

# 2 Multi-Modal Operations

<b>2.1 Overview</b>	<b>147</b>
<b>2.2 Pedestrian</b>	<b>151</b>
<b>2.3 Bicycle</b>	<b>227</b>
<b>2.4 Transit</b>	<b>247</b>
<b>2.5 Vehicular Traffic</b>	<b>277</b>
<b>2.6 Parking</b>	<b>293</b>
<b>2.7 Delivery and Taxis</b>	<b>301</b>
<b>2.8 Safety</b>	<b>307</b>
<b>2.9 Hot Spots</b>	<b>321</b>







## 2.1 Overview

# 2.1 Overview

## Introduction

Market Street is used by hundreds of thousands of people each day, consisting of commuters, shoppers, visitors and residents. People travel along and across Market Street many ways – by foot, bicycle, riding a transit vehicle, and automobile.

During weekday peak periods, almost one-half of those traveling along Market Street are walking (at some point, all person-trips include a walking trip, e.g., a commuter departing a bus and walking to an office). About one-third of the person-trips are via transit vehicles traveling along the surface of Market Street. Fourteen percent of the trips are in private automobiles or taxis. While only five percent of the trips are currently by bicycle, the number of bicyclists using Market Street is increasing exponentially.

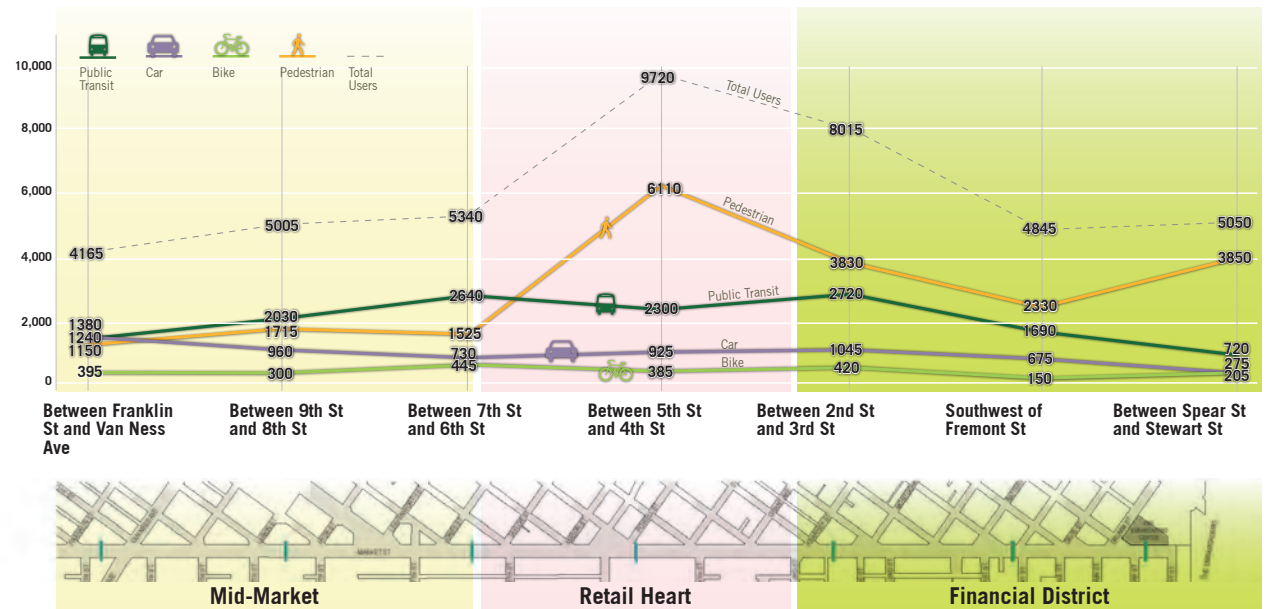
The two miles of Market Street between Octavia Boulevard and Justin Herman Plaza are characterized by unique districts with differing use and appeal, including the Mid-Market area west of 5<sup>th</sup> Street, the “retail heart” between 5<sup>th</sup> Street and 3<sup>rd</sup> Street, and the Financial District east of 3<sup>rd</sup> Street. Pedestrian, bicycle, public transit and automobile use vary significantly within each district, on weekdays and weekends, and at different times of the day.

Chapter 2 describes current pedestrian, bicycle, transit vehicle and automobile operations along and across Market Street considering each mode individually, each mode’s interaction with other modes, and each mode’s operations at different locations along Market Street and at different times of the day.

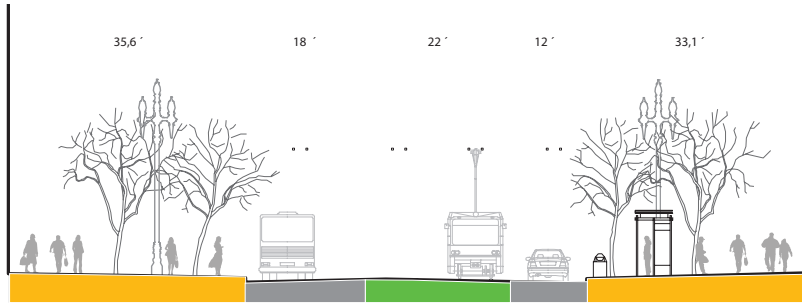
### During weekday peak periods, the average number of people traveling along Market Street



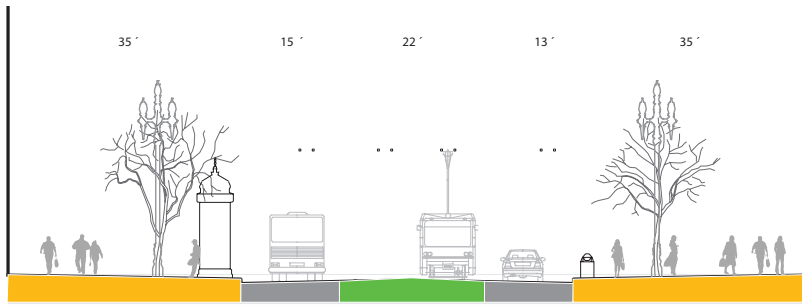
### Number of people along Market Street - by mode - peak weekday, 5-6 PM



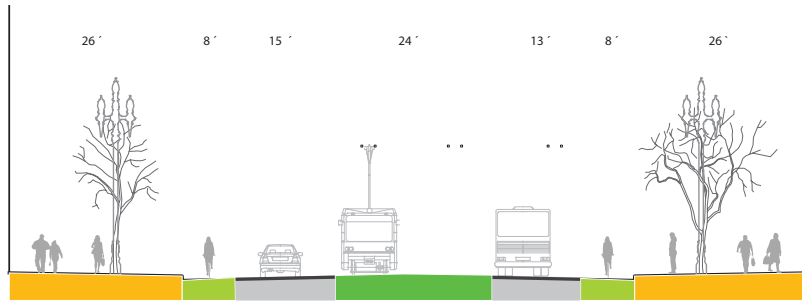
## Distribution of space - above grade



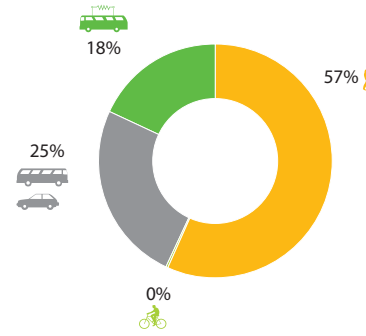
SECTION - Market Street SW of Fremont Street



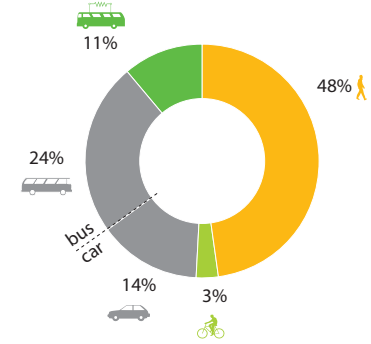
SECTION - Market Street between 5th & 4th Street



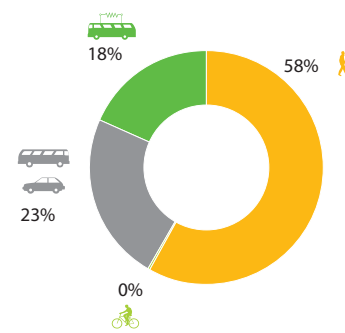
SECTION - Market Street between 9th & 8th Street



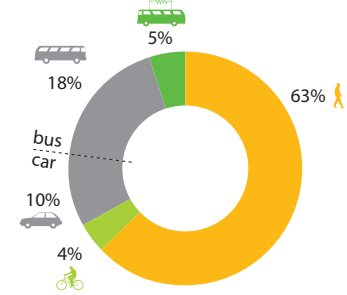
Space Distribution



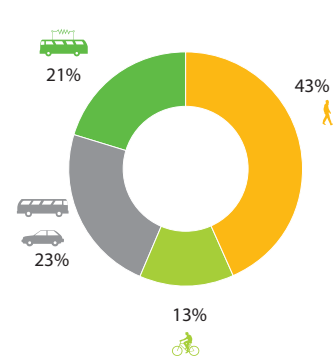
Volume of people/  
passengers



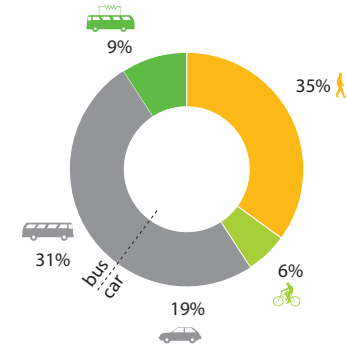
Space Distribution



Volume of people/  
passengers



Space Distribution



Volume of people/  
passengers

This chapter was developed based on a review of a substantial amount of data collected for the Better Market Street project, as well as hundreds of hours spent conducting field reviews. Public input gathered from open houses and other outreach contributed to the assessment of existing conditions. Planners, urban architects, traffic engineers and many other professionals worked collaboratively to document current multi-modal operations. The information contained in this chapter will be valuable as the project evolves into the design stage and applicable best practice treatments are considered.

The following sections are included in this chapter:

## **2.2 Pedestrian**

This section, also titled “Public Space Public Life”, is somewhat unique from the other sections because pedestrians more directly interact with land use and urban design contexts than users of other transportation modes. This section includes a general overview that includes the results of Gehl Architect’s Public Space Public Life Survey, an assessment of physical conditions, and an evaluation of pedestrian behaviors and major public spaces.

## **2.3 Bicycle**

The bicycle section includes information about bicycle volumes and their increased use, including comparisons to other major bicycle corridors in the world. Market Street bicyclist demographics, including age, gender, trip origin and trip purpose, are described. Market Street’s existing

bikeway infrastructure is illustrated and recent enhancements and proposed improvements are described.

## **2.4 Transit**

Existing transit service along and under Market Street is described in this section. Transit vehicle performance is documented, including ridership and the primary causes of transit vehicle delays along the corridor. The trip origins and destinations of Market Street transit riders from a previous study are summarized. Other fixed route transit services that operate along Market Street are described. Future planned transit-related projects that could affect Market Street operations are discussed.

## **2.5 Vehicular Traffic**

The vehicular traffic section describes current traffic volumes along and across Market Street, the major roadway routes used to access or cross Market Street, and the unique configurations encountered at various intersections along the street. Vehicle level-of-service is documented within the section and future traffic-related projects that may impact Market Street operations are discussed.

## **2.6 Parking**

The location of existing on-street and off-street (i.e., surface lot and parking garage) parking facilities are illustrated. Current off-street parking demands are compared to parking capacities. A description of SFpark’s new technologies and

policies to improve parking in San Francisco is provided.

## **2.7 Delivery and Taxis**

This section provides information about Market Street’s loading bays and regulated curb space, loading behaviors and operations, and taxi operations along the corridor.

## **2.8 Safety**

The safety section documents reported collision history along Market Street by mode and location. Collisions involving pedestrians, bicyclists and motorists at intersections, midblock locations, and near boarding islands are quantified. Transit vehicle collisions, include those along and those crossing Market Street, are summarized. The highest collision locations as well as factors potentially contributing to the collisions are discussed. On-going safety-related programs are described.

## **2.9 Hot Spots**

Eight locations along Market Street with unique attributes related to intersection geometry and multi-modal operations were chosen for focused analysis related to pedestrian circulation, bicycle circulation, transit operations, vehicular traffic, and loading and taxis. Key challenges relating to each mode at each location are identified; these will be addressed during the design phase of the Better Market Street project.

## 2.2 Pedestrian

<b>A. Walking on Market Street</b>	<b>155</b>
<b>B. The Pedestrian Environment</b>	<b>177</b>
<b>C. Hotspots on Market Street</b>	<b>191</b>
<b>D. Linger activities</b>	<b>205</b>

# 2.2 Pedestrian

## Introduction

This chapter includes three subsections: **Walking on Market Street**, **The Pedestrian Environment** and **Lingering Activities**.

**Walking on Market** provides an overview on pedestrian traffic volumes based on the Public Life Public Space Survey. The second part, **The Pedestrian Environment**, analyzes the physical conditions and the pedestrian experience concerning intersections, crosswalks and the ground floor frontage. The subsection, **Lingering Activities**, evaluates pedestrian activities in three key plazas adjacent to Market Street. Collectively, this analysis investigates the relationship between the physical and the social; how physical conditions of street and building impact the public life of Market Street.

## Key Findings

### Walking on Market Street

**The Intensity of pedestrian usage varies. Some areas along the street do not meet the threshold for perceived urbanity, in terms of pedestrian intensity, while other areas experience crowding and extreme peaks of pedestrian traffic.**

#### The Retail Heart

- Dominant use is leisure - increases in the afternoon and on the weekends.
- Market Street between 4th and 5th carry very high levels of pedestrians.
- During peak times, there is a high volume of pedestrians.

#### The Financial District

- Utilitarian type of use - mostly to and from work during rush hour and lunch breaks.
- Less intense use on weekends.

#### Mid-Market

- Low use throughout the day and week.
- The street section is consistent, despite the number of pedestrians using the space varying dramatically. Some stretches of sidewalks are too spacious for the volume of pedestrian traffic and other stretches are too narrow.

**Market Street is not well integrated into a wider public space network.**

- Located at the border of two different street grids, Market Street is perceived less as a 'unifier' (a street where neighborhoods and activities overlap and intersect), and more like a 'dividing line' (defining the boundary of districts and activities)
- With the exception of the Retail Heart, neighborhoods are separated by Market Street and are not well integrated with Market Street.
- Only at the Retail Heart does Market Street play an important role as part of a wider network of open spaces and major destinations, which stretch across Market Street.

**Despite numerous hotels and cultural venues nearby and along Market Street, there is very little pedestrian activity after 6 pm.**

- Some portions of Market Street were deemed to be unsafe to survey after 8 pm.
- Perceived safety is low between 6th street and 12th.
- Few night time uses and destinations along the street that stay open after 7 pm.
- Lack of residential use that could provide 'passive surveillance' of the street.

## The Pedestrian Environment

### Large sections of Market Street ground floor frontages fail to engage with the street.

- Only 22% of ground floor facades are attractive and pleasant.
- 44% of ground floor facades are dull and unattractive.
- Vacant and inactive ground floor units detract from Mid-Market area.
- Large scale buildings and few entrances limit street activity.
- Several plazas lack active ground floor use (retail, culture) as well as activate edges (high transparency, several entrances).

### Quantitatively conditions for pedestrians are satisfactory, but quality of experience is lacking.

- Pedestrian through zones on sidewalks (16-22.5 feet wide) is generous, providing space for improvements.
- Pedestrian desire lines (most direct route between A and B from a pedestrian's perspective) at sidewalks are kept free of obstructions. Street furniture, bus shelters, street trees etc. are already placed in separate furniture zones.

- Pedestrian crowding is generally not a problem.
- Pedestrian desire lines at intersections are interrupted at more than 40% of side street intersections on the northern side of Market St.
- At 36% of the northern side intersections, pedestrians are forced to cross in two-steps and to wait on small "islands" in the middle of the traffic.

## Lingering Activities

### Public spaces along Market Street do not invite for enough recreational or lingering activities.

- Levels of all stationary activities are in general low.
- There are an exceptionally low number of benches, commercial seating, or other opportunities to sit along Market Street and in adjacent open spaces.
- There are few invitations for people to engage in cultural, commercial, physical or playing activities along Market Street and in the plazas.
- Hallidie and Linear plaza are actively used during both the weekday and weekend. The other plazas surveyed are more heavily used either on the weekday or weekend, but not both.

### Market Street crosses through diverse neighborhoods yet the activities along the street are similar in character.

- Type of lingering activity surveyed, (i.e. standing and waiting for transport) are remarkably similar, despite varying character and intensity of use along the street.
- With the exception of the Retail Heart, Market Street is mostly used on weekdays, rather than on weekends.
- Sunken portions of their groundscape limit how plazas can be used.





000-  
HYDE

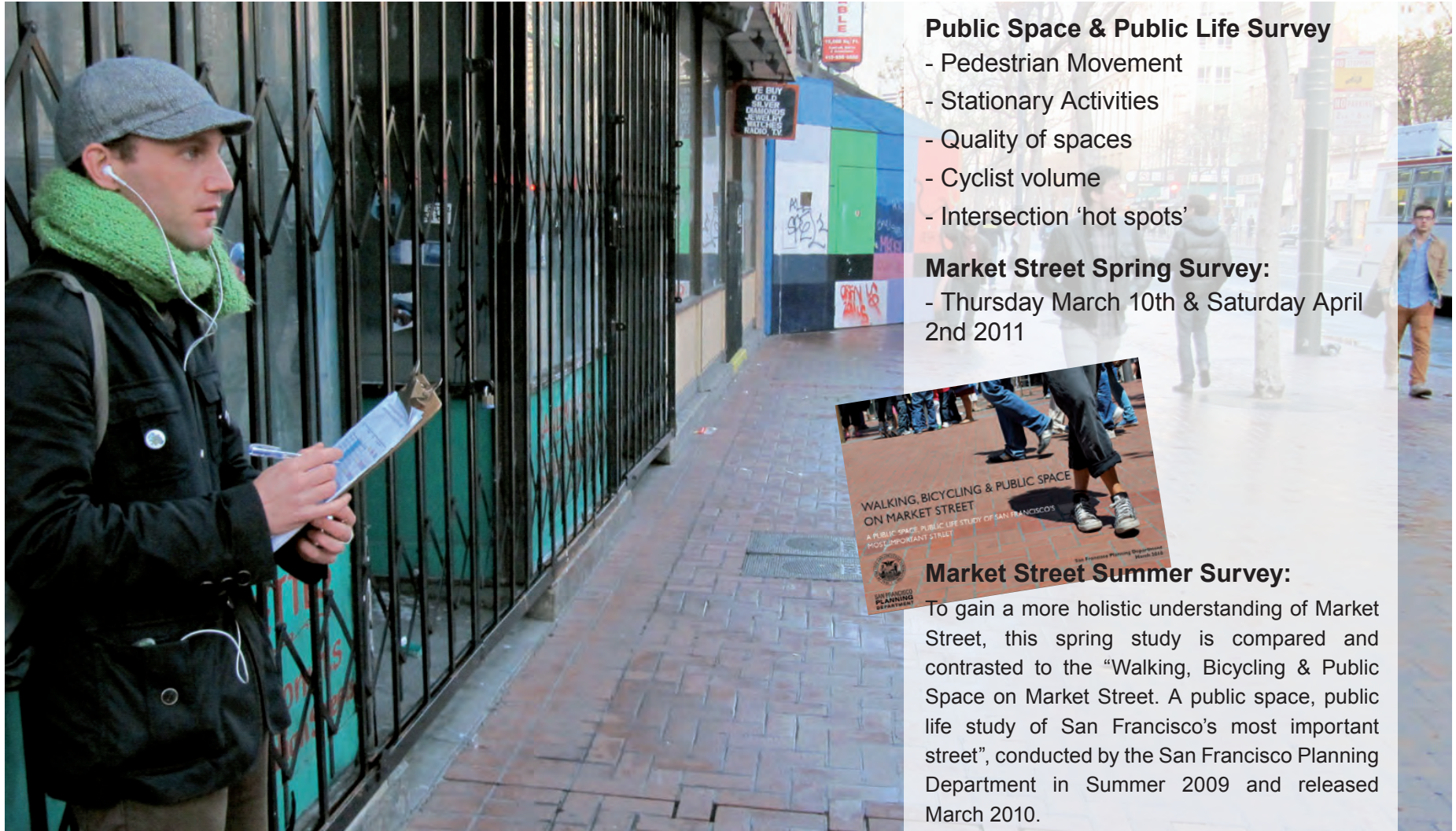
OPEN  
TIL MIDNIGHT  
OR LATER



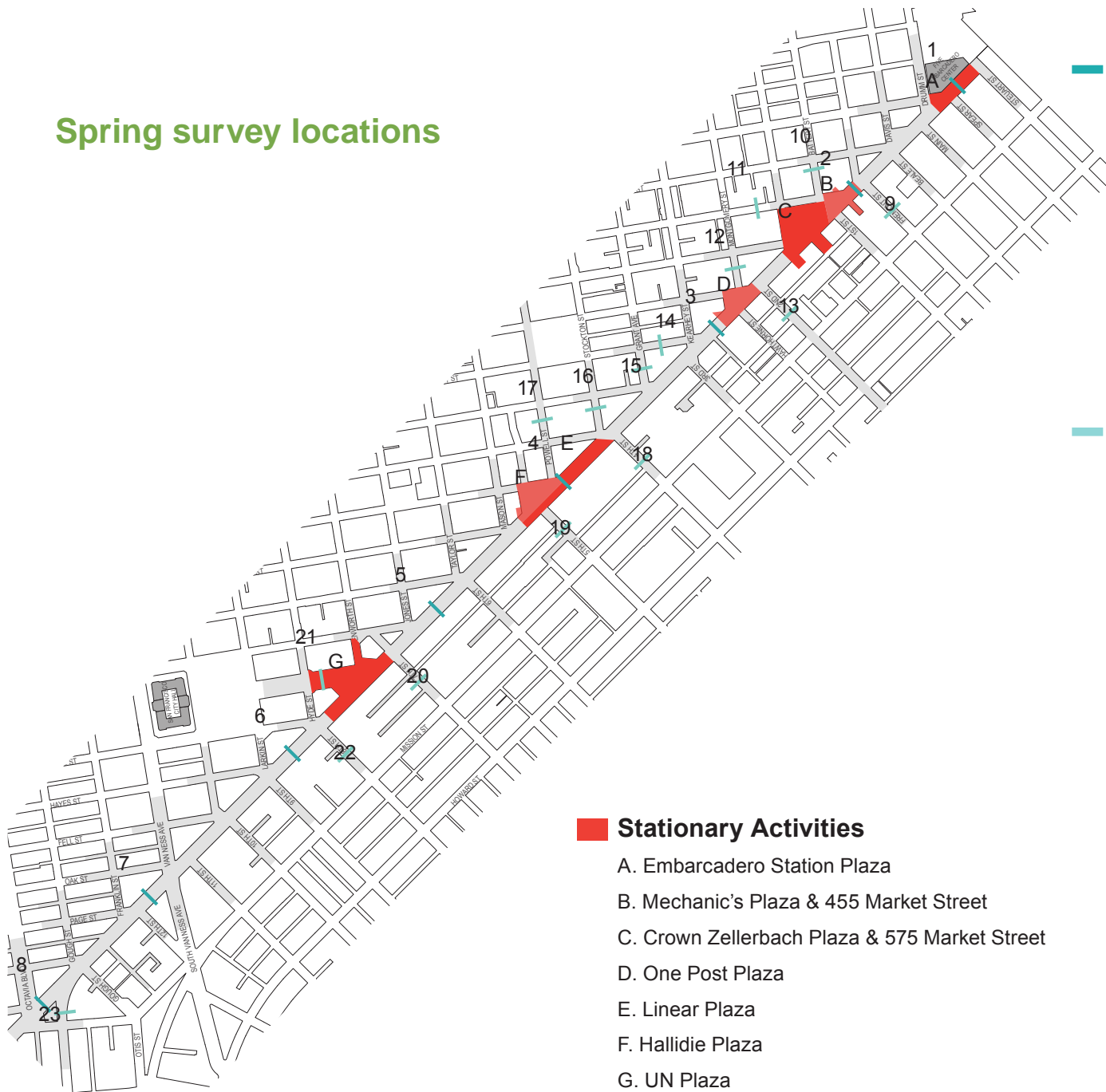
## **A. Walking on Market Street**

## A. Walking on Market Street

### PSPL Survey at Market Street



## Spring survey locations



### Pedestrian Movement

#### Market Street

1. Market St SW of Stuart St
2. Market St SW of Fremont St
3. Market St NW of Annie St
4. Market St NE of Powell St
5. Market St, betw. 6th St & McAllister St
6. Market St, betw. 8th St and 9th St
7. Market St, betw. Franklin St & Van Ness Ave
8. Market St, betw. Octavia Blvd. & Valencia St

#### Side streets

9. Fremont St, E of Market
10. Battery St, N of Bush St
11. Bush St, E of Montgomery St
12. Montgomery St, N of Post St
13. 2nd St, SE of Stevenson St
14. Geary St, E of Kearny St
15. Grant Ave, N of Market St
16. Stockton St, N of Market St
17. Powell St betw. Ellis & O'Farrell St
18. 4th St, betw. Stevenson St & Jessie E
19. 5th St, betw. Stevenson St & Mint Plaza
20. 7th St, betw. Stevenson St & Mission St
21. UN Plaza, E of Hyde St Mission St
22. 8th St, betw. Stevenson St & Mission St
23. Valencia St, betw. McCoppin St & Market St

### Stationary Activities

- A. Embarcadero Station Plaza
- B. Mechanic's Plaza & 455 Market Street
- C. Crown Zellerbach Plaza & 575 Market Street
- D. One Post Plaza
- E. Linear Plaza
- F. Hallidie Plaza
- G. UN Plaza

# Public life survey

## Pedestrians

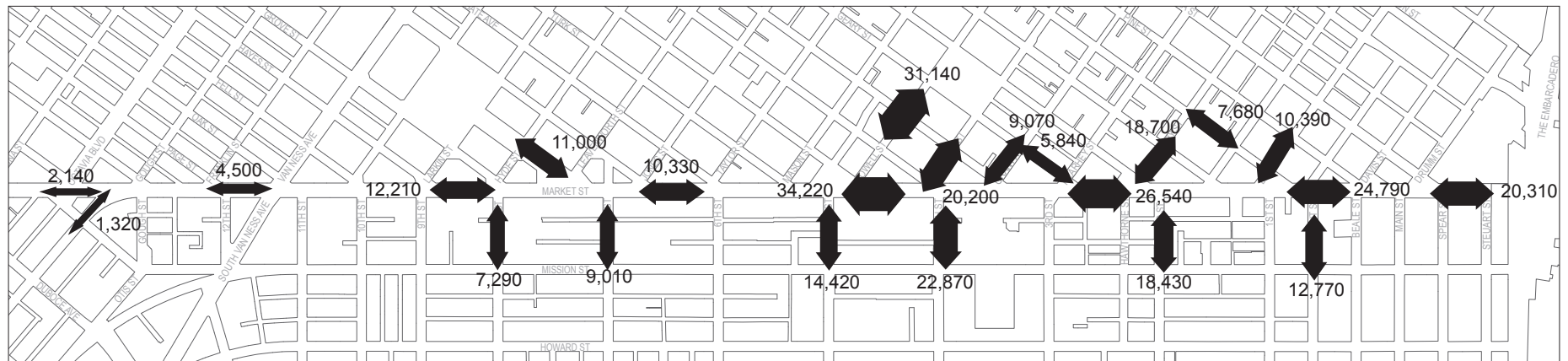


Thursday, March 10, 2011

Weather: Mix of rain and sunshine,  
windy, high in the low 50's

### Weekday pedestrian traffic, spring 2011

total amount of pedestrians 8 am - 6 pm



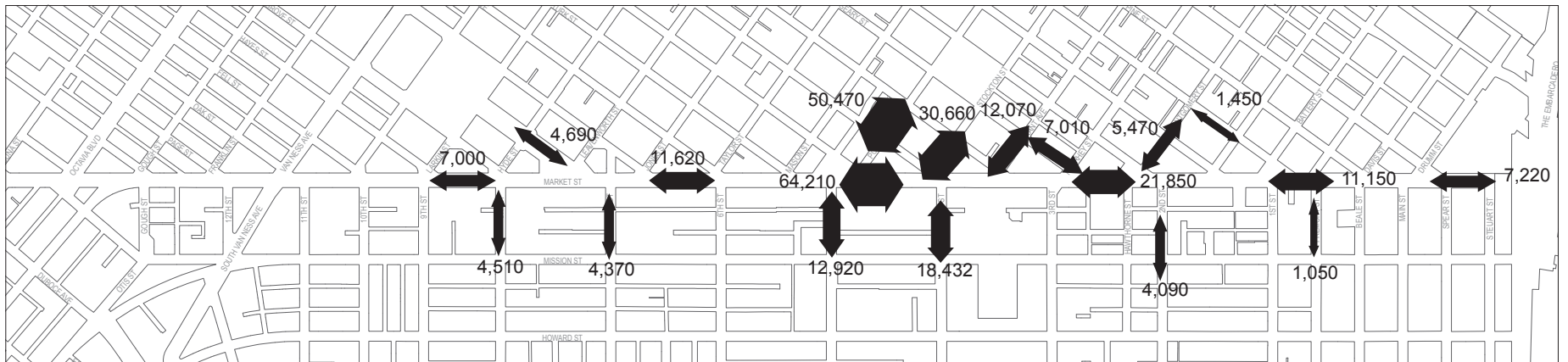
## Pedestrians



Saturday, April 2, 2011

Weather: Clearing to mostly sunny in the afternoon, windy, high in the low 60's

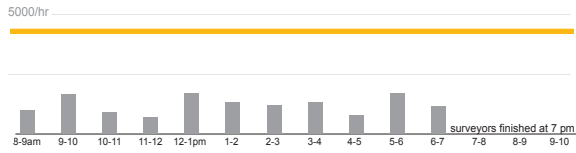
Weekend pedestrian traffic, spring 2011  
total amount of pedestrians 8 am - 6 pm





### 3 Distinct type of use and intensities

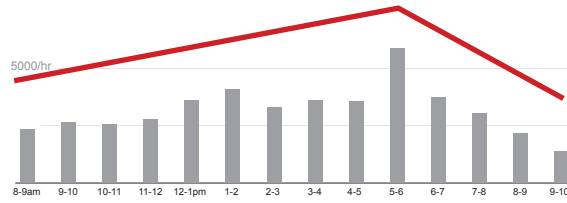
#### Mid-Market



**Market St, between 8th St and 9th St**  
Weekday, spring 2011, pedestrians by hour



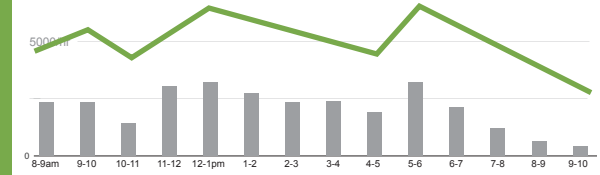
#### Retail Heart



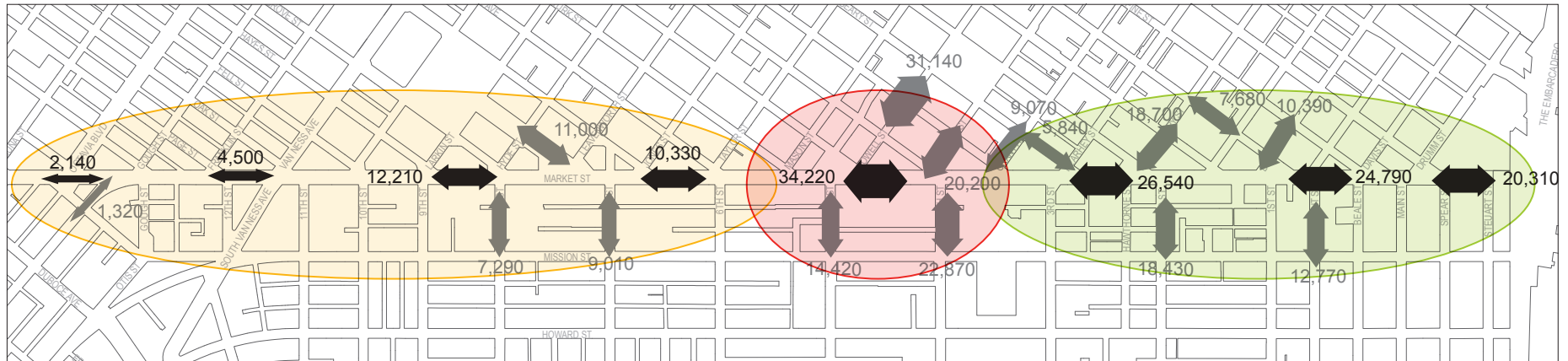
**Market St NE of Powell St**  
Weekday, spring 2011, pedestrians by hour



#### Financial District



**Market St SW of Fremont St**  
Weekday, spring 2011, pedestrians by hour



**Weekday pedestrian traffic, spring 2011, total amount of pedestrians 8 am - 6 pm**

## Mid-Market - there is always too much space

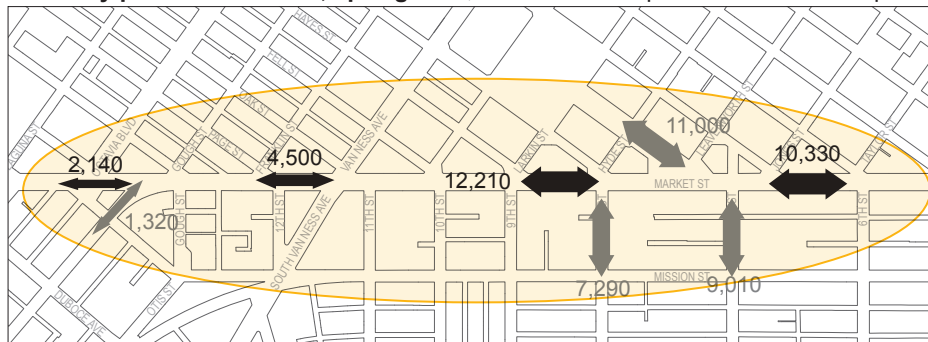
### Daytime footfall:

- Pedestrian traffic peaks at morning, lunch and afternoon.
- Large and expansive areas have been abandoned by pedestrians, limiting the potential walkability of this portion of Market Street.

### Under utilized sidewalks

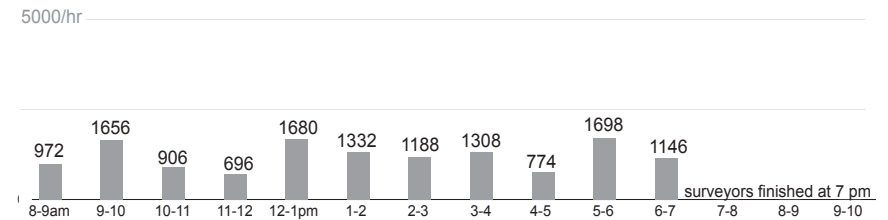
- There is no pedestrian crowding at any time of the day. International research indicates that crowding is defined as more than 237 people/hour/ft of clear sidewalk path.
- Based on the above metric, the current volume of pedestrians could walk comfortably on a clear sidewalk path of only, each sidewalk only needs to be 5ft wide.

Weekday pedestrian traffic, spring 2011, total amount of pedestrians 8 am - 6 pm



Market St, between 8th St and 9th St

7610 ped/hour ..... capacity of 2\*16' unobstructed sidewalks



### Weekday

spring 2011, pedestrians by hour



## Financial District - Sometimes there is too much space

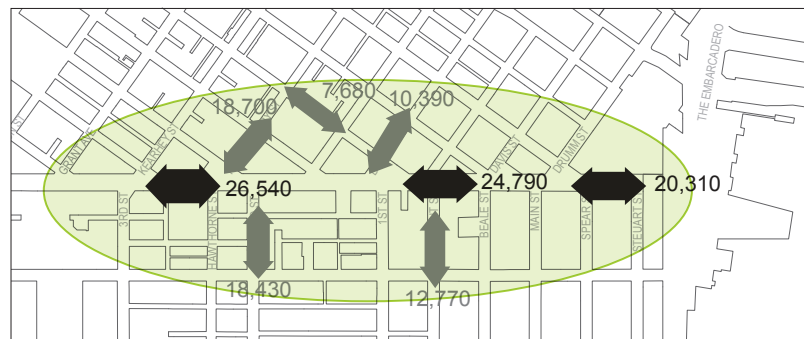
### Daytime footfall similar to office environment

- Activity generally only for utilitarian use, i.e. getting to and from work.
- Significant decrease in pedestrian use over weekends.

### Under utilized sidewalks

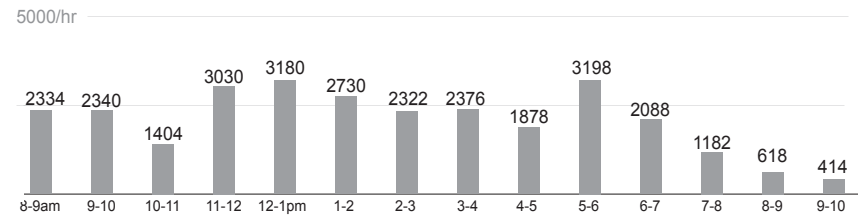
- There is no pedestrian crowding at any time of the day.
- Based on the definition of crowding on the previous page (237 people/hr/ft) the sidewalk clear path only needs to be 10ft wide on each side of the street to ensure comfortable passage.

**Weekday pedestrian traffic, spring 2011**  
total amount of pedestrians 8 am - 6 pm



**Market St SW of Fremont St**

7610 ped/hour ..... capacity of 2\*16' unobstructed sidewalks



**Weekday**  
spring 2011, pedestrians by hour





## Retail Heart - space and use is more balanced

Daytime footfall indicating leisure use:

- Higher levels of activity during the afternoon hours.

Threshold of perceived urbanity based on pedestrian use (1000 pedestrians per hour) is reached consistently throughout the day

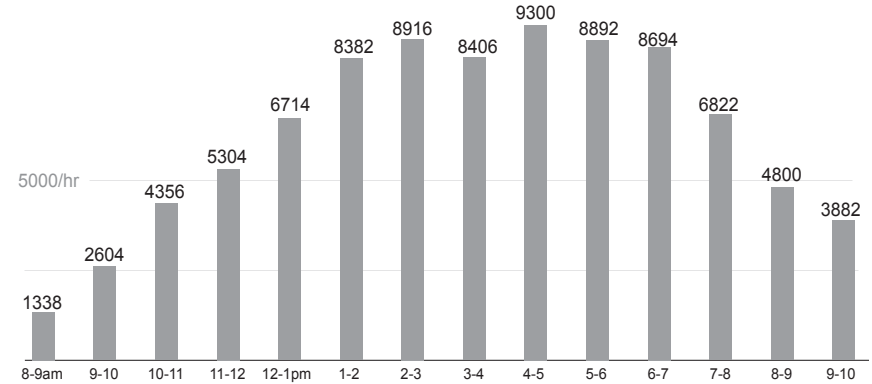
- With up to 9,300 pedestrians/hour

More activity but still not “crowded”

- Highest peak volume (9300 peds/hr) is still below the comfortable capacity of sidewalk (10,700 peds/hr).

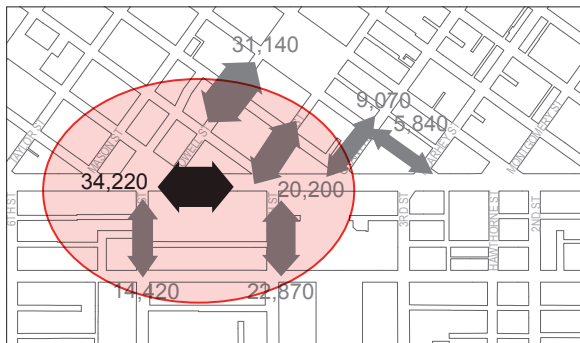
Market St NE of Powell St

10700 ped/hour ..... capacity of 2\*22.5' unobstructed sidewalks



Weekend  
Spring 2011, pedestrians by hour

Weekday pedestrian traffic, spring 2011  
total amount of pedestrians 8 am - 6 pm

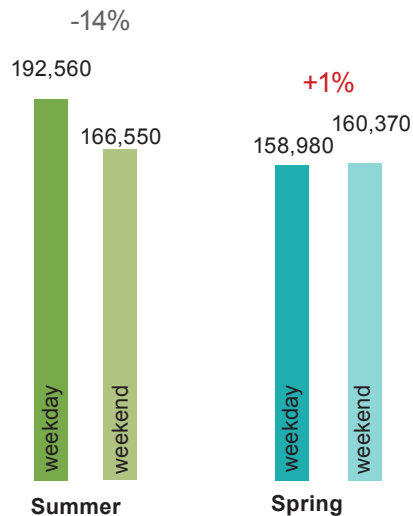


## Less weekend than weekday activity in all locations but the Retail Heart

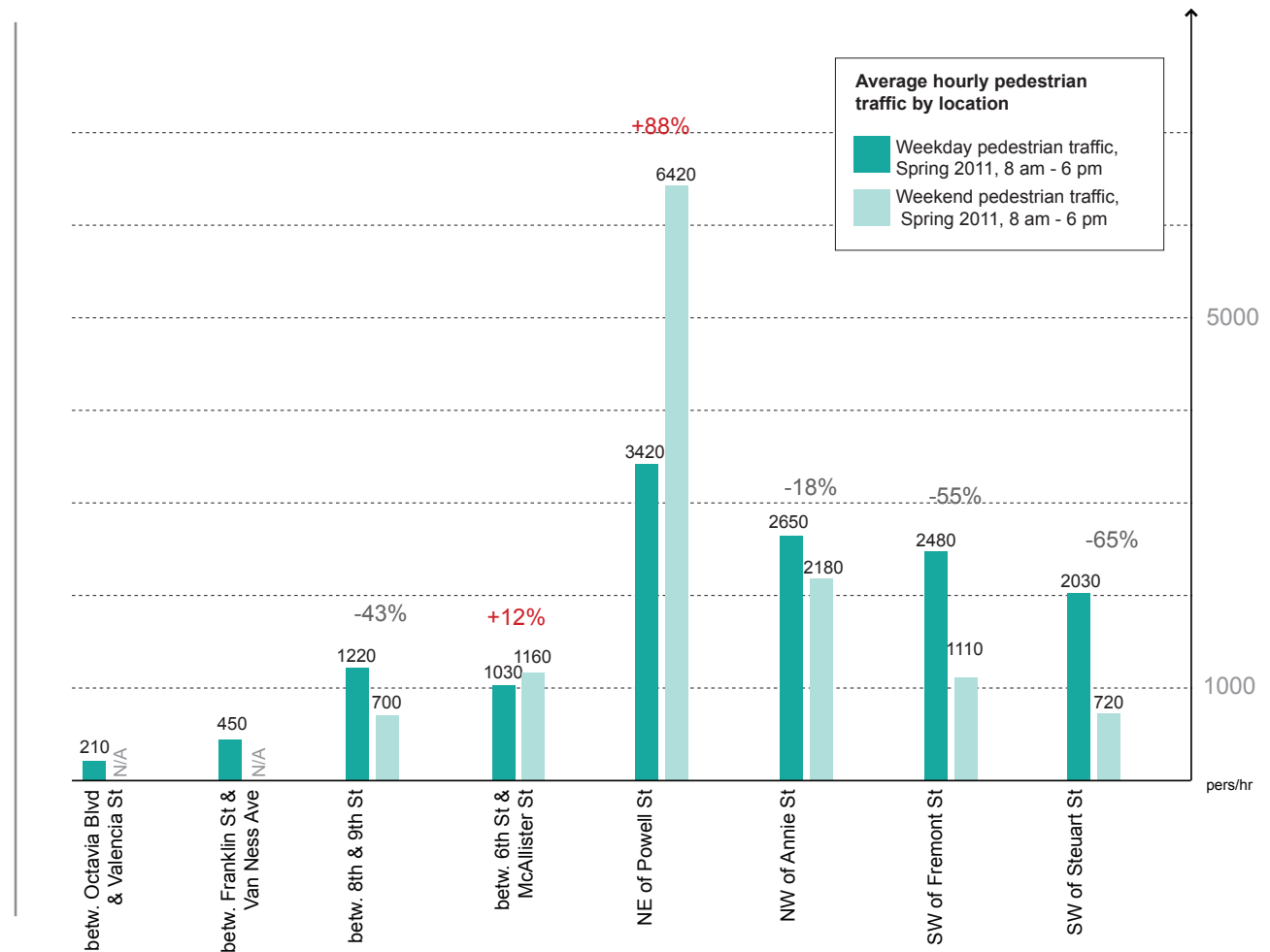
### Weekend pedestrian traffic concentrated at the Retail Heart

- Compared to weekday activities, there is an 88% increase between 4th and 5th on weekends.
- However, other locations have less activities over the weekend.

Daytime pattern and activity levels are similar in summer and winter but differences between weekday and weekend are, in general, smaller at each location.



**Pedestrian traffic**  
Total amount of pedestrians 8 am - 10 pm  
6 locations

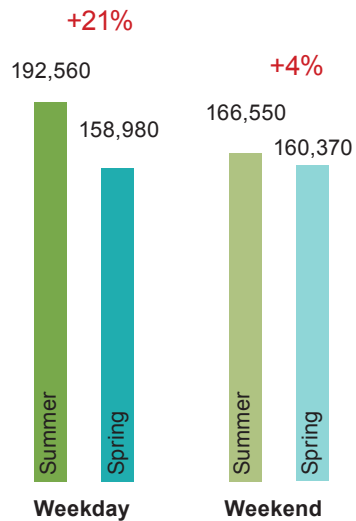


## Comparing summer and spring weekends

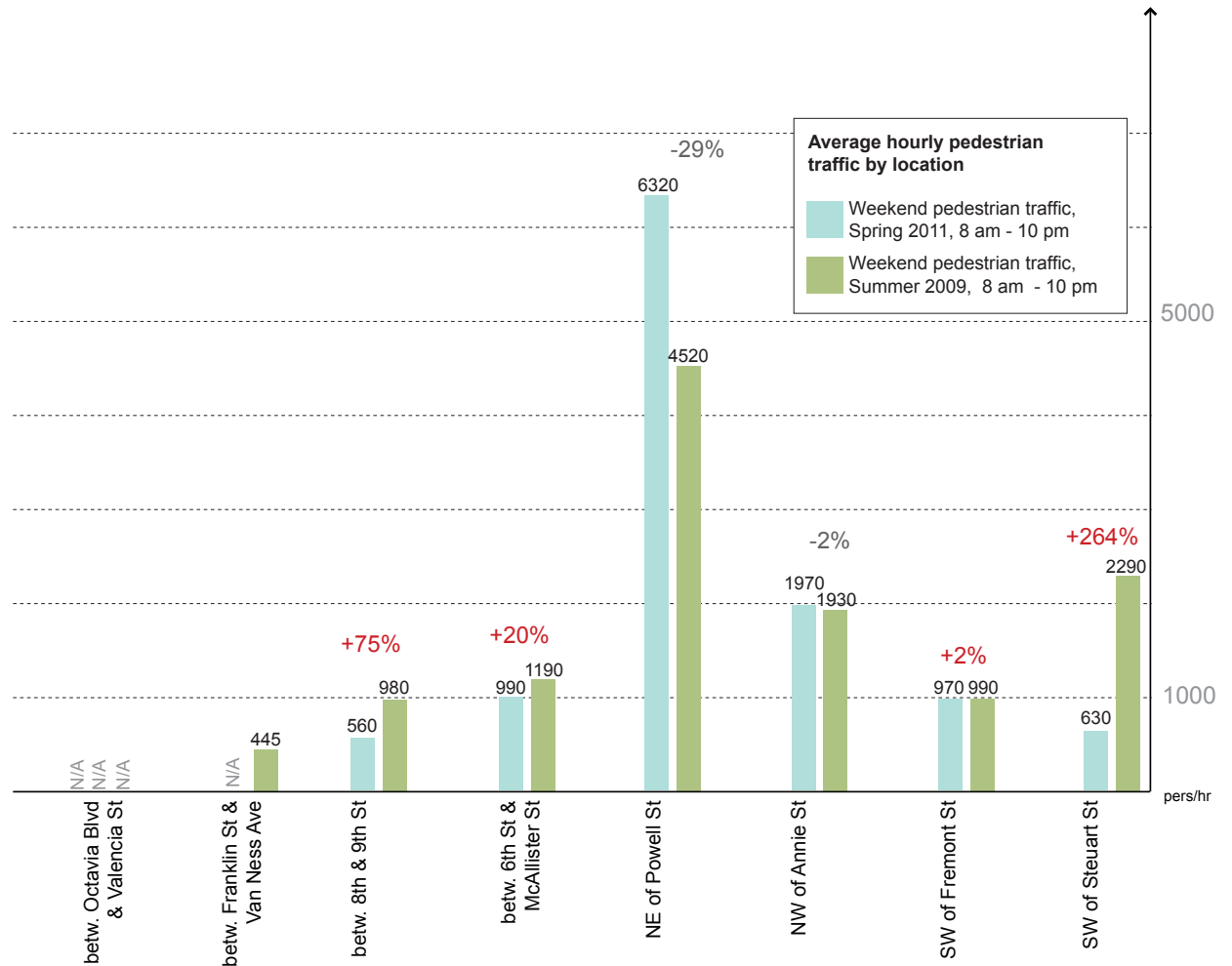
The highest level of pedestrian activity surveyed is near Powell on a spring weekend (64,200) or an average of 6,320 pedestrians per hour

- All locations experience an increase in summer weekend activity except near Powell Street and Annie Street.

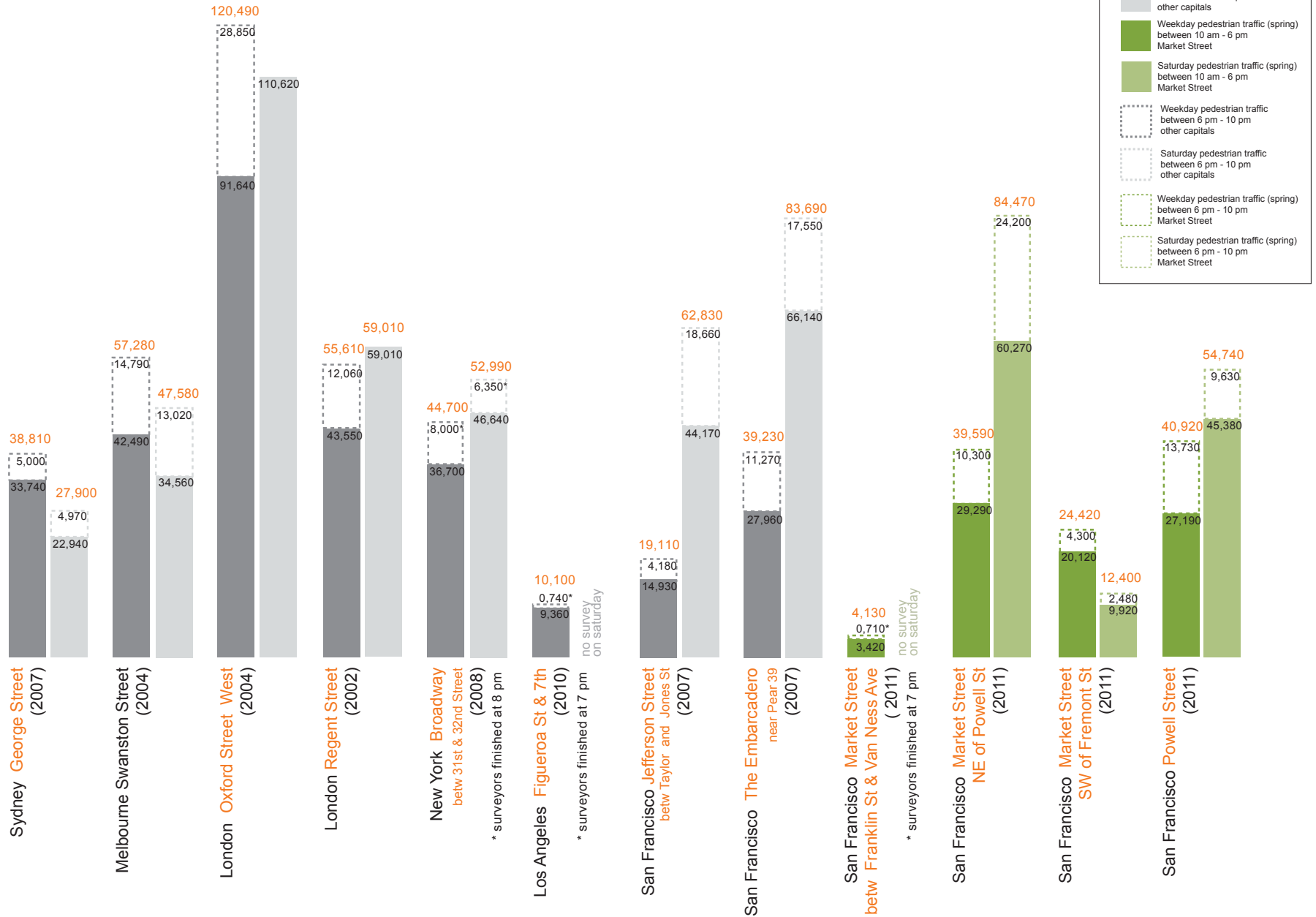
The difference between summer and winter use is larger on weekdays (+21%) than the weekend (+4%)



**Pedestrian traffic**  
total amount of pedestrians 8 am - 10 pm  
6 locations



# Comparing Market Street to other streets





Swantson Street, Melbourne



Oxford Street, London



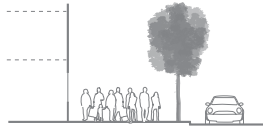
Figueroa Street, Los Angeles



Broadway, New York City



# Average level, weekdays



## Market Street Crowding

13pers / min / unobstructed m  
Market Str app. 16 feet/sidewalk

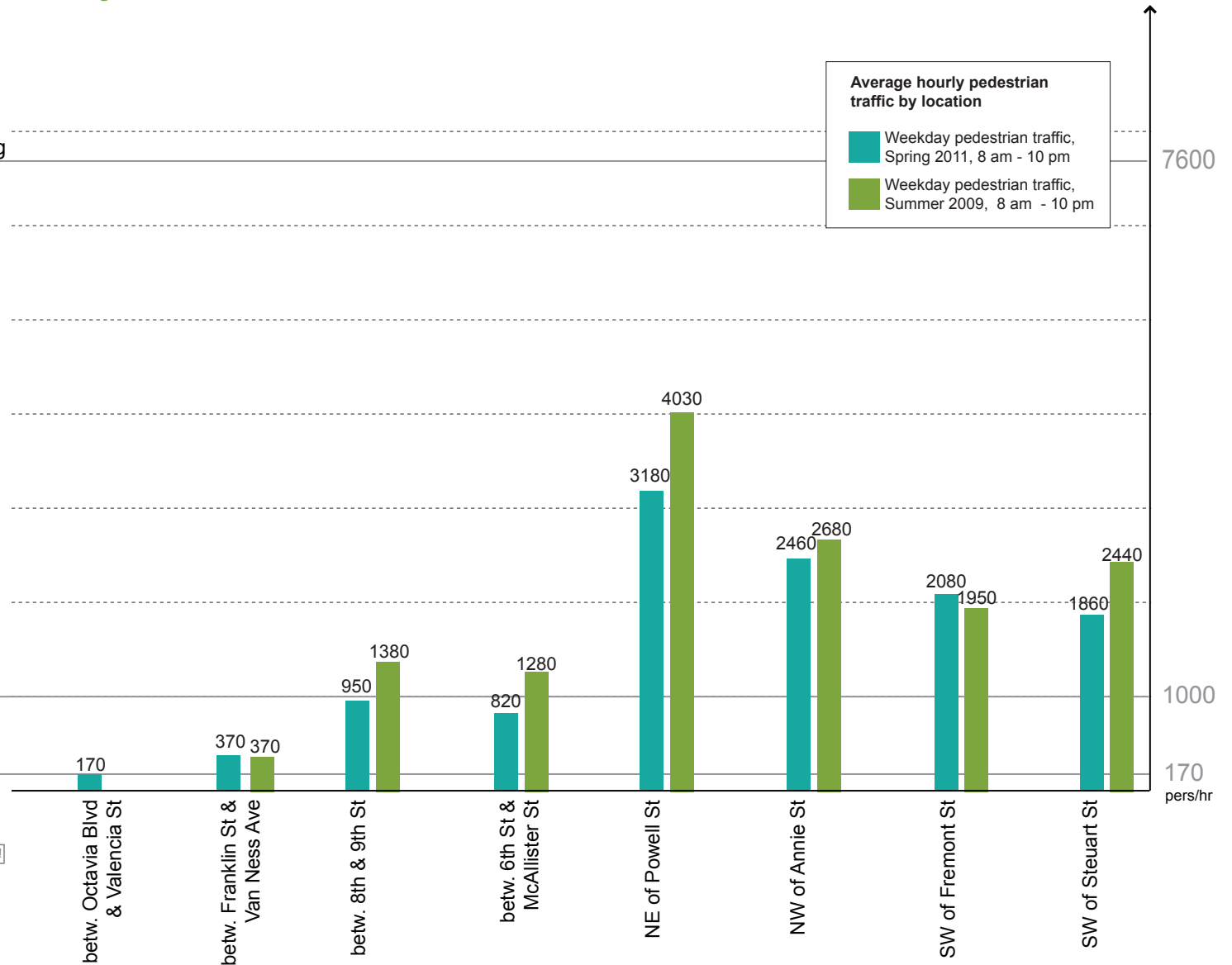
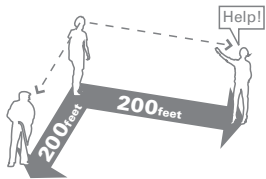


