

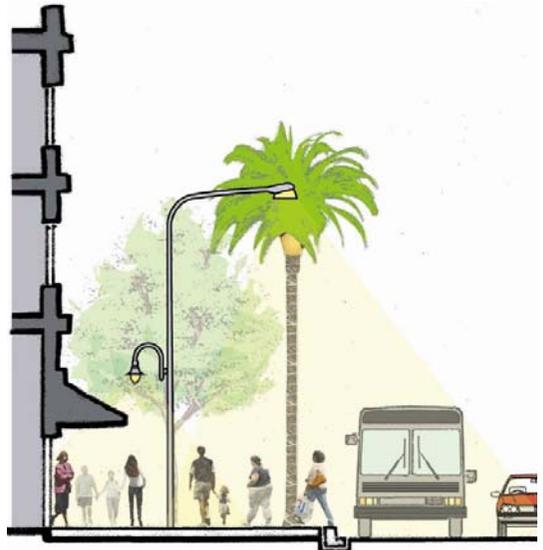
# 1. STUDY OVERVIEW AND OBJECTIVES

## 1.1 STUDY OVERVIEW

The Mission-Geneva Neighborhood Transportation Plan, led by the San Francisco County Transportation Authority (Authority) is a community-based transportation plan intended to identify transportation improvements that can be implemented in the near- to mid-term to address key neighborhood transportation-related concerns.

As a community-based transportation plan, the Mission Geneva effort has been a collaborative process between the community and the Transportation Authority. The Authority retained a technical consulting team, led by San Francisco-based Nelson\Nygaard Consulting Associates, to assist in developing and refining community-based transportation plans throughout several neighborhoods in San Francisco. In addition to the technical consulting team, the Authority retained the Excelsior Neighborhood Commercial Revitalization Project (ENCoRe), a community-based organization (CBO) with strong ties to the neighborhood, to identify and engage a broad range of input from various community stakeholders. The Authority also assembled a Technical Advisory Committee (TAC) consisting of representatives of various City agencies and two community members to facilitate inter-agency coordination and to make the process more transparent.

This Chapter provides relevant background to the study process, describes the study area, presents the findings of previous studies of the area, and details the outreach efforts used to engage a diverse range of community interests.



### 1.1.1 Study Funding

Funding for the study comes from the Proposition K sales tax, a Caltrans Environmental Justice Planning grant, and an MTC Community-Based Transportation Planning grant. The goal of MTC's Community-Based Transportation Planning (CBTP) program is to advance the findings of a Lifeline Transportation Network Report from 2001 that identified transit needs in economically disadvantaged communities throughout the San Francisco Bay Area.

### 1.1.2 Study Timeline

The study process and timeline is as follows:

Study Kickoff	September 2005
Document Existing Conditions	October 2005 - February 2006
Identify and Prioritize Transportation Needs	February – April 2006
Develop Transportation Solutions / Project Designs	May – June 2006
Prioritize Solutions / Project Designs	July – October 2006
Develop Implementation and Funding Plans	October – December 2006
Present Plan to Authority Board for Approval	April 2007

## 1.2 STUDY AREA

The Mission-Geneva study area, shown in Figure 1.1 is comprised of two intersecting corridors in southern San Francisco along Mission Street between Silver Avenue and Rolph Street (just south of Geneva Avenue) and Geneva Avenue between San Jose Avenue (near the Balboa Park BART station) and Paris Street (just east of Mission Street).

**FIGURE 1.1: MISSION-GENEVA STUDY AREA**



Source: Authority and Fehr & Peers, 2006



### 1.3 COORDINATION WITH OTHER STUDIES

There are many transportation and related planning studies in the vicinity of the study area that are either ongoing or have been recently completed. The recommendations of this study are consistent and/or compatible with recommendations from previous efforts.

This section summarizes key findings from studies related to the Mission-Geneva Neighborhood Transportation Plan. The studies include:

- Outer Mission Strategic Analysis Report (SAR) (2002)
- Community Action Plan for Safer Streets in the Excelsior (2003)
- San Francisco Better Neighborhoods 2002 – Balboa Park Plan (2002)
- Balboa Park BART Comprehensive Station Plan (2002)
- Balboa Park Parking SAR (2003)
- Daly City BART Access Plan (2002)
- Daly City BART Capacity Plan (2004)
- Glen Park Community Plan (2003)
- Glen Park BART Capacity Plan (2004)
- Glen Park Traffic Calming Project
- Excelsior Traffic Calming Project
- San Francisco PedSafe (2003)
- Alemany Boulevard Bicycle Lane Project (2005)
- Balboa Park-Ocean Avenue Walkway and Entrance Project (2005)
- Balboa Park Station Master Planning Strategy (2005)
- Mission Street Community Vision: Cesar Chavez to Randal Street (2005)
- San Jose / Guerrero Save our Street Coalition (2005)
- ENCoRe Action Plan
- St. Charles Bridge Project (2002)
- Safe Routes to School Project for Monroe and SF Community Schools (July 2006)
- Outer Mission Transit Preferential Street Study (Future)

