WALKFIRST

IMPROVING SAFETY & WALKING CONDITIONS IN SAN FRANCISCO

FINAL REPORT | OCTOBER 2011

San Francisco Department of Public Health

SAN FRANCISCO PLANNING DEPARTMENT

SFMTA | Municipal Transportation Agency

PROJECT TEAM

San Francisco Department of Public Health

Ana Validzic, *Project Coordinator*

Megan Wier

Municipal Transportation Agency

Sam Fielding

Frank Markowitz

Timothy Papandreou

Planning Department

Gary Chen

Lily Langlois

Alexis Smith

Adam Varat

Michael Webster

San Francisco County Transportation Authority

Tilly Chang

Seon Joo Kim

Jesse Koehler

WALKFIRST

IMPROVING SAFETY & WALKING CONDITIONS IN SAN FRANCISCO

FINAL REPORT | OCTOBER 2011

Contents

CHAPTER

1

Introduction

1.1 CONTEXT

Overview

Walking provides numerous benefits, not only for individual health, but also for economic development, neighborhood vitality, and environmental sustainability. San Francisco experiences these benefits from the high volume of pedestrian trips that already occur in the city every day. Given the key role of walking in San Francisco, the pedestrian environment is the focus of numerous specific initiatives and ongoing investment programs and is officially recognized through the City's Transit First policy and Better Streets Plan. San Francisco was recently awarded Gold Level status as a "Walk Friendly City" by the University of North Carolina's Pedestrian & Bicycle Information Center.

Pedestrian safety is a major concern in San Francisco: annually, over half of San Francisco's fatalities from vehicular collisions involve a motor vehicle colliding with either a pedestrian and hundreds of people are injured1. However, the recent Mayor's Executive Directive on Pedestrian Safety provides specific goals to address this issue, specifically to:

- Reduce severe and fatal pedestrian injuries by 25% by 2016.
- Reduce severe and fatal pedestrian injuries by 50% by 2021.
- Increase walking citywide as a share of trips in the city.

In addition, pedestrian safety is officially a key focus of City government. However, safety is not the only goal of citywide efforts to improve the pedestrian environment – which also include the complementary goals of improving walkability and increasing walking. For example, creating safer streets can encourage more people to walk. As more people shift from driving to walking, local auto volumes may be reduced, thus improving safety. Efforts to make the street environment more attractive and sustainable can also slow traffic (e.g., through new street trees).

1 The City and County of San Francisco, San Francisco Municipal Transportation Agency. (2009). San Francisco 2008 collisions report San Francisco, CA: SFMTA. Retrieved from http://www.sfmta.com/cms/vsafe/documents/Collision_report_2008.pdf

Pedestrian Trips

Approximately 20 percent of the more than four million average trips per day in San Francisco are solely walking trips. When only trips within the city are considered, the number of walking trips jumps to more than one-quarter of total trips. Even those who choose other primary modes of travel have walking on foot or with assistive devices as a component of their trip. Those driving by car must walk to and from their parking space, and those taking transit walk (or bike) to and from their stop or station. The importance of walking as a transit access mode is particularly notable in San Francisco, where the City has had a Transit First policy in place since 1973.

Census data from 2000 shows that San Francisco has a significantly higher walking mode share (commute mode) and zero-car household share than the rest of the Bay Area, the state, and the United States as a whole. The 2000 Census data showing San Francisco's high comparative walking commute mode share is a pattern that has held in the subsequent American Community Surveys conducted by the Census Bureau.

Recent Pedestrian Safety Initiatives

In addition to completing the first phase of the WalkFirst Project, San Francisco is implementing several initiatives to improve pedestrian safety. The following are highlights of projects underway that were mandated in the Mayor's Executive Directive on Pedestrian Safety:

Near Term Actions

The near term actions include the following:

a) Speed limits were lowered from 25 MPH to 15 MPH around schools; new 15 MPH speed limit signs are being installed on streets adjacent to 213 public and private schools in San Francisco by summer 2012;

b) Implementing at least one "home zone" (larger area traffic calming zones);

c) Implementing a pedestrian safety engineering program focused on higher-injury corridors and neighborhoods;

d) Implementing a targeted pedestrian safety enforcement program;

e) Developing pedestrian injury prediction models;

f) Evaluating opportunities to use the Pedestrian Environmental Quality Index to prioritize pedestrian improvements;

g) Identifying international evidence-based pedestrian safety practices;

h) Identifying existing and new funds to implement the above actions, seeking cost-reducing efficiencies; and

i) Outreach to the community.

Pedestrian Action Plan

As part of the Mayor's Executive Directive, the City will be developing a Pedestrian Action Plan to provide goals and strategies to promote walking and pedestrian safety in the City. The Pedestrian Action Plan will:

a) Create additional goals for promoting walking and pedestrian safety, strategies and actions, with timelines for implementation;

b) Using the Pedestrian Safety Advisory Committee (PSAC) as the community advisory body charged with providing input to the Plan;

c) Create a summary document and central repository for data and tools;

d) Analyze current city investments in pedestrian safety, including infrastructure, data collection, enforcement, and education; and

e) Identify existing and future funds for the above tasks, including staffing, planning and monitoring, program and project environmental clearance, and funding capital projects, data collection and research, and non-infrastructure programs.

1.2 PROJECT BACKGROUND

Purpose

The WalkFirst project is a multi-agency effort to improve pedestrian safety and walking conditions, encourage walking as a mode of transportation, and enhance pedestrian connections to key destinations. The goals of the project are to:

- Identify key walking streets in San Francisco
- Develop a criteria to prioritize pedestrian improvements.

This project builds on the Better Streets Plan, a comprehensive set of pedestrian-oriented policies and design guidelines for San Francisco's public streets and sidewalks, and coordinates with other efforts to improve the City's streets and transportation system.

Partners and Timeline

WalkFirst is a collaborative effort between the San Francisco Department of Public Health, San Francisco Planning Department, San Francisco Municipal Transportation Agency, and San Francisco County Transportation Authority. Funding for this program was provided by a grant from the California Office of Traffic Safety, through the National Highway Traffic Safety Administration. This grant was funded for one year starting October 1, 2010 through September 30, 2011.

Key Work Products

This document integrates the five key work products of the WalkFirst project. The key work products are listed below along with the corresponding chapter.

- Criteria for prioritizing pedestrian improvements (Chapter 2)
- A citywide map of key pedestrian streets and areas (Chapter 3)
- Draft policies and investment strategies relating to walking and the pedestrian environment (Chapter 3)
- A preliminary project list of recommended safety pedestrian improvements (Chapter 7)
- Five Case studies and concept designs of pedestrian improvements at key locations (Chapter 8)

1.3 PUBLIC ENGAGEMENT

Pedestrian Safety Advisory Committee

The primary forum for public engagement for the WalkFirst project took place through meetings of the Pedestrian Safety Advisory Committee (PSAC). The Pedestrian Safety Advisory Committee is the official public representative body to the Board of Supervisors on pedestrian issues. The Pedestrian Safety Advisory Committee meets once a month to review City plans and projects and to research potential improvements to the pedestrian environment.

A summary of all public outreach conducted is provided in Appendix A1. An archive of all project materials and presentations can be found on the project website: **http://walkfirst.sfplanning.org.**

Focus Groups

To compliment monthly presentations to the Pedestrian Safety Advisory Committee, the project team conducted a number of focus groups with specific populations including youth, seniors, the blind and visually impaired, and persons with physical disabilities. The goal of these focus groups was to have a more detailed conversation about where participants walk, the conditions they face, and the street qualities that they like and dislike. A summary of key comments received at each focus group is provided in Appendix A1.

Walking Survey

The WalkFirst team created a walking survey, which was widely distributed online and in paper format. The survey highlighted the WalkFirst project and gave the public an opportunity to identify key pedestrian concerns, by location and by theme. The public was invited to provide feedback on where they walk and to identify the qualities that influence their particular walking route. The survey was available from February 8, 2011 - March 25, 2011, and over 380 responses were received

The walking survey was comprised of two parts: the first part was a map in which participants could draw the walking routes they typically use. Participants were invited to identify multiple walking routes. The second part of the survey was a questionnaire. Participants were asked to identify their favorite and least favorite street, and to identify the qualities that make these streets their favorite or least favorite.

The survey was intended as an outreach tool and was not a representative sample of San Franciscans or a particular community. The results from the survey are included in Appendix A1.

1.4 NEXT STEPS

The completion of phase one of the WalkFirst project is an important milestone in an effort to improve pedestrian safety and walking conditions in San Francisco and to establish a framework to prioritize pedestrian safety improvements. While this project was made possible by a one year grant, a number of next steps have been identified and should be pursued.

STEP 1 - Data Collection

Additional data pertaining to street and sidewalk features would need to be collected in order to create a comprehensive capital projects list. Availability of existing data is outlined in Appendix A4

STEP 3 - Refined Capital Projects List

Develop focused recommendations for highest priority streets for pedestrian safety improvements and public realm improvements.

STEP 3 - Additional Outreach

Citywide outreach on Map of Key Walking Streets and Areas, High-Injury Density Corridors, and preliminary project list of pedestrian safety improvements, and neighborhood level outreach to prioritize desired improvements.

STEP 4 - Develop Funding and Implementation Strategies

STEP 5 - Integrate WalkFirst framework into the City's capital planning for street improvements.

This would include environmental review and formal adoptions by City bodies.

CHAPTER

2

Prioritizing Pedestrian Improvements

2.1 PRIORITIZATION CRITERIA

The WalkFirst project focuses on four high-level criteria to inform where to prioritize pedestrian improvements and what types of improvements to make.

The prioritization criteria include:

- Pedestrian activity
- Pedestrian safety
- Street and sidewalk characteristics
- Project readiness

Pedestrian activity

Pedestrian Activity is approximated by factors that determine where people are walking, or where people would walk, given good pedestrian infrastructure. Land use characteristics, transportation access and street slope are examples of some of the factors which influence pedestrian activity that are analyzed in this project. Pedestrian Activity is discussed in further detail in Chapter 3.

Pedestrian Safety

Pedestrian Safety is characterized using pedestrian injury data from the Statewide Integrated Traffic Records System (SWITRS). For the WalkFirst project, locations of pedestrian injury by severity have been analyzed. Pedestrian Safety is discussed in further detail in Chapter 4.

Street and Sidewalk Characteristics

Street and Sidewalk Characteristics are defined by the physical features and conditions along the sidewalk and within the right of way. In addition to the physical features, crime was also considered. The physical features of the street and sidewalk reflect the relative state of pedestrian infrastructure, including gaps in the existing infrastructure.

Project readiness

Project readiness reflects how efficiently and how quickly desirable improvements can be made. The project readiness factors also reflect how well positioned a specific project is to be funded and built. These factors include available funding, coordination with existing projects, cost (capital and maintenance), and public support. The project readiness criteria would need a closer look as part of next steps to refine the capital project list. See Appendix A7 for Project Readiness Factors for Phase 1A street segments and intersections.

Table 1
PRIORITIZATION CRITERIA

CATEGORY	GOAL	PRODUCT
PEDESTRIAN ACTIVITY	Identify places where people walk	Map of key walking streets in SF
PEDESTRIAN SAFETY	Identify most important locations for safety improvements	Map of identified areas of improvement for pedestrian safety
STREET AND SIDEWALK CHARACTERISTICS	Identify street and sidewalk infrastructure/conditions	Preliminary project list
PROJECT READINESS	Identify opportunities to fund and construct pedestrian improvements	Preliminary project list

2.2 LOCATIONS AND TYPES OF IMPROVEMENTS

The four criteria detailed in Table 1 have been used to inform where to prioritize pedestrian improvements and the types of improvements that should be made.

Where to prioritize: The methodology to determine where to prioritize pedestrian improvements is based on the overlap between pedestrian safety and pedestrian activity. The intersection of streets with high pedestrian activity and high pedestrian safety has been identified as high priority locations for pedestrian improvements. This is discussed in further detail in Chapter 5.

Table 2 illustrates how locations would be prioritized for improvements. As shown, two of the four areas inform these locations; pedestrian activity and pedestrian safety.

Types of improvements: The methodology to determine the types of physical improvements is based on the existing conditions of the street and sidewalk as well as project readiness. The specific design recommendations would be based on the existing street and sidewalk characteristics to ensure that the most promising physical improvements or design treatments are applied to a specific location.

Recommendations for locations and the types of improvements would also take into account project readiness, equity considerations, and community support to ensure that improvements can be implemented in a cost-effective, fair and timely manner.

Table 2
PRIORITIZING LOCATIONS FOR WALKING IMPROVEMENTS

PEDESTRIAN ACTIVITY: KEY WALKING STREETS AND AREAS	PEDESTRIAN SAFETY: # COLLISIONS AND COLLISION RATE/CROSSING		
	HIGH: *Ranks 1/3 of pedestrian safety needs*	MEDIUM: *Ranks in next 1/3*	LOW: *Ranks in next 1/3*
HIGH: *Identified as key walking street or area*	HIGHEST	HIGH	MEDIUM
MEDIUM: *Identified as a Key Walking Street*	HIGH	MEDIUM	LOW
LOW: *not identified*	HIGH	LOW	LOW

CHAPTER

3

Where People Walk

3.1 PEDESTRIAN ACTIVITY FACTORS

People walk for a variety of reasons - as a form of transportation, for recreation, for exercise, or as a way to experience a city. In addition, there are numerous factors that contribute to where people walk. These factors include pedestrian generators that draw people to a destination, such as schools, parks, or tourist attractions; transit stops that have concentrations of people walking to or from a transit stop to another destination; or natural features such as topography.

To develop a map of key walking streets, the process began by looking at the pedestrian activity factors, identifying what the factors are and where they exist. Next the pedestrian activity factors were applied to the street segment to develop a category map for seven pedestrian activity categories. Next the seven category maps were added together to create one composite map. The composite map is a comprehensive illustration of pedestrian activity based on the available census, economic, and land use data. As a final step, the composite map was refined based on a qualitative assessment of what is happening on the ground today as well as what is planned for the future, and this is the Map of Key Walking Streets and Areas (Map 2). This methodology is outlined in greater detail in the next section.

3.2 DETERMINING PEDESTRIAN ACTIVITY LOCATIONS

The following steps have been used to identify locations with factors that contribute pedestrian activity.

Step 1: Identify Factors that Contribute to Walking

To understand where people currently walk in the city, or where people would likely walk if the conditions were better, a number of pedestrian activity factors were identified. These factors have been organized into seven categories.

Pedestrian Activity Factors & *Categories*:

1. **Access/Need to Walk**
   - *% of people who walk to work*
   - *% of people who take transit to work*

2. Transit Ridership

3. Density of People

- *Population density*
- *Job density*

4. **Pedestrian Generators**
   - *Tourist destinations*
   - *Colleges and universities*
   - *Hospitals, Clinics & Mayor's Office on Disability Service Providers*
   - *Public & private schools*
   - *Parks and open space*
   - *Shopping districts*
   - *Senior Centers*

5. Vulnerable populations

- *Density of seniors*
- *Density of youth*
- *Density of persons with disabilities*

6. Income

7. Street slope

Step 2: Determine How to Measure and Score Factors for Each Category

The pedestrian activity factors illustrate the factors which contribute to pedestrian activity (See Appendix A2).

The next step is to measure how each street segment within the city performs for each category. This information can be used to understand the prevalence of the pedestrian activity factor on the actual street segment, and help to identify and prioritize pedestrian improvements.

If the pedestrian activity factor has a specific geographic location such as a school or park, the street segment score was determined based on a geographic distance from the location of that factor, either a 1/4 or 1/8 mile. For economic and demographic characteristics, such as journey to work or income, the most recent version of United States Census data available for each measure was used, and the data was analyzed at the smallest available unit.

The descriptions below describe how individual factors for each category have been measured. These factors were then added together to get an overall score for each category. All categories have been scored out of a total of 10 points.

Category 1: Access/Need to Walk

"Access/Need to Walk" measures the locations where people are dependent on walking or transit for their daily trips. Two factors within this category have been measured: the percentage of people who walk to work and the percentage of people who take transit to work, for every census block group[1] in the city. These two factors were added together to get a sum for the block group. For each block group in the City, the data was divided into ten natural breaks[2], and assigned a score of 1 to 10 for the category. The score for that block group was then assigned to each street segment within the block group.[3]

Category 2: Transit Ridership

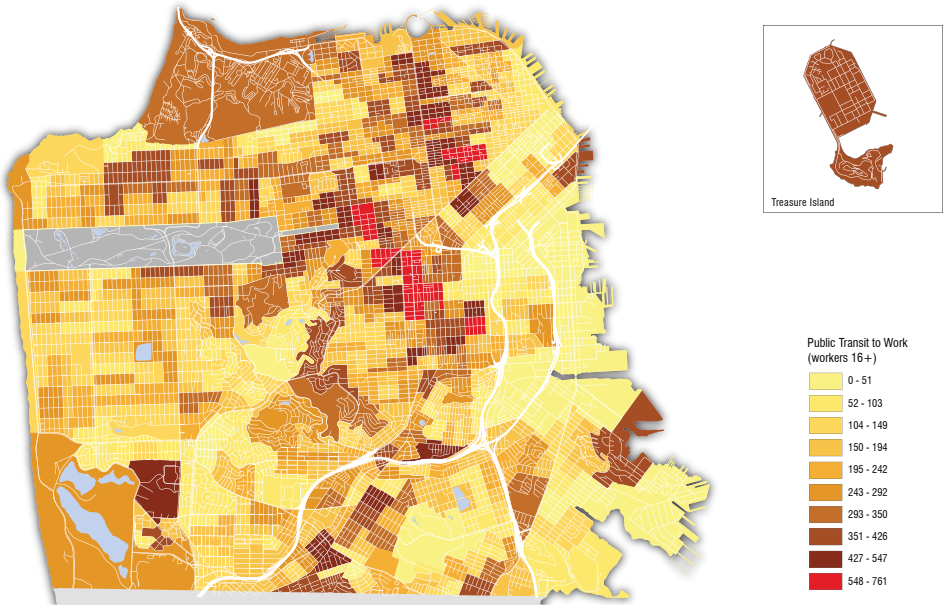
"Transit Ridership" measures daily ridership (boardings and alightings) for each stop on Muni bus, Muni Metro, BART, Caltrain, Transbay Terminal, and Ferry Terminal. For each stop the total ridership was calculated. 1/8 and 1/4 mile buffers were applied to each stop, and then points were assigned to the street segment, as shown in the table below. The final street segment score is the greater of the two points (1/8 mile or 1/4 mile).