## Sense of urbanity

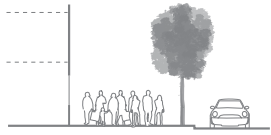
\* based on W. White analysis

## Feeling of insecurity

seeing & hearing more than 2 people at one time along footway



# Average level, weekends

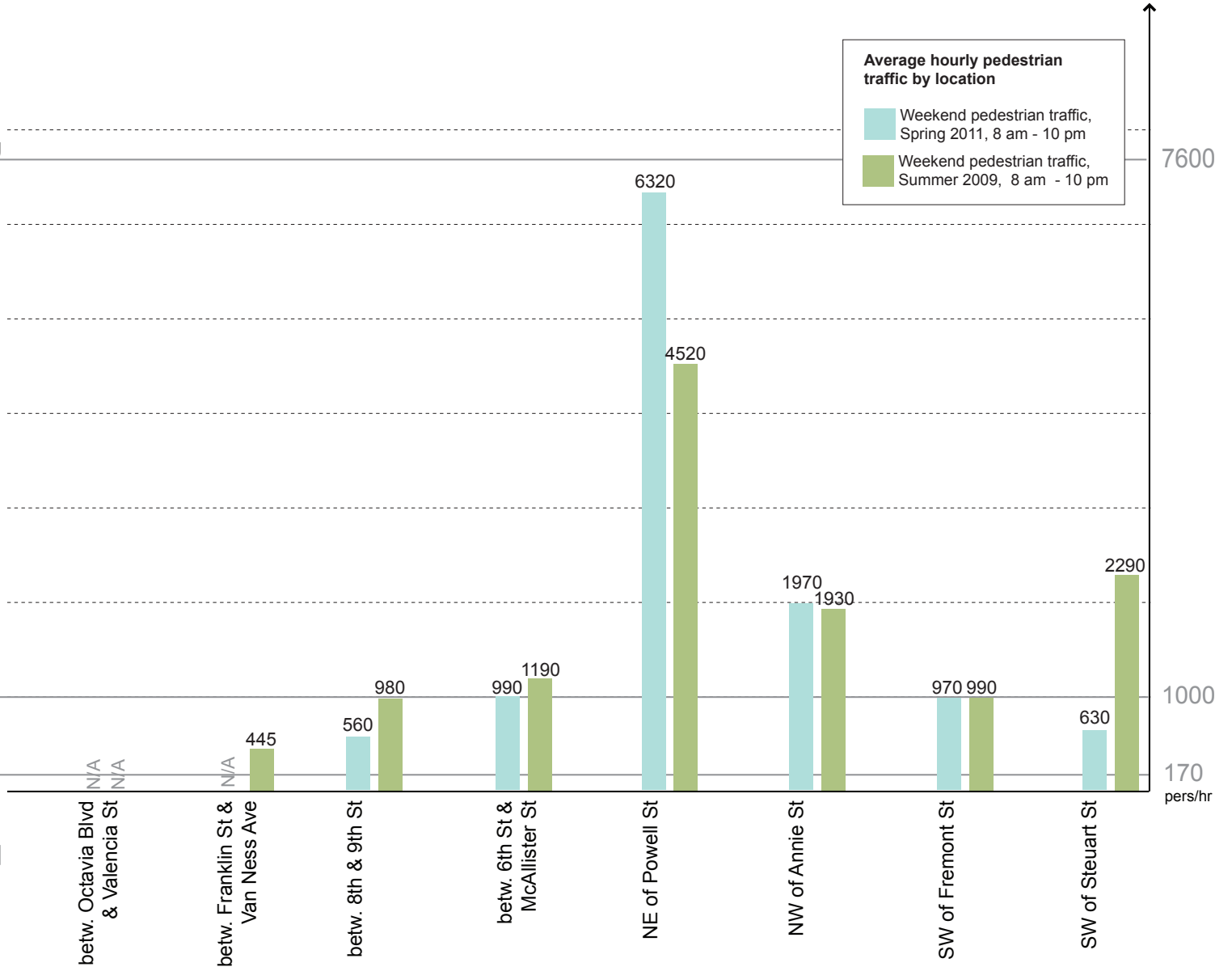
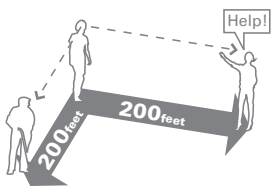


**Market Street Crowding**  
 13pers / min / unobstructed m  
 Market Str app. 16 feet/sidewalk

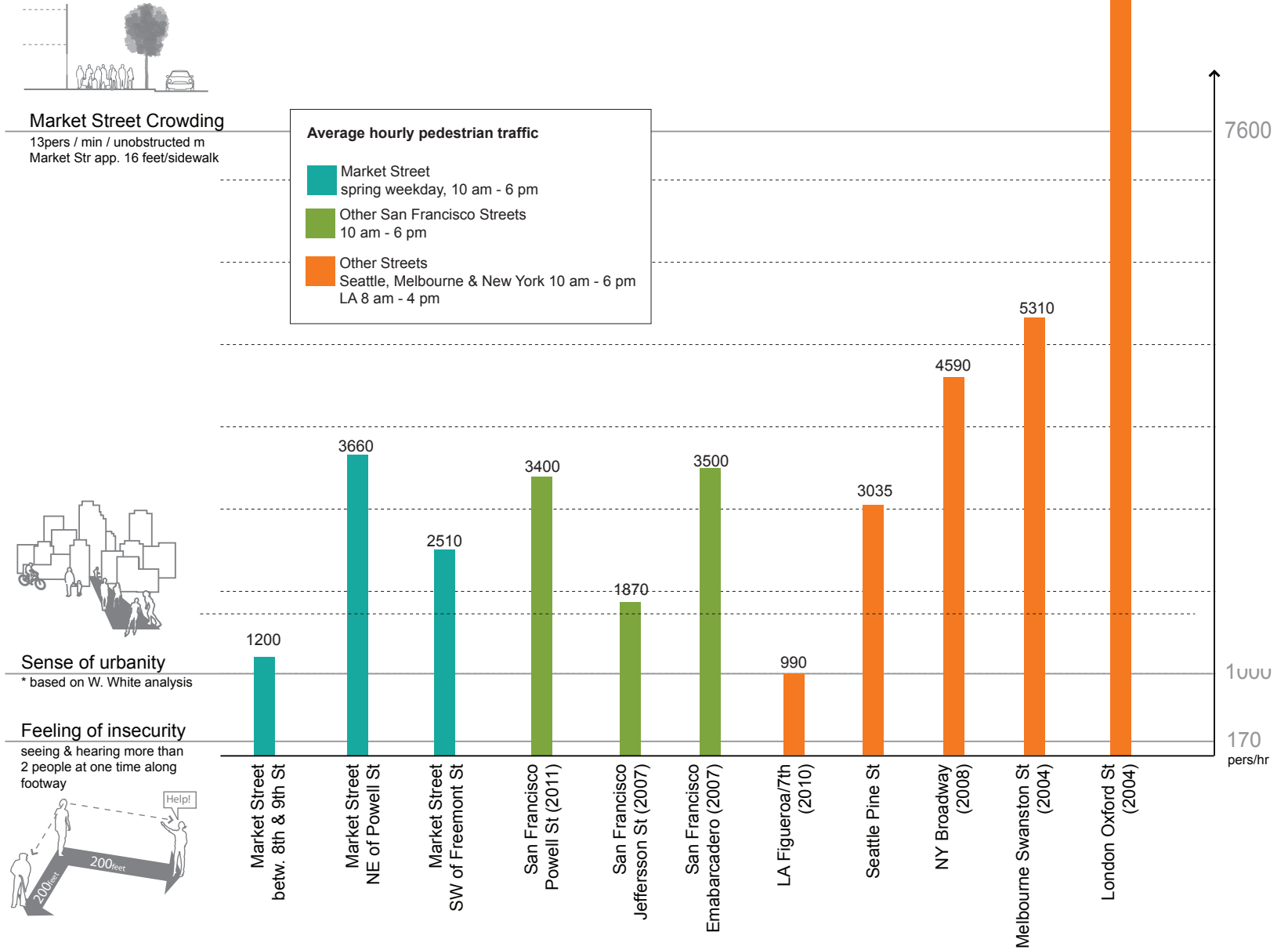


**Sense of urbanity**  
 \* based on W. White analysis

**Feeling of insecurity**  
 seeing & hearing more than  
 2 people at one time along  
 footway



# Average Market Street Intensity compared to other streets

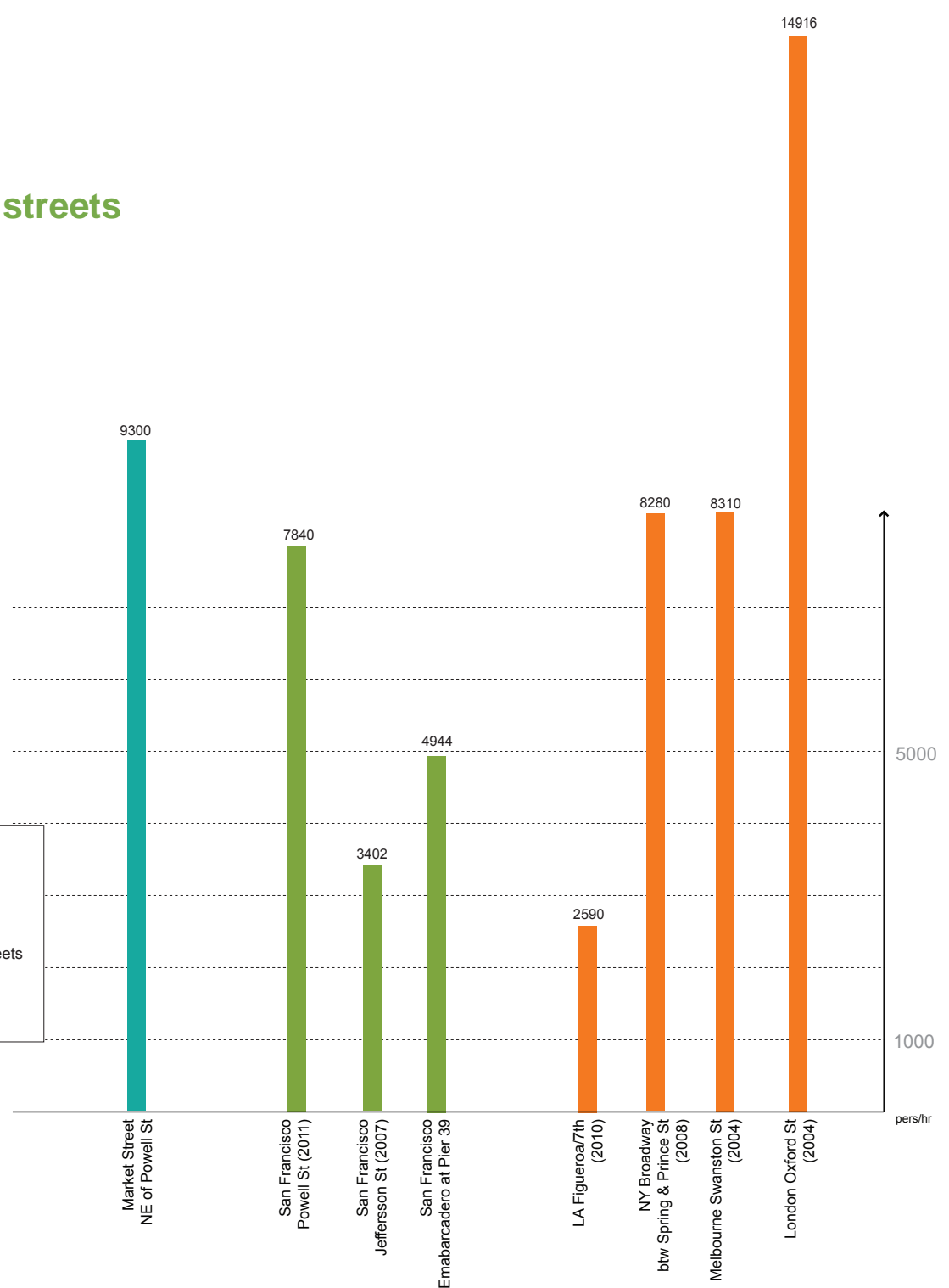
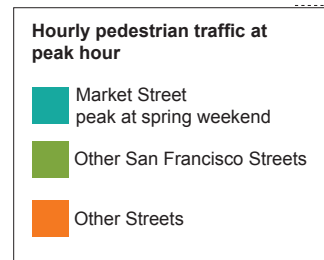




## The busiest hour compared to other streets

### Market Street between 4th and 5th St experiences a very high peak volume

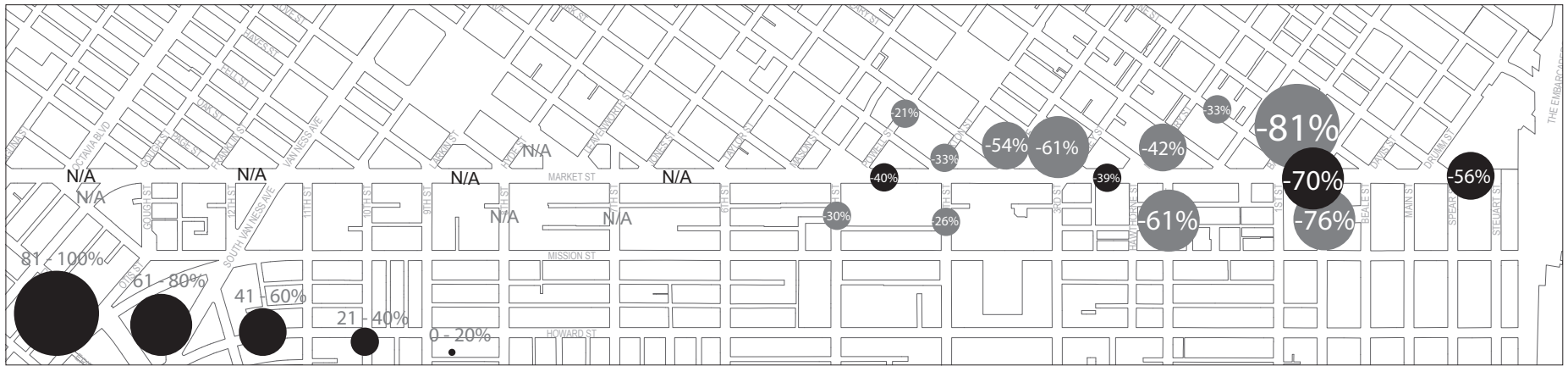
- The busiest hour surveyed of pedestrians at a single point along a street provides an interesting point of comparison. Despite Market Street experiencing lower total volume throughout the day than Broadway and Swanston St., it experiences a higher peak than those streets.
- **At its peak, Market Street between 4th and 5th St carries more people than any other point along any other San Francisco streets.**



## There is a large drop in activity after 7 pm

Larger drop in pedestrian activity after 7 pm in weekdays compared to weekends.

The Financial District experience a particularly large drop in activity in the weekdays



**Decline in hourly pedestrian volumes after 7 pm**  
Weekday, spring 2011



**Decline in hourly pedestrian volumes after 7 pm**  
Weekend, spring 2011







FRANCISCO SAN FRANCISCO

OUT TWIST

SANTITAS

OUT TWIST

San Francisco

San Francisco

San Francisco

San Francisco

San Francisco

San Francisco

San Francisco

San Francisco

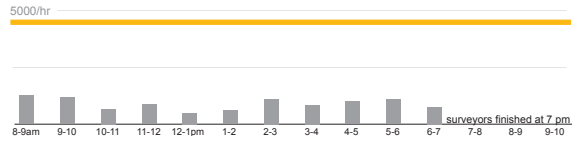
San Francisco

San Francisco



# 3 distinct types of side streets

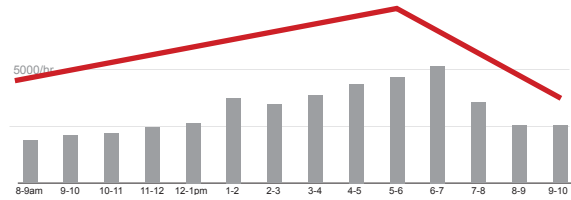
## Mid-Market



**7th St, between Stevenson St & Mission St**  
Weekday, spring 2011, pedestrians per hour



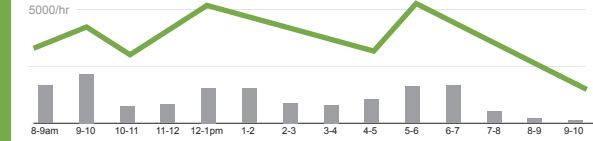
## Retail Heart



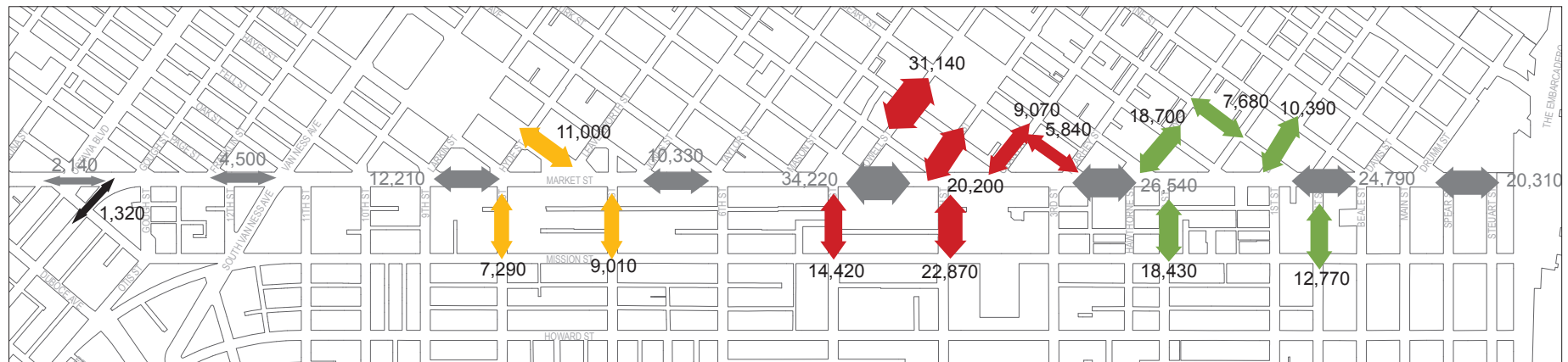
**Powell St between Ellis & O'Farrell St**  
Weekday, spring 2011, pedestrians per hour



## Financial District



**Fremont St, E of Market**  
Weekday, spring 2011, pedestrians per hour



**Weekday pedestrian traffic, spring 2011, total amount of pedestrians 8 am - 6 pm**

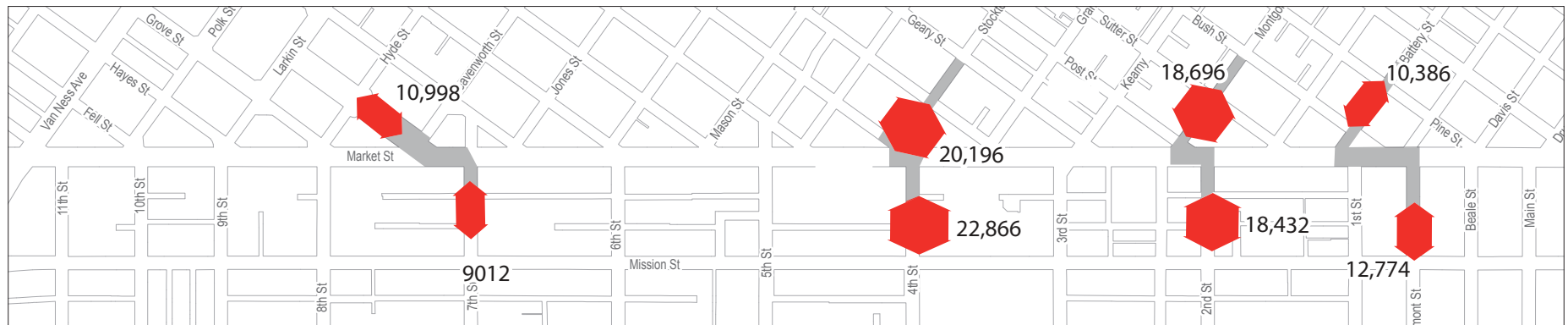
## 'Getting Across' Market Street



Connecting neighborhoods

Crossing the street

Connecting destinations



Weekday pedestrian traffic, spring 2011, total amount of pedestrians 8 am - 6 pm





SAN FRANCISCO

to beat your body's daily energy needs, clearly, you're hard.

Open to the Public

HICKEY FREEMAN

SCHUGGI

THE REAL



## **B. The Pedestrian Environment**





## B. The Pedestrian Environment

### Introduction

**In general the basic conditions for pedestrians are satisfactory:**

- Sidewalks are generous 16 - 22.5' wide.
- Pedestrian desire lines along the street are kept free of obstructions. Street furniture, bus shelters, street trees etc. are placed in separate furniture zones.
- Pedestrian crowding is generally not a problem.

However the pedestrian experience along Market Street is still perceived as poor quality and can be improved.

**The key challenges of the pedestrian environment along Market Street will be described further on the following pages, but in summary are:**

- Desire lines are interrupted at more than 40% of side street intersections on the northern side of Market Street.
- Neighborhoods on either side of Market Street do not integrate well with Market Street. Only at the Retail Heart does Market Street play an important role as part of wider network of open spaces and major destinations that stretches across Market Street.

- Ground floor frontages are of varying quality. For large portions, buildings fail to engage with the street.
- At 26% of the intersections, pedestrians are forced to cross at long and indirect crossings forcing them to wait on traffic "islands" in the middle.
- Very few seating opportunities are provided along Market Street, and the seating that is available, varies greatly in quality.

# Intersections

## Frequent interruptions of pedestrian desire lines at side street intersections

Pedestrian desire lines are interrupted at almost half of the side street intersections at the northern side

It takes approximately 15 minutes longer to walk from Octavia to Embarcadero on the north side of the street compared to the south due to the more complex side street intersections and interrupted desire lines.

### Pedestrian crossings following desire lines



Straight forward pedestrian crossings following pedestrian desire lines at all side street intersections on south side.



Straight forward pedestrian crossings following pedestrian desire lines by diagonal side street at northern side.



Side street intersection types

- Side street intersections
- Straight forward pedestrian crossing following pedestrian desireline / T - type
- Straight forward pedestrian crossing following pedestrian desireline / Diagonal side street
- Interrupted pedestrian desireline at side street intersection & "Island hopping"
- Interrupted pedestrian desireline at side street intersection
- Public Space node at side street intersection

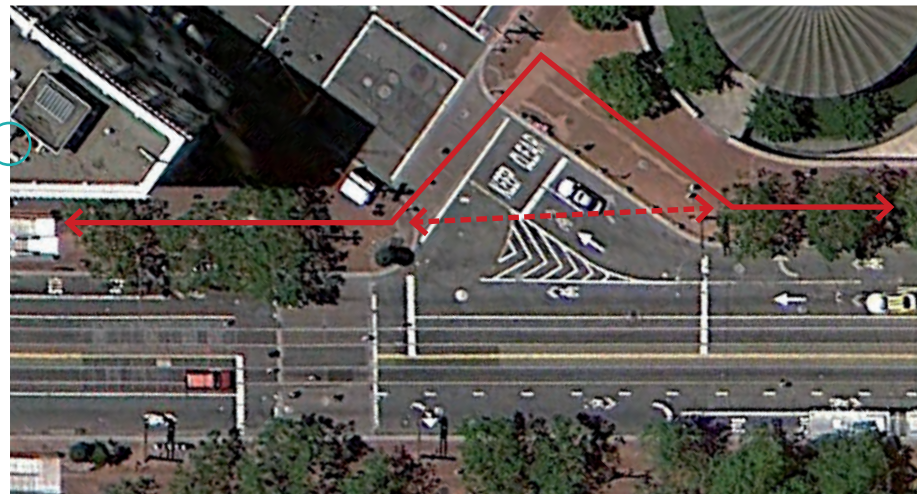


### Interrupted pedestrian desire lines



Geary and Kearny Streets intersection

Desire line interruptions with “island hopping” by side streets in **36%** (7 of 19) of side street intersections at northern side



Sansome Street intersection

Desire line interruptions in **11%** (2 of 19) of side street intersections at northern side



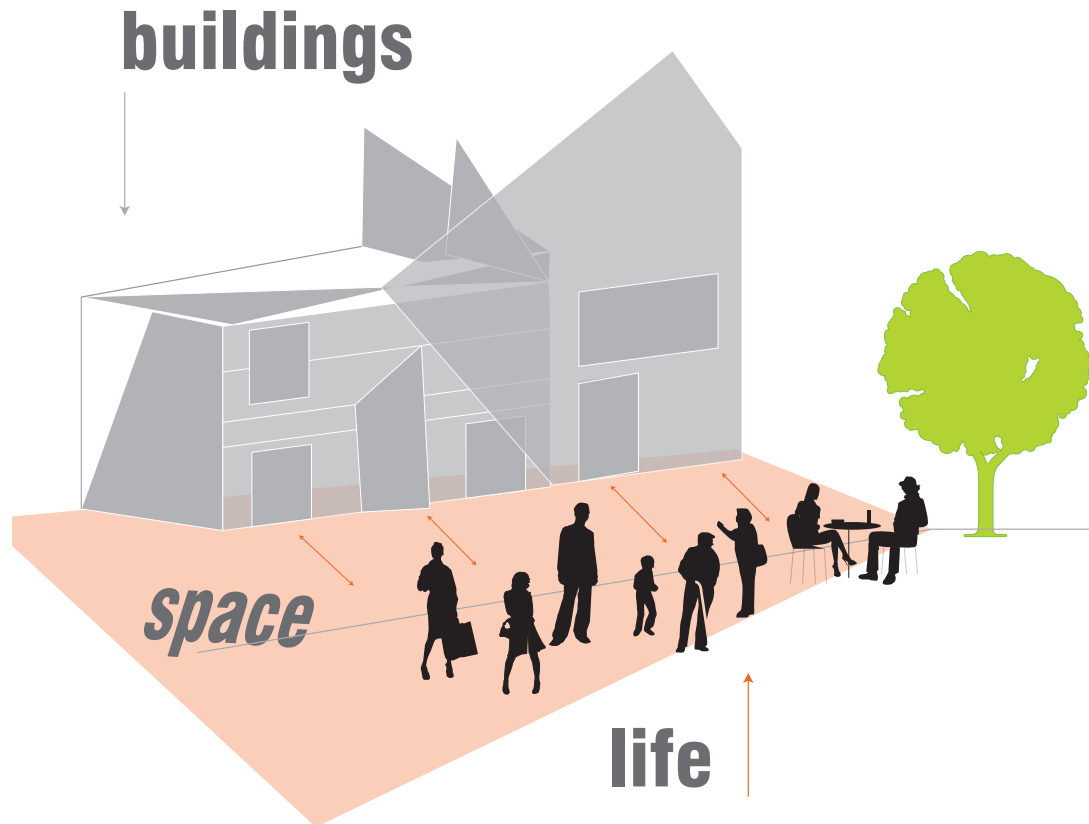


## Analyzing the pedestrian environment

Along Market Street, the character of public life and the sense of place are influenced by the interaction between people, transportation infrastructure and the built environment.

With this in mind, Gehl's approach for Market Street has been both integrated and holistic. The study analyzed the quality of the pedestrian environment not only in terms of sidewalk dimensions and cross-walks but also in terms of **grain** (size of building footprint, number of entrances) and in terms of **quality of frontage** (transparency, amount of detail, human scale).

Quality of experience and more intangible aspects of the pedestrian environment is most lacking along Market Street.





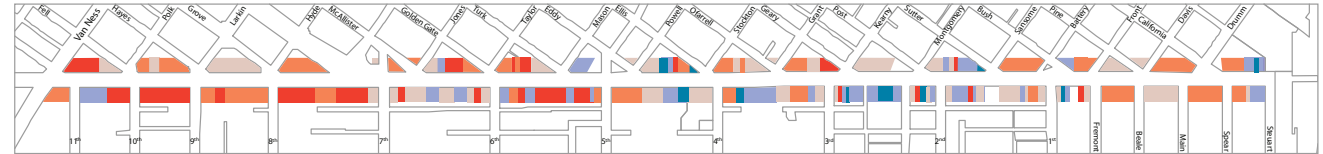
# Ground floor façades

## Varying quality

### Inconsistent ground floor edges quality and activity

- Treatment of ground floor facades is key to an attractive and successful pedestrian environment.
- Currently, ground floor facades vary significantly, with long stretches of Market Street offering an unattractive, inactive pedestrian environment including blank walls and vacant storefronts.
- Retail District and the south side of the Financial District feature the highest concentration of attractive façades; conversely, the Central Market area currently has the highest concentration of dull and unattractive façades

### Ground floor façades quality



### Façades quality Index



ACTIVE / ATTRACTIVE	PLEASANT	SOMEWHERE in BETWEEN	DULL	INACTIVE / UNATTRACTIVE
<ul style="list-style-type: none"> <li>• Small units, many doors (15-20/328')</li> <li>• Diversity of Functions</li> <li>• No closed or passive units</li> <li>• Interesting relief in frontages</li> <li>• Quality materials &amp; refined details</li> </ul>	<ul style="list-style-type: none"> <li>• Relatively small units (10-14/328')</li> <li>• Some diversity of functions</li> <li>• Only a few closed or passive units</li> <li>• Some relief in the façades</li> <li>• Relatively good detailing</li> </ul>	<ul style="list-style-type: none"> <li>• Mixture of units sizes (6-10/328')</li> <li>• Some diversity of functions</li> <li>• Only a few closed or passive units</li> <li>• Uninteresting design of frontages</li> <li>• Somewhat poor detailing</li> </ul>	<ul style="list-style-type: none"> <li>• Large units with few doors (2-5/328')</li> <li>• Little diversity of functions</li> <li>• Many closed units</li> <li>• Predominantly unattractive frontages</li> <li>• Few or no details</li> </ul>	<ul style="list-style-type: none"> <li>• Large units with few or no doors</li> <li>• No visible variation of function</li> <li>• Closed and passive façades</li> <li>• Monotonous frontages</li> <li>• No details, nothing interesting</li> </ul>

### Ground floor facades that contribute to street life



Attractive, interactive ground floor with small units, many doors and a high degree of transparency.



Activity spilling out onto the street.



Small scale units of high transparency.



Kiosks are small scale units that can activate the public realm.

## Ground floor frontage potential

The character of the built environment and its impact on public space and public life varies dramatically throughout the length of the project site.

Below we analyzed the grain, quality of frontage and scale of buildings. Each area present a unique set of challenges and potential to be addressed in the design.



### Octavia Blvd. - Van Ness Ave

- Medium grain
- Low quality ground floor facades
- Narrow sidewalks



### Van Ness Ave - 8th St

- Large grain
- Low quality ground floor facades



### 8th - 5th St

- Small grain
- Low quality ground floor facades



### 5th - 4th St

- Large grain
- Good quality ground floor facades



### 4th - 1st St

- Medium grain
- Medium quality facades



### 1st - Steuart St

- Large grain
- Low quality ground floor facades



Urban grain and ground floor quality





## Ground floor frontage challenges



Mid-Market - North side of street



Mechanics Plaza (Market/Battery Plaza)



4th Street



Mid-Market



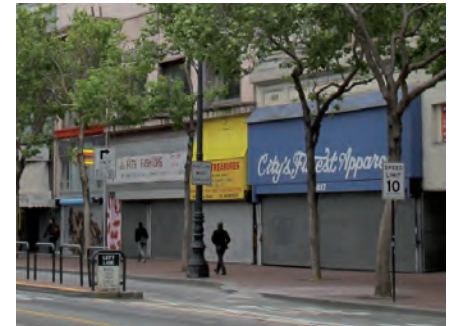
UN Plaza



One Post Plaza (McKesson Plaza)



Mid-Market - South side of street



Mid-Market

### Blank Facades

- Back of buildings
- No detailing or visual contact to inside

### Opportunities

- Visually more interesting treatments of facades e.g. greenery, art installations...
- Inviting people to interact and use the wall e.g. graffiti wall, climbing wall, etc.

### The Corporate Look

- Large units with few doors and poor detailing
- Only occasional visual contact with interior
- Use typically not addressing the wider public
- Typically foyers are located at the ground floor

### Opportunities

- Activation of the public realm through kiosks and mobile units

### Introvert Uses

- Large units of high architectural quality
- Use addressing the wider public, e.g. departments stores, theatres etc.
- Blocked windows

### Opportunities

- Relocation / introduction of small scale functions related to main use e.g. eateries, shops, punched into facade
- Making use of window displays for artistic advisements

### Vacant Units

- Often buildings of high quality and human scale
- Small units
- Fine detailing

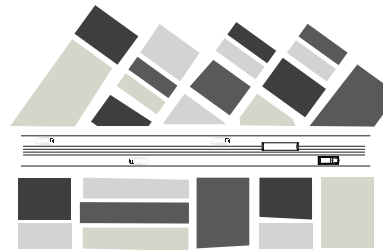
### Opportunities

- Economic incentives, e.g. low or no rents, to attract small businesses
- Temporary artistic installations

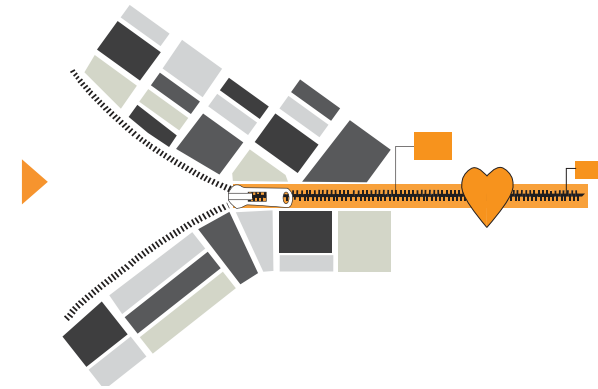
## Public space network

Neighborhoods are located on either side of Market Street and do not integrate well with Market Street.

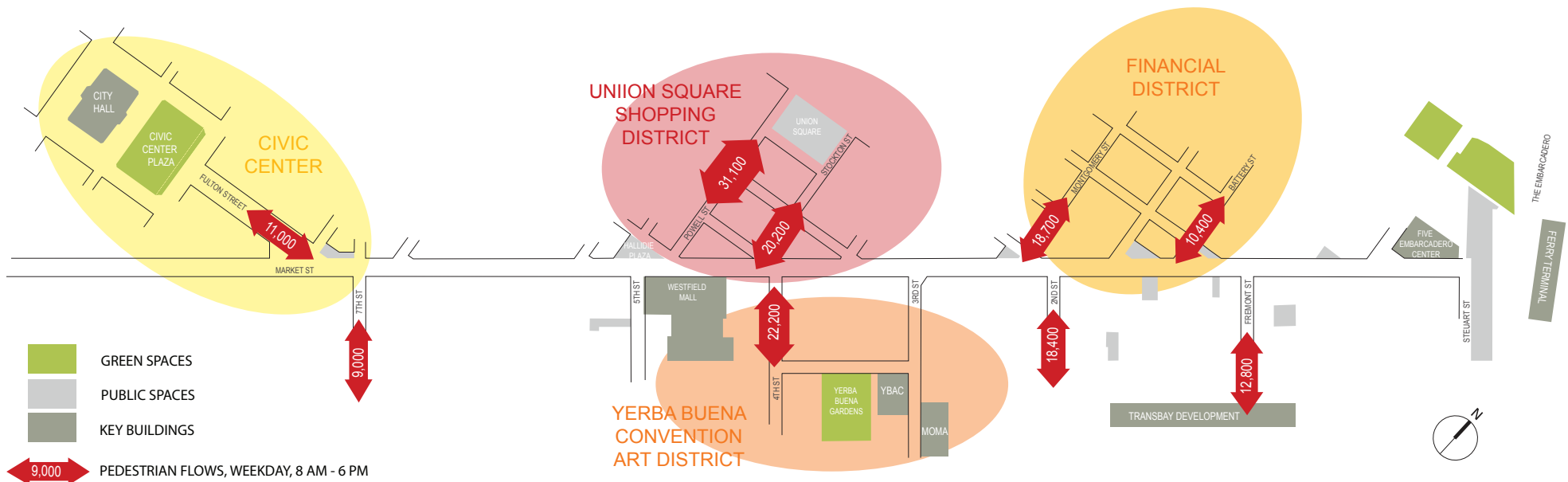
Only at the Retail Heart does Market Street play an important role as part of wider network of open spaces and major destinations that stretches across.



Market Street as a dividing line



Opportunity: Market Street as unifier





## Emerging public space network across Market Street

Market Street must provide excellent possibilities for the very high volumes of pedestrians to cross the street and walk between key city destinations.

Market Street between 4th and 5th St and Hallidie Plaza provide great opportunities for becoming important “people spaces” in the city.



## Pedestrian crosswalks

At 26% of the intersections pedestrians are forced to cross in two steps and to wait on small “island” in the middle of the traffic.

There are locations where pedestrians desire lines across Market Street are not respected.

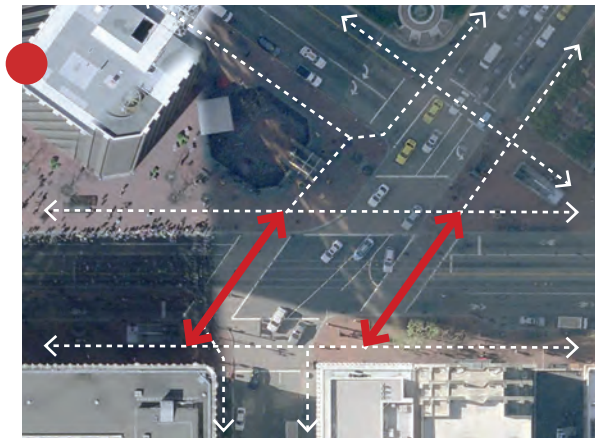


Public transit waiting areas are located near the pedestrian crosswalks.



- <-----> pedestrian desire lines
- ↔ existing cross walk
- ↔ missing crosswalk

### Straight forward crosswalk

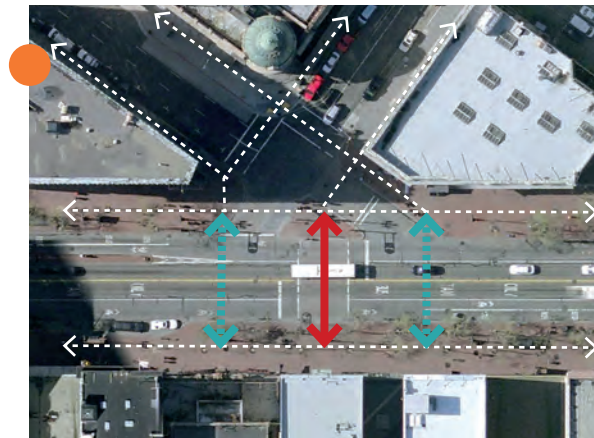


**53%** of the intersections have straight or diagonal crosswalks that basically follow pedestrian desire lines.



Market Street by 2nd Street

### “Traffic Island” crosswalk

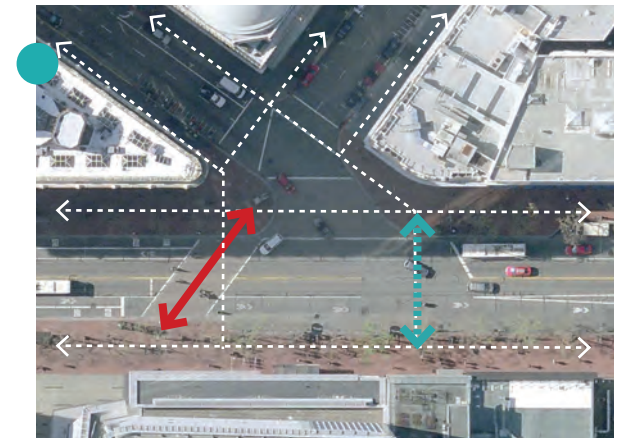


At **26%** of the intersections pedestrians are forced to cross in two steps and to wait on small “island” in the middle of the traffic.



Market Street by Jones and McAllister Street

### Missing crosswalk



At least **6** locations lack crosswalks where people would like to cross.



Market Street at Sansome and Sutter





EE6

1600





## **C. Hotspots on Market Street**

# C. Hotspots on Market Street - Pedestrian and cyclist experience

## Challenging intersections

Gehl Architects conducted an on-site analysis of nine important intersections for pedestrians and cyclists along Market Street. Intersection flexibility and performance was noted at: 1st St & Battery St, 2nd St & Montgomery St, 3rd St & Kearny St, 4th St & Ellis St, 8th St & Hyde St, Fell St & 10th St, Franklin St & 12th St, Haight St & Gough St

and Octavia St & Valencia St. Focus at these intersections was based on the user experience of cyclists and pedestrians and where the design of the intersections cause problems for these road users. This section complements the transport team's hot spot analysis section, in which, contribution was also made by Gehl Architects.

This section, in contrast to the 'Hotspots on Market Street' Chapter, which focuses more on collision data and other statistics, aims to address the way pedestrians and cyclists experience intersections along Market Street, which have been identified as hot spots.

### 1 Circulation:

#### Potential and effectiveness of circulation patterns

*What are current circulation patterns? Where can circulation be improved?*

### 2 Safety:

#### Perceived safety for the different users

*Is this a safe crossing for drivers, cyclists, people walking, trams, and buses?*

### 3 Organization:

#### Effectiveness and organization for all modes

*Does the intersection achieve the optimum performance and safety for a well balanced mixture of mobility?*



## Undefined & long distance pedestrian crossings



Motorists infringing on pedestrian crossing  
(2nd & Montgomery)



Very long pedestrian crossing distance  
(2nd & Montgomery)

- There are numerous conflicts between cyclists, pedestrians and vehicles.
- Several southbound intersections are approached with high vehicular speeds.
- The width and the number of vehicle lanes, invites cars to drive at high speeds and change lanes quickly in order to pass others. This type of driving behavior is dangerous in close proximity to pedestrians.
- Pedestrians cross at unexpected places because pedestrian crosswalks are undefined, missing or not following the pedestrian desire lines at several intersections.



Very long pedestrian crossing distance  
(Octavia & Valencia)



Limited pedestrian visibility from side streets  
(3rd & Kearny)

## Bike pinch zones



Bike pinch zone  
(4th & Ellis)



Sharrow creating pinch zones  
(Octavia & Valencia)

- Sharrows and transit boarding islands promote conflicts between large vehicles and cyclists all along Market Street.
- When buses are stopped at alighting points or when delivery trucks are unloading, cyclists are either forced to wait or swerve into faster moving traffic.
- Although there is room for all users, most of the intersections are out-of balance in terms of mode share.



Unsafe condition for cyclists  
(Fell St & 10th)



Delivery truck blocking bike lane  
(2nd & Montgomery)



## Difficult crossings and turning conditions for cyclists



Bike left-turn inviting conflicts  
(2nd & Montgomery)



Cyclists accessing Market Street are often forced into compromising positions  
(Franklin & 12th)



Unclear crossing  
(Octavia & Valencia)



Without proper bike lanes and infrastructure, demarcation of space for bicyclist at intersections is also unclear  
(3rd & Kearny)



Interrupted bike lane  
(Polk St & 10th)

- There is a lack of waiting space for cyclists at intersections causing unsafe conditions for cyclists when waiting to turn.
- Buses and vehicles turning right from Market Street onto northeast side streets conflict with cyclists following Market Street southbound.
- Left-turns are prohibited at several intersections, making it unclear for cyclists where and how to cross some intersections.
- Bike lanes lack a coherent design and arouse confusion when crossing or turning streets.
- Despite a moderate volume of cyclists, Market Street lacks basic and deliberate bicycle infrastructure.



# 1st & Battery

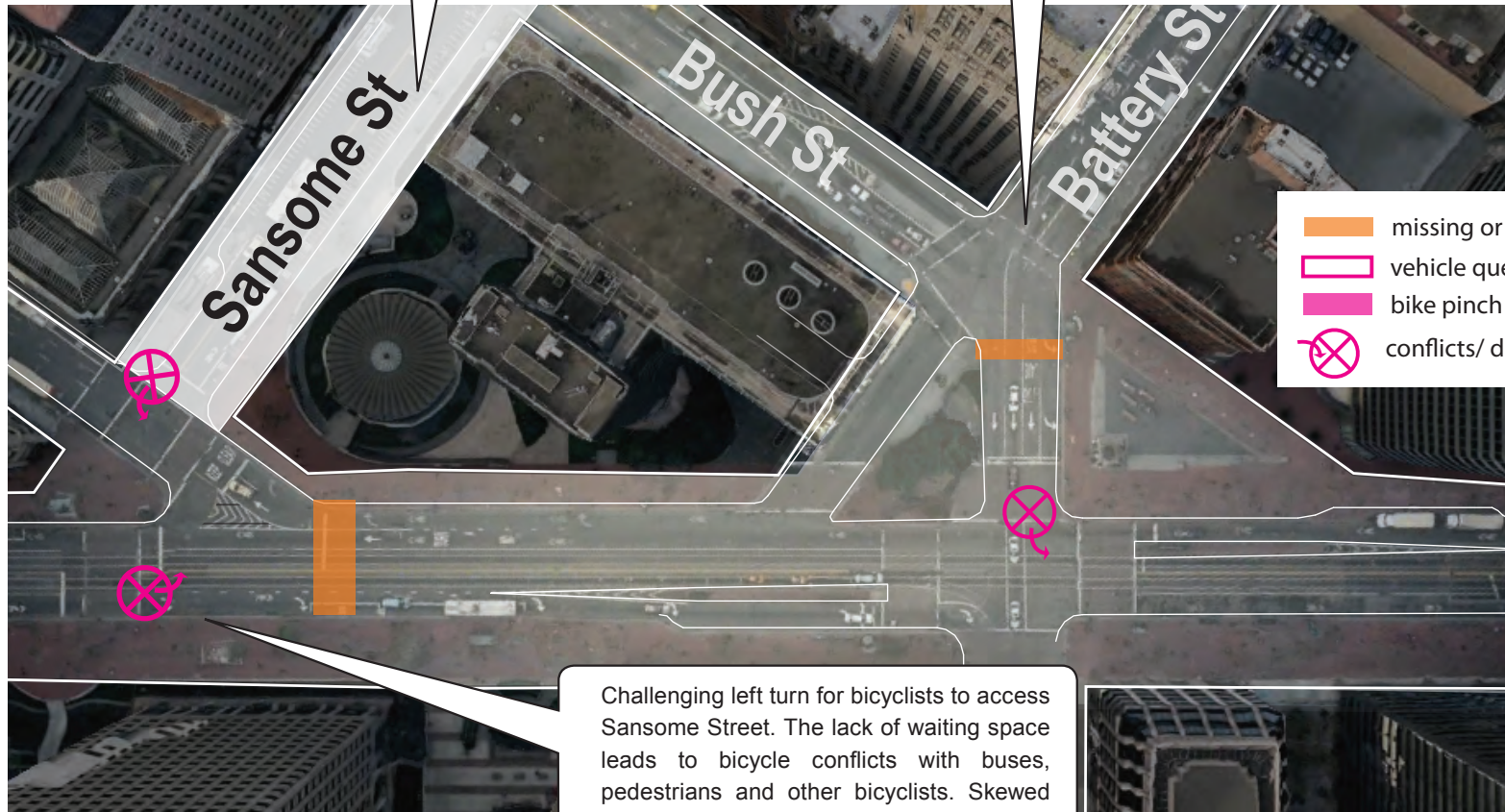
## Pedestrian and cyclist hot-spot



Existing geometry is challenging for pedestrians and bicyclists. Pedestrians often cross Bush Street during the Don't Walk phase due to low vehicle volumes. It is often unclear which direction vehicle traffic will be approaching from due to limited sight lines and intersection geometry.

There is high vehicle volumes through this intersection. Parking garage access/spur contributes to additional movements and conflict points across the Bush/Battery intersection.

Very low vehicle volumes along this segment of Sansome Street provides an opportunity for better pedestrian, bike and bus transit amenities.



- missing or undefined crosswalks
- vehicle queue
- bike pinch zones
- conflicts/ difficult turns for cyclists

Challenging left turn for bicyclists to access Sansome Street. The lack of waiting space leads to bicycle conflicts with buses, pedestrians and other bicyclists. Skewed intersection also leads to unpredictable maneuvers by bicyclists.



# 2nd & Montgomery

## Pedestrian and cyclist hot-spot

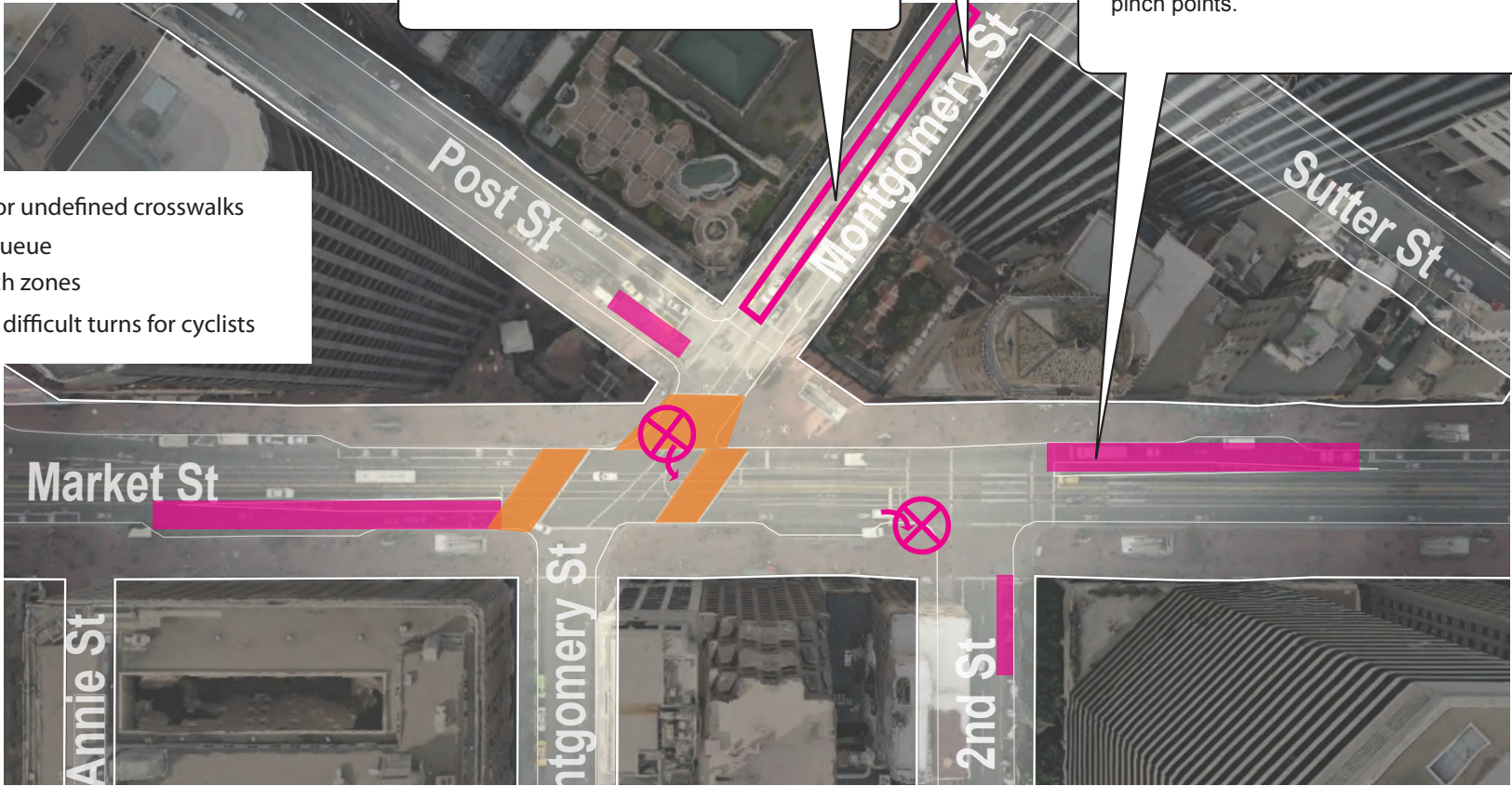


Montgomery is an important street for vehicular traffic.

Vehicle queue - especially PM

Transit boarding islands cause cycling pinch points.

- missing or undefined crosswalks
- vehicle queue
- bike pinch zones
- ⊗ conflicts/ difficult turns for cyclists



# 3rd & Kearny

## Pedestrian and cyclist hot-spot



High vehicle volumes along 3rd Street intersect and attempt to merge/cross Market Street. This disrupts the flow of travel along Market Street.

Along with 4th/Stockton, this intersection is one of the highest crash locations for Muni vehicles along and across Market Street.

Buses (30-Stockton, 45-Union) stop here along the right side of the road, then they have to cross all travel lanes in a short one-block segment in order to turn left onto Sutter. This is difficult and delays buses but also blocks traffic that backs into the Kearny/Market intersection. As noted on other comments, this causes a backup of drivers.



- missing or undefined crosswalks
- vehicle queue
- bike pinch zones
- conflicts/ difficult turns for cyclists

Buses and vehicles turning right onto Geary conflict with bicyclists heading westbound on Market.



# 4th & Ellis

## Pedestrian and cyclist hot-spot



Transit boarding islands cause cycling pinch points.



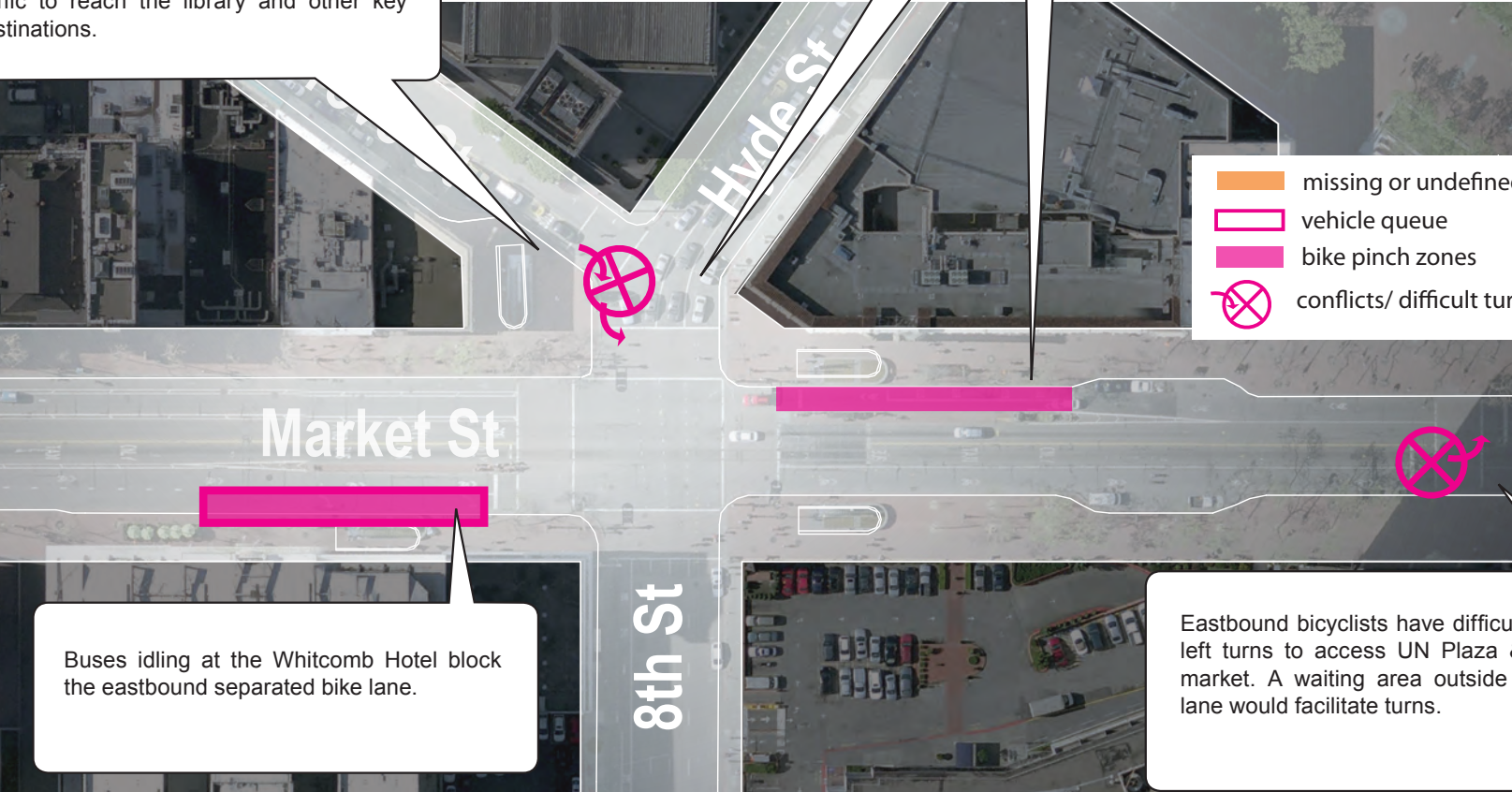
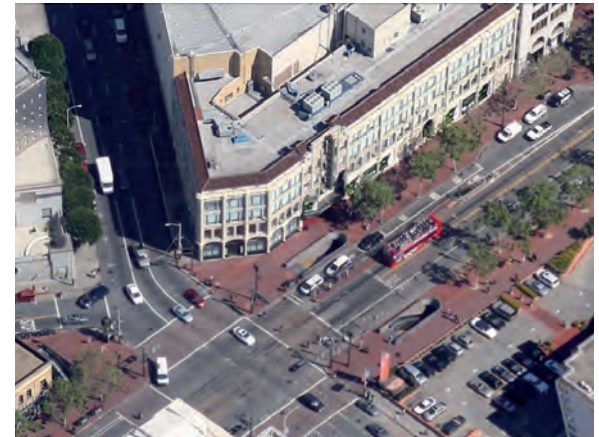
# Hyde St & 8th

## Pedestrian and cyclist hot-spot

Pinch point in westbound direction in front of the Orpheum Theater. Bus stop adjacent to sidewalk a butts transit island. When buses are dwelling, bicyclists and vehicles are caught behind.

Skewed intersection limits sight lines and visibility. Southbound vehicles approach the intersection at high speeds.

Setback of Grove Street entrance is difficult for bicyclists to access. Currently bicyclists must ride the wrong way illegally through traffic to reach the library and other key destinations.

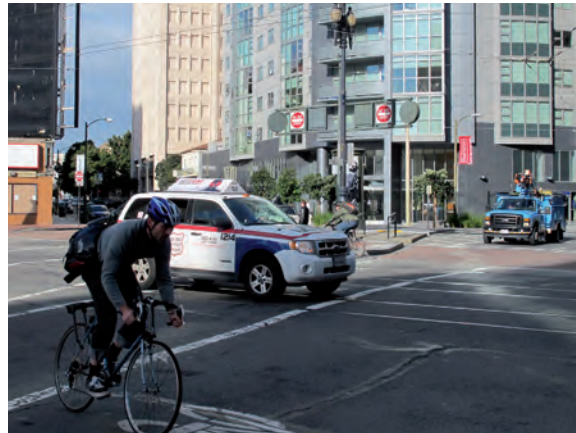


- missing or undefined crosswalks
- vehicle queue
- bike pinch zones
- / conflicts/ difficult turns for cyclists

Buses idling at the Whitcomb Hotel block the eastbound separated bike lane.

Eastbound bicyclists have difficulty making left turns to access UN Plaza & farmer's market. A waiting area outside the travel lane would facilitate turns.







