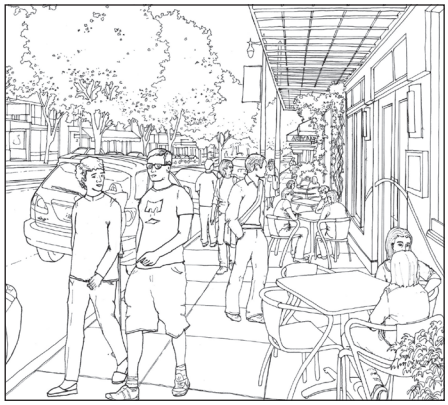
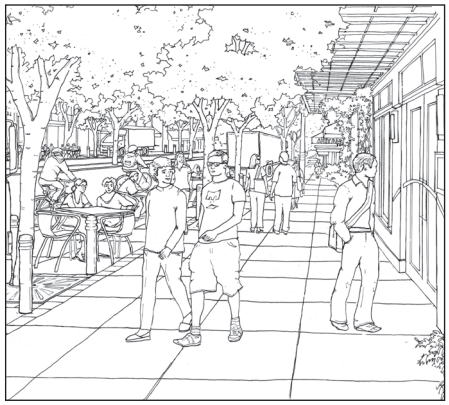
Authority Board
February 23, 2010
Item 8 Enclosure

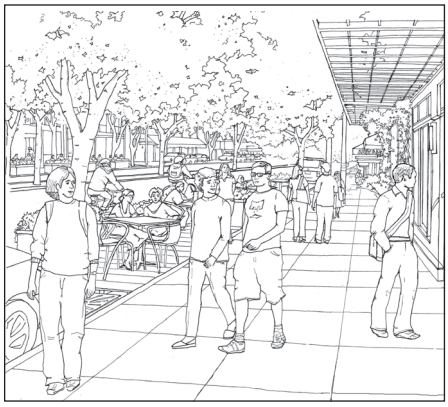
FINAL REPORT

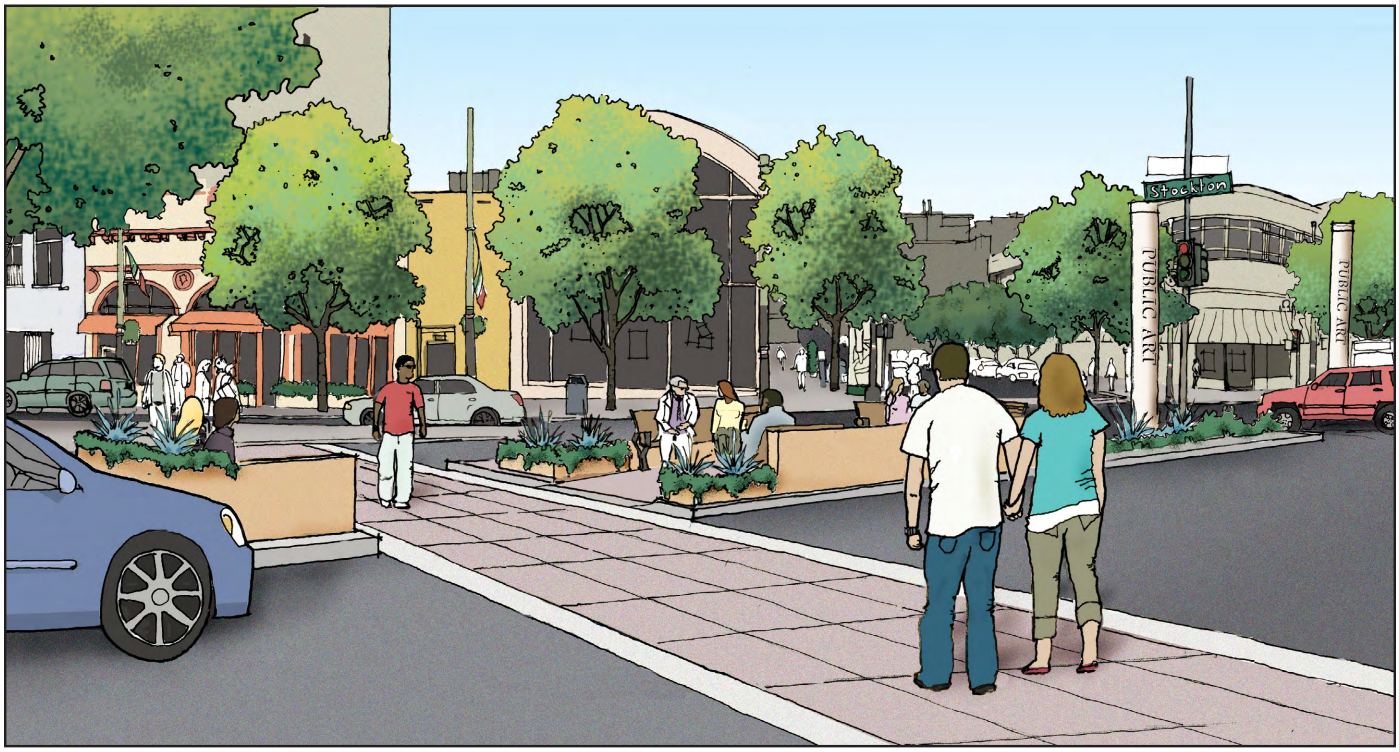
Columbus Avenue Neighborhood Transportation Study