DAILY RIDERSHIP FOR ALL STOPS WITHIN BUFFER	< 1/8 MILE BUFFER STREET SEGMENT POINTS	<1/4 MILE BUFFER STREET SEGMENT POINTS
>12,000	10	7
6,001 - 12,000	5	3
1,000 – 6,000	2	1
< 1,000	0	0

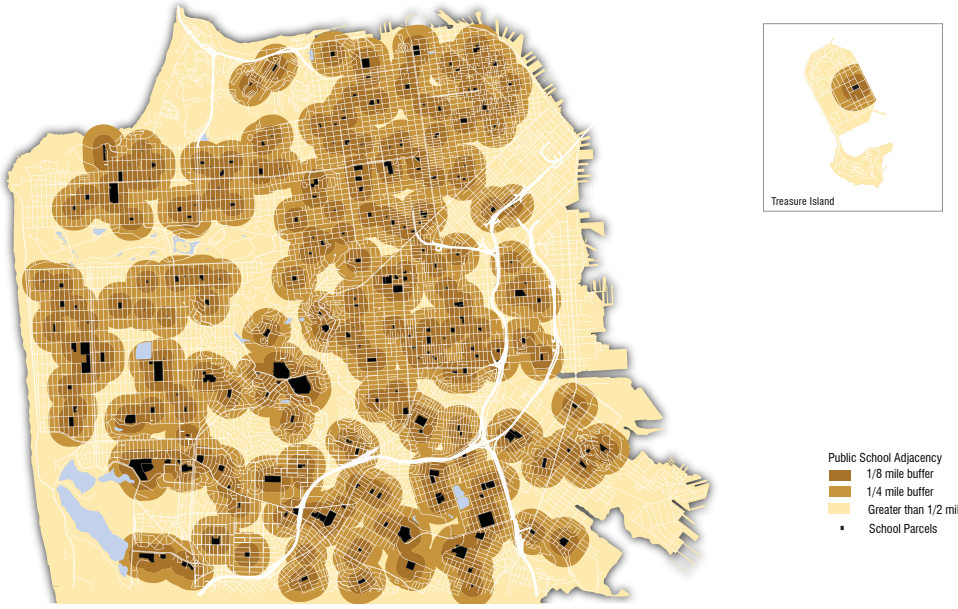
1 Block groups are the smallest area of measurement in the U.S. Census. This project is using data from the 2000 Census and the 2005-2009 American Community Survey.

2 Natural breaks is a data classification method designed to determine the best arrangement of values into different classes, based on where the natural breaks in the data occur.

3 Streets that form the boundary between two block groups are given the score for the higher of the two.



ACCESS/NEED TO WALK: PUBLIC TRANSIT TO WORK, BY CENSUS BLOCK GROUP - NATURAL BREAKS, 10 CLASSES
Source: Census 2000



PEDESTRIAN GENERATORS: PUBLIC & PRIVATE SCHOOLS - BUFFERS
Source: San Francisco Unified School District, September 2010; Department of Technology, March 2011

PEDESTRIAN ATTRACTOR	SCALE	CRITERIA	EXAMPLES
Tourist Destinations	Regional	Tourist Sites: >1,200 visitors (average daily attendance) Hotels: >500 rooms	Based on survey of top tourist destinations in San Francisco according to SFVCB. Attendance ranged from 1,350-12,877 average daily weekday visitors. e.g. Palace Hotel, Fisherman's Wharf, De Young Museum
	District	Hotels: 100-499 rooms	e.g. St Regis Hotel, Marriott Fisherman's Warf
	Local	Hotels: <100 rooms	e.g. Presidio Inn, Travel Lodge Golden Gate
Colleges & Universities	Regional	All	City College, CCA, USF, UCSF, Academy of Art, University of the Pacific
	District	NA	
	Local	NA	
Hospitals, Clinics & MOD Service Providers	Regional	>300 Beds	SF General , Kaiser, CPMC, UCSF, Laguna Honda
	District	<250 Beds	St. Luke's, St Marys'
	Local	Department of Public Health, and Community Health Network Clinics, MOD service providers	
Public & Private Schools	Regional	NA	
	District	Public & Private Elementary, Middle and High Schools	
	Local	NA	
Senior Centers	Regional	NA	
	District	NA	
	Local	ALL	Dunn & Bradstreet data & Community center data from DPH
Shopping Districts	Regional	C-3-R zoning district	Downtown shopping: area adjacent to Union Square
		C-2 zoning district	Downtown shopping: area adjacent to Union Square
	District	NC-S zoning district	Shopping centers
		NC-3, NCT-3 zoning district	Large-scale neighborhood commercial districts
		NC-2, NCT zoning district	Medium-scale neighborhood commercial districts
		NCD, NCT zoning district	Named neighborhood commercial district
		CVR, CCB zoning district	Chinatown commercial districts
	Local	NC-1, NCT-1 zoning district	Small-scale neighborhood commercial districts

Category 3: Density of People

"Density of People" measures the number of people who live or work in each census block group. The number of residents per acre and the number of employees per acre were added together to get a total number of people per acre for each block group. For each block group, the data was divided into ten natural breaks, and assigned a score of 1 to 10 for the category. The score for that block group was assigned to each street segment within the block group.

Category 4: Pedestrian Generators

"Pedestrian Generators" look at the different types of activities or land uses which attract pedestrian activity. Scores were assigned based on the geographic scale of the pedestrian generator, and the distance from the generator. Categories of pedestrian generators include tourist destinations, colleges and universities, hospitals, clinics & service providers, public & private schools, parks & open space, shopping districts, and senior centers. Each pedestrian generator was given a designation based on its geographic scale (regional, district, local). See table to the left.

A score from 1-10 was assigned to the street segment based on the geographic scale of the destination (regional, district, local) and distance from the destination. The street segment score for each pedestrian generator was added together. The total score was then divided into ten natural breaks, and that number is the final street segment score for this category.

SCALE	< 1/8 MILE	< 1/4 MILE
Regional	10	7
District	5	3
Local	2	1

Category 5: Vulnerable Populations

"Vulnerable Populations" measures the number of seniors, youth and persons with a disability in each census tract. This category is intended to give added weight to locations with high populations of people who are more dependent on walking and/or transit, and are affected by pedestrian safety. Based on data availability, youth and seniors were measured at the block group level, and persons with a disability were measured at the census tract level[4]. For each category, the data was divided into ten natural breaks, and assigned a score of 1 to 10 to the street segment. The street segment score for youth and seniors was added to the street segment score for persons with disabilities. Then the total score was divided into ten natural breaks, and that number is the final street segment score for this category.

4 This category includes the following disabilities: sensory disability, physical disability, mental disability, self-care disability, go outside-home-disability, and employment disability. (2000 U.S. Census)

Category 6: Income

"Income" measures median household income for each census block group. This category was included as an equity consideration, to make sure key walking streets are located in all areas of the city, especially areas with lower median household income. For each block group, the data was been divided into ten equal intervals[5], and assigned a score of 1 to 10. The score for that block group was then assigned to each street segment within the block group.

Category 7: Street Slope

"Street Slope" measures the slope of each street segment within the city. This category is included because the slope of a street may influence a particular walking route. The data has been grouped according to the percentage change in street slope, and given a score of 0, 5 or 10. The number of points was assigned to the street segment

% CHANGE IN STREET SLOPE	STREET SEGMENT POINTS
0-5%	10
6-10%	5
>11%	0

5 Equal intervals creates categories that are equally spaced from each other numerically, regardless of the distribution of the data. Equal intervals was used, rather than natural breaks, to highlight the income disparities among different areas in San Francisco. The equal intervals approach helps to ensure that the extremes (lowest and highest) are captured in separate categories while the natural breaks approach might group them with nearby data which would diminish some of the disparities

Step 3: Score Each Street Segment

In Step 2, a score was determined for each pedestrian activity factor. This score was then applied to the street segment. For each category the street segment scores for the pedestrian activity factors were added together to create a composite map for each category (See Appendix A3) These category maps have also been added together to create an overall composite map.

The Composite Map of Pedestrian Activty Factors (Map 1) represents the sum of the factors which contribute to pedestrian activity. This map illustrates the relative importance of that street segment in terms of contributing to pedestrian activity as well as how the street segments compare to one another.

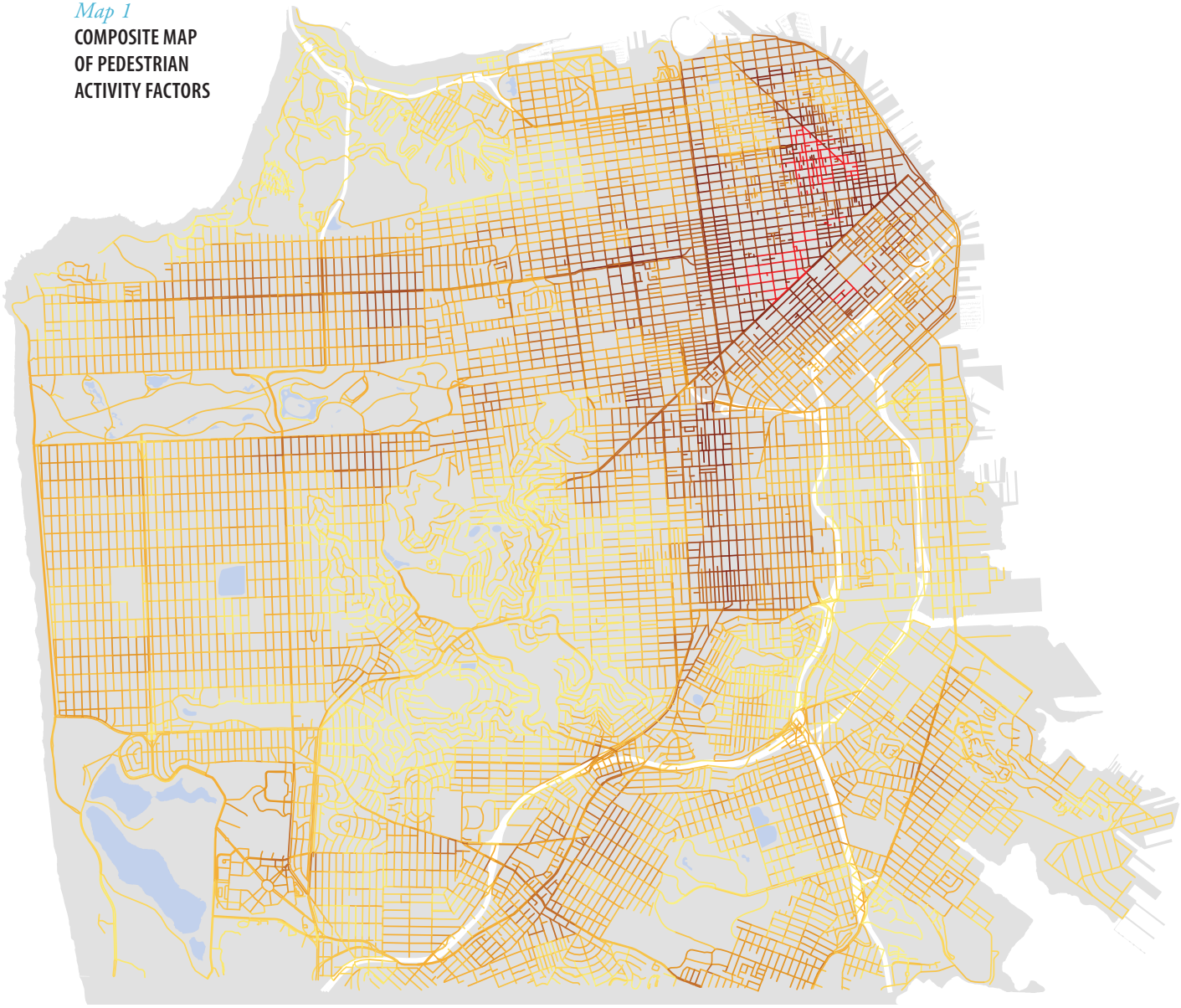
Step 4: Refine Map Based on Public Input and Technical Analysis

The Composite Map is the first step in creating a map of pedestrian activity factors. Further refinements and community feedback are necessary to ensure that the experience on the street is reflective of the data.

Some streets that score high may currently have high levels of pedestrian activity, while others may have low pedestrian activity, even though they have a high score. The imbalance between a street segment's score and its actual relative level of pedestrian activity may also be due to factors that the scoring system did not capture, such as safety, security, and/or physical barriers. For example, in some areas there may be many factors that contribute to high levels of walking, but people may not be walking because they don't feel comfortable or safe. Also, there may be physical barriers such as a freeway that cause people to take a different street or a less direct route to access a particular destination.

Map 1

COMPOSITE MAP OF PEDESTRIAN ACTIVITY FACTORS



Composite Map:

Category 1: Access / Need to Walk
Category 2: Transit Ridership
Category 3: Density of People
Category 4: Pedestrian Generators
Category 5: Vulnerable Populations
Category 6: Income
Category 7: Street Slope

Street Segment Score

- 7 - 16
- 17 - 21
- 22 - 26
- 27 - 31
- 32 - 36
- 37 - 41
- 42 - 47
- 48 - 53
- 54 - 59
- 60 - 68

3.3 KEY WALKING STREETS AND AREAS

Based on the pedestrian activity factors and the composite map, the Map of Key Walking Streets and Areas is intended to eventually update existing Map 11 and Map 12 of the Transportation Element of the General Plan. Additional community feedback and input is needed prior to the adoption of this map into the City's General Plan.

Key Walking Streets are characterized by street segments in close proximity to significant pedestrian generators such as schools, parks, tourist activities and shopping districts. Key Walking Streets are also characterized by street segments in neighborhoods where there is more dependence on walking as a means of transportation, due to demographics, street slope, and/or limited access to transit or private automobiles.

Key Walking Areas are characterized as having high concentrations of pedestrian activity (current or planned), including Downtown, Chinatown, the Mission District and Fisherman's Wharf. In these "Key Walking Areas," every street is a key walking street and specific street improvements would be developed in accordance with a pedestrian or multi-modal improvement plan for the area.

The design recommendations for these streets would be based on the typologies outlined in the Better Street Plan.

3.4 POLICIES TO GUIDE CITY DECISIONS ABOUT PEDESTRIAN SAFETY AND WALKING CONDITIONS

As part of the WalkFirst project, three new objectives and associated policies have been developed for the General Plan. These policies are related to the pedestrian network and key pedestrian streets. The specific design treatment would be based on the typologies identified in the Better Streets Plan. This content is intended to guide City decisions about pedestrian safety and walking conditions.

The Better Streets Plan, adopted in December 2010 creates a unified set of standards, guidelines, and implementation strategies to govern how the City designs, builds, and maintains its pedestrian environment. As part of the adoption process for the Better Streets Plan, general plan objectives and policies related to design and engineering of pedestrian features were amended.

This content could eventually be added to the Pedestrian Section of the Transportation Element of the General Plan, pending further community input and environmental review.

NEW OBJECTIVE 1:
DESIGN EVERY STREET IN SAN FRANCISCO FOR SAFE AND CONVENIENT WALKING

NEW Policy :
Every surface street in San Francisco should be designed for safe and convenient walking, including generous and continuous sidewalks and safe pedestrian crossings.

NEW Policy:
Where it is not feasible to provide a continuous pedestrian route due to topography, preexisting barriers, or other factors, there should be a safe alternate route that minimizes the distance a pedestrian has to go out of their way

NEW Policy:
Ensure safe and convenient access for pedestrians to all transit stops, particularly the rapid and local Muni network, regional transit stations and ferry terminals.

NEW OBJECTIVE 2:
MAINTAIN A SYSTEM OF KEY WALKING STREETS AND AREAS

NEW Policy:
Prioritize safe and convenient walking as a mode of travel on Key Walking Streets and Areas. Ensure a high level of pedestrian quality and safety, and give sufficient right-of-way space to pedestrians.

NEW Policy:
In considering use of funding for pedestrian improvements, give greater priority to Key Walking Streets and Areas.

NEW Policy:
Design pedestrian improvements on Key Walking Streets and Areas consistent with the principles and guidelines for the appropriate street type in the Better Streets Plan.