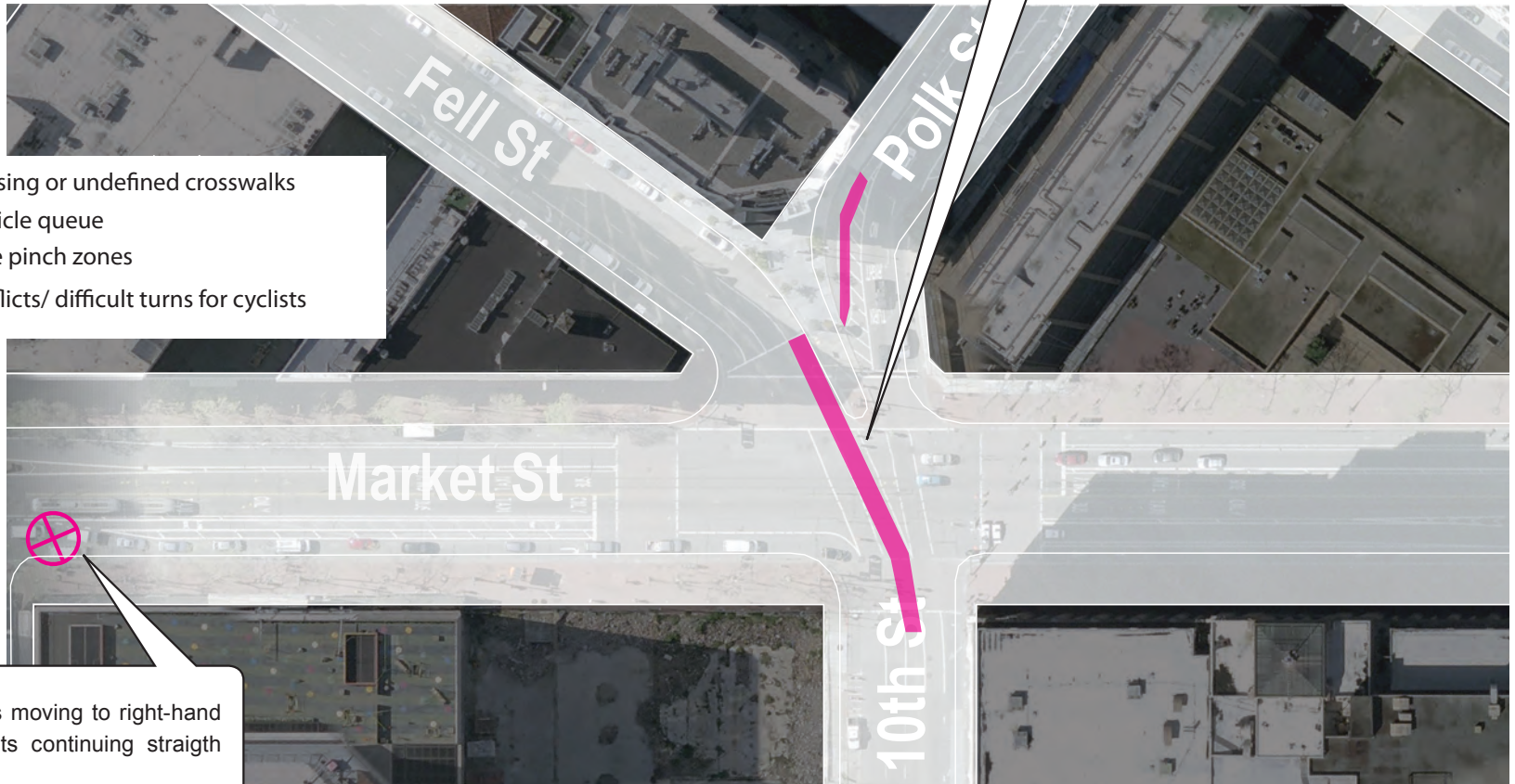


# Fell St & 10th

**Pedestrian and cyclist hot-spot**

Difficult navigation for cyclists crossing Market Street

-  missing or undefined crosswalks
-  vehicle queue
-  bike pinch zones
-  conflicts/ difficult turns for cyclists



Conflict with vehicles moving to right-hand turn lane and cyclists continuing straight ahead

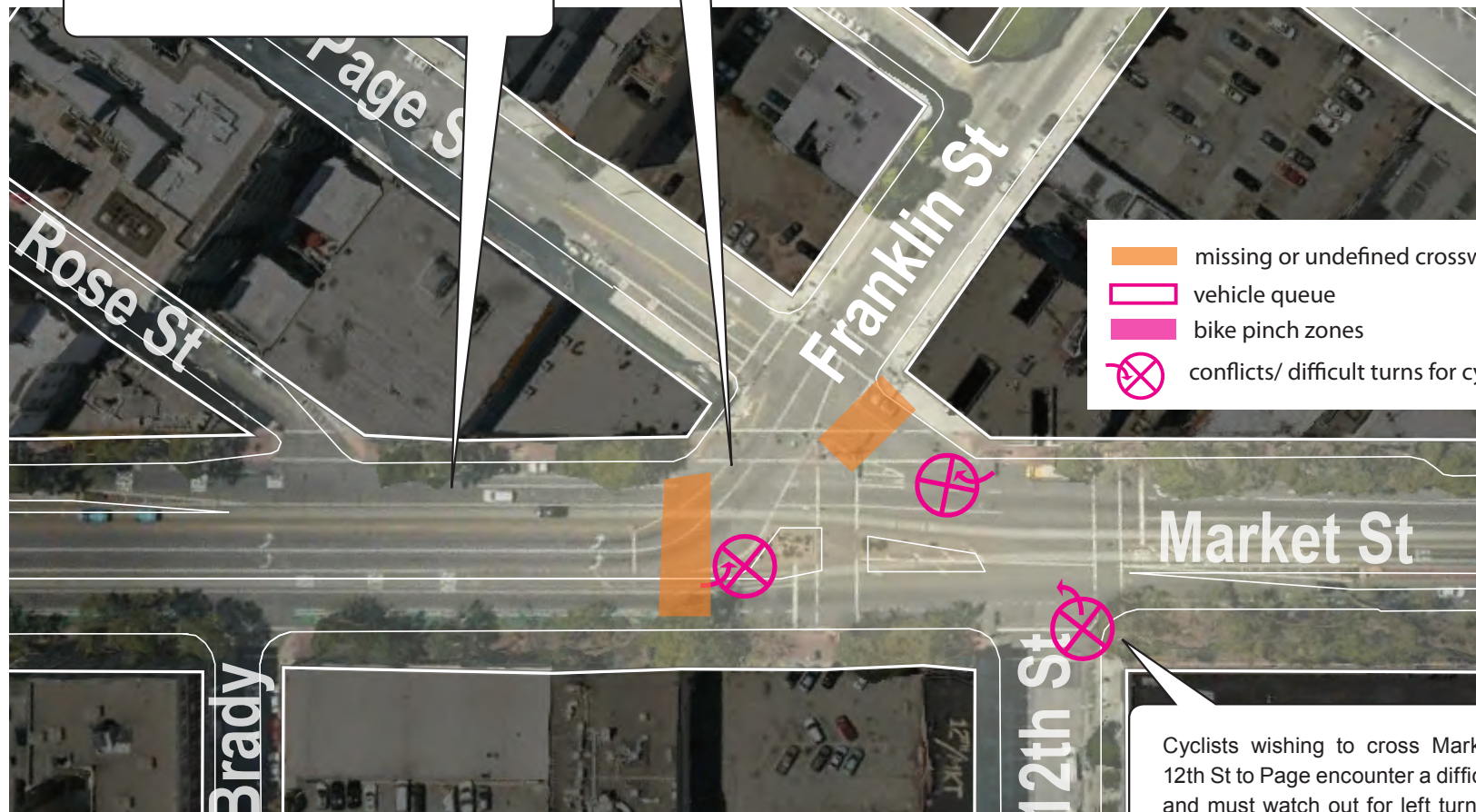


# Franklin & 12th

## Pedestrian and cyclist hot-spot

Challenging crossing location for pedestrians due to high vehicle volumes approaching from multiple directions. Skewed intersection limits sight lines and visibility. Few cross walks provide direct connection for pedestrians.

Frequent drop-offs during lunch and dinner hours along Market and Rose Street create conflicts with bicyclists and pedestrians.



- missing or undefined crosswalks
- vehicle queue
- bike pinch zones
- X conflicts/ difficult turns for cyclists

Cyclists wishing to cross Market St. from 12th St to Page encounter a difficult crossing and must watch out for left turning vehicles from Market onto Franklin.







# Haight & Gough

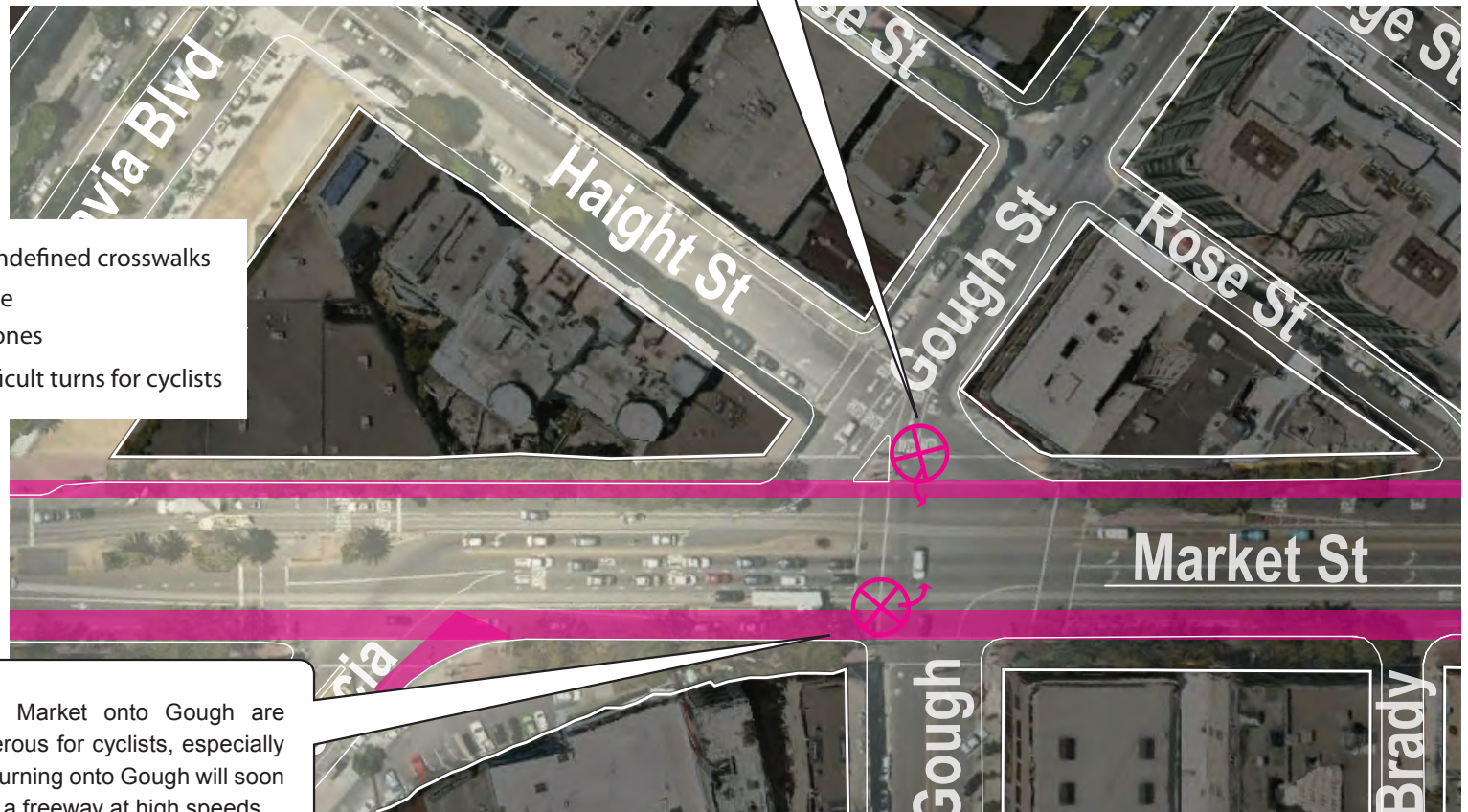
## Pedestrian and cyclist hot-spot



Skewed intersection limits sight lines and visibility and southbound vehicles approach intersection at high speeds.

Difficult intersection for bicyclists to navigate: cyclists wishing to turn from Gough to Market have to navigate a difficult intersection and left turn onto Valencia is difficult to access from bike lane.

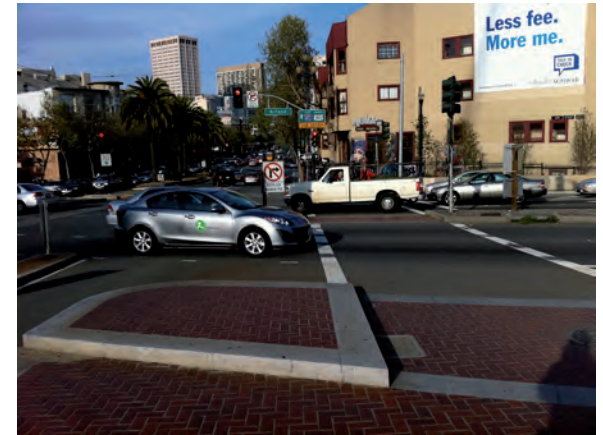
-  missing or undefined crosswalks
-  vehicle queue
-  bike pinch zones
-  conflicts/ difficult turns for cyclists



Left turns from Market onto Gough are extremely dangerous for cyclists, especially as most drivers turning onto Gough will soon be merging onto a freeway at high speeds.

# Octavia & Valencia

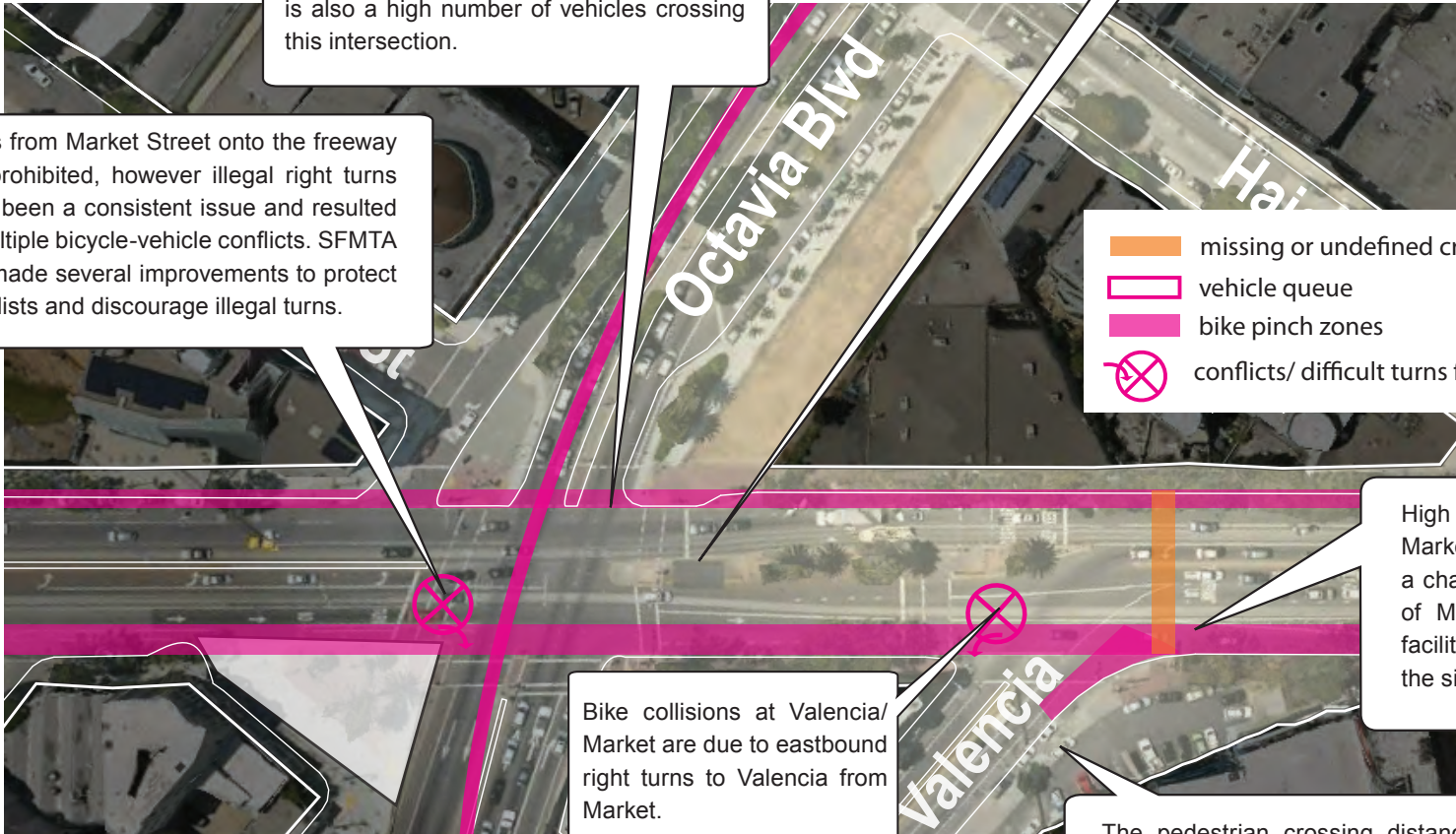
## Pedestrian and cyclist hot-spot



Intersection has vehicle speeds that would significantly injure a bicyclist in the event of an accident. The grades of Market Street, here, encourage faster vehicle speeds in north, south and eastbound directions than at other points along Market Street. There is also a high number of vehicles crossing this intersection.

Collisions involving bicyclists accounted for over half of all collisions at Octavia and nearly all collisions at Valencia.

Turns from Market Street onto the freeway are prohibited, however illegal right turns have been a consistent issue and resulted in multiple bicycle-vehicle conflicts. SFMTA has made several improvements to protect bicyclists and discourage illegal turns.



- missing or undefined crosswalks
- vehicle queue
- bike pinch zones
- / conflicts/ difficult turns for cyclists

High vehicle volumes traveling east on Market and north on Valencia contribute to a challenging bike environment. This block of Market Street has no dedicated bike facilities and a constrained ROW between the sidewalk and boarding island

Bike collisions at Valencia/Market are due to eastbound right turns to Valencia from Market.

The pedestrian crossing distance across Valencia is especially long



## **D. Lingering activities**

# D. Lingering activities

## Purpose and method

Activity mapping essentially is a snap shot of "stationary activities" occurring in carefully chosen public spaces, at a given time.

Activities recorded include, but are not limited to: sitting on benches, physical activities such as children playing, as well as commercial activities, such as street performers or sidewalk merchants.

These stationary activities act as good indicators of the quality of the urban spaces. A high number of

pedestrians walking in the city does not necessarily indicate a high level of quality. However, a high number of people choosing to spend time in the city indicates a lively city of high urban quality.

**In general, there are few people lingering on Market Street.**

**Hallidie, UN and Linear Plazas are the more active spaces in weekdays.**

**There is little activity after 7 pm**

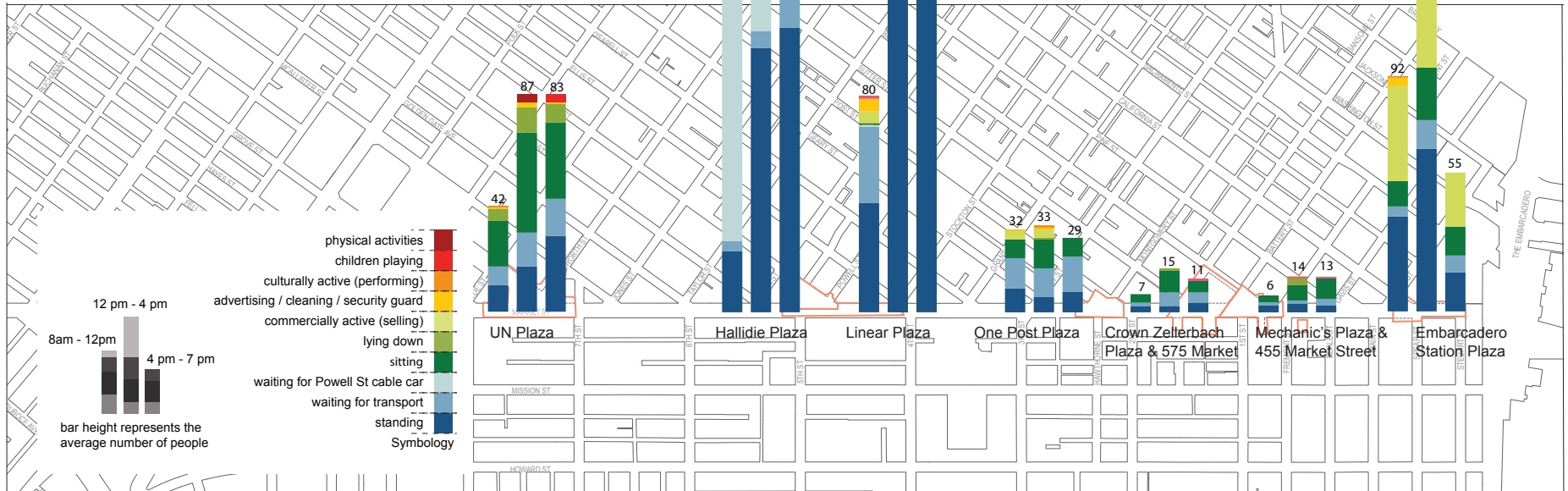
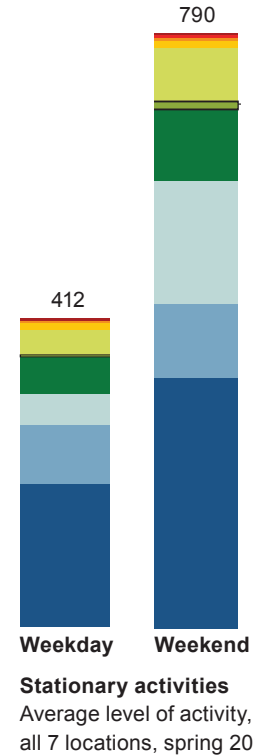
### Weekday stationary activities, spring 2011

Average level of activity, 7 am - 7 pm



# Weekday lingering activities

**Weekend stationary activities, spring 2011**  
Average level of activity, 7 am - 7 pm



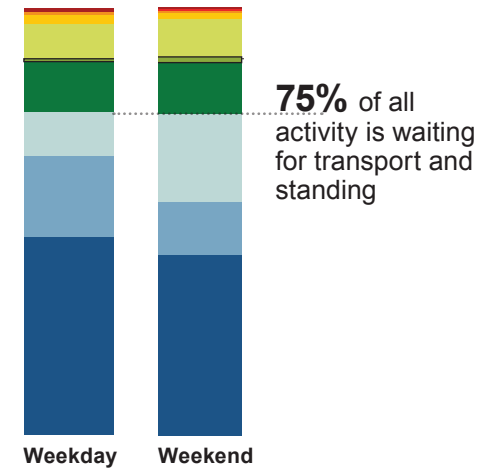


## Monofunctional public life

### Utilitarian uses dominate

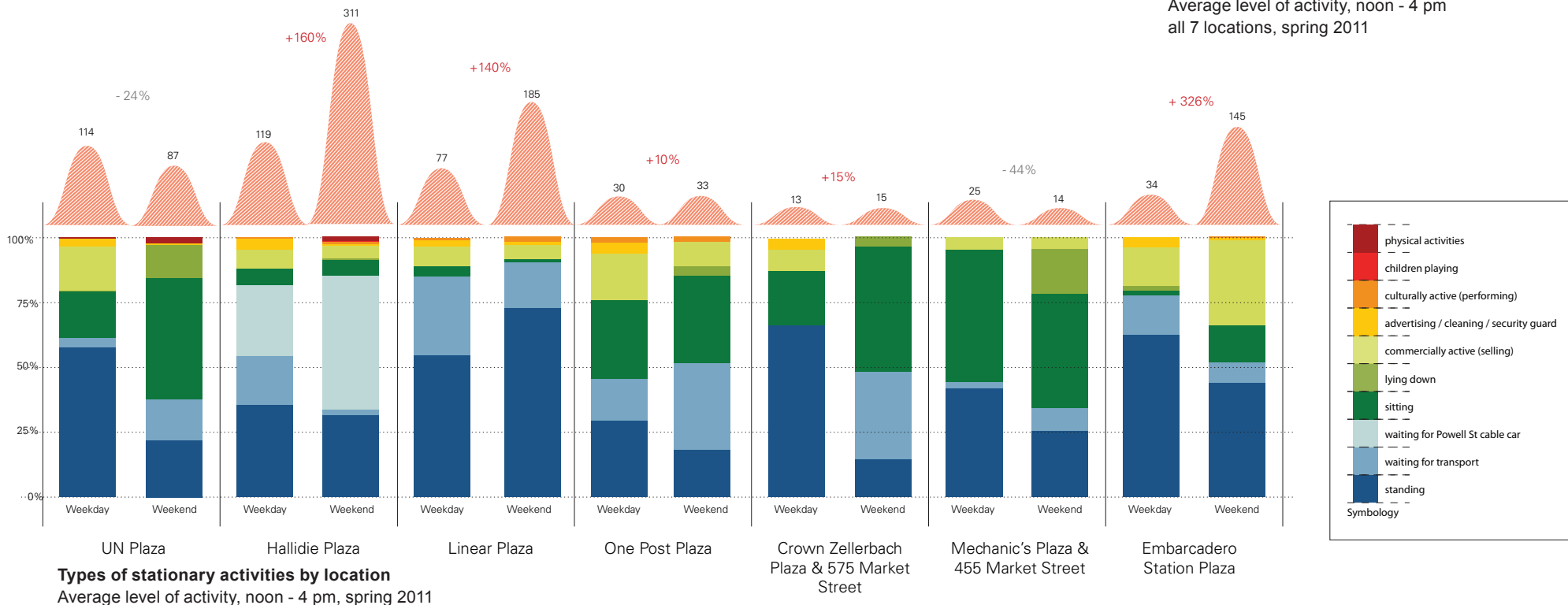
- 75% of activities are standing and waiting for transport.
- Very few recreational activities like playing and physical activities.
- Few cultural activities
- Types of activities in the weekend are similar to weekday

Intensity of use changes from space to space - but type of activities are similar along entire street



### Types of stationary activities

Average level of activity, noon - 4 pm  
all 7 locations, spring 2011

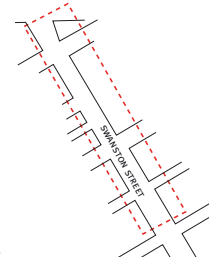
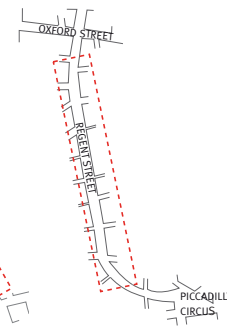
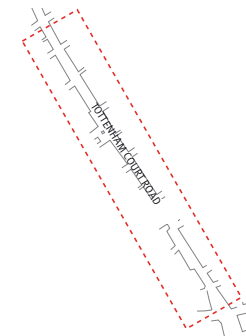
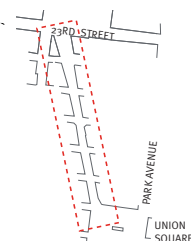
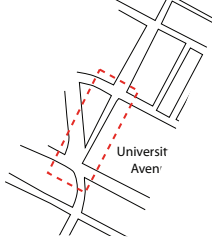
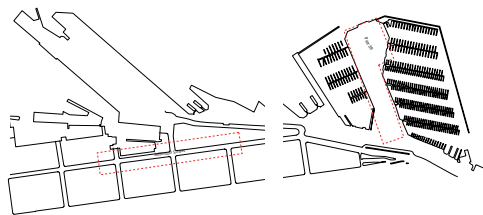
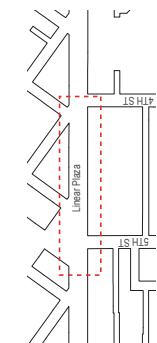
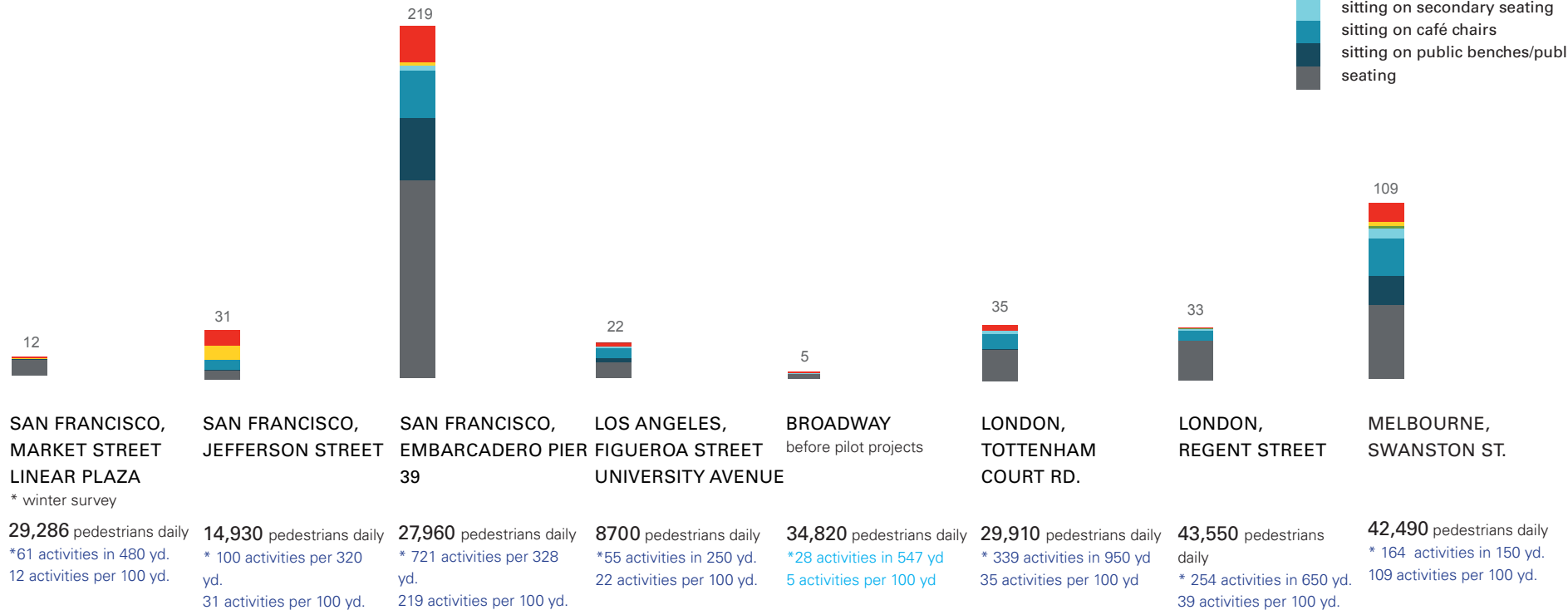
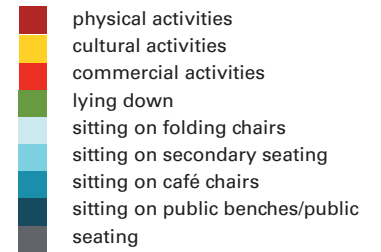


# Comparing Market Street to other streets

## Few activities per 100 yards along Market Street

### ACTIVITY PER 100YARD

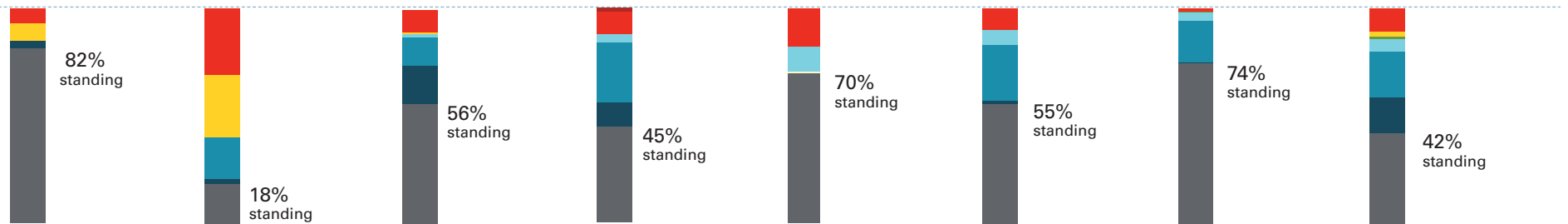
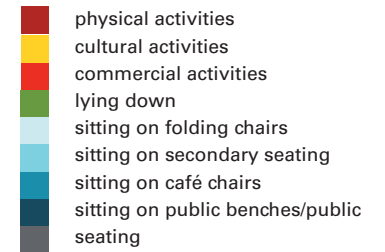
\*Average number of activities based on 3 surveys 11 am, 3 pm, and 5 pm on weekdays // Pedestrian volumes daily = 10 am - 6 pm,



# More mono-functional than other streets

## TYPES OF STATIONARY ACTIVITIES

\*Average number of activities based on 3 surveys 11 am, 3 pm, and 5 pm on weekdays



SAN FRANCISCO, MARKET STREET LINEAR PLAZA  
\* winter survey

SAN FRANCISCO, JEFFERSON STREET

SAN FRANCISCO, EMBARCADERO PIER 39

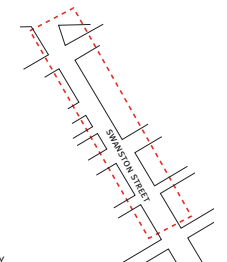
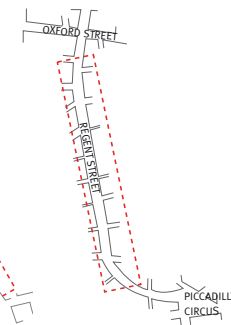
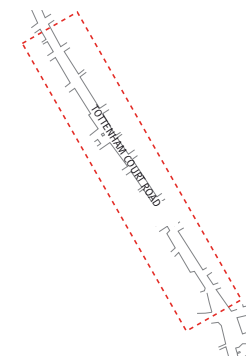
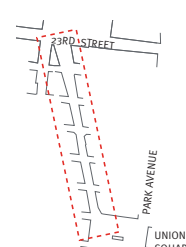
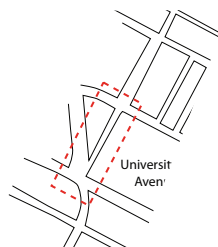
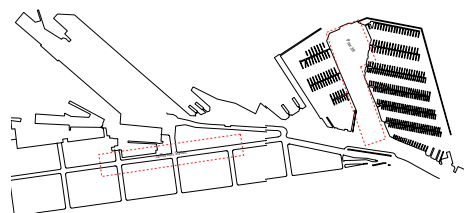
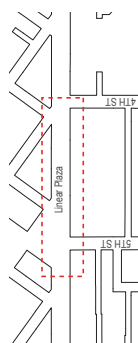
LOS ANGELES, FIGUEROA STREET UNIVERSITY AVENUE

BROADWAY

LONDON, TOTTENHAM COURT RD.

LONDON, REGENT STREET

MELBOURNE, SWANSTON ST.

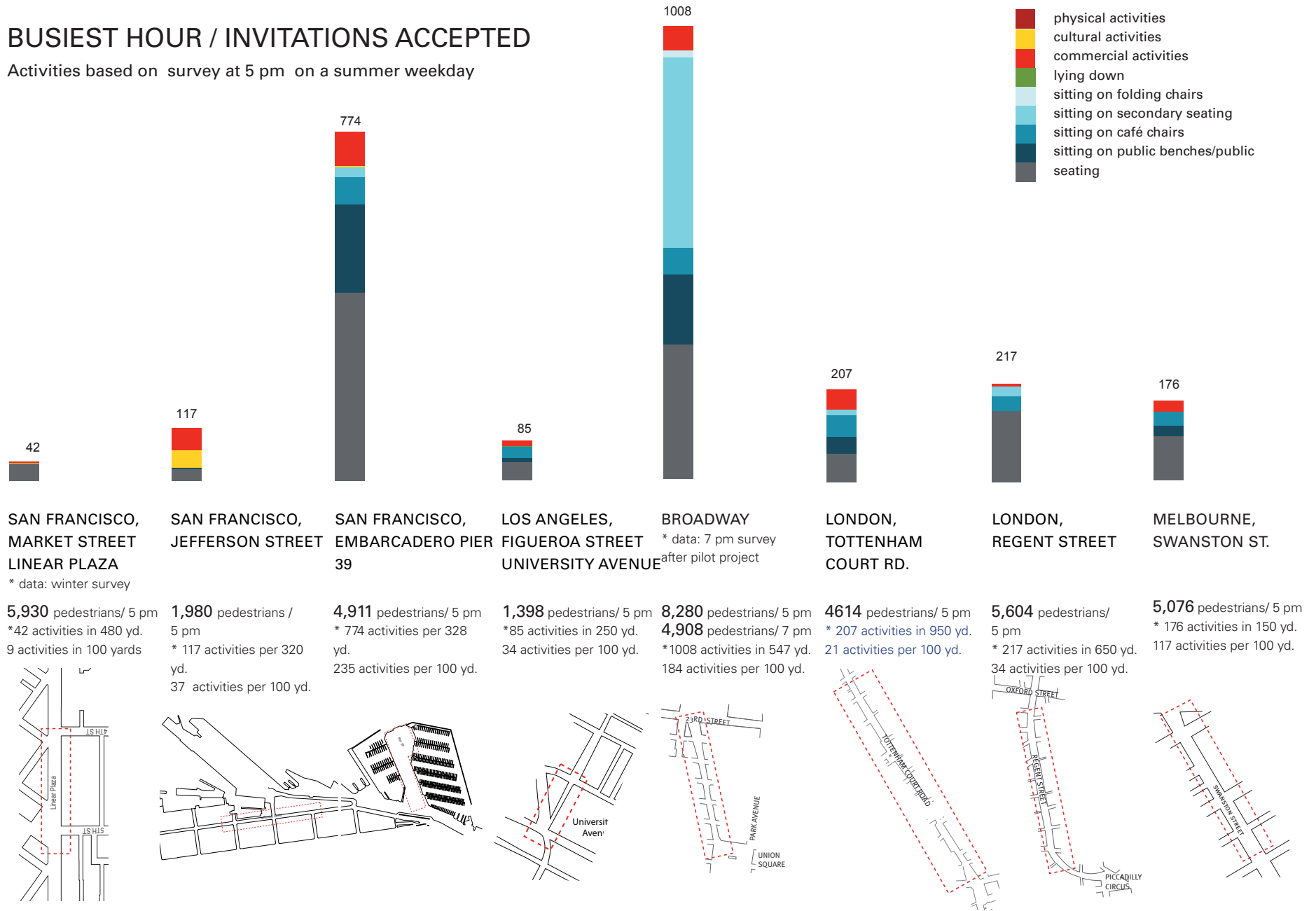




# Invitation accepted compared to other streets

## BUSIEST HOUR / INVITATIONS ACCEPTED

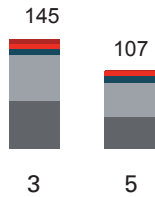
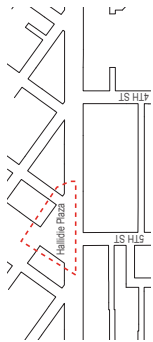
Activities based on survey at 5 pm on a summer weekday



# STAYING ACTIVITIES

WEEKDAY, 3pm+ 5pm

SAN FRANCISCO,  
MARKET STREET  
HALLIDIE PLAZA  
\* winter survey



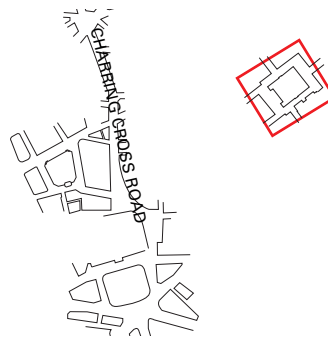
3,600 pedestrians/ 3 pm  
145 activities

4% of invitations

5,930 pedestrians/ 5 pm  
107 activities

1,8% of invitations accepted

LONDON,  
COVENT GARDEN



3,620 pedestrians/ 3 pm  
1130 activities

31% of invitations accepted

5,160 pedestrians/ 5 pm  
972 activities

19% of invitations accepted

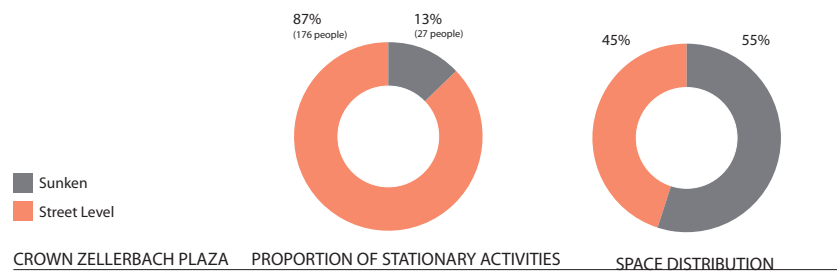
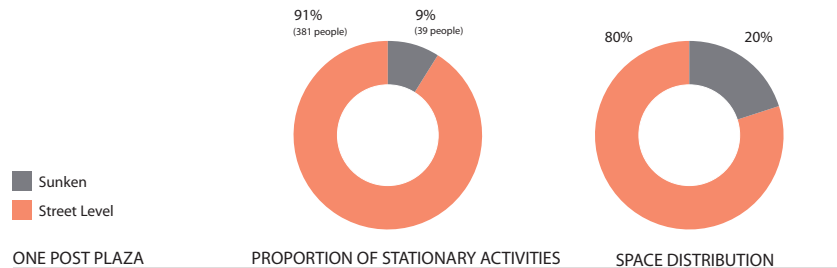
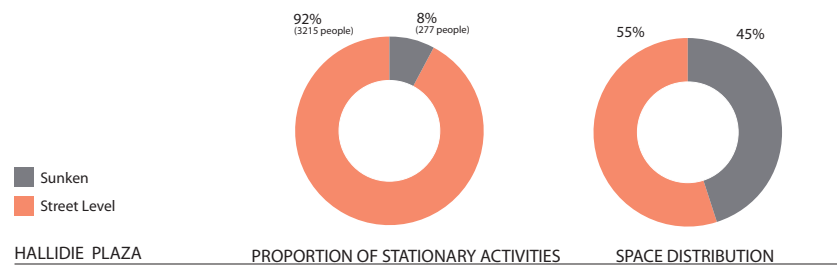
- children playing
- cultural activities
- commercial activities
- lying down
- sitting on folding chairs
- sitting on secondary seating
- sitting on café chairs
- sitting on public benches/public seating
- waiting for cable car

# SUNKEN PLAZAS USED DIFFERENTLY

People linger in the lower level far less than at grade level

Sunken plazas are more of a problem in some locations than others...

Poor sense of arrival





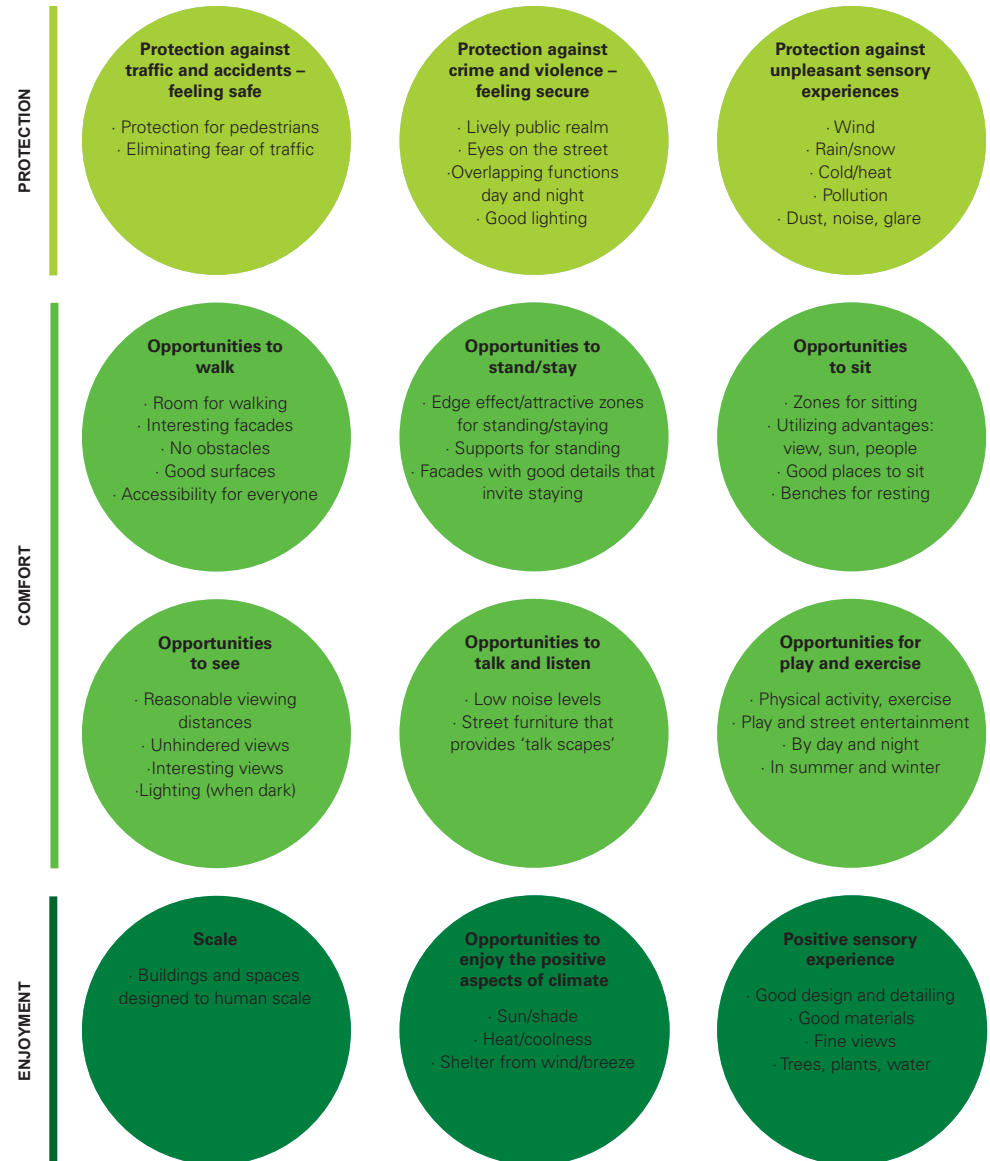
# 12 QUALITY CRITERIA

## City Spaces Quality

City spaces are places where children and adults from all cultures and lifestyles can move freely and meet to socialize and play and enjoy experiences with visual appeal. Although the modern world seems smaller in many ways thanks to information technology, it is still infinitely complex. Now more than ever it is crucial for us to encounter people with other lifestyles and from other cultures as the starting point for a social and cultural exchange in our daily and public lives that can be based on first-hand experience and trust.

The list of 12 key quality criteria, shown here, promote safe, comfortable and enjoyable city space for residents is based on research developed and tested over many years by the Center for Public Space Research in Copenhagen. The quality criteria are presented, explained and then applied to the two city spaces visited during the bus and walk tour in June 2010. The individual fields are coded to indicate good, average and poor fulfilment of the requirements.

It is interesting to note that in general the city spaces meeting most quality requirements are also the most popular and well-visited sites in cities. Conversely, the city spaces that meet few or next to no quality criteria are those least utilized. The city's residents have a well-developed sense of where they like to be – and where they don't.



## PROTECTION

Protection expresses our need to be kept safe from accident, insecurity and discomfort. Traffic is an important factor. Good city spaces provide such good traffic safety that we do not have to fear being run down or remain on constant alert, with children firmly in hand and so on. In short: good city spaces provide good conditions for pedestrian traffic.

Another criterion that falls under protection is crime prevention to ensure a genuine sense of security when we move about the city. Dark, deserted spaces and streets often promote a feeling of insecurity. For places to feel safe, there have to be people around with things to do. This is best achieved by the presence of diverse functions: housing, offices, shops and restaurants, so that there are lights in the windows and people nearby at all times of night and day.

The third factor deals with protection against uncomfortable sensory experiences such as unpleasant smells, pollution or adverse weather conditions. In Scandinavia, the main problem is that wind cools us down and cloud cover keeps the sun from warming us up again. But the problems vary with the seasons and from region to region. Other parts of the world often have completely different climate problems, but protection from unwanted elements of the climate remains important.

## COMFORT

Opportunities to participate in a variety of activities and experience the surroundings rest on how city space is designed to facilitate basic human activities under good conditions. Pedestrians need to move freely, as well as stand and sit where it feels good and natural.

Designing the edges of public space is especially important to city life. People prefer to stay at the edges or border zones with their backs well protected. They want good opportunities for looking, listening and talking.

Good city space has multiple uses. It is important to be able to stay and experience city space, to use it for both passive and active recreation. It is not necessary for many things to happen at once, but rather for the “stage” to be set so that it can be used for many different things sequentially: from quiet square to marketplace to open-air cinema, and so on.

## ENJOYMENT

Creating thoroughly enjoyable spaces is highly dependent on utilizing the qualities, attractions and special opportunities found in and around city spaces. It is vital to create city spaces on a human scale, with fine details, good materials and good street furniture. Good city space must also provide opportunities to enjoy the positive aspects of the local climate.

Finally, city space should offer good experiences, fine views and interesting sensory impressions. Last but not least and it almost goes without saying: all qualities should be part and parcel of beautifully conceived architectural unity.

# HALLIDIE PLAZA

## Key plaza in the commercial heart

**Size:** 33,000 sq. ft. /15,000 sq. ft. (45%) sunken

**Ownership:** Public Space

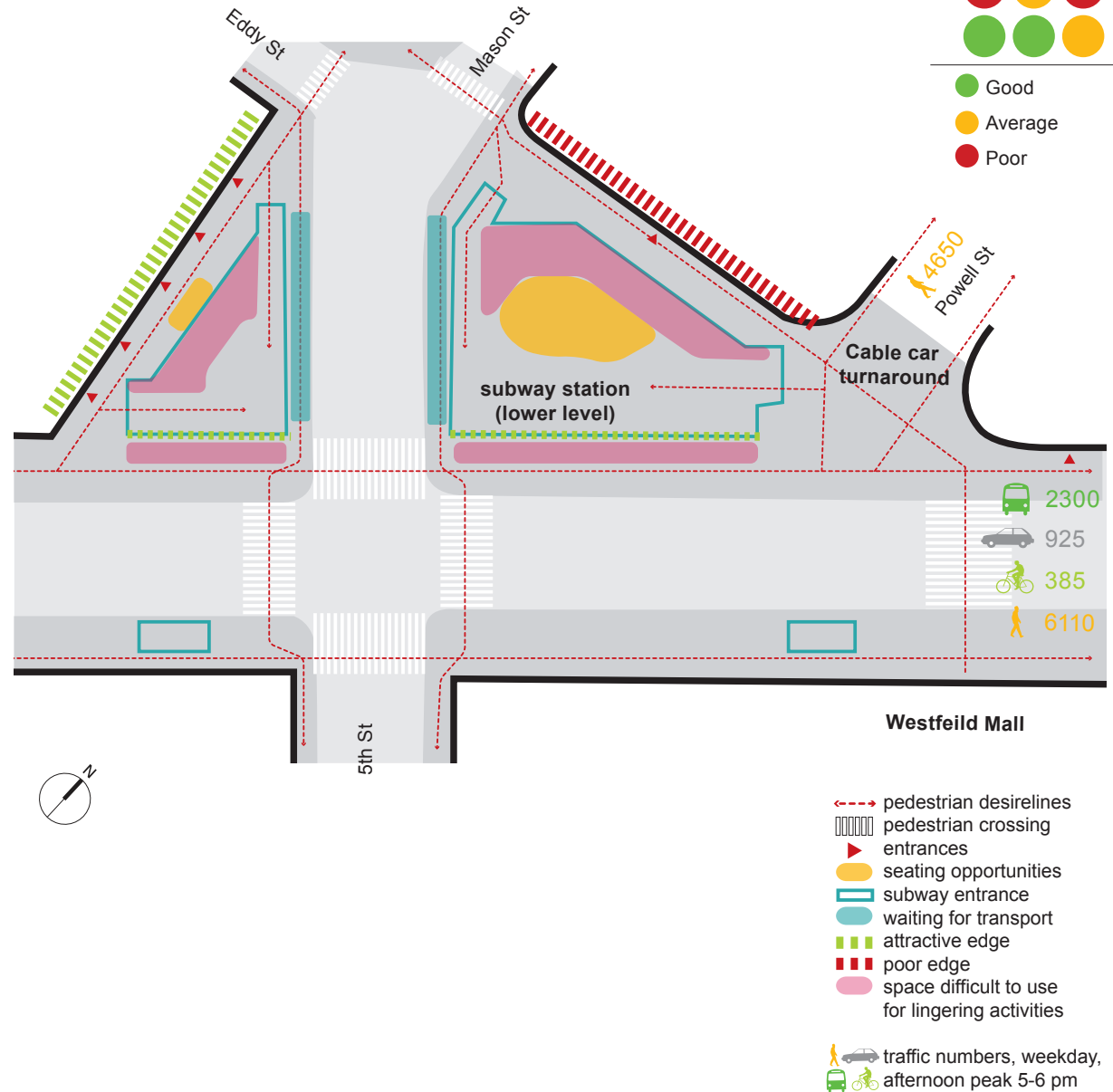
**Characteristics:** Triangular plaza on northern side of Market Street. Divided into two areas by 5th St. and the large portion (45% of the plaza) is sunken. Adjacent destinations include: Powell St cable car turnaround, Powell St, Westfield Mall opposite Market Street and the subway station.

### Key qualities

- Located in the very heart of Market Street and downtown San Francisco and linked to key city destinations and open spaces.
- Large amount of pedestrians passing. The busiest public space along Market Street.

### Key challenges

- There are not really any reasons for people to stay at Hallidie Plaza.
- Sunken portion limits the opportunities for lingering activity as well as walking at this potential key public space node.
- Sunken portion is under used, poorly designed and creates poor edges.
- Built edge in most attractive but climatic orientation is of low quality.
- Very few seating opportunities are provided, and absolutely no public seating opportunities at street level.





## Qualities



The western edge of Hallidie Plaza is of relatively good quality with small units and transparency. However the space provided along the edge is limited due to the sunken portion.



The Powell Street cable car turnaround provide one of the few reasons to stay at Hallidie Plaza.



The cafe at the lower level is one of the few places in Hallidie Plaza where seating is provided. However the environment isn't very attractive.

## Challenges



The built edge with the most favorable climatic condition has only one entrance and does not invite for interaction or staying activities along the edge.



The sunken portions create unattractive edges to Hallidie Plaza and limit the way in which the plaza can be used.



Large parts of the sunken portions are very unattractive and do not invite for people to use them.

## Lingering activity at Hallidie Plaza

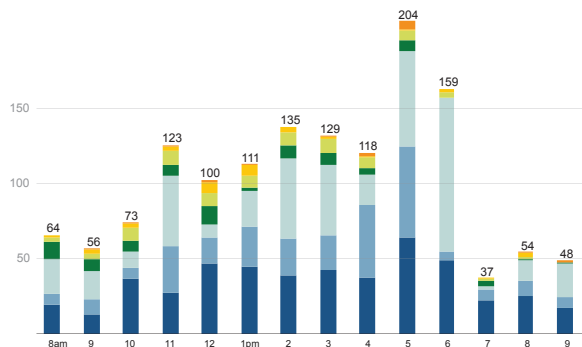
### The busiest public space along Market Street throughout the week

#### Use follows a leisure type pattern

- Weekday peak occurs in the afternoon.
- Activity more than doubles during the weekend.

#### Monofunctional type of use

- More than 80% of activities registered are standing and waiting for transit.
- Waiting for the Powell Street cable car is the key attraction, counting for 51% of activities registered in weekends.
- Only 6% of activity is sitting.
- Few playing, physical and cultural activities.



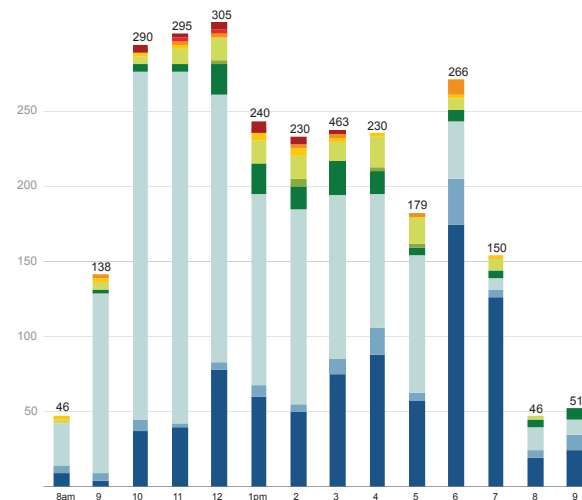
Weekday

#### Level of activity by hour

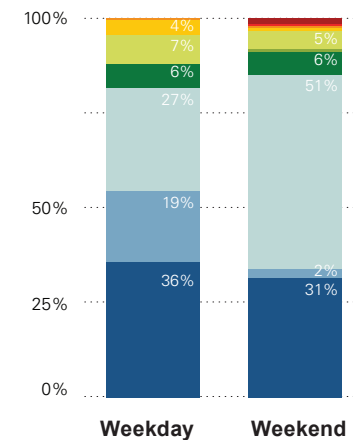
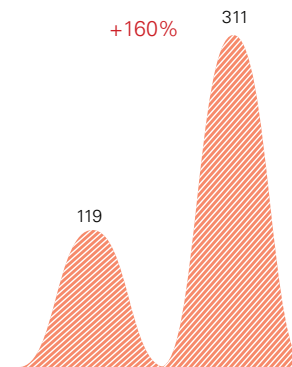
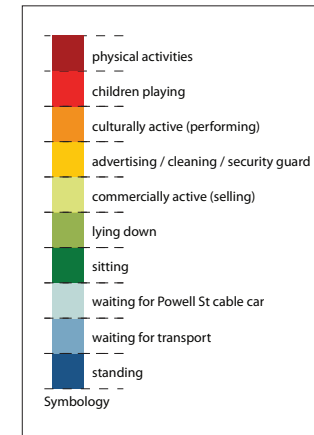
Average level of activity, spring 2011

### Little use in the evening

- Dramatic drop in activity after 6 pm in weekdays and 7 pm in weekends.