January 2010









Cover images from Community Design + Architecture

Acknowledgements

This study has been a truly collaborative effort. The Authority would like to thank:

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Graphic design: NaiadDesign.com

TABLE OF CONTENTS

TABLE OF FIGURES

Executive Summary

Chapter 1 Study Overview

Chapter 2 Transportation Conditions

Chapter 3 Parking Conditions & Recommendations

Chapter 4 Discussion & Evaluation of Design Alternatives

Chapter 5 Community Involvement

Chapter 6 Design Recommendations & Implementation

Executive Summary

ES.1 STUDY OVERVIEW

The Columbus Avenue Neighborhood Transportation Study was a joint effort of community partners Revitalize and Energize the Northeast and Waterfront of San Francisco (RENEW SF), the San Francisco County Transportation Authority (the Authority), and a consulting team led by Nelson\Nygaard Consulting Associates (Nelson\Nygaard). The Columbus Avenue Neighborhood Transportation Study's objective was to identify street design changes and policy measures to support the livability and vitality of Columbus Avenue, and which enjoy broad support among residents, merchants and visitors alike.

The study included three major rounds of public involvement, as well as supplemental outreach activities and events throughout the study duration. As usual, the goal of outreach was to inform, consult and collaborate with stakeholders about transportation needs, and the prioritization and trade-offs required for desired solutions. Special tasks such as a shopper survey provided data and insight into the transportation behavior and preferences of particular groups of stakeholders such as visitors to the street. The Authority and RENEW SF also collaborated with neighborhood organizations such as the Telegraph Hill Dwellers in developing street design alternatives. RENEW SF served as the primary liaison between the Authority and the many stakeholders with an interest in transportation issues in the study area by helping with publicity efforts, conducting event logistics, and co-hosting outreach events. The Chinatown Community Development Center provided a link to the Chinese-speaking stakeholders of Columbus Avenue, providing translation services and organizing outreach events for Chinese speakers.

ES.2 TRANSPORTATION CONDITIONS

Columbus Avenue is the heart of the North Beach neighborhood; an active street lined with cafes and restaurants and heavily traveled by pedestrians – residents and visitors alike. The street is one of two diagonal arteries bisecting San Francisco's street grid (Market Street is the other). It does not "cleanly" intersect its north-south and east-west cross streets, resulting in a series of uniquely configured six-legged intersections. And unlike Market, Columbus is narrow, with a right-of-way of just 80 feet within which to accommodate heavy use by motorists, delivery trucks, tour buses, transit vehicles, cyclists and pedestrians. This narrow right-of-way presents a challenge, since Columbus Avenue is identified as a key link in the Muni Rapid network, the Bicycle Network, and the Congestion Management Plan.

Conditions for motorists, transit users, cyclists and pedestrians were analyzed in detail as part of the Study, finding that:

- Vehicles enjoy a disproportionate share of Columbus Avenue's right of way:
    - Over 2/3 of Columbus Avenue is vehicle space, yet people in cars are only 1/3 of the users of Columbus Avenue.
    - More people are on transit on Columbus Avenue than in cars, yet transit has no dedicated space, and must compete with cars.
    - Pedestrians outnumber people in cars on Columbus, yet cars have nearly three times the space that pedestrians do.
- The street operates most effectively for vehicle circulation, and operates the least well for pedestrian, transit, and bicycle circulation.
    - Vehicle "level of service" ranges between A and C.
    - Pedestrian "level of service" ranges between C and E.
    - Bicycle "level of service" is E.
    - Transit operates at average speeds of about 5 mph within the study area.

The 10-foot sidewalks on Columbus Avenue are sub-standard for a major arterial heavily used by pedestrians, and other sidewalk uses, such as merchandising and café seating, further reduce the sidewalk's width at chokepoints. Many crosswalks are significantly longer than the width of the street, when Columbus intersects streets at odd angles.

This Study considered how to improve the design of Columbus Avenue for pedestrians, while taking into account all street users.

