as surface streets), potential strategies include: high-occupancy vehicle (HOV) treatments (such as queue jumps, dedicated lanes, and prioritized freeway access ramps); consolidation and/or reconfiguration of closely-spaced interchanges (particularly in SoMa); regional corridor strategies to provide complete HOV facilities (particularly to/from the Peninsula) into and through the City; and regional pricing and parking management policies to reduce regional automobile traffic.

4 Project Analysis

This chapter summarizes the Study's development, prioritization, and analysis of potential transportation solutions to respond to the key transportation needs identified through the existing conditions and needs analysis.

4.1 Potential Projects and Screening

The Study Team organized potential solutions into five project categories, each of which maps to multiple Study goal areas as shown in Table 14, below.

Table 14: Project Categories

Project Category	Circulation/Traffic Management	Mode Shift	Safety and Walkability
Circulation Improvements	◆		◆
Transit Network Improvements	◆	◆	◆
Pedestrian and Bicycle Projects	◆	◆	◆
"Hot-Spot" and Traffic Management Projects	◆		◆
Policy and Programmatic Strategies	◆	◆	◆

The Study Team compiled a list of potential projects/programs/strategies within each category through an initial sketch-level planning exercise based on the existing conditions and needs assessment, past planning efforts, stakeholder input and suggestions, and TAC input. This compilation exercise also resulted in a survey of relevant planned or programmed projects within each category. The full potential project list included a wide range of projects. Given the transportation needs in the Study Area, some projects are not physically located within the Study Area, but were included due to their potential effect on circulation within the area.

The Study Team prepared a fully-compiled table and analysis of all potential projects across all categories, which is available as an appendix to this Report.

4.1.1 Project Screening

A key Study task following the development of the initial full list of potential projects was to identify up to three specific projects for design development activities, in order to advance projects for competitive grant opportunities.

This process was conducted in two sequential components: screening and prioritization. First, following TAC input and public input (both at a community-wide workshop and other, smaller forums), the Study Team undertook a screening process to narrow the full-range of projects to those that would be considered for this work. Then, among this shorter list of potential projects, three were further prioritized for near-term project development and analysis.

The goal of the screening process was to identify potential projects that would likely be appropriate or suitable for more detailed project-level analysis.

The criteria to guide this screening process were as follows:

- Potential for Near-Term Implementation
- Need for Further Technical Analysis/Design
- Extent to Which Project Not Being Addressed by Other Efforts
- Readiness and Fundability

A more detailed description of this screening process is available as an appendix to this Report. In short, projects not sufficiently meeting all four criteria were eliminated. The projects discussed in the immediately below subsection are those which were advanced from the screening process.

4.1.2 Project Prioritization

Following the narrowing of the full potential project list, the reduced list of projects was prioritized. The projects identified as potentially suitable for design development were evaluated using the following criteria:

- **Strategic Goal Areas:** To what extent would the project be anticipated to address the Study's three goals areas: circulation and traffic management; mode shift; and safety and walkability.
- **Benefit/Impact Area:** Would the project have local effects, regional effects, or both?
- **Community Support:** Has the community articulated a desire for these improvements? Has the project been a high-priority need?
- **Readiness and Coordination:** This criterion reflects a wide range of project coordination and readiness considerations, such as coordinating with adjacent projects including City initiatives, fundability, and likelihood for near- to mid-term implementation.

The criteria were not weighted. Rather, they were used to inform the selection of three projects by the Study Team in consultation with the TAC. In order to be advanced, however, a project must meet readiness and coordination considerations; have community support; and respond to at least two of the Study goal areas.

In many cases, readiness and coordination considerations were dominant. For example, a high-performing project with community support may not be a good candidate for design development through the Circulation Study for a variety of reasons, such as if a separate but related project is addressing the given need already, or if a separate project must proceed prior to advancement of the project.

Table 15, below, presents the evaluation matrix.

Table 15: Evaluation Matrix

Potential Project/Project Bundle	Strategic Goal Areas			Benefit/Impact Area		Community Support	Readiness & Coordination	Notes
	Circulation	Mode Shift	Safety & Walkability	Local	Regional			
Hayes Two-Way, Phase 2 (including 21 re-route, traffic calm 9th/10th)	♦	–	♦	♦	♦	♦	–	Not a high priority within overall TEP
San Jose Corridor Transition (options for expressway transition)	♦	–	♦	♦	♦	♦	♦	City agency interest in Caltrans coordination and near-term actions ahead of larger Planning effort
Areawide Pedestrian Program (improve ped. conditions in M-O area)	–	♦	♦	♦	♦	♦	♦	Focus especially on missing crosswalks
Bike Hotspots/Key Intersections (address bike connectivity at priority locations, e.g. Market & Buchanan/Duboce)	♦	–	♦	♦	–	♦	–	Various locations are currently being addressed by SFMTA (e.g. Polk)
Traffic Hotspots (address localized issues, e.g. Octavia ops)	♦	–	♦	♦	–	♦	♦	Octavia intersections at Oak and Page are highest priority
Franklin/Gough-Otis/Mission (traffic circulation at Franklin/Gough transition to Market & south)	♦	–	♦	♦	♦	–	–	Better Market Street Process
N-S Multimodal Corridor(s) (e.g. Guerrero-Laguna)	♦	♦	♦	♦	♦	–	–	Lack of strong community interest/consensus (e.g. Guerrero-Laguna)
E-W Multimodal Corridor(s) (e.g. Fulton-McAllister, Guerrero-Laguna)	♦	♦	♦	♦	♦	–	–	Longer-range project; need for SFTP analysis and coordination
Programmatic Strategies (e.g. signage, School TDM)	♦	♦	♦	♦	♦	–	–	Various strategies and programs can be advanced without extensive technical analysis/design

Based on the prioritization evaluation, the following projects were selected for project development and analysis:

- Octavia intersections operations/design. This project would design improvements (potentially including pilot/test treatments) at high-traffic intersections, with a focus on locations with conflicts for pedestrians and/or bicyclists. Prime candidates are along the Octavia Boulevard facility itself, specifically at the intersections with Fell and Oak streets.

  This project rated highly across most criteria, with the notable exception of mode shift. From a project readiness and coordination point-of-view, as well as in terms responding to public input (both local and citywide), a project focusing on Octavia, particularly at Oak, is highly attractive. The technical analysis and design effort should focus on improving peak-period operations and addressing pedestrian and bicycle conditions.

- Missing pedestrian facilities. This project would address key pedestrian infrastructure gaps, focusing on those associated most strongly with circulation needs. In the case of the study area, this corresponds with closed crosswalks at intersections of the area's major arterials. Other facilities also have some gaps, which are relatively more straightforward to address. The City's Civic Center Sustainable District planning process currently underway can further certain pedestrian recommendations of the Circulation Strategy, such as the Grove Street pedestrian spine, even if they are not analyzed in detail through the Circulation Study.

  This project rated strongly across multiple criteria, with the strongest being community support and safety and walkability. Technical analysis should focus on the closed crosswalks, specifically operational and traffic issues associated with re-opening them.

- San Jose Avenue. This project would address traffic issues in the San Jose Avenue corridor, specifically at the intersection/interchange of I-280, Monterey Boulevard, and San Jose Avenue. The project would seek to reduce through traffic capacity northbound to two lanes at this location (from the current three lane configuration). This would help calm traffic, facilitate bicycle facilities, and set up further planning and design efforts consistent with the Glen Park Community Plan.

  This project rated strongly across the technical criteria and had a high level of interest among City staff. City agencies have already done a good deal of background work and coordination with Caltrans. This project would both identify near-term, lower-cost actions, and lay the foundation for further, more in-depth planning with higher levels of community involvement.

These three projects and related analysis are described in detail further below in this Chapter.

Although the remainder of projects within Table 15 were not advanced for more detailed project level analysis, these other projects warrant brief individual discussion to describe their components and summarize the issues associated with their evaluation:

- Hayes Two-Way, Phase II. This project would build on the implemented Phase I project (which provided a two-way treatment on Hayes Street between Gough and Van Ness). A Phase II project would extend the two-way treatment east to Market Street, facilitating the routing of both directions of the 21-Hayes trolleycoach service via Hayes Street. This project

bundle could also include further traffic management treatments to 9th and 10th streets, focused on the sections north of Folsom.

This project bundle rated strongly with respect to multiple evaluation criteria, however, due to project readiness and coordination issues, it was not advanced for design through the Circulation Study. One factor is that the 21-rerouting project is not among the SFMTA's top capital priorities, meaning that it would not be competitive from a funding and implementation point of view.

- Bike Hotspots/Intersection Connections. This project would address one or more challenging connections in the bike network within the study area. Prime candidates include Market at Buchanan/Duboce (start of the Wiggle) and Market at Polk/Fell.

  Although there is significant public interest in improving bicycle conditions within the study area, the Circulation Study will not devote significant technical resources to designing new facilities or addressing key locations. Since the lifting of the citywide injunction on bicycle improvements, the SFMTA has been implementing a wide range of bicycle improvements and developing designs for other locations, including at Market/Polk.

- Franklin and Market. This project would consider designs for the intersection of Franklin/Market/Page/12th to improve pedestrian conditions and transit operations, while maintaining Franklin's key circulation role.