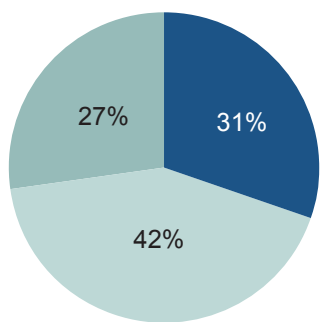
Weekend



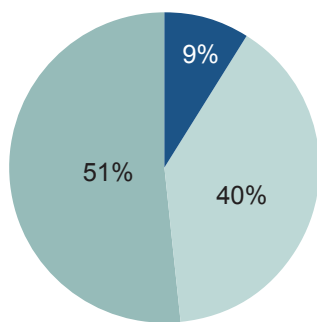
#### Types of stationary activities

Average level of activity, noon - 4 pm, spring 2011

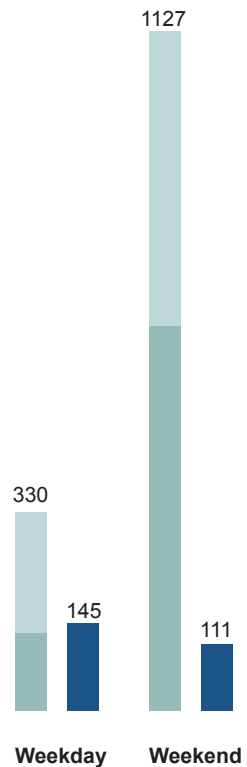
**84%** of all activity is waiting for transport and standing



**Weekday**



**Weekend**



**Weekday**

**Weekend**



**Necessary Activities**

- Waiting for transit (MUNI, or Bus)
- Lying down (undesirable, or anti social)
- Advertising
- Cleaning/working
- Security Guard
- Commercially active (selling)
- Culturally active (performing)



**Optional Activities**

- Sitting
  - Standing
  - Children Playing
  - Physically active
- Waiting for transit (Powell street cable car)

**Necessary and optional activities**  
Average level of activity, noon - 4 pm, spring 2011



# MECHANIC'S PLAZA

## Public plaza in the financial district

**Size:** 15,000 sq. ft.

**Ownership:** Public Space

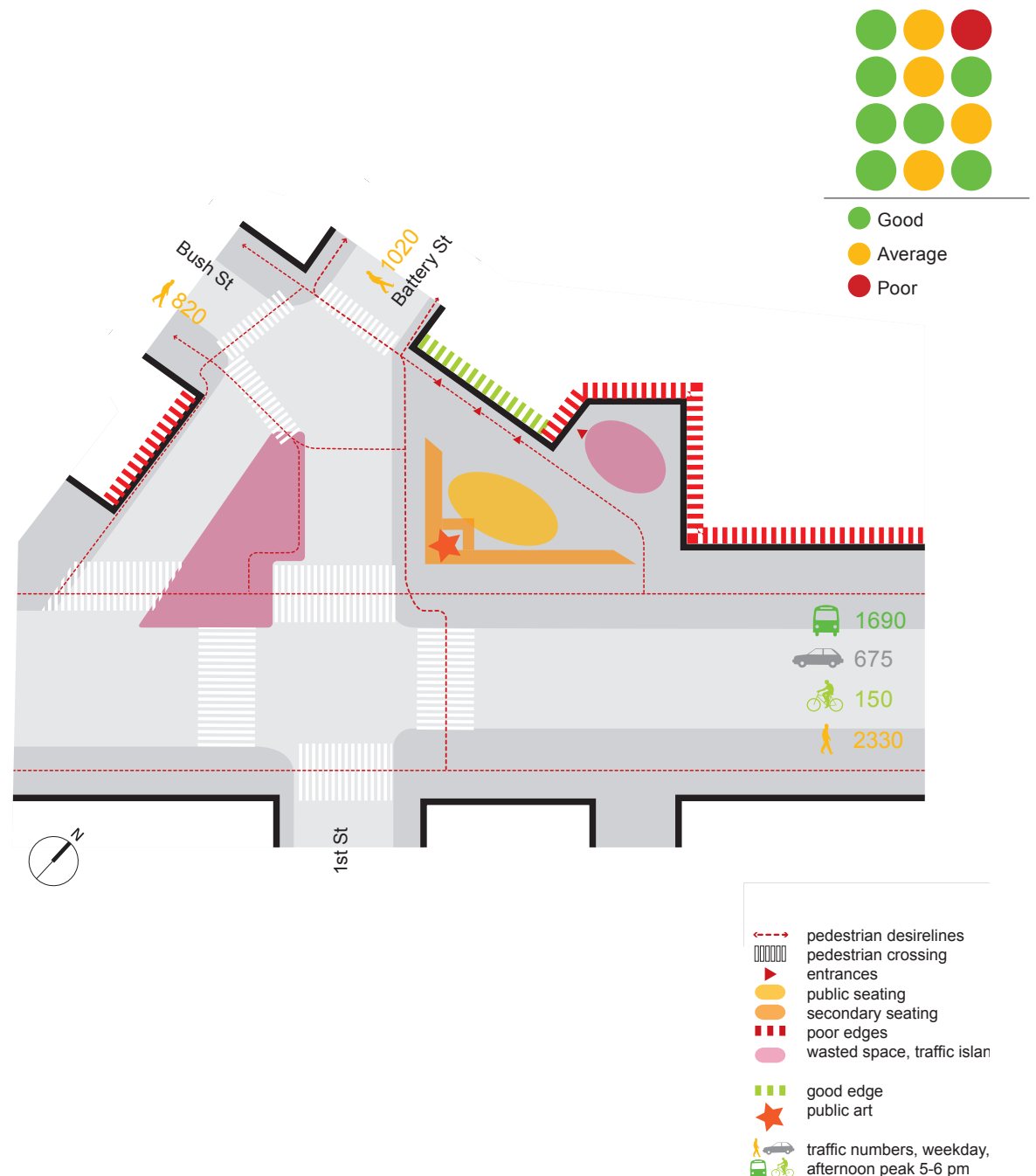
**Characteristics:** Triangular plaza on northern side of Market Street.

### Key qualities

- Humanly scaled space.
- Public benches as well as secondary seating opportunities
- Active and transparent built edge has favorable climatic location.

### Key challenges

- The seating and landscaped area is "isolated" from where people and activities are happening i.e. the built edges and the sidewalk.
- Tall building opposite Market Street casts a shadow on the plaza.
- The area opposite Battery and 1st is dominated by traffic and provides a very poor pedestrian environment with interrupted pedestrian desire lines.
- The plaza is used much less during weekends and in the evening.
- Cafe and juice bar not open at weekends.



## Qualities



Attractive, transparent facade with uses that potentially could spill out into the plaza.



One of the few spaces along Market Street where public seating is provided. Benches are located towards the sun but they do not provide very interesting views or opportunities to socialize.



Secondary seating at the base of the sculpture offer the best climatic conditions and most interesting views.

## Challenges



Edge of low quality and forgotten corner create disconnected area.



The plaza is experienced as an "island" and could engage much more with the built edges and sidewalk activity.



Opposite the plaza the pedestrian environment is poorly designed.

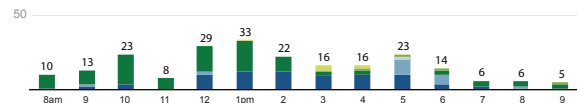
# Lingering activity at Mechanic's Plaza

## Very low levels of lingering activities

- Similarly low levels of activity as other financial district plazas, such as, One Post Plaza and Crown Zellerbach Plaza.

## Use follows a working environment type of use

- Weekday peak use is at 10 am, lunch time and in the afternoon.
- This is one of the few plazas that is used more in weekdays than on weekends.
- Sitting was the dominate activity during lunch time and during the afternoon peak period. People waiting for transport was an increasing activity during this time period.

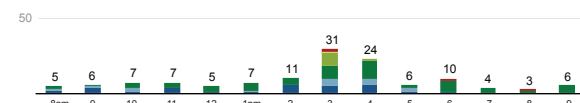


**Weekday**  
Level of activity by hour  
average level of activity, spring 2011

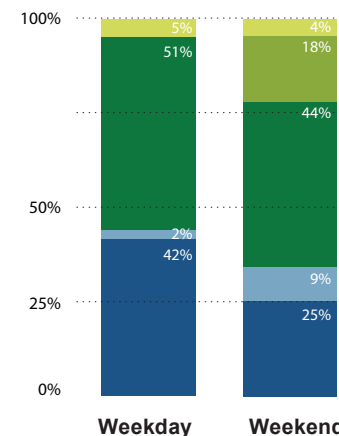
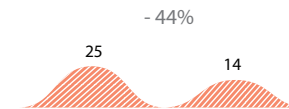
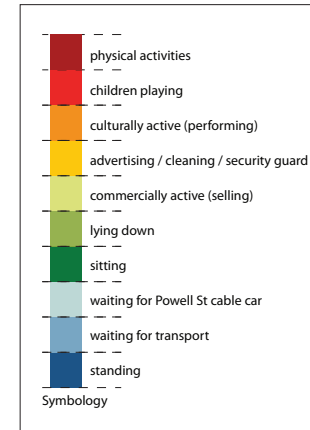
## Sitting dominating activity

- More than 50% of activities registered are sitting down.
- Most sitting occur at the lunch time, from 10 am to 2 pm.

## Very little use in the evening



**Weekend**



**51%** of all activity is sitting down

**Types of stationary activities**  
Average level of activity, noon - 4 pm, spring 2011







# UNITED NATIONS PLAZA

## Public plaza in the civic center

**Size:** 116,500 sq. ft.

**Ownership:** Public Space

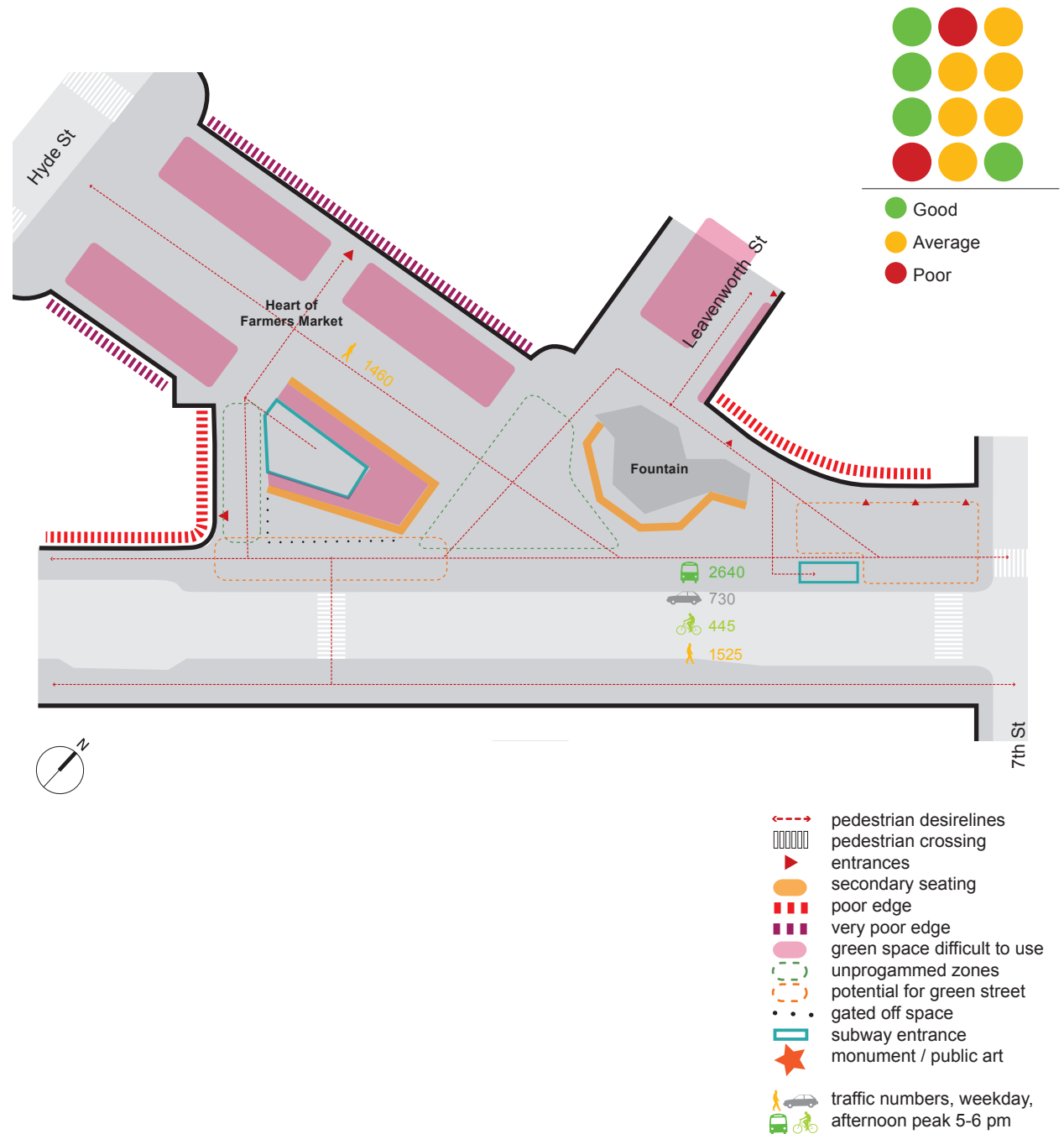
**Characteristics:** Large scale, symmetrical, monumental public open space in Mid-Market. The main attraction of the plaza is the weekly farmer's market.

### Key qualities

- Wednesday fruit and vegetable farmers market.
- Many secondary seating opportunities, but not necessarily of high quality.
- One of the most used spaces along Market Street in the weekday.

### Key challenges

- Large scale buildings that lack of variation.
- Built edges providing no interaction with the open space and no opportunities for passive surveillance.



## Qualities



The farmer's market attracts a wide range of people on Wednesdays, the busiest day at UN Plaza. The market adds an extra layer of human scale and variation to the monumental space.



Characteristic symmetrical spatial layout celebrating City Hall. Beautiful historic buildings surrounding the plaza, however, the large scale, lack of variation and monumental feeling present a set of challenges.



Mature trees provide a more intimate scale and potential recreational area along Market Street and entrance to UN Plaza.

## Challenges



Vast unprogrammed areas provide very few reasons to spend time at UN Plaza.



Beautiful historic buildings surround the plaza but provide inactive edges and no opportunities for passive surveillance. Lawn-areas at the edges are hard to use and do not really invite people to inhabit them.



Built edges of large scale that provide very little interaction with the outdoor space.



# Lingering activity at UN Plaza

## Amongst the busier spaces along Market Street

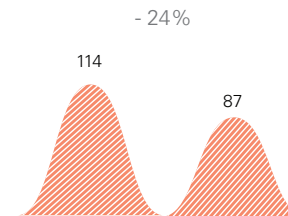
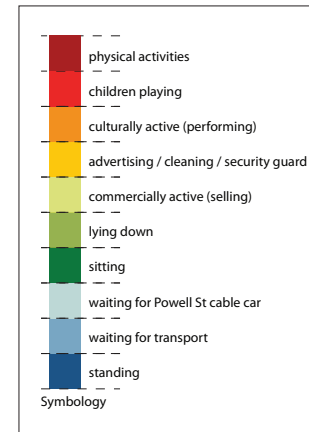
- Medium levels of lingering activities.
- Is the second busiest plaza in the weekdays.

## More used in weekdays than weekends

- One of only two spaces surveyed that experienced a weekend decrease.

## See very different use patterns depending on if there is a market

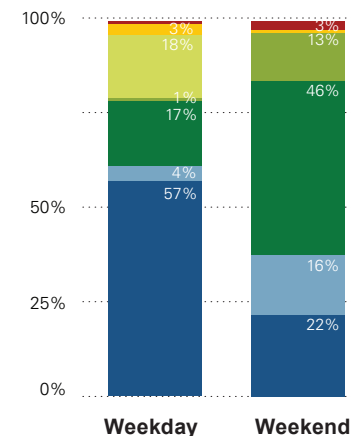
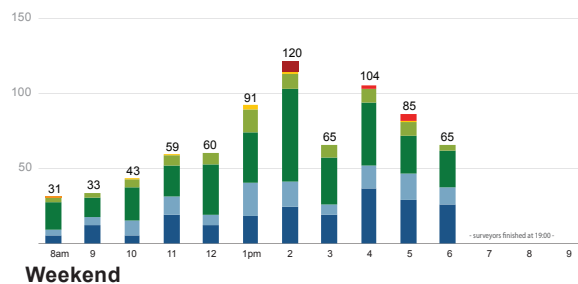
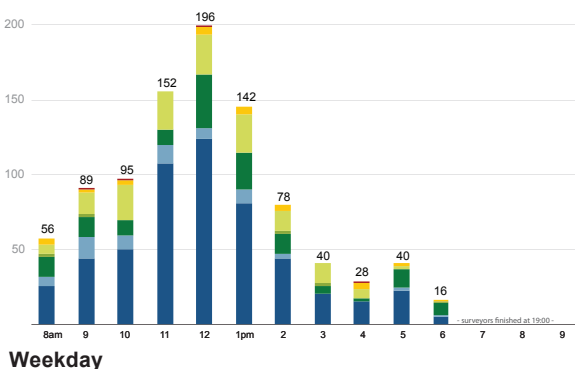
- On weekdays there is more activity between 9 am and 2 pm. Standing dominating activity, 57% were standing and 18% commercially active.
- Most activity towards the weekend afternoons. Sitting is the most common activity, at 46%, but there are also more people surveyed lying down, playing and physical activity.



### Level of activity by hour

Average level of activity, spring 2011

**Note:** Market took place on the Thursday of the survey (typically markets are on Wednesday only)



### Types of stationary activities

Average level of activity, noon - 4 pm, spring 2011



## 2.3 Bicycle







## 2.3 Bicycle

Over the past decade the number of people bicycling in San Francisco has increased substantially. Bike to Work Day has seen impressive increases in bicycling participants since its inception in 1994, with bicycles now outnumbering cars two to one on Market Street at Van Ness Avenue. In recognition and support of increased bicycling in San Francisco, the City is engaged in promoting bicycling on many levels. From the adoption of the 2009 Bicycle Master Plan to participation in the NACTO Cities for Cycling Initiative, the City has demonstrated a commitment to innovative strategies to achieve its sustainability goals.

In coordination with the City's Transit First policy and Climate Action Plan, the 2009 Bicycle Plan includes several projects within the Market Street study area. By investing in and implementing bicycle facility improvements, educational efforts and innovative policies and programs recommended in this plan, the City is working to make bicycling a more viable and sustainable mobility option.

The following section provides an overview of bicycle conditions along the Market Street study area. Bicycle volumes, user characteristics, trip purposes, origins and destinations are discussed.

### Key Findings

#### General

- **Market Street is one of the most heavily traveled bicycle corridors in San Francisco.** Citywide bicycle counts consistently show Market Street as having the highest recorded bicycle volumes of all San Francisco streets.
- **Market Street is the principal bicycle commute route in San Francisco.** According to the Great Streets Project/SFMTA survey, approximately 75 percent of bicyclists on Market Street are traveling to and from work. A relatively small percentage of people bicycle on Market Street for other purposes, such as shopping, recreation and errands.
- **Most bicyclists are traveling along rather than across Market Street.** Market Street is a primary commuter route to downtown San Francisco, whereas the multi-lane arterial cross streets lead to the freeway and are challenging places to bicycle. However, Valencia Street has a high number of bicyclists, especially during peak periods.
- **There are disproportionately few women, children and seniors riding bicycles on Market Street.** Gehl Architects' survey found that over 70 percent of bicyclists were male, and were almost entirely between the ages of 15 and 65 years old.
- **On-street Facilities – The west end of the study area has dedicated bike facilities that are continuing to be improved and**

**extended.** Closing the gaps at intersections and other conflict points through this area will help make a seamless experience for bicyclists. Between 5th and 8th Street vehicles travel at faster speeds; this contributes to an uncomfortable bicycling environment.

- **The supply of secure, on-street bicycle parking is limited.** SFMTA has installed inverted U-racks, which are appropriate for short-term parking, on sidewalks in multiple locations along the corridor. Providing a greater supply of both short- and long-term bicycle parking facilities will be key to encouraging bicycle trips, and supports bicyclists in stopping and participating in Market Street commercial activity.

#### Safety-Related

- **“Leap-frogging” between bikes and buses and other vehicles becomes an issue east of 8th Street where the bike lane ends and the right-of-way becomes more constrained.** Treatments that separate bicycles from bus and vehicle movements should be considered to reduce these conflicts.
- **Traffic signal timing is a challenge for bicyclists through most of the corridor.** Though signals are timed to optimize transit operations, it does not work very well for bike speeds. This causes bicyclist platoons and bunching.

- **Left-turns from Market Street are prohibited.** Except for a few locations, left turns are illegal for all vehicles, including bicyclists, along Market Street. Despite this prohibition, bicyclists frequently make left turns, often through unpredictable maneuvers. The corridor lacks comfortable areas to wait at the curb to cross the street, out of the way of moving traffic. Transit islands, BART vents and Muni Streetcar tracks also impact bicycle movements across Market Street. Skewed intersections and one-way streets further reduce bicycle access to destinations directly off Market Street.
- **Pinch points between transit boarding islands and the curb occur at almost every intersection, particularly east of 8th Street.** Pinch points are further exacerbated when curb-side bus stops are located in close proximity and where vehicles queue to turn right. Providing a dedicated bike lane, or relocating bus stops, boarding islands or subway portals would remove these pinch points.
- **BART vents and Muni tracks are problematic for all bicyclists, particularly in wet conditions.** Any new vents and tracks should be designed to maximize bicycle safety. Non-slip materials, closing flange gaps, and realigning angled crossings should be considered in the design phase.
- **Bicyclists encroach on crosswalk areas at red lights and frequently don't give pedestrians right-of-way.** Advanced stop bars and bike boxes have helped reduce these conflicts, however both education and better distinction/separation of bicycle and pedestrian facilities is needed.
- **Conflicts between bicycles and right turning vehicles are a safety and operational issue.** Conflicts between bicycles and right turning vehicles traveling eastbound create "right hook" safety issues, and also affects vehicle queuing and delay for all users, including transit. Westbound, the wide intersection geometries encourage vehicles to turn right off Market Street at higher speeds. Future safety improvements to reduce right-turn conflicts must also consider impacts to queuing and delay for all users.

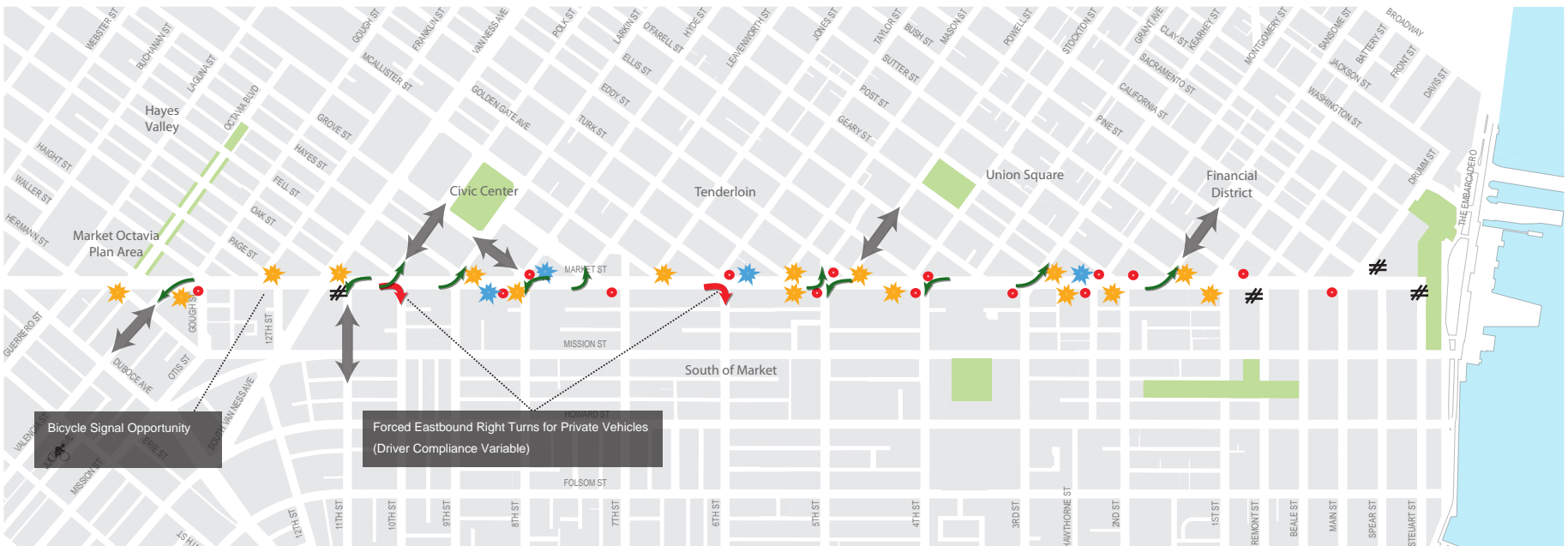
**Figure 2.3.1: Existing Bicycle Conditions**

**CORRIDOR CONDITIONS**

Signal Timing Not Optimal for Cycling Speeds

Dedicated Bicycle Facilities "Leapfrogging" With Buses and Vehicles

Market Street at Guerrero Street      Market Street at 8th Street      Market Street at 5th Street      Market Street at Steuart Street



Source: San Francisco GIS Data - <http://gispub02.sfgov.org/website/sfshare/index2.asp>

- Pinch Points
- ★ Conflicts with Right Turning Vehicles
- ★ Conflicts with Dwelling Buses
- ↙ Desirable Left-Turn For Bikes from Market Street
- ↔ Challenging Connection Point
- # Muni Track Conflicts (Track Spurs/Constrained Space for Bicycles)





## Bicycle Volumes

In August 2006, the SFMTA conducted its first citywide bicycle count, with the goal of establishing a baseline of bicycling use in the City. Since then, the SFMTA has continued with bicycle counts in the first three weeks of August, as well as on Bike to Work Day in May. The data gathered from the last five years has enabled the SFMTA to identify and measure some basic trends in bicycle ridership throughout San Francisco. The bicycle counts also inform the ongoing bicycle planning efforts in the City, providing data needed to evaluate the efficacy and efficiency of the City's bicycle network, as well as identifying locations where there is a need for additional infrastructure improvements.

Counts are recorded manually at locations throughout the City, including the intersection of 11th / Market Street and 5th/ Market Street as shown in the table below. More recently, the SFMTA installed automated bicycle counters in the fall of 2010 on Market Street between 12th Street and Van Ness Avenue. These locations are the top locations for recorded bicycle activity in San Francisco.

Citywide, bicycling has increased 58 percent since SFMTA's 2006 baseline counts. This increase in bicycle ridership is especially significant when viewed in light of the court injunction against the San Francisco Bicycle Master Plan, which restricted the construction of bicycle projects identified in the Plan for close to four years.

**Table 2.3.1: Annual SFMTA Bicycle on Market Street**

	PM Peak Hour <sup>1</sup> Bicycle Counts (Percent Increase from Previous Year)				
	2006	2007	2008	2009	2010
11 <sup>th</sup> Street/Market Street	360	386 (7%)	480 (24%)	533 (11%)	540 (1%)
5 <sup>th</sup> Street/Market Street	309	343 (11%)	406 (18%)	492 (21%)	525 (7%)
<sup>1</sup> Peak hour counts are estimated based on PM peak period counts between 5:00PM-6:30PM Source: SFMTA 2010 Bicycle Count Report					

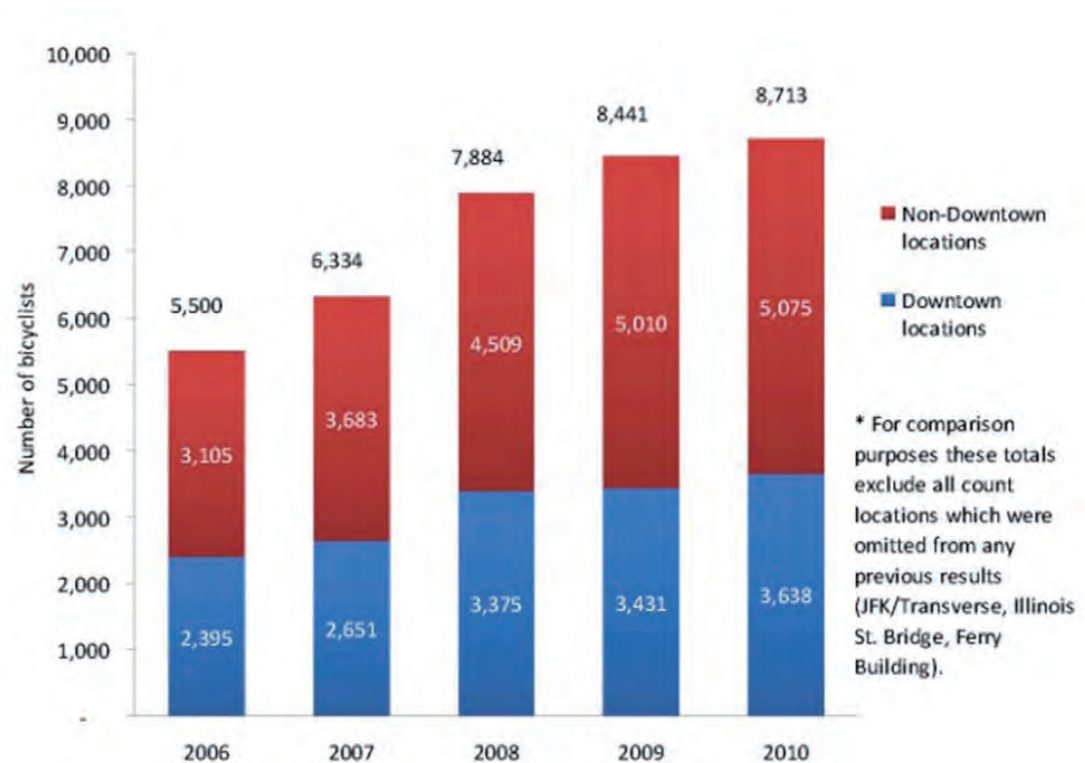
## Other Data

Bicycle counts were also collected by Gehl Architects at multiple locations for the Better Market Street project. These counts were recorded in the spring of 2011 between 8 am and 6pm. Gehl Architects' count methodology varied slightly from the SFMTA's. SFMTA counts were performed at the intersection on all legs over a 1.5-hour PM peak period timeframe. Gehl Architects counted bicyclists on Market Street as well as at mid-block locations and on side streets.

Even when these differences are accounted for, bicycle counts collected by Gehl Architects were lower than SFMTA's most recent counts. Weather conditions, time of year, survey practices or other external factors may have contributed to these differences in volumes. Findings from Gehl Architects' bicycle counts include the following:

- Bicycle volumes peak during the weekday AM and PM peak hour.
- Volumes are considerably lower on the weekend at points west of 3rd Street. East of 3rd Street, weekday and weekend volumes are comparable.
- There are few bicyclists on the side streets of Market Street. However, Valencia Street has a high number of bicyclists, especially during peak periods.
- More people bicycle on Market Street in the summertime than in spring. In particular, bicycling on the weekends is higher in the summer as compared to the spring.

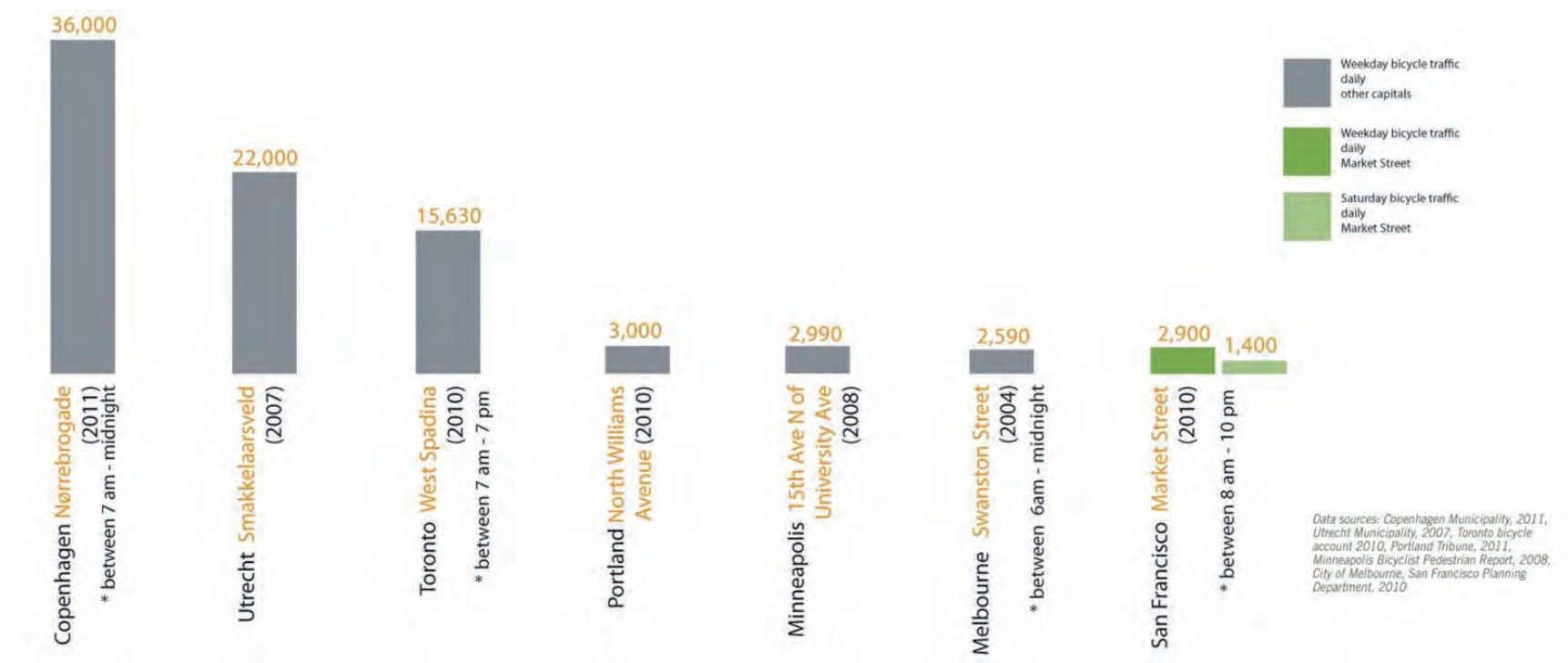
**Figure 2.3.2: San Francisco Citywide Bicycle Counts (2006-2010)**



Source: City of San Francisco 2010 Bicycle Count Report, SFMTA (2010)

Market Street is among the highest bicycling streets in the U.S. When compared to other major streets in the world, Market Street is on par with key corridors in other U.S. cities known for their bicycle-friendliness, such as Portland and Minneapolis. However, it lags behind internationally recognized bicycling cities such as Copenhagen, Utrecht and Toronto.

**Figure 2.3.3: Market Street and Other Major Bicycle Corridors**



Source: Perkins + Will, 2011



## Bicyclist Characteristics

A recent survey<sup>1</sup> was conducted to better understand the travel habits, origins and destinations, and user preferences of people bicycling along Market Street. The nonprofit San Francisco Great Streets Project and the SFMTA collaborated to survey 425 people, approximately half of whom were intercepted while biking on Market Street between Octavia Boulevard and the Embarcadero and the other half reached through an online survey in early 2011. The survey results provide insight on how bicyclists are currently experiencing Market Street and what would draw them to the street more often.

### Trip Purpose

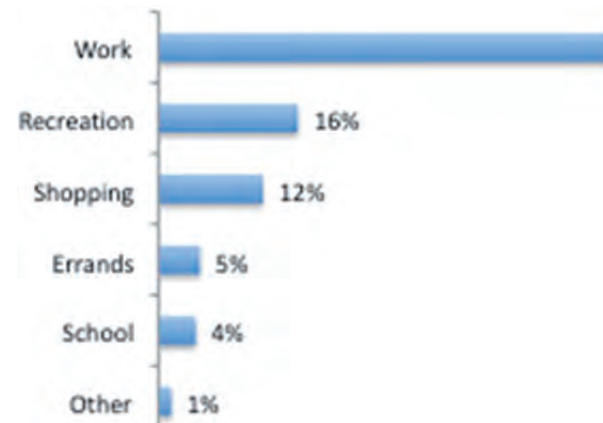
Market Street is the principal bicycle commute route in San Francisco. According to the Great Streets Project/SFMTA survey, approximately 75 percent of bicyclists on Market Street are traveling to and from work. A relatively small percentage of people bicycle on Market Street for other purposes, such as shopping, recreation and errands.

Many people bicycle on Market Street for the same reason people walk or take transit – it is the most direct route to their destination. However, bicycle facilities along the west end of the study area also attract riders. In addition, there appears to be a perception of “safety in numbers”, as close to half of survey respondents said they ride on Market

<sup>1</sup> Preference Survey of People Riding Bikes on Market Street. San Francisco Great Streets Project and the SFMTA, February 2011

Street because the presence of other people on bikes made them feel safer.

**Figure 2.3.4: Trip Purposes of Bicyclists on Market Street**



Source: Great Streets Project and SFMTA

Trip Purpose / Reason for Biking on lower Market Street	Direct Route	Dedicated bikeway	Logical route connection	Presence of other people	Access to businesses and institutions	Other
<b>Work + School</b>	69%	64%	48%	46%	21%	22%
<b>Shopping + Errands</b>	80%	70%	54%	29%	67%	19%
<b>Recreation</b>	69%	65%	62%	31%	54%	19%
<b>Other</b>	67%	67%	33%	17%	67%	33%
<b>Total</b>	<b>69%</b>	<b>64%</b>	<b>49%</b>	<b>40%</b>	<b>29%</b>	<b>21%</b>

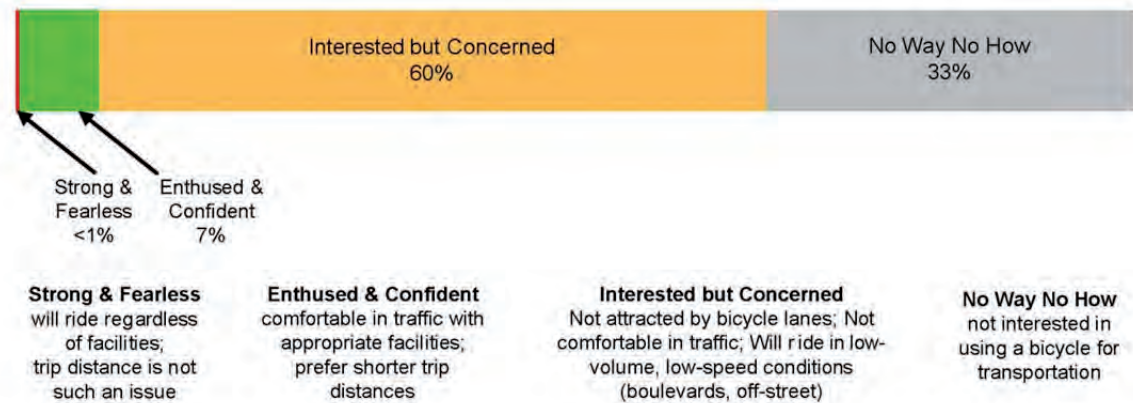
## Rider Type

A good barometer for measuring how safe a street feels to bicyclists is the mixture of people who actually ride bikes on a street. A safe street for bicycling is inviting for people of all ages, and where men and women both feel comfortable using the space. Gehl Architects' Public Life Public Space Study analyzed the age and gender of people bicycling on Market Street. The study found that over 70 percent of bicyclists were male, and were almost entirely between the ages of 15-65 years old.

Market Street bicyclists' demographics are not unique. Recent studies in Portland, Oregon have found several distinct types of transportation bicyclists: strong and fearless; enthused and confident; interested but concerned; as well as those that are not interested (see Figure 2.3.5). Primary commuter routes in US cities typically attract bicyclists from these first two categories, which, as shown on the figure, represent a very small portion of the total potential bicyclists. However, recent safety improvements such as the physically separated bike lanes and forced right turns for vehicles may encourage new riders from the other categories to the Market Street corridor. Survey respondents noted that physical separation from vehicle traffic was the most important attribute of a bike facility when choosing a bike route.

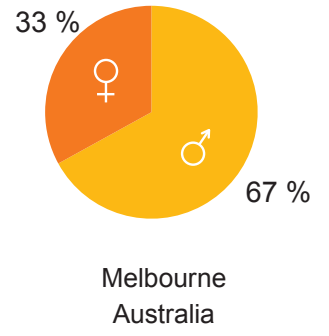
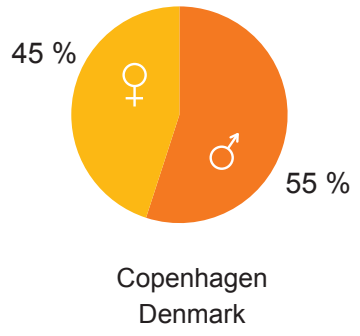
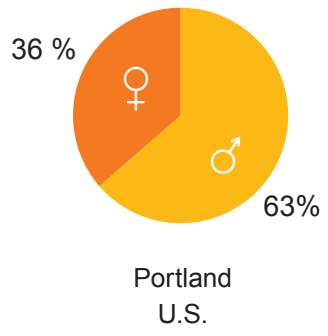
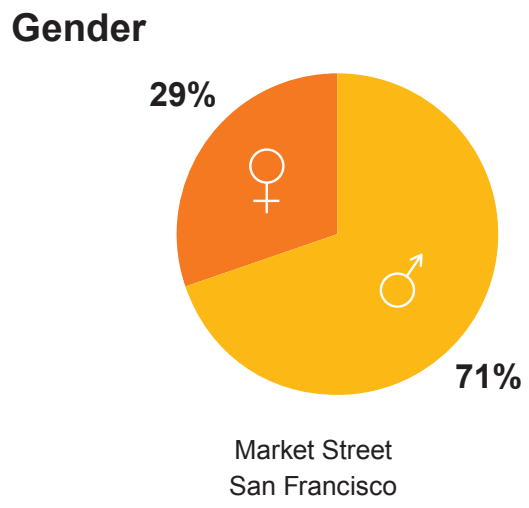
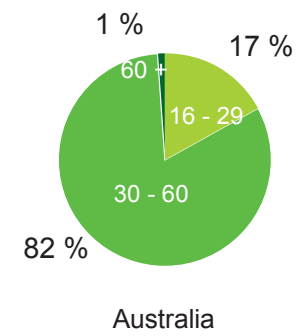
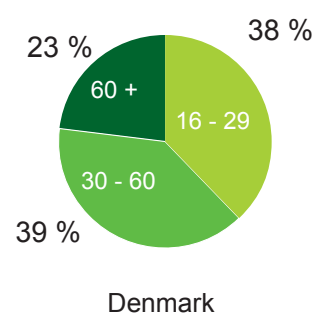
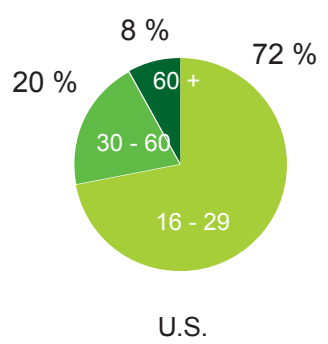
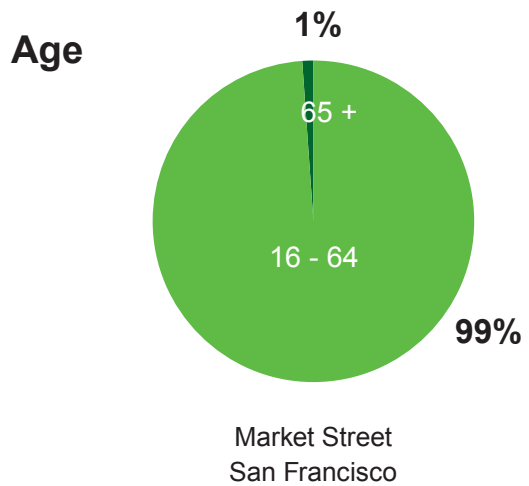
Increases in bike mode share through San Francisco over the past decade are an encouraging indicator for new types of bicyclists that may be more comfortable riding on protected and dedicated bikeway facilities.

**Figure 2.3.5: Distinct types of transportation bicyclists**



Source: Portland Department of Transportation

**Figure 2.3.6: Cyclist Age & Gender**



Source: Gehl Architects



## Trip Origin and Destinations

Most people on bikes are coming from central neighborhoods on the west end of Market Street and are traveling to the Financial District. Approximately half of all bike trips on Market Street originate from Western Addition, the Mission, Castro/ Upper Market and Haight Ashbury, all neighborhoods within a mile of Market Street. Close to a quarter of bike trips end in the Financial District.

Figure 2.3.7: Origins and Destinations for Bicyclists on Market Street



Source: San Francisco Great Streets Project and SFMTA, 2011

## Existing Facilities

Bikeway planning and design in California typically relies on the guidelines and design standards established by Caltrans as documented in “Chapter 1000: Bikeway Planning and Design” of the *Highway Design Manual* (5th Edition, California Department of Transportation, January 2001). Chapter 1000 follows standards developed by the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA), and identifies specific design standards for various conditions and bikeway-to-roadway relationships.

Caltrans standards provide for three distinct types of bikeway facilities:

**Class I:** Bike Path/Shared Use Path – These facilities provide a completely separate right-of-way and are designated for the exclusive use of bicycles and pedestrians with vehicles cross-flow minimized.

**Class II:** Bike Lane – Bike lanes provide a restricted right-of-way and are designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally five feet wide. Vehicle parking and vehicle/pedestrian cross-flow are permitted.

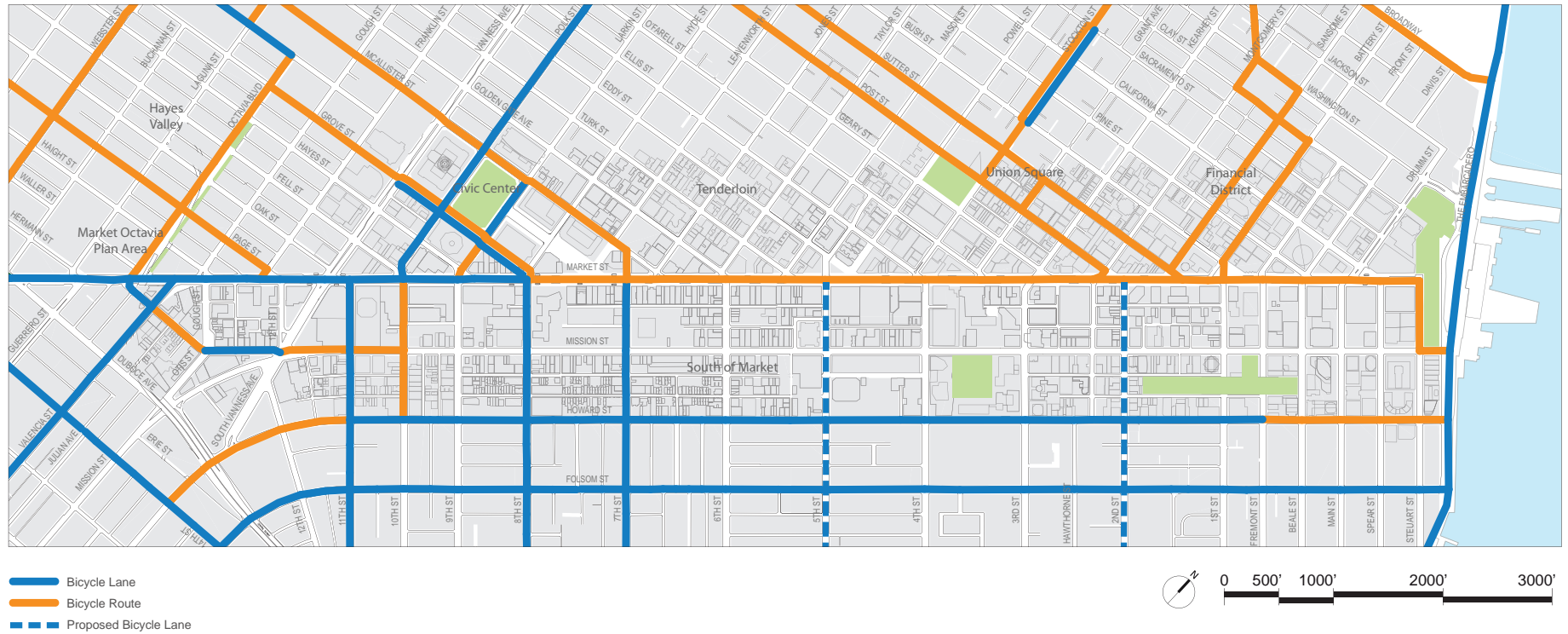
**Class III:** Bike Route – Bike routes provide a right-of-way designated by signs or pavement markings for shared use with pedestrians or motor vehicles. A shared-use arrow (or “sharrow”) can be marked in the outside lane on a Class III route to show the suggested path of travel for bicyclists. This is traditionally done when the route has on-street parking, in order to encourage cyclists to ride a safe distance away from the parked vehicles’ “door zone.” The sharrow can also be used at intersections with multiple turn lanes to show bicyclists the recommended lane for through travel.

## Facilities on Market Street

Market Street is part of the citywide bicycle network, as set forth in the San Francisco Bicycle Master Plan (2009). The corridor and surrounding study area provide connections to virtually every neighborhood in the City, as shown in the existing and proposed network map on the next page.

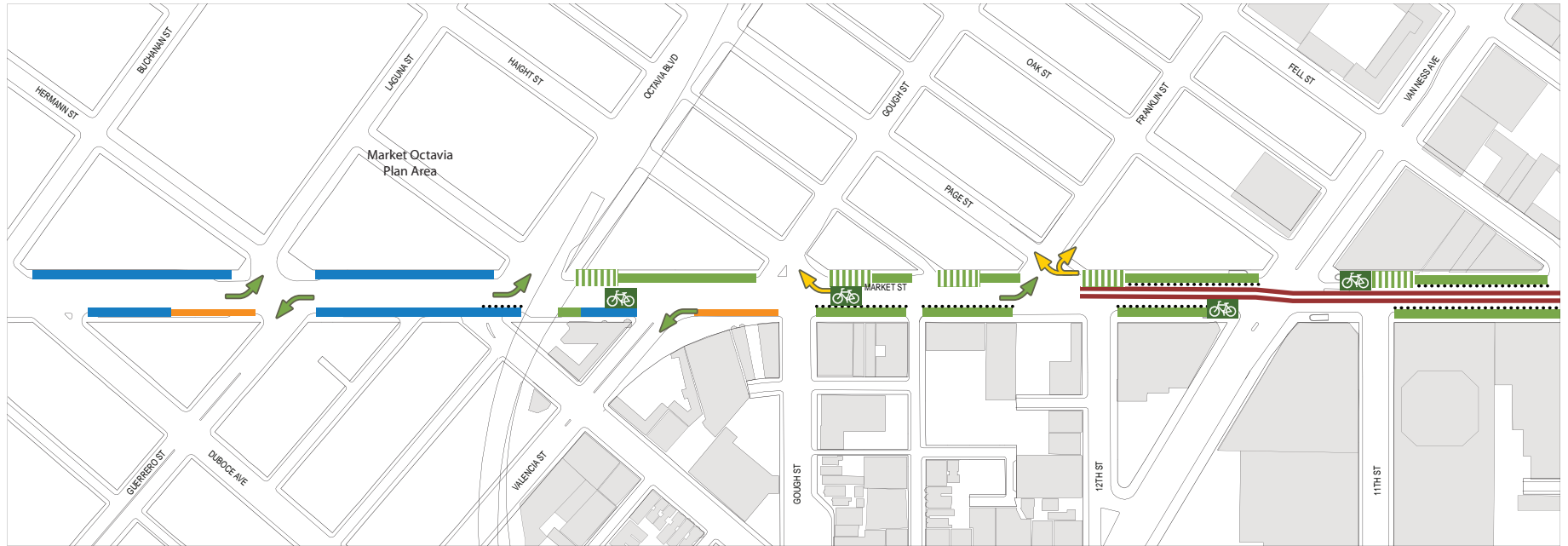
Market Street has Class II bike lanes between 8th and 17th Street, and is designated as a Class III facility east of 8th Street where there are no designated bike lanes. On the western end of the study area, standard bike lanes are striped between Guerrero and Valencia Street. Between Valencia and 8th Street, facilities range from shared travel lanes with sharrows, to green colored bike lanes that are physically separated with soft-hit post bollards. East of 8th Street, sharrows are the only on-street treatments for bicyclists. The lack of on-street facilities in this area is primarily due to the constrained right-of-way and the shared use of the outside travel lane by transit vehicles, private automobiles, trucks and bicyclists.

**Figure 2.3.8: Bicycle Facilities**











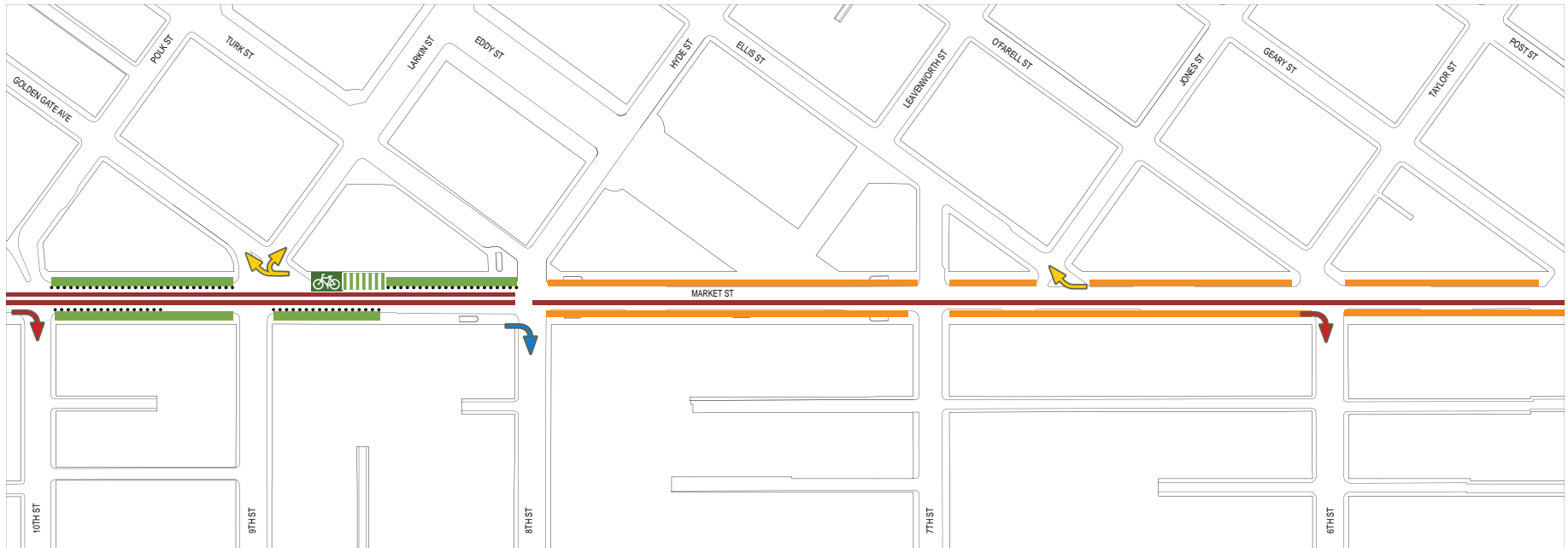
**Figure 2.3.9: Market Street Configuration (1 of 4)**















-  Transit-Only Lane (Bi-directional)
-  Transit-Only Lane (Eastbound)
-  Left-Turn Permitted (from Market Street)
-  Required Eastbound Right-Turn
-  Right-Turn Slip Lane (Westbound on Market Street)
-  Turn Lanes

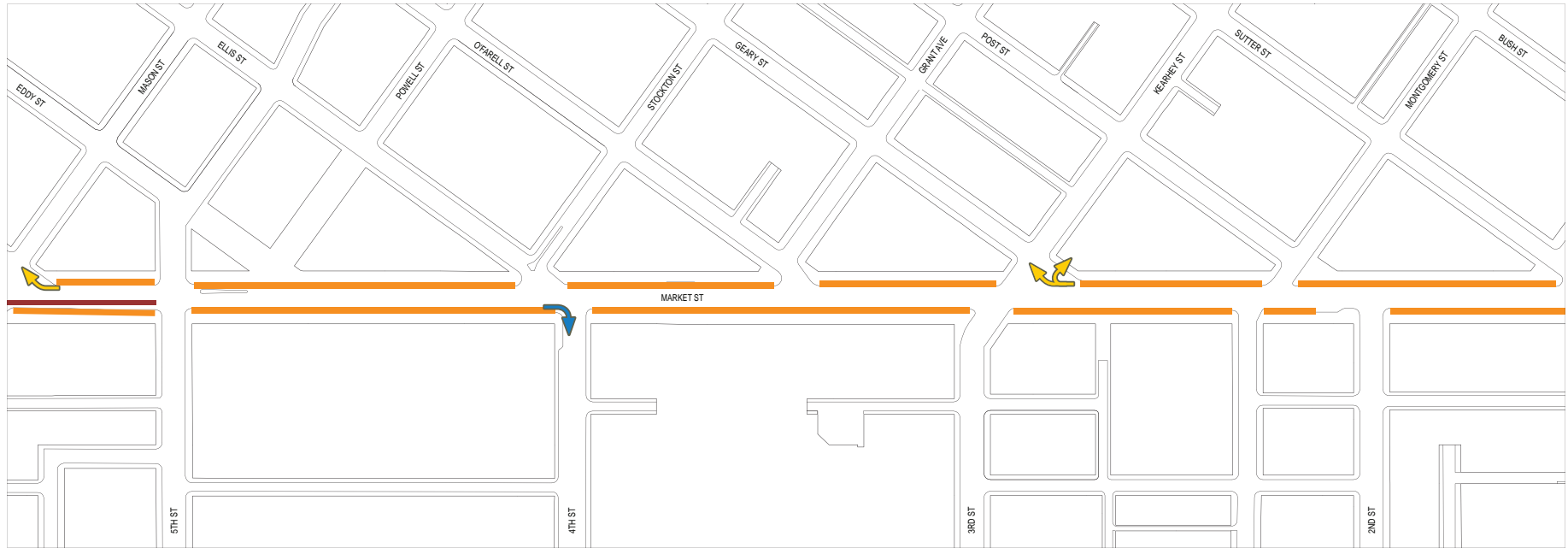
- Bicycle Facilities**
-  Bicycle Lane
  -  Bicycle Route
  -  Green Bicycle Lane
  -  Physically Separated Bicycle Lane
  -  Future Green Dashed Mixing Zone
  -  Bicycle Box













**Figure 2.3.9: Market Street Configuration (2 of 4)**



- |   |   |   |
|---|---|---|
|    | Transit-Only Lane (Bi-directional)                | <b>Bicycle Facilities</b>   |
|  | Transit-Only Lane (Eastbound)                     |  Bicycle Lane                      |
|  | Left-Turn Permitted (from Market Street)          |  Bicycle Route                     |
|  | Required Eastbound Right-Turn                     |  Green Bicycle Lane                |
|  | Right-Turn Slip Lane (Westbound on Market Street) |  Physically Separated Bicycle Lane |
|  | Turn Lanes  |  Future Green Dashed Mixing Zone   |
|   |   |  Bicycle Box                       |

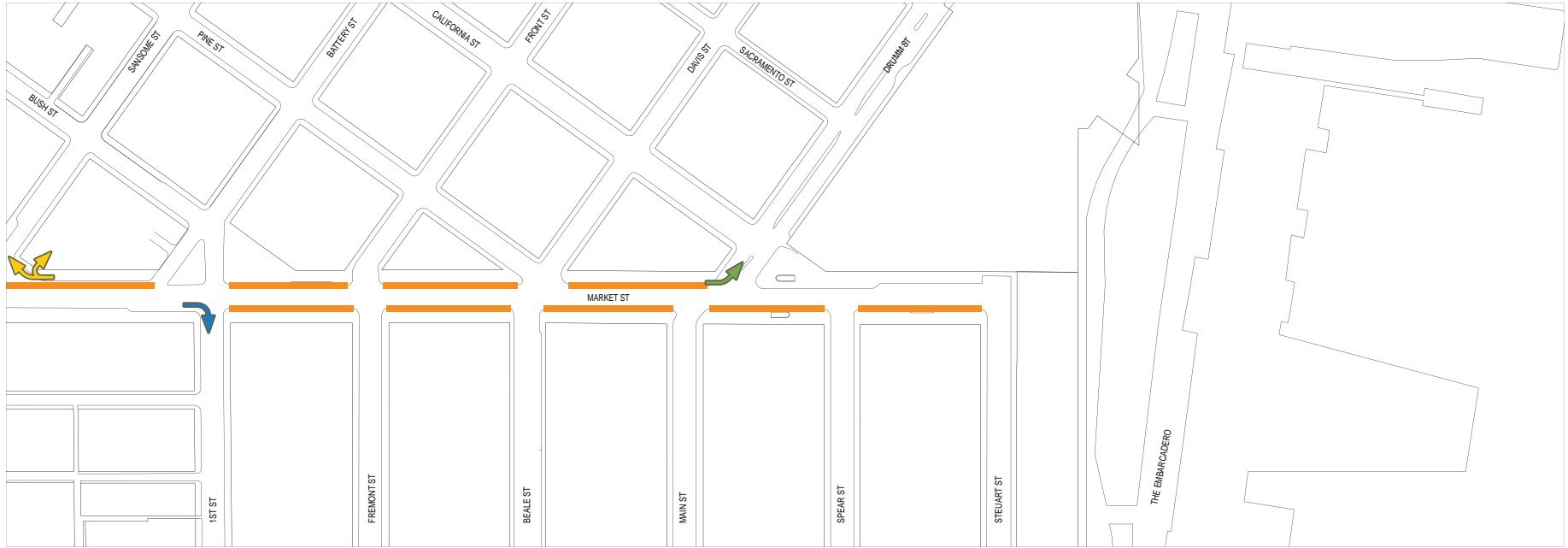
**Figure 2.3.9: Market Street Configuration (3 of 4)**















- |   |   |   |                                   |
|---|---|---|-----------------------------------|
|    | Transit-Only Lane (Bi-directional)                |  | Bicycle Lane                      |
|  | Transit-Only Lane (Eastbound)                     |  | Bicycle Route                     |
|  | Left-Turn Permitted (from Market Street)          |  | Green Bicycle Lane                |
|  | Required Eastbound Right-Turn                     |  | Physically Separated Bicycle Lane |
|  | Right-Turn Slip Lane (Westbound on Market Street) |  | Future Green Dashed Mixing Zone   |
|  | Turn Lanes  |  | Bicycle Box                       |



**Figure 2.3.9: Market Street Configuration (4 of 4)**



- |   |   |   |                                   |
|---|---|---|-----------------------------------|
|   | Transit-Only Lane (Bi-directional)                |  | Bicycle Lane                      |
|  | Transit-Only Lane (Eastbound)                     |  | Bicycle Route                     |
|  | Left-Turn Permitted (from Market Street)          |  | Green Bicycle Lane                |
|  | Required Eastbound Right-Turn                     |  | Physically Separated Bicycle Lane |
|  | Right-Turn Slip Lane (Westbound on Market Street) |  | Future Green Dashed Mixing Zone   |
|  | Turn Lanes  |  | Bicycle Box                       |

## Ongoing Projects

### Market Street Required Right Turn Project

In 2009, SFMTA launched a pilot project, which was made permanent in 2010, to reduce through traffic on Market Street by requiring eastbound traffic, with the exception of transit, taxis, delivery vehicles and bicycles, to turn right at 10th and 6th streets. This project is described in Section 2.5: Vehicular Traffic.