NEW Policy:
Develop and regularly update pedestrian improvement plans for Key Walking Areas.

NEW OBJECTIVE 3:
EMPLOY A MULTI-DISCIPLINARY APPROACH TO IMPROVING PEDESTRIAN SAFETY

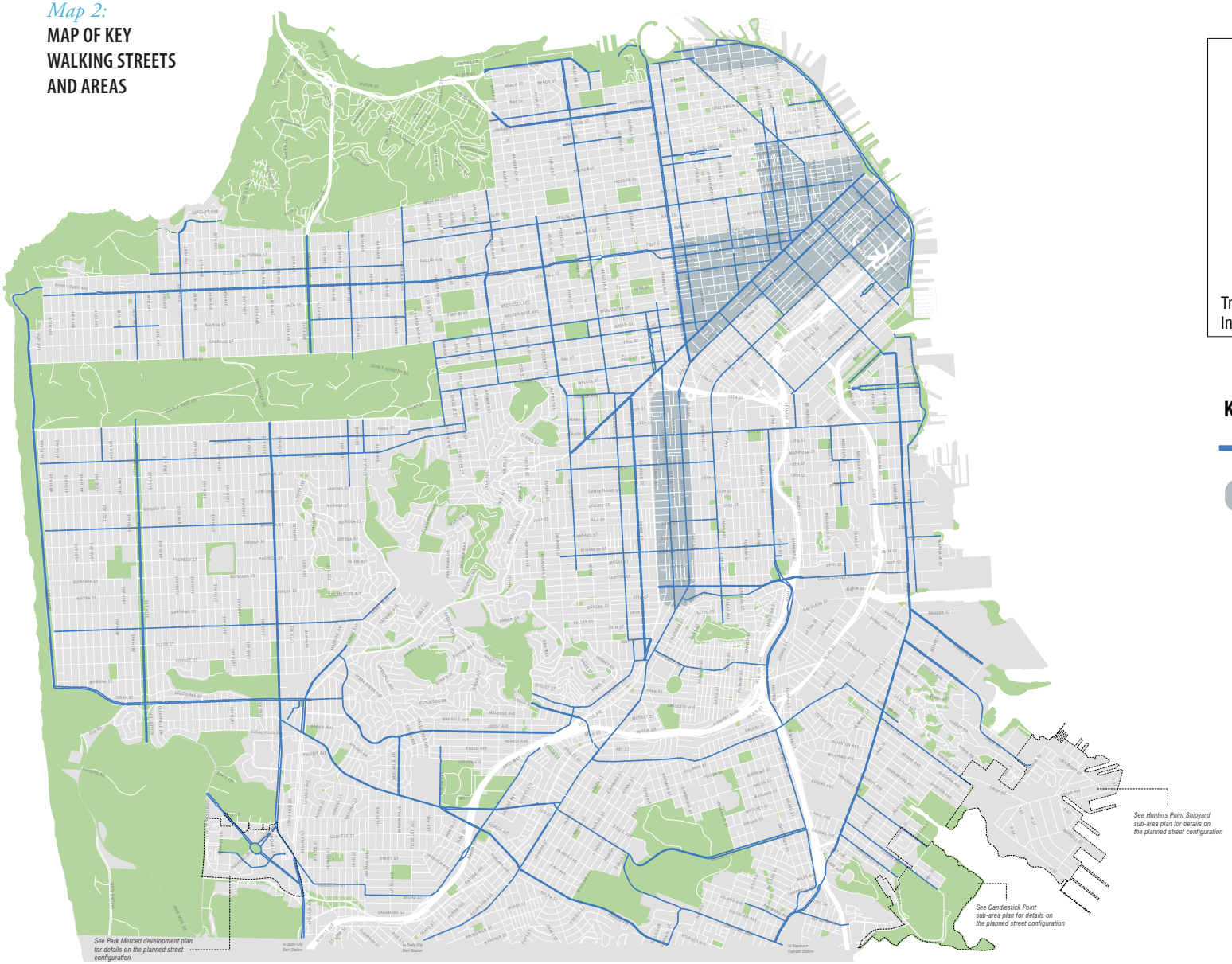
NEW Policy:
Promote education and awareness to improve pedestrian safety across the City.

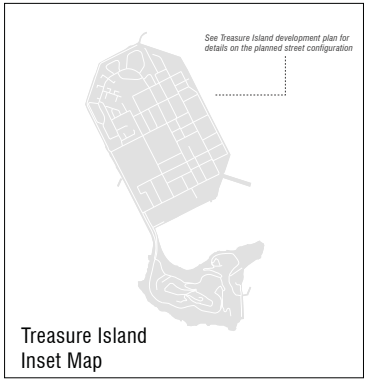
NEW Policy:
Apply best practices in traffic engineering to improve identified high risk areas for pedestrian safety across the City.

NEW Policy:
Identify areas of greatest pedestrian safety need based on available data; in considering use of funding for pedestrian safety programs and improvements, give priority to areas of greatest pedestrian safety need.

EXISTING Policy:
Provide enforcement of traffic and parking regulations to ensure pedestrian safety

Map 2:
MAP OF KEY WALKING STREETS AND AREAS





Key Walking Streets

key walking street

key areas

CHAPTER

4

Pedestrians Safety Conditions

4.1 CONTEXT

A safe pedestrian environment is crucial for people to choose walking as a travel option. In the first half of the decade pedestrian collisions came down from the over 1,000 incidents recorded annually in the 1990's, plateauing at approximately 730-800 annually in recent years. The number of fatal collisions involving a pedestrian being severely injured or killed has also been relatively constant, ranging from approximately 90-100 people killed or seriously injury annually. According to the San Francisco 2009 Collision Report[1], about a quarter of San Francisco's 2,877 total injury collisions and over half of the 30 total fatal collisions involved pedestrians. With 744 pedestrians reported killed or injured in 2009 by the State Office of Traffic Safety (OTS), San Francisco is ranked by OTS as the county having the highest total rates of fatalities and injuries to pedestrians by both vehicle miles and by population, and also has the highest injury rates for seniors over 65 years of age.[2]

In the 2000-2005 period, San Francisco pedestrian-involved collisions gradually decreased from the 1,000+ incidents recorded annually in the 1990's. Pedestrian collisions then leveled off or rose during the 2006-2008 period. According to the San Francisco 2009 Collision Report[3] , about a fourth of San Francisco's 2,877 injury collisions (695) and half of the 30 fatal collisions (17) involved pedestrians. The 2009 total of 695 injury collisions involving a pedestrian was down 13% from the 799 injury collisions reported in 2008.

In 2009, the most frequent cause of pedestrian injury collisions (42%) was violation by the motorist of the pedestrian right-of-way, such as a motorist not yielding to a pedestrian at a crosswalk or at a signalized intersection when making a turn. The second most frequent cause (34%) was violations by the pedestrian, including crossing against a red light at a signalized intersection. Violation of traffic signals and signs contributed to 4%. Speeding was 5%, and other causes added up to the remaining 14%.

1 The City and County of San Francisco, San Francisco Municipal Transportation Agency. (2010). San Francisco 2009 collisions report San Francisco, CA: SFMTA. Retrieved from http://www.sfmta.com/cms/vsafe/documents/Collision_report_2009.pdf

2 California Office of Traffic Safety. 2009 OTS Rankings. Available at: http://www.ots.ca.gov/Media_and_Research/Rankings/default.asp.

3 The City and County of San Francisco, San Francisco Municipal Transportation Agency. (2009). San Francisco 2008 collisions report San Francisco, CA: SFMTA. Retrieved from http://www.sfmta.com/cms/vsafe/documents/Collision_report_2008.pdf

Notably, the assessment of the primary cause of the collision is made by the police department, and does not include an assessment of environmental factors (e.g., roadway design) or physical and mental abilities (e.g., disabled pedestrians) contributing to the collision.

An analysis in San Francisco comparing data from 2000-2001 police records with hospital data from San Francisco General Hospital (SFGH, the City's Level-I Trauma Center which sees the majority of more severely injured pedestrians) found that 22% of pedestrians injured and seen at SFGH were not reported in police records.[4] This means that the police-reported injuries recorded in SWITRS likely represent an under count of the total number of pedestrian injuries in San Francisco each year.

4.2 DETERMINING PRIORITY LOCATIONS FOR PEDESTRIAN SAFETY IMPROVEMENTS

The methodology to rank pedestrian safety levels was analyzed at two scales: at a corridor-level and at an intersection-level. This is necessary for efficient and effective pedestrian injury prevention. Prioritization based on high injury intersections alone typically identify and address only a very small overall proportion of vehicle-pedestrian injuries. For example, for a given year the top 10 intersections with the highest numbers of pedestrian injuries in San Francisco account for <3% of the total pedestrian injuries. Furthermore, because pedestrian injuries are relatively rare events at an individual intersection, there can be a high degree of variability at individual intersections from year-to-year. However, there are evident corridor- and area-level patterns of injury that represent a much larger share of injuries.

The concentration of pedestrian injury collisions along corridors and in areas represents the aggregation of established environmental-level risk factors including pedestrian activity, traffic volumes and traffic speeds. Interventions targeting areas and corridors can address the factors contributing to injuries at multiple streets and intersections.

4 Sciortino S, Vassar M, Radetsky M, Knudson MM. 2005. San Francisco pedestrian injury surveillance: mapping, underreporting, and injury severity in police and hospital records. Accident Analysis and Prevention 37(6): 1102-1113.

Data for 2005-2009 from the Statewide Integrated Traffic Records System (SWITRS), managed by the California Highway Patrol, was used for this analysis and included all pedestrian injuries resulting from a collision between a vehicle and a pedestrian. This included a total of 3,883 pedestrian injuries (383 of which were severe) and 97 fatalities. To focus on locations with more severe injury burdens, severe and fatal injuries were weighted by multiplying those counts times 3.

Corridor-Level Analysis:

The corridor-level analysis utilized an approach developed by the San Francisco Department of Public Health, as follows. See Appendix A5 for a detailed summary of the High-Injury Density Corridors.

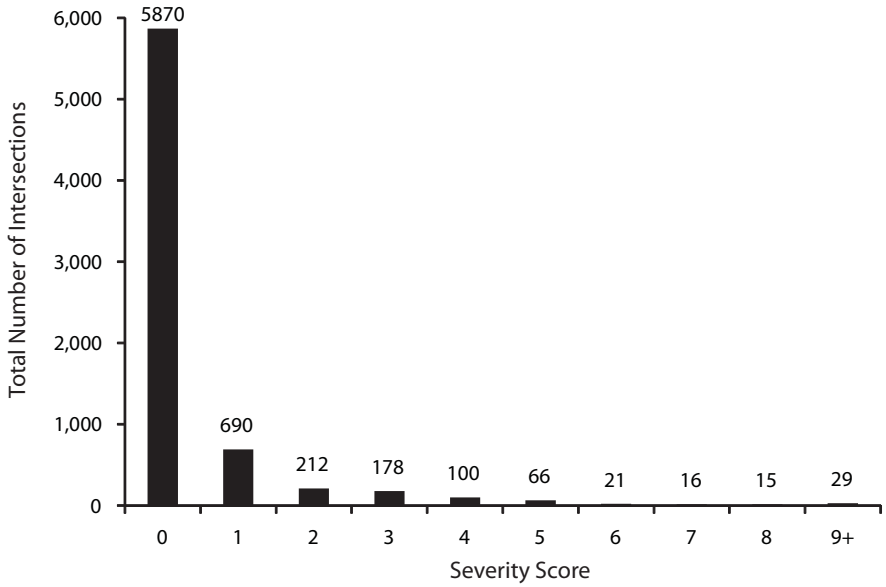
Step 1: Map Pedestrian Injuries
First, pedestrian injury counts were mapped to the street segments by aggregating injury counts (initially assigned to intersections based on primary and secondary streets in SWITRS) and then assigning them to their adjoining street segments. Note that this approach results in injuries being counted on each of the streets that intersect at that intersection.

Step 2: Assign to Street Segments
Next, potential high injury density corridors were defined by proximate street segments with weighted counts >9. San Francisco Department of Public Health determined the cut-point of weighted counts >9 based on the distribution of the data; this cut-point also includes intersection-level hotspots with three or more severe/fatal collisions in the 5-year period. (See Map 3)

Step 3: Identify Concentrations of Pedestrian Injuries
For this project; one area was identified as a "key safety area" given its high concentration of high-injury density corridors. (See Map 3a).

Step 4: Define a Subset of High-Injury Density Street Segments as the Highest Priority
For purposes of developing a preliminary capital improvement list, segments from the high-injury density corridors were identified with at least 38 injury severity points per mile. These were designated as Phase 1A and 1B segments. See Chapter 5 for more detail.

Severity Score Distribution:
A relatively few number of intersections and street segments account for a disproportionate share of the severe and fatal injuries. An estimated 82% of San Francisco intersections have had no pedestrian injuries in the last five years. Approximately 6% of intersections have a severity weighted score of 3 or more, indicating that those intersection may have a disproportionate share of severe and fatal injuries. The chart to the right shows the number of intersections with specific pedestrian injury severity scores, with fatal/severe injuries counted as three points, other injuries as one point.



Intersection-Level Analysis:

While the primary safety needs analysis was oriented at the corridor, it is also valuable to determine whether stand-alone intersections have major safety issues. San Francisco now has estimates of pedestrian crossing volumes at intersections. Rather than relying solely on absolute injury totals, this data provides estimates of injury rates per walk trip.

Pedestrian safety has been measured to the nearest intersection and is based on:

1. Severity-weighted number of pedestrian injuries (absolute number of pedestrian injuries at each intersection from SWITRS, 2005 - 2009)
2. Pedestrian injury rate (per estimated number of pedestrian crossings), based on the Fehr & Peers/SafeTREC "SF Pedestrian Volume Model"

Step 1: Map Pedestrian Collisions
Using SWITRS create map of pedestrian collisions including criteria for all pedestrian injuries with criteria of fatal, severe, visible injury and complaint of pain.

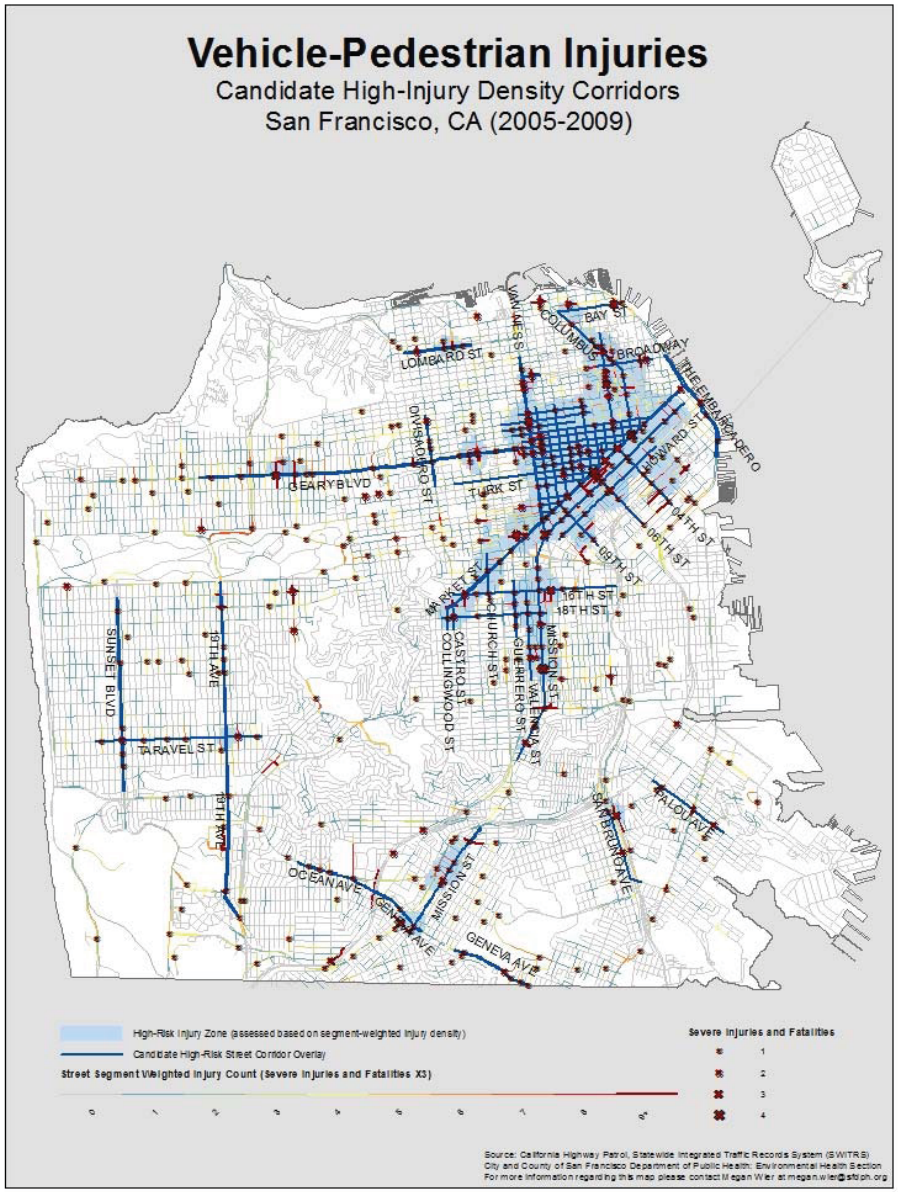
Step 2: Develop a score for intersections not included in high-injury density corridors

Score the intersection based on 3 points for every fatal and severe injury and 1 point for every intersection with pedestrian collisions with a visible injury and complaint of pain. Severity = 3 x (fatal + severe) + 1 x (visible injury + complaint of pain). All intersections with 5+ injury severity points were reviewed. The vast majority of these intersections were included in the high-injury density corridors with at least 38 injury severity points per mile (ranked as Phase 1A and 1B locations). 16 intersections were identified that did not fall within these corridors; therefore, they will be included as stand-alone intersections.