  This project generally rated high along technical criteria, but does not have sufficient project readiness to be moved forward through the Circulation Study. This intersection may be addressed through future planning efforts, particularly following lessons learned and circulation changes associated with implementation of improvements to the adjacent Gough/Market/Haight intersection as part of the Haight two-way project.

- East-West and North-South Multimodal Corridor Development. This project would select a north-south and/or east-west corridor in which to design a multimodal package of improvements to improve person-capacity, safety, and community design. Potential corridors include the Guerrero-Laguna corridor (N-S) and Turk-Golden Gate (E-W).

  Multimodal corridor development is a central theme of the overall strategic framework for the circulation study—that is, the need to develop the multimodal street network to accommodate growth and prioritize the circulation needs of transit-first modes. However, given these central needs, it is premature to advance design work in this regard until the Study (and the SFTP countywide plan update) are able to address the issues involved from a more areawide perspective, and until further outreach and agency coordination (informed by technical analysis) can take place.

- Programmatic Strategies. A limited number of the programmatic strategies identified in the initial wide range of projects had a potential for further analysis and technical design through

the Circulation Study. These options are meritorious to varying degrees, and some have been developed preliminarily, but were not be advanced for more detailed technical analysis through the Circulation Study, but may be advanced via overall Study recommendations and, as appropriate, via existing venues such as the City's Safe Routes to School program.

4.2 Missing Pedestrian Facilities

As discussed above, the Study prioritized the analysis of missing pedestrian facilities in the core Study Area. Specifically, the Study considered the potential to re-open closed pedestrian crosswalks at three locations in the Study Area:

- Gough and Fell – west side crosswalk
- Franklin and Fell – east side crosswalk
- Franklin and Oak – north side crosswalk

The rationale for focusing on the currently closed crosswalks was due to community and agency feedback, as well as the anticipated relative complexity of safely introducing pedestrian crossings at these locations. Additional pedestrian improvements are also warranted in the Study Area, such as:

- Accessible curb ramps – providing up-to-standard directional curb ramps at all crossing locations
- Pedestrian signal heads – providing pedestrian countdown signals at all signalized crossings
- High-visibility crosswalks – upgrading crosswalk markings to the new SFMTA standard "continental" design
- Corner bulbs – providing sidewalk extensions at corners, where feasible, to increase pedestrian space, shorten crossing distances, and calm turning traffic
- Grove Street pedestrian corridor – upgrading pedestrian amenities along this key pedestrian route, connecting civic and arts destinations to the Civic Center BART station, including addressing pedestrian crowding in the vicinity of Grove and Franklin
- Shared spaces – developing further shared space treatments, such as the Linden Alley design, at other suitable locations

The remainder of this section focuses on the specific closed crosswalk locations.

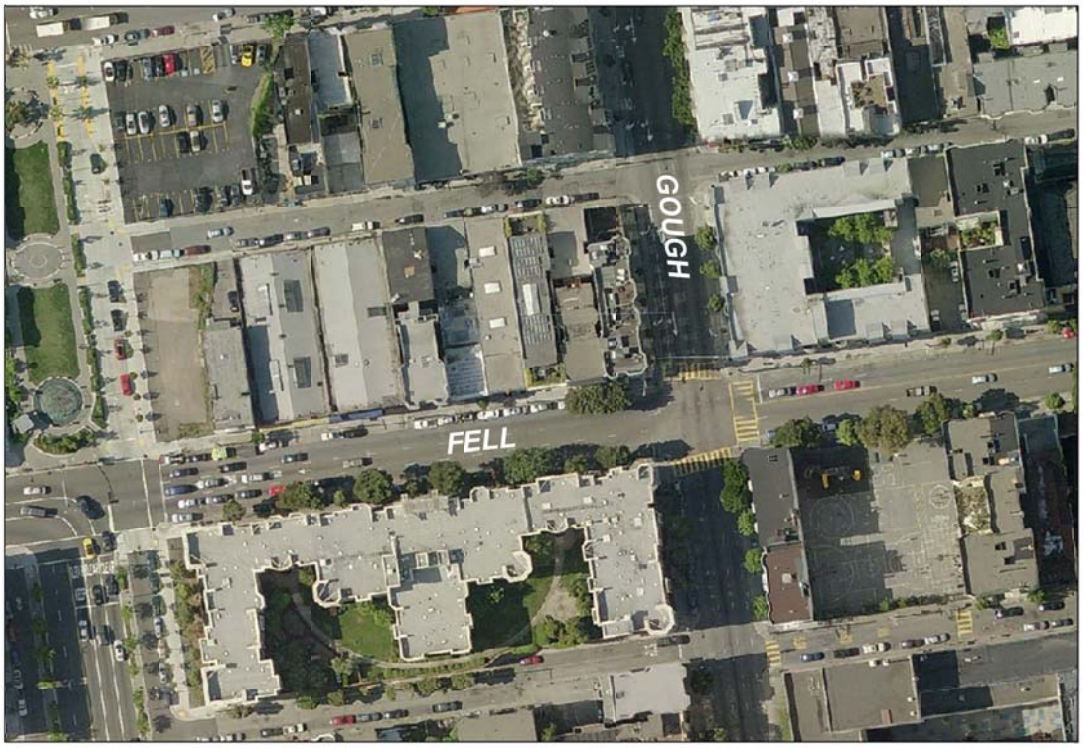
The traffic analysis for re-opening the crosswalks was performed using a SYNCHRO model developed for the Van Ness BRT environmental study, and accompanying traffic counts and signal timing information. Both AM and PM peak analyses were conducted for various signalization scenarios at each crossing; however, AM peak analysis was only conducted for the previous one-way Hayes Street configuration. This consideration has a generally minimal effect on the high-level analysis presented in this report, and subsequent, further analysis would be required in the design and implementation phases, if pursued.

Discussion of the three individual locations follows.

4.2.1 Gough and Fell

At this location, the west side crosswalk is currently closed. This closure prioritizes the heavy right turn volume from southbound Gough Street to westbound Fell Street. This vehicular

movement has its peak in the afternoon period, with approximately 1180 vehicles in the PM peak hour (vph) making this right turn. The right turn is made via two lanes: one a dedicated turn lane (at the curb); the second a combined through/right lane. Prior to implementation of two-way Hayes, this intersection operated with an intersection vehicular level of service (LOS) of C in the PM period; with two-way Hayes implemented, the intersection was forecast to operate at B, due to additional traffic routings facilitated by the two-way change.



Three scenarios were developed that could potentially allow for the opening of this crosswalk:

A. Existing Lane Configuration with Lead Pedestrian Interval.
B. Modified Lane Configuration – 2 Dedicated Right-Turn Lanes.
C. Modified Lane Configuration – 1 Dedicated Right-Turn Lane.

Each of these three options presents unique tradeoffs. Scenario A would maintain traffic circulation as it currently is configured; however, a pedestrian signal would be provided where it is currently absent. This pedestrian signal would be timed to provide a five-second "lead pedestrian interval" (LPI)—during which parallel traffic sees a red light and pedestrians receive a green Walk signal and establish their presence in the intersection prior to the allowance of conflicting vehicular movements. Similar treatments have been recently implemented elsewhere, such as at the north-side crosswalk at the nearby intersection of Hayes and Franklin.

Under Scenario A, Vehicular level of service (LOS) would remain acceptable, with no movements forecast to operate below LOS D. Potential supporting elements for this approach

could include one or more corner bulbouts to reduce the crossing distance of the new crosswalk and improve pedestrian visibility. The chief concern regarding Scenario A is the relatively high amount of peak-period right-turning traffic that would compete with this pedestrian movement.

Generally, high-volume double right turn movements are not desirable if they conflict with a pedestrian crosswalk during the same phase. There are a number of other locations in the city with a somewhat similar configuration in which the crosswalk is present. For example, at the intersection of Fremont and Howard streets in SoMa, northbound left turning traffic (from Fremont to Howard) utilizes two-lanes (one dedicated, one shared left/through). However, traffic volume during the peak period (AM) is 200 vph less than at Fell/Gough, with 980 vehicles per hour making this movement.