Bicycle traffic has increased on eastbound Market Street after the changes. Some of this increase appears to be a result of bicyclists diverting from eastbound Folsom Street to eastbound Market Street as a result of this project and other recent bicycle improvements on Market Street.

### Innovative Bicycle Treatments

In addition to the required right turn project, SFMTA has recently installed a number of innovative bicycle treatments along Market Street. The purpose of these treatments is to provide bicyclists a greater degree of physical separation from vehicles, to raise the visibility of bicyclists to drivers, to mitigate conflict areas, and close key gaps along the corridor. SFMTA has installed the following treatments incrementally in a series of trial projects over the past three years:

- Colored green bike lanes
- Physically separated bike lanes (delineated with soft-hit post bollards)
- Bike boxes at intersections

- Dashed green bike lanes through conflict zones
- Extended bike lanes on Lower Market Street
- “Green backed” Sharrows

In addition, the first phase of the “Calm the Safety Zone” project included a number of measures to improve safety for bicyclists and encourage safe bicycling behavior through transit boarding island areas. Colored pavement was installed to slow vehicle speeds. Study results found that the colored pavement didn’t show any clear impact on the speed of the vehicles. Advanced stop bars were installed at intersections to encourage drivers and bicyclists to stop in advance of the crosswalk to reduce encroachment. Although this treatment helped to reduce vehicle and bicycle encroachment in the crosswalk area, additional measures may still be considered to support pedestrians’ right of way at crosswalks. The second phase of the project will include an evaluation of colored bike boxes. More discussion of the Calm the Safety Zone project can be found in the “Safety” section.

### Safety

Bicyclists are involved in approximately 25 percent of all police-reported collisions on Market Street. This number far exceeds the five percent mode share for bikes, and is an important indicator for the quality and safety of the bicycling environment. Bicycle collisions peak towards the west end of the Market Street study area where traffic volumes are higher and vehicle travel speeds are greater. In particular, the intersections of Market/Octavia and Market/Gough experience the highest number of

bicycle-related collisions along the corridor. A more in-depth analysis of collisions and intersection “hot spots” are provided in Section 2.8: Safety and Section 2.9: Hotspots on Market Street, respectively.

### San Francisco Bicycle Sharing

The City of San Francisco is currently working with the MTC and Bay Area Air Quality Management District (BAAQMD) to implement its version of a bicycle share program by 2012. The project would initially be focused within Downtown San Francisco. Other areas in the region are planning bicycle sharing stations at major transit stations, including Caltrain Stations and BART stations. SFMTA is leading the effort in San Francisco, but Samtrans, the City of Redwood City, County of San Mateo, and the Valley Transportation Authority are also participating in Bike Share Planning.

The following are general benefits of implementing a bike sharing program in San Francisco:

- Encourages alternative modes of travel and provides those who already use alternative modes more options.
- Provides a fast alternative mode of transportation, specifically in downtown settings where vehicular congestion and parking shortages exist.
- Provides an environmentally-friendly option for short-distance links in the transportation network.
- Provides low cost, sustainable transportation.

- Increases the awareness of bicycling and introduces more commuters to the benefits of cycling.
- Potential to increase commuter health through physical activity.

The initial program would have 1,000 bicycles and 100 stations along the Caltrain corridor from San Francisco to San Jose. Within San Francisco, 500 bicycles would be placed at 50 stations in the Downtown and South of Market area to serve the Financial district, Market Street, and Transbay/Caltrain area. Stations would be placed about 300 meters apart and be located at major transit stations, job centers, retail centers, public facilities. The SFMTA is currently investigating station locations, public outreach needs, vendors, and sponsorships for the program.





## 2.4 Transit



## 2.4 Transit

Market Street is the most transit-oriented corridor in the Bay Area, with multiple modes of service operated by numerous providers on the street surface and in two underground levels.

The primary provider of surface transit is Muni. While a total of two dozen Muni routes operate on Market at some point, 12 routes – 11 bus routes, and the F Line historic streetcar line – operate throughout the day for several blocks or more. These routes, which account for the vast majority of transit service on Market Street, are the focus of this section.

Muni operates in all four lanes of Market Street, with some routes stopping along the curb and others stopping at island platforms in the center of the roadway. These platforms are relatively narrow, yet must accommodate high volumes of passengers loading and unloading, particularly near the Financial District and Union Square, as well as major transfer points.

Because Muni routes primarily operate in traffic (parts of the center lanes are reserved for transit and taxis, but are often used by cars and trucks), and because Market Street is such a complex operating environment, transit service on Market is relatively slow and unreliable.

### Key Findings

- **Market Street is a key corridor for Muni, and both underground and surface transit is heavily utilized.** Close to one-third of Muni's all-day, weekday transit lines operate on Market Street at some point. This is an

outgrowth of land use patterns – of downtown densities – but also of the design of the street network, as north-of-Market bus lines naturally “funnel” onto Market in order to access downtown. Several of these lines are among Muni's busiest, including Lines 38 and 38L serving the Geary corridor, Line 5 in the Fulton corridor, and Lines 6, 71 and 71L serving the Haight. In the lower reaches of Market Street during the busiest hour of the day, more than 80 buses and streetcars pass in each direction, averaging more than one per minute. Not surprisingly, then, transit is the predominant mode of travel at most points along Market Street– not including the even greater demand for transit below the street.

- **Market Street is designed to accommodate a high volume of transit, but limitations remain.** From the Civic Center east, transit operates in all four lanes of Market Street, with center island stops accommodating service in the center lanes and limited segments of lanes reserved for transit vehicles and taxis. Transit vehicles generally benefit from the flexibility of being able to change lanes; however, access to island stops, which are long enough to accommodate two vehicles, can be delayed not just by other transit vehicles but by auto queues. Boarding islands also do not meet eight-foot-wide standards for wheelchair access, some are so narrow that wheelchair lifts cannot be deployed, and some lack the wheelchair ramps needed for F Line boarding. Additionally, transit vehicles operating in the

inbound curb lane must contend with queues of cars prevented from turning right by pedestrians in the crosswalk on connecting streets.

- **Transit vehicles on Market Street travel slowly.** Market Street is a complex operating environment including high-volume stops. Transit service is slower on Market Street than in most other parts of the city, with average speeds between 5 and 6 miles per hour. Muni vehicles are in motion only about half of the time, and time spent loading and unloading passengers at stops and stopped at traffic signals each account for close to a quarter of total travel time.
- **Most delay is caused by loading and unloading and by traffic signals.** Together, dwell time and signal delay account for 87 percent of all time spent stopped. All other sources of delay combined, including delays caused by traffic, are responsible for just 13 percent of time stopped and just 6 percent of total travel time. (However, traffic-generated delay is significant at a few key locations.)
- **Demand for transit service is relatively constant along Market Street east of Van Ness.** Although the busiest stops can be found near the Financial District and Union Square, this is partly a function of the volume of service at these stops, and demand remains relatively high (multiple stops with more than 2,000 combined daily boardings and alightings) at other locations including the Civic Center. Stops near subway stations and at major



transfer points between surface transit lines are busy; indeed, the busiest stops in the corridor, by far, are the stops just off of Market on Kearny, 3rd and 4th streets, where connections can be made to and from Chinatown buses. Much of this demand is likely to be removed from the street and relocated below the surface by the Central Subway project.

- ***Slightly more riders of Market Street transit lines are bound for destinations North-of-Market than South-of-Market.*** However, the 2004 survey data on which this finding are based are both somewhat dated and limited, and an on-board survey will be conducted as part of the Better Market Street process to provide more current and detailed information.
- ***Demand for Muni Metro service is oriented toward peak-commuter periods, while demand for surface transit is more consistent throughout the day.*** Close to one-third of all weekday boardings on Muni Metro in the study area take place between 4 and 7 p.m., while slightly less than one-quarter of all boardings on surface lines take place during this period.
- ***The highest numbers of collisions involving Muni vehicles are at 3rd and 4th Streets.*** These two intersections, with their high volumes of transit vehicles (including major routes crossing at Market), pedestrians, cyclists and non-transit vehicles, have by far the highest numbers on Market Street of collisions involving Muni vehicles.

- ***Demand for transit on Market Street is likely to increase significantly.*** While the Central Subway project is projected to actually decrease transfer activity on the surface of Market Street, other major projects including the Transbay Transit Center and Transit Effectiveness Project implementation will increase demand and service. Muni has proposed to increase service on Market Street by roughly half by 2030.

## Existing Infrastructure and Services

A total of 24 Muni lines, or 30 percent of all routes operated by Muni, operate on the surface of Market Street within the study area: 16 local- and limited-stop bus lines, four peak-only express bus lines, two “Owl” bus lines replacing light rail service overnight<sup>1</sup>, a Sunday-only bus line and a historic streetcar line, the F Market. A dozen of these lines – 11 local- and limited-stop bus lines, and the F Line – operate on Market for some distance, making multiple stops, throughout the day, and these lines are the focus of this assessment<sup>2</sup>.

---

<sup>1</sup> Two local-stop lines also serve as Owl lines; overnight, one terminates at Market rather than operating on the street.

<sup>2</sup> Of the remaining 12 lines, seven operate for only a limited time (during peak periods, overnight, or on Sunday), while five operate on Market for only a block or two, making no more than one stop on Market.

Below the street are four subway stations providing Muni Metro local light rail and Bay Area Rapid Transit (BART) regional rail service, at Embarcadero, Montgomery, Powell and Civic Center/UN Plaza as well as a fifth, Muni-only station at Van Ness. Overnight “Owl” bus service operated by AC Transit to and from the East Bay, Amtrak bus service to and from its nearest station in the East Bay, paratransit service for disabled riders, and private shuttle services also operate on Market Street.

Between 8th and Drumm streets, Muni service operates in all four lanes of Market Street, with service in the center lanes topping at island platforms between the center and curbside lanes. With the exception of a short segment near the foot of Market Street, the F Line streetcar tracks are located in the center lanes. The inbound center lane is designated as transit- and taxi-only between 12<sup>th</sup> and 5<sup>th</sup> Streets, and the outbound center lane is similarly restricted between 8<sup>th</sup> and 12<sup>th</sup> Streets.

As several of the bus lines operating on Market Street are electric trolley rather than motorcoach lines, there are overhead wires above much of the street, including wires over all four lanes in segments in which trolley buses operate in the center and curbside lanes with crossover wires at select locations allowing trolley buses to change lanes. Signals are timed for a progression designed to be optimal for transit service, a system described by SFMTA staff as “passive” transit priority.

While transit vehicle stop spacing varies, the general pattern is one stop per (south side) block, about every 900 feet apart on average. This conforms to the Muni standard of 800 to 1,000 feet between stops. Center islands are typically five to seven feet wide, vary in length (but are long enough to accommodate two transit vehicles), and are located on the near sides of intersections, while curbside stops are along the sidewalk, most often at mid-block locations.

Curb stops typically feature full shelters with amenities including NextMuni real-time wait time displays and system maps, while island stops, with their limited width, offer only limited shelters. Island stops predate passage of the Americans with Disabilities Act (ADA) and are narrower than the current eight-foot standard for wheelchair access; some lack wheelchair ramps for streetcar boarding and alighting (some feature hydraulic lifts, but these are often out of service), and some platforms are too narrow for bus wheelchair lifts to be deployed.

There are nearly 30 subway portals located on Market Street sidewalks in the study area, with additional station entrances and exits in adjacent plazas, on sidewalks or in buildings adjacent to Market Street. There is just one elevator at each station, limiting access when elevators are out of service.

All Muni lines operating on Market Street, including limited-stop lines, make all stops in the lanes in which they operate (curb or center).

**Figure 2.4.1: Buses in the Curb and Center Lanes, and Center Island Stop**



The F Line operates along the length of Market Street through the study area, while Muni bus lines operating along Market Street (rather than across it, with a short segment on Market Street) generally terminate just south of Market near its eastern end, at the Temporary Transbay Terminal, Main and Mission streets, or Ferry Plaza.

Most Muni service on Market Street continues outbound onto east-west streets to the north of Market Street. In effect, Market Street serves as a “trunk” for Muni service, with “branches” extending off of the street. All lines come together in the lower reaches of Market Street, adjacent to the Financial District between 2nd and Sansome Streets. In this segment, there are up to 173 scheduled vehicle trips in both directions during the peak hour of 5 to 6 PM. Over 24 hours, there are close to 2,900 scheduled transit trips operating on some part of

Market Street. The configuration of Muni service on Market Street in the study area, including stops, is shown in Figure 2.4.2, a map developed by Muni. Figure 2.4.3 takes a broader view of Muni service in the area.

Figure 2.4.2: Map of Market Street Muni Service

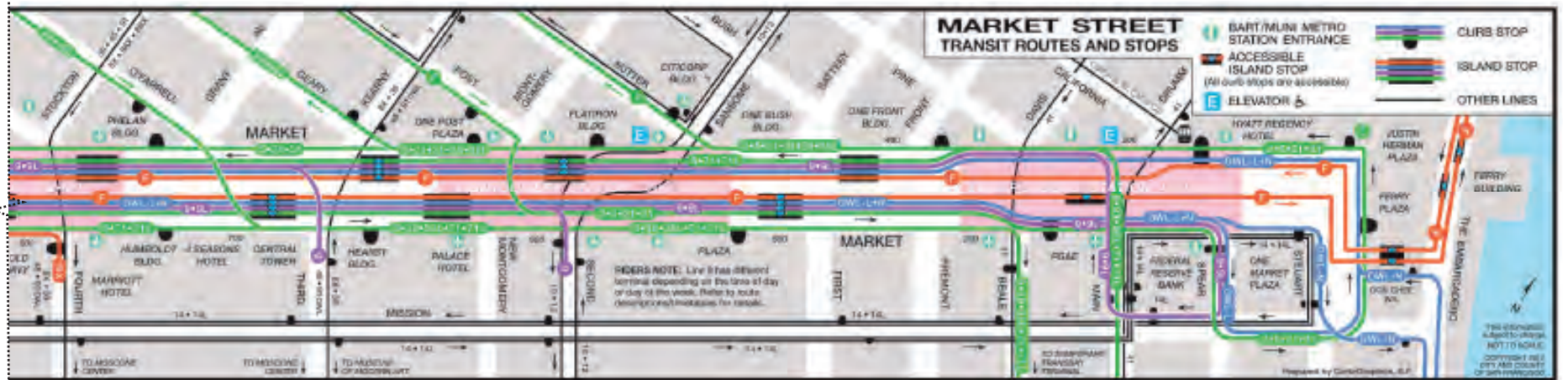
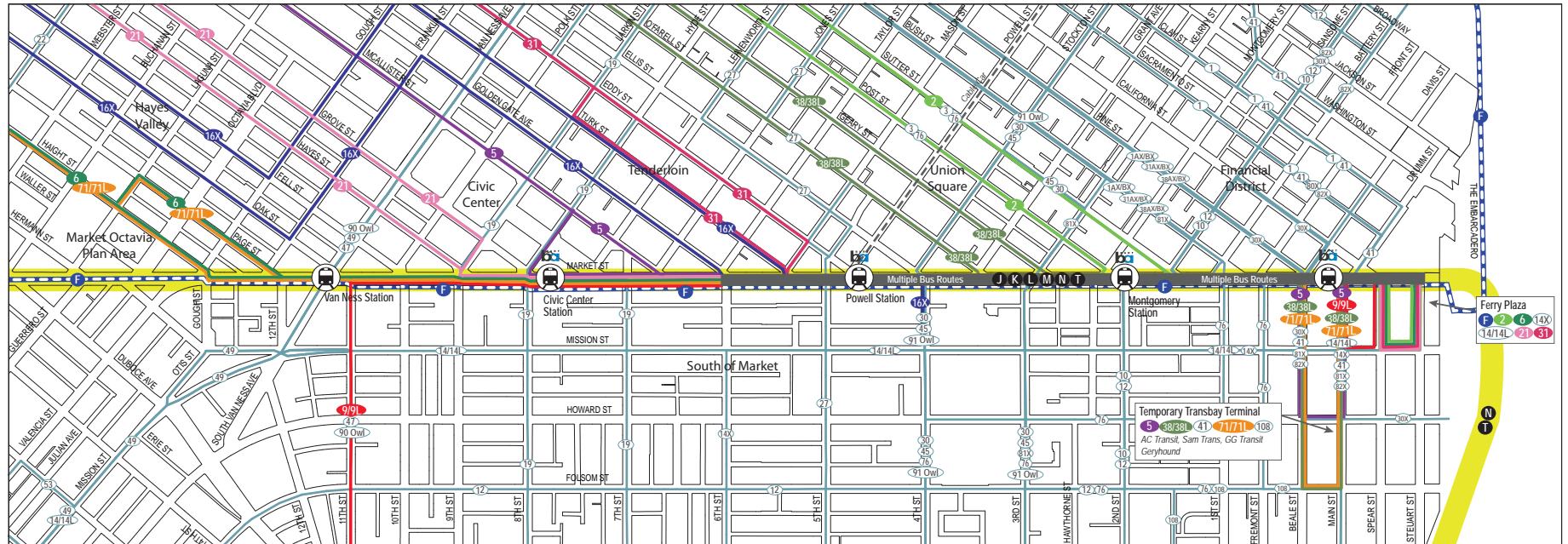




Figure 2.4.3: Map of Market Street Area Muni Service



**LEGEND**

- Muni Metro / BART
- Market Street Bus Routes
- Other Bus Routes
- Historic Streetcar
- Cable Car
- Muni Metro Station
- BART Station





Table 2.4.1 provides basic information about the dozen “primary” Market Street lines previously

identified. Lines are grouped by primary corridor (e.g., the 6, 71 and 71L all serve Haight Street;

generally, line names include their primary corridors), and are listed from north to south.

**Table 2.4.1: Guide to Market Street Muni Service (listed in order of primary corridor, from north to south)**

Line	Service Category <sup>3</sup>	Terminus <sup>4</sup>		Lane/Stop Assignment <sup>5</sup>		Headway <sup>6</sup>		Span <sup>7</sup>
		Inbound	Outbound	Inbound	Outbound	Peak	Base (Mid-day)	
2 Clement	Local	Ferry Plaza	Richmond (Clement/ 14 <sup>th</sup> Ave)	Center	Curb	12	20	5:15 a.m.-7:30 p.m.
38 Geary	Local	Temporary Transbay Terminal	Richmond (48 <sup>th</sup> Ave/ Point Lobos)	Curb	Curb	7	8	Owl (24 hours)
38L Geary Limited	Rapid	Temporary Transbay Terminal	Richmond (48 <sup>th</sup> Ave/ Point Lobos)	Curb	Curb	6	6	6:45 a.m.-8 p.m.
31 Balboa	Local	Ferry Plaza	Richmond (Cabrillo/La Playa)	Center	Curb	10 (AM), 15 (PM)	15	5:30 a.m.-12 a.m.

<sup>3</sup> Muni categorizes lines based on key characteristics. Rapid Network lines are the “(h)eaviest ridership lines with the most frequent service (every five to 10 minutes), while Local Network lines “combine with Rapid Network to create core network (service every 10 to 15 minutes).” In practice, some Rapid lines operate less frequently, and some Local lines more frequently. Where local- and limited-stop lines share a corridor, the local-stop line is typically assigned to the Local Network even if ridership is high and service frequent. Other categories are Community Connectors and Specialized Services.

<sup>4</sup> On some lines, some trips terminate at alternate locations. On Market Street, some Line 9 trips terminate at 2<sup>nd</sup> Street inbound and 3<sup>rd</sup> Street outbound.

<sup>5</sup> Center-running lines may stop curbside near the foot of Market, and Lines 71 and 71L operate in the center lane inbound west of 8th Street.

<sup>6</sup> In minutes. Scheduled frequencies are approximate, from the online Muni Frequency Guide at <http://www.sfmta.com/cms/mroutes/WeekdayFrequencyGuide.htm>.

<sup>7</sup> Weekday hours of service, based on departures from first stop, from the online Muni Frequency Guide at <http://www.sfmta.com/cms/mroutes/WeekdayFrequencyGuide.htm>.

5 Fulton	Rapid	Temporary Transbay Terminal	Richmond (Cabrillo/La Playa)	Curb	Curb	4 (AM), 5 (PM)	8	Owl (24 hours)
21 Hayes	Local	Ferry Plaza	Inner Richmond (Fulton/Schrader)	Center	Curb	9 (AM), 10 (PM)	12	5:45 a.m.- 12:30 a.m.
6 Parnassus	Local	Ferry Plaza	Inner Sunset (Quintara/ 14 <sup>th</sup> Ave)	Center	Center	10	12	6:15 a.m.- 12:15 a.m.
71 Haight-Noriega	Local	Temporary Transbay Terminal	Ocean Beach (48 <sup>th</sup> Ave/ Ortega)	Curb	Center	10 <sup>8</sup>	12	6:15 a.m.- 12:15 a.m.
71L Haight-Noriega Limited	Rapid	Temporary Transbay Terminal	Ocean Beach (48 <sup>th</sup> Ave/ Ortega)	Curb	Center	10	12	6:15 a.m.- 12:15 a.m.
F Market and Wharves	Rapid	Fisherman's Wharf	Castro Station	Center	Center	6	7	5:45 a.m.- 12:45 a.m.
9 San Bruno	Rapid	Mission/Main	Visitacion Valley (Geneva/ Rio Verde)	Center	Center	12	12	5:30 a.m.-1 a.m.
9L San Bruno Limited	Rapid	Mission/Main	Visitacion Valley (Bayshore/ Visitacion)	Center	Center	12	12	6:30 a.m.-5:45 p.m.

<sup>8</sup> Between 7 and 8:30 a.m. and 4 and 6 p.m., Line 71L replaces Line 71 in the peak direction of travel.

The configuration of Muni lines on Market Street, in terms of lane and stop assignments, is designed to facilitate transit operations. Inbound, routes that terminate at the Temporary Transbay Terminal – the westernmost of the three terminuses, meaning that lines operating there are first to turn right off of Market – operate along the curb. These lines share another common characteristic: they are designated as part of Muni’s Rapid Network and operate on streets with some of the highest frequency and highest ridership of any of the Muni (Fulton, Geary or Haight).

Outbound, lines that turn right off of Market prior to Van Ness Avenue operate along the curb. This configuration serves to more or less “balance the load” between center and curb lanes and stops, although there is some variation by location.

In addition to its service on Market Street, Muni operates two lines on Mission Street, 550 feet to the south. As their names suggest, the 14 Mission and 14L Mission Limited routes operate on Mission Street for much of their length. Of the services on Market, only Lines 9 and 9L operate south of Market. Unlike the 14 and 14L, the 9 and 9L do not connect to BART stations before reaching Market Street.

Along with the subway stations beneath Market Street in the study area, there are a number of important transfer points on the street surface, including 3rd, Kearny and 4th Streets, where connections can be made to and from Lines 8X Bayshore Express, 30 Stockton and 45 Union/Stockton (operating northbound on 3<sup>rd</sup> and

southbound on 4<sup>th</sup>) and Van Ness Avenue, where connections can be made to and from Muni lines 47 Van Ness and 49 Van Ness/Mission. Both corridors are part of Muni’s Rapid Network.

Finally, while Market Street is an important corridor for transit, and while transit service on Market enjoys many advantages (including convenient access to much of the Financial District, Union Square and Civic Center as well as limited transit- and taxi-only lanes and four lanes in which to operate), service on Market Street also suffers from many disadvantages, primarily in terms of conflicts with other users of the street. These are discussed in detail later in this chapter. However, generally speaking Market is a busy corridor for all modes, and transit service is impacted by:

- Conflicts with other transit vehicles. The sheer volume of transit vehicles operating on Market Street during peak periods (up to 173 per hour in segments) can result in transit-on-transit delays, most notably at island stops, which are on the near sides of intersections (and so are subject to signal queues) and are of limited length. Sometimes, transit vehicles operating in curb lanes will temporarily merge into the center lane to avoid right-turn queues, serving to further contribute to this phenomenon.
- Conflicts with private vehicles. In addition to the scenario described above, delay is generated by private vehicles. Traffic congestion-caused delay can take several forms:

- Taxis are allowed in the transit-only lanes, and autos and delivery vehicles often occupy them, as they are not physically separated from unrestricted lanes.
- Transit vehicles are sometimes delayed in arriving at island stops not merely by other transit vehicles, but by taxis, autos and delivery vehicles, including vehicles illegally in the transit- and taxi-only lanes and vehicles attempting to make illegal left turns.
- Conflicts with bicyclists. Despite a series of improvements to bicycle safety on Market Street in the study area, an increase in bicycle traffic has brought with it increased conflicts with transit vehicles operating in the curb lanes used by cyclists. Painted boxes indicating curbside stops are located within the lanes, not outside of them, and both there and in the “safety zones” between island stops and the curb there is little room for cyclists and buses to pass one another. This represents a risk for cyclists, but also impacts transit.
- Conflicts with pedestrians. The ultimate source of the right-turn scenario previously described is not motorists, but pedestrians in the crosswalk. High volumes of pedestrians crossing connecting streets can cause long right-turn queues, which in turn force transit vehicles from the curb into the center lane, where transit-on-transit delay occurs (this phenomenon is quantified in a following section). Additionally, pedestrians often



jaywalk on Market Street, including pedestrians who have just alighted from transit vehicles stopped at islands and who then slip through gaps in the railings behind islands to illegally cross the safety zone, or curb lane between islands and the sidewalk.

## Transit Performance

In this section, performance of Muni surface transit in a number of areas is analyzed. Analyses are based on available data provided by Muni and other City agencies, including results of a Speed and Delay Study conducted by SFMTA for the Better Market Street project. Additional origin and destination data will be collected through an on-board survey at a later date.

## Ridership

### Boardings and Alightings

Average weekday numbers of boardings and alightings at each Muni stop along Market Street for adjacent stops and on Muni and BART subway platforms were provided by SFMTA and BART. By necessity, data are derived from various sources<sup>9</sup>. Data are illustrated in Figure 2.4.4.

<sup>9</sup> Muni buses are equipped with automated passenger counters, so data for bus lines are relatively recent, from September and October 2010. However, rail lines are not equipped with APCs, so data for the F Market and Wharves and for Muni Metro lines were collected by traffic checkers (in-house data collection staff) during various periods between 2007 and 2010. BART exit data is regularly collected and reported;

A number of key findings may be derived:

- **Both underground and surface stops are well utilized.** The busiest transit stops along Market Street are the subway platforms under the street: combined daily boardings at the four BART platforms exceed 120,000, and at the five Muni Metro platforms, 55,000. However, there are close to 38,000 daily boardings on Muni streetcars and buses at surface stops from Van Ness east, a distance of approximately 1.9 miles. This represents a bidirectional average of close to 20,000 boardings per mile, more than for many rail systems. The roughly 93,000 daily boardings on Muni on or under Market Street east of Van Ness amounts to close to one-eighth of all Muni boardings.
- **The busiest surface stops are adjacent to Market Street, at transfer points for Chinatown buses.** These transfer points to and from some of Muni's busiest routes – the 8X, 30, and 45 which serve the Stockton Street corridor – handle volumes comparable to Muni Metro platforms below Market Street.

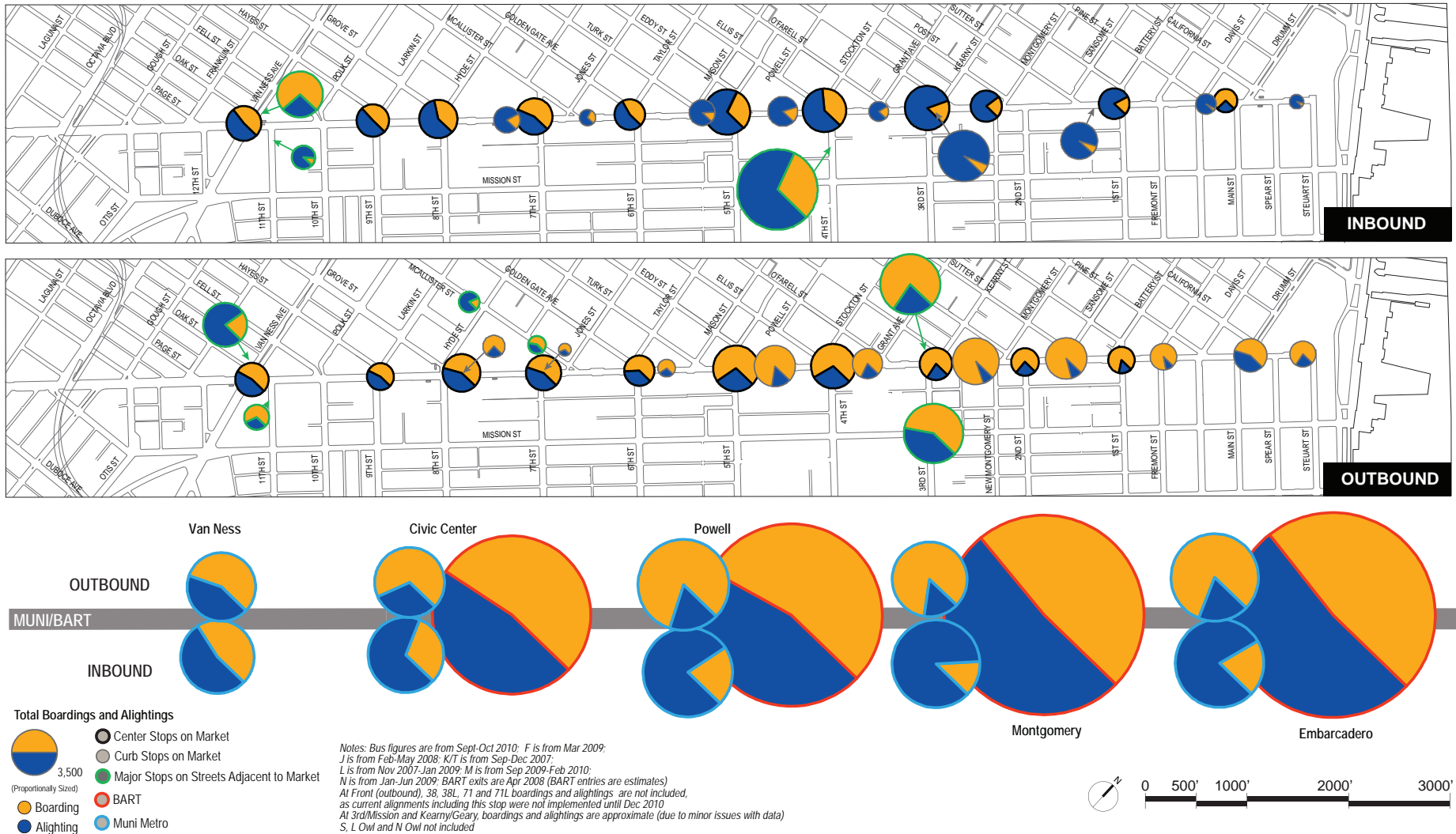
---

however, the data used here is from April 2008, because entries were estimated for the same time period for BART by Fehr and Peers. Muni service was reconfigured a few months after opening of the Temporary Transbay Terminal, so data for Lines 38, 38L, which now stop at Front Street outbound, are not included in the figures for that stop. Finally, figures for the stops at 3rd and Mission Streets and Kearny and Geary Streets include partial estimates necessitated by minor technical issues with the data.

There are more than 8,000 combined daily boardings at the stops at 3rd and Mission and at Kearny and Geary Streets, and more than 8,000 alightings at the stop at 4<sup>th</sup> and Market Streets. The Lines 47 and 49 stops on Van Ness at Market, meanwhile, each have more than 3,000 combined daily boardings and alightings.

- **Ridership is highest near Union Square and the Financial District, but remains high at other locations.** On Market Street itself, activity is generally heaviest between 5<sup>th</sup> and Montgomery Streets, near Union Square and the Financial District. However, there is also significant activity in lower Market, mid-Market, near the Civic Center, and at Van Ness. Table 2.4.2 lists all stops with more than 2,000 combined daily boardings and alightings (according to the methodology previously described) from east to west. Fifteen of the 40 stops on Market Street from Van Ness east meet this standard

**Figure 2.4.4: Average Weekday Boardings and Alightings**



**Table 2.4.2: Busiest Stops (from east to west)**

Location	Direction	Lane	Boardings	Alightings	Combined	Lines	Transfer
1 <sup>st</sup>	IB	Curb	169	2,181	2,350	5, 38, 38L, 71, 71L	Montgomery Stn, 10, 12
Sansome	OB	Curb	2,655	248	2,903	5, 21, 31, 38, 38L	Montgomery Stn, 10, 12
Montgomery	OB	Curb	3,405	276	3,681	5, 21, 31, 38, 38L	Montgomery Stn, 8X, 30, 45
3 <sup>rd</sup>	IB	Curb	290	4,284	4,574	5, 38, 38L, 71, 71L	Montgomery Stn, 8X, 30, 45
3 <sup>rd</sup>	IB	Center	597	2,803	3,400	F, 6, 9, 9L, 21, 31	Montgomery Stn, 8X, 30, 45
Stockton	OB	Center	2,371	988	3,359	F, 6, 9, 9L, 71, 71L	Powell Stn, 8X, 30, 45
4 <sup>th</sup>	IB	Center	1,266	1,994	3,260	F, 6, 9, 9L, 21, 31	Powell Stn, 8X, 30, 45
Powell	OB	Curb	2,445	439	2,884	5, 21, 31	Powell Stn, Cable Cars, 27
Cyril Magnin	OB	Center	2,551	1,009	3,560	F, 6, 9, 9L, 71, 71L	Powell Stn, Cable Cars, 27
5 <sup>th</sup>	IB	Center	1,068	2,472	3,540	F, 6, 9, 9L, 21, 31	Powell Stn, Cable Cars, 27
7 <sup>th</sup> North	OB	Center	1,203	901	2,104	F, 6, 9, 9L, 71, 71L	Civic Center Stn, 19
7 <sup>th</sup>	IB	Center	1,276	1,011	2,287	F, 6, 9, 9L, 21	Civic Center Stn, 19
Hyde	OB	Center	1,397	1,016	2,413	F, 6, 9, 9L, 71, 71L	Civic Center Stn, 19
8 <sup>th</sup>	IB	Center	1,026	1,499	2,525	F, 6, 9, 9L, 21, 71, 71L	Civic Center Stn, 19
South Van Ness	IB	Center	1,000	1,097	2,097	F, 6, 71, 71L	Van Ness, 47, 49

## Loads

Analysis of passenger loads aboard transit vehicles is based on the data presented in the previous section<sup>10</sup>. All loads are numbers of passengers aboard vehicles *departing* each stop.

Figure 2.4.5 shows average combined loads aboard all transit vehicles operating in each segment over the period between 4 and 7 p.m. weekdays, for outbound (peak-direction) trips only.

As the map indicates, combined loads are an outcome of two factors:

- Numbers of vehicles operating in that segment
- Distance from the foot of Market Street, as there are more boardings than alightings and loads increase for all lines until they reach their maximum load points, which for Market Street routes are typically near or Van Ness Avenue

While a separate analysis of average loads per transit vehicle over the peak period was not conducted, additional analysis was completed of average load factors (ratio of load to capacity) over the peak half-hour period for each bus line<sup>11</sup>. All

bus lines operating on Market Street on weekdays except Lines 38 and 38L use standard 40-foot motor coaches with a seated and standing capacity of 63 passengers, while Lines 38 and 38L use articulated 60-foot coaches with a capacity of 94.

Figure 2.4.6 shows maximum load points, on this basis, for each line both on Market Street and along its entire alignment.

As the map indicates, passengers on Market Street buses generally do not experience a great deal of crowding *while traveling along Market Street*, as maximum load points for each line are typically farther to the west. Nonetheless, buses are often relatively full even before departing Market Street – for example, an average load on outbound buses over the peak half-hour of 52 passengers, for a load factor of 0.83, on Line 71L. Moreover, increased service on Market Street would serve to alleviate overcrowding on other segments of lines operating on Market Street.

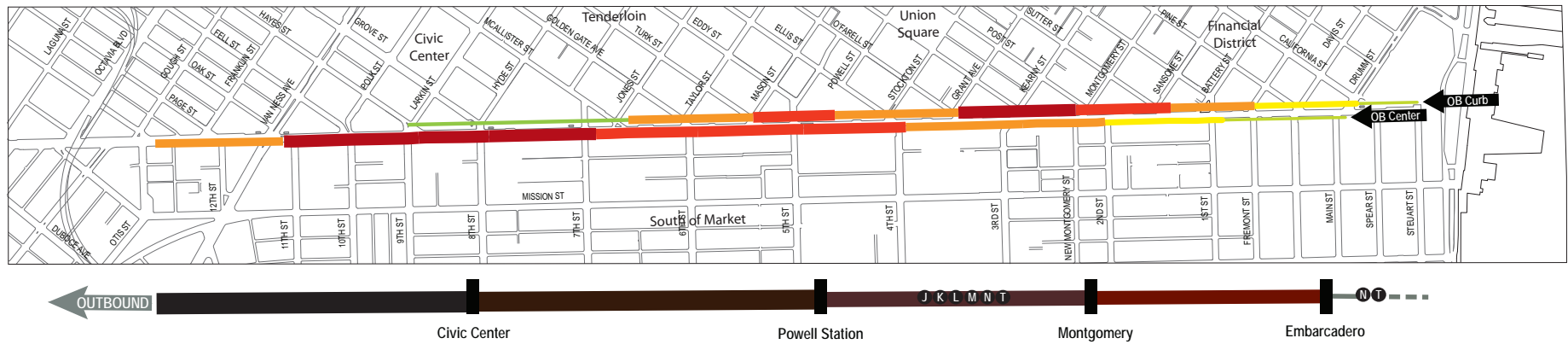
---

<sup>10</sup> Numbers of people on Line 38 and 38L buses east of Sansome are based on the previous alignment still in effect at the time of observation (see further explanation under footnote 7).

<sup>11</sup> Half-hourly data are unavailable for F Line; however, average load factors for outbound trips between 4 and 6 p.m. weekdays are 0.63 at the maximum load point on Market Street (2nd Street) and 0.95 at the maximum load points for the entire alignment (The Embarcadero at Green and at Broadway).



**Figure 2.4.5: Total Passenger Loads, 4-7p.m. Weekdays**



Total Numbers of People on Transit Vehicles  
Between Stops for Outbound Trips  
Starting Between 4 and 7 p.m. Weekdays

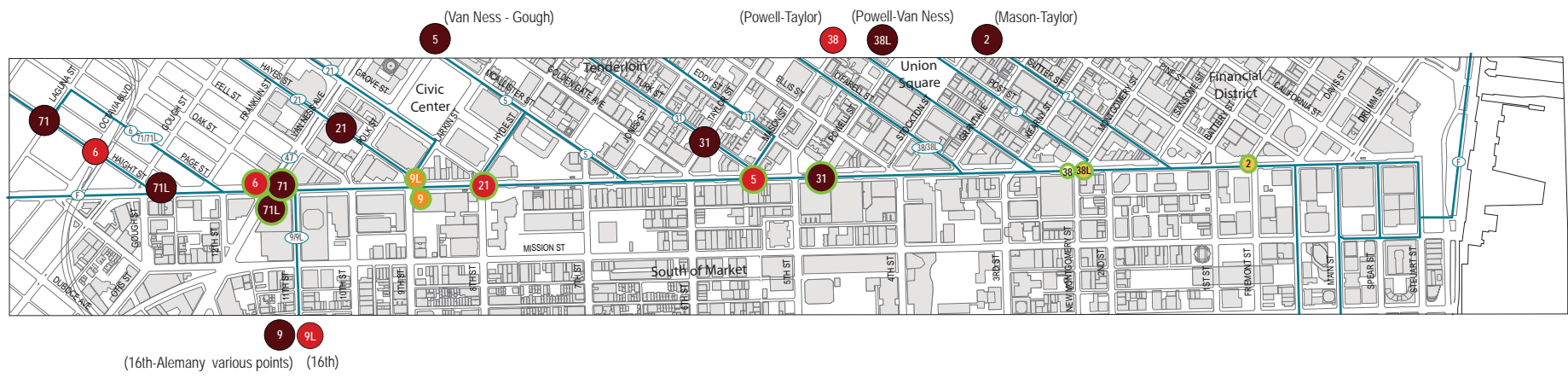
- 272 - 500
- 501 - 1,000
- 1,001 - 1,500
- 1,501 - 2,000
- 2,001 - 2,500
- 2,501 - 5,000
- 5,001 - 8,000
- 8,001 - 10,000
- 10,000 - 12,500
- 12,500 - 13,280

Bus Routes

Notes: Bus figures are from Sept-Oct 2010. F is from Mar 2009  
Numbers of people on 38 and 38L buses east of Sansome are based on previous alignment (still in effect at time of observation)  
Lines making no stops or only one stop on Market not included



**Figure 2.4.6: Average Load Factors at Maximum Load Points, Peak PM Half-Hour**



Average Load Factors at Maximum Load Points  
on Market & Line for Outbound Trips  
During Peak Half-Hour Between 4 and 7 p.m., Weekdays

- 0.34 - 0.40
- 0.41 - 0.50
- 0.51 - 0.60
- 0.61 - 0.70
- X 0.71 - 0.87
- Maximum load points on Market Street
- Maximum load points on Line
- Bus Routes



Notes:  
Load factor is the ratio of passengers to the total seated and standing capacity of the vehicle.  
For a 40-foot bus, this figure is 63, and for a 60-foot bus, it is 94.  
Half-hourly data unavailable for Line F; average load factors for outbound trips between 4 and 6 p.m. weekdays are 0.95 at Green-Broadway and 0.63 at 2nd St

## Speed and Delay

Detailed data on speeds and sources of delay were collected by SFMTA for the Better Market Street project as part of a Speed and Delay Study conducted in May 2011. The Study surveyed more than 500 runs on a variety of routes on Market and Mission Streets, between 2 and 7 p.m. on a series of mid-week (Tuesday, Wednesday, and Thursday) days. Surveyors recorded travel times and time spent stopped, and identified the reasons for each stop. In total, more than 7,900 stops were observed. A complete Speed and Delay Study report produced by SFMTA can be found in the appendix; findings are briefly summarized here.

Additional data on reliability (schedule and headway adherence) may be provided by SFMTA at a later date; available general information is summarized in this section.

## Reliability

While average speeds on Market Street are relatively slow (see following section), it is variability in running time, or reliability that most significantly impacts passenger experience. Improving the reliability of transit service is likely to be a primary objective of Better Market Street project development. Unfortunately, at this point data on schedule adherence are only available at the line level. Muni collects this data at or near maximum load points, which for Market Street lines are typically just to the west of Market Street.

Fiscal Year 2010 customer-observed schedule adherence<sup>12</sup> for lines operating on Market Street is shown in Table 2.4.3. For sake of comparison, system wide schedule adherence for FY 2010 was 73.5 percent, with an on-time performance goal of 85 percent.

**Table 2.4.3: Schedule Adherence by Line, FY 2010**

Line	Schedule Adherence
F	69.3%
2	66.2%
5	73.6%
6	76.5%
9	68.9%
9L	74.5%
21	77.1%
31	73.5%
38	74.8%
38L	72.4%
71/71L	63.6%

<sup>12</sup> “Customer-observed schedule adherence” is a measure of whether a vehicle arrives at a timepoint no more than one minute earlier or four minutes later than scheduled. The vehicle may or may not be the vehicle scheduled to arrive at that time; for example, if Bus A is scheduled to arrive at 5 p.m. and Bus B at 5:10 p.m., and Bus A arrives at 5:12 p.m., then Bus A is considered “on-time.”

More detailed information on schedule and headway adherence may be provided by SFMTA at a later point.

## Speed

In 2009, the most recent year for which data were available, the average commercial speed (including stops) of all Muni service was 8.7 miles per hour. By contrast, average speeds on Market Street east of Van Ness Avenue were found, through the Speed and Delay Study, to generally be just 5 to 6 miles per hour. Healthy adults, by comparison, generally walk at about 3 mph.

Overall average speeds between 2 and 7 p.m. and during the peak hour (as determined for this study) of 5:15 to 6:15 p.m. on both Market and Mission Streets<sup>13</sup> are shown in Table 2.4.4.

As the data indicate, average speeds during the peak hour are somewhat slower than over the full course of the mid- and late-afternoon. Outbound trips – on which vehicles must load large volumes of passengers, in addition to unloading – are also somewhat slower than inbound trips.

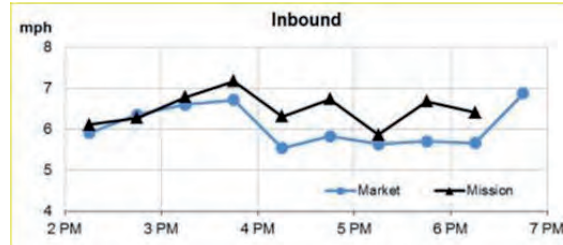
<sup>13</sup> Mission Street was included in the survey because it is part of the Study Area, because SFMTA staff wanted to leverage the opportunity of the Study to obtain a better sense of transit operations not just on Market, but on Mission, and because it is possible that Better Market Street recommendations might include reconfiguration of transit services on both Market and Mission. While the volume of transit service on Mission Street is less than on Market, the busy 14 Mission and 14L Mission Limited routes operate there, primarily in bus-only lanes.

**Table 2.4.4: Average Muni Speeds**

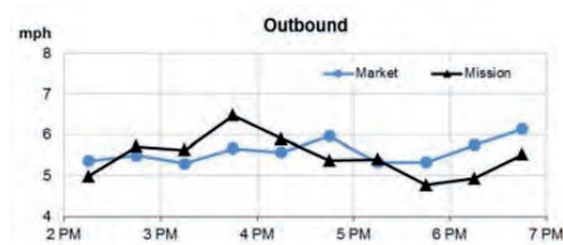
	Inbound		Outbound	
	2-7	5:15-6:15	2-7	5:15-6:15
<b>Market</b>	5.8	5.4	5.6	5.3
<b>Mission</b>	6.5	6.2	5.5	5.1

Figures 2.4.7 and 2.4.8 show average speeds by half-hour period for inbound and outbound trips on Market and Mission Streets.

**Figure 2.4.7: Average Muni Speeds by Half-Hour Period (Inbound)**



**Figure 2.4.8: Average Muni Speeds by Half-Hour Period (Outbound)**



These figures illustrate a pattern of general slowing after 4 p.m. for inbound trips on both Market and Mission, and inbound trips on Market; curiously, however, with the exception of the 5:15 to 6:15 p.m. peak hour, outbound trips on Market do not show noticeable slowing. (Sources of delay are discussed in the following section.)

Table 2.4.5 shows average speeds by mode and by lane, for Market Street only (as all Mission Street transit service is provided by motor coaches operating primarily in bus-only lanes).

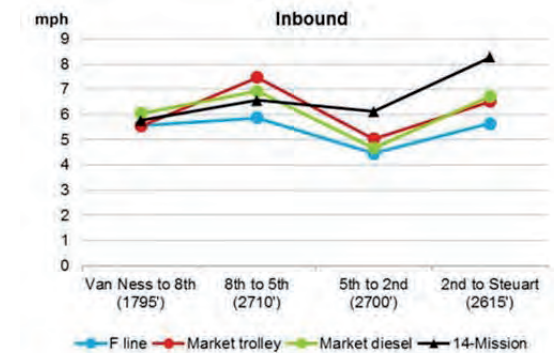
**Table 2.4.5: Average Muni Speeds by Mode and Lane (Market Only)**

	Inbound		Outbound	
	2-7	5:15- 6:15	2-7	5:15- 6:15
F Line	5.3	4.9	5.6	5.3
Trolley	6.0	5.5	5.6	5.2
Motor Coach	5.8	5.4	5.7	5.5
Curb Lane	5.6	4.9	5.4	5.0
Center Lane	5.8	5.6	5.8	5.5

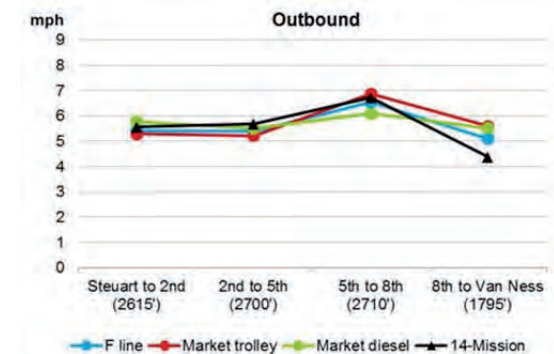
As might be expected given its physical properties (streetcars not only cannot maneuver around vehicles blocking their path, but are slower to accelerate and decelerate than buses) and given the fact that it continues to pick up passengers all the way down Market Street as it continues toward Fisherman's Wharf, the F Line is somewhat slower

in the inbound direction than buses. Buses operating in curb lanes are also somewhat slower than those in the center lanes, where there is less interference from traffic. This is especially true inbound during the peak hour, when transit vehicles must contend with traffic bound for the Bay Bridge.

**Figure 2.4.9: Average Muni Speeds by Mode and Segment (Inbound)**



**Figure 2.4.10: Average Muni Speeds by Mode and Segment (Outbound)**





Figures 2.4.9 and 2.4.10 show average speeds by segment on Market Street.

Unsurprisingly, service is generally slowest between Van Ness and 8<sup>th</sup> Street, where vehicles are near the maximum load points on their routes, and between 5<sup>th</sup> and 2<sup>nd</sup> Streets, where the highest volumes of loading and unloading take place and where there are higher volumes of pedestrians, resulting in conflicts.

### Sources of Delay

The Speed and Delay Study methodology is described in detail in the report found in the appendix. Generally, however, the definition of “delay” developed for data collection and analysis was, by necessity, somewhat limited – only time spent fully stopped was categorized as delay, as time spent accelerating or decelerating is difficult to quantify.<sup>14</sup>

In this light, the average speeds described in the preceding section make sense when combined with the observed amounts of time spent fully stopped: 49 percent on Market Street, and 45

<sup>14</sup> Surveyors did record instances of vehicles slowing down, using notes fields on forms. In many cases, transit operators were observed slowing down well in advance of a perceived need to stop; for example, if operators perceived that they would be unable to reach an intersection before a traffic signal turned from green to red, they would often “coast to a stop.” Observations of “slow down” were most common between Van Ness and 9<sup>th</sup> Street, and below 4<sup>th</sup> Street.

percent on Mission Street. This results in an average speed *while in motion* of 10 to 12 miles per hour in most cases, a not unreasonable figure given the fact that transit vehicles must frequently slow to a stop, and take some time to reach full speeds following stops (transit vehicles also must often slow down for various reasons without coming to a full stop).

Figures 2.4.11 and 2.4.12 shows components of travel time on Market and Mission. A variety of delay categories were developed for the survey; however, two categories – time spent loading and unloading passengers at stops, and time spent stopped at traffic signals – accounted for the overwhelming majority of time spent stopped on both Market and Mission Streets. This finding is consistent with a previous speed and delay study conducted in 2004, before the restrictions on traffic implemented in 2009 as part of the Required Right Turns Project (see later section).

Other than signals and loading, the primary contributors to delay were traffic congestion (other than queuing at intersections), queues of vehicles waiting to turn right (for curb lanes only), and an inability to access island stops because of queues in center lanes (illustrated in Figure 2.4.13).

Congestion, notably, would logically be a contributing factor to other types of delay, such as signal delay, so these figures likely understate impacts from traffic.

Figure 2.4.11: Components of Delay (Market)

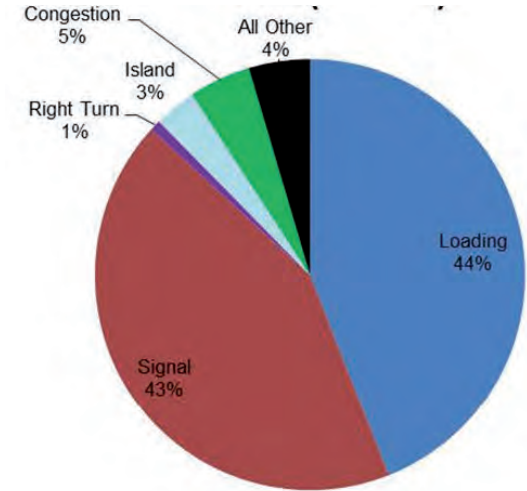
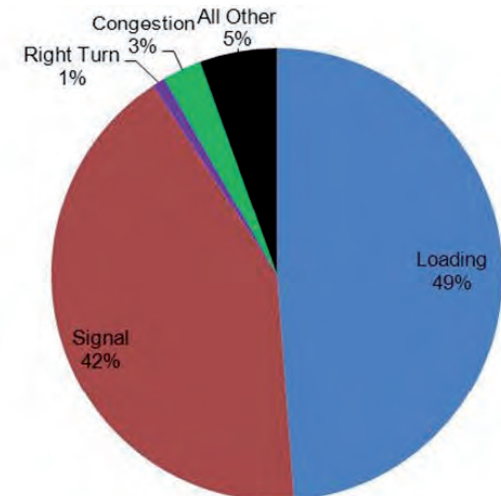


Figure 2.4.12: Components of Delay (Mission)

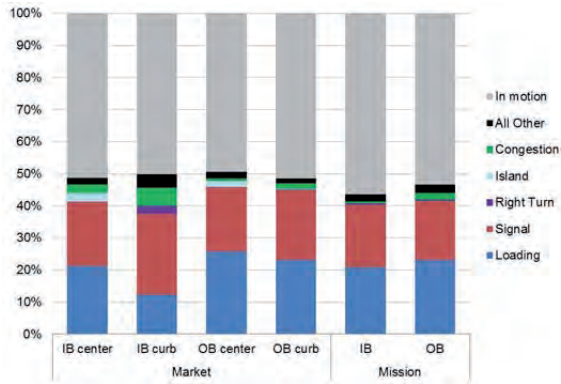


**Figure 2.4.13: Bus Unable to Access Island Stop Because of Queue**



Figure 2.4.14 shows the relative impacts of different sources of delay for different operating contexts on Market and Mission Streets.

**Figure 2.4.14: Components of Travel Time by Direction and Lane**



As the chart illustrates, sources of delay vary significantly depending on operational context. On Market, loading accounts for a greater share of travel time in the outbound direction, and inbound in the center lane where the F Line operates, than in the inbound curb lane – in other words, in locations where significant amounts of both unloading *and* loading take place, and in the case of center lanes, where platform space is limited (curiously, loading is a significant factor inbound on Mission Street). However, vehicles operating inbound along the curb must contend with significantly more congestion in the afternoon, due to access routes to the Bay Bridge: autos queue in order to turn right off of Market, and queues on cross streets sometimes extend into intersections on Market (though generally only into the inbound lanes). On Mission Street, outbound buses encounter more congestion, likely because Mission, unlike Market, is used as a commuter route by many motorists headed away from the Financial District.

Figures 2.4.15 and 2.4.16 show proportions of delay for different sources on each block of Market Street east of Van Ness.

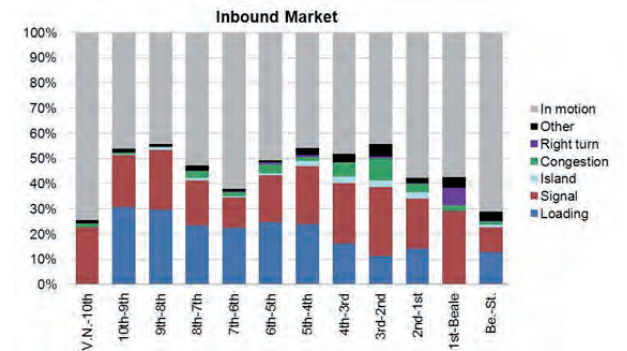
A number of patterns are evident:

- Inbound, loading declines in significance as most vehicles are nearing the ends of their routes, and few passengers are boarding.
- Outbound, loading is most time-consuming between 4<sup>th</sup> and 5<sup>th</sup> Streets, where boarding volumes are high and where some vehicles

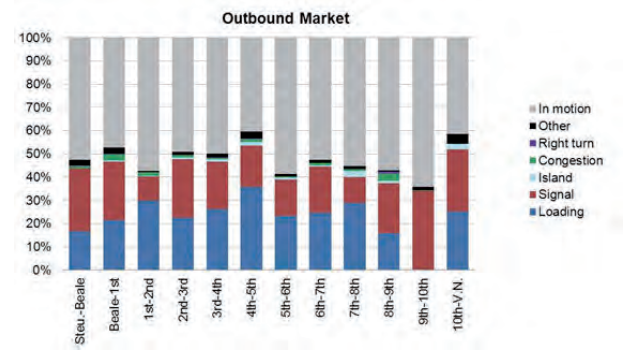
may already be relatively crowded, further slowing the loading process.