Step 3: Determine Pedestrian Injury Rate
To determine the pedestrian injury rate, the total intersection score will be divided by the estimated annual pedestrian crossings at the intersection, based on the Fehr & Peers/SafeTREC "SF Pedestrian Volume Model." Injury rate = intersection score / estimated annual pedestrian crossings.

Step 4: Rank Stand-alone Intersections
These stand-alone intersections were divided into two priority groups:

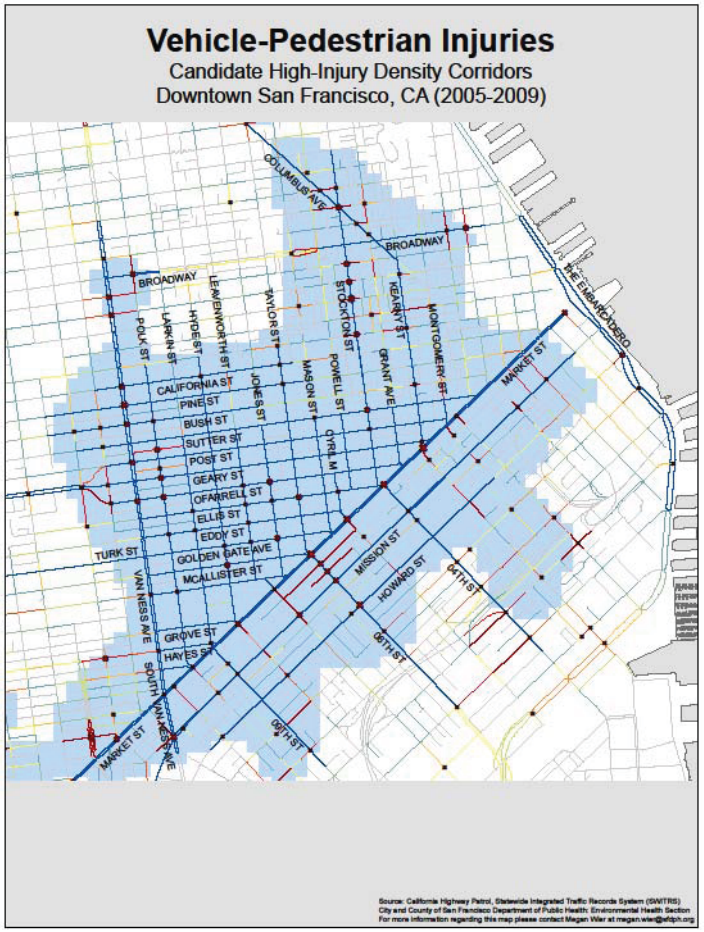
- Highest priority (1A) - over 2.0 injury severity points per 10 million walk trips.
- Second highest priority (1B) - between 0.86 and 2.00 injury severity points per 10 million walk trips.



Map 3
HIGH-INJURY DENSITY CORRIDORS

4.3 HIGH-INJURY DENSITY CORRIDORS

The identified corridors shown in blue in Map 3 represent 6.7% of San Francisco's street miles, and include 55% of all severe and fatal injuries and 51% of total pedestrian injuries in the five-year period.



Map 3a
KEY SAFETY AREA

CHAPTER

5

High Priority Segments

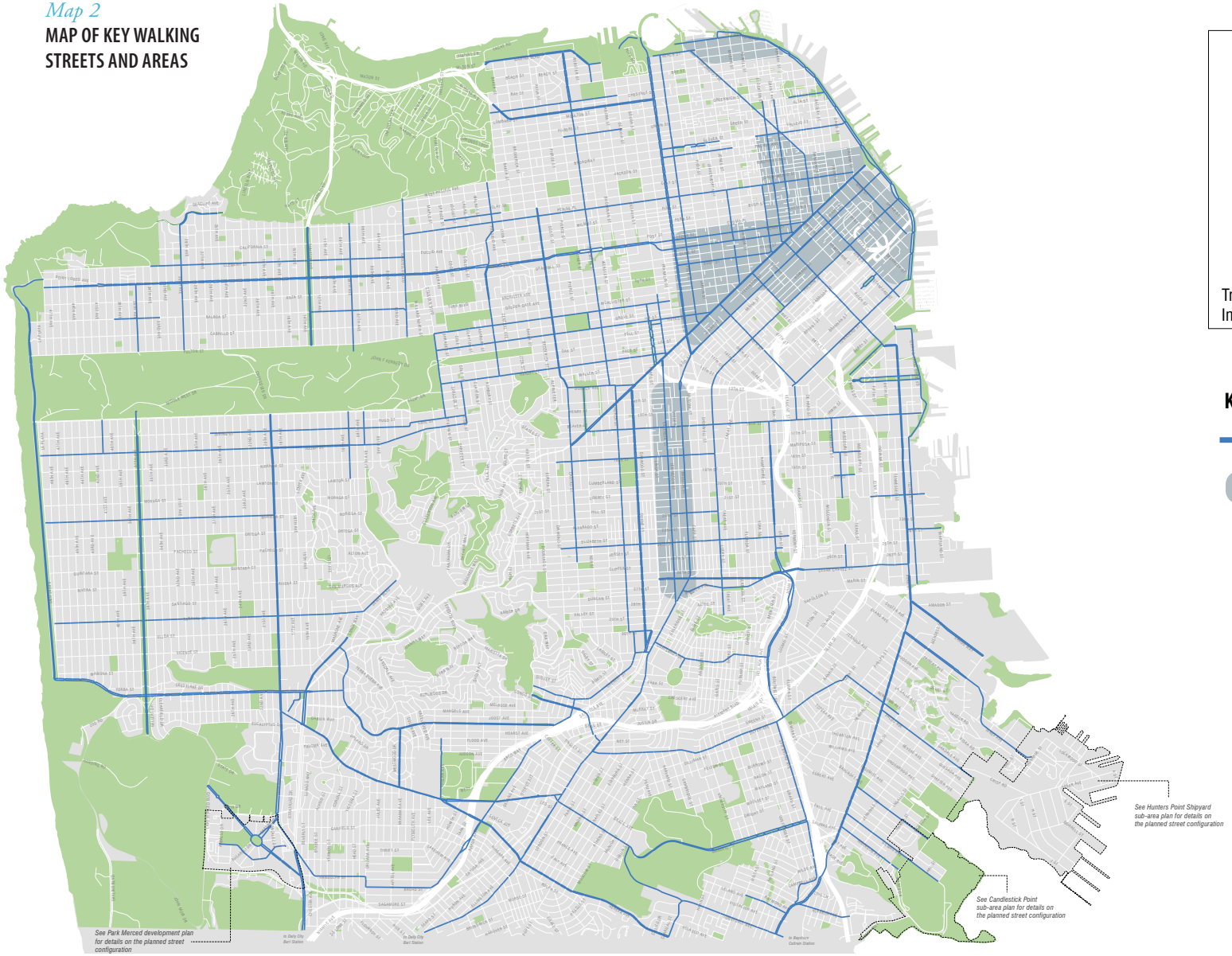
5.1 HIGH PRIORITY SEGMENTS

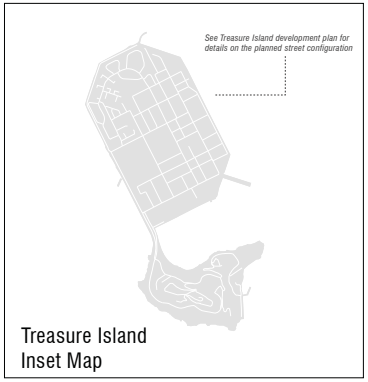
The pedestrian activity factors have been used to develop the Map of Key Walking Streets and Areas (Chapter 3). The pedestrian safety factors have been used to develop a map of High-Injury Density Corridors (Chapter 4).

High priority segments represent the overlap between the street segments with both high pedestrian activity factors and high pedestrian safety factors. These segments are the highest priority for pedestrian safety improvements, and add up to about 44 miles or about 3.3% of the City's entire roadway system.

Map 2

MAP OF KEY WALKING STREETS AND AREAS





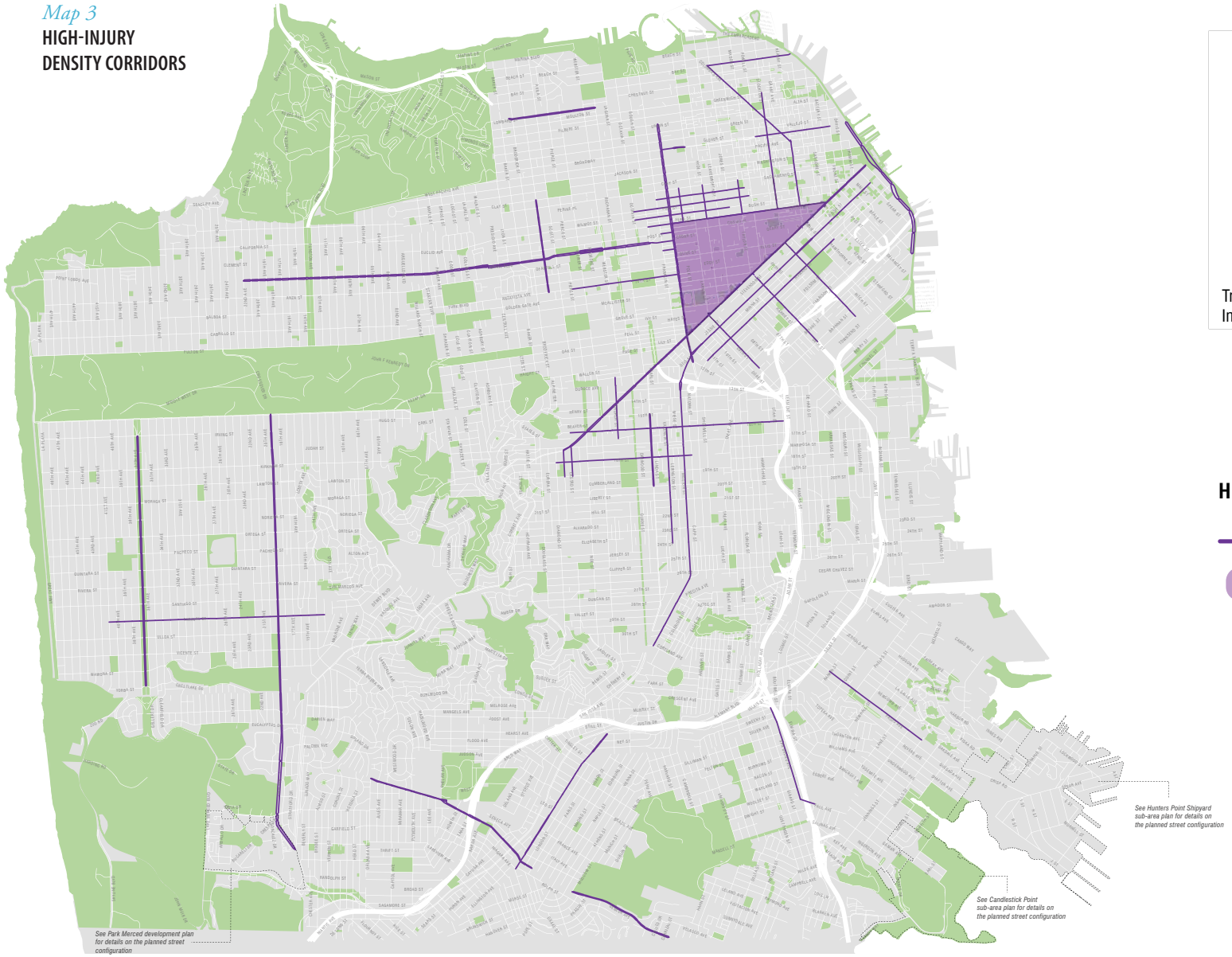
Key Walking Streets

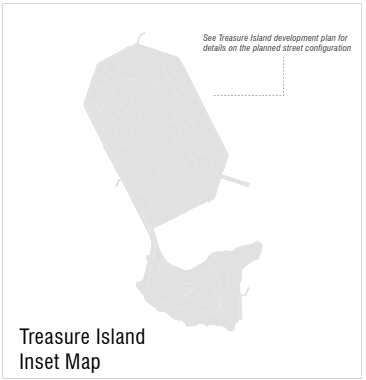
key walking street

key areas

Map 3

HIGH-INJURY DENSITY CORRIDORS





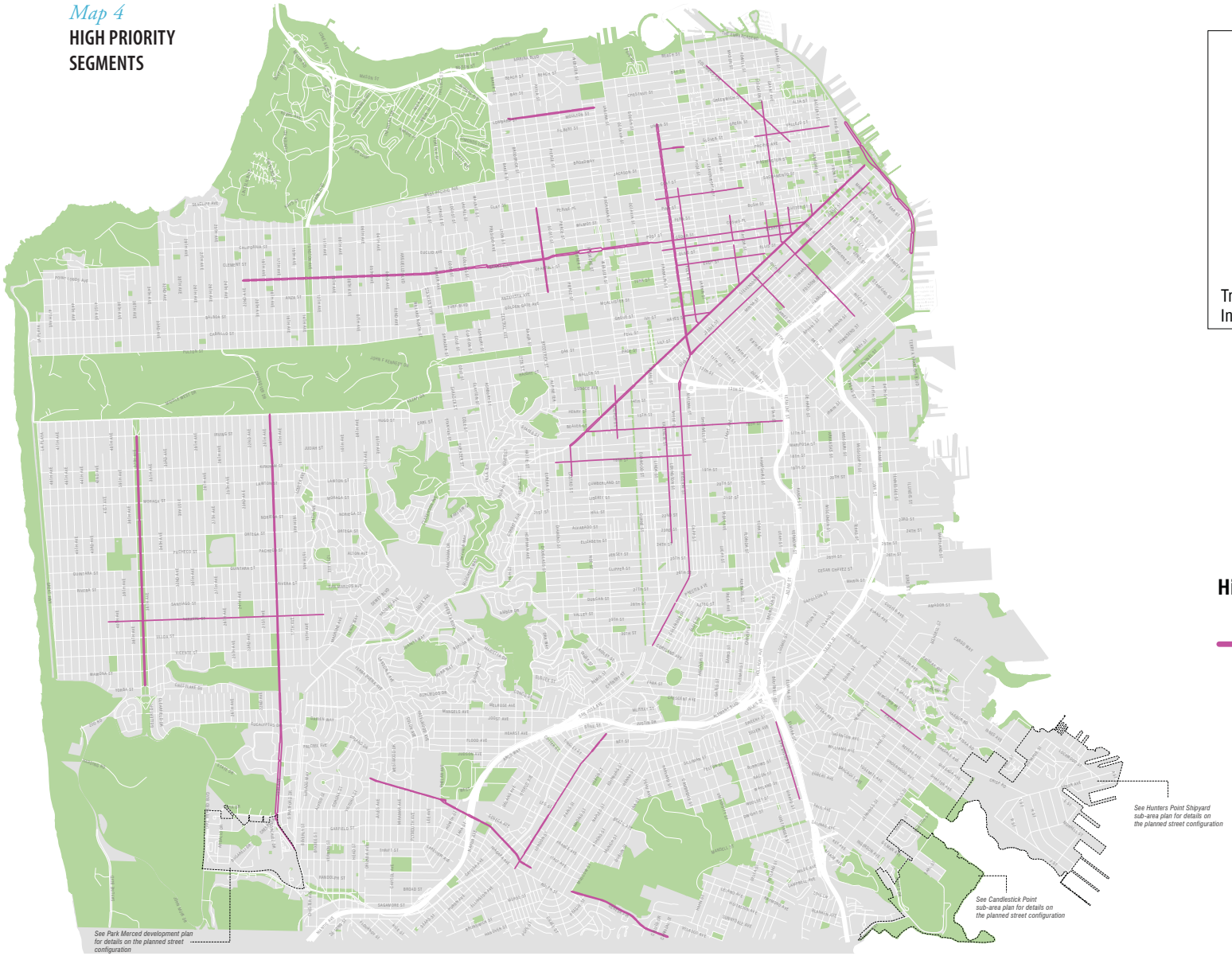
High Risk Corridors

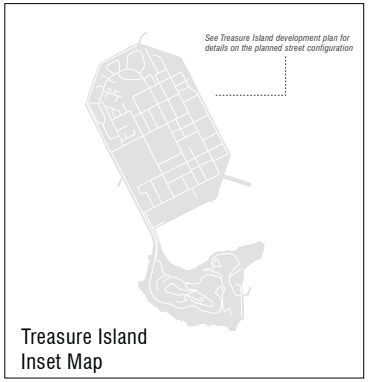
high risk corridors

key safety area

Map 4

HIGH PRIORITY SEGMENTS





High Priority Segments

high priority segments

CHAPTER

6

Street & Sidewalk Characteristics

6.1 PHYSICAL FEATURES

San Francisco has a relatively high level of pedestrian infrastructure compared to many other cities, although there are imperfections often related to the age of the street system and high densities of the built environment. The physical conditions of the street and sidewalk affect pedestrian activity levels as well as pedestrian safety conditions. For example, crime locations and sidewalk widths influence which streets people walk on and where they cross the street.