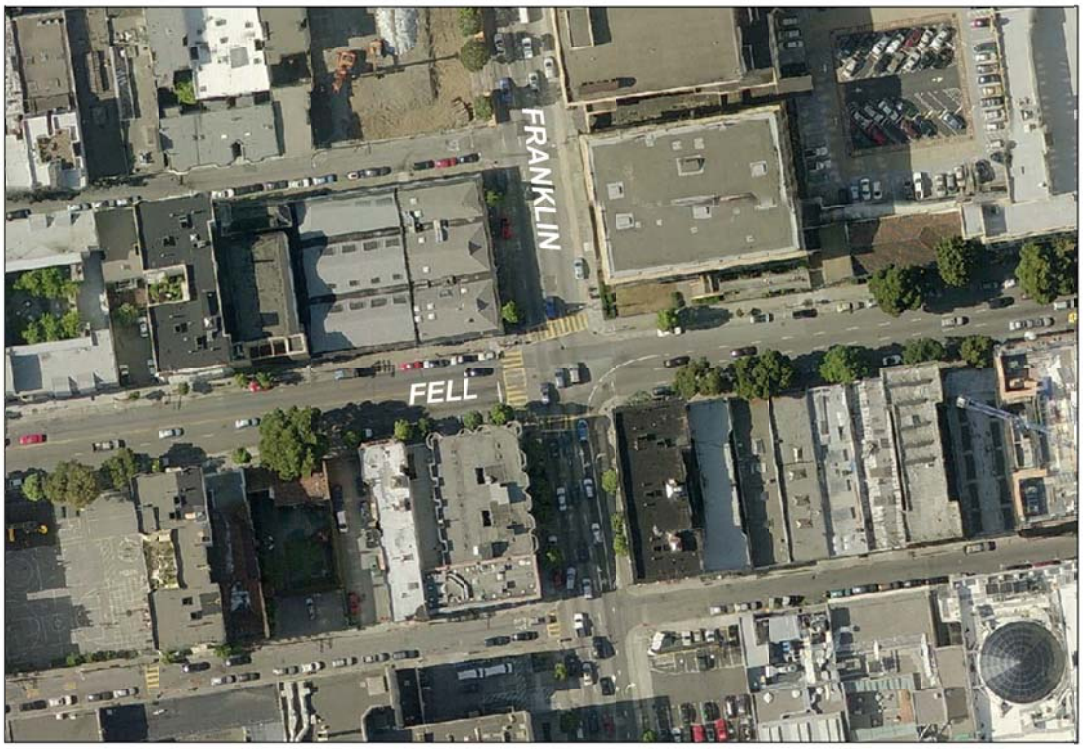
In light of this concern, two additional scenarios were tested for this location. Under both Scenario B and Scenario C, pedestrian movements at the new crosswalk would not be subject to conflicts with turning traffic. Right turns would be accommodated via dedicated signal phase, with queuing in either two lanes (Scenario B) or one lane (Scenario C). Scenario B would continue to provide two lanes for turning traffic by reducing through traffic lanes from three to two. Under Scenario C, the number of lanes provided for making the heavy right turn would be reduced from two to one. Under either Scenario B or C, substantial traffic delay would be generated through the circulation change. (The Study Team also investigated a pedestrian scramble—dedicated all-way pedestrian phase—at this location, though it had even more severe traffic impacts.)

The Study recommends that more detailed engineering analysis be conducted of these three scenarios. It is anticipated that Scenario A is feasible, as other intersections in the City feature this type of configuration, although typically at a somewhat lower traffic volume. Among scenarios B and C, Scenario C would have less overall circulation impact, as through (southbound) movements on Gough would be preserved at existing levels of capacity. It is further anticipated that with Scenario C, traffic seeking to make the southbound right turn to Fell would be reduced as some motorists would divert to alternate routes to avoid increased delay at this location. (For example, motorists bound for the freeway via Octavia Boulevard could continue via Gough Street across Market Street to access the freeway at Duboce Avenue.

4.2.2 Franklin and Fell

The intersection of Franklin and Fell has many similarities to the Gough and Fell location. At Franklin/Fell, the east side crosswalk is currently closed. This closure prioritizes the heavy right turn volume from northbound Franklin Street to eastbound Fell Street. This vehicular movement has its peak in the morning period, with approximately 1400 vehicles in the AM peak hour making the right turn prior to the Hayes and Fell two-way conversion project. (Since implementation of the two-way conversion project, current turn volumes are somewhat less, as eastbound travelers may now alternatively utilize eastbound Hayes Street from Franklin.)

Analogous to Gough and Fell, the right turn at Franklin and Fell is made via two lanes: one a dedicated turn lane (at the curb); the second a combined through/right lane. The intersection currently operates at LOS C in the AM peak period (B in the PM).



As with Gough and Fell, three scenarios were developed that could potentially allow for the opening of this crosswalk:

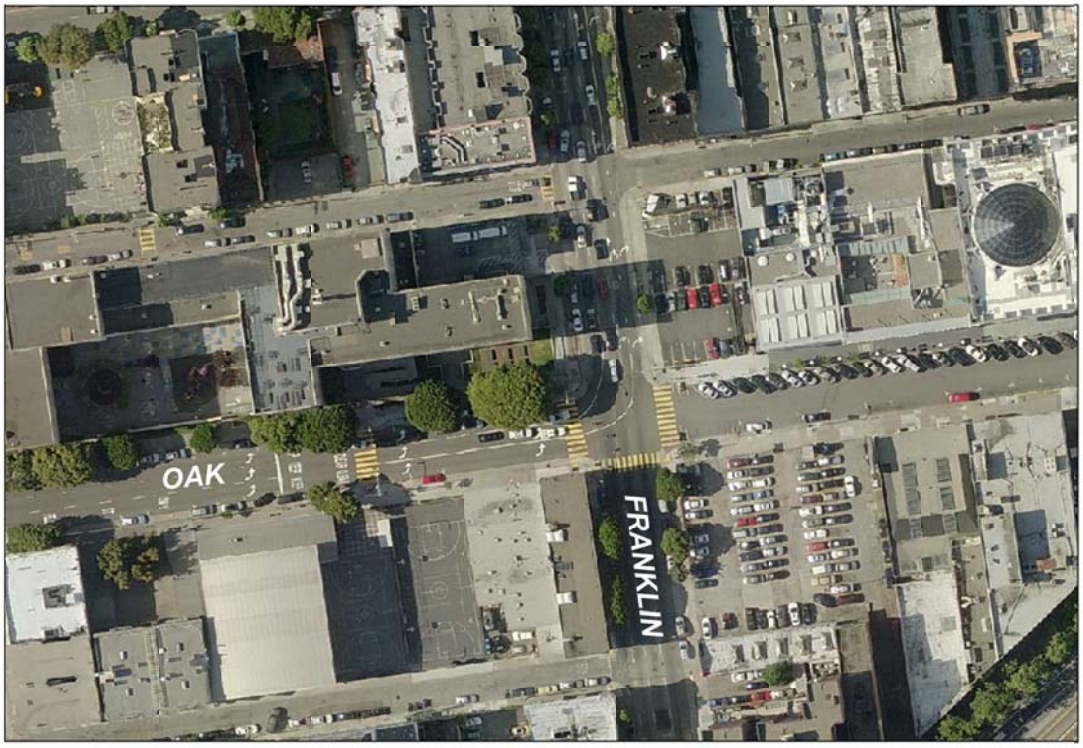
A. Existing Lane Configuration with Lead Pedestrian Interval.
B. Modified Lane Configuration – 2 Dedicated Right-Turn Lanes.
C. Modified Lane Configuration – 1 Dedicated Right-Turn Lane.

Again, these three scenarios mirror the three that were developed and tested for the Gough/Fell location. The effects are similar. Scenarios B and C would provide a dedicated pedestrian phase but bring significant traffic delay to either northbound through traffic (B) or to eastbound turning traffic (C). For any of the scenarios, a potential supporting element would be the actuation of the new crosswalk, which would reduce the effect on traffic circulation by only providing a green walk signal when it is requested by a waiting pedestrian. (A pedestrian scramble was also tested here, but resulted in gridlocked traffic conditions.)

The Study recommends that more detailed analysis and engineering of the above three options be undertaken, particularly in light of recent traffic circulation changes in the area.

4.2.3 Franklin and Oak

At this location, the north side crosswalk is currently closed. This closure prioritizes the heavy left turn volume from eastbound Oak Street to northbound Franklin Street. This vehicular movement has its peak in the morning period, with over 1600 vehicles in the AM peak hour making the left turn. Unlike the two locations described above, the left turn at Franklin and Oak is served by three dedicated left turn lanes; no through movement is allowed—all eastbound traffic is forced to turn left. The intersection currently operates at LOS C in the AM peak period (A in the PM). In addition to LOS at the intersection, another concern at this location is the effect of vehicular queuing; when congestion mounts, traffic streams from both the west (Oak) and south (Franklin) approaches sometimes spill into the mid-block crossing on Oak and the Franklin/Market/Page intersection, respectively.



Three scenarios were developed that could potentially allow for the opening of this crosswalk:

A. Split East/West Phasing.
B. Pedestrian Scramble for all movements
C. Pedestrian Scramble for only east-west pedestrian movements

Under Scenario A, the new pedestrian signal phase would be accommodated in conjunction with a phase for westbound motorists from the eastern block of Oak—a low-volume block that is one-way westbound—that must turn right to northbound Franklin. (Currently these vehicles make this turn during the heavy right from the opposing direction via a flashing yield indication.)

Given the low volume of traffic from the easternmost block of Oak to Franklin, Scenarios B and C are effectively variations of this option, which provide a dedicated signal phase—either for all movements (B) or only for east-west pedestrian movements across Franklin (C).

Under all scenarios the intersection would continue to perform at LOS C or better during both peak periods. As a variation, the walk signal at the new northern crosswalk could be actuated, so that green Walk signals would only be shown when requested.

The Study recommends that either Option B or C be further analyzed and designed. This analysis may also consider a further configuration variation: reducing Oak's travel lanes east of Octavia from three to two. (East of Octavia, Oak serves significantly less traffic due to heavy right turns from Oak to southbound Octavia.) This may present an opportunity to re-open the Oak and Franklin intersection in a more acceptable manner.