- Inbound, congestion is a significant factor between 3<sup>rd</sup> and 2<sup>nd</sup> Streets, and right-turn queues are a significant factor between 1<sup>st</sup> and Beale Streets.

**Figure 2.4.15: Components of Travel Time by Block (Market Street, Inbound)**



**Figure 2.4.16: Components of Travel Time by Block (Market Street, Outbound)**



On Mission Street, the slow outbound speeds previously identified appear to be driven by long loading times west of 4<sup>th</sup> Street, as well as by significant congestion between 1<sup>st</sup> and 3<sup>rd</sup> Streets.

Further analysis of delay durations normalized for distance traveled indicates that, inbound:

- In most segments, total delay amounts to between 10 and 15 seconds per 100 feet traveled
  - Loading is a significant factor between 10<sup>th</sup> and 8<sup>th</sup> Streets
  - Congestion is a significant factor between 4<sup>th</sup> and 2<sup>nd</sup> Streets
  - Signal delay is a significant factor at 2<sup>nd</sup> Street
- Outbound, there is significantly more delay at Van Ness (more than 20 seconds per 100 feet) than at other locations, due to both high signal and loading delay.

Figure 2.4.17 shows average durations of dwell time (time spent loading and unloading passengers at stops) on Market under different circumstances. As with delays caused by different types of vehicles (see explanation in the following paragraphs), surveyors were asked to use their notes fields to indicate factors that might have some impact on dwell time: passengers asking operators questions, loading or unloading of passengers in wheelchairs, or passengers that were unusually slow to board or alight (for reasons including mobility difficulties or a heavy load of bags or suitcases).

**Figure 2.4.17: Durations of Dwell by Dwell Subcategory, Direction, Lane and Mode**



As the figure indicates, stops at which one or more of these phenomenon occurred accounted for a relatively small proportion of all stops (notably, passengers in wheelchairs boarded or alighted at less than one percent of stops). For this reason, sample sizes were somewhat limited, and data should be viewed with appropriate skepticism.

Nonetheless, each of these phenomenon clearly have some impact on dwell times. Despite their limited occurrence, they were found to increase overall average bus loading times by 3 seconds, or about 15 percent, and to increase average F Line loading times by seven seconds, or about 25 percent. Wheelchairs, in particular, appear to have a disproportionate impact on dwell time – while such events are rare, they add more than a minute, on average, to stops at which they occur (this problem is compounded by stops that are too narrow for efficient wheelchair loading and unloading) – while passengers asking questions or taking an unusually long time to board or alight appear to have a significant impact on the F Line in

particular (averages of approximately 30 and 40 seconds, respectively), especially in the inbound direction, headed toward the Ferry Building and Fisherman’s Wharf.

**Figure 2.4.18: Durations of Vehicle-Caused Delay by Direction, Block and Mode (Market Only)**

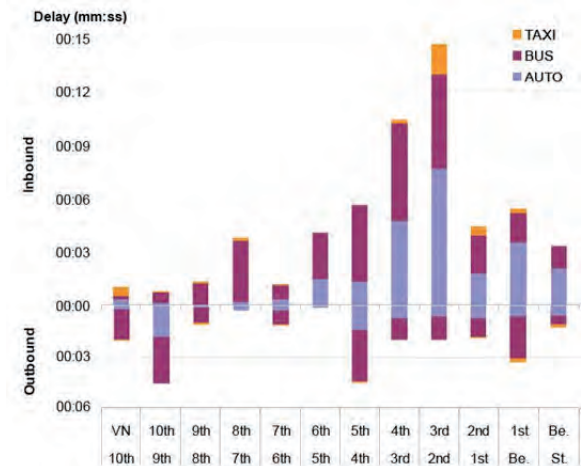


Figure 2.4.18, meanwhile, shows average durations of delay caused by vehicles (other transit vehicles, taxis and private autos) on each block, for each direction. Delays caused by vehicles included queues behind vehicles attempting to turn left from the center lane, right-turn queues in the curb lane, inability to access islands and general congestion. For these types of delay, surveyors were asked to attempt to identify the type of vehicle ultimately “responsible” for the delay, at the front of the queue (although in cases where the front of the queue wasn’t visible, they were told to simply identify the



type of vehicle in front of the bus; additionally, the ultimate source of many right-turn delays is pedestrians in the crosswalk preventing vehicles from turning right).

As the chart indicates, other transit vehicles are the greatest source of delay overall, although autos are primary contributors in some segments. Taxis appear to have little impact. (Separately, surveyors identified delays caused by bicycles. Only 15 full-stop events caused by bicycles were observed, out of more than 7,900 total stops; however, bicycles were identified as the source of 11 percent of all slow-down events). In general, vehicle-caused delays were much greater inbound than outbound. The greatest vehicle-caused delays were experienced inbound between 3<sup>rd</sup> and 2<sup>nd</sup> Streets, a segment that includes right turns onto New Montgomery Street.

The 3<sup>rd</sup>-to-New Montgomery block was also found to have the highest incidence of “lane switching” by buses. Another previous study, conducted by the SFCTA in 2009, found that operators of buses in the curb lane often merge into the center lane to avoid right-turn queues, and that these vehicles, in turn, often contribute to inability of other transit vehicles to access center islands. While analysis conducted for the Speed and Delay Study did not attempt to correlate these phenomenon geographically, as the previous study did, the report noted that the 3<sup>rd</sup>-to-2<sup>nd</sup> segment suffers from significant levels of congestion, as it lies along primary access routes to the Bay Bridge

(Montgomery to Market, then 2<sup>nd</sup>, as well as Market to New Montgomery).

Finally, SFMTA staff conducted more detailed analysis of another especially problematic block; inbound between Fremont and Beale Streets. Inbound at Beale, right-turn and signal delay in the curb lane are major factors. Staff noted that there is no right-turn phase at this location, so vehicles must wait for a pedestrian “gap” in the crosswalk to turn. Significant numbers of motorists turn right here during the PM peak period (Beale provides access to the carpool-only Bay Bridge on-ramp along Bryant), as do buses bound for the Temporary Transbay Terminal. At Beale, autos accounted for the vast majority of vehicle-caused delay, and between 4 and 5 p.m., average right-turn delay per transit vehicle reached 38 seconds.

### Delay Source Findings

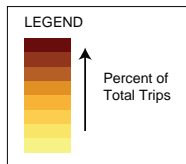
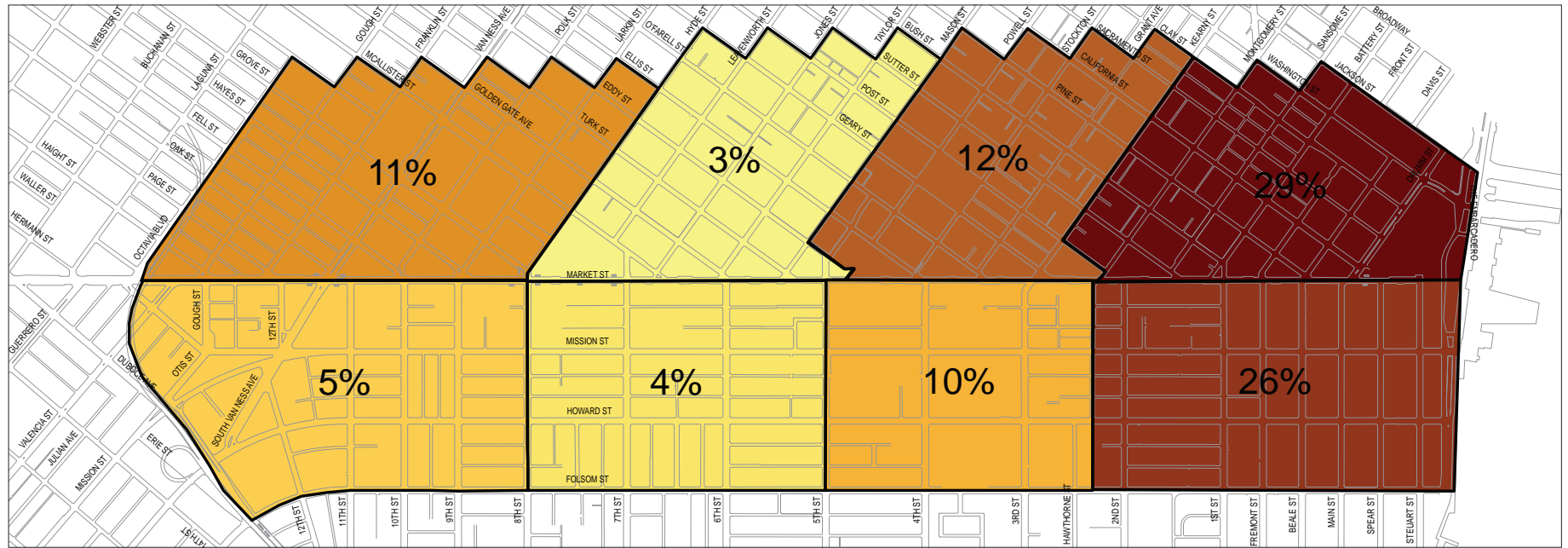
A number of preliminary conclusions may be drawn from the Speed and Delay Study data. These findings reflect conclusions in the SFMTA Speed and Delay Study draft report, with some modifications:

- The vast majorities of delays are caused by signals and dwell. All other forms of delay account for just 6 percent of total travel time on Market.
- On Market Street, outbound travel times are only slightly slower than inbound travel times. On Mission Street, however, outbound travel times are significantly slower (15 percent or more) than in the inbound direction.

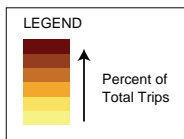
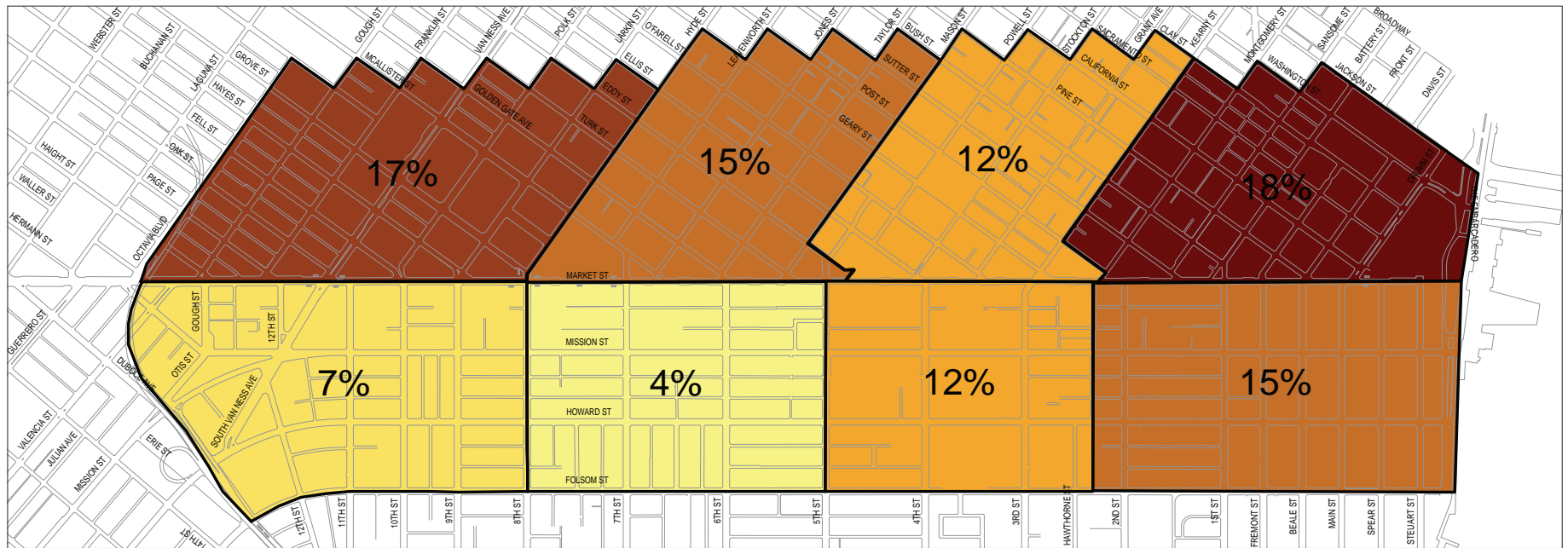
- Inbound, travel times on Mission are faster than on Market. However, outbound the reverse is true (albeit only slightly).
- Travel times are more impacted by peak conditions on Mission Street than on Market, where speeds are relatively constant in the outbound direction.
- Travel in the curb lane is somewhat slower than in the center lane, especially in the inbound direction where traffic has significant impacts at a few key locations (largely related to right-turn delays that may ultimately be attributed to pedestrian activity in crosswalks on crossing streets).
- Loading delay is greater in the center lane than in the curb lane. The SFMTA report notes that this may be because of greater loads on vehicles in the center lane (several lines in both the curb and center lanes are near their maximum load points by the time they leave Market or reach Van Ness in the outbound direction), or it may be because island stops are simply too small for efficient loading and unloading.
- Delay caused by other vehicles is largely caused by other transit vehicles, although autos are the primary source in certain locations. However, vehicle-related delay accounts for a relatively small percentage of overall delay.
- Conflicts with bicycles rarely cause transit vehicles to come to a full stop, although they often cause them to slow down.



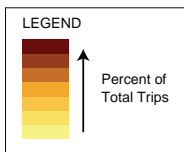
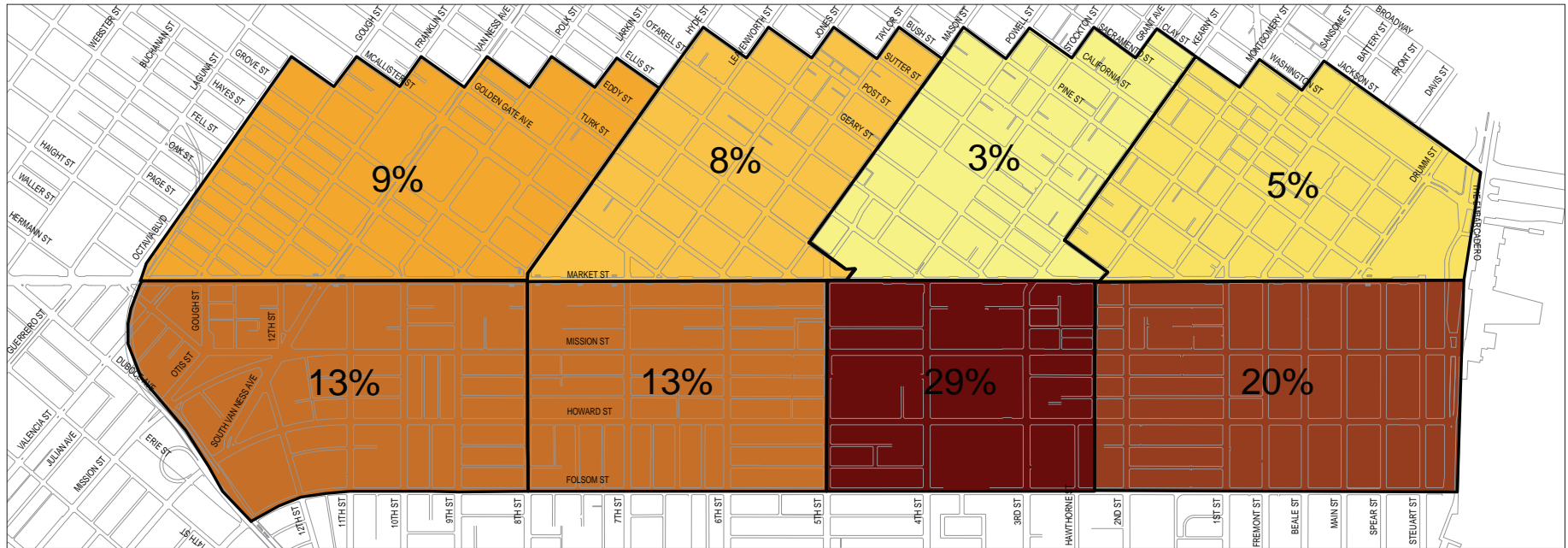
**Figure 2.4.19: Distribution of Destinations for Riders on Metro Lines**



**Figure 2.4.20: Distribution of Destinations for Riders on Market Street Streetcar and Bus Lines**



**Figure 2.4.21: Distribution of Destinations for Riders on Mission Street Lines**



## Travel Patterns

### Origins and Destinations

A survey of trip origins and destinations of Muni riders on both Market and Mission Streets will be conducted in the future as part of the Better Market Street project. High-level analysis of limited data collected in 2004 is provided below.

The 2004 data was collected by the SFCTA as part of the *Multimodal Transportation Survey*, a system wide survey with a sample size of more than 15,000. However, the subsets analyzed here are significantly smaller, as they are limited to:

- Lines serving Market and Mission Streets (which are further subdivided into three categories, for reasons explained below)
- Destinations within the study area

In all, 1,742 destinations were analyzed, in three categories:

- Destinations of riders on Metro lines, which stop below Market Street (653 responses)
- Destinations of riders on surface bus and streetcar lines with stops on Market within the study area (971 responses)
- Destinations of riders on Lines 14, 14L and 14X, which operate primarily on Mission (118 responses)

An area roughly reflecting the boundaries of the study area was then defined, and divided into eight

subareas of roughly equivalent size<sup>15</sup>. Figures 2.4.18, 2.4.19 and 2.4.20 show percentages of all destinations within the larger area that are located within each subarea, for each of the three categories previously identified.

A number of key findings might be identified:

- Most Metro destinations were located in the Financial District (29 percent) or South Financial District (26 percent).
- With the exception of the Civic Center (11 percent) and Western SOMA (5 percent), Metro destinations were roughly evenly split between North- and South-of-Market “companion” districts.
- Market Street bus and streetcar destinations were more heavily weighted toward North-of-Market districts to the west of Union Square (17 and 15 percent, respectively, for Civic Center and the Tenderloin, compared to 7 and 4 percent for Western and Central SOMA). However, several of these lines operate north-of-Market in these areas.
- Mission Street destinations were primarily South-of-Market, most notably in Yerba Buena (29 percent) and the South Financial District (20 percent). However, riders of Lines 14 and 14L may transfer to BART in the Mission

<sup>15</sup> Where possible, subarea boundaries follow commonly understood district boundaries. As a result, western and eastern subareas are slightly larger than central subareas. However, “companion” North- and South-of-Market subareas, such as Union Square and Yerba Buena, are of comparable size.

District for easier access to North-of-Market destinations.

Altogether, slightly more riders of Market Street lines were bound for North-of-Market destinations than for South-of-Market destinations: 55 percent of Metro riders and 62 percent of streetcar and bus riders. Once again, however, many bus lines operate primarily or partly North-of-Market, and sample sizes were relatively small. Moreover, both service and land use patterns have changed somewhat since 2004.

### Time of Day

Analysis was also conducted of the extent to which Market Street transit ridership is peak- or commute-oriented. In order to do this, daily boarding and alighting totals for each stop (see previous section) were compared to boardings and alightings during the PM peak period of 4 to 7 PM. Table 2.4.6 summarizes this research.

**Table 2.4.6: Percentages of Weekday Boardings and Alightings between 4 and 7 p.m.**

Lines	Boardings	Alightings
Surface	24.1%	18.6%
Metro	33%	17%

While spans of service of lines operating on and under Market Street vary, most services operate between 18 and 19 hours per day. If ridership were evenly distributed over the course of the day, the three-hour PM peak period would account for roughly 15 to 17 percent of all boardings and



alightings. While numbers of alightings are close to this amount, there are significantly more boardings in the PM peak – especially under Market Street on Muni Metro lines. If one were to assume that AM peak patterns are a rough reflection of PM peak patterns, then travel during peak periods, covering about one-third of the day, would account for close to half of all Metro trips and more than two-fifths of bus and F Line trips.

## Access

Data on modes of access to and from Market Street transit stops and stations are generally unavailable. As part of the planned transit trip origin and destination survey, passengers may be asked about their means of access. However, given the high-density downtown context, with limited opportunities for auto access to transit, it is clear that walking and transfers from other transit lines are the dominant modes of access to transit. Available data for access to BART stations can be found in the *2008 BART Station Profile Study*. For non-home-based trips, which account for the overwhelming majority of trips to Market Street BART stations, the top two modes of access are:

- Embarcadero: walk 88 percent, transit 9 percent
- Montgomery: walk 94 percent, transit 4 percent
- Powell: walk 82 percent, transit 14 percent
- Civic Center/UN Plaza: walk 71 percent, transit 21 percent

## Safety

Information on Muni safety can be found in Section 2.8, Safety.

## Recent Transit-Related Projects

### Required Right Turns

The Required Right Turns Project, a pilot program to divert private traffic from eastbound Market Street that has recently been made permanent, is described under Section 2.5, Vehicular Traffic. Key findings relevant to transit are as follows:

- In an initial analysis (results were published in June 2010), SFMTA compared travel times before and after program implementation for more than 1,400 transit trips on four bus lines, using NextMuni data. The analysis found that while average transit travel times along Mission Street between 9<sup>th</sup> and Main Streets rose by 25 seconds (three percent), average transit travel times along Market Street between 9<sup>th</sup> and 1<sup>st</sup> Streets fell by 50 seconds (five percent).
- In a second analysis of more than 900 Muni trips conducted in September 2010, SFMTA found that average transit travel times on Market between 9<sup>th</sup> and 1<sup>st</sup> were reduced by approximately three percent from before program implementation, and that there was virtually no change in transit travel times inbound on Mission.

## Future Conditions

### Transit Effectiveness Project

The *Transit Effectiveness Project*, or TEP, was a comprehensive analysis of Muni services, completed in 2008. Recommendations were adopted by the SFMTA Board, which oversees Muni and other SFMTA divisions. The recommendations have not yet undergone environmental review. However, a Draft Implementation Strategy including modified recommendations was recently released. The strategy assumes capital improvements to Market Street to be identified through the Better Market Street process. It also recommends service changes including:

- Expansion of Line 38L service to Sundays in 2013-2014
- Additional service on Lines 2, 5, 9, 9L, and 71L in 2013-2014
- Introduction of Line 5L Fulton Limited service in 2015-2016
- Additional service on F Line in 2015-2016
- Travel Time Reduction Proposal (TTRP) improvements to Rapid Network corridors improving the speed and reliability of lines operating on Market Street including the 5, 5L, 9 and 9L by mid-2015, and the 6, 71 and 71L by mid- 2020 (as well as the 14 and 14L on Mission Street by mid-2015)

Additionally, major connecting services including Lines 8X, 30, 45, and 47 would be improved, and new Line 49L Van Ness-Mission Limited service would be introduced in 2015-2016.

### **Central Subway**

Muni's Central Subway project, currently scheduled to be completed in 2018, is projected to substantially reduce activity at the busy bus stops just off of Market Street on Kearny, 3<sup>rd</sup> and 4<sup>th</sup> Streets, as many transfers now taking place at these locations would be relocated underground.

### **Transbay Transit Center**

The new Transbay Transit Center, now under construction just south of Mission near 1st and Fremont Streets on the site of the former Transbay Terminal, is scheduled to open in 2017. Market Street bus routes now terminating at the Temporary Transbay Terminal will be realigned. Future increases in regional transit serving the Terminal (and, potentially, introduction of California High-Speed Rail service) could have a substantial impact on demand for Market Street transit service. Additionally, changes to the configuration of Mission Street near the terminal could impact both Mission and Market Street transit and traffic.

### **Van Ness and Geary Bus Rapid Transit**

The Van Ness BRT project is currently scheduled to be completed in 2017; an opening date for Geary BRT has not yet been set. The Van Ness project will result in additional service on Van Ness,

and additional demand for transfers to and from Market Street transit service at Van Ness. No additional service has been proposed for Geary; however, the Fleet Management Plan described in the following section proposes a substantial increase in service by 2030.

### **SFMTA Transit Fleet Management Plan**

In 2010, SFMTA provided to the Federal Transit Administration (FTA) a plan for rehabilitation and replacement of its vehicle fleet over the next 20 years. The Fleet Management Plan is driven by fleet requirements that are in turn based on existing plans (including Transit Effectiveness Project "budget-neutral" recommendations; recommendations were also made requiring additional revenue) as well as projected growth in population, employment, and transit demand.

The plan proposes minimum peak headways for the year 2030 that might be used to identify Muni's long-term capacity needs on Market Street. Service on several lines would be increased significantly, including:

- Line 9, which would have a peak headway of 3.75 minutes (compared to 12 today), and Line 9L, which would have a peak headway of 7.5 minutes (compared to 12 today). This would result in approximately 14 more buses per hour, per direction in the peak period on parts of Market Street where Lines 9 and 9L operate. (Some 60-foot articulated coaches would also operate on Lines 9

and 9L, in place of the 40-foot coaches used today.)

- Line 38, which would have a peak headway of five minutes (compared to seven today), and Line 38L, which would have a peak headway of four minutes (compared to six today). This would result in approximately eight more buses per hour, per direction in the peak period.
- F Line, which would have peak headway of four minutes (compared to six to seven today). This would result in approximately six more streetcars per hour, per direction in the peak period.
- Line 21, which would have a peak headway of six minutes (compared to nine to ten today), resulting in approximately four more buses per hour, per direction in the peak period.

Additionally, the new Line 5L (see "Transit Effectiveness Project") would have a peak headway of 7.5 minutes, or eight buses per hour, per direction. Together, these changes would result in an additional 40 vehicles per hour, per direction in the segment of Market Street where they all operate, near the Financial District. Today, there are approximately up to 173 vehicles per hour in this segment, meaning that Muni service would be increased by nearly half.

## Other Fixed-Route Services

While Muni accounts for the vast majority of fixed-route transit service operating on Market Street, a number of additional services exist.

### Amtrak Thruway

The closest Amtrak station to San Francisco is in Emeryville, in the East Bay. In order to provide connections to and from San Francisco, Amtrak California offers Thruway bus service, timed to meet trains. Thruway Route 99 makes two stops on Market Street, at the curbside inbound Muni stops between 4th and 5th streets and between 7th and 8th streets. Approximately 45 stops are made on non-holiday weekdays at the former, and only eight daily stops at the latter. This service is available only to Amtrak passengers with tickets or reservations.

According to SFMTA staff, Amtrak buses sometimes layover along the curb between 4th and 5<sup>th</sup> Streets.

### All Nighter

In addition to Muni overnight Owl bus service (consisting of four lines operating on various segments), two regional bus operators provide All Nighter service along Market Street: the Alameda-Contra Costa Transit District, or AC Transit, operates Route 800, while the San Mateo County Transit District, or SamTrans, operates Route 397. These services essentially replace BART and Caltrain service overnight.

Route 800 operates inbound-only between Octavia Boulevard and 1<sup>st</sup> Street, stopping curbside at 11<sup>th</sup> Street, between 7th and 8th streets, between 4th and 5th Streets, at 3rd Street, and between 1<sup>st</sup> and 2nd streets. It operates hourly between 1 AM and 6 AM, providing service to and from the Richmond BART station via Downtown Oakland and Berkeley.

Route 397 operates primarily on Mission Street, but makes a single stop on Market Street; inbound at the curb at 11<sup>th</sup> Street. It operates hourly between 1:30 AM and 5 AM, providing service to and from Palo Alto.

### Shuttles

In recent years, private shuttle services have proliferated throughout the region. A 2008 inventory conducted by SFMTA found 14 such services operating in downtown San Francisco, including several operating on parts of Market Street. These services typically are available only to employees or students, operate during peak hours, and provide connections to and from BART/Muni subway stations.

In 2010, SFCTA produced a *Strategic Analysis Report on The Role of Shuttle Services in San Francisco's Transportation System*. It noted that shuttles often use Muni stops, resulting in conflicts. However, it added, shuttle operators and SFMTA have begun to collaborate. In order to preserve the public benefits of shuttle services (deriving from a reduction in auto demand) while reducing conflicts, the report recommended that SFMTA and shuttle

providers further collaborate on potential consolidation and public use of services.

According to SFMTA staff, shuttle buses sometimes use commercial loading bays. Shuttles can also sometimes be seen stopped in travel lanes to load or unload. The SFCTA report also relayed anecdotal accounts of conflicts between stopped shuttles and cyclists on Market Street.

**Figure 2.4.22: Shuttle Stopped in Travel Lane to Unload Passengers**



## Paratransit

SFMTA is required by the federal Americans with Disabilities Act (ADA) to provide complementary paratransit service. SFMTA contracts with a Paratransit Broker, Veolia Transportation, to manage the SF Paratransit service. SF Paratransit is comprised of a network of services for eligible riders, including SF Access, Group Van and Taxi. SF Access is prescheduled, ADA-compliant, shared ride van service. Group Van is provided to individuals going to a single location, such as an Adult Day Program or work site. Paratransit Taxi service is for individuals whose transit needs are singular in nature, e.g., not accommodated by group trips to agencies. All cab companies in San Francisco are required by City ordinance to participate in the SF Paratransit program, subject to SFMTA's requirements. The taxi industry has an extensive vehicle capacity and is able to provide a high level of service because these vehicles are also available for dispatch to the public at-large. Approximately 1 million paratransit trips are provided annually in San Francisco to 14,000 eligible riders.





## **2.5 Vehicular Traffic**





## 2.5 Vehicular Traffic

Market Street is San Francisco's central ceremonial street, cutting diagonally across the City from the Castro District to the Financial District. Between Van Ness Avenue and the Embarcadero, Market Street serves as the boundary between two of San Francisco's street grids. South of Market Street, the grid pattern is parallel and perpendicular to Market Street and consists of relatively large blocks (approximately 900 feet by 600 feet), often characterized by wide, one-way, auto-oriented streets. North of Market Street, the street grid is skewed nearly 45 degrees, and the blocks are smaller (approximately 500 feet by 350 feet). As the boundary between these two grids, Market Street must contend with a number of unique and challenging features, including many multi-legged intersections, skewed turns and crossings, and poor sight lines. These configurations are confusing for drivers who are both visitors and residents unaccustomed to driving Downtown.

### Key Findings

- **Only 14 percent of people on Market Street are in private vehicles.** Market Street is the City's transit backbone, and it is not heavily used by automobiles. There are no destinations for private vehicles on Market Street, since there are virtually no driveways or parking garages that provide direct access on Market Street. Of the private vehicles that do use Market Street, 80 to 85 percent are crossing Market Street via one of the North/South cross streets. And of those trips that travel on the street, the average trip length is only two blocks.
- **Intersections on Market Street have very unique geometries.** Market Street's intersections are extremely unconventional because the street is the border between two differently-skewed street grids. This creates challenges for auto circulation by introducing additional conflict points. At some intersections, the street north of Market Street and the street south of Market Street do not meet at a 90-degree angle, and traffic crossing the street must navigate through the intersection very carefully, as lanes may be skewed to shift within the intersection.
- **High pedestrian volumes along Market Street often delay vehicles that are making a right turn off of Market Street.** Eastbound right turn lanes are provided at intersections where right turns are allowed. Westbound right

turn pockets create wide lanes that may encourage higher speed right turn maneuvers.

**Table 2.5.1: Terminology for Various Modes of Travel**

<i>Term</i>	<i>Definition</i>
Vehicle	Private vehicles, taxis, transit and commercial vehicles combined
Private Vehicle	Private automobiles
Taxi	Taxi
Transit	Transit vehicles, including paratransit and shuttles
Commercial Vehicle	Commercial vehicles/loading
Bicycle	Bicycle
Pedestrian	Pedestrian, including people who use mobility assistive equipment

## Traffic Volumes

By far, the primary source of vehicle traffic on Market Street is traffic crossing the street: 80 to 85 percent of all vehicle traffic along Market Street is crossing Market Street northbound or southbound. This is because – although there are few reasons to drive on Market Street itself – most streets that cross Market Street provide access to or from the San Francisco-Oakland Bay Bridge (I-80), US 101, or I-280. Many of the streets and intersections on these routes are frequently congested in the evenings when traffic approaching the San Francisco-Oakland Bay Bridge backs onto Market Street from the South of Market neighborhood due to congestion on the bridge approaches.

West of 8th Street, traffic associated with the Central Freeway/US 101 and Oak/Fell one-way couplet is a major consideration. Octavia Boulevard and 9th Street provide direct connections between the freeway and the Oak/Fell one-way couplet that extends to the western residential neighborhoods. Prior to 1989, Octavia Boulevard was an elevated freeway through Hayes Valley with exits at Oak, Fell, and Golden Gate. When the freeway was removed, this traffic was shifted to surface streets in the area. Gough Street and Van Ness Avenue also provide direct connections to and from the Central Freeway/US 101 via the on- and off-ramp at Duboce Avenue-Division Street and Mission Street and Howard Street.

During peak hours, vehicle traffic is highest between Octavia Boulevard and Franklin Street,

where traffic from the Upper Market/Castro neighborhood, Valencia Street, and US 101 converge at Franklin and Gough Streets. This area is also a major crossing point for drivers travelling from the northeastern portion of San Francisco to the Mission and Castro Districts

Despite its prominent role as both a transportation corridor and public space, Market Street does not play a major part in moving automobile traffic through and around San Francisco, other than for cross-traffic. In fact, only 14 percent of all people on Market Street are in a private vehicle, far fewer than those who are walking or on transit.

For those vehicles being driven on Market Street, most are on the street for less than two blocks. Since several streets terminate at Market Street, vehicles are often required to turn onto Market Street for one block, before turning and continuing onto another street. These blocks tend to have higher traffic volumes as a result. Specifically, vehicle traffic tends to peak on the blocks of Market between Octavia and Franklin, Montgomery and 2nd Street, and 1st Street and Beale Street. In each of these locations, traffic is “wiggling” from one side to the other. The only reason this vehicle traffic travels along Market Street is to cross from one side to the other. Other blocks serve private vehicles circling the block looking for parking garage entrances, such as between 5th Street and 4th Street as traffic circles between the San Francisco Center and the 5th/Mission Garage to the south.



**Figure 2.5.1: Major Freeway Access Routes**



**Figure 2.5.2: Vehicle Traffic Volumes: PM Peak Hour**



Traffic counts show that Market Street carries far fewer vehicles than most other major streets in the City – including both large streets and smaller, neighborhood and transit-oriented streets. In general, Market Street has on average about 7,000 vehicles per day. In comparison, Mission Street carries approximately 20,000 vehicles per day, Howard Street handles approximately 15,000 vehicles per day, and Folsom Street carries approximately 20,000 vehicles per day. Compared to other transit-preferential and commercial streets, Haight Street handles approximately 12,000 vehicles per day; Castro Street (near 15th Street) carries 18,000 vehicles per day; and Polk Street carries approximately 15,000 vehicles per day.

**Table 2.5.2: Traffic Volume Comparison, Other Parallel Streets and Transit-Preferential Commercial Streets**

Market Street	7,000 vehicles per day
Mission Street, near 1st Street	20,000 vehicles per day
Howard Street, near 3rd Street	15,000 vehicles per day
Folsom Street, near 7th Street	20,000 vehicles per day
Haight Street, near Ashbury Street	12,000 vehicles per day
Castro Street, near 15th Street	18,000 vehicles per day
Polk Street, near Post Street	15,000 vehicles per day

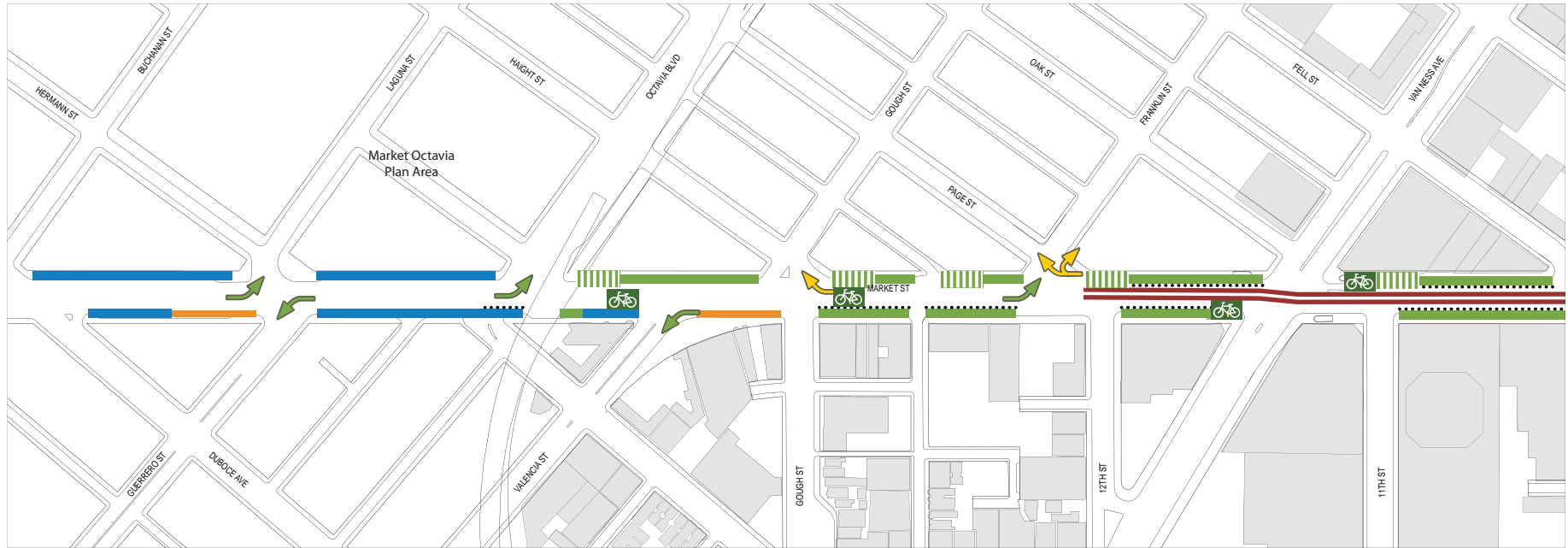
Source: SFMTA


## Configuration







Over the years, the City has installed many design treatments to make the most of the unusual conditions presented by Market Street. In some locations, streets crossing Market Street have been reconfigured so that they meet Market Street at a perpendicular angle and roadway tracking lines have been painted to guide drivers through the intersection. Decorative crosswalks have been added to highlight pedestrian zones; and the SFMTA has been recently added vehicle advance stop bars on Market Street. West of 5th Street, where vehicle traffic is higher and may conflict with transit, transit- and taxi-only lanes have been added. Separated and green bicycle lanes and bicycle boxes have been added to increase bicycle safety.

Despite limitations caused by geometry, most of Market Street from curb to curb is a relatively undefined space that is shared between vehicle traffic, transit, and bicyclists. Except for the physically separated bikeway west of 8<sup>th</sup> Street, most space is delineated with minimal roadway striping or signage.

**Figure 2.5.3: Market Street Configuration (1 of 4)**

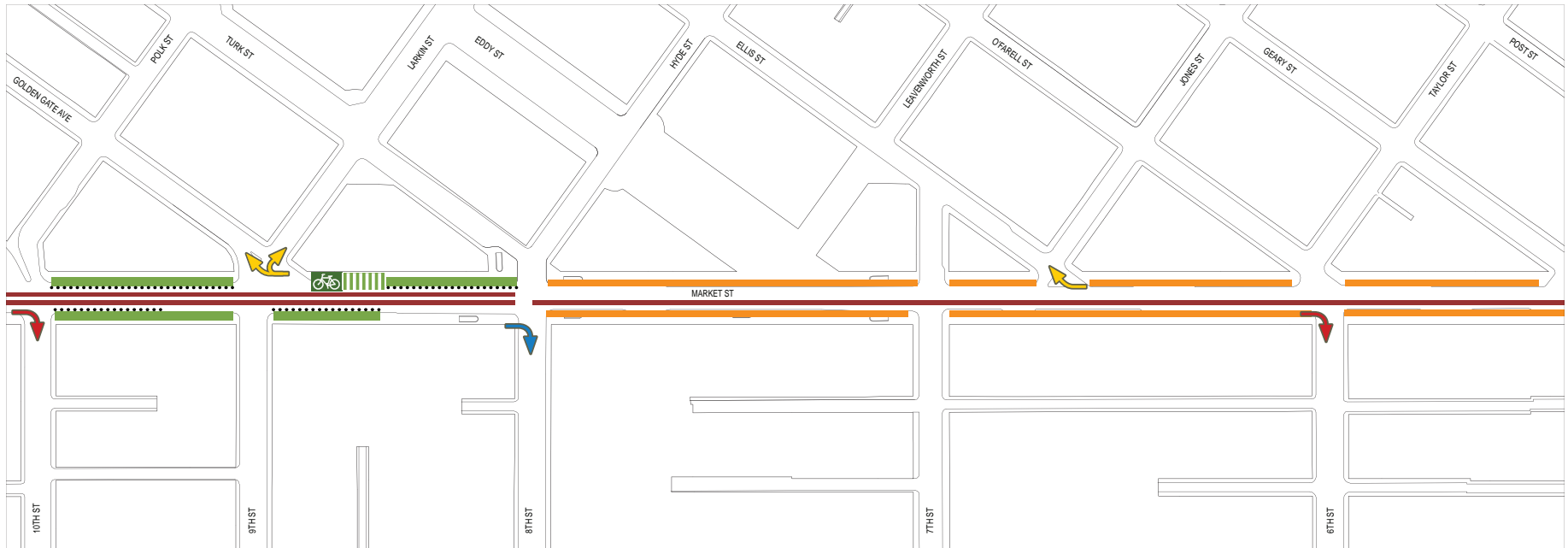














-  Transit-Only Lane (Bi-directional)
-  Transit-Only Lane (Eastbound)
-  Left-Turn Permitted (from Market Street)
-  Required Eastbound Right-Turn
-  Right-Turn Slip Lane (Westbound on Market Street)
-  Turn Lanes

- Bicycle Facilities**
-  Bicycle Lane
  -  Bicycle Route
  -  Green Bicycle Lane
  -  Physically Separated Bicycle Lane
  -  Future Green Dashed Mixing Zone
  -  Bicycle Box

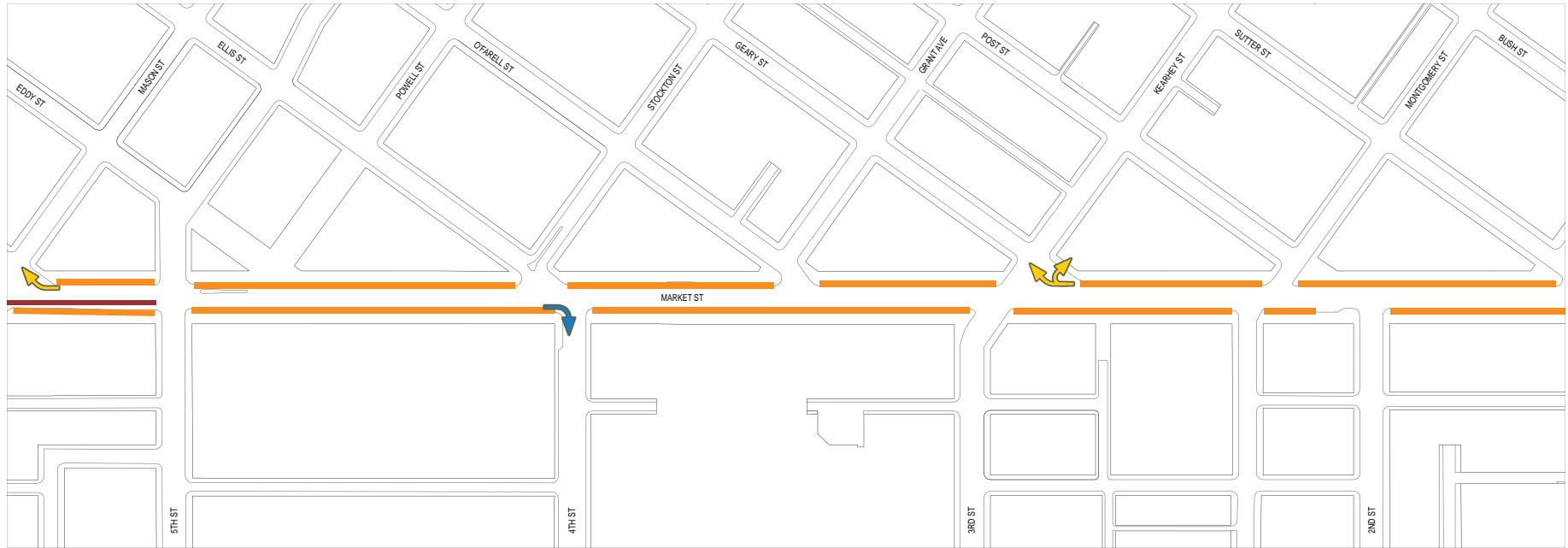














**Figure 2.5.3: Market Street Configuration (2 of 4)**



- |   |   |   |
|---|---|---|
|   | Transit-Only Lane (Bi-directional)                | <b>Bicycle Facilities</b>   |
|  | Transit-Only Lane (Eastbound)                     |  Bicycle Lane                      |
|  | Left-Turn Permitted (from Market Street)          |  Bicycle Route                     |
|  | Required Eastbound Right-Turn                     |  Green Bicycle Lane                |
|  | Right-Turn Slip Lane (Westbound on Market Street) |  Physically Separated Bicycle Lane |
|  | Turn Lanes  |  Future Green Dashed Mixing Zone   |
|   |   |  Bicycle Box                       |













**Figure 2.5.3: Market Street Configuration (3 of 4)**



- |   |   |   |
|---|---|---|
|   | Transit-Only Lane (Bi-directional)                | <b>Bicycle Facilities</b>   |
|  | Transit-Only Lane (Eastbound)                     |  Bicycle Lane                      |
|  | Left-Turn Permitted (from Market Street)          |  Bicycle Route                     |
|  | Required Eastbound Right-Turn                     |  Green Bicycle Lane                |
|  | Right-Turn Slip Lane (Westbound on Market Street) |  Physically Separated Bicycle Lane |
|  | Turn Lanes  |  Future Green Dashed Mixing Zone   |
|   |   |  Bicycle Box                       |

**Figure 2.5.3: Market Street Configuration (4 of 4)**



- |   |   |   |                                   |
|---|---|---|-----------------------------------|
|   | Transit-Only Lane (Bi-directional)                | <b>Bicycle Facilities</b>   |                                   |
|  | Transit-Only Lane (Eastbound)                     |  | Bicycle Lane                      |
|  | Left-Turn Permitted (from Market Street)          |  | Bicycle Route                     |
|  | Required Eastbound Right-Turn                     |  | Green Bicycle Lane                |
|  | Right-Turn Slip Lane (Westbound on Market Street) |  | Physically Separated Bicycle Lane |
|  | Turn Lanes  |  | Future Green Dashed Mixing Zone   |
|   |   |  | Bicycle Box                       |

Between Octavia Boulevard and The Embarcadero, Market Street generally provides two vehicle travel lanes in each direction, with the inner lane shared with the F Market & Wharves historic streetcar line and the outer lane shared with bicyclists. Both lanes are shared with high bus volumes. Between 12th Street and 5th Street, the inner lanes are designated as a transit-only/taxi-only lane; although, some bus routes travel in the outer, mixed-flow lane. These transit/taxi lanes are designed to reduce travel delay for transit where Market Street has higher traffic volumes. Although traffic volumes are low along Market Street, the multiple lanes have helped facilitate transit movement on the street.

### Turning On or Off Market Street

Turning onto or off of Market Street can pose an issue for a number of reasons, including the unique angles of intersections, high pedestrian volumes, and left-turn restrictions. Left-turns from Market Street are prohibited or restricted to transit vehicles and taxis with the exception of a few locations. Only three intersections have dedicated left-turn lanes with protected signal phases: Franklin Street, Valencia Street and Octavia Boulevard. Left-turn volumes from eastbound Market Street onto northbound Franklin Street are the highest, as Franklin Street is part of the Franklin Street/Gough Street north/south one-way couplet. Two eastbound left-turn lanes accommodate this high traffic volume. Left turns are permitted, but designated lanes are not provided on Market Street at Drumm Street. As a result of the frequent left-

turn restrictions, drivers must execute several right-turns to travel in the desired direction.

Right turns off of Market Street are generally permitted. However, in locations where pedestrian volumes are high, turning right from Market Street can be challenging for motorists. As a result, vehicular queues often form due to right-turning vehicles. To reduce the likelihood that these queues affect through traffic and transit service along Market Street, dedicated right turn lanes are provided at several locations, including at the following intersections:

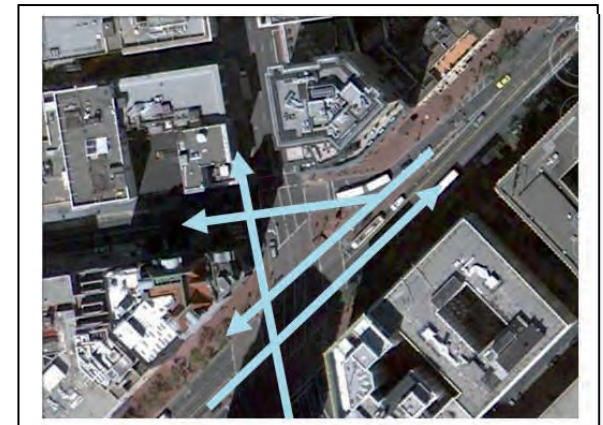
- 10th Street – Eastbound
- 8th Street - Eastbound
- 6th Street - Eastbound
- 4th Street - Eastbound
- 2nd Street –Eastbound
- 1st Street – Eastbound
- Page Street – Westbound

Many intersections on the north side of Market Street are multi-legged, due to the angle of the street grid. At these locations, westbound traffic on Market Street often has the option of turning onto two different streets north of Market Street, which can be confusing and operationally challenging. At several of these intersections, a traffic lane is provided to allow vehicles to turn off of Market Street just prior to the intersection. These lanes are generally referred to as “slip lanes.” These lanes make vehicle turns easier, but also increase the number of conflict points at intersections for all modes, and create small, isolated strips of land

used as a pedestrian waiting area. Slip lanes are located on westbound Market Street at:

- Sutter Street – Sansome Street
- Geary Street – Kearny Street
- Turk Street – Mason Street
- McAllister Street – Jones Street
- Hayes Street – Larkin Street
- Page Street – Franklin Street

**Figure 2.5.4: “Slip Lane” at Market Street and 3rd Street/Kearny Street/Geary Street**



Market Street at 3<sup>rd</sup> Street-Kearny Street-Geary Street



## Crossing Market Street

Crossing Market Street by automobile can also be challenging. The orientation of the street also results in many cross-streets having offset travel lanes or multiple intersection legs. For example, northbound and southbound traffic at Main-Drumm, Montgomery-New Montgomery, 3rd-Kearny, Stockton-Ellis-4th, Golden Gate-Taylor-6th, Polk-Fell-10th, and Gough must navigate a curve through the intersection. Most of these intersections have tracking lines to guide traffic through the intersection into the correct lane; however, based on observations, drivers frequently ignore the lane markings.

## Vehicle Level of Service

Vehicle operations were analyzed for the study area shown in the figure below. The traffic analysis study area includes the streets and intersections on Market Street and south of Market Street to Folsom Street, between The Embarcadero and the Central Freeway/Division Street, plus each intersection one block north of Market Street. The area was defined based on the roadways parallel to Market Street that typically carry traffic from the Financial District to the western neighborhoods. The streets in the South of Market neighborhood also serve traffic that is diverted off of Market Street because of required right-turns and left-turn restrictions.

For this study, vehicle operations were described for each intersection in the study area, using a concept known as level of service (“LOS”), a

description of the quality of an intersection’s operation from a driver’s perspective. This methodology, prescribed in the Highway Capacity Manual, assigns a LOS letter grade to each intersection, which ranges from LOS A (indicating free flow traffic conditions with little or no delay) to LOS F (representing over-saturated conditions where traffic flows exceed design capacity, resulting in long queues and delays).

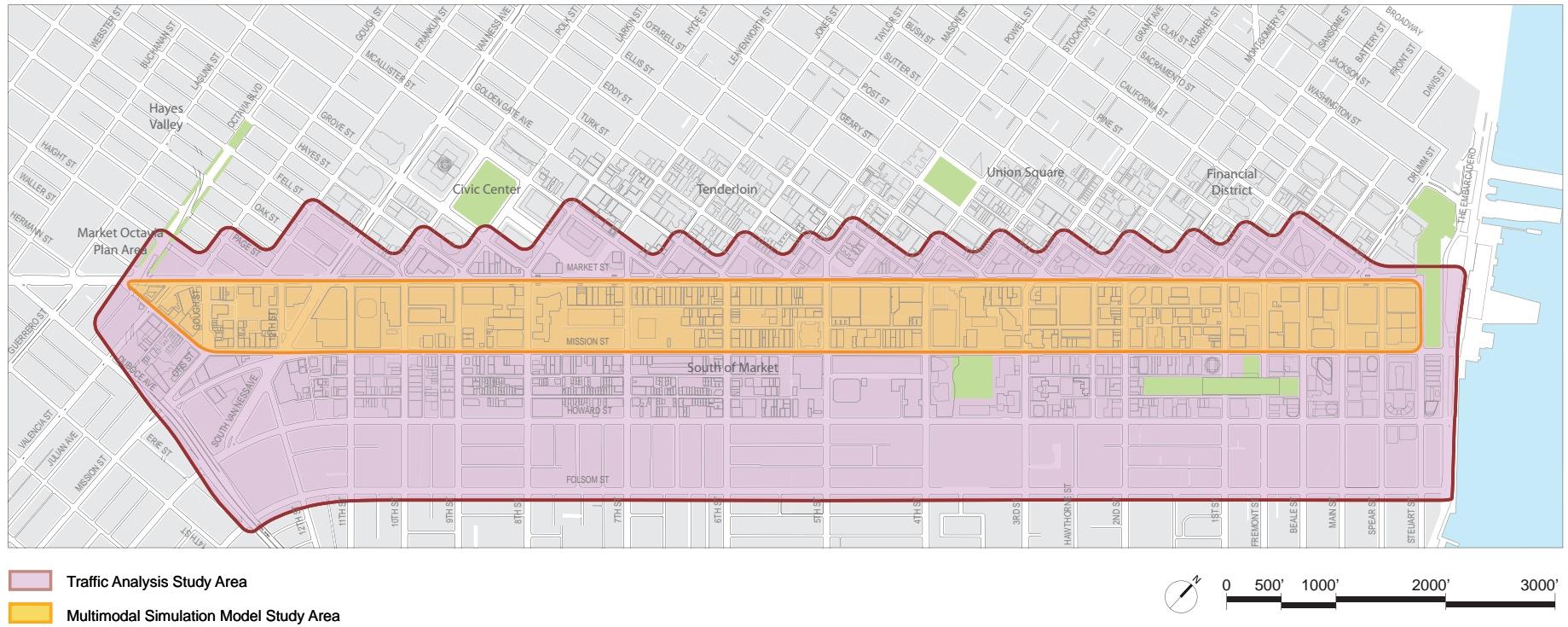
At signalized intersections, the LOS rating is based on the average delay per vehicle at an intersection, measured in seconds per vehicle. Peak hour traffic volumes, lane configurations, and signal timing plans are used as inputs in the calculations. The table below summarizes the relationship between the average delay per vehicle and LOS for signalized intersections. The City of San Francisco typically considers intersections to be operating acceptably at LOS D or better.

**Table 2.5.3: Intersection Level of Service Thresholds**

Level of Service	Control Delay (sec/veh) <sup>1</sup>	General Description
A	0 – 10.0	Little to no congestion or delays.
B	10.1 – 20.0	Limited congestion. Short delays.
C	20.1 – 35.0	Some congestion with average delays.
D	35.1 – 55.0	Significant congestion and delays.
E	55.1 – 80.0	Severe congestion and delays.
F	> 80.0	Total breakdown with extreme delays.

Source: Highway Capacity Manual, Chapter 16 (Signalized Intersections) and Chapter 17 (Unsignalized Intersections), Transportation Research Board, 2000.

**Figure 2.5.5: Traffic Analysis Study Areas**



**Figure 2.5.6: Vehicle Level of Service: PM Peak Hour**



The following figure summarizes the results of the vehicle level of service analysis. Most intersections in the study area operate at LOS C or better, with some congestion, but average delay. This is not surprising since many streets in the South of Market neighborhood contain many wide, multi-lane streets that were designed to move private vehicles quickly through what was originally a primarily industrial area.

Although levels of service are shown for Market Street and Mission Street, a separate multi-modal micro-simulation for the Market Street and Mission Street corridors is under development by the Planning Department. These two streets are much more complex and serve substantial transit, bicycle, and pedestrian traffic, as well as vehicle traffic. The multi-model analysis will be able to more effectively capture the complex interaction

between vehicles, pedestrian, and transit vehicles on these streets. In addition, many of the intersections on Market Street are skewed or have more than four or five approaches. The micro-simulation is better able to estimate delay in these conditions. The micro-simulation will be used as the primary analysis tool in analyzing reconfiguration scenarios in the future.

## Ongoing Projects

### Required Right Turn Project

In 2009, SFMTA launched a pilot project to reduce through traffic on Market Street by requiring eastbound traffic, with the exception of transit, taxis, delivery vehicles and bicycles, to turn right at 8th and 6th streets. The overall goals of the program were to improve the performance of buses and streetcars and to create a more pedestrian- and bicycle-friendly street by reducing the volume of traffic on eastbound Market Street. In 2010, SFMTA refined the project by removing the regulation on eastbound Market Street at 8th Street and implemented it on eastbound Market Street at 10th Street instead. The project did not “close” any portions of Market Street to general traffic, as traffic may still turn onto eastbound Market Street from nearly all cross streets.

The SFMTA collected extensive Muni travel time and traffic and bicycle volume data on eastbound Market, Mission and Folsom streets before and after these changes were implemented. Transit travel times on eastbound Market Street have decreased by approximately three percent, while the transit travel time on Mission Street has been virtually unchanged. Traffic volumes have increased on Mission Street, but congestion problems have not arisen.

### Eastern Neighborhoods Transportation Implementation Planning Study (EN TRIPS)

The Eastern Neighborhoods Transportation Implementation Planning Study (EN TRIPS) is currently being conducted to evaluate potential future transportation improvements in the Eastern Neighborhoods of San Francisco. These improvements would be designed to help facilitate the growth in the area facilitated by the recently-adopted Eastern Neighborhoods Plan. Within the Better Market Street study area, the EN TRIPS study area includes Market Street, Mission Street, Harrison Street, and Folsom Street. Although it is important that these two studies (Better Market Street and EN TRIPS) carry forward a consistent vision of the future, the EN TRIPS study has not yet developed recommendations for transportation improvements. Therefore, it is uncertain how or whether implementation of recommendations from the EN TRIPS study may affect traffic conditions in the area, and specifically, on Market Street.

### Transit Center District Plan

The City recently adopted the Transit Center District Plan, which identifies land use and transportation policies for the area surrounding the Transbay Terminal. Specific to the Better Market Street study area, the Transit Center District Plan calls for further study of several concepts that may affect vehicular circulation in the area, including:

- Minimizing queues on 1st Street approaching the San Francisco-Oakland Bay Bridge
- Converting Folsom Street to two-way operation

- Prohibiting private vehicles on Mission Street, between 1st Street and Fremont Street

Each of these, as well as many of the other recommendations in the Plan, will require further study and evaluation before a final decision is made.