#### 1.3.1 Key Findings from Previous Studies

Although some of these studies contain more detailed analysis of the Mission-Geneva area than others, and some include additional concerns beyond transportation, the following are the primary issues echoed in most of the previous studies:

- Pedestrian safety is a key issue in the study area, primarily due to:
  - Difficulty crossing Mission Street at “T” and offset intersections
  - Difficulty crossing specific complex intersections such as Mission Street / Geneva Street and Mission Street / Ocean Avenue
  - Transfers between different Muni lines result in pedestrians running across streets to catch adjacent buses
  - General driver inattention to pedestrians
- Accessing the Balboa Park BART station via Muni from the study area is difficult. Recent service cuts have exacerbated this problem.



- Crosswalks on Mission Street are worn, faded, or inadequate reducing pedestrian visibility
- There is a general lack of landscaping in the study area
- Lack of available on-street parking contributes to double-parking and parking on sidewalks in the neighborhoods
- Sidewalks in the area, particularly at transit stops, are crowded

### **1.3.2 Recommendations from Previous Studies**

Several improvements have been suggested to enhance the Balboa Park BART station and to better connect it with the Mission Geneva area, including the following:

- Information displays should be improved at local bus stops, to provide real-time transit information
- Transit reliability should be increased, especially for routes serving the BART station
- Land uses around the Balboa Park BART station should be intensified and focused on uses that support transit
- BART-Muni transfers should be improved
- Pedestrian and bicycle connections between the Balboa Park BART station should be enhanced
- Parking shortfalls around the Balboa Park BART station could be addressed through expansion of residential parking permit zones, installation of parking meters, and prioritization of parking permits at City College of San Francisco to necessary drivers
- The 14-Mission route could be extended to Daly City or Colma to provide better service to BART riders who otherwise drive to Balboa Park BART stations
- Efforts should be made to extend service hours in lifeline transit routes that serve low-income communities in the study area

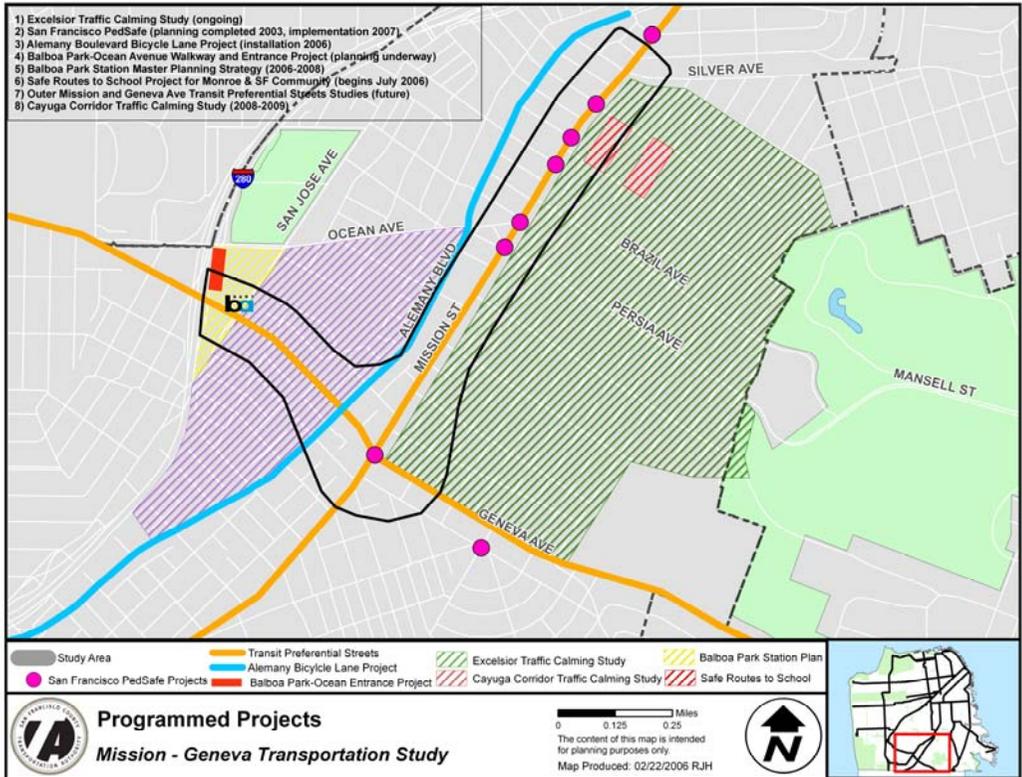
In addition, the *Community Action Plan for Safer Streets in the Excelsior* developed a series of recommended intersection improvements related to pedestrian safety that generally:

- Improve pedestrian visibility through reduction in double parking, removal or relocation of street furniture, and repainting and upgrading existing marked crosswalks
- Reduce pedestrian exposure through shortened crossing distances (i.e., curb extensions), modified signal timings, and addition of pedestrian countdown signals

Many recommendations from previous and ongoing studies or variations of previous recommendations are currently programmed to be constructed in the study area. A map describing the major projects in and near the study area is shown on Figure 1.2.



FIGURE 1.2: PROGRAMMED PROJECTS IN THE STUDY AREA



Source: SFCTA

## 1.4 OUTREACH

One of the key objectives of this plan was to fully engage the community throughout the study process and to develop priorities that reflect the community's perspective. This community involvement was essential both to understand the highest-priority transportation issues and needs and to develop potential improvements that would be supported by the neighborhood. As noted earlier, the Authority retained the services of ENCoRe, a CBO with strong ties to the community, to assist the outreach effort. ENCoRe developed an outreach plan that included a series of community meetings, a survey, multilingual focus groups, a walking tour with community leaders, three public workshops, a number of mobile workshops (e.g., presentations at existing community group meetings), and a booth at the 2005 and 2006 Excelsior Festival. A detailed version of the outreach plan for this project is included in the Appendix.

In addition to engaging members of the community, the Authority assembled a Technical Advisory Committee (TAC). In addition to the Authority, ENCoRe, and the consultant team, the TAC included representatives from the San Francisco Municipal Transportation Agency (including both Muni and the Department of Parking and Traffic), the Department of Public Works (DPW), the Planning Department, the Department of Public Health (DPH), the Metropolitan Transportation Commission (MTC), and two community members-at-large. The composition of the TAC ensured that various City agencies were kept apprised of the study's progress, fostered inter-agency communication and coordination, and ensured that community concerns were addressed. The TAC met at key points throughout the study process to ensure agency and community coordination and to review key study findings and recommendations.



## 2. STUDY AREA NEEDS

The first stage of the study planning process was to understand the existing conditions and work with the community to identify and prioritize key transportation needs. This chapter includes a discussion of the data collected, with some key findings, and a summary of the high priority transportation needs identified by the community and confirmed by the technical analysis. A more detailed discussion of existing conditions was documented in the *Mission-Geneva Study Area – Existing Conditions Report*.

### 2.1 SUMMARY OF DATA COLLECTION AND OUTREACH

This study includes an extensive community outreach and involvement element, which was essential to understanding the primary needs of the study area. The aim of the community outreach component was to ensure broad and inclusive community participation to identify problems and to prioritize and support transportation improvements in the area. Specifically, the community outreach process was designed to engage not only the most actively interested parties (e.g., existing neighborhood organizations and community leaders), but to also engage groups who might not otherwise participate in this process, including, but not limited to youth, off-peak transit users, non-English speakers and other minorities, and seniors.

Outreach to the Mission-Geneva area community was led by ENCoRe and consisted of a three-pronged approach. The first tool used was a one-page survey conducted in October 2005 at the annual Excelsior Festival, a community “block-party” organized by ENCoRe, and other community meetings in the fall of 2005. The second type of community outreach involved detailed focus groups targeting specific populations that are frequently difficult to reach. These populations included seniors (Chinese and Spanish speaking), youth, merchants and commercial property owners, and off-peak transit riders (Spanish and English speaking) from various economic and cultural backgrounds - a diversity of stakeholders reflective of the Excelsior’s demographic. Finally, the third community involvement technique included a walking tour of the area with neighborhood leaders.