Street and Sidewalk Characteristics will be considered in selecting and prioritizing specific capital improvements. However, the data for this category is incomplete, so it is not possible to analyze all street and sidewalk features in detail or to develop a comprehensive priority list that covers all locations and possible improvements. When the data is complete, a more inclusive process will be developed to refine and expand the Preliminary Capital Improvements list discussed in Chapter 7.

The data that is available will be used to recommend improvements to specific locations. Maps have been developed for some of the data that is available (See Appendix A4). These maps are a counterpart to the pedestrian activity maps discussed in Chapter 3. The physical features fall into several categories:

- Traffic Control Devices
- Street Design and Streetscape
- Walking Space and Buffers
- Traffic Characteristics
- Traffic Calming
- Accessibility
- Crime Locations

Traffic Control Devices

San Francisco is a national leader among larger cities in installing pedestrian countdown signals citywide, which is now the national standard. Pedestrian countdown signals have been installed at 992 of approximately 1,180 intersections with traffic signals (131 of these intersections have countdowns only for some crosswalks.) Funded projects will install pedestrian countdown signals at 27 additional intersections

At 579 intersections converted to countdown signals, pedestrian injury collisions declined 22%, compared to a 2% decline at other signalized intersections where a countdown signal was not installed. Red light running crashes also dropped from 45% to 34% of all traffic collisions[1].

Pedestrian countdown signals are generally well distributed throughout San Francisco. Corridors with significant number of intersections missing countdowns include: Van Ness Avenue and parallel streets, Post and Sutter Streets, and Park Presidio Boulevard.

San Francisco also has a relatively high level of accessible (or audible) pedestrian signals (APS), typically with more modern designs. These have been installed at 124 intersections to date based on an established prioritization process that considers such factors as key destinations for services and public requests.

While there are APS locations throughout San Francisco, they tend to be concentrated especially in the Civic Center area, along Market Street, and along Third Streets. The Civic Center and Market Street concentrations result in part from the number of civic destinations and transit access. The Third Street light rail project included major signal improvements along the entire corridor, including APS.

1 SFMTA and UC Berkeley SafeTREC, San Francisco PedSafe Phase II: Final Implementation Report and Executive Summary, prepared for Federal Highway Administration, February 2008, p. 74.

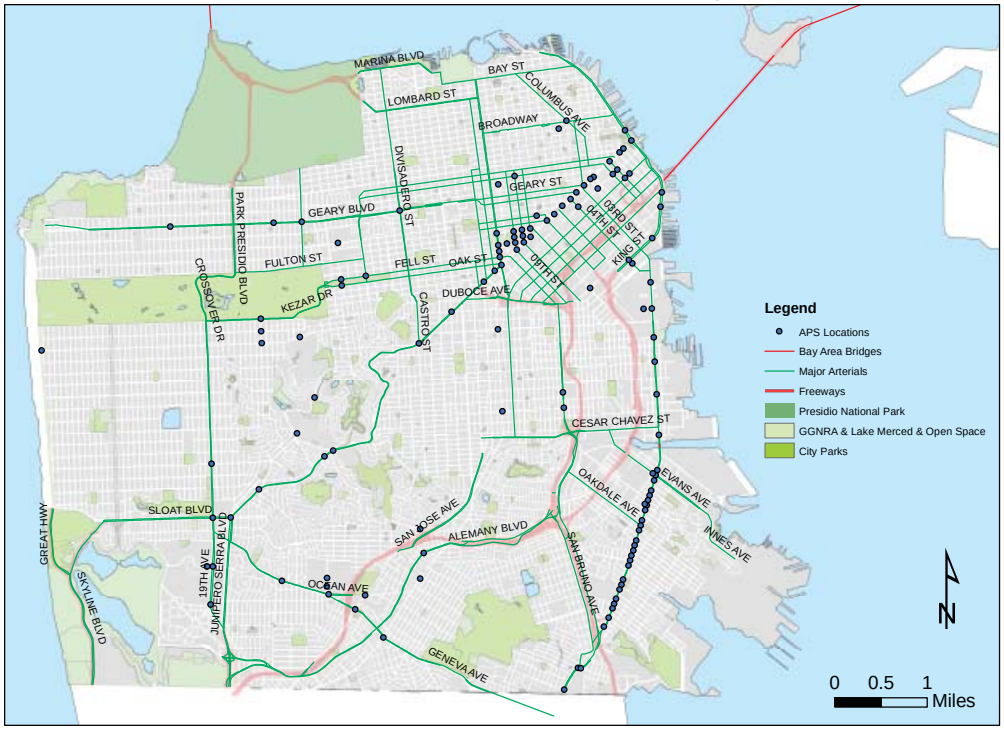
Street Design and Streetscape

San Francisco is an older city compared to many other California cities. Basic features of street design, such as roadway width and intersection spacing, were set decades ago for most of the city, but generally support walking with higher intersection densities that encourage walking in areas with higher residential and employee densities. However, there are major redevelopment projects and growth areas in design and construction, such as Candlestick Point/Hunters Point Shipyard, Parkmerced, the Transbay Transit Center District, and Treasure Island that provide opportunities for new street design. These areas are adopting pedestrian-supportive street designs, often incorporating innovative approaches. The San Francisco Better Streets Plan provides comprehensive guidelines on street design and streetscape features based on street typology. Design standards from the Department of Public Works, Public Utility Commission, Planning Department, and SFMTA were incorporated into these guidelines.

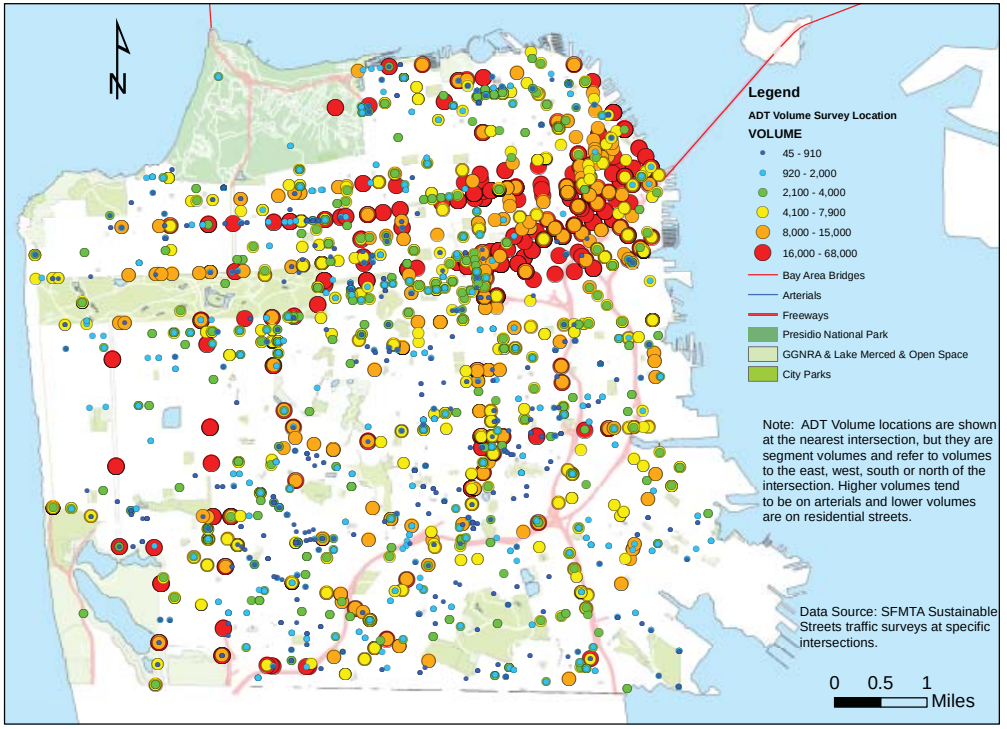
Key roadway characteristics like roadway width and intersection spacing vary by district, but not in a systematic pattern. For example, the South of Market (SOMA) area has relatively long block lengths (excluding alleys), although there is a high level of pedestrian activity. But residential streets in the Sunset and Richmond districts with low pedestrian volumes also have longer north-south block lengths. Major arterial streets are typically wider, with more traffic lanes, but the street right-of-way on many arterials is more constrained than in suburban locations in the Bay Area.

Walking Space and Buffers

Unlike many other older, large cities, San Francisco has sidewalks on both sides of the vast majority of its streets, including smaller residential streets. However, in some high-activity areas, sidewalk widths are inadequate to serve the high demand. Since the city is highly developed, possibilities for expanding sidewalk width are constrained.



ACCESSIBILITY: ACCESSIBLE PEDESTRIAN SIGNALS



TRAFFIC CHARACTERISTICS AVERAGE DAILY VOLUMES

Sidewalks are occasionally missing from "unaccepted" streets, those the City has not accepted for maintenance and liability purposes. Sidewalks with the highest volumes relative to capacity often are in areas with major tourist concentrations, such as near Union Square.

San Francisco is a national leader in adding green space to sidewalks and streets. San Francisco has started several innovative pilot projects throughout the City led by the Mayor's Office and City Planning Department with the collaboration of other City Departments to increase walking space and create buffers between pedestrians and moving traffic. These projects include the Pavement to Parks Program and Parklets Program, to provide new public plazas and parks on unused street swathes and converting on-street parking spaces to green places for pedestrians.

Traffic Characteristics

San Francisco has relatively lower posted speed limits than many of suburban cities in the Bay Area. Most San Francisco streets are set at the 25 mph limit. However, speeding is common. On 25 mph streets, almost 50% of drivers exceed the speed limit and 4 percent of drivers are traveling at speeds 10 mph above the limit.

The higher speed limits are found on wider, arterial streets. However, there is no systematic difference in posted speeds by district.

Traffic volumes are also relatively high on many streets in neighborhood commercial areas, employment centers, or in areas with existing or planned future residential communities. The highest volumes are on streets with high levels of through traffic For example, 19th Avenue and the southern portion of Junipero Serra Boulevard accommodate between 86,000 and 123,000 vehicles on an average daily basis.

Traffic Calming

To address complaints from neighborhoods across San Francisco about speeding traffic and commuters "cutting-through" their streets, the SFMTA has a Traffic Calming Program that works on improving safety on San Francisco's residential streets. The goal of the Program is safer streets for everyone, without restricting access to anyone. The SFMTA has traffic calming guidelines and an application process whereby interested neighborhoods can apply to see if their area would qualify for a traffic calming project. Traffic calming measures that have been installed in neighborhoods throughout the City include: speed humps, speed cushions, bulb-outs, channelization and median islands, traffic circles, intersection islands, road diets and edgelines.

Traffic calming measures are distributed throughout the city, although the outer (western) residential neighborhoods in the Sunset and Richmond have fewer installations. These are further from major non-residential uses and get a lower level of cut-through traffic.

Accessibility

San Francisco provides curb ramps at the majority of its intersections, but the City has identified significant deficiencies. After surveying the majority of street corners, DPW found that nearly a third of all potential sites (crosswalk entries), lacked a curb ramp or required reconstruction due to deficiencies in the existing ramp. Corners missing any curb ramps tend to be concentrated in the southern and central parts of the city, including hilly residential locations.

The goal of the Department of Public Works ADA Transition Plan for Curb Ramps and Sidewalks is to ensure that the City creates accessible paths of travel in the public right of way for people with disabilities. The Better Streets Plan also incorporates accessibility improvements guidelines. Another accessibility measure, accessible pedestrian signals (APS) are discussed above

Crime Locations

The WalkFirst online survey found that when respondents selected their least favorite streets for walking, 48 percent gave crime levels as one factor in their selection. Furthermore, 24 percent indicated this was the single most important reason, just behind "fast traffic."

In addition, the online internet CRIME Maps tool was used to examine the categories of crime committed (over a 90 day period) in the City and compare these locations with the key walking and pedestrian safety need streets identified by this project. Several key walking streets with pedestrian safety needs also have "hot spots" of crime related activities such as assaults, homicides, robberies and sex crimes. For example, SOMA, the Mission, and the Tenderloin have higher reported crime levels, and also have higher pedestrian injury levels.[2]

2 Trulia online crime maps: http://www.trulia.com/crime/San_Francisco,CA/.

CHAPTER

7

Preliminary Capital Project List

7.1 INTRODUCTION

High Priority Segments identified in Chapter 5, represent 44 miles or about 3.3% of the City's entire roadway system. As previously discussed, these streets were those identified by the Department of Public Health (SFDPH) as having the highest severity-weighted pedestrian injury density and are key walking streets. To ensure geographic equity and recognizing limited funding, the capital project list has been divided into three phases (1A, 1B and 1C).

7.2 PHASING PEDESTRIAN IMPROVEMENTS ON HIGH PRIORITY SEGMENTS

The high priority segments were based on pedestrian severity-weighted injury points per mile in absolute numbers. (See Chapter 4 for methodology to calculate severity injury points per mile). The different thresholds for the Northeast and other areas were an adjustment to address the higher pedestrian volumes in the Northeast. Higher pedestrian activity levels contribute to higher pedestrian injury levels, but these higher injury levels in the Northeast do not reflect the actual risk to the pedestrian of a single walk trip. There are no pedestrian volume estimates for segments, and therefore it was not possible to estimate an injury rate per pedestrian trip or pedestrian-mile for segments.

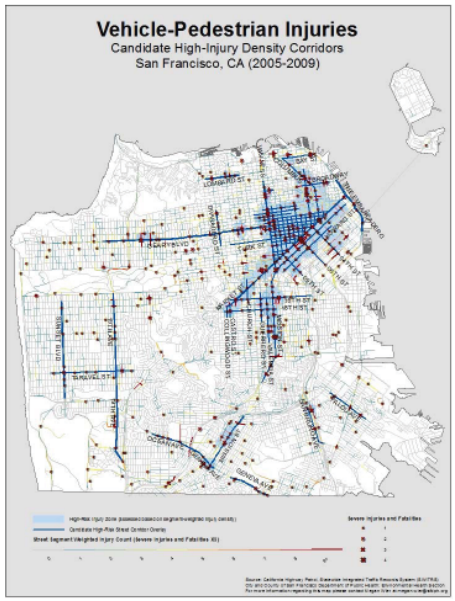
PHASE	GEOGRAPHIC QUADRANT OF SAN FRANCISCO	THRESHOLD *(Severity injury points per mile)*
Phase 1A	Southeast, Southwest, Northwest	>38
	Northeast	>90
Phase 1B	Northeast	38-39
Phase 1C	Southeast, Southwest, Northwest, Northeast	<38

The high priority intersections were based on the estimated risk and injury severity, rather than simply the absolute number of injuries. See Chapter 4 for methodology to calculate severity injury points per walk trips). [1]

PHASE	THRESHOLD *(Severity points per 10 million walk trips)*
Phase 1A	2.11 - 19.86
Phase 1B	86 - 1.89

1 DRAFT San Francisco Pedestrian Volume Model, March 2011, prepared for SFMTA by Fehr & Peers and UC Berkeley SafeTREC.

The high priority locations for preliminary capital improvements are illustrated in Map 5. The segments are shown in red, yellow and blue to represent a phased approach for implementation. These segments also correspond to the High-Injury Density Corridors shown in Map 3.