FIGURE ES-3 EXISTING ALLOCATION OF STREET SPACE

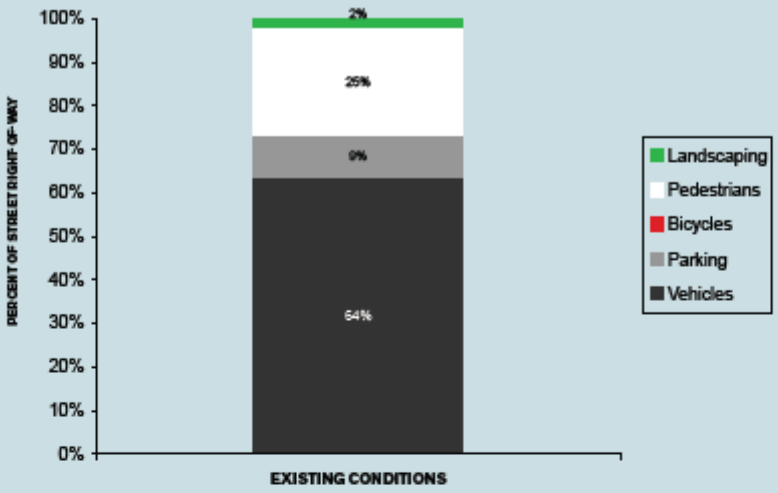
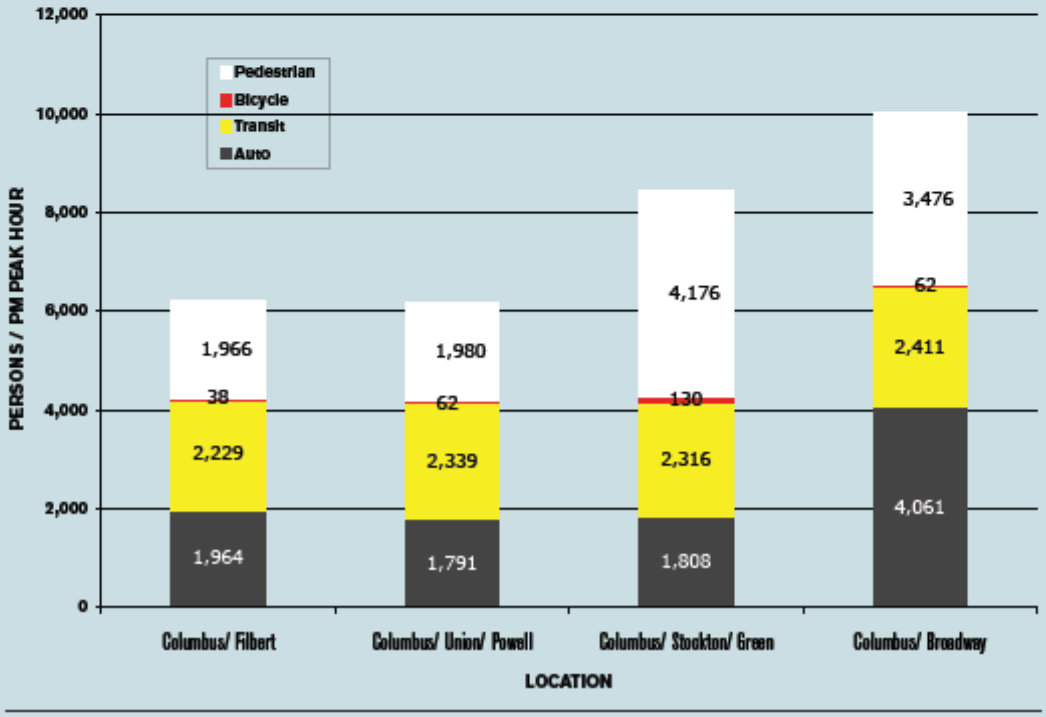


FIGURE ES-4 PM PEAK HOUR PERSON VOLUMES BY MODE AT DIFFERENT INTERSECTIONS



COMMUNITY PRIORITIES

Based on technical analysis and public input, the study team focused on developing improvements for the stretch of Columbus Avenue between Broadway and Filbert Streets. This stretch includes several complex, six-legged intersections, as well as the segment of Columbus Avenue where the Central Subway tunnel boring machine will be extracted. The study's technical analysis and community outreach identified the top transportation needs along Columbus Avenue as::

- Pedestrian conditions
- Streetscape vitality
- Transit service efficiency

- Coordination with the planning for Central Subway
- Parking management

PARKING CONDITIONS & RECOMMENDATIONS

To support recommendations regarding parking availability, the study team conducted a comprehensive parking occupancy and turnover survey. The survey provided two key findings. First, a significant disparity exists in demand for on and off-street spaces in the vicinity of Columbus Avenue. While peak occupancy rates for on-street spaces are high (above 100 percent, when illegal parking is included), occupancy rates for off-street parking range from 50% to 85%. Second, there is evidence of significant under-pricing of parking in the Columbus area at peak times. The price of on-street parking in the survey area is lowest precisely when demand is highest, in the evening and on weekends.

ES.3 DESIGN ALTERNATIVES

In collaboration with the community and agency staff, the study team developed and evaluated three Columbus Avenue design alternatives intended to improve pedestrian and sidewalk conditions, all consistent with MTA plans for Central Subway construction. As the primary design challenge for Columbus Avenue was to expand space for pedestrians, the primary differences between the design alternatives are the space they allot to