The community outreach effort was supplemented by the technical consulting team, which collected and analyzed data related to multimodal transportation conditions in the study area. This data included:

- Existing transit routes and service information, including connections to regional transit (i.e., BART)
- A survey of conditions at bus stops along the study portions of Mission Street and Geneva Avenue
- Muni transit performance data, including load factors, reliability, on-time performance, and travel times
- Morning and evening peak period intersection vehicle turning movement counts, bicycle counts, and pedestrian counts at the following intersections:
  - Mission Street / Silver Avenue
  - Mission Street / Ocean Avenue
  - Mission Street / Persia Avenue
  - Mission Street / Onondaga Avenue
  - Mission Street / Geneva Avenue
  - Geneva Avenue / Alemany Boulevard
  - Geneva Avenue / Cayuga Avenue
- 7-Day, 24-hour machine counts on Mission Street, Geneva Avenue, and Alemany Boulevard



- Observations of congestion on a typical weekday along Mission Street during the morning and evening peaks and the midday off-peak periods
- Parking supply, peak occupancy, and turnover rates
- Pedestrian collision statistics
- An inventory of current turn and parking restrictions

All of this data was compiled and used in the analysis of existing conditions. This information, in combination with the community outreach, formed the basis for understanding the key needs in the community.

## 2.2 SUMMARY OF KEY NEEDS

Based on the extensive data collection and community outreach, three high priority needs were identified.

### ***Transit Reliability***

Mission Street and Geneva Avenue are major transit corridors for Muni near many important regional connections, including BART. Bus service arrives frequently in the corridor and provides 24-hour service.

Though distant from San Francisco's downtown core, the Mission-Geneva area is well-served with local and regional transit lines, with the Balboa Park BART Station and the intersection of Mission Street / Geneva Avenue as two primary transit nodes. Transit issues in the area are related to its performance, not to its supply. According to community members, the biggest Muni performance issue in the area is reliability, and original data collected for this report (as well as data collected by Muni) confirm that reliability is poor.



**Figure 2.2 – Transit unreliability contributes to sidewalk overcrowding at bus stops.**

Routes serving the area are among the most heavily used bus lines in the Muni system. Transit vehicles, especially during commute hours, are often heavily loaded while traveling through the corridor, particularly near the Balboa Park Station. As a result, even with buses that are scheduled frequently, high demand coupled with reliability issues results in overcrowding on some buses.

Reliability is measured primarily by on-time performance. On-time performance is complex, being influenced by many factors over the length of a route. Mixed traffic, double parking, pedestrian activity, and passengers boarding at stops all can introduce unpredictable variability in travel times, which can pull buses off schedule and cause them to bunch rather than stay evenly spaced. Because the bus routes that travel through the neighborhood are long, they have many opportunities to develop reliability problems, especially southbound buses on the last leg of their route. Original data collected for this study indicate that conditions along Mission Street in the study area exacerbate these reliability problems.

Another important aspect of transit service is the quality of transit stops, where riders first access the system. Stops that are safe and inviting encourage transit use, while stops that are poorly maintained or threatening may prevent some riders from using the system, and will detract from the overall experience for others. An inventory of bus stops in the corridor revealed that shelters were in good condition with a low occurrence of painted graffiti and

trash. However, lighting at many stops could be improved and some stop locations should be reconsidered to improve their accessibility and usefulness for riders. In addition, many transit stops experience substantial crowding due to inadequate sidewalk space.

### **Transit Delays**

Technical analysis identified two primary causes of transit delay along the study portion of Mission Street. The first impediment to transit is due to double-parked vehicles. Because parking in the area is scarce and a number of small businesses along Mission Street rely on regular deliveries, it is rare to travel along Mission Street without encountering at least one double-parked vehicle, usually parked in the same lane that buses use. This forces buses to merge into the center lane to get around the double-parked vehicle. The second factor that slows transit vehicles along Mission Street is lack of left-turn lanes. This means that vehicles must wait at intersections for gaps in opposing traffic before turning left. This frequently blocks the center lane of traffic at intersections. The result is that for much of the Mission Street corridor, the right lane is frequently blocked by delivery vehicles toward the middle of blocks and the center lane is blocked by left-turning vehicles closer to intersections. This forces transit vehicles (and private autos, as well) to weave back and forth around the blockages. As a result, the traffic capacity is approximately the equivalent of one traffic lane in each direction. It is also important to note that current traffic volumes on this portion of Mission Street are similar to other two-lane streets in San Francisco and are lower than a number of other four-lane streets (see the Existing Conditions report).