4.2.4 Summary of Closed Crosswalk Recommendations

With respect to the above-described closed crosswalks, the Study recommends the following:

- Gough and Fell is the highest-priority for re-opening. Among the three locations, the intersection of Gough and Fell has the most active adjacent land uses at all three corners, including a busy drugstore, fitness studio, and restaurant. The conflicting traffic volume associated with the closed crosswalk is also the lowest among the three locations, and some of it is divertible to an alternate route as described above. There is also the potential to shorten the crossing distance of a new crosswalk in this location through the construction of one or more corner bulbouts.
- Further traffic simulation analysis is recommended, utilizing new traffic data to the extent feasible. The implementation of the Hayes and Fell two-way project has redistributed traffic to some extent in the area, allowing for some new circulation routes and the reduction in some turning movements. Updated modeling utilizing traffic turning movement counts reflecting the post-two way implementation should be conducted to more accurately analyze the effects of re-opening the crosswalks, particularly to compare scenarios that maintain multiple conflicting turn lanes versus those that provide a dedicated phase.
- If Fell and Gough is re-opened, carefully evaluate its performance to inform potential subsequent improvements at the other two locations.

The SFMTA currently has an active Prop K-funded project to plan, design, and implement the re-opening of closed crosswalks at citywide locations.

4.3 Octavia Boulevard – Design and Operational Opportunities

As described above, the Study prioritized further analysis of design and operational opportunities at key intersections along Octavia Boulevard. Operationally, Octavia's intersections are challenged by high levels of peak-period traffic—particularly traffic seeking to access the Central Freeway facility (southbound). (In the opposite direction, the Central Freeway facility itself effectively serves to "store" and "meter" traffic prior to its entry onto surface streets via the Mission Street off-ramp and the Market Street touchdown.) As discussed elsewhere in this report, addressing many of the concerns and issues relating to the Boulevard ultimately will require robust demand management strategies that alleviate some of the peak-period congestion burden on the facility and surrounding grid system.

The design and analyses conducted for the Study focused on strategies with the potential to be delivered in the near-term, within the general context of the relatively recently constructed Boulevard. In particular, the Oak and Octavia intersection was a focus, due to the high level of vehicular traffic (particularly turning movements) and areas of conflict among motorists and between motorists and other Boulevard users. Although conflicts are less severe at Fell and Octavia, initial design opportunity analysis was also conducted for this location. At both locations, signalization and design issues were considered.

This section of the Report summarizes the findings of the analysis conducted at both of these intersections, and closes with a discussion of overall Boulevard functioning, which also considers the role of intersections with Page and Haight. This overall analysis tiers off of the Circulation Strategy analysis described earlier in the Report.

4.3.1 Fell and Octavia

The heaviest traffic flow at Fell and Octavia occurs from northbound Octavia to westbound Fell Street, with approximately 1400 vehicles making this movement in the PM peak hour via three left turn lanes. The primary point of conflict associated with this turning movement is with pedestrians crossing the west side crosswalk across Fell. Overall heavy congestion levels are also a significant concern.

The Study Team assessed signal phasing at this location, in response to community concerns regarding signal timing at the west side crosswalk. Currently, the west-side signal is actuated—that is, in order to receive a Walk signal, the pedestrian must press a pushbutton. This allows additional signal cycle time to be devoted to the traffic phases in the absence of a pedestrian. The Study Team found that the pedestrian phases meet timing requirements for the Walk and Flashing-Don't-Walk (FDW) phases. (Pedestrian signal timing standards in San Francisco require sufficient time from the start of the walk phase for a pedestrian traveling at 2.5 feet per second to safely cross the intersection, and sufficient time from the start of the FDW phase for a pedestrian traveling at 3.5 feet per second to safely cross.)

In order to improve the pedestrian crossing experience at the west side crosswalk, the Study Team considered the addition of corner bulbouts at both the north and south sides of the west-side crosswalk. Installing either or both of these bulbs would shorten crossing distance, and ease the case for providing a dedicated pedestrian phase in every signal cycle (because the amount of time required to do so would be reduced). Implementing bulbs in this location appears to be feasible, as there is all-day (non-towaway) on-street parking present on both the north and south sides of Fell. However, detailed site analysis was not conducted, and the presence of nearby garage access points may complicate design (i.e., a standard bulbout may not be feasible on the northern side). Given the slopes in the area and the current location of catchbasins, drainage considerations are also likely to challenge design at the intersection.

Despite these challenges, the Study recommends that the potential for one or both bulbouts be further explored through an engineering design process. In addition, it is recommended that removing the pedestrian actuation requirement be explored. Given the highly-active nature of land uses in the vicinity (particularly the park immediately to the north), the pedestrian phase is requested in nearly every signal phase during peak periods, indicating that actuation is superfluous.

The Study Team also considered the opportunity presented by the northwesternmost segment of Octavia—the primary southbound travel lanes between Fell Oak. These lanes currently serve a limited amount of traffic. They are only accessed via left-turning traffic from Fell Street—a much smaller turning movement than others in the Study Area. There is a potential opportunity to rethink the role of this segment, potentially as additional public space in the area. As discussed in the next subsection, it would also permit a higher degree of channelization of turning traffic from eastbound Oak to southbound Octavia. Vehicles currently using the segment (coming from Fell), would still be able to proceed southbound on Gough to access the freeway at Mission Street. To advance this concept, significant further analysis would be required, particularly to assess diversion impacts such as to Haight Street.

4.3.2 Oak and Octavia

Oak and Octavia was perhaps the most frequently and intensely discussed intersection during the course of the Study. The heavy traffic movement at this location is from eastbound Oak Street to southbound Octavia Boulevard, with more than 1,100 vehicles making this turn in the PM peak hour via two dedicated turn lanes. Through movement from Oak is also heavy, with just *under* 1,100 PM peak hour vehicles traveling across Octavia through on Oak. The southern pedestrian crosswalk (along Oak across Octavia) is actuated and timing depends on the presence of the median halfway across the Boulevard. This allows additional signal cycle time to be dedicated to the heavy turn movement (with a right-run arrow signal) that conflicts with this movement.

Community input reflected a desire to calm and manage traffic, particularly, the turning movement, and to improve crossing conditions, particularly on the west-side crosswalk across Oak. The SFMTA has implemented a number of spot measures in recent years in an effort to improve conditions at this location. These have included installation of red-light cameras, extension of solid white lines demarcating turn lanes further west on Oak, and signal timing modifications. In 2010, an additional three seconds of walk time were added for pedestrians crossing Oak on the west side.

The Study Team considered further relatively-low cost design improvements that could improve pedestrian crossing conditions and calm traffic in this location. These included the following:

- **Provide a corner bulb at the northwestern corner of Oak and Octavia.** This bulb is feasible as there is a full-time curbside parking lane on the north side of Oak. A six-foot bulb would increase available signal time for pedestrians by 2-3 seconds while also reducing crossing distance. This is shown in Figure 9, below.
- **Improve striping and channelization of turning traffic.** Safe-hit posts mounted on a quick-curb treatment could be installed along Oak Street where a solid striped line is currently provide to better channelize drivers approaching the turn. There would be some concerns relating to driveway access and maintenance of the safe-hit posts.
- **Extend southern side median further north and provide median on northern side.** The geometry of the intersection allows for the extension of the current median to a point further north, as shown in Figure X, below. In addition, a median could be provided on the northern side of the intersection as well, by reducing the length of the leftmost of the left-turn storage lanes used by traffic turning from northbound Octavia to westbound Fell.
- **Rethink southbound-through Boulevard traffic at this location.** The concept of eliminating southbound through traffic from the northernmost segment of the Boulevard was discussed above in the context of the Fell/Octavia intersection. It clearly would have implications for this location as well. Eliminating this movement would provide some additional signal cycle time that could be dedicated to pedestrians. More importantly, this circulation change would allow for much more robust channelization of turning traffic by

eliminating the southbound through movement. This would allow channelization treatments to continue into the intersection.

Figure 9. Oak Octavia Design Opportunities

In addition the Study Team and the TAC conceived of a design variation to the above-described options. The components of this design variation are as follows:

- **Shift the peak-period tow-away lane to the north side of Oak.** Between Laguna and Octavia, Oak Street currently has a peak-period tow-away lane, which serves as queuing storage for the innermost right-turn lane to southbound Octavia. Under the design variation scenario, a peak-period curbside towaway lane would be provided on the northern side of Oak Street rather than the south side. All-day parking would be permitted on the southern side of Oak (where not restricted by the presence of garage access curb cuts.
- **Maintain two through lanes during peak periods.** When the northernmost lane serves as a traffic lane, two through lanes (to eastbound Octavia) would be provided. At other times, one through lane would be provided. Two right turn lanes would be provided at all times.
- **Provide a corner bulbout at the southwest corner of the intersection.** Rather than provide a bulbout at the northwest corner, as under the original scenario, the design variation would provide a bulbout at the southwest corner.
- **Reduce Oak Street capacity from three to two lanes east of Octavia.** Oak Street carries significantly less traffic east of Octavia than upstream of Octavia. This component of the design variation could be accomplished under either scenario. The additional roadway space made available by this reduction in traffic capacity would a prime candidate for an eastbound bicycle facility connecting the Boulevard to the key node of Van Ness and Market,.