## 2.6 Parking



## 2.6 Parking

Providing new parking spaces and garages in downtown San Francisco has generally been discouraged through both the Planning Code, which restricts the amount of parking a new development can provide, and through policies in the San Francisco General Plan. In fact, San Francisco was one of the first cities to implement “parking maximums”, which provide a “ceiling” to parking supply rather than a “floor” that requires developers to provide a minimum number of new parking spaces. Typically, new developments in parts of downtown San Francisco are not permitted any new parking without a planning variance, and any new parking is typically limited to no more than seven percent of total building size. The goal of these policies is to encourage transit usage, walking, and bicycling rather than automobile use within downtown.

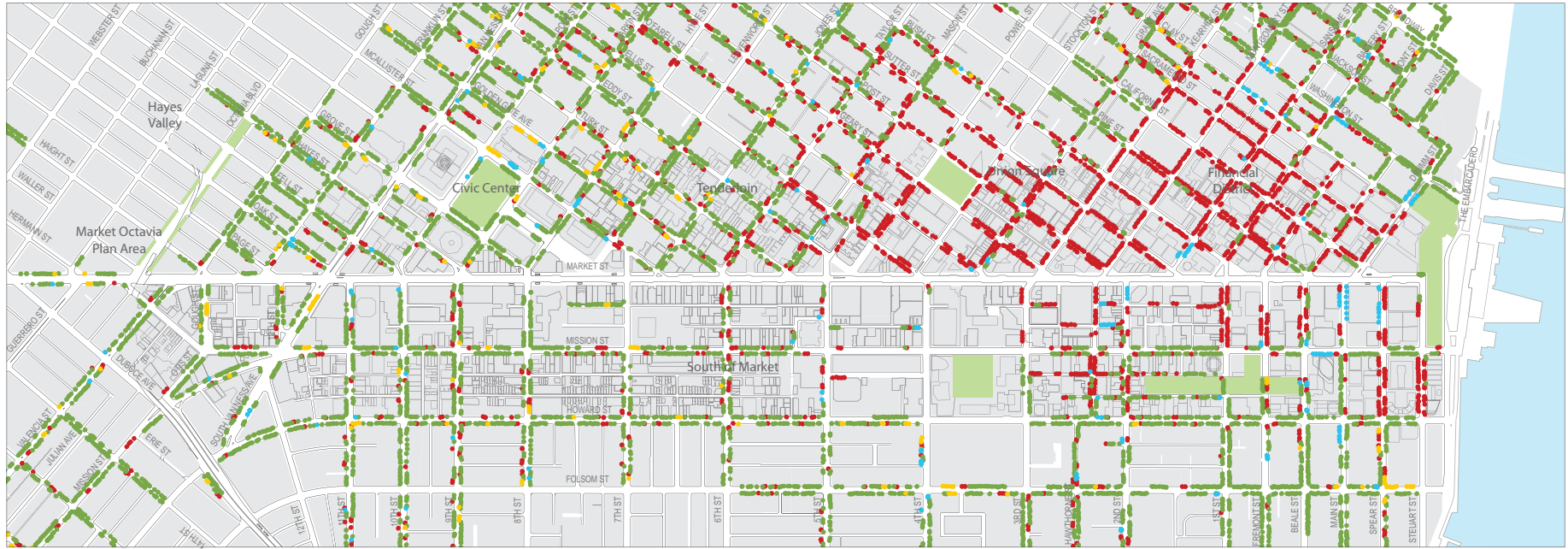
This section describes the location and types of parking available within the Market Street study area.

### Key Findings

- **Market Street does not provide access to parking garages, nor does it have on-street parking.** Sidewalks along Market Street provide an uninterrupted pedestrian environment for adjacent businesses. East of Van Ness Avenue, there are no driveways for parking lots and there is not on-street parking except for designated on-street loading zones. Not having on-street parking or direct access to parking garages is consistent with the fact that most people on Market Street are walking to their destination after either taking transit or bicycling to the corridor.
- **Approximately 75 percent of all garaged parking spaces are privately-owned and operated.** Many buildings in the Financial District and Downtown have private parking garages for tenants. However, approximately 85 percent of the private parking garage spaces are publicly-accessible for a fee. These garages may not be as visible or known, since 80 percent of all parking garages within ¼ mile of Market Street have fewer than 250 parking spaces. In general, wayfinding signage routes drivers to larger garages.
- **One third of parking spaces are managed by the SFMTA.** Although City-owned parking garages, such as the one at 5th/Mission, are some of the most well-known and prominently located garages near Market Street, they account for only a quarter of all garaged parking spaces. With on-street metered

parking, SFMTA only regulated approximately one third of all parking within ¼ mile of Market Street.

**Figure 2.6.1: On-Street Parking**



Source: SFMTA, 2010

SFMTA Parking Meters by Type

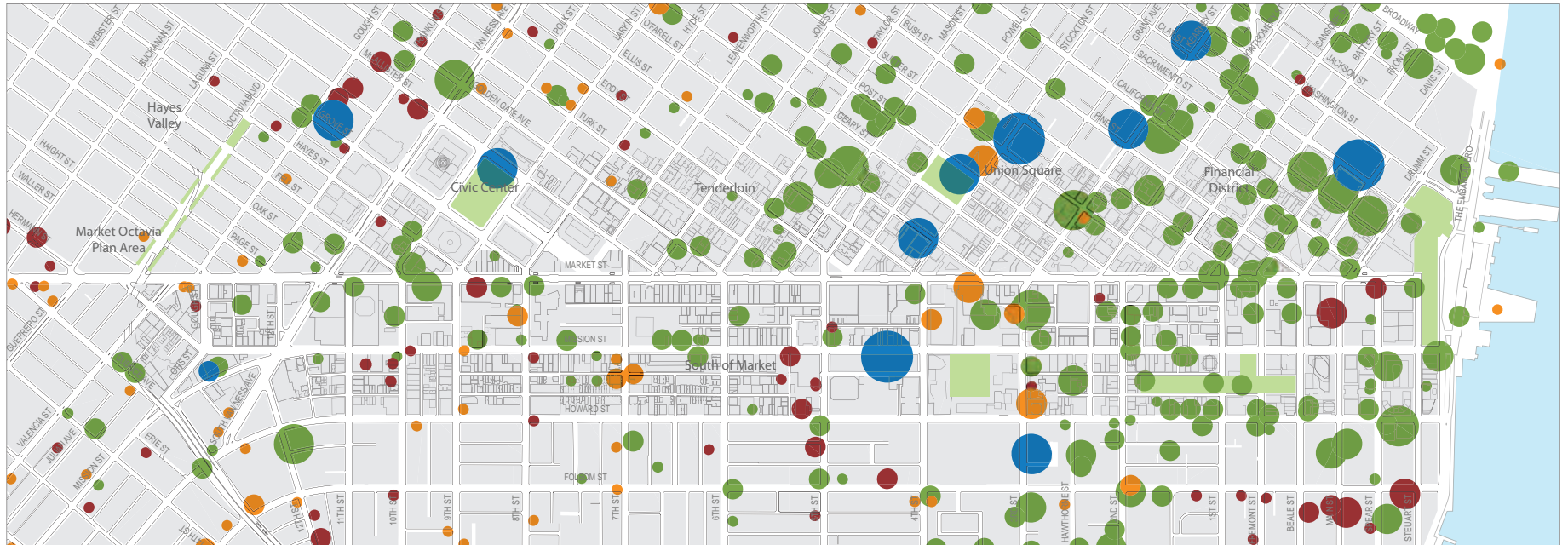
- Motorcycle
- Short-Term
- General
- Commercial Loading

Note: Additional data about parking on Market Street is shown on Page 284.



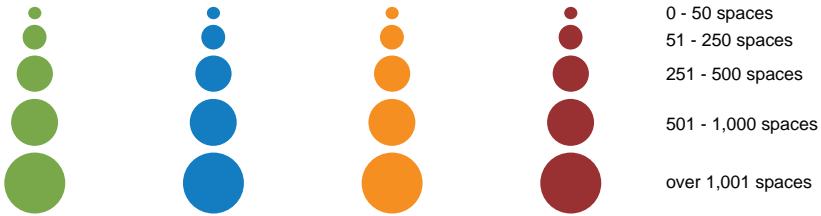


**Figure 2.6.2: Off-Street Parking**



Source: SFMTA, 2010

**Paid Public Parking**    **Paid Public Parking (SFMTA owned)**    **Free Parking (Customer-Only)**    **Permit Parking**



## Parking Supply

Despite parking restrictions in downtown San Francisco, there are over 30,000 parking spaces within publicly-accessible parking garages and lots within ¼ mile of Market Street. Most of these parking garages are smaller, with a capacity of fewer than 250 parking spaces.

- Within ¼ mile of Market Street, or about two to four blocks south or north of Market respectively, there are approximately 5,200 on-street metered parking spaces and 32,000 off-street parking spaces (parking lots and garages).
- Within ¼ mile of Market Street, 80 percent of the paid public off-street parking lots and garages contain less than 250 parking spaces. The spaces within these lots account for approximately one-third of all paid public off-street parking spaces within ¼ mile of Market Street.
- Within ¼ mile of Market Street, roughly half of the paid public off-street parking lots and garages contain less than 100 parking spaces. The spaces within these lots account for about 10 percent of all paid public off-street parking spaces within ¼ mile of Market Street.
- Virtually all parking meters in the downtown area have some time restrictions, varying from one to two hours. East of Mason Street and north of Market Street, almost all on-street parking is restricted to commercial vehicles throughout the day. During the PM peak commute hour, on-street parking is prohibited

to allow for additional vehicle travel lanes and bus loading zones during the most congested commute hours. In the evening, parking is unrestricted.

- City-owned, SFMTA-operated, parking garages and on-street metered parking spaces account for one third of all parking within ¼ mile of Market Street.

**Table 2.6.1: On- and Off-Street Parking Supply Near Market Street**

Location	Within ¼ mile
On-Street Parking Meters	5,227
Off-Street Parking Garages	189
Off-Street Parking Spaces	32,073

Source: SFMTA, 2010

**Table 2.6.2: Off-Street Parking Supply by Type within ¼ mile of Market Street**

Type	Garages	Spaces	% of Total Supply
Private-Operator Paid Public Parking	132	20,255	63%
SFMTA Paid Public Parking	7	8,357	26%
Customer Only Parking	25	2,073	6%
Permit Holder Parking	25	1,388	5%
Total	189	32,073	100%

Source: SFMTA. 2010

Of the publicly available parking, parking spaces in City-owned parking garages, including the 5th/Mission Garage, Union Square Garage, Stockton/Bush Garage, Ellis/O'Farrell Street Garage, Moscone Center, and Civic Center Garage, make up about one quarter of the total parking supply near Market Street. These garages are typically filled at peak times, and have an average occupancy between 45 and 73 percent. Each of the city-owned is typically most full in December; however, peak usage times can vary depending on garage. For example, the Moscone Center garage is most full on weekday afternoons, whereas the garages at 5<sup>th</sup>/Mission and near Union Square are more full on weekends.

During peak times, though, the Union Square, Ellis/O'Farrell, and 5th/Mission garages can reach capacity. Although these garages are largest and most well-known garages, as shown in the figure, parking options throughout Downtown are not necessarily limited.

In addition to limiting the number of parking spaces in Downtown, Market Street, east of Octavia Boulevard, is one of the only streets in the City on which on-street parking is prohibited. Also, no off-street garages or lots have driveway access onto Market Street. To access parking, most garages have entrances on the north-south streets that cross Market Street or from alleys between major streets. Despite not having direct access onto Market Street, to access several garages, drivers may need to circle the block depending on the direction they are traveling from to reach their final destination.

## Ongoing Projects

Aside for other on-going circulation improvements in SoMa, San Francisco has one new and on-going project that will directly influence parking near Market Street.

### SFpark

Beginning in 2011, SFMTA established SFpark to use new technologies and policies to improve parking in San Francisco. The goal of the project was to reduce the amount of time drivers spent circling the block looking for parking, reduce congestion (thereby improving transit speed and reliability), improve safety, and make paying at the parking meter easier. By implementing demand-responsive rate changes for parking, San Francisco is the first city in the world to adjust parking rates on such a large scale to achieve goals for parking availability. The program will periodically adjust meter pricing up and down to match demand. Demand-responsive pricing encourages drivers to park in underused areas and garages, reducing demand in overused areas.

The program also works by collecting and distributing real-time information about where parking is available so drivers can quickly find open spaces. Through SFpark, real-time data and demand-responsive pricing are planned to work together to readjust parking patterns in the City so that parking is easier to find.

SFpark is testing its new parking management system at 7,000 of San Francisco's 27,000 metered spaces and 12,250 spaces in 14 of 20 City-owned parking garages. The pilot phase of

SFpark will run until summer 2012. Downtown San Francisco, including the Financial District and The Embarcadero, are included in the first round of pilot testing for the program.





## 2.7 Loading, Delivery and Taxis



## 2.7 Loading, Delivery and Taxis

In addition to delivery vehicles and taxis, this chapter briefly addresses other non-transit-related activities that take place along the curb of Market Street, including passenger loading.

### Key Findings

#### Delivery

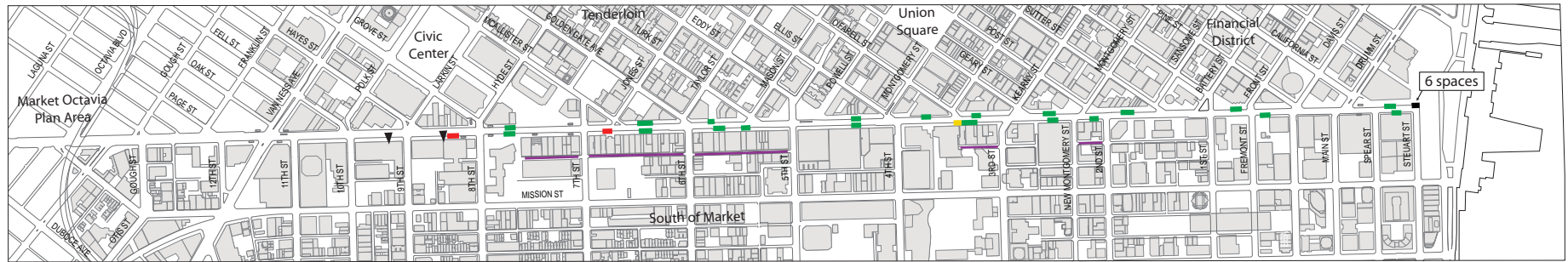
- **Loading bays are heavily used for many different purposes.** Because they represent the only locations along Market Street where one can stop alongside the curb, loading bays are heavily used not just for delivery, but for passenger loading, as well as by tour buses, shuttle buses, taxis and paratransit vehicles.
- **Double-parking and parking on the sidewalk are relatively common.** Because loading bays are heavily used, and because they are not always conveniently located, vehicles often park with two wheels on the sidewalk, or in the travel lane.
- **Most businesses must take delivery from Market Street.** Many parcels fronting on Market Street cannot be accessed via rear alleys or conveniently from side streets, and rear loading docks are rare.
- **Delivery access is essential to the economic well-being of Market Street.** Much of Market Street is lined by retail uses and restaurants that rely on regular deliveries.

#### Taxis

- **There are few spaces reserved for taxis on Market Street.** On Market itself, there is one drop-off zone, there is one passenger loading zone that may be used by taxis, and there are no taxi stands (there are taxi stands located just off of Market). Like other vehicles, taxis use delivery bays and sometimes stop in travel lanes.
- **Taxis may legally use transit-only lanes.** Additionally, taxis have benefitted from a reduction in eastbound auto traffic since the Required Right Turn program was implemented.

Figure 2.7.1 shows locations at which curb space is dedicated to non-transit uses – loading bays, taxi drop-off zones, and parking. It also shows curb cuts, as well as alleys that are adjacent to properties fronting onto Market Street.

**Figure 2.7.1: Loading Bays and Regulated Curb Space**



**Curb Uses / Regulations**

- Metered parking 7 AM to 6 PM, Monday through Saturday
- Loading zone - trucks with six or more wheels only  
30 minute time limit
- Passenger loading zone
- Taxi drop-off
- Possible alley loading access
- ▼ Curb Cut





## Delivery

### Configuration

West of 8th Street, where the roadway is wider, there are no accommodations for deliveries to businesses on Market Street. East of 8th Street, where the roadway is narrower and sidewalks are wider, deliveries to businesses are accommodated using approximately 20 “bays” or “cut-outs” or recessed spaces along the curb. These bays are wide enough to accommodate large vehicles and vary in length, but can generally accommodate several vehicles. They are reserved for vehicles with six or more wheels, and 30-minute time limits are in effect.

Since the current basic configuration of Market Street was implemented in the early 1970s, only one loading bay has been lengthened, in front of the Four Seasons Hotel between 3rd and 4th Streets (and this was done in order to accommodate taxis; see next section). At least one other business has requested a new bay, but the location was found to be impractical.

In addition to loading bays, Figure 2.7.1 shows segments of Stevenson Street, an alley, that are adjacent to businesses fronting Market Street. While some businesses could use rear loading docks, they are rare, and most businesses along the south side of Market Street effectively must take delivery from Market Street. Along the north side of the street, blocks are shorter and cross streets with designated loading zones are closer; however, according to SFMTA staff many delivery

drivers prefer to park on Market Street, closer to businesses.

### Behaviors

Recent data on loading behaviors along Market Street are not available. However, a 1990 study and observations by SFMTA staff suggest that:

- Many different types of vehicles use loading bays, including tour buses, shuttle buses, taxis and private autos
- Violations of 30-minute time limits are common
- Due to limited availability of legal spaces, vehicles often double-park or park partially on the sidewalk, especially west of 8th Street where there are many small businesses and no loading bays (in this segment, vehicles block bike lanes and sometimes drive over “soft hit” posts separating the lanes from traffic)
- Even where legal loading docks or zones exist, drivers may choose to park illegally closer to businesses
- Enforcement is inconsistent
- Other unpermitted activities take place along the curb, such as valet parking operations, passenger bus layover (by Amtrak) and tour bus loading (the latter in a passenger loading zone located at the end of a bike lane, resulting in conflicts during the AM peak period)

Due to limitations on space, SFMTA has made informal arrangements with some businesses to try

to accommodate loading activity while reducing impacts, for example by limiting delivery to periods of reduced traffic. The agency also recognizes that curb space adjacent to subway station elevators may need to be used for pick-up and drop-off of persons with disabilities.

## Taxis

Taxis serve a unique role in the City’s overall transportation system. By allowing door-to-door travel by individuals and small groups of passengers, taxis can access destinations that fixed transit routes cannot. Furthermore, after-hours and time-sensitive trips are especially well-served by taxis.

San Francisco has 1,471 taxis operating on City streets. Taxi service is run by 32 different taxi companies. In March 2009, the Taxicab Commission became a division of the San Francisco Municipal Transportation Agency (SFMTA), the Division of Taxis and Accessible Services (DTAS). SFMTA is now in charge of regulating the taxi industry and other motor vehicles for hire in San Francisco.

### Configuration and Behaviors

A taxi stand is a curbside area designated for the exclusive use of taxis, at which taxis wait for passengers. There are approximately 50 taxi stands scattered throughout the northeast quadrant of San Francisco, with a majority concentrated around destinations in the downtown core, and taxi stands can be found at most hotels

and medical centers and a select number of other locations such as AT&T Park, the Moscone Center, and City Hall.

However, there are no taxi stands on Market Street. According to data provided by the City, there are approximately eight taxi stands located within one block of Market on connecting streets, and there is a taxi drop-off zone on Market adjacent to the Four Seasons Hotel at 765 Market Street. A passenger loading zone located at Market and Jones Street may also be used by taxis for picking up and dropping off passengers. SFMTA staffs have indicated that taxis often wait for fares in the drop-off zone at the Four Seasons Hotel, and that additional taxi stands near hotels on or just off of Market Street may be desirable<sup>1</sup>.

---

<sup>1</sup> A study recommending ways of *Making Taxi Service Work in San Francisco*, which was commissioned by the San Francisco Planning and Urban Research Association (SPUR) in 2001, recognized the value of installing additional taxi stands throughout the city. In short, the report summarized, taxi stands serve four key purposes:

- They make it easier for passengers to find an available taxi, as taxi supply is concentrated at key points.
- They reduce the need for drivers to “cruise” in search of passengers, a practice which increases “dead” (unpaid) mileage, contributes to traffic congestion, and can pose safety hazards if drivers make sudden swerves to pick up passengers.

Unlike other private vehicles, taxis are allowed to travel in the transit-only lanes on Market Street inbound between 12th and 5th Streets and outbound from 8th to 12th Street. They also often use general traffic lanes to bypass transit vehicles stopped at boarding islands. These practices allow for faster and more efficient taxi travel along Market Street. In their analysis of the effects of the Required Right Turn pilot project implemented at 6th and 10th Streets, SFMTA staff observed that taxis “appear to move more freely on eastbound Market Street as a result of the modest decline in eastbound Market Street traffic.”

- 
- If located at transit centers such as Muni Metro and BART stations, they can extend the reach of fixed-route transit services.
  - If properly located, they can reinforce neighborhood commercial centers.

The report recommended that the Department of Parking and Traffic (now part of SFMTA) establish taxi stands at locations where taxis naturally congregate, especially at high-capacity transit stations, and that stands should be clearly marked. The report also suggested that public telephones with numbers to taxi dispatch services should be installed at new taxi stands. While all of the report’s recommendations may no longer be applicable, depending on present demand for taxi services in the downtown core, there may be opportunity for taxi stand expansion along Market Street.

## 2.8 Safety





## 2.8 Safety

Market Street has some of the highest numbers of police-reported collisions citywide, particularly pedestrian-related and bicycle-related collisions. Many intersections and blocks of Market Street also have more pedestrians and bicyclists than any other street in the City. However, the unique angled geometry of intersections and the sheer volume of people on the street in various competing travel modes make Market Street a candidate for safety improvements.

In response to these trends, the City of San Francisco has undertaken steps to improve safety along Market Street for all users. The Calm the Safety Zone project, conducted by SFMTA beginning in 2009, focuses on traffic calming and pedestrian safety at transit boarding islands along Market Street. The project has resulted in the implementation of innovative treatments to reduce vehicle speeds and alert pedestrians when on the boarding islands and when crossing to the sidewalk. The 2009 Bicycle Plan includes several safety-related projects within the Market Street study area, such as the separated green bicycle lane between 12th Street and 8th Street and bicycle boxes at key intersections.

The following section provides an overview of collision statistics along the Market Street study area. General collision statistics and collision causes by mode are discussed.

### Key Findings

- ***Bicyclists are involved in a disproportionately high number of collisions.*** Although bicyclists only make up about 5 percent of all users of Market Street, they are involved in nearly 30 percent of all reported collisions. Bicyclists are particularly over-represented in collisions occurring on Market Street between Octavia Blvd and Gough Street. Most bicyclist collisions along the corridor fall into one of two factors, improper turning by drivers (“right-hook collisions”) and improper passing by either drivers overtaking bicyclists or bicyclists passing vehicles stopped at intersections. SFMTA has made incremental progress in improving bicycle safety through installation of separated bicycle lanes, painted bicycle lanes, and bicycle boxes at intersections.
- ***Pedestrian collisions occur most frequently at intersections with high pedestrian volumes.*** Intersections within the “retail core” of Market Street between 4th Street and 7th Street have the highest number of pedestrians and the most pedestrian-involved collisions. Although pedestrians make up nearly half of all people on Market Street, they are only involved in about 30 percent of all reported collisions.
- ***Collisions involving left-turning vehicles and pedestrians are disproportionately high.*** Although turns from Market Street are restricted, there are several intersections where vehicles cross Market Street at odd angles or “wiggle” to other streets because the grid systems north of Market and south of Market do not align at right angles. At intersections where these unusual movements occur, collisions involving vehicles making left turns accounted for half of reported incidences.
- ***Transit collisions are highest within the retail core, between 3<sup>rd</sup> Street and 6<sup>th</sup> Street.*** Transit collision statistics should be treated with some caution, as Muni operators are required to stop their vehicle and provide details on any collisions that occur during their route, even if the second party leaves the scene. However, some general themes are evident from the data. Most transit collisions occur during the evening commute period when transit service is most frequent and pedestrian, bicycle, and vehicle traffic is highest along Market Street. Pedestrian and bicycle collisions typically occur near boarding islands and at intersections where there are more people and less space.
- ***Vehicle-only collisions typically occur on major cross streets.*** Streets that carry heavier cross traffic, such as Gough Street, 3rd Street, and Fell Street-Polk

Street-10th Street, had the highest number of reported vehicle-only collisions.

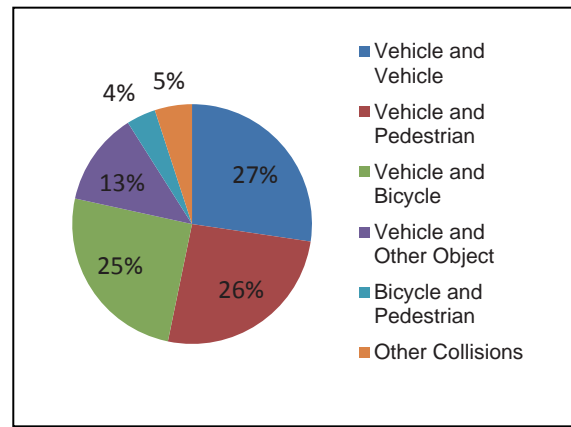
- ***Bicyclist and Pedestrian collisions represent a small proportion of total collisions, but conflicts frequently occur along the corridor.*** Approximately four percent of all collisions involved conflicts between bicyclists and pedestrians. Although this represents a small proportion of total collisions, bicyclists are often observed encroaching into crosswalks while waiting for green lights. Incremental improvements have been made to address this issue, such as green bicycle boxes along the corridor.

## General Collision Analysis

Over a recent five-year period (2005-2009), there have been approximately 560 police-reported collisions along Market Street. Pedestrians and bicyclists make up approximately 55 percent of all of the users on Market Street and are involved in approximately 55 percent of police-reported collisions.

Pedestrian-related collisions are generally higher at locations where pedestrian activity is the greatest, e.g., between 6th Street and 3rd Street. Despite making 49 percent of all people on the street, pedestrians are involved in about 30 percent of all reported collisions.

**Figure 2.8.1: Collisions on Market Street, by Mode**



Source: SFMTA. 2010

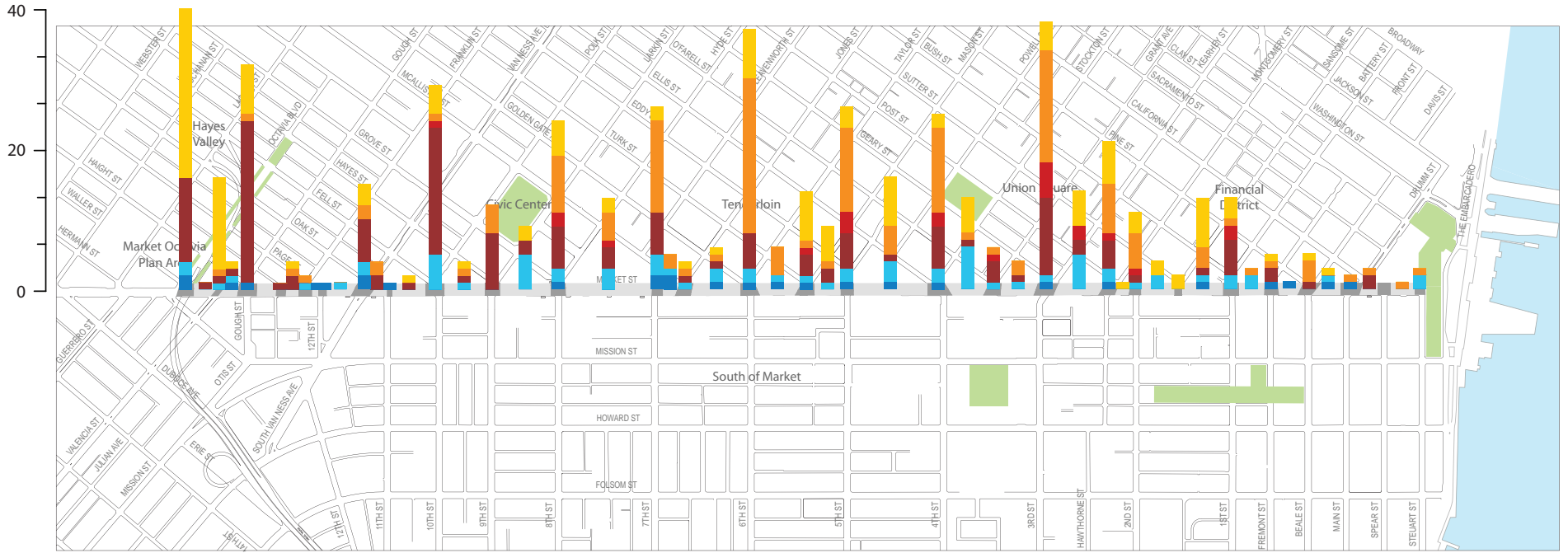
Bicyclists, on the other hand, are over-represented in the collision data. Collisions involving bicyclists are generally evenly distributed along the corridor matching the relatively consistent volume of bicycle traffic along the street. However, while bicyclists only make up about five percent of all users on Market Street, they are involved in nearly 30 percent of all collisions. This number far exceeds the mode share for bikes, and is an important indicator for the quality and safety of the bicycling environment.

Vehicle-only collisions, however, are most frequent west of 8th Street, where traffic volumes on Market Street and crossing Market Street are higher.

Vehicle-only collisions also tend to occur at locations with higher traffic volumes crossing Market Street and where vehicle congestion is most common.

The remainder of this section discusses collisions involving the various modes separately. The collision percentages in this chapter only consider the number of people, by mode, on Market Street and not on the cross streets.

**Figure 2.8.2: All Market Street Collisions, 2005-2009**



- Collisions involving a bicycle and vehicle
- Collisions involving a pedestrian and vehicle
- Collisions involving a pedestrian and bicycle
- Collisions involving two vehicles
- Collisions involving a vehicle and other object
- Other collisions\*
- Intersection
- Midblock

\* Other includes bicycle, pedestrian, or other undefined collisions not included in other categories



## Pedestrian-Involved Collisions

Pedestrians comprise nearly 50 percent of all people travelling on Market Street and were involved in about 30 percent of all reported collisions. Between 2005 and 2009, there were approximately 170 police-reported collisions involving pedestrians along Market Street between Octavia Boulevard and Steuart Street. Nearly 90 percent of these collisions involved a pedestrian and a vehicle; the remaining 13 percent of reported collisions involved pedestrians and bicyclists. Four collisions with vehicles resulted in pedestrian fatalities.

### The following five intersections had the highest number of reported collisions:

- 6th Street – Golden Gate – Taylor / Market Street
- 3rd Street – Kearny / Market Street
- 5th Street / Market Street
- 4th Street – Stockton – Ellis / Market Street
- 7th Street / Market Street

All of these intersections are also located in or near the “retail heart” of Market Street, where pedestrian volumes are highest. These intersections also have heavily used transit stops and transit boarding islands and are located near Muni Metro/BART subway portals.

Thirteen percent of all pedestrian-involved collisions involved drivers making left or right turns

onto or off of Market Street. Vehicle left-turn collisions with pedestrians was most common at Montgomery Street, where half of all pedestrian-vehicle collisions involved drivers making left turns onto eastbound Market Street.

The intersection of Montgomery Street-New Montgomery/Market Street has substantial pedestrian activity, particularly during the peak commute hours when people are traveling to and from the Muni Metro/BART portals at the intersection and drivers travel from the north of Market Financial District to the freeways in SoMa. Vehicle traffic making a southbound left turn from Montgomery Street to Market Street conflicts with pedestrians in the eastern crosswalk and drivers typically have higher delay. Also, drivers making this left turn often attempt to make an immediate right turn onto southbound 2nd Street. This maneuver often results in drivers making quick adjustments to change lanes when turning.

Collisions occurring near transit boarding islands were separated from other pedestrian-involved collisions since pedestrians in these areas usually behave differently than those crossing at mid-block locations and intersections. The SFMTA has recently implemented a series of recommendations from a 2005 study of conditions on Market Street. The SFMTA has already conducted some analysis of collisions near transit boarding areas as part of the Calm the Safety Zone study to measure the effectiveness of those improvements. That study is reviewed in more depth later in this discussion of

safety; however, some data regarding collisions near transit boarding islands is provided below.

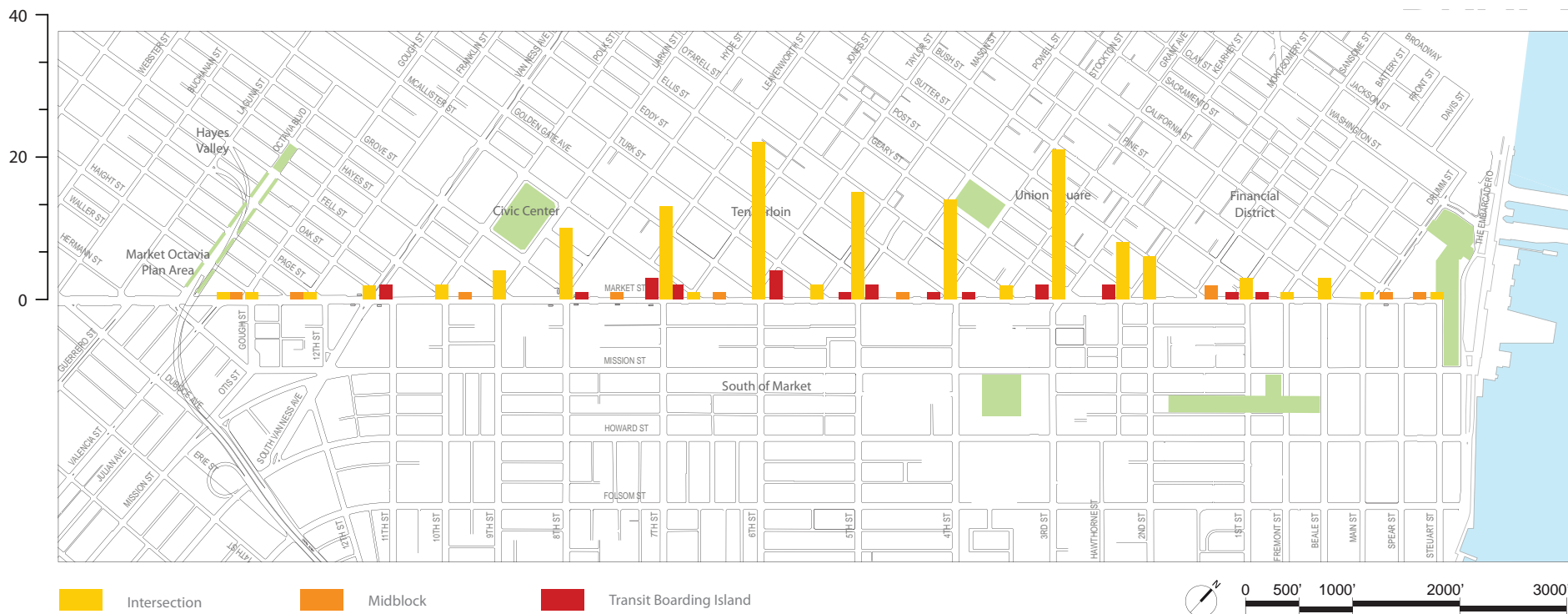
Of the reported pedestrian-involved collisions, approximately 15 percent occurred near transit boarding islands. The transit boarding island zone was classified by any collision that occurred adjacent to an intersection and up to 100 feet behind a crosswalk (i.e., away from an intersection) on Market Street.

### These collisions were distributed throughout the corridor; however, more than one collision was reported at the following boarding islands:

- 6th Street Outbound
- 7th Street Inbound
- 7th Street Outbound
- 5th Street Inbound
- Van Ness Outbound
- 3rd Street Inbound
- 5th Street Outbound
- New Montgomery Inbound



**Figure 2.8.3: Market Street Collisions Involving Pedestrians, 2005-2009**



Pedestrian behavior at transit boarding zones tends to be more uncontrolled than at a typical signalized crosswalk or intersection. Pedestrians will often cross the vehicle travel lane in these areas between the sidewalk and the boarding island to board transit at the island or to exit transit onto the adjacent sidewalk. Four of the locations identified above – 7th Street inbound, 5th Street inbound, Van Ness outbound, and New Montgomery inbound – also have Muni/BART

subway portals adjacent to the transit island.

Surface transit stops at subway portals tend to have additional pedestrian activity due to a larger number of bus-to-subway transit transfers, particularly at Van Ness Avenue.

Only a small percentage – about six percent – of all pedestrian-involved collisions occurred at mid-block locations, and only one block – between 1st and Sutter – had more than one reported mid-block

collision. Due to the relatively low number of mid-block pedestrian collisions, there are no clear trends from the data. Interestingly, although pedestrian activity is greatest between 4th Street and 5th Street and frequent mid-block crossings were observed, only one mid-block collision was reported at this location. This statistic includes collisions occurring at the signalized crosswalk between 4th Street and 5th Street at the Powell Street cable car turnaround.

## Bicycle-Involved Collisions

Between 2005 and 2009, there were approximately 160 reported bicycle collisions along Market Street between Octavia Boulevard and Steuart Street. Approximately 85 percent of these collisions involved a bicycle and a vehicle; the remaining collisions involved pedestrians and bicyclists. Although bicyclists make up only about five percent of all users on Market Street, they are involved in nearly 30 percent of all collisions.

### **The following intersections had the highest number of reported collisions at the intersection:**

- Octavia Boulevard – US 101 / Market Street
- Valencia Street / Market Street
- 3rd Street / Market Street
- Jones Street – Turk Street / Market Street
- Gough Street / Market Street; 8th Street / Market Street; 6th Street / Market Street; Montgomery Street – New Montgomery Street / Market Street (4-way tie)

Over 25 percent of all bicycle-involved collisions occurred on two blocks of Market Street between Octavia Boulevard and Gough Street. Bicyclists were also involved in over half of all collisions at Octavia Boulevard and virtually all reported collisions at Valencia Street. Furthermore, improper turning by motorists at Octavia Boulevard or Valencia Street was the primary collision factor

for over 70 percent of all reported bicycle-vehicle collisions at these intersections. All of these turning-related collisions involved eastbound bicyclists and drivers. Corridor-wide, improper turning by motorists was associated with approximately 30 percent of all reported bicycle-involved collisions. Virtually all of these collisions involved bicyclists continuing straight and vehicles turning. These types of collisions are frequently referred to as “right hook” collisions.

Vehicle turning maneuvers from eastbound Market Street to Guerrero Street, Octavia Street, Valencia Street, and Gough Street are generally associated with drivers accessing the Central Freeway on-ramps just to the south of Market Street. Although right-turns are prohibited from eastbound Market at Octavia/US 101 and substantial signage, knock-down posts, and a raised median between the bicycle lane and travel lane have been installed, many drivers continue to make this turn illegally. After crossing Octavia Boulevard headed eastbound, drivers and bicyclists must merge into the outer travel lane, particularly if drivers intend to turn right onto Valencia Street or Gough Street. The SFMTA has recently installed new green-backed sharrows and a short bicycle lane on Market Street between Octavia and Valencia to address this issue.

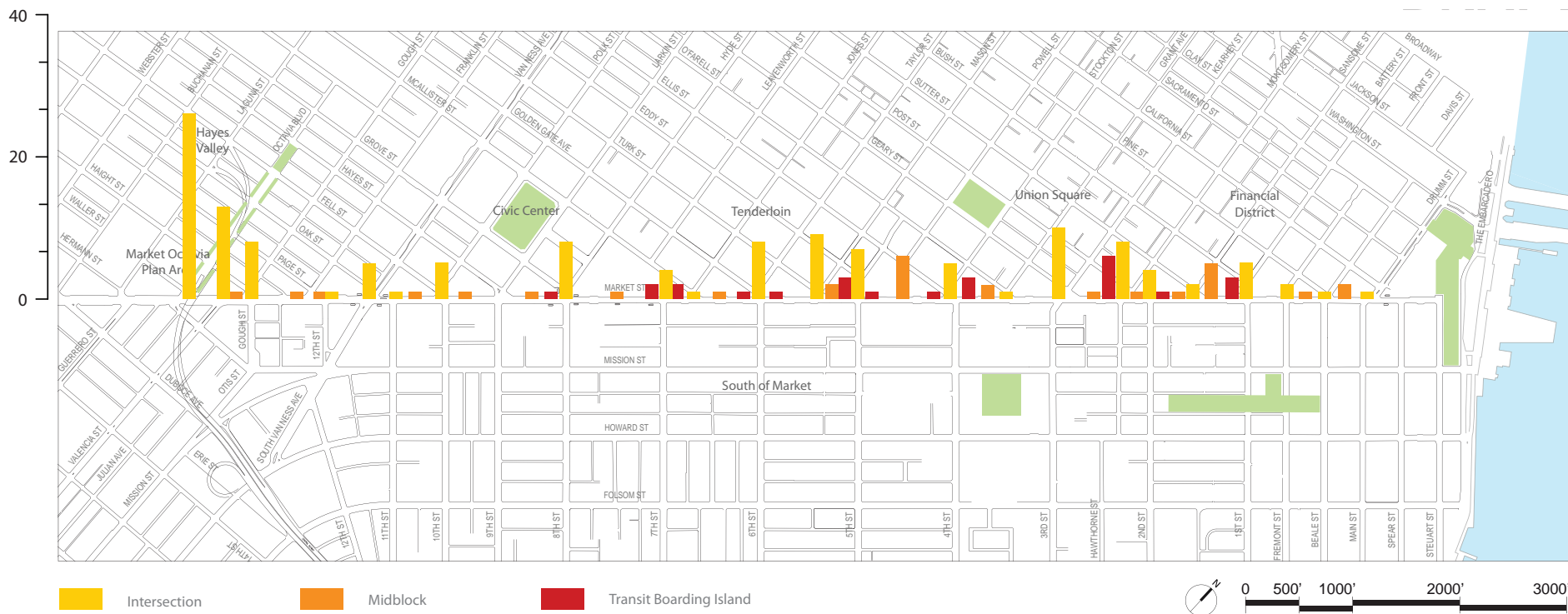
Over 50 percent of bicycle-related collisions involved improper turning by motorists or improper passing of motorists by bicyclists. Bicycle-involved collisions reported as “improper passing” typically involved a bicyclist proceeding straight and a

vehicle that was stopped, slowing, or proceeding straight. Many of these collisions involved cyclists or vehicles “leap-frogging” around each other. This behavior is frequently observed at intersections and near transit boarding islands, where bicyclists will often pass vehicles stopped at a red light and wait at the front of the vehicle queue. When the light turns green, both bicyclists and vehicles continue forward, but vehicles will often pass bicyclists quickly after the intersection.

Although the number of bicycle-involved collisions at transit boarding islands was lower compared to the intersection collisions, there were a higher number of collisions at the New Montgomery inbound transit boarding island. All but two of the collisions at New Montgomery-Montgomery-2nd Street involved bicyclists and vehicles passing each other. This location has higher traffic volumes, a higher eastbound right-turn volume, and substantial pedestrian activity that makes the intersection at this location very congested. The outer travel lane, which is shared by bicyclists and vehicles, is also narrow. As a result, bicyclists often weave through vehicle traffic and around pedestrians.

Two mid-block locations had more reported collisions involving bicycles compared to other mid-block locations. The mid-block spikes occurred on Market Street at Sutter Street and at Powell Street. Both of these locations are near intersections where bicycles often make left turns from eastbound Market Street to the north side of Market Street. At Sutter Street, all of these

**Figure 2.8.4: Market Street Collisions Involving Bicycle, 2005-2009**



collisions involved bicyclists turning to and from the north side of Market Street. Due to streetcar tracks and turning prohibitions, eastbound bicyclists generally have to dismount and use crosswalks to get to the north side of Market Street. There is no waiting area in the street or on the sidewalk for cyclists to do this at Powell or Sutter. At Sutter, Sansome Street, a designated bicycle route, has

no connection to Market Street. To get to Market Street from Sansome Street, bicyclists must make a left onto Sutter Street against traffic (Sutter is one-way westbound) and a quick right turn onto Market Street. It should be noted that transit vehicles are permitted to do this maneuver, but private motorists are not.

## Transit-Involved Collisions

As part of its routine record keeping, SFMTA/Muni maintains a detailed database of collisions involving transit vehicles. The database describes the collisions and includes statements from involved parties. The records also include details about collisions that occur in which the non-Muni party leaves the scene. This database is separate from state police maintained records; therefore, all of the details provided about the collisions are standard operations for Muni. Further, the collision data involving Muni vehicles is slightly more recent (2006 – 2010) than the collision data provided by police records used for analysis of other modes (2005 – 2009). Transit collision statistics should be treated with some caution, as Muni operators are required to stop their vehicle and provide details on any collisions that occur during their route, even if the second party leaves the scene.

Between 2006 and 2010, Muni reported approximately 400 transit-involved collisions along Market Street between Octavia Boulevard and Steuart Street. These collisions overwhelmingly involved transit vehicles travelling on Market Street; however, there were noticeable increases in collisions involving transit crossing Market Street at 3rd Street, 4th Street, and Van Ness Avenue. These streets also have the highest number of transit vehicles crossing Market Street compared to other intersections in the study area.

**The following five intersections had the highest number of reported collisions at the intersection:**

- 3rd Street / Market Street
- Montgomery Street – New Montgomery Street – 2nd Street / Market Street\*
- 4th Street / Market Street
- 5th Street / Market Street
- 7th Street / Market Street

*\*The intersection of Montgomery Street – New Montgomery Street – 2nd Street / Market Street is actually two separate intersections, but because of their proximity to each other and the fact that they interact somewhat, they were treated as a single intersection for purposes of this analysis.*

The majority of transit collisions on Market Street – 66 percent – involved a private vehicle. Of transit-related collisions involving transit vehicles crossing Market Street, 85 percent involved a private vehicle. Of collisions involving transit traveling on and along Market Street, 58 percent involved private vehicles. Thus, collisions with private vehicles accounted for a much greater share (85 percent) of all incidents crossing Market Street and accounted for a smaller proportion (58 percent) of all incidents on or along Market Street.

**For collisions involving transit lines running along Market Street, the following parties were involved:**

- 58% involved private vehicles
- 13% involved pedestrians
- 11% involved other Muni vehicles
- 10% involved bicyclists

- 8% had collisions with other objects, including fixed objects

Generally, transit collisions occurred more frequently along the eastern portion of Market Street, where more transit is operating. Collisions occurred relatively evenly on both inbound and outbound sides of Market Street. Collisions with other Muni vehicles and pedestrians were most common in the inner transit lane at the transit boarding islands. Bicycle collisions tended to be most common when bicyclists were passing transit vehicles at curbside transit stops.

Due to the detail provided in Muni records, developing common collision factors for transit collisions is challenging.

**However, some common themes emerge:**

- The F Market & Wharves streetcar accounts for a disproportionate share of all incidents: 34 percent, or approximately one-third. The F is just one of a dozen Muni lines operating some distance along Market Street throughout the day, although it operates along the full length of Market, and more frequently than most other lines.
- Transit collisions occur most frequently during the evening commute period between 4 PM and 7 PM. Collision rates are somewhat lower and fluctuate between 8 AM and 4 PM, and are



**Figure 2.8.5: Market Street Collisions Involving Transit, 2005-2009**



significantly lower in the early morning and later evening.

- Pedestrian-involved transit collisions often occur at or near transit boarding islands and involve pedestrian who are standing at the edge of the boarding island or who step in front of transit vehicles that they did not notice where moving.

- Bicycle-involved collisions occurred at bus stops when bicyclists were passing slower moving or stopped buses. Bicyclists also were involved in collisions occurring when they attempted to pass vehicles at transit boarding islands and were caught between the curb and the bus vehicle.

- Collisions involving other Muni vehicles typically occurred where one Muni vehicle was following too closely behind another Muni vehicle.
- Collisions involving a private vehicle often occurred when vehicles attempted to pass transit vehicles at bus stops, or when navigating through skewed intersections.

## Vehicle-Only Collisions

Private vehicles make up a relatively small percentage of traffic on Market Street, but a substantial number of vehicles cross Market Street. Between 2005 and 2009, there were approximately 152 reported vehicle-only collisions along Market Street between Octavia Boulevard and Steuart Street. Vehicle-only collisions were relatively evenly distributed along Market Street, except for at Gough Street and Polk Street, where the highest number of vehicle-only collisions occurred.

### **The following three intersections had the highest number of reported collisions along Market Street:**

- Gough Street / Market Street
- Polk Street – Fell Street – 10th Street / Market Street
- 3rd Street / Market Street

Interestingly, the intersection at Van Ness Avenue had a similar number of vehicle-only collisions as other intersections along Market Street, even though Van Ness Avenue is a major arterial cross street, serving substantially higher traffic volumes than many other streets crossing Market Street in the study area.

The most common collision factor at Gough Street / Market Street was caused by driver error and failing to adhere to posted traffic signals and signs. Most collisions at this intersection involved eastbound vehicles broadsiding southbound

vehicles. About half of the collisions occurred at night.

Collisions at Polk Street – Fell Street – 10th Street / Market Street typically involved vehicles from Polk and Fell merging at Market Street, to travel southbound onto 10th Avenue. Fell Street and Polk Street are multilane one-way streets that put traffic onto southbound-only 10th Street. Making turns and changing lanes at the intersection are prohibited. However, multiple collisions involved vehicles attempting to make a prohibited left turn from Fell Street to eastbound Market Street. Observationally, many vehicles on Fell Street attempt to cross over to the eastern lanes to make a left turn onto Mission Street. This quick merge may be a cause of several collisions and near misses.

There was not clear collision trend at 3rd Street; however, several collisions involved vehicles traveling in the same direction, attempting to pass, or attempting to make a prohibited turn.

The City and SFMTA regularly review collision data and make targeted modifications to intersections based on noted trends. In the past several years, modifications have been made to address collisions at Market Street and its high volume cross streets.

In generation, reported vehicle-only collisions occur most frequent at intersections, compared to midblock locations. Vehicle volumes at the intersections tend to be higher, since the volume of traffic crossing traffic is substantially greater than the volume on Market Street.

**Figure 2.8.6: Market Street Vehicle Collisions with Other Vehicles, 2005-2009**



## Ongoing Projects

### Calm the Safety Zone

In 2010, the San Francisco Municipal Transportation Agency (SFMTA) launched the first phase of its “Calm the Safety Zone” project to test and compare the effectiveness of several traffic calming strategies around four of Market Street’s center island stops. The term “safety zone” refers to the travel lane between the islands and the sidewalk; there are 21 along Market in the study area.

The pilot phase of the project installed a mix of traffic safety improvements around the safety zones at the Fourth and Market and Fifth and Market intersections and then expanded the improvements to the 33 other safety zones on Market Street between Steuart Street and Castro Street.

SFMTA staff has regularly evaluated the effectiveness of each of the safety measures in slowing down traffic and enhancing pedestrian safety. As more data is reviewed, the SFMTA makes targeted modifications to address bicycle and pedestrian safety in these zones.

### Required Right Turns

In September 2009, SFMTA initiated a pilot project to mitigate traffic along eastbound Market Street by requiring all private vehicles (except for transit, taxis, delivery vehicles, and bicycles) to turn right at two intersections. The methodology and findings of this project were summarized in a 2010

memorandum entitled “Environmental Clearance for Market Street Required Right Turns Project.” By reducing private vehicle access along certain blocks of Market Street, the project sought to improve Muni bus and streetcar speed and reliability and increase bicycle and pedestrian safety.

As part of the original plan, SFMTA installed mandatory right turns at 6th and 8th Streets. In late 2009, additional analysis of transit, pedestrian, and bicycling conditions west of 6th Street led SFMTA staff to relocate the western required right turn from 8th Street to 10th Street. Because pedestrian volumes were lower at 10th than at 8th, staff expected fewer potential pedestrian conflicts with traffic. Staff also noted that at 10th, there was no center boarding island, which allowed for a configuration of through and turning lanes that prevented conflicts between vehicles and bicycles. The relocated required right turn was implemented in January 2010.

Throughout the course of the project, SFMTA conducted qualitative and quantitative analyses to determine whether the new required right turns improved traffic calming and transit reliability along Market Street. In general, SFMTA found that the project benefitted transit, bicycle, taxi, and pedestrian travel on Market Street while not drastically increasing traffic on streets to the south.

SFMTA concluded that taxis, bicycles, and pedestrians benefited from the project because reduced overall traffic created a safer and more efficient travel environment. In March 2011, the

SFMTA Board of Directors voted to establish the required right turns as permanent traffic requirements.



## 2.9 Hot Spots on Market Street



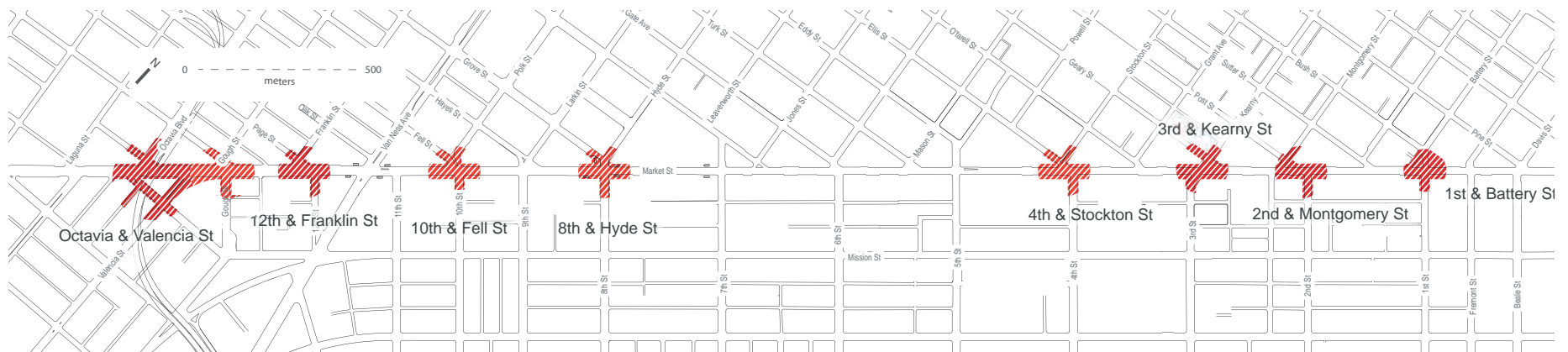
# Introduction

Although intersections along Market Street have unique physical characteristics and challenges, some common themes emerge. Eight areas along the Better Market Street study segment were chosen for a focused analysis. These locations, or “hot spots” shown on the map below, do not necessarily represent the most challenging intersection complexes, rather each was selected because each has unique attributes related to intersection geometry and multi-modal operations shared by other intersections along the corridor.

Five key transportation issues were evaluated at each hot spot location: **(1) pedestrian circulation**; **(2) bicycle circulation**; **(3) transit operations**; **(4) vehicular traffic**; and **(5) loading & taxis**. Other issues that did not align with the five core focus areas were identified in a sixth – **(6) other challenges**. Challenges were noted, particularly where the current physical design created pinch points for certain users or where conflicts were noted. Limiting factors, such as if an intersection is along a primary access route to the Bay Bridge, were also identified.

The following eight hot spots are discussed in this document:

1st & Battery Street	Page 326
2nd & Montgomery Street	Page 329
3rd & Kearny Street	Page 332
4th & Stockton Street	Page 335
8th & Hyde Street	Page 338
10th & Fell Street	Page 341
12th & Franklin Street	Page 344
Octavia & Valencia Street	Page 347



## Key challenges

### 1 Pedestrian Circulation

- a. Pedestrian crosswalks are undefined, missing, or are located in less convenient locations, such that pedestrians may want to cross at unexpected locations.
- b. High pedestrian volumes conflict with high traffic volumes at some intersections creating longer vehicle queues.

### 2 Bicycle Circulation

- a. Deliberate and basic bicycle infrastructure is limited, despite growing bicycle volumes.
- b. There are fewer bicycle accommodations east of the separated bikeway ending at 8th Street.
- c. Left turns are challenging for bicyclists, particularly for less-experienced riders.
- d. There are no waiting areas for bicyclists making turns at intersections.
- e. Buses and vehicles turning right from Market Street conflict with bicyclists.
- f. Bicyclists are frequently caught behind dwelling buses, particularly at locations where a curbside bus stop is located near a transit boarding island.

### 3 Transit Operations

- a. Transit boarding island areas create conflicts between vehicles, buses, and bicyclists at intersections.
- b. Vehicles crossing Market Street block transit on Market Street during peak commute hours when vehicle queues form on approaches to the Bay Bridge.
- c. Transit stops that serve more buses or have more transit boardings often have the same amenities as stops with fewer buses or fewer passengers.
- d. Boarding islands are too small for efficient loading and unloading of large number of passengers, and often too short for several transit vehicles to use simultaneously. Transit operators often load wheelchair passengers from the crosswalk because of limited space on the islands.
- e. Transit and taxi only lanes are unprotected from traffic.



## 4 Vehicular Traffic

- a. The unusual geometry and organization of street space on Market Street invites conflicts between vehicles.
- b. Vehicle traffic volumes crossing Market Street are high, particularly during the PM peak hour commute.
- c. Traffic patterns on and around Market Street are confusing, even for some San Franciscans.