### **Pedestrian Safety**



**Figure 2.3 – Long pedestrian crossing distances at the Mission / Geneva intersection**

While the Mission-Geneva neighborhood has one of the highest automobile ownership rates in San Francisco, its commercial corridors and rich transit supply provide many of the infrastructure requisites for a pleasant walking experience and enjoyable street environment. One of the key characteristics of Mission Street is high pedestrian activity associated with retail and commercial uses along the corridor. Conflict between pedestrians and cars, especially at unsignalized intersections, is the community's primary pedestrian safety priority. In addition, the corridor includes several large, complex intersections that are challenging and uncomfortable to navigate as a pedestrian. On Geneva Avenue, sidewalks are narrow, and pedestrian circulation space is constrained – especially at bus stops. Crossing the wide, auto-oriented arterial is also a challenge.

and they are the community's main pedestrian safety concern. Parked cars in the crosswalks at "T" intersections limit pedestrian visibility. Combined with all the activity on Mission Street competing for drivers' attention, many drivers using this stretch of Mission are looking for turning opportunities, rather than driving through – this further increases the likelihood of conflicts between cars and pedestrians.

The stretch of Mission Street in this neighborhood includes a number of unsignalized intersections and "T" intersections. Many of the pedestrian/car conflicts occur at these locations,

Several intersections, most notably Mission/Geneva, are large, complex intersections with long crossing distances and low pedestrian visibility.

Pedestrian conditions on Geneva Avenue exhibit some of these concerns but are further worsened by the very narrow 8' sidewalks.

The community generally perceives that the street environment is not safe or comfortable for pedestrians. Further, the chaotic nature of both Mission Street and Geneva Avenue provides substantial distractions for drivers and reduces the visibility of pedestrians.

### **Streetscape Improvements**

The streetscape along Mission Street in the Excelsior District is primarily characterized by the small scale shop fronts and their individual signage. Consistent rows of street trees could define the roadside edges of the pedestrian environment. However, Mission Street's inconsistent tree line does not lend visual coherence or pedestrian scale. The only other streetscape element that occurs with regularity along the sidewalks is the City's standard trash receptacles.



**Figure 2.4 – Typical streetscape conditions on Mission Street**

Mission Street also lacks lighting that serves pedestrian needs, which contributes to larger concerns related to security for both pedestrians and transit passengers waiting for the bus. The lack of pedestrian-scale lighting was among the top concerns for local residents.

Two areas identified by the community as key nodes in the Excelsior District along Mission Street, the Persia Triangle and the Mission/Geneva intersection, will both benefit from pedestrian safety upgrades accompanied by streetscape enhancements. The Persia Triangle area, which is host to the annual community festival, provides long and short term opportunities for street trees and other landscaping (see

Section 5.1 - Persia Triangle) that will enhance the pedestrian experience by buffering the pedestrian realm from vehicular traffic and auto-oriented uses, and establishing pedestrian scale. The Mission/Geneva intersection will benefit from a similar treatment of landscape buffering between the gas station at the northwest corner of the intersection and adjacent sidewalks and bus stops, and the increases in pedestrian circulation spaces through elimination of the free right turn at the same corner.

Finally, the community expressed interest in adding community art to the corridor by treating signal controller cabinets with public art installations (painting), which could contribute to the unique character of the area.

### 3. OVERVIEW OF RECOMMENDATIONS

This Chapter provides a summary of the recommended improvements for the study area. The recommended improvements were identified through a design charrette with the TAC, a series of public workshops, surveys, and presentations to the community. A number of other options were considered in developing these recommended solutions. More detail about the preferred and other alternatives considered and the results of the technical analysis are provided in subsequent chapters of this report.

#### 3.1 INTERSECTION SPECIFIC IMPROVEMENTS

The Plan recommendations focus on corridor-wide improvements to both Mission Street and Geneva Avenue and some high-priority intersection where improvements consistent with the recommended corridor plan can be constructed in the short-term. Both the technical analysis and community input identified these as highest-priority locations for improvements. A description of the specific improvements for these locations is provided below.

##### *Persia Triangle*

The Persia Triangle is formed by the intersection Mission Street, Persia Avenue, and Ocean Avenue, a hub of pedestrian and transit activity in the corridor. While many community members identified the Persia Triangle as the “heart” of the Excelsior District, this intersection is one of the least safe for pedestrians in the corridor. Therefore, this location was deemed a high-priority for near-term investment. Specific recommendations are as follows:

- Reduce conflicts between pedestrians and cars by reversing the direction of San Juan Avenue’s one-way operation and providing corner curb extensions and bus bulbs;
- Slow car traffic by realigning the Persia Avenue / Ocean Avenue intersection;
- Establish a more pedestrian-scale streetscape by planting street trees, creating a landscaped visual buffer between sidewalk edges and surface parking lot, and adding street furnishings and pedestrian scale lighting; and
- Improve direct access to Balboa Park BART by building bus bulbs and rerouting Muni’s 29-Sunset to use Ocean Avenue and providing signage about the BART connection.