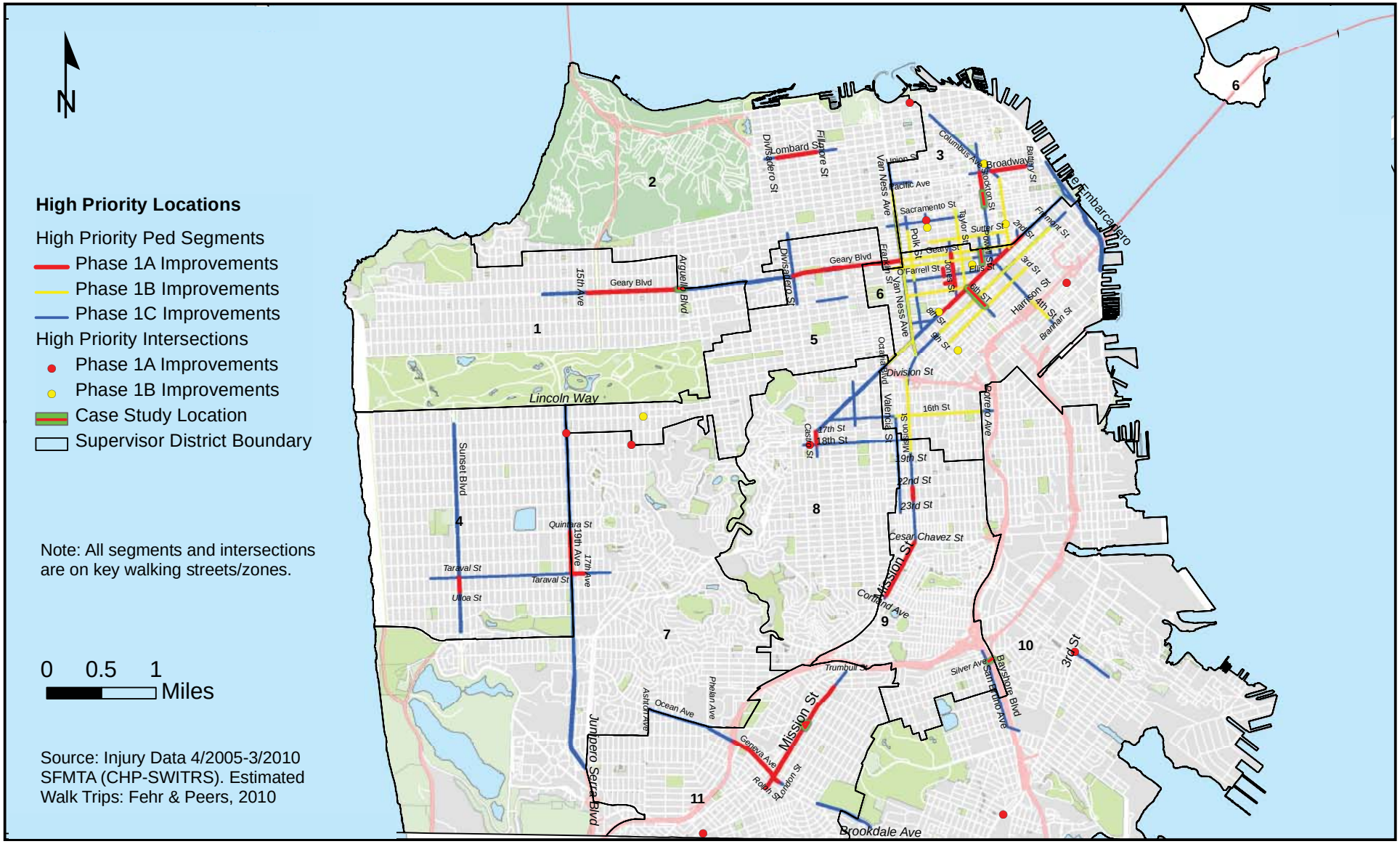
Map 3
HIGH-INJURY DENSITY CORRIDORS

7.3 RECOMMENDED IMPROVEMENTS

The Better Streets Plan (BSP) provides recommendations for pedestrian improvements for all San Francisco streets based on typologies defined by the land use and transportation function of the street. These recommended improvements would enhance safety, accessibility, and walkability. The safety-related improvements recommended in the Better Streets Plan, as well as traffic safety measures proven to be effective and recommended by the SFMTA, have been included in the Preliminary Capital Project List for all 44 miles of Phase 1 segments. See table 4 for more details.

Map 5

WALK FIRST MAP OF PRELIMINARY CAPITAL IMPROVEMENTS



Intersection Improvements

- Corner Curb Extensions (bulbouts)
- Curb Ramps
- Pedestrian Countdown Signals
- Accessible (Audible) Pedestrian Signals
- High visibility (continental) crosswalk markings (new SFMTA standard) with advance yield lines
- Speed reduction measures

Corridor Wide Improvements

- Sidewalk widening to the Better Streets Plan minimum
- Pedestrian-Scale Lighting

Additional improvement types were added for a subset of the highest priority locations (Phase 1A):

- Flashing beacons
- Intersection safety lighting (crosswalks and corners)
- Speed reduction measures for corridors and intersections

While specific recommendations were not developed, in future refinements of the Preliminary Capital Improvements List, pedestrian refuge islands and signal timing changes should be considered.

7.4 CAPITAL PROJECT LIST

For the purpose of the WalkFirst project, a capital project list was developed in detail for Phase 1A. Phase 1A locations are predominately wider residential or commercial streets in the northeast quadrant of the city and/or neighborhood commercial streets in other districts. Key characteristics of these locations are provided in Appendix A6.

Preliminary cost estimates for the High Priority Segments are summarized in the table below. The cost to implement is an estimate of a wide range. This range takes into account the costs associated with different types of improvements. For example, sidewalk widening and corner bulb-outs are infrastructure changes that can be more costly than other safety improvements such as continental crosswalks or accessible pedestrian signals.

PHASE	LENGTH & NUMBER OF INTERSECTIONS	COST
Phase 1	44 miles	633M – 723M
Phase 1A	7.6 miles & 10 stand-alone intersections	18.5 - 81.3 Million
Phase 1B	11.7 miles & 6 stand-alone intersections	TBD
Phase 1C	24 miles	TBD

The Preliminary Capital Project List is provided in Table 3. Improvements marked with an “x” are recommended improvements. The Phase 1A list is not an exclusive or comprehensive list of all locations and improvement types. Because the Phase 1A segments represent the streets with the highest need for safety improvements, the recommendations are highly focused on safety needs, but other needs (pedestrian comfort, sustainability) should also be considered.

The pedestrian improvements on Phase 1A street segments are recommendations pending further study, refinement, community outreach, and environmental review. For example, a variety of speed reduction measures may need to be considered, prioritized, and tailored for each location Final recommendations for the Phase 1A street segments and intersections will be coordinated with adopted and under-development plans and projects (See Appendix A7). Some of these recent or ongoing projects could potentially incorporate the recommendations. It may also be necessary to adjust the Phase 1A recommendations to be consistent with these plans and projects.

Table 3

PRELIMINARY CAPITAL PROJECT LIST

1A SEGMENT OR INTERSECTION	FROM	TO	SEGMENT LENGTH *MILES*	COST TO IMPLEMENT		INTERSECTION IMPROVEMENTS						MID-BLOCK IMPROVEMENTS		
				LOW	HIGH	CORNER BULBOUTS (EACH)	BUS BULBOUTS (EACH)	CONTINENTAL CROSSWALKS AND ADVANCED LIMIT LINES	FLASHING BEACONS (CROSSING)	PEDESTRIAN COUNTDOWN SIGNALS (CROSSING)	LIGHTING (INTERSECTION)	SIDEWALK WIDENING (BLOCK FACE)	SPEED REDUCTION MEASURES (BLOCK)	FLASHING BEACONS (CROSSING)
STREET SEGMENT:														
19TH AVE.	TARAVAL	QUINTARA	0.40	$1,738,500	$1,738,500	X	X	X					X	
6TH ST.	MARKET	HOWARD	0.20	$88,000	$10,463,000	X		X				X	X	
BROADWAY	BATTERY	COLUMBUS	0.30	$816,000	$1,566,000	X		X		X	X			
CASTRO	MARKET	18TH	0.10	$238,000	$550,500	X		X			X			
GEARY BLVD.	ARGUELLO	15TH AVE.	0.80	$528,000	$4,028,000	X		X						
GEARY BLVD.	VAN NESS	DIVISADERO	1.00	$3,202,500	$15,202,500	X		X		X		X	X	
GENEVA	I-280	LONDON	0.60	$1,205,500	$10,330,500	X	X	X	X		X	X	X	
JONES	GOLDEN GATE	GEARY	0.30	$163,000	$1,288,000	X		X			X			
LEAVENWORTH	EDDY	ELLIS	0.06	$44,000	$294,000	X		X						
LOMBARD	DIVISADERO	FILLMORE	0.40	$1,801,000	$7,801,000	X		X			X	X	X	
MARKET ST.	2ND	8TH	1.00	$308,000	$308,000			X						
MISSION ST.	C. CHAVEZ	CORTLAND	0.10	$1,058,000	$2,933,000	X	X	X						
MISSION ST.	SILVER	ROLPH	0.50	$4,973,500	$8,223,500	X	X	X	X	X	X			
MISSION ST.	23RD	22ND	1.10	$44,000	$294,000	X		X						
POWELL	MARKET	GEARY	0.10	$132,000	$882,000	X		X						
SILVER	BAYSHORE	SAN BRUNO	0.06	$88,000	$1,588,000			X				X	X	
STOCKTON	SACRAMENTO	BROADWAY	0.30	$176,000	$5,488,500	X		X				X		
SUNSET	TARAVAL	ULLOA	0.10	$88,000	$1,588,000			X				X	X	
TARAVAL	19TH AVE.	17TH AVE.	0.10	$44,000	$3,544,000	X						X		
TURK ST.	JONES	LEAVENWORTH	0.09	$75,000	$325,000	X		X			X			
		SEGMENTS TOTAL:		**$16,811,000**	**$78,436,000**									
STANDALONE INTERSECTIONS														
18TH ST	COLLINGWOOD ST			$75,000	$325,000	X					X			
19TH AVE.	JUDAH			$625,000	$625,000	X	X							
2ND ST.	BRYANT ST.			$44,000	$294,000	X		X						
3RD	PALOU			$44,000	$44,000			X						
BAYSHORE	ARLETA			$244,000	$244,000	X		X			X			
BEACH	HYDE			$44,000	$231,500	X		X						
CALIFORNIA	HYDE			$44,000	$294,000	X		X						
IRVING	7TH AVE.			$0	$125,000	X								
KIRKHAM	9TH AVE.			$44,000	$231,500	X		X						
MISSION	SICKLES			$484,000	$484,000	X		X		X	X			
		INTERSECTIONS TOTAL:		**$1,648,000**	**$2,898,000**									
		TOTAL		**$18,459,000**	**$81,334,000**									

CHAPTER

8

Case Studies

8.1 INTRODUCTION

The Case Studies are illustrative concept designs which have been applied to a range of street environments in San Francisco. The locations selected for this project have both high pedestrian safety concerns and high levels of pedestrian activity.

The design concepts test a broad range of street environments in different neighborhoods throughout the city, and illustrate typical conditions and replicable concepts that could be broadly applied to similar street conditions. In most cases, the concepts build on earlier community and department planning efforts.

These designs are intended to illustrate how the priority recommendations can be translated into physical improvements and applied to specific locations.

Table 4

WALKFIRST CASE STUDY COMPARISON

CASE STUDY	BETTER STREETS PLAN CLASSIFICATION	STREET WIDTH *(curb-to-curb, plus number of through lanes)*	TRAFFIC CONTROLS	ESTIMATED PEDESTRIAN VOLUMES *(rank out of 8,135 intersections)*	PEDESTRIAN INJURIES/FATALITIES *(rank in severity-weighted injuries)*	KEY PROJECTS AND PLANS
Geary Boulevard (Arguello to Palm)	Neighborhood commercial	99 ft. (6 lanes)	Traffic & pedestrian signals Flashing beacons at Palm Avenue	161st	82nd	Geary Bus Rapid Transit environmental review underway
Stockton Street (Sacramento to Washington)	Neighborhood commercial	46 ft. (3 lanes)	Traffic & pedestrian signals	Stockton/Sacramento: 501st Stockton/Clay: 346th Stockton/Washington: 184th	Stockton/Sacramento: 7th Stockton/Clay: 148th Stockton/ Washington: 23rd	Central Subway in design
6th Street (Market to Howard)	Neighborhood commercial	62.5 ft. (4 lanes, 5 with tow-away lane)	Traffic & pedestrian signals at major intersections Marked crosswalk at Minna	6th/Market: 123rd 6th/Jessie: 737th 6th/Mission: 328th 6th/Howard: 317th	6th/Market: 1st 6th/Jessie: 5th 6th/Mission: 3rd 6th/Howard: 2nd	Continental crosswalks and pilot end of tow-away lane; Area studies underway
Mission/ Persia/ Ocean Triangle	Mission and Ocean: Neighborhood commercial Persia: Neighborhood residential	Mission: 58.5 ft. (4 lanes) Ocean: 46 ft. (2 lanes) Persia: 40 ft. (2 lanes)	Traffic & pedestrian signals at Mission intersections. Persia stop controlled at Ocean Avenue.	Mission/Persia: 779th Mission/Ocean: 568th Ocean/Persia: 1,556th	Mission/Persia: 3rd Mission/Ocean: 248th Ocean/Persia: No injuries recorded	Mission-Geneva Study completed; Prop K grant for design to SFMTA
Silver Avenue (San Bruno to Bayshore)	Silver and Bayshore: Neighborhood residential San Bruno: Neighborhood commercial	56 ft. on overcrossing (4 lanes)	Traffic & pedestrian signals	Silver/San Bruno: 1,516th Silver/ Bayshore: 3,138th	Silver/San Bruno: 148th Silver/ Bayshore: 13th	San Bruno "Great Street" streetscape improvements completed

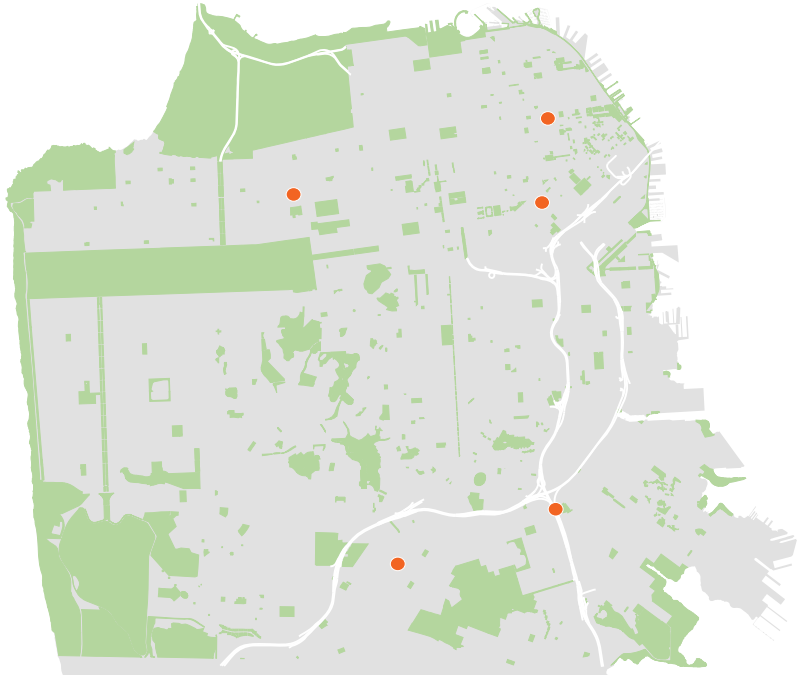
Case Study Criteria

The case studies were selected based on a broad criteria including; safety conditions, pedestrian injury levels, potential for safety improvements, high volumes, public support, geographic equity, street type, replicability, and project time line and coordination. Table 4 outlines the key attributes of the case study corridors, and highlights the range of street types and conditions that have examined through the WalkFirst project.

Case Study Locations

Five case study locations have been selected. Background information and concept designs are detailed on the following pages.

- 6th Street (Market – Howard)
- Stockton Street (Sacramento - Washington)
- Geary Boulevard (Arguello - Palm)
- Silver Avenue (Bayshore Boulevard- San Bruno Avenue)
- Mission/Persia/Ocean Triangle



Map 6
CASE STUDY LOCATIONS

8.2 CASE STUDY: 6TH STREET (MARKET – HOWARD)

BACKGROUND

Sixth Street is a primary commercial corridor for the South of Market Neighborhood. Market Street is the civic spine of San Francisco, and numerous transit lines run along the corridor as do bicycles as it is a primary bicycle route. The 14X Muni bus runs along a portion of 6th Street. The intersection of 6th and Market is one block from Civic Center and Powell Bart/Muni stations in either direction, and in the center of the theater district. As a result there are high volumes of pedestrian activity. Additionally, these street segments are within a primary commercial district; 1/8 mile of MOD service providers (Senior Action Network & Planning for Elders), a senior center (Filipino Senior Citizens Club), and multiple tourist hotels. This corridor is in close proximity to many parks and plazas including SOMA Recreation Center, Boeddeker Park, UN Plaza, Mint Plaza, and Yerba Buena Gardens; as well as within a ¼ mile from Hastings Law School; ½ mile of City College; and ¼ mile of three other schools

PEDESTRIAN SAFETY & STREETSCAPE EFFORTS

6th Street Tow-away Lane Removal Pilot Project, San Francisco Municipal Transportation Agency

Sixth Street currently has two traffic lanes in each direction, while the eastern curb parking lane becomes a third northbound lane between 7-9 a.m. and 3-7 p.m., Monday through Friday. The curb tow-away lane does not appear to be heavily used by traffic or transit. A trial removal of the peak-period tow-away lane restrictions on the east side of 6th Street between Folsom and Market streets may improve pedestrian safety and comfort by decreasing the pedestrian crossing distance across 6th Street traffic lanes and by increasing the separation between pedestrians on the sidewalk and moving traffic. Removing a lane of traffic could also help to decrease traffic speeds during peak periods. If the project is successful, curb parking spaces could conceivably be converted to other uses such as parklets to increase the amount of open space in the area. By removing tow-away regulations on 6th Street, parking enforcement resources currently dedicated to enforcing the peak period tow-away restrictions could be freed up for other uses.

Streetscape Improvements, San Francisco Redevelopment Agency

In 2006, public streetscape improvements on 6th Street between Market and Harrison Streets were completed. The streetscape improvements included widened sidewalks, new street trees, and ornamental street lights. These improvements could be expanded to other alleys along 6th Street.