The primary benefit of this variation would be a more orderly fashion for vehicles seeking to turn right on the Boulevard to queue. Presently, queuing traffic frequently extends to the west of Laguna Street, utilizing a single travel lane. Under the design variation, the two southernmost travel lanes along Oak would serve as queuing lanes. An additional key benefit of this variation would be the provision of a sidewalk corner bulb extension at Oak and Octavia, which is currently infeasible due to the right-turn pocket. A potential disadvantage of the design variation would be the need to adjust signal placement on the signal mast arm to align with new lane positions. The community may also have concerns about the effect of parking loss on the north side of Oak. (There is presently more on-street parking on the north side of Oak than the south side, due to the presence of numerous curb cuts on the southern side of the street.)

The Study recommends that further design and traffic engineering be undertaken to further develop these design options at the Boulevard's intersections with Fell and Oak streets. It is also important to reiterate that the most effective mechanism for improving circulation, Boulevard operations, and neighborhood livability over the longer-term is robust demand management and the improvement of alternative modal networks, particularly transit and bicycle networks.

4.3.3 Overall Boulevard Circulation

While the Study's initial design analyses focused on the intersections of Oak and Octavia and Fell and Octavia, this work was done within the context of the Study's overall Circulation Strategy as presented in Chapter 3.

This work recognizes that while Oak and Fell serve important circulation functions for mixed traffic, future improvements should focus on addressing pedestrian needs and improving safety for all users.

Although design concepts were not developed for the Boulevard's other two primary intersections—Page and Haight—the Study did consider these streets' modal roles and priorities and the implications for these intersections at Octavia.

The overall recommendation from this analysis is that in order to provide sufficient transit priority (on Haight) and bike priority (on Page), that the role of these two streets as access routes to and from the Boulevard should be minimized as much as possible.

Page Street is an important and well-utilized bicycle route, with the potential for further improvements. A promising opportunity from this perspective is to reduce or eliminate through vehicular traffic by converting the route into a "bicycle boulevard" in which bicycles may proceed straight, but vehicles must turn at most intersections. A version of a bicycle boulevard design was attempted several years ago along Page; however, it was subsequently removed due to a lack of community consensus on the design. Advancing any bicyle priority design in the future will require sufficient community outreach and efforts to design a facility that balances needs to the best degree possible.

As discussed elsewhere in this Report, Haight Street will soon be converted to two-way transit operations for its full length, by adding overhead contact system wires east of Laguna for inbound trolleycoach vehicles and allowing eastbound travel east of the Boulevard. The SFMTA is leading this effort. This design will reduce travel time and improve reliability for the heavily utilized 6-Parnassus, 71-Haight/Noriega and 71L-Limited service. Currently a good deal of traffic utilizes Haight to access the Boulevard (and subsequently the freeway) from both the east and from the west. The Study recommends that strategies be developed to reduce these traffic movements, such as by encouraging traffic to utilize Gough Street south across Market to the Duboce/Mission Street on-ramp to access the freeway.

4.4 San Jose Avenue Corridor

The final area of project development for the Study was focused outside of the immediate Market-Octavia neighborhood; rather, it concerned a key corridor—San Jose Avenue from I-280 to Richland Street—that serves as a parallel facility to the Central Freeway, and thus was affected by the implementation of the Octavia Boulevard facility.

The Study conducted an initial analysis of traffic flows and design opportunities in the corridor in the vicinity of the Glen Park neighborhood. In this location, a primary function of San Jose Avenue is to connect the Mission District to and from the I-280 freeway. As currently configured, the street acts much like a freeway in this segment, and is frequently referred to as the "expressway" segment. This section assesses the benefits and impacts of three project scenarios for improving traffic management and flows in this area.

4.4.1 Background and Goals

San Jose Avenue is an arterial of varying width and use. In the southernmost portion of San Francisco, San Jose Avenue serves as State Route 82 and provides multiple lanes of traffic capacity in each direction. In the vicinity of Balboa Park, San Jose Avenue is a lower-capacity facility, with two lanes of traffic per direction, including light rail operations in mixed traffic in one lane per direction.

Immediately south of the I-280 junction, San Jose Avenue has a single northbound lane of traffic. (The J-Church light rail line operates in a second lane which is transitioning to dedicated light rail right-of-way). San Jose Avenue northbound merges with an I-280 northbound off-ramp. The I-280 off-ramp effectively acts as the primary traffic flow because it has higher traffic volumes and twice the lane capacity as San Jose. At this point, San Jose Avenue primarily functions as a merging lane (from the left) that meets traffic exiting I-280.

Shortly north of the I-280 off-ramp merge, San Jose Avenue merges with the Monterey Boulevard northbound on-ramp (a fly-over ramp from the west). Hereafter, northbound San Jose Avenue functions as an "expressway" with three lanes in each direction until the Randall Street intersection, just north of which it splits into Guerrero and Dolores Streets with two lanes in each direction for both streets. This northbound "expressway" corridor also includes a continuous Class I bike lane. Throughout this area, southbound San Jose Avenue generally has two lanes of through traffic capacity provided as compared to the three lanes in the northbound direction. A buffered bicycle lane is provided in the southbound direction.

The Study Team undertook initial analysis of reconfiguration options for northbound San Jose in this vicinity, including potential changes to the system of ramps that feed into the expressway segment, with the goal of calming traffic, reducing speeds through options with the potential for near- to medium-term implementation. The following objectives guided the process:

- Reduce through capacity on northbound San Jose from three lanes to two lanes, to match southbound San Jose's capacity
- Improve the northbound bicycle facility and provide convenient bicycle connections to neighborhoods on both sides of San Jose
- Facilitate safe traffic movements, particularly weaving from the various upstream traffic flows and turns to local streets
- Provide for sufficient regional connectivity
- Seek to restore the I-280 off-ramp to northbound San Jose to its pre-Loma Prieta configuration.

This section assesses benefits and impacts of three alternative project scenarios for the San Jose Avenue/I-280/Monterey Boulevard merge. Managing upstream traffic flow is expected to ease traffic conditions in the Study Area by eliminating some unnecessary through trips. This project is also expected to have localized effects of calming traffic, facilitating bicycle facilities, and setting up further planning and design efforts building on the Glen Park Community Plan.

4.4.2 Description of alternatives

Three project scenarios were developed that seek to reduce traffic on the "expressway" segment of San Jose Avenue by eliminating and/or metering access points to San Jose. By reducing or managing upstream access points, a road diet of San Jose Avenue is made feasible. (Under the current configuration, three lanes of traffic are necessary to permit safe traffic weaving movements of vehicles from the various traffic flows to both local street access to the east and through movements to the north.)

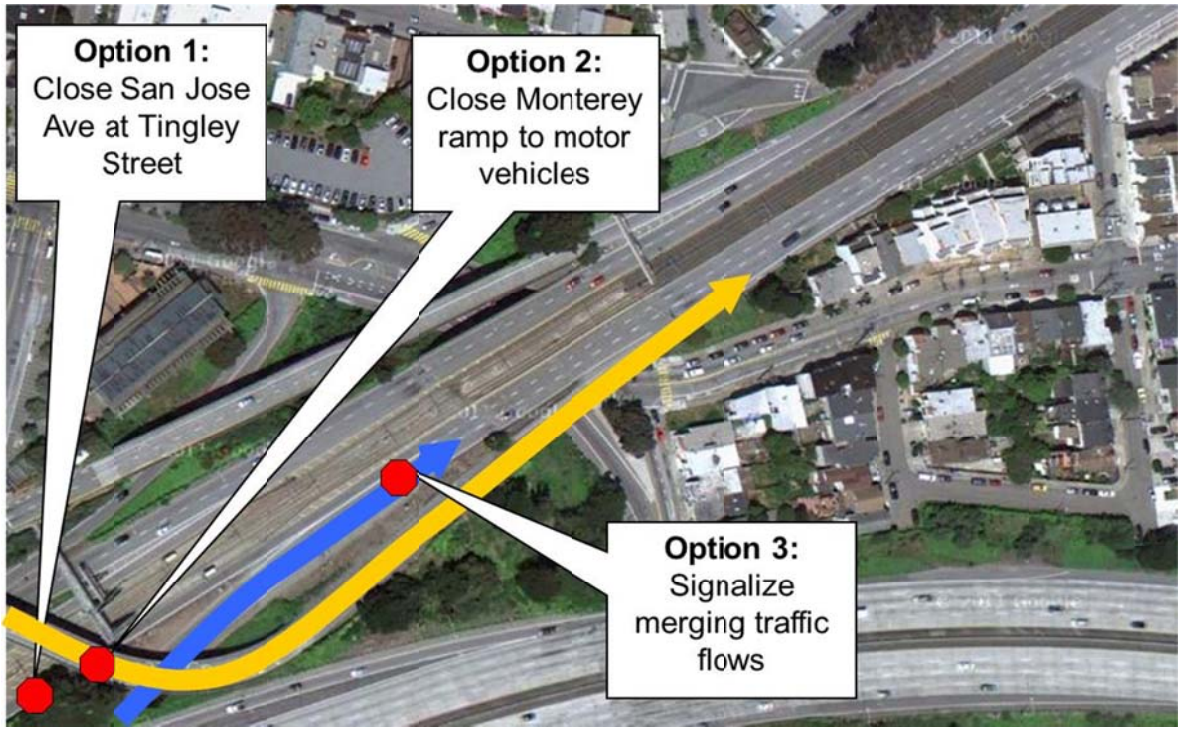
The project scenarios are described below.