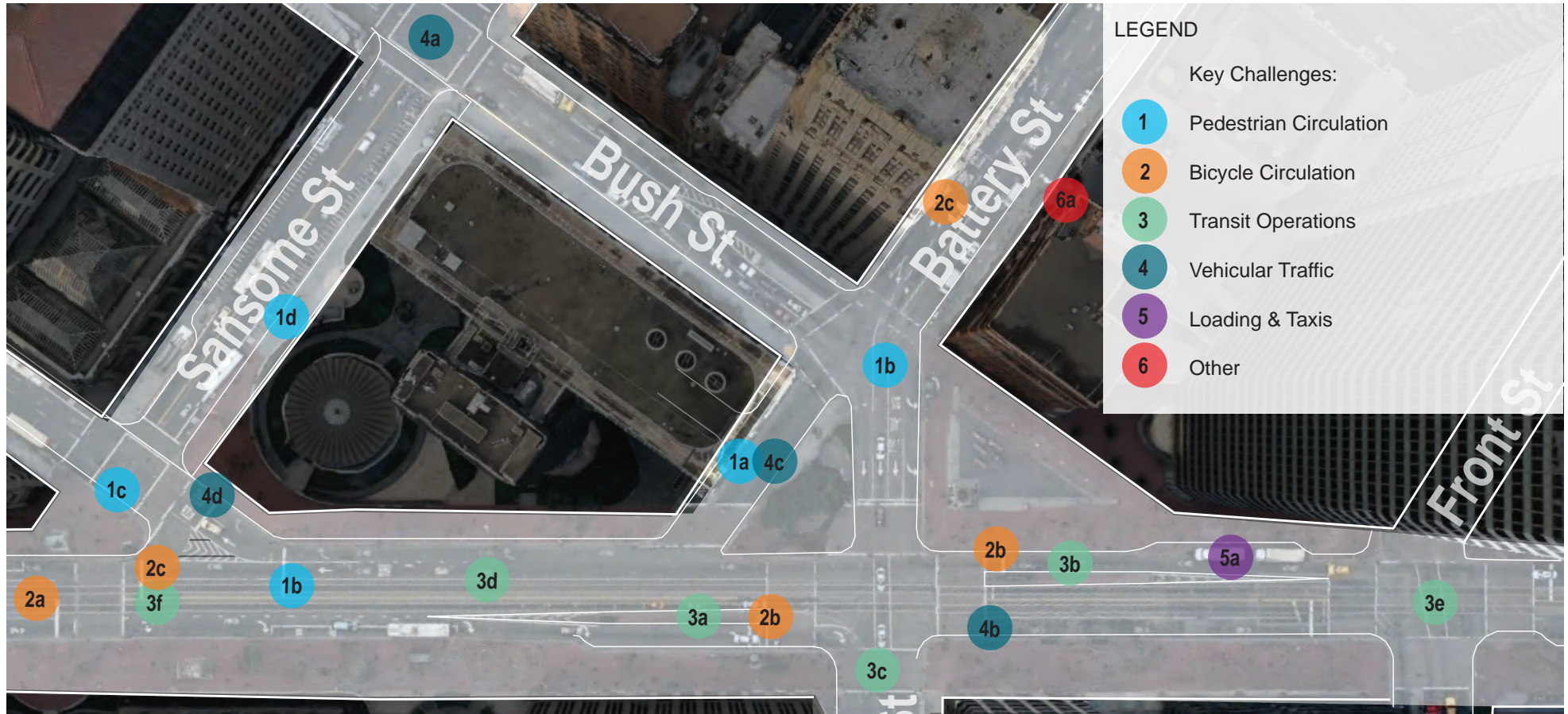
## 5 Loading & Taxis

- a. On-street loading bays create additional conflicts with bicyclists.
- b. Delivery times are unregulated, resulting in conflicts during peak periods.
- c. Businesses on the south side of Market Street can be up to 400 feet from a side street that provides additional on-street loading spaces.

## 6 Other Issues

- a. Skewed intersection limits sightlines and visibility for all users.

# 1st & Battery Street



- LEGEND**
- Key Challenges:
- 1 Pedestrian Circulation
  - 2 Bicycle Circulation
  - 3 Transit Operations
  - 4 Vehicular Traffic
  - 5 Loading & Taxis
  - 6 Other

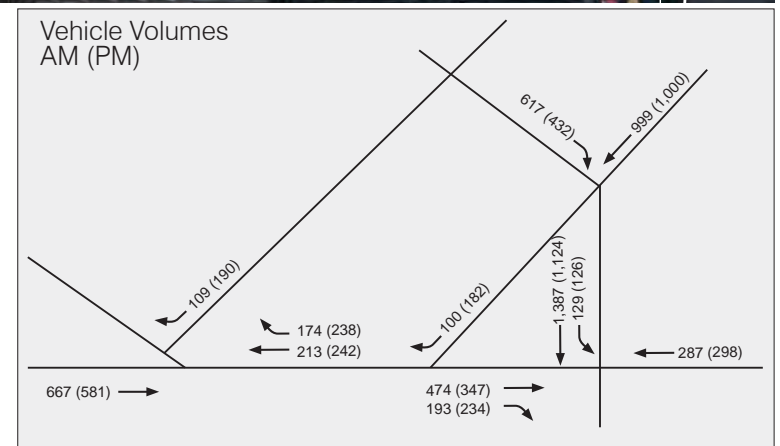
Collisions (2005-2010)*			
	Intersection	Transit Boarding Island	Trends
Auto	7	2	Half of all collisions involved pedestrians or bicyclists (11 of 20 total) 20 transit-involved collisions between 2004 and 2009
Bike	3	3	
Pedestrian	1	2	
Ped/Bike	2	0	
Transit crossing Market Street	Low		
Transit on Market Street	Medium		

**Transit Lines**

Along Market:  
 F, 5, 6, 9, 9L, 21, 31, 38, 38L, 71, 71L

Across Market:  
 2, 3, 10, 12, 30X, 76, 81X, GGT

Under Market:  
 J, K, L, M, N, S, T, BART, Muni Metro Portal (Sansome)



\*NOTE: Transit data from SFMTA/Muni. All other data from SWITRS.

## Key challenges

### 1. Pedestrian Circulation

- a. The southbound over pass next to 1 Bush Street is an attractive pedestrian shortcut.
- b. There are no crosswalks on the east side of the Market Street/Sutter Street intersection, or across Battery Street, just south of Bush Street, even though pedestrians may find it convenient to cross. New crosswalks in these locations would improve pedestrian convenience but require a dedicated signal to protect pedestrians from turning vehicles.
- c. The skewed configuration of the Sutter Street/Sansome Street intersection is challenging for pedestrians. Pedestrians often cross Sutter Street during the DON'T WALK phase due to low vehicle volumes. Limited sightlines and intersection geometry make it unclear which direction vehicle traffic will be approaching from.
- d. The 10 Townsend and 12 Folsom-Pacific bus routes operate along Sansome Street and have stops at Sutter Street; however, these stops do not have designated shelters or waiting areas for passengers. The west-side sidewalk is frequently crowded with pedestrian traffic from the subway portal, and transit riders who transfer to surface transit often cross Sansome Street midblock to access stops on the east side of the street. Sansome Street between Bush Street and Sutter Street is also a stop for many private shuttles.

### 2. Bicycle Circulation

- a. Left-turns from eastbound Market Street to access Sansome Street are extremely challenging for bicyclists. The lack of waiting space leads to bicycle conflicts with buses, pedestrians and other bicyclists waiting for a safe time to cross. Although Sansome Street is a designated north-south bicycle route, there is no easy connection to Market Street without riding against the direction of traffic on Sutter Street or by using the pedestrian signals and crosswalks.
- b. The transit boarding islands and wide sidewalks on Market Street at 1st Street are pinch points for bicyclists continuing eastbound or westbound on Market Street. Vehicles turning right onto 1st Street, transit vehicles, and the delivery zone east of the intersection contribute to conflicts.
- c. Battery Street and Bush Street are multi-lane, one-way arterials that are difficult to navigate for bicyclists. Battery Street is a designated bicycle route, though bicyclists must share the lane with high vehicle volumes.

### 3. Transit Operations

- a. Transit vehicles accessing the boarding island are often delayed by queues in the center lane. Curb-running transit vehicles temporarily switching to the center lane to avoid right-turn queues can contribute to this problem.
- b. During the PM peak period, average speeds for outbound transit in this segment are less than 6mph.
- c. During the peak period, vehicles attempting to access the Bay Bridge queue across Market Street, blocking transit vehicles.
- d. This is the busiest segment for Muni traffic on Market Street, with more than 170 buses and streetcars passing by in the PM peak hour. In order to accommodate these volumes and provide some flexibility to operate, Muni uses all four lanes of Market Street east of 8th.
- e. East of Front Street, Muni vehicles turn and weave near the beginnings and ends of their routes in a complex arrangement that requires a great deal of space.
- f. The 10 Townsend and 12 Folsom-Pacific must make a challenging turn at Sutter Street.

## 4. Vehicular Traffic

a. During rush hour, vehicles frequently queue on Bush Street to Sansome Street and block crosswalks and transit. These queues slow transit on Sansome Street, create pedestrian conflicts, and cause drivers to make sudden, potentially dangerous, maneuvers.

b. Left turns for vehicles from Battery Street to Market Street are challenging due to high pedestrian volumes across Market Street.

c. The southbound right turn volume from Battery Street to westbound Market Street is generally low; however, the movement has a separate roadway and signal connecting it to Market Street, just west of 1st Street. This separate signal also serves a parking garage exit from a garage under 1 Bush Street.

d. The westbound right-turn lane from Market to Sansome and Sutter is wide and can allow vehicles to travel at higher speeds through the interaction.

## 5. Loading & Taxis

a. The loading zone between Front Street and Battery Street is located near the transit boarding island and creates an additional bicycle conflict.

## 6. Other Issues

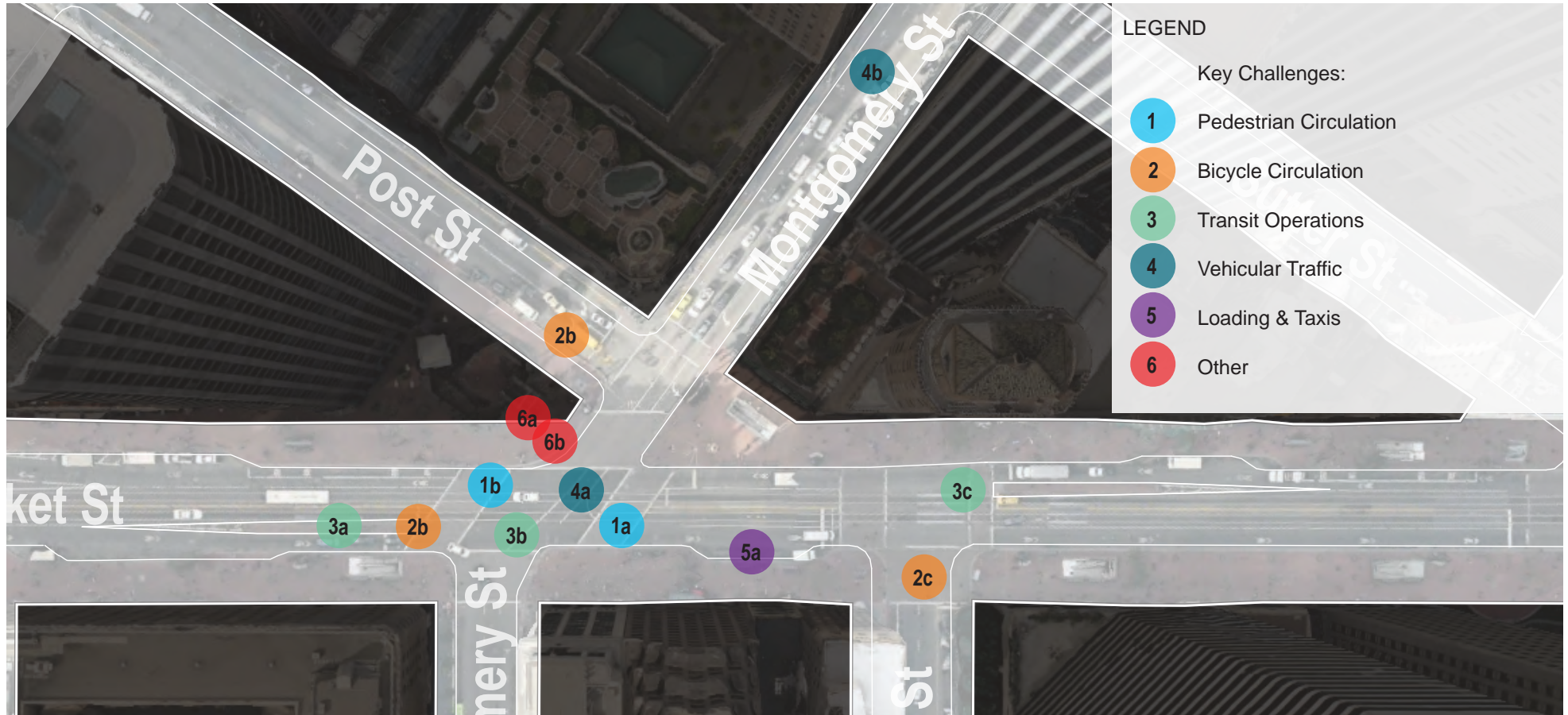
a. Several parking garages have entrances and exits onto Battery Street between Bush Street and Pine Street. This contributes to additional conflict points before the intersection at Bush Street.

## Summary

Market Street, between Front Street and Sutter Street, is near the center of the Financial District between the Embarcadero and Montgomery BART/Muni Stations and is a very active pedestrian and vehicle node throughout the workday. Sansome Street is a major pedestrian connection between the two Montgomery Street BART/Muni subway portals and the north of Market business district. A pedestrian plaza on the northeast corner of the Market Street/1st Street-Battery Street-Bush Street intersection provides public space for outdoor seating. Bush Street and Battery Street, via 1st Street, are major routes between the Financial District and the San Francisco-Oakland Bay Bridge with peak hour congestion during the evening commute that causes conflict between transit and bicyclists on Market Street and Sansome Street and vehicle traffic on Bush Street, Battery Street, and 1st Street.



# 2nd & Montgomery Street



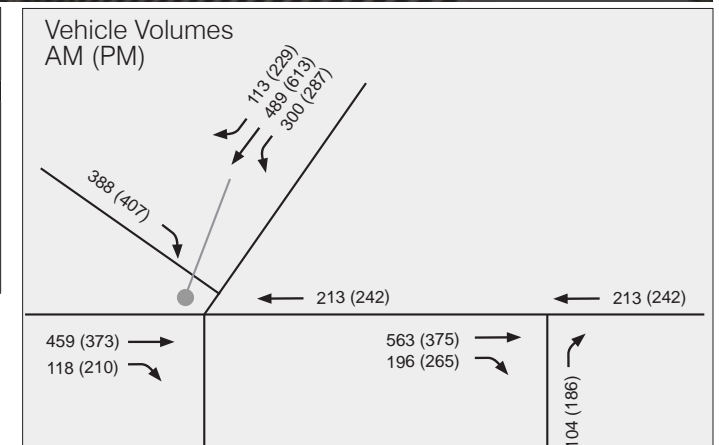
Collisions (2005-2010)*			
	Intersection	Transit Boarding Island	Trends
Auto	8	6	2/3 of all collisions involve pedestrians or bicyclists. (27 of 45 total) Most bicycle-involved collisions involve cyclists passing stopped cars, particularly at the eastbound transit boarding island.
Bike	10	5	
Pedestrian	12	0	
Ped/Bike	3	2	
Transit crossing Market Street		Low	Half of all pedestrian-involved collisions involved drivers making left-turns onto Market Street from Montgomery.
Transit on Market Street		High	Speed was a primary factor in most vehicle collisions. 45 transit-involved collisions

**Transit Lines**

Along Market:  
F, 5, 6, 9, 9L, 21, 31, 38, 38L, 71, 71L

Across Market:  
2, 10, 12

Under Market:  
J, K, L, M, N, S, T, BART, Portal at Montgomery Street



\*NOTE: Transit data from SFMTA/Muni. All other data from SWITRS.

## Key challenges

### 1. Pedestrian Circulation

a. This intersection has a substantial number of pedestrian-involved collisions involving vehicles making a southbound left turn from Montgomery Street onto eastbound Market Street. This turn is challenging for vehicles because of a high pedestrian volume in the crosswalk and vehicle queues on the approach to 2nd Street.

b. Sight distance between southbound right turning vehicles on Montgomery Street and pedestrians in the western crosswalk is limited.

### 2. Bicycle Circulation

a. Bicyclists merge into the center lane to bypass vehicles queued to turn right onto New Montgomery Street and 2nd Street.

b. The travel lane adjacent to the eastbound/inbound transit island to the west of the intersection has a substantial number of right turning vehicles. The outbound/westbound transit stop on the west side of Montgomery Street is a very highly used stop. This is a pinch point for bicyclists.

c. 2nd Street is an important north-south bicycle route through SoMa and Rincon Hill; however, bicyclists must share lanes with vehicle traffic at the intersection with Market Street. There is no waiting area for bicyclists wanting to make a left turn from westbound Market Street to southbound 2nd Street or a left turn from northbound 2nd Street to Market Street.

d. Post Street is an eastbound bicycle route; however, bicyclists must merge with vehicle traffic to make a left turn onto eastbound Market Street after Montgomery Street.

### 3. Transit Operations

a. Transit vehicles accessing the boarding island are often delayed by queues in the center lane. Curb-running transit vehicles temporarily switching to the center lane to avoid right-turn queues contribute to this problem.

b. During the peak period, vehicles attempting to access the Bay Bridge queue across Market, blocking transit vehicles.

c. The 10 Townsend and 12 Folsom-Pacific must make challenging left turns off of Market at 2nd Street.

## 4. Vehicular Traffic

- a. Vehicles turning left onto Market Street from Montgomery Street get stuck in the intersection because high pedestrian volumes limit their ability to make the maneuver to eastbound Market Street.
- b. Queues on Montgomery Street often extend northward through the Financial District during the peak evening commute.

## 5. Loading & Taxis

- a. A loading zone on the south side of Market between New Montgomery Street and 2nd Street adds additional conflicts and creates a pinch point for bicyclists, transit, and vehicles on this block.

## 6. Other Issues

- a. The sunken plaza between Post Street and Market Street has several active street-style vendors that add activity to this area.
- b. The steps at the subway portal are a gathering space during the lunch hour.

## Summary

Montgomery Street-New Montgomery Street is an important vehicle route from the Financial District to the San Francisco-Oakland Bay Bridge. There are subway portals for the Montgomery Street BART/Muni Station located on the three of the five corners, and during the day, there are several street vendors that use available open space. 2nd Street is a local street through SoMa to Rincon Hill; however, it also provides a secondary access route for vehicle traffic heading towards the freeway. Heavy pedestrian volumes and vehicles queues heading towards the Bridge conflict, causing delays to transit and pinch points for bicyclists.



# 3rd & Kearny Street



- LEGEND**
- Key Challenges:
- 1 Pedestrian Circulation
  - 2 Bicycle Circulation
  - 3 Transit Operations
  - 4 Vehicular Traffic
  - 5 Loading & Taxis
  - 6 Other

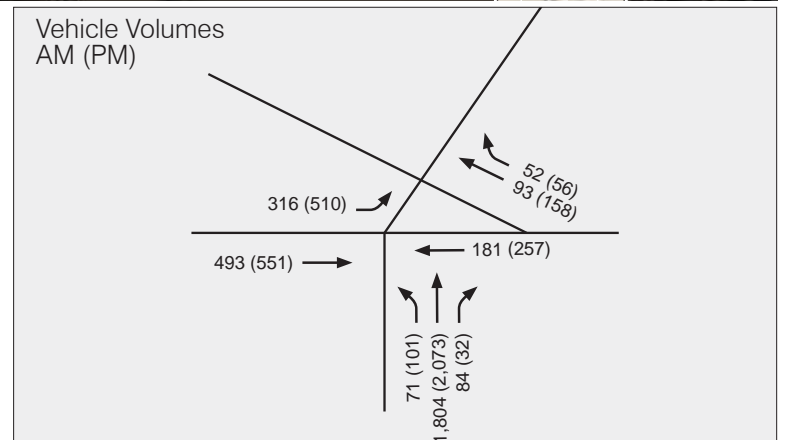
Collisions (2005-2010)*			
	Intersection	Transit Boarding Island	Trends
Auto	12	3	Over half of all collisions involved pedestrians. Passing was a factor in most bicycle-involved collisions. Most pedestrian-involved collisions occurred on the west side of the intersection and involved drivers traveling east.
Bike	4	0	
Pedestrian	16	2	
Ped/Bike	6	0	
Transit crossing Market Street		High	70 transit-involved collisions between 2004 and 2009.
Transit on Market Street		High	Most collisions occurred on the west side of the intersection.

**Transit Lines**

Along Market:  
F, 5, 6, 9, 9L, 21, 31, 38, 38L, 71, 71L

Across Market:  
8X, 8AX, 8BX, 30, 45, 81X

Under Market:  
Portal at New Montgomery Street



\*NOTE: Transit data from SFMTA/Muni. All other data from SWITRS.



## Key challenges

### 1. Pedestrian Circulation

- a. The distance between the northbound approach of 3rd Street and the north-most crosswalk across Kearny Street is long and limits pedestrian visibility. Vehicles are at full speed when they reach the crosswalk.
- b. Vehicles making a northbound left from 3rd Street onto Market Street conflict with pedestrians in the western crosswalk.

### 2. Bicycle Circulation

- a. Bicycles leap-frog or pass buses stopped at the westbound stop at Montgomery Street, only to conflict again at the intersection at 3rd Street-Kearny Street.
- b. The transit boarding island on the west side of the intersection is a pinch point for cyclists and transit vehicles in the outer travel lanes. Bicycles will often pass eastbound buses stopped at the signal. When the light turns green, bicyclists will slow transit in the outer lane that needs to stop at the stop immediately east of the intersection.

### 3. Transit Operations

- a. Due to high volumes of traffic and transit vehicles (on Market Street and on 3rd Street & Kearny Street), this intersection and 4th Street & Stockton Street have the most frequently occurring collisions involving Muni vehicles on Market Street.
- b. During the peak evening period, average speeds for outbound transit in this segment are less than 6mph.
- c. This stop is one of the busiest in the Muni system, with close to 3,400 daily boardings and alightings. The stop is only about six feet wide, providing inadequate space for comfortable or efficient loading and unloading, or for movements by wheelchairs.
- d. Stops near Market Street on 3rd Street and Kearny Street are even busier (more than 8,000 combined daily boardings), making this intersection one of the most important transfer points in the Muni system. Many pedestrians in the area are walking to, from, or between Muni stops, or to or from the Montgomery BART/Muni Station.
- e. Buses traveling north on 3rd Street must merge from a transit-only lane to a mixed-flow lane in the intersection with Market Street causing traffic congestion and delay to transit.

## 4. Vehicular Traffic

a. The two signals on 3rd Street-Kearny Street are timed to allow cars extra time to cross both Market Street and Geary Street. This can be confusing for drivers on 3rd Street who see the green light on Geary Street and elect to proceed through the intersection. Vehicles frequently queue in the middle of the intersection, delaying transit on Market Street.

## 5. Loading & Taxis

a. The Ritz-Carlton Residences drop-off zone is located near the westbound right-turn lane, creating additional conflicts from merging and parked vehicles.

b. There are no taxi stands on Market Street, although the taxi drop-off zone in front of the Four Seasons Hotel at Grant Street is often used by waiting cabs.

## 6. Other Issues

a. Along with Market Street and 4th Street, this intersection has some of the highest number of reported collisions involving transit vehicles. This intersection is also the location of some of the highest number of vehicle-only collisions. Bicyclists frequently conflict with buses and vehicles merging onto Geary Street. The SFMTA has noted that Market Street between 3rd Street-Kearny Street and Grant Street has historically had a higher than average number of mid-block collisions.

## Summary

3rd Street and Kearny Street is a major cross route between SoMa, north of Market, and I-280; a transit connection for buses serving the northeastern quadrant of the City; and a pedestrian node between the Union Square retail area and Financial District. This intersection is very wide and vehicle circulation takes physical precedence over accommodations for other modes.

# 4th & Stockton Street

## LEGEND

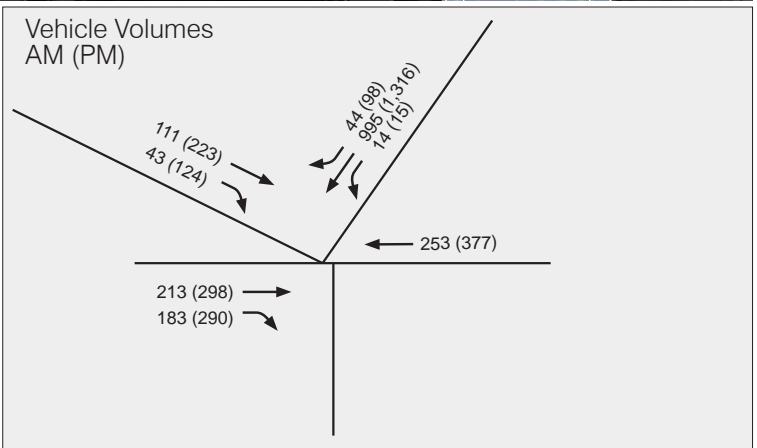
Key Challenges:

- 1 Pedestrian Circulation
- 2 Bicycle Circulation
- 3 Transit Operations
- 4 Vehicular Traffic
- 5 Loading & Taxis
- 6 Other



Collisions (2005-2010)*			
	Intersection	Transit Boarding Island	Trends
Auto	8	5	33 collisions, over half of which involve pedestrians and bicyclists.
Bike	2	4	
Pedestrian	12	2	8 of 14 pedestrian collisions occurred on the western side of the intersection. The other pedestrian collisions occurred at the transit boarding island.
Ped/Bike	3	0	
Transit crossing Market Street		High	Most bicycle-involved collisions reported are from passing vehicles at intersection. 65 reported transit-involved collisions.
Transit on Market Street		High	

Transit Lines
Along Market: F, 5, 6, 9, 9L, 16X, 21, 31, 71, 71L
Across Market: 8X, 8AX, 8BX, 30, 45
Under Market: J, K, L, M, N, S, T, BART, Portals on all five corners



\*NOTE: Transit data from SFMTA/Muni. All other data from SWITRS.

## Key challenges

### 1. Pedestrian Circulation

**a.** Sidewalk space along Market Street is wide and used by people walking through and by street vendors; however, sidewalks on Stockton Street, Ellis Street, and 4th Street are narrower and less active. They also tend to be very crowded, particularly the corner between Ellis Street and Stockton Street. This corner has a subway portal.

**b.** The south crosswalk has very high pedestrian volumes, causing vehicles to queue to make a right turn from eastbound Market Street to 4th Street and block bicycles and transit on Market Street.

**c.** Both sides of Market Street between 4th and 5th Streets have a high number of destinations and attractions, and mid-block pedestrian crossings are common in this area. Although the mid-block crossing at Powell is signalized, pedestrian volumes tend to be very high and pedestrians often cross until the very last second on the countdown timer.

### 2. Bicycle Circulation

**a.** Transit boarding islands on Market Street are a pinch point for bicyclists. These areas are located between heavily used transit boarding islands and subway portals for Powell Street BART/Muni Station. Vehicle traffic, bicyclists, and pedestrians conflict in this area.

**b.** The eastbound approach has a long queuing zone between the stop bar at 4th Street and the crosswalk at the transit boarding island. This area is typically used by buses; however, bicyclists will frequently wait in this area. Additional pedestrian-bicycle conflicts are created when bicyclists travel through the crosswalk to wait in this zone.

### 3. Transit Operations

**a.** Due to high volumes of traffic and transit vehicles (on Market and on 4th/Stockton), this and 3rd/Kearny have the highest number of collisions involving Muni vehicles along Market Street.

**b.** Due to the irregular intersection configuration, long crossing distance, high vehicle volumes and high pedestrian volumes in the crosswalk on 4th Street, southbound motorists often get “stuck in the box,” blocking transit vehicles, during peak periods.

**c.** The boarding island stops at 4th Street and Stockton Street are among the busiest in the Muni system, with more than 3,000 daily boardings and alightings each. Yet the stops are only about six feet wide, providing inadequate space for comfortable or efficient loading and unloading, as well as movements by wheelchairs.

**d.** This is likely the busiest bus stop in San Francisco, with more than 8,000 daily alightings and close to 4,000 daily boardings. Many of the pedestrians in this area are transferring between this stop and the Powell BART/Muni Station. When the Central Subway opens, much of this activity will be moved underground.

**e.** Amtrak buses often remain stopped for long periods in the curb lane or loading bay near the Westfield Shopping Center.



## 4. Vehicular Traffic

**a.** Stockton Street and 4th Street are offset from each other, requiring vehicles to navigate the intersection in an elongated “S” figure. Although tracking lines have been added through the intersection to assist drivers, this location still has a high number of vehicle-vehicle and transit-involved collisions.

**b.** Traffic from Ellis Street merges with southbound traffic on Stockton Street within the intersection, which could be confusing to some drivers unfamiliar with the intersection.

## 5. Loading & Taxis

**a.** There is a heavily-used loading zone and bus stop located immediately west of the inbound transit boarding island on the west side of the intersection. This loading zone is congested with commercial vehicles loading and unloading for businesses at the Westfield Shopping Center, private shuttles dropping off and picking up passengers, and Amtrak buses. When the zone is full, bicyclists travelling eastbound on Market Street must merge with vehicle traffic and buses. This congestion leads to unpredictable bicycle movements within the zone between the curb and the transit boarding island.

## 6. Other Issues

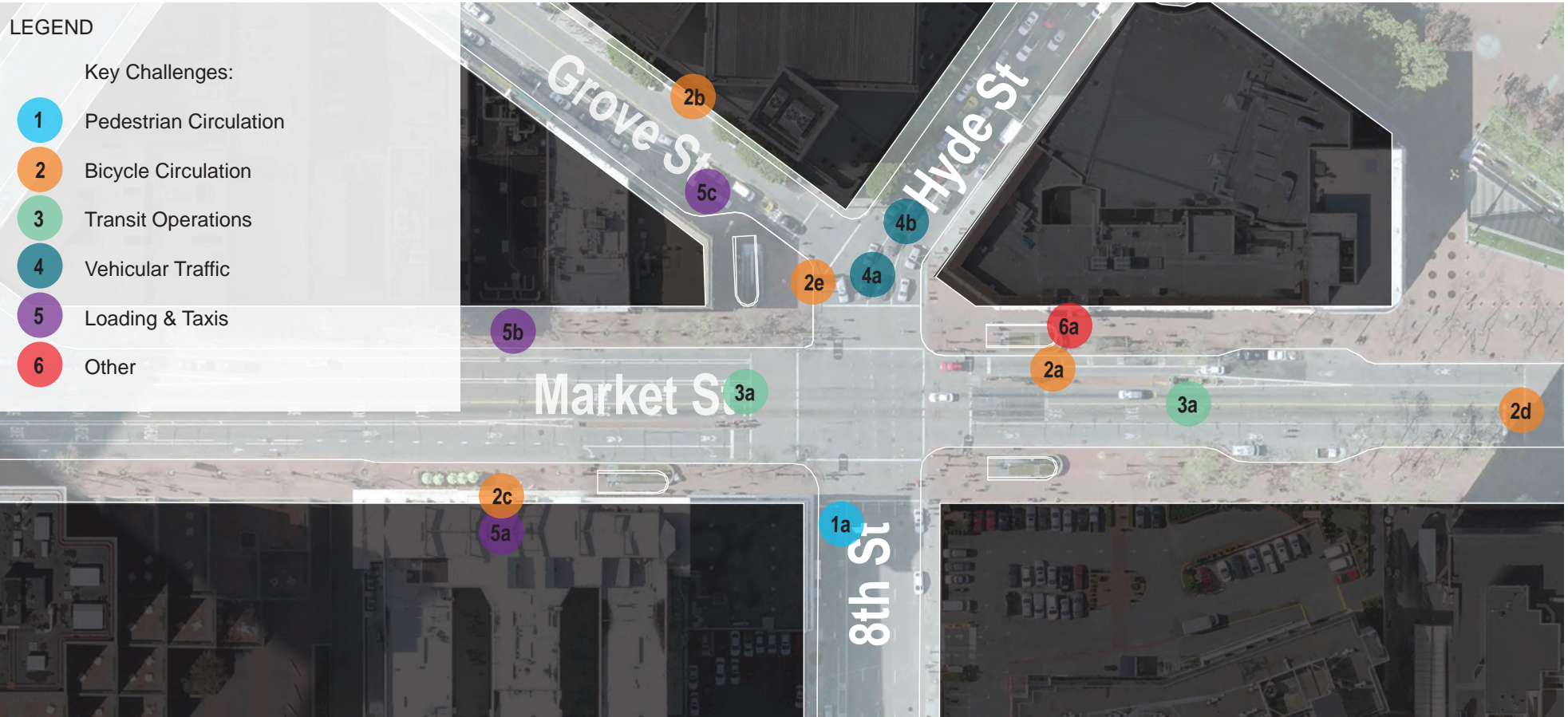
**a.** Major parking garage entrances and exits affect this location. The Ellis/O’Farrell Garage has an entrance and exit on Ellis Street just north of this intersection. Vehicles that drop off passengers on Market Street in front of the Westfield Shopping Center can circulate back down 4th Street to the 5th/Mission parking garage - a major source of traffic at this location.

**b.** Taxis frequently drop-off and pick up passengers on this block and sudden movements to and from the curb can conflict with bicyclists.

## Summary

This area is a central node within the Union Square retail and entertainment core of San Francisco, and the intersection has some of the highest pedestrian volumes in the city. High pedestrian volumes in the southern crosswalk delay vehicles making an eastbound right from Market Street, creating vehicle queues that conflict with bicyclists and eastbound transit. The north-south movement from Stockton or Ellis Street to 4th Street is skewed and vehicles can be queued through the intersection and conflict with traffic on Market Street.

# 8th & Hyde Street



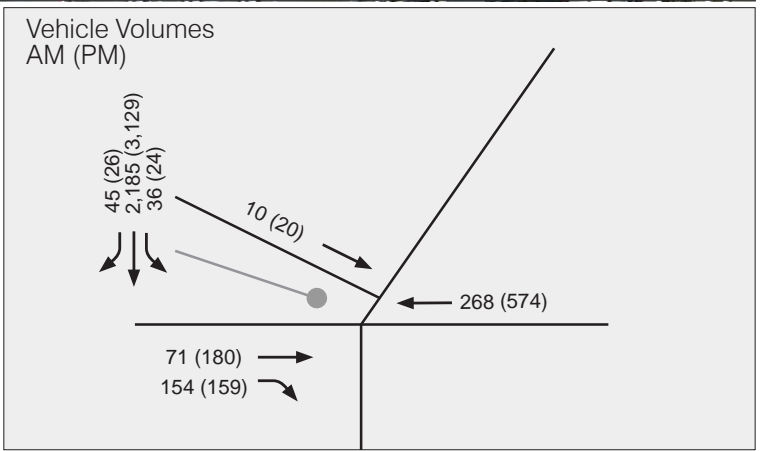
Collisions (2005-2010)*			
	Intersection	Transit Boarding Island	Trends
Auto	8	6	6 bicycle-involved collisions; 9 pedestrian-involved collisions (including 1 fatality); 14 auto-only collisions
Bike	5	1	
Pedestrian	8	1	
Ped/Bike	3	0	
Transit crossing Market Street		High	Most collisions occur at the intersection and not in the transit boarding island areas
Transit on Market Street		High	

**Transit Lines**

Along Market:  
F, 6, 9, 9L, 21, 31, 71, 71L

Across Market:  
5, 19, GGT

Under Market:  
J, K, L, M, N, S, T, BART, Portals on all corners



\*NOTE: Transit data from SFMTA/Muni. All other data from SWITRS.

## Key challenges

### 1. Pedestrian Circulation

a. 8th Street was the original location of the required right turn off of Market Street; however, the turn was relocated to 10th Street due to high pedestrian volumes in the southern crosswalk. This intersection has substantial pedestrian volumes partly because of the Civic Center BART/Muni subway portals on all intersection corners. This is also the first surface bus stop at a BART station for many Muni bus routes and is a major transfer point.

### 2. Bicycle Circulation

a. The transit boarding island in the outbound/ westbound direction in front of the Orpheum Theater is a pinch point for bicyclists. In addition to being a heavily used transit island stop, there is a curbside bus stop and entrance to the Civic Center BART/Muni subway on the curbside sidewalk adjacent to the transit boarding island. Bicyclists will often attempt to pass stopped buses here.

b. The Library's Grove Street entrance is difficult for bicyclists to access. Bicyclists must ride the wrong way illegally through traffic on the southbound approach of Hyde Street to reach the library and other key destinations in the Civic Center area from Market Street.

c. Hotel Whitcomb has a loading zone just west of 8th Street-Hyde Street; however, when buses are present they block the eastbound separated bike lane.

d. Eastbound bicyclists have difficulty making left turns to access U.N. Plaza. Bicyclists must wait in traffic for the signalized crosswalk signal. This creates a conflict with other bicyclists and buses in the outer lane.

e. Bicyclists on Grove Street must merge across several lanes of traffic on Hyde Street or use the crosswalks to make a turn onto eastbound Market Street.

### 3. Transit Operations

a. The center lanes are transit- and taxi-only outbound between 8th Street and 12th Street and inbound between 12th Street and 5th Street, yet many private vehicles use them. This can delay transit, especially if vehicle uses block transit access to island stops.

## 4. Vehicular Traffic

**a.** There are a high number of vehicle-vehicle collisions at this intersection compared to other modes. Most collisions occur at the intersection and not in the transit boarding island areas. Hyde Street curves to meet Market Street at a perpendicular angle; this skew could limit visibility of traffic signals for drivers. Grove Street is also stop-controlled, which may be confusing for some drivers who might expect all streets to be controlled by one signal.

**b.** Although the southbound approach of the intersection is square to Market Street, Hyde Street is slightly skewed before the intersection, limiting sightlines and visibility. Southbound vehicles can approach the intersection at high speeds when the light is green. Additionally, this intersection is a main route for vehicles headed southbound towards the freeway, and vehicles can queue back from the intersection into adjacent intersections north of Market Street.

## 5. Loading & Taxis

**a.** The loading zone west of the intersection is a major conflict point with cyclists in the separated green bicycle lane.

**b.** West of 8th Street, there is no curbside loading on Market Street, and delivery trucks sometimes park in the bicycle lane.

**c.** Civic Center Station is a popular transfer point for private shuttles to load and unload on Grove Street.

## 6. Other Issues

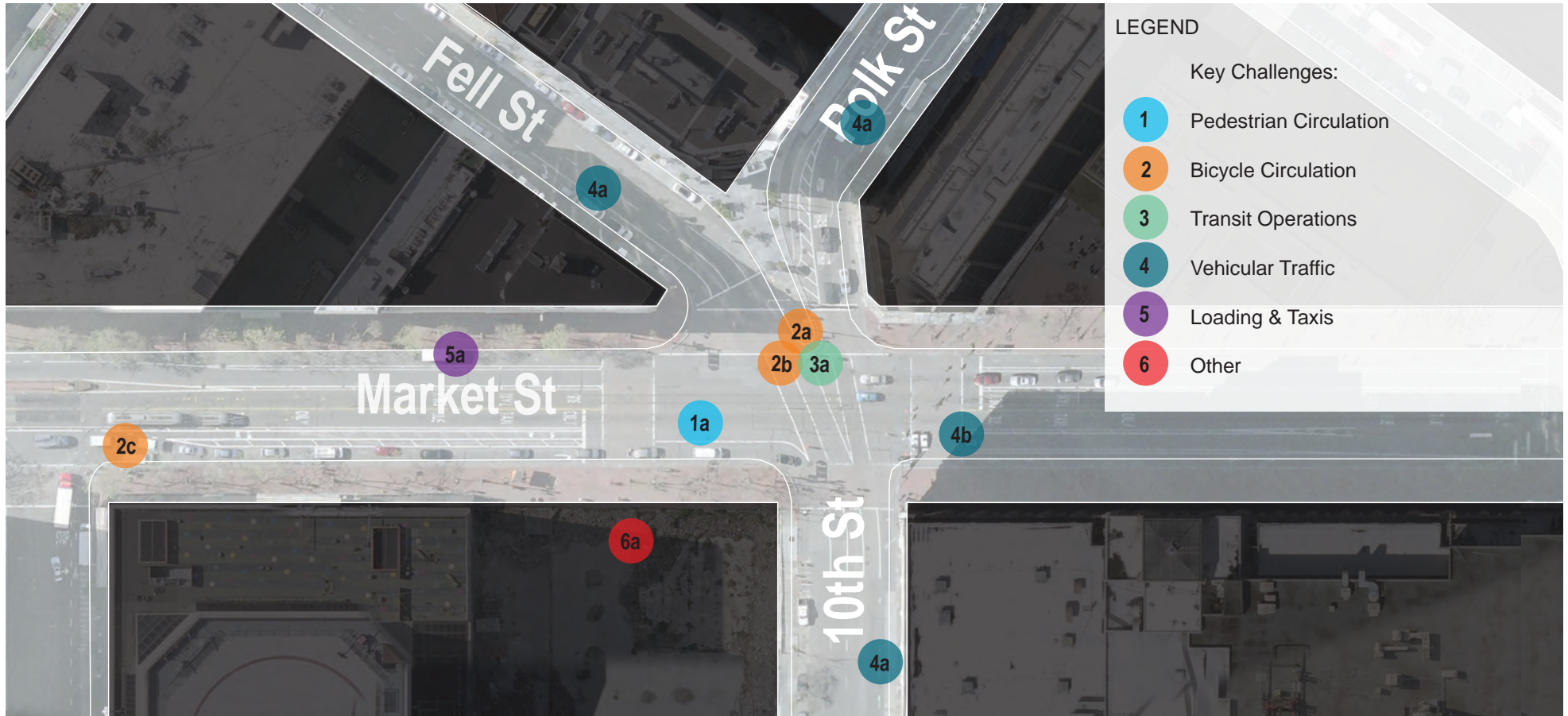
**a.** The Orpheum Theater on the northeast corner of the intersection is a major attraction, and pedestrian activity in this area increases dramatically when an event occurs.

## Summary

The intersection of 8th Street-Hyde Street-Grove Street/Market Street is the primary entrance and exit to the Civic Center BART/Muni Metro Subway Station and is a major north-south route for traffic heading to the freeway. Vehicle queues on Hyde Street often extend several blocks to the north. The transit stops to the east of the intersection (in front of the Orpheum Theater) are very busy and transit vehicles and bicyclists are required to share the same lane between the transit boarding island and the curbside bus stop. The protected green bicycle lane ends to the west of the intersection, and eastbound bicyclists must merge with vehicle traffic at the signal. The loading zone on the south side of Market Street is frequently filled with tour buses blocking the outer lane. Cyclists must cross traffic in the eastbound right turn lane to continue straight.



# 10th & Fell Street



## LEGEND

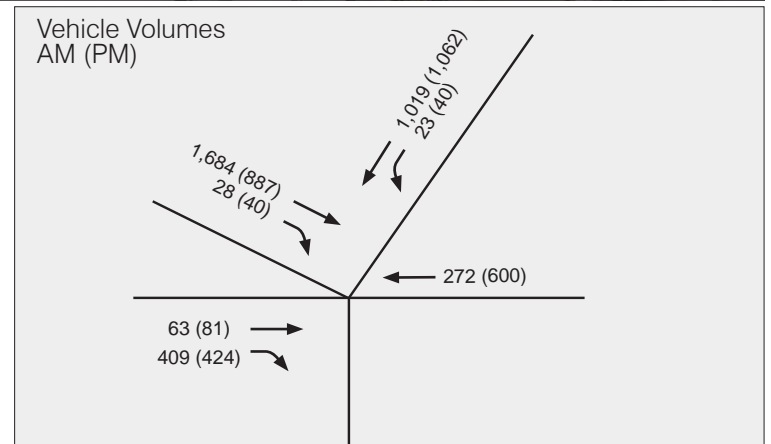
Key Challenges:

- 1 Pedestrian Circulation
- 2 Bicycle Circulation
- 3 Transit Operations
- 4 Vehicular Traffic
- 5 Loading & Taxis
- 6 Other

Collisions (2005-2010)*			
	Intersection	Transit Boarding Island	Trends
Auto	23	0	Most vehicle collisions are associated with southbound traffic on Polk or Fell Street.
Bike	7	1	
Pedestrian	2	1	
Ped/Bike	1	0	
Transit crossing Market Street	Low		
Transit on Market Street	Low		

**Transit Lines**

Along Market:  
F, 6, 9, 9L, 71, 71L  
Across Market:  
21  
Under Market:  
No Portal at Intersection



\*NOTE: Transit data from SFMTA/Muni. All other data from SWITRS.

## Key challenges

### 1. Pedestrian Circulation

a. The intersection is very wide due to the configuration of Fell Street, creating a large zone after the crosswalk on the west approach that bicyclists encroach during red lights. The space also creates extra room for vehicles turning right to queue in while waiting for a gap in pedestrians in the south approach crosswalk.

### 2. Bicycle Circulation

a. Polk Street and 10th Street are designated bicycle routes; however, the connection across Market Street is difficult for bicyclists. Currently, bicyclists on southbound Polk Street have two options to merge onto 10th Street. Confident bicyclists can share the travel lane on Polk Street with vehicle traffic through the intersection; however, this positions them in the center lane of five lanes on 10th Street. Alternatively, bicyclists can wait in the median separating Fell Street and Polk Street and transition themselves in front of traffic on Fell Street during a red light.

b. Due to a long signal time, westbound bicyclists occasionally ignore the red light when traffic has cleared; however, visibility is limited north of where Fell Street and Polk Street turn.

c. Bicyclists must cross streetcar tracks to position themselves in the protected bicycle lane.

### 3. Transit Operations

a. West of 8th Street, where there are only about half as many transit vehicles on Market Street as there are near the Financial District, Muni is able to operate without using the curbside lanes.

## 4. Vehicular Traffic

a. Fell Street and Polk Street are both multilane and higher speed roadways. When they merge onto 10th Street, vehicles that were on Fell Street that want to turn left onto Mission Street must quickly merge across two lanes of traffic.

b. Eastbound private vehicles are required to turn right, however, the barrier on the other side of the intersection is easy to ignore when not enforced.

## 5. Loading & Taxis

a. West of 8th Street, there is no curbside loading on Market Street, and delivery trucks sometimes park in the bicycle lane.

## 6. Other Issues

a. The southwest corner of the site is a major open development site along Market Street, and future development would increase the number of pedestrians and bicyclists in this area.

## Summary

This intersection is located in the Civic Center area and is a key intersection for vehicles converging from the west via Fell Street and the Fell/Oak couplet, from the north from Polk Street and City Hall, and into the required right-turn lane on eastbound Market Street. It is also the first required right turn location as drivers travel east from Upper Market. The San Francisco Bike Plan proposes a contra-flow bicycle lane on Polk Street between Market Street and Grove Street to facilitate bicycle access to City Hall.



# 12th & Franklin Street



### LEGEND

Key Challenges:

- 1 Pedestrian Circulation
- 2 Bicycle Circulation
- 3 Transit Operations
- 4 Vehicular Traffic
- 5 Loading & Taxis
- 6 Other

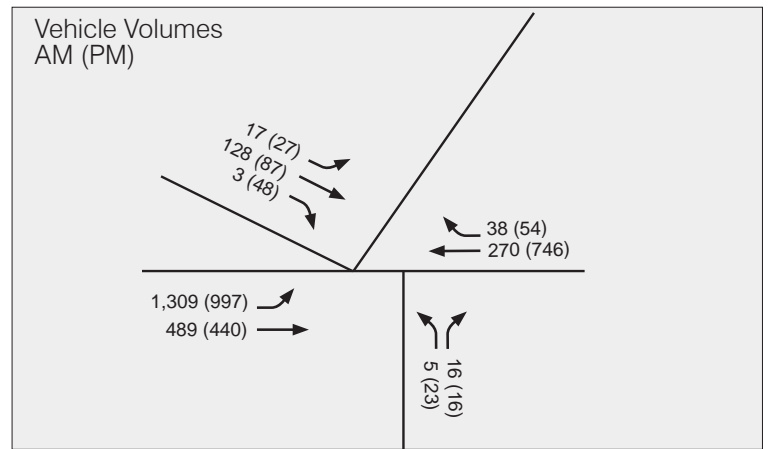
Collisions (2005-2010)*			
	Intersection	Transit Boarding Island	Trends
Auto	1		Transit was involved in most collisions at this intersection.
Bike	0		
Pedestrian	1		
Ped/Bike	0		
Transit crossing Market Street		Low	
Transit on Market Street		Low	

**Transit Lines**

Along Market:  
F, 6, 71L

Across Market:  
71

Under Market:  
J, K, L, M, N, S, T, Portal at Van Ness Avenue



\*NOTE: Transit data from SFMTA/Muni. All other data from SWITRS.



## Key challenges

### 1. Pedestrian Circulation

a. Crossing Franklin Street, Page Street, or 12th Street is challenging for pedestrians due to high vehicle volumes approaching from multiple directions.

b. Due to the double eastbound left-turn lane on Market Street, the western crosswalk has been located closer to 12th Street. Although this reduces vehicle conflicts, it increases the walking distance for pedestrians on the south side of Market Street walking to destinations between Franklin Street and Gough Street.

c. The acute corner angles at the intersection limit sightlines and visibility for bicyclists and pedestrians and creates an excess land-wedge between Page Street and Franklin Street. The existing island is a small waiting area for pedestrians crossing Market Street.

d. Motorists turning left from Market Street onto Franklin Street often run the red light, speeding through the crosswalk on Franklin Street during the walk phase. Vehicle queues also back up in the crosswalk, impeding pedestrians.

### 2. Bicycle Circulation

a. Page Street is a designated bicycle route that converges with Market Street at the intersection. The end of Page Street has limited space for bicyclists waiting to cross Market Street.

b. There is a wide right turn lane on westbound Market Street before Franklin Street. This area is challenging for cyclists, who must merge with vehicle traffic to avoid turning vehicles.

### 3. Transit Operations

a. The highest volumes of traffic on Market Street are between Franklin and Octavia, much of it consisting of vehicles that are “wiggling,” or changing lanes while using short segments of Market Street to get from one side of Market to the other. These vehicles can delay transit vehicles.

## 4. Vehicular Traffic

- a. Maintaining vehicle traffic flow in this area, particularly the eastbound left turn, has limited the improvements made to accommodate pedestrians and bicyclists.
- b. Volumes on 12th Street are low and the street provides local access to businesses only.

## 5. Loading & Taxis

- a. Frequent drop-offs during lunch and dinner hours along Market Street and Rose Street create conflicts with bicyclists and pedestrians. This section of Market Street has higher traffic volumes that bicyclists must merge with when the bicycle lane is blocked by curbside loading.
- b. West of Van Ness Avenue, there is some curbside parking and loading, but much of the curb space is dedicated to bicycle lanes.

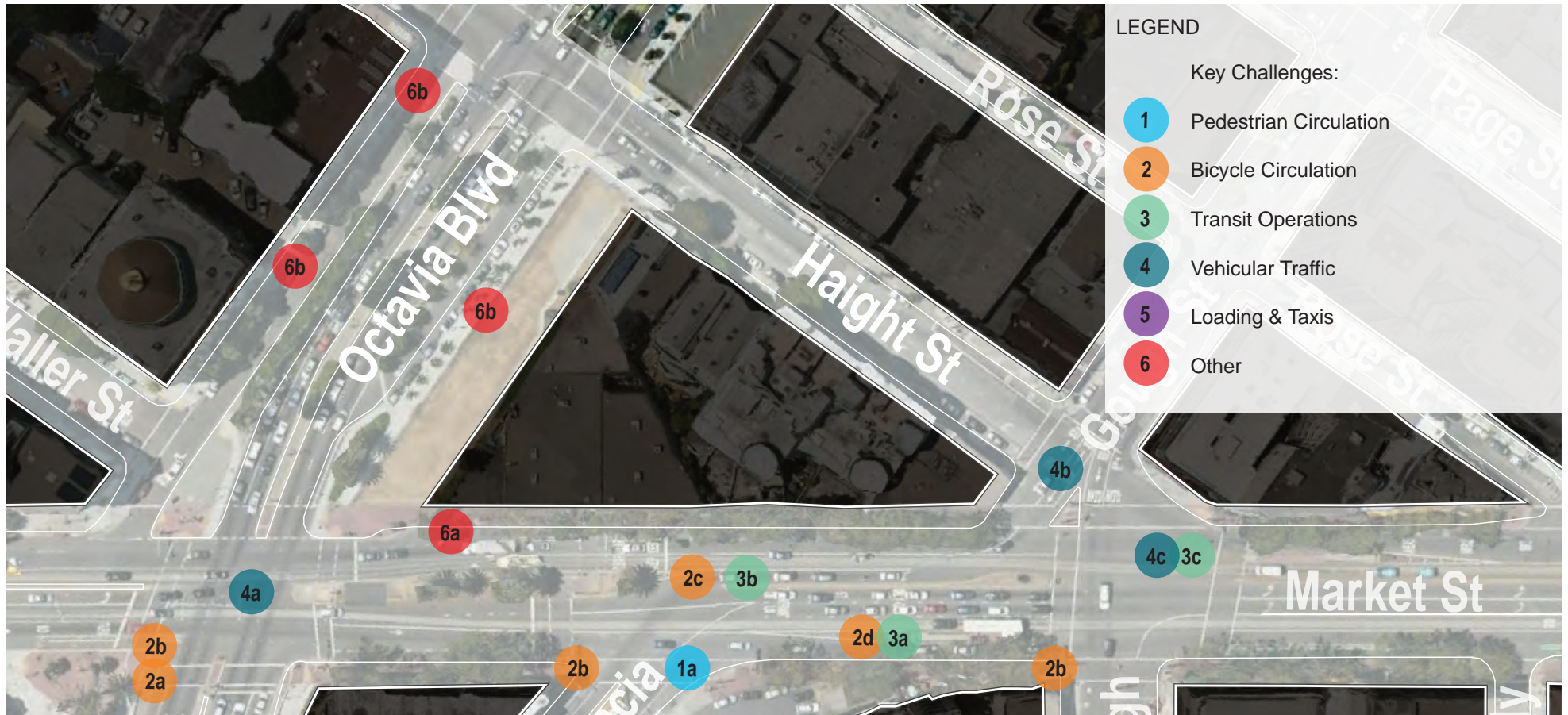
## 6. Other Issues

None.

## Summary

Franklin Street-Page Street-12th Street is a major intersection for vehicle traffic headed northbound on Franklin Street and bicycle traffic on Page Street and Market Street. 12th Street is slightly offset from Page Street and Franklin Street and provides mostly local access for businesses south of Market at this location. This area is also an important connection from Market Street to the Hayes Valley neighborhood immediately north of Market Street. Although there are several active retail uses on Market Street in this area, vehicle traffic is very heavy and pedestrian activity is generally lower than most other active retail areas on Market Street. This section of Market Street has the highest vehicle traffic volumes compared to any other portion of Market Street. Franklin Street is a major connection to and from the freeways south of Market and is the northbound portion of the Franklin and Gough roadway couplet.

# Octavia & Valencia Street



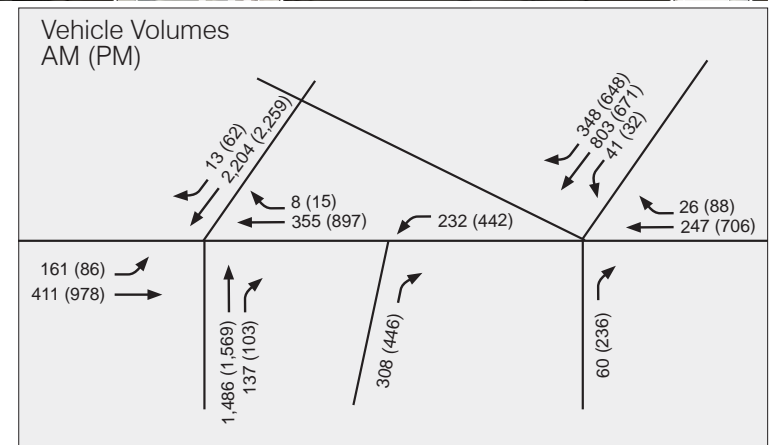
## LEGEND

Key Challenges:

- 1 Pedestrian Circulation
- 2 Bicycle Circulation
- 3 Transit Operations
- 4 Vehicular Traffic
- 5 Loading & Taxis
- 6 Other

Collisions (2005-2010)*			
	Intersection	Transit Boarding Island	Trends
Auto	17		Collisions involving bicyclists accounted for over half of all collisions at Octavia and nearly all collisions at Valencia.
Bike	37		
Pedestrian	1		
Ped/Bike	2		
Transit crossing Market Street		Low	Improper right turns accounted for 70% of all bicycle-vehicle collisions. These collisions involved eastbound drivers and bicyclists at both intersections.
Transit on Market Street		Low	

Transit Lines
Along Market: F, 71L
Across Market: None
Under Market: None



\*NOTE: Transit data from SFMTA/Muni. All other data from SWITRS.

## Key challenges

### 1. Pedestrian Circulation

a. The pedestrian crossing distance across Valencia is long, and the right turn radius on the southeast corner is large. This configuration can lead to vehicles encroaching into the crosswalk to make a right-turn-on-red.

### 2. Bicycle Circulation

a. Turns from Market Street onto the freeway are prohibited; however, illegal right turns have been a consistent issue and resulted in multiple bicycle-vehicle conflicts. SFMTA has made several improvements to discourage illegal turns, including a protected bicycle lane and signage.

b. Collisions involving bicyclists accounted for over half of all collisions at Octavia and nearly all collisions at Valencia. Improper right turns by drivers accounted for 70 percent of all bicycle-vehicle collisions. These collisions involved eastbound drivers and bicyclists at both intersections. The SFMTA has already made improvements at this location as a result, including extending the green bicycle lane west to Octavia Boulevard.

c. Left-turns from westbound Market Street to Valencia are difficult for bicyclists; bicyclists must transition across three lanes of traffic and streetcar tracks to turn onto southbound Valencia Street.

d. High vehicle volumes traveling east on Market Street and north on Valencia Street contribute to a challenging bicycle environment. This block of Market Street has no dedicated bike facilities. The right-of-way is constrained at Gough Street because of vehicle capacity needs, transit accommodations (including a boarding island), and wide sidewalks.

### 3. Transit Operations

a. Vehicle queues on eastbound Market Street between Valencia Street and Gough Street delay the F Market & Wharves historic streetcar line and buses operating in the inner travel lanes on Market Street.

b. At Franklin Street and at Valencia Street, motorists must merge across the F Market & Wharves streetcar tracks to turn left.

c. West of Haight Street, the only transit vehicles on Market Street are F Market & Wharves streetcars and the 71L Haight-Noriega during peak hours.



## 4. Vehicular Traffic

**a.** The intersection at Octavia Boulevard is the touchdown ramp of the Central Freeway (US 101) and has very high traffic volumes. The roadway grades encourage faster vehicle speeds in northbound, southbound, and eastbound directions.

**b.** The intersection at Gough Street is angled, limiting sightlines and visibility. Southbound vehicles must position themselves either to turn right onto westbound Market Street or continue southbound on Gough Street south of Market. There are currently two lanes for each movement.

**c.** Westbound right turns from Market Street to Haight Street are also permitted, resulting in a wide right turn lane and bicycle-vehicle merge area on Market Street. This makes the intersection difficult for bicyclists to navigate: right turning vehicles conflict with bicycles, and vehicles turning onto westbound Market Street from Gough Street often queue into the bicycle lane during peak times of day.

## 5. Loading & Taxis

None.

## 6. Other Issues

**a.** On-street parking is allowed on the north side of Market Street, west of Gough Street.

**b.** Bicyclists must share the local travel lane on Octavia Boulevard. Although volumes are lower on these local side roads, vehicles will often use local lanes to bypass traffic on the main lanes of Octavia Boulevard before turning onto their final destination. Bicyclists will also occasionally block the local lanes waiting for the green light before crossing Octavia Boulevard.

## Summary

Although the development of Octavia Boulevard has opened up the neighborhood and created a new, key gateway into the City, the circulation patterns at the Octavia Boulevard-US 101/Market Street intersection remain challenging. Most traffic crossing or traveling on Market Street between Duboce Street in the west and Van Ness Avenue to the east is traveling to or from freeway on- and off-ramps in the area, and Octavia Boulevard is the most heavily used and direct on- and off-ramp in the area. There are two key challenges in this area. First, and more generally, the area must safely and effectively transition freeway traffic onto surface City streets. Secondly, traffic on City streets must have a clear and direct path to the freeway on-ramps that reduce conflicts with bicyclists, with particular attention paid to areas where vehicles make right turns across bicycle facilities.