RECOMMENDED IMPROVEMENTS

Two alternatives are proposed for further study that includes major changes suited for the corridor with the highest pedestrian injury levels in the city. Both aim to slow vehicles significantly and to improve crossing conditions, especially at the crossings of 6th Street at alleys. The first alternative is a road diet, which would reduce the number of travel (traffic) lanes to one in each direction. This would also widen the sidewalks, providing additional area for walking and gathering. It would also reduce traffic exposure through a wide median and "flex space" in the roadway. It would reduce speeds directly by retiming signal progression for 20 mph. The second alternative would retain two travel lanes in each direction, but would signalize the crossings of 6th Street at alleys and provide curb bulb-outs at intersections and alley crossings to increase pedestrian visibility and sidewalk space. The second alternative could be provided as an interim phase, or as an ultimate solution.

Both alternatives would entail major costs, and are not funded. However, the SFMTA is proposing that the alley intersection of 6th and Minna be prioritized and included in a signal design/construction package. These alternatives may also require an Environmental Impact Report, especially the road diet. This would entail a detailed traffic study considering the impacts on traffic level of service (LOS), the potential for diversion to other streets, and the likely impacts on Muni service. Therefore, it could require at least two years for implementation. Either alternative would also need to be coordinated with other planning work in the area, such as the Eastern Neighborhoods Transportation Planning Study (ENTRIPS) and the Western SoMa Neighborhood Transportation Plan (WS NTP).

ALTERNATIVE 1 RECOMMENDED IMPROVEMENTS:

Corridor-wide Treatments

- Reduce to one travel lane in each direction on Sixth Street
- Post 25 mph speed limit signs
- Re-time signals for 20 mph progression along Sixth Street
- Improve lighting at crossings
- Install accessible curb ramps & advance limit lines
- Create flush median with textured surface treatment
- Restrict left turns to and from alleys onto sixth street
- Establish a "flex zone" between parking lane and travel lane
- Marked crosswalks with pedestrian refuges at alley crossings
- Informal seating at sidewalk extensions

Intersection Improvements

- Corner bulb-out at Taylor Street
- Sidewalk extensions on one or both sides of Sixth Street at Market
- Right-turn pockets at Mission Street
- Pedestrian refuge with thumbnails at Mission Street

ALTERNATIVE 2: RECOMMENDED IMPROVEMENTS

Corridor-wide Treatments

6th Street (Market to Howard)

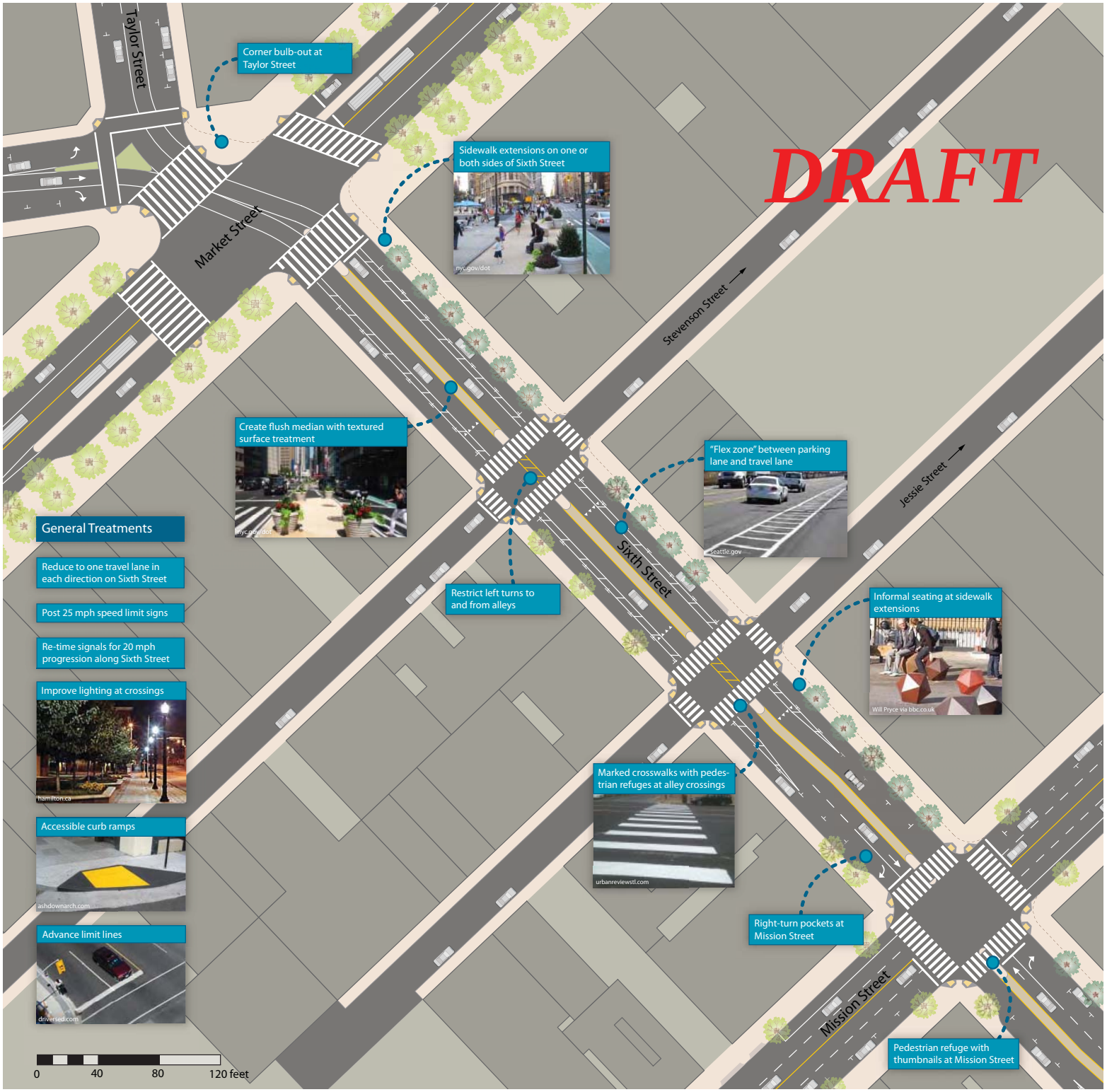
- Widen sidewalk on one side of 6th street
- Sidewalk extensions with mid-block parking/ loading bays

6th Street (Howard to Folsom)

- Moveable sidewalk extensions with low plantings and or furniture
- Remove tow away lane to provide all day parking/loading

Intersection Improvements

- Continental crosswalks with advance stop bars
- Signalize alley crosswalks

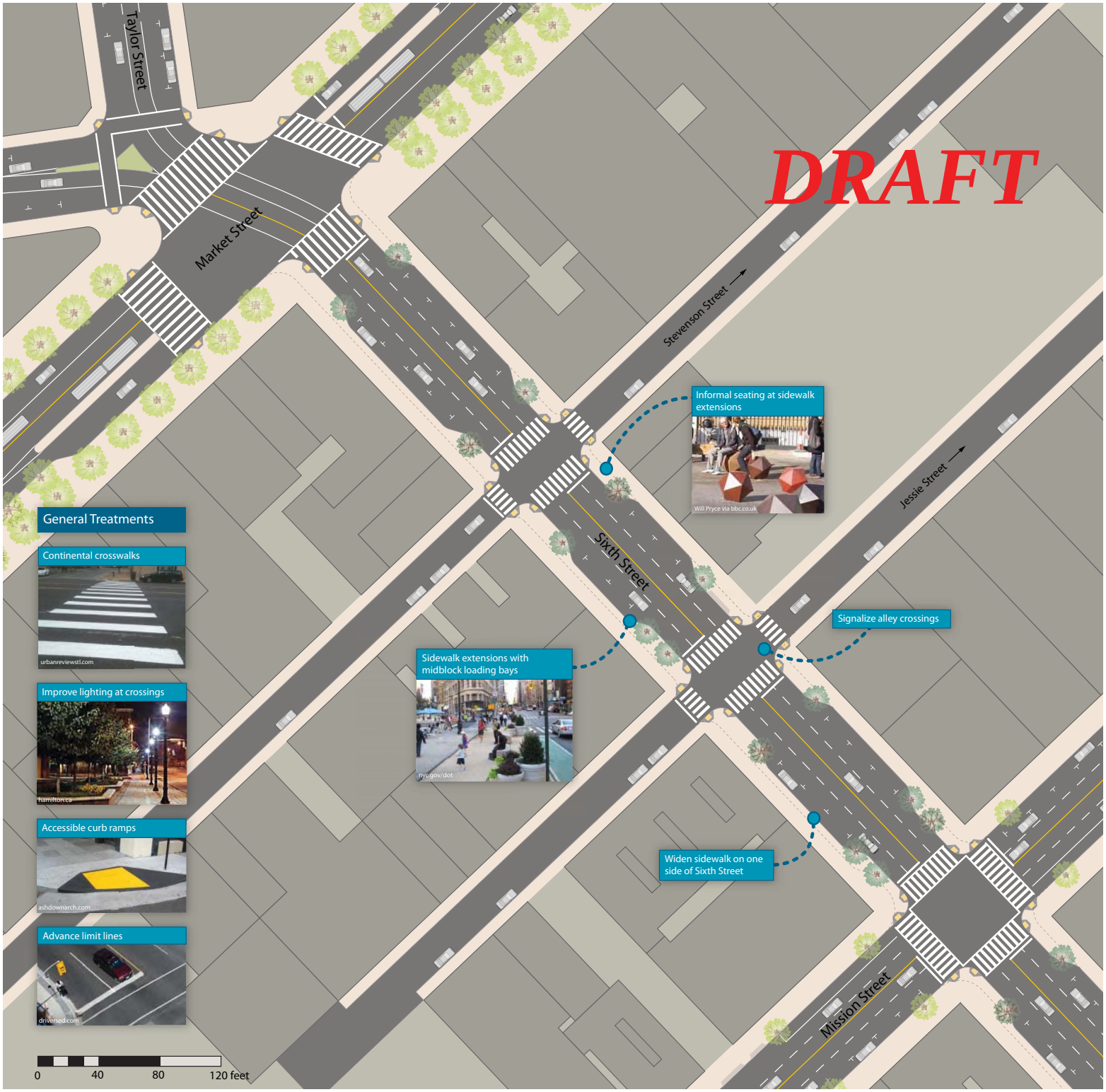


Alternative 1

DRAFT
CONCEPT DESIGN

Alternative 2

DRAFT
CONCEPT DESIGN



8.3 CASE STUDY: STOCKTON STREET (SACRAMENTO - WASHINGTON)

BACKGROUND

Stockton Street has one of the City's highest pedestrian activity composite scores (based on a variety of factors including transit ridership, pedestrian generators, income levels, street slope, journey to work data, and the presence of seniors, youth and persons with a disability). Chinatown is one of the densest neighborhoods in San Francisco and is also a major tourist destination. There are very high concentrations of pedestrians in this area, and one of the highest densities of youth and seniors in San Francisco. The 30-Stockton, 45-Union, and 8X-Bayshore Express bus lines run along Stockton through Chinatown from Union Square to North Beach. The future Central Subway will run below grade of Stockton.

The Chinatown portion of Stockton has many retail outlets, particularly grocery stores. Additionally, these streets segments are estimated to be within: ⅛ mile of three senior centers (Ming Yee Kee Loo, Yee Ying Music Association and Self Help for the Elderly), less than ¼ mile of several public spaces or playgrounds (Collis P. Huntington Park, Chinese Recreation Center, Woh Hei Yuen, Portsmouth Square, and Will "Woo Woo" Wong Playground), less than ¼ mile of several schools (Jean Parker Elementary, Gordon J Lau Elementary, Chinese Education Center, and San Francisco City College's Chinatown Campus), and within ½ mile of the Academy of Art and the University of the Pacific. The major tourist destination of Grant Street is less than ⅛ mile away, which includes numerous tourist hotels in the immediate area

PEDESTRIAN SAFETY & STREETSCAPE EFFORTS

Chinatown Pedestrian Safety Plan, Chinatown Community Development Center

The Pedestrian Safety Plan prioritizes 8 project areas to direct future funding. These areas have high pedestrian volumes, poor pedestrian amenities, and frequent mention in interviews and at the public forum. Stockton Street from Vallejo Street to Sacramento Street was identified as priority project #1. Improvements aim to increase pedestrian space, comfort, and freedom of movement by adding pedestrian scramble phases and full intersection crosswalk treatments– to allow crossing in all directions, including diagonally, and define the right-of-way area – and curb extensions at intersections, adding seating, removing old signage and meter posts, and eliminating newspaper racks. Strategies to decrease vehicle speeds and turning conflicts include replacing standard "No Right on Red" signs with LED signage, which illuminate to eliminate turning movements during pedestrian phases, and adding a dedicated left turn signal phase to the traffic lights.

Central Subway Chinatown Station Community Design Guidelines, Chinatown Community Development Center

The southwest corner of Stockton and Washington Streets has been chosen as the site for the Central Subway Chinatown Station. Preliminary SFMTA concept drawings indicate one station entry only, located in an indoor lobby within a new building built to the existing zoning for market-rate developments. The CCDC believes that this project creates opportunities to implement several of the Stockton Street Enhancement Project Report's recommendations for physical street improvements, including corner sidewalk widening, bilingual signage, and larger more-open bus shelters. The Community Design Guidelines list many pedestrian-related elements, including: multiple station entrances and elevators; street-level open space with seating and greenery; bus stops adjacent to station entrances; bus bulbs and open bus shelters; corner bulb-outs; and pedestrian-scale lighting.

RECOMMENDED IMPROVEMENTS

Proposed improvements address Stockton Street's needs as a corridor with very high current pedestrian volumes, to the extent that some pedestrians may be tempted to walk in the street for short distances. Improvements also address the need to support the existing "pedestrian scramble" signal operations at Washington and Clay Streets. The proposed Sacramento Street improvements would address the conflicts between left turning traffic and pedestrians at an intersection that does not have a pedestrian scramble, but where drivers may be distracted from pedestrians by "tunnel vision," speeding to and from the tunnel.

The Central Subway project, which is completing design and starting construction, may provide an opportunity to implement recommendations in a cost-effective manner. Recommendations will be studied further and coordinated with station entrances and other Central Subway features.

CORRIDOR-WIDE TREATMENTS

- Accessible pedestrian signals
- Pedestrian-scale lighting focused on crosswalks
- Update curb ramps to ADA compliance
- Multi-space parking meters to reduce sidewalk clutter

INTERSECTION IMPROVEMENTS

Washington and Stockton

- New bus bulbs and relocated stops for access to Central Subway Station
- Marked diagonal crossing and decorative paving to emphasize the pedestrian scramble
- Sidewalk extension at future Central Subway station entrance
- 24-hour two-phase signal operation at Washington

Clay and Stockton

- Red visibility curb
- Diagonal crossing and decorative paving to emphasize the pedestrian scramble
- Sidewalk extension

Sacramento and Stockton

- Decorative paving at crosswalk
- Left turn pocket and exclusive signal phase
- Radar speed displays near tunnel
- Rumble strips or textured pavement at tunnel exit

DRAFT CONCEPT DESIGN

8.4 CASE STUDY: GEARY BOULEVARD (ARGUELLO - PALM)

BACKGROUND

Geary Boulevard is a major east west transit corridor, with future plans for a Bus Rapid Transit system, currently in the environmental study phase. The corridor is surrounded by neighborhood commercial and residential land uses from Union Square to Ocean Beach. Arguello Boulevard is a primarily residential street with clusters of commercial activity between Clement Street and Balboa Street. At the intersection of these two streets, there is a new senior residential and support services campus for the Institute on Aging. This intersection has a high concentration of seniors and youth, populations particularly more vulnerable to pedestrian injuries. Additionally, this intersection is located within: a commercial district, ⅛ mile of a school (Roosevelt Middle School) and senior center (Institute on Aging), ¼ mile of a park (Rossi Playground) and hospital (Sutter Visiting Nurse Association & Hospital), and ½ mile of UCSF & USF.

PEDESTRIAN SAFETY & STREETSCAPE EFFORTS

Geary Bus Rapid Transit (BRT), San Francisco County Transportation Authority

Geary BRT would create a new exclusive busway from just east of Gough Street to the outer Richmond. Center platform and side-running alignment alternatives are being considered. With pre-paid fares and multiple-door boarding, bypass lanes for express buses, and car-free transit lanes, the Transportation Authority expects to shave from five to nine minutes off the typical trip, as much as 30% of the transit travel time in the dedicated busway portion of the corridor. With stations instead of stops and low-floor buses with multiple doors operating in a smooth alignment, BRT provides a high level of transit amenity, comfort, and reliability.