Option 1: Close San Jose Avenue northbound at Tingley Street.
This option involves closing San Jose Avenue northbound at the Tingley Street intersection. Bicycles would retain access to San Jose Avenue north of Tingley Street, but automobiles would be diverted to other streets

Option 2: Eliminate automobile access to the Monterey Blvd northbound on-ramp to San Jose Avenue.
Eliminating automobile access to the Monterey Boulevard northbound on-ramp to San Jose Avenue (bicycles would still have access to this ramp, unless it were removed).

Option 3: Signal and/or meter traffic at merge point
A signalization option may be an effective way of regulating congestion at the converging points of San Jose Avenue, the I-280 off-ramp, and Monterey Boulevard off-ramp. By controlling the flow of vehicles, weaving movements would be safer because neighboring lanes would be clear for the merging vehicle.

The Study Team also explored a design variation (potentially applicable to all three options) that incorporated a reduction of the number of travel lanes along the I-280 San Jose Avenue northbound off-ramp from two lanes to one. Assessment was performed using the existing counts obtained from several available recent studies[1] and origin-destination data obtained from a select link analysis using the Authority's SF-CHAMP model and traffic volumes obtained from the SFMTA's San Jose Avenue/Guerrero Street TETAP Project report.



[1] Source: SF Bicycle Plan EIR (SF Planning), Balboa Park Pedestrian and Bicycle Study (SFMTA), Glen Park Station Area Improvement EIR (SF Planning), and 24 hour tube count data provided by SFCTA

4.4.3 Findings

Option 1: Closing San Jose Ave northbound at Tingley Street

Closing San Jose Avenue at Tingley Street would reduce the number of weaving movements at the San Jose Avenue merge point, especially vehicles from San Jose that must cross three lanes of traffic to turn right onto Rousseau Street. Northbound traffic on the "expressway" section of San Jose would be reduced by 400 vehicles during the AM peak (from 2,450 to 2,050 vehicles) and 320 vehicles in the PM peak (from 2,390 to 2,070 vehicles). The remaining traffic could be comfortably accommodated by two travel lanes (each lane is assumed to have a capacity of 1,400 vehicles per hour). Reducing San Jose Avenue's traffic capacity to two lanes for this segment would allow the construction of a buffer zone and wider bike lane along northbound San Jose.

In general, streets south of Tingley Street would not be significantly impacted; however, more detailed studies would be needed at key intersections, such as Ocean Avenue and Mission Street. Mission Street in the area could potentially be affected with a modest amount of diverted traffic. More detailed studies would be needed to assess the extent of any impacts and develop mitigations as necessary, especially for Muni bus operations along Mission Street. This option does not significantly hinder automobile access, as the large majority of origin-destination pairs utilizing San Jose Avenue at this location do not require this specific connection.

Option 2: Eliminate automobile access to the Monterey Blvd northbound on-ramp

Eliminating automobile access to the Monterey Boulevard northbound on-ramp to San Jose Avenue would reduce the number of weaving movements, by eliminating one of the three upstream traffic flows. The closure would allow the on-ramp to be designated exclusively for bicycle use, connecting the Glen Park neighborhood directly to an improved bikeway along San Jose Avenue. (Alternatively, the flyover ramp could be closed and/or removed.) This option would facilitate the reduction of San Jose Avenue from three lanes to two, as described in Option 1, above, with similar benefits of reduced traffic capacity and an improved northbound bicycle facility.

Traffic volumes on the Monterey Boulevard ramp are significantly lower than those on upstream San Jose Avenue (as contemplated in Option 1). The closure is unlikely to cause significant traffic impacts. Overall traffic volumes along the ramp are relatively low (155 vehicles in the AM peak hour and 170 in the PM peak hour). Modest, but localized impacts may be possible at the Diamond and Bosworth intersection in Glen Park, due to traffic diverted away from the Monterey ramp. This intersection is currently congested during peak periods due to the high volumes of vehicular and pedestrian traffic. (The intersection operates at LOS E/F). The Diamond/Bosworth intersection is expected to get somewhat more congested as a result of the projects developed in the Glen Park Community Plan. Further study and coordination will be required to understand total impacts to vehicle circulation at this intersection and to develop appropriate design mitigations.

Option 3: Signal and/or meter traffic at one or more merge points

Two traffic signals are proposed in this option. The first signal is a set, controlling the I-280 off-ramp and San Jose Avenue traffic with separate, alternating lights. The signals would be placed approximately 140 feet downstream of the San Jose Avenue/I-280 merge. The second signal would control the Monterey Avenue on-ramp traffic merging onto San Jose Avenue, similar to a freeway ramp metering control. The I-280 San Jose Avenue northbound off-ramp would be reduced from a 2- to 1-lane off-ramp at the diverging point with I-280, but would be widened to 2 lanes after approximately 500 feet from the diverging point.

The signal timing developed for Option 3 is as follows:

1. Signal for the I-280 off-ramp (two lanes and two signal heads) would turn green every 4 seconds (900 vehicles per hour per lane);
2. Signal for San Jose Avenue would turn green every 6 seconds (600 vehicles per hour per lane); and
3. Signal for Monterey Boulevard would turn green every 12 seconds (300 vehicles per hour per lane).

Reducing the number of travel lanes along the I-280 San Jose Avenue northbound off-ramp from 2 lanes to 1 (as described below) would have the potential to reduce traffic volumes using the off-ramp to northbound San Jose Avenue, because of the reduction of the off-ramp capacity. If additional constraints were added to the off-ramp, such as the proposed signal at the merging point, then the reduction could be more substantial.

4.4.4 I-280 Off-Ramp Variant

Following the 1989 Loma Prieta earthquake, access to the San Jose off-ramp from northbound I-280 was expanded from a single lane to two lanes to facilitate traffic displaced by the damaged Central Freeway. The adjacent neighborhood has raised concerns about traffic volumes and speed along the expressway segment of San Jose Avenue and in the neighborhood. There is a desire to restore the northbound I-280 northbound off-ramp access to one lane in conjunction with options described above to reduce of San Jose Avenue northbound lanes from three to two. In addition there is a desire to maintain only one lane of off-ramp traffic downstream of the mainline exit point rather than expanding to two lanes. In short, the off-ramp capacity both at and downstream of the exit point would remain at a single lane under this variant. It is assumed that off-ramp capacity for a ramp of this configuration is approximately 1,800 vehicles per hour.

The Study recommends further analysis and coordination with Caltrans on this issue. A key area for further analysis will be the extent to which a single lane is sufficient to meet peak-period demand for access to San Jose Avenue. The Study Team utilized the Caltrans PeMS highway volume database to assess existing off-ramp volumes, in 2007 and 2010, as shown in Table 16, below.

Table 16. PM Peak San Jose Off-Ramp Volumes

	15-Minute Peak (vph)		60-Minute Peak (vph)	
	Peak Volume	Peak Interval	Peak Volume	Peak Interval
2007	1760	5:00p-5:15p	1670	5:00p-6:00p
2010	1530	6:15p-6:30p	1520	5:45p-6:45p

The 2005 TETAP report documented 2002 peak hour traffic volumes on the facility of approximately 1900 vehicles per hour. Since then, traffic volumes have declined significantly, both with the opening of the rebuilt Central Freeway and Octavia Boulevard and the 2008-09 recession. Traffic is not highly-peaked: 15-minute flow rates are similar to peak hour flow rates. In addition, volumes are currently low enough to indicate that a single off-ramp lane is likely sufficient to handle peak period capacity.

The Study recommends further analysis of options to reduce off-ramp capacity, particularly in combination with the above-described options that would allow the reduction of northbound San Jose Avenue in the expressway segment from three lanes to two lanes. The Study's preliminary analyses indicate that the freeway ramp modification, paired with a closure of San Jose Avenue or Monterey access, is feasible and warrants further analysis and community consultation.

4.4.5 Recommendations

The Study preliminarily identifies Option 2, closing the Monterey on-ramp, as the most promising option for further design development, agency input, and public outreach. This option would fulfill all of the above-discussed goals, with very limited traffic diversionary impacts. Option 1, closing upstream San Jose, would have more significant traffic impacts, including anticipated undesirable effects to Mission Street, a key transit corridor.

The design options, any variants, and further consideration of modifications to the I-280 off-ramp configuration will be best accomplished through a dedicated planning and design study that should involve significant community outreach and coordination with partner agencies. In spring 2012, the Authority submitted a Caltrans Planning Grant application to conduct this work in collaboration with the community and partner agencies.

4.4.6 Monterey Boulevard Considerations

Over the course of the Study's development, public and stakeholder input was also received concerning traffic congestion on Monterey Boulevard, to the west of the San Jose Avenue expressway segment. Members of the public expressed concerns regarding traffic utilizing Monterey Boulevard to connect to and from I-280 to the Sunset District. The above-described option involving closure of the Monterey access ramp to San Jose Avenue would relieve some of this traffic. Additionally, the Study Team developed a signage proposal for US-101 southbound and I-280 southbound, which seeks to discourage the use of Monterey Boulevard as a direct access route to the Western neighborhoods. This signage scheme is illustrated in Figure 10, below.