##### *Mission Street / Geneva Avenue*

The intersection of Mission Street / Geneva Avenue is where the two study corridors meet. The intersection is congested for traffic, transit, and pedestrians alike. To enhance this intersection, this Plan calls for the following intersection improvements:

- Improve reliability and reduce bus stop crowding by constructing bus bulbs;
- Reduce cut through traffic on neighborhood streets by providing left-turn lanes on Mission Street;
- Reduce conflicts between cars and pedestrians by removing the large-radius free-right turn lane at the northwest corner; and
- Improve the pedestrian scale of the streetscape by providing a landscaped buffer between sidewalks and stretches of surface asphalt (e.g., at the northwest corner).



### ***Additional Intersections on Mission Street (Silver Avenue, Santa Rosa Avenue, and Onondaga Avenue)***

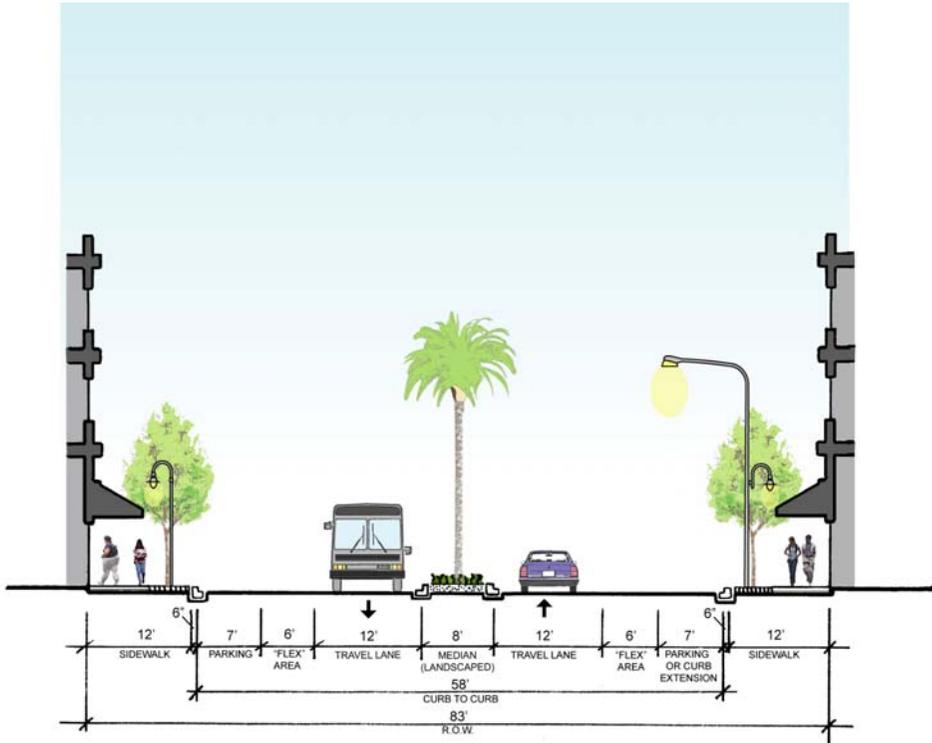
Three “T” intersections at Silver Avenue, Santa Rosa Avenue, and Onondaga Avenue should receive priority improvements if the entire corridor improvements cannot be constructed at once. The improvements recommended below are consistent with the recommended corridor treatments for Mission Street:

- Improve reliability and provide sufficient bus stop space by constructing bus bulbs consistent with ultimate plan for Mission Street;
- Improve pedestrian visibility and shorten crossing distances by constructing corner curb extensions; and
- Visually narrow the street to reduce car speeds by widening sidewalks on the “dead” end of T intersections and installing palm trees.

### **3.2 MISSION STREET CORRIDOR**

The Mission-Geneva neighborhood consists of primarily residential land uses surrounding a commercial core on Mission Street. The commercial uses along Mission Street are primarily located on the first floors of two- to three-story buildings, with residential uses on upper floors. Ground floor uses range from professional offices to retail. Although the Mission Street corridor has a relatively high amount of scheduled transit service, residents of the community have voiced a general opinion (consistent with data for on time performance) that transit service along Mission Street routes is unreliable, which frequently leads to bus overcrowding. The community also feels that the streetscape lacks a consistent identity for the neighborhood and that pedestrian safety could be improved.