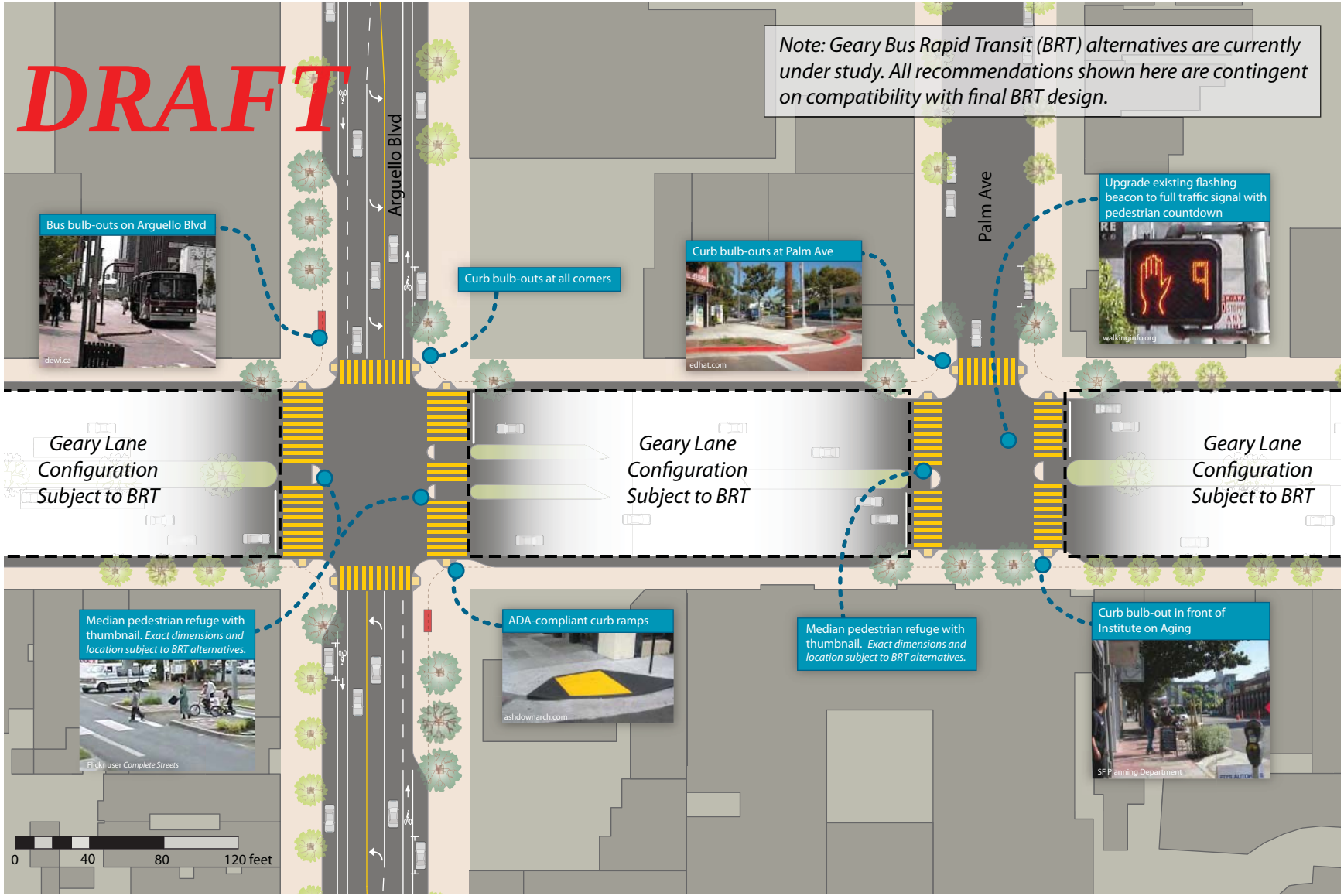
RECOMMENDED IMPROVEMENTS

The Geary Bus Rapid Transit (BRT) alternatives are currently under study. All WalkFirst recommendations are contingent on compatibility with the final BRT design. Since Geary Blvd. is one of the widest streets in the City, the recommendations primarily attempt to mitigate the impact of the very wide crossings by extending the sidewalk at intersections and providing median refuges. Improvements also address the conflicts between left turning traffic from Arguello and pedestrians crossing Geary and better protect pedestrians crossing Geary at Palm Avenue to and from the new Institute on Aging Campus. The recommendations are generally compatible with different alignment alternatives.

INTERSECTION IMPROVEMENTS

- Bus bulb-outs on Arguello Blvd (transit stops on Muni Route)
- Curb bulb-outs at all corners
- Curb bulb-outs at Palm Ave
- Upgrade existing flashing beacon at Palm Avenue to full traffic signal with pedestrian countdown
- Median pedestrian refuge with thumbnail. Exact dimensions and location subject to BRT alternatives.
- ADA-compliant curb ramps Median pedestrian refuge with thumbnail. Exact dimensions and location subject to BRT alternatives.
- Curb bulb-out in front of Institute on Aging on Geary

DRAFT CONCEPT DESIGN



8.5 CASE STUDY: SILVER AVENUE (BAYSHORE BOULEVARD- SAN BRUNO AVENUE)

BACKGROUND

Silver Avenue is a key street providing a direct connection between the neighborhoods of Silver Terrace and Portola. The 101/280 freeway connector is located directly above this street segment (with the 101 freeway mainline below) which can create a perceived barrier for pedestrians and preventing the full use of this important connection. In this area, there is a relatively high density of youth, and the median household income is relatively low compared to the City. Additionally, this street segment is estimated to be within: a commercial district, 1/8 mile from a health clinic (Silver Avenue Family Health Center) and a park (Silver Terrace Playground), and ¼ mile of a school (Thurgood Marshall High).

PEDESTRIAN SAFETY & STREETSCAPE EFFORTS

San Bruno "Great Street" streetscape improvements, San Francisco Department of Public Works

San Bruno Avenue Streetscape Improvements was the first completed project of the new Great Streets program. The scope of work included 120 new street trees, enlarged tree wells and the installation of street banner poles and banners. Four major goals were identified for San Bruno Avenue through the planning process, including the following:

- Improving the commercial corridor by providing a more pleasant pedestrian experience
- Making San Bruno Avenue a more inviting, friendly, and safe environment
- Promoting a pedestrian-friendly corridor
- Balancing the needs of businesses and residents

RECOMMENDED IMPROVEMENTS

The recommended improvements would extend the San Bruno Avenue "Great Streets" environment to the San Bruno intersection with Silver Avenue and the Silver overcrossing over the 101 freeway. They would also try to improve pedestrian-transit connections and transit conditions at an important Muni transfer location. Improvements aim to slow vehicles on the overcrossing by narrowing lanes and providing a wider median with pedestrian refuges. Relocating the bus stop on San Bruno closer to Silver should reduce the desire to cross mid-block. Signal phasing changes would reduce pedestrian conflicts with left-turning vehicles.

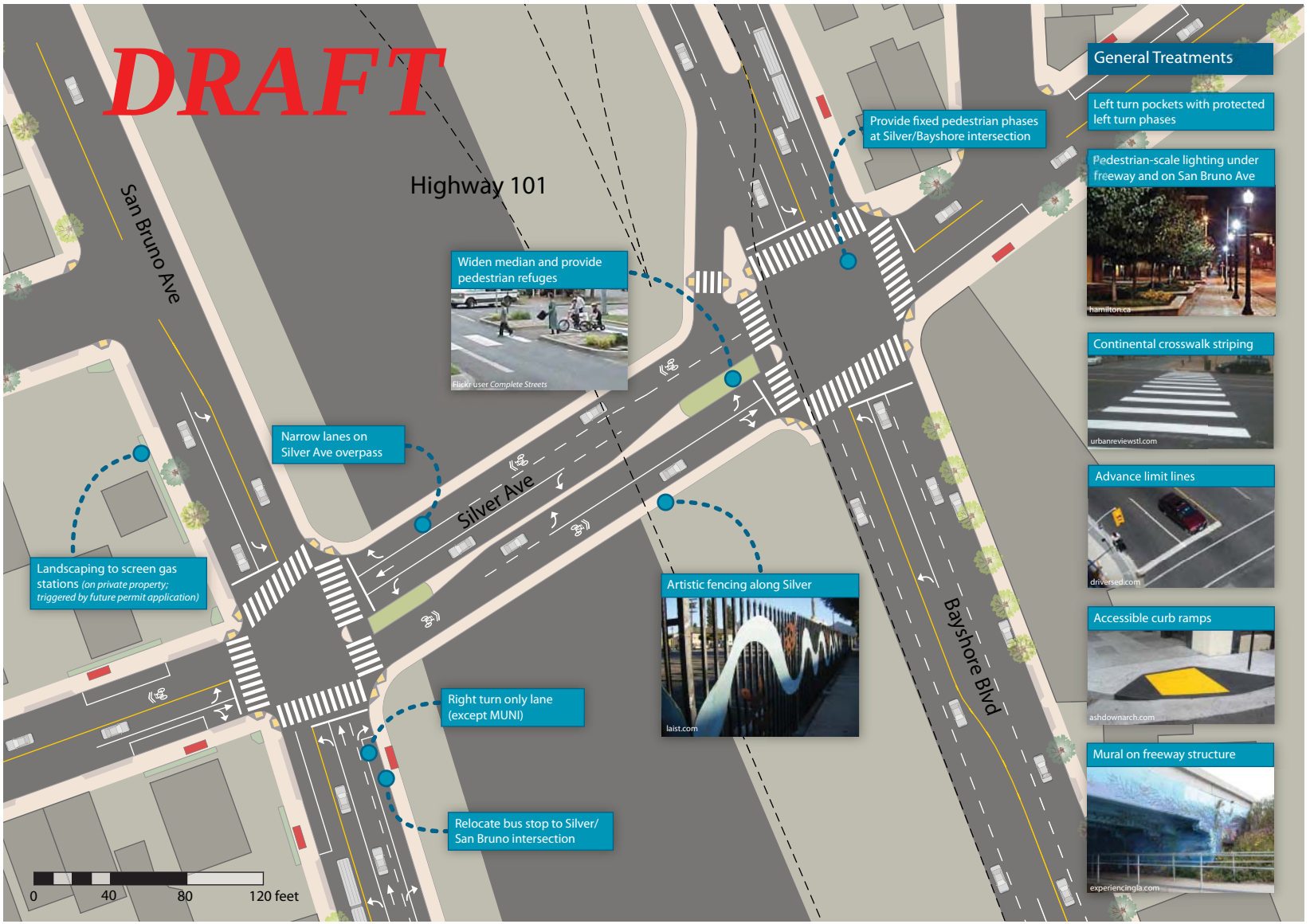
CORRIDOR-WIDE TREATMENTS

- Left turn pockets with protected left turn phases
- Pedestrian-scale lighting under freeway and on San Bruno Ave
- Continental crosswalk striping
- Advance limit lines
- Accessible curb ramps
- Mural on freeway structure

INTERSECTION IMPROVEMENTS

- Landscaping to screen gas stations (on private property; triggered by future permit application)
- Narrow lanes on Silver Ave overpass
- Right turn only lane (except Muni)
- Relocate bus stop to the intersection of Silver & San Bruno
- Widen median and provide pedestrian refuges
- Artistic fencing along Silver
- Provide fixed pedestrian phases at Silver/ Bayshore intersection

DRAFT CONCEPT DESIGN



8.6 CASE STUDY: MISSION/PERSIA/OCEAN TRIANGLE

BACKGROUND

The Persia triangle is formed by the intersection of Mission Street, Ocean Avenue and Persia Avenue. Mission Street and Ocean Avenue are two neighborhood commercial streets with high volumes of transit ridership and pedestrian activity. Additionally, this intersection is estimated to be within 1/4 mile of five schools including (Balboa High School, Monroe Elementary and SF Community School); 1/2 mile from three senior centers (St. Mary's Adult Day Health, RSP Senior Services, Mission Neighborhood Centers); and 1/2 mile of five parks or playgrounds including Excelsior Playground, Crocker Amazon and McLaren Park.

PEDESTRIAN SAFETY & STREETSCAPE EFFORTS

Mission-Geneva Neighborhood Transportation Plan, San Francisco County Transportation Authority

This community-based transportation plan identifies transportation improvements that could be implemented in the near- to mid-term to address key neighborhood transportation-related concerns. The Plan recommendations focus on corridor-wide improvements to Mission Street and Geneva Avenue and some high-priority intersections. Specific recommendations for the Persia Triangle include:

- 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 lots, adding street furnishings and pedestrian scale lighting; and reducing transit delays
- Improve direct access to Balboa Park BART by rerouting Muni's 29-Sunset to use Ocean Avenue.

Persia Triangle Improvement Project, San Francisco Municipal Transportation Agency

A grant received from the Metropolitan Transportation Commission Lifeline Transportation Program (LTP) includes the following scope: installation of bus bulbs, consolidate bus stops, and other traffic and streetscape improvements in the Persia Triangle area.

RECOMMENDED IMPROVEMENTS

The Persia triangle is an important transit hub, and the recommendations would enhance the pedestrian-transit connections while improving pedestrian safety generally. Specifically, the recommended improvements would reduce crossing distances, widen sidewalks at bus stops and intersections, and make crossings more visible.

The Mission/Persia intersection has one of the highest pedestrian injury per crossing rates in San Francisco, partly related to conflicts between left turning vehicles and pedestrians. Left turn prohibitions from Persia are proposed to address this conflict. Recommendations will be refined in ongoing design work the SFMTA is undertaking.

General Treatments

- Bus bulb-outs
- Sidewalk bulb-outs
- Corner bulb-outs
- Pedestrian-scale lighting focused on crosswalks and bus stops
- Limit lines
- ADA-compliant curb ramps

SPECIFIC IMPROVEMENTS

- Stop signs at Ocean and Persia (requires further analysis)
- Square off Persia/Ocean intersection
- Informal seating at large bulb-outs
- Left turn prohibition from Persia (both directions) except Muni

DRAFT CONCEPT DESIGN

CHAPTER

9

Funding Strategy Considerations

9.1 INTRODUCTION

Appendix A8 shows funding programs that support pedestrian projects in San Francisco. Locally-funded programs are the largest sources of funding for pedestrian projects, with approximately $10 million provided by the Prop K transportation sales tax. Federal, state, and regional funds combined provide more than half of the funds programmed to San Francisco pedestrian projects. A majority of this external funding is administered at the regional level by the Metropolitan Transportation Commission (MTC).

The total average annual funding for San Francisco pedestrian projects, estimated at $23.4 million, does not include the ongoing operational/maintenance and General Fund expenditures by the Department of Public Works (DPW), the San Francisco Municipal Transportation Agency (SFMTA), Public Utilities Commission (PUC), and other agencies that support the pedestrian realm, as well as developer fees and tax increment financing that fund pedestrian improvements. Moreover, this figure does not include pedestrian improvements constructed through larger capital projects such as street resurfacing and transit projects, as well as funding programs with a focused goal of promoting air quality improvements. While it is difficult to isolate the cost of pedestrian-specific improvements from these projects, walking plays a key role in the functioning of and connection between all transportation modes, and the related need to integrate pedestrian elements into transportation projects should not be underestimated.

In addition, most of the funding programs listed in Appendix A8 do not support incremental maintenance costs of improved, more pedestrian-friendly streetscapes. This issue echoes the analysis of the City Controller's recent Streetscape Maintenance Financing Strategies Report, which identified special assessment districts, special taxes, and community stewardship/maintenance programs as the most promising revenue sources for such incremental maintenance. Notably, all depend on the public's willingness to share in the responsibility for delivery and upkeep of "complete streets" projects.

9.2 RECOMMENDATIONS AND CURRENT PROGRESS

[1] Improve the integration of pedestrian elements in all transportation projects

Since walking is the most basic and vulnerable of all transportation activities by nature, improvements for pedestrians serve diverse goals and should be integral to project development for not only pedestrian-specific projects, but also as part of other streets projects, such as transit projects and major utility projects. The Better Streets Plan streetscape capital working group has recently launched a database with all planned projects to help facilitate such coordination. Also, to ensure such opportunities are matched with appropriate funding sources, the City has started developing a coherent citywide investment strategy for the pedestrian sector as part of WalkFirst, the Pedestrian Safety Task Force, and the San Francisco Transportation Plan update. The City should continue the positive progress to streamline and institutionalize the pedestrian planning and investment process to integrate pedestrian elements in all transportation projects.

[2] Build local capacity to deliver projects with a steady flow of funds

Given that locally programmed funds support the majority of pedestrian projects, the City needs to assess its project delivery process and the capacity to expand should more funding be dedicated to the planning, design, and delivery of pedestrian improvements. Successful development and delivery of a prioritized citywide investment strategy is dependent upon the commitment and capacity of all involved City agencies. The advancement of the WalkFirst analyses and related, coordinated efforts, will help to better identify needs, prioritize investments, and coordinate project delivery.

[3] Advocate for dedicated funding for pedestrians

The large share of discretionary funds controlled by the MTC underscores the importance of pedestrian advocacy in the regional planning process, specifically the MTC's Regional Transportation Plan (RTP) process. The RTP currently under development will integrate long-range regional land use and housing policy with transportation investments through the Bay Area's inaugural Sustainable Communities Strategy (SCS), as required by SB 375. The development of the RTP/SCS is a key opportunity for San Francisco to advocate for a dedicated regional funding program to support pedestrian safety investments, since the RTP will ultimately drive investment decisions for discretionary funds. In particular, while WalkFirst focuses primarily on capital projects, the scarcity of funding sources for effective non-capital pedestrian initiatives, such as targeted enforcement programs and education efforts, deserves attention and calls for an increase in the share of discretionary funding programs. Developing clear priorities, documenting cost estimates, and analyzing comprehensive benefits of walking will also support revenue advocacy efforts, both within the City and the region.

9.3 RESOURCES

San Francisco County Transportation Authority (SFCTA) webpages

- Funding Opportunities: **www.sfcta.org/fundingops**
- Prop K: **www.sfcta.org/propk**
- San Francisco Transportation Plan: **www.sfcta.org/sftp**

RTP/SCS webpages

- MTC: **http://www.mtc.ca.gov/planning/plan_bay_area**
- SFCTA: **www.sfcta.org/rtp**