Figure 10. Existing Signage and Signage Proposal for US-101 and I-280 Southbound

The Study recommends that the Authority and the City work with Caltrans to explore signage changes in this corridor.

5 Study Findings and Overall Recommendations

This Chapter closes the Final Report by synthesizing and briefly presenting the Study's key findings and recommendations.

5.1 Findings

As has been discussed throughout this report, the Study Area is central to circulation and travel needs for nearly every mode of local and regional travel in the city. In many ways, the Market-Octavia neighborhood is ground zero for the competing interests of neighborhood livability, system performance, and regional access that are developing across the city, including in the burgeoning development areas in SoMa. In addition to these pressures, the Study Area has seen substantial change in motorist accessibility (the reconfiguration of the Central Freeway to terminate at Market Street at a surface-level boulevard) without a commensurate change in alternative modes. Notably, improvements to the transit network were not provided as part of the Central Freeway and Octavia Boulevard project. Though the transportation network in the Study Area serves well over 300,000 total trips each day (excluding through trips) in a very small area, its performance seems to fall short of the desires and expectations of most travelers, regardless of mode.

Based on technical analysis, public input, and project development, the Study has the following high-level findings concerning circulation and transportation needs:

- **Octavia Boulevard brought significant urban design and land use benefits to the Market-Octavia area; however, operational challenges and concerns remain.** The replacement of the Central Freeway's northern segment with a surface-level boulevard has greatly enhanced the livability and public realm in the immediate area. In particular, the Hayes Valley neighborhood has seen significant revitalization now that an elevated freeway no longer bisects the community. Still, the freeway access generates significant travel demand to and through the area, causing heavy peak-period traffic areawide and severe congestion in a number of specific streets and intersections. This congestion causes air quality and noise impacts, creates conflicts with non-motorized users, and impairs the travel time and reliability of surface-running transit.

- **Given the somewhat lower capacity of the Boulevard as compared to the facility that it replaced, some traffic has diverted to other routes—both nearby and across the city.** Given the diverse travel patterns served by the Central Freeway—including district-to-district intra-San Francisco travel as well as regional travel—some motorists have diverted to other parallel routes such as 9th and 10th streets, the San Jose Avenue/Guerrero Street corridor, and 19th Avenue/State Route 1. Even when the new facility was opened, some newly established routes taken by motorists were maintained.

- **These shifts in circulation patterns have also been accompanied by a general growth in traffic citywide and regionally, which has obscured the impact of the Boulevard alone.** Over the course of the planning, design, and implementation of the new Boulevard and Central Freeway, travel has increased significantly within San Francisco and the Bay Area due to population growth and economic growth. Thus, it is not possible to isolate precisely the circulation impact of the facility.

- **Trips generated to, from, and within the neighborhood have high transit first mode shares; however, the area's position at the center of the regional roadway network means that it is substantially affected by crosstown and regional traffic.** A key objective for improvements to the transportation network in the Market-Octavia area is to improve the balance between local transportation needs and regional connectivity. Improvements to the bicycle and transit networks in the area are warranted to serve the high proportion of local-serving trips in the area. Regional access must also be accommodated, with appropriate management of demand through design strategies and policy measures.

- **High traffic volumes impair the neighborhood's ability to grow in a livable and sustainable manner.** As envisioned in the Market and Octavia Area Plan, growth in the community is intended to support high levels of walking, bicycling, and transit use in a safe and reliable manner. There is extremely limited ability for the street network in the neighborhood to accommodate additional peak-period automobile trips. Accommodating additional residents and workers within the area will require serving growth in travel demand primarily through new non-motorized and transit trips.

- **Addressing transportation needs in this neighborhood is challenged by the diversity of travel and commute patterns on the network.** About three-quarters of motorized travel within the Market-Octavia area is passing through the neighborhood—i.e., it has neither an origin nor a destination within the neighborhood. Managing this travel demand will require providing improved alternatives for travelers in a wide range of corridors and markets, including to regional destinations and for intra-San Francisco patterns not well-served by the existing transit network.

- **Improvements to travel alternatives have not kept pace with growing travel demand and did not accompany the reduction in vehicular capacity that the Central Freeway replacement represented.** In the absence of meaningful improvements to travel improvements, the reduction in automobile capacity has not been accompanied by noticeable mode shift. Instead, the neighborhood has been challenged to effectively deal with high peak-period traffic levels and resulting congestion. In this respect, the Boulevard points to the need to pair shifts in automobile capacity with improvements to the bicycle and transit networks and with effective demand management strategies.

While some changes can be made to moderately improve the transportation network in Study Area, comprehensive demand management and investment measures will be most effective in providing sustainable relief to both residents and the traveling public over the long term. The findings of this Study will help to inform improvements not only for this neighborhood, but also for circulation and mobility in the broader context by informing the update to the San Francisco Transportation Plan.

5.2 Summary of Recommendations

In Chapter 3, the Study recommended a high-level circulation strategy for the Study Area, in order to guide the development of future improvements and programs. In many cases, this translated to street-level recommendations for future planning and design efforts focused on certain key modes. In Chapter 4, the Study presented the findings and recommendations from project-level analyses focused on a prioritized set of areas, including closed crosswalks, Octavia Boulevard, and San Jose Avenue's expressway segment. This section of the report will not reiterate all of the recommendations encompassed in these earlier chapters. Rather the below subsections first highlight key specific recommendations, then present a set of high-level recommendations to guide future improvements.

5.2.1 Summary of Project-Level and Corridor Recommendations

The Study makes a number of specific recommendations for individual projects and for the corridors that were analyzed as part of the development of the circulation strategy.

Concerning the Projects that were developed and analyzed through the Study, the Study makes the following recommendations:

- Detailed designs, including operational considerations, should be developed for the re-opening of closed crosswalks at Gough/Fell, Franklin/Fell, and Franklin/Oak. The highest priority location among these three is at Gough/Fell. Development of this and other designs should account for traffic circulation changes associated with the Hayes and Fell two-way project. Subsequent potential crosswalk openings at the two remaining locations should be informed by the results of the Gough/Fell re-opening. Some additional localized traffic congestion is likely to be anticipated with the re-opening of the closed crosswalks. The Prop K program currently funds design and implementation activities for a program of re-opening closed crosswalks on a citywide basis.
- Relatively inexpensive design improvements should be developed and implemented at the intersections of Oak/Octavia and Oak/Fell. The Study presented a set of design concepts for these locations, with a focus on addressing pedestrian safety concerns and improving motorist behavior. A relatively modest level of investment (less than $500,000 per intersection) could provide significant benefits in this location. As, discussed further below, additional relief from congested conditions will require pursuing robust demand management measures.
- A dedicated planning and design effort should be pursued to advance multimodal improvements to the expressway segment of San Jose Avenue, between the Glen Park and Bernal Heights neighborhoods. The Circulation Study preliminarily developed multiple options that would facilitate a road diet of this segment to calm traffic, improve bicycle conditions, and set the stage for further improvements. In spring 2012, the Authority, in coordination with partner agencies, applied for planning funds to undertake a planning effort to more comprehensively analyze conditions in the San Jose Avenue corridor, conduct community engagement, and further develop potential options from a design and operational perspective. This work will include working with Caltrans to assess opportunities to better manage the intersection of the I-280 off-ramp with San Jose Avenue.

- Improvements to signage and navigation should be advanced to improve the distribution of travel routes for regional and district-to-district travel. The Study developed a potential signage regime for one corridor, specifically southbound freeway travelers accessing the Sunset District. This and other similar strategies will provide improved traveler information and help to address some neighborhood concerns regarding freeway cut-through traffic.

With respect to the Circulation Strategy, highlighted recommendations are presented below, organized by the broad corridors defined in the Report:

North-South – West of Van Ness

- Improve conditions for pedestrians on high-volume traffic streets, such as Franklin and Gough. This may be accomplished through coordinated improvements at opportune times, such as planned repavings which are an opportunity to upgrade crosswalks and provide corner bulbs at strategic locations.
- Improve bicycle connectivity along and across Market Street at key locations, such as the northern terminus of Valencia Street. The street grid in this area is discontinuous at or near Market in multiple locations west of Van Ness, requiring innovative designs to provide convenient bicycle connections.
- Improve multimodal conditions along Laguna through an integrated set of design and operational improvements. This may be a combination of public realm, signal, crosswalk, and transit improvements to be further developed with and vetted by the community. Laguna is currently subject to high levels of peak-period traffic particularly from Guerrero Street to the south.
- Develop designs and strategies to improve transit travel time and reliability on key transit corridors. These improvements will range from potential dedicated rights-of-way (such as on Mission) to improved travel time and reliability through other measures (suitable for Church and Fillmore) such as signal priority, standardized stop spacing, and reduced local traffic circulation through parking management and other strategies.