**To address these concerns, this Plan recommends converting the existing four-lane undivided roadway to a two-lane roadway with left-turn lanes at intersections and a raised, landscaped median elsewhere. Further study is needed to vet this alternative and better understand the impacts and benefits to transit, traffic and pedestrians.**



**Figure 3.1 – Cross-section view of recommendation for Mission Street**

In addition to raised medians and left-turn lanes, there are a number of other details embedded within this concept that work together to achieve the primary goals of the study:

- Provide additional marked crosswalks
- Maintain six-foot “flex space” between on-street parking and travel lane
- Provide corner curb extensions
- Provide bus turnouts with widened sidewalks/bus bulbs

In recommending such a transformative change for Mission Street, this Plan recognizes that some details still need to be worked out. For example, by providing only one traffic lane in each direction and requiring buses to pull out of traffic, there is some concern that buses will have a more difficult time entering the traffic stream. While there are a number of potential design features that can address this concern, more analysis is required to identify the best treatments.

This does not mean that nothing can be done while the necessary analysis is performed. In the near- to mid-term, a number of improvements can be implemented that are not dependent on the roadway cross-section. These improvements include the following:

- Extend the improvements recommended for specific high-priority intersections along Mission Street (Silver Avenue, Santa Rosa Avenue, and Onondaga Avenue) to the entire corridor;
- Consider bus stop consolidation and improved transfers with cross-town routes;
- Improve pedestrian comfort and security with pedestrian scale lighting;
- Reduce conflicts between pedestrians and cars at intersections by providing pedestrian countdown signals where missing, providing advance limit lines at crosswalks, and enhancing crosswalk visibility; and
- Reduce double-parking through adjusting siting of loading zones and adjusting parking enforcement beats, and supporting creative strategies for parking management.

### 3.3 GENEVA AVENUE CORRIDOR

The Geneva Avenue corridor is important as a direct route from the neighborhood to the Balboa Park BART Station and Interstate-280, and accommodates a large amount of transit service. Specific recommendations for Geneva Avenue are as follows:

- Reduce the design speed of the street to slow speeding traffic and provide a more comfortable pedestrian environment by installing a landscaped median between Alemany Boulevard and San Jose Avenue, planting consistent street trees (potentially in the parking lane), creating landscaped buffers between sidewalks and extensive surface paved areas,
- Maintain landscaping along lots east of Mission Street (where landscaping is encroaching on sidewalk)
- Reduce transit delays and streamline BART access by consolidate Muni stops and constructing bus bulbs at Cayuga Avenue;
- Increase pedestrian visibility by providing corner curb extensions at Mission Street, Alemany Boulevard, Cayuga Avenue, and Delano Avenue, install high-visibility crosswalks and advance limit lines at marked crosswalks; and
- Smooth traffic flow by considering restricting left-turns from Geneva Avenue to Paris Street, working with Caltrans to coordinate signals at Geneva Avenue / I-280 Interchange, and signaling Cayuga Avenue.

This Chapter has presented a summary of the Plan's recommendations. More discussion of recommendations, other alternatives considered, and the technical evaluation of these recommendations is provided in subsequent chapters.



## 4. TECHNICAL EVALUATION METHODOLOGY

### 4.1 PURPOSE OF TECHNICAL EVALUATION

The consultant team prepared a technical evaluation of the potential improvements. The purpose of this evaluation is to provide an objective evaluation of the various proposed changes in the study area, documenting the benefits and impacts of each change to a range of multimodal criteria in the Mission-Geneva study area. This evaluation included the following areas:

- Transit Performance and Rider Experience
- Pedestrian and Bicycle Safety and Access
- Streetscape Environment (Neighborhood Character)
- Traffic and Parking
- Construction Cost
- Construction Impacts

The results of this analysis were provided to the community along with the proposed improvements at the second Public Workshop in July 2006. This ensured that when weighing all of the options and prioritizing projects, community members had the benefit of understanding the potential impacts and benefits of each change.

### 4.2 EVALUATION FRAMEWORK AND METHODOLOGY

The evaluation framework provides a set of multimodal criteria to evaluate the proposed projects. This evaluation framework provided a consistent technical evaluation of the proposed projects. A discussion of the technical analysis methodology used to evaluate each of the criteria is provided below.

#### 4.2.1 *Transit Performance and Rider Experience*

The impacts and benefits of the proposed designs on transit performance were evaluated using several criteria: reliability, travel times, waiting/boarding experience, and wayfinding. Reliability was measured by the expected changes in travel time and headway variation based on similar experiences in other locations. Expected changes to travel time were measured also based on previous experience. Effects on the waiting and boarding experience were based on a project's change to transit stop or platform area; the availability of security features such as lighting; and the quality and condition of bus stops infrastructure. Finally, effects on wayfinding were measured by the directness of transit routes, the availability of maps and signage, and the convenience of transfers.