North-South – east of Van Ness

- Manage traffic demand and its impacts along the 9th and 10th streets. This one-way couplet pair connects directly to the regional freeway system. Potential design improvements should improve conditions for pedestrians and should seek to manage traffic through policy and operational measures.
- Improve neighborhood livability and bicycle facilities on 7th and 8th Streets. This one-way couplet pair serves as a bicycle route connection, and 7th Street provides one of the key access routes to Mission Bay. Improvements to these streets should better balance local access needs as this area develops while maintaining a key circulation connection.
- Provide a complete, bidirectional bicycle facility along Polk Street all the way to Market Street and advance planning for a more neighborhood-oriented street along the northern portion of Polk Street. The lack of a northbound bicycle facility on the southernmost segment of Polk is a significant gap in the San Francisco bicycle route network. There is also a community desire for multimodal improvements to Polk Street north of Civic Center.
- Improve pedestrian conditions on Larkin, Hyde, and Leavenworth. These three one-way streets north of Market currently serve a number of functions, including distributing traffic flow to and from the South of Market and providing a route for surface transit (e.g., 19-Polk). There is a need to improve pedestrian safety in this portion of the study area, while also

providing for sufficient transit priority, transit stop features, and bicycle network connectivity (i.e., to 7th and 8th streets).

East-West – North of Market

- Develop the Turk and Golden Gate corridor for transit and/or bicycle priority. Turk Street and Golden Gate Avenue currently provide more roadway capacity than is necessary, particularly as 6th Street (to which they both connect on the eastern end) is traffic calmed in order to improve pedestrian safety. As such, there is an opportunity to develop a bicycle facility on one or both of the streets, as well as to provide for improved transit priority for the 16AX/BX services that utilize the two streets.
- Improve transit priority on McAllister. The 5-Fulton utilizes McAllister Street in both directions through the Study Area. The 5-Fulton is part of the Muni Rapid network and additional and design is recommended to provide for improved transit service along this route, including consideration of dedicated right-of-way.
- Take advantage of Grove Street's broad right-of-way in the Civic Center to improve conditions and amenities for non-motorized users. Grove Street is particularly wide between Franklin and Larkin Streets, and congestion is not a significant issue. Improvements to the pedestrian realm are warranted, in particular to provide an improved connection between the Civic Center BART/Muni Metro station at Grove/Larkin/Market and Civic Center Arts destinations at Van Ness/Grove. Given the broad right-of-way, and relatively low traffic, there is also an opportunity to provide an improved bicycle facility.
- Discourage through traffic on Page Street and develop the route as bicycle priority street. For much of its length within and beyond the Study Area, Page is a low traffic volume residential street. In the vicinity of Octavia Boulevard, the street is affected by peak-period traffic congestion. Through traffic, including that accessing the Boulevard, should be discouraged, and design options for a bicycle priority street (such as a bicycle boulevard) should be developed and further vetted with the community.
- Implement two-way transit along Haight Street and provide improved transit priority. The SFMTA is in the process of advancing the Haight two-way project to deliver two-way transit operations on Haight Street across Octavia Boulevard. In addition, further transit priority measures should be developed for this key transit street.

East-West – South of Market

- Improve pedestrian conditions on Duboce Avenue and Division Street. Duboce and Division are subject to high traffic volumes connecting both to adjacent land uses and to the Central Freeway via the Mission Street ramps. This creates a relatively unwelcoming environment for pedestrians. Conditions should be improved through strategies to slow traffic, minimize conflicting turn movements, provide better lighting and security, and shorten crossing distances and increase crossing times.
- Improve bicycle connections to and along 14th and 15th streets, particularly to the east. At the eastern side of the Study Area, street grid connectivity is challenged both by land uses and the freeway system. The irregularity of the grid affects the connectivity for bicyclists along the 14th and 15th Street routes. There are opportunities in further land use planning to develop connections in this location, such as to Alameda Street. Within the center of the Study Area, upgrades to bicycle facilities should also be developed.

- Provide transit priority designs along 16th Street. Multiple design options for improving the performance of the 22-Fillmore were developed as part of various other planning processes, including EN-TRIPS. Following environmental review, a preferred option should be advanced for final design and funding.
- Improve pedestrian conditions at key Market Street intersections, with a priority on the intersection of 16th/Noe/Market. The six-legged intersections of Upper Market create long crossings for pedestrians. In particular, the 16th/Noe/Market intersection is subject to heavy traffic volumes, particularly from 16th Street to Market Street, and is also a high pedestrian activity area. Design improvement concepts have been developed through other planning processes and should be advanced for further design and implementation.

As discussed in Chapter 3, these circulation recommendations may be developed over time as relevant street-level design efforts are undertaken, as land uses change, and as other major capital projects affecting the streets are advanced.

5.2.2 High-Level Recommendations

Based on the findings described above, the Study makes the following high-level summary recommendations:

- The grid network should be leverage to distribute travel demand and accommodate greater person throughput and local accessibility. San Francisco's grid system of streets is an incredible resource. The Study recommends developing the grid through multimodal strategies that protect community livability while also improve system efficiency, particularly through improvements to the bicycle and transit networks.

- Given their varying network roles, different modes warrant varying levels of priority and design accommodation on different streets through the study area. Across broadly-defined corridors (i.e., collections of parallel streets serving similar travel demands), all modes should be safely accommodated. Collectively, this approach should better balance local, citywide, and regional access and mobility needs.

- As the design of streets is rebalanced to accommodate and prioritize non-automobile modes, improvements to transit service in affected corridors is also called for. The reduction of automobile capacity is supported by improvements to transit service to provide improved travel choices for motorists. This entails a combination of physical (street-level) improvements and accommodation, policies (such as enforcement), and support for the operation of increased transit service levels in these areas.

- Demand management strategies, from shuttle services to pricing, are warranted to reduce automobile trip-making, particularly during peak hours, as well as to support competitive options to driving. Demand management is critical to meeting community objectives for improving transportation and livability within the Market-Octavia neighborhood, especially as planned growth transpires. Pricing strategies, such as roadway and parking pricing, are a particularly robust set of measures for managing high demand for scarce roadway space and

should be developed further with careful attention to local conditions and factors within and around affected neighborhoods.

- Pedestrian accommodations should be improved throughout the neighborhood, particularly to help achieve the City's goals regarding enhanced mobility, sustainability, and livability. All surface streets should provide clear, safe, and accessible pedestrian paths of travel. The Market-Octavia area must be an increasingly walkable environment in order to accommodate high levels of pedestrian trip-making. Improvements to the pedestrian realm are particularly important on higher-volume and higher-speed streets within the Study Area where collisions have historically been concentrated.

The Study and its recommendations provide a key input into the San Francisco Transportation Plan, which will further develop recommendations for circulation in the city's core areas. Study findings will help both in the technical analysis for this work, applying recommendations for improvements in key corridors in the vision for this area of the city, as well as community requests for broader changes that can address key needs for the Market-Octavia neighborhood, and further contribute to the long-range vision of more vibrant and sustainable San Francisco.

5.3 Next Steps

As an areawide planning effort with a particular focus on policy recommendations and coordinated design strategies, the Circulation Study helps to set the stage for a range of further planning efforts and specific project opportunities well into the medium-term. Still, there are a number of areas in which the Study and its recommendations point to various next steps. Highlights among these key activities are as follows:

- Collaborate with City agencies to improve the design and delivery of streets projects to support "complete streets" and "better streets" objectives. With the adoption of the Better Streets Plan in 2010, the City Family is making significant progress in coordinating streets and public works projects to support multimodal objectives and to leverage project coordination opportunities. A number of design strategies prioritized through the Study are ripe for implementing in a coordinated fashion. Integrating pedestrian improvements into repaving and transit projects in the Study Area is a key example of this strategy, which will require collaboration between the SFMTA, Department of Public Works, Planning Department, the Authority, and other agencies as appropriate.

- Advance design efforts for the projects preliminarily analyzed in the Study. Additional detailed design is necessary for the projects analyzed in the Study. Re-opening closed crosswalks will require further traffic analysis. The SFMTA currently undertakes these activities with funding from the Prop K program. A set of both near- and medium-term improvements for the San Jose Avenue corridor should be developed, including a phasing and funding strategy; this will require the active involvement of the SFMTA and Caltrans. Design improvements for intersections along Octavia will require engineering design work.

- Support relevant projects in the design or environmental phase currently. A number of key projects are well into corridor-level planning, detailed design, and/or environmental reviews. The signature projects of this type are the Van Ness BRT and Better Market Street projects. However, other, smaller projects are also being advanced presently by City agencies, such as the Polk Street bicycle network connection and the Haight Street two-way transit project.

- Develop other potential projects through planning and design activities. The Study identified a wide range of potential project opportunities for which the Study only conducted sketch-level planning. The next step is to develop design concepts for community and agency input. Several such project opportunities fit into this category, including Oak Street design options east of Octavia and bicycle facility improvements on Golden Gate Avenue and/or Turk Street.

- Integrate project concepts and recommendations into citywide planning efforts and funding programs. For advancement to implementation projects typically get prioritized through citywide processes associated with modal sectors (e.g., a bicycle plan) as well as in programming for specific funding sources (e.g., the Prop K 5-Year Prioritization Programs). Various transportation improvement projects for the Market-Octavia area are already included to some extent in relevant plans and programming documents, and over time additional projects should be advanced to this stage.