In addition, the study team completed an inventory of the bus stops on the corridor, noting the condition of the stop, the level of amenities present and how well the stop was marked. This information, combined with the amount of activity at the stop created a hierarchy of improvements at bus stops.

#### 4.2.2 *Pedestrian and Bicycle Safety and Access*

The first category in which pedestrian and bicycle safety and access was evaluated was the "crossing experience." This was measured in terms of:



- Average distance to cross the street (this distance would be lower with curb extensions and/or bus bulbs)
- Number of unmarked unsignalized crossings (this number would be lower for improvements that would safely allow more marked crosswalks)
- Longest gap between marked crossing opportunities
- Volume and speed of traffic on the adjacent street
- Average number of lanes between refuges (this would be lower for improvements that provided center pedestrian refuges)

The second category in which pedestrian and bicycle safety and access was evaluated was “sidewalk conditions.” Sidewalk conditions were evaluated in terms of:

- Average sidewalk width
- Speed of traffic on the adjacent street
- Pedestrian buffer from traffic (on-street parking, street trees, and street furniture provide a buffer between pedestrians and vehicular traffic)

The final category in which pedestrian and bicycle safety and access was evaluated was “bicycle conditions.” Bicycle conditions were evaluated in terms of:

- Width of shared/dedicated bike lane
- Volume and speed of traffic on the street
- Network connectivity
- Degree of “pinching” (projects that call for corner curb extensions, for example, would improve pedestrian crossing distances; however, if designed poorly, they may not fare well in this category if they “pinch” down the available roadway width for bicycles)

#### **4.2.3 Streetscape Environment (Neighborhood Character)**

The first category in which the streetscape environment was evaluated was the “presence of a distinct street identity.” This was measured in terms of:

- Recognizable theme or street element
- Condition and quality of pedestrian amenities

The second category in which streetscape was evaluated was “land use integration.” To evaluate the integration of the streetscape with adjacent land uses, the study considered:

- The quality of access between bus stops and adjacent land uses
- The overall benefit/impact of the streetscape conditions to adjacent businesses
- The presence of a flexible sidewalk space, usable for store displays, outdoor seating, etc.



A third category by which streetscape conditions were evaluated was the overall landscaping conditions. This was measured in terms of:

- The consistency of the landscape footprint
- The degree to which an improvement or alternative would contribute to “placemaking”

The final category by which the streetscape was evaluated was the degree to which various improvements or alternatives would improve sustainable storm water management, specifically in terms of natural storm water retention:

- The permeability of surfaces
- The number and type of new vegetation

#### **4.2.4 Traffic and Parking**

Although most of this Plan’s recommendations call for improvements to pedestrian and transit circulation conditions, they may impact vehicular traffic. Understanding the magnitude of the potential impacts to vehicular circulation and parking conditions is important in evaluating alternatives.

Impacts to vehicular circulation were evaluated based on two sub-criteria:

- Intersection level of service (based on average peak hour vehicular delay per intersection)
- Change in turn restrictions

Impacts to parking were evaluated based solely on the change to overall on-street parking supply.

#### **4.2.5 Costs**

Another important characteristic to understand is its cost. For example, if an improvement performs moderately well in all of the other evaluation criteria, but has a disproportionately high cost, it may not offer the best value. The cost evaluation was based on capital (construction) costs.

Capital costs were estimated based on unit cost figures provided by the San Francisco DPW and SFMTA on other recent projects. The capital cost estimates used for this project are planning-level estimates due to the unknown factors (e.g., location of existing utilities,) that will be identified as part of the detailed design phase. Planning-level cost estimates are detailed enough for a relative comparison of improvement costs and an understanding of the “order of magnitude” costs of various improvements.

Operation and maintenance cost estimates were developed in a more qualitative nature. For example, an improvement that calls for more street trees would likely have increased costs in terms of maintenance (e.g., pruning, replacement, etc.). Improvements were evaluated according to the magnitude and direction (i.e., increase or decrease) in expected maintenance costs.

#### **4.2.6 Construction Impacts**

Many of the truly transformative improvements would require some level of construction. Because construction has the potential to disrupt activities on adjacent land uses as well as transportation circulation for all modes, it is important to understand potential construction impacts before prioritizing improvements. Construction impacts



were evaluated with respect to likely duration (length of construction), potential intensity of disruption, the potential implementation timing (including design, approvals, and construction), and whether or not there would be the possibility of construction phasing to reduce the intensity of construction impacts.

The detailed results of the technical evaluation are provided in the Appendix, along with a summary matrix with arrows indicating the relative magnitude and whether the improvement would offer a benefit or negative impact to each of the general characteristics described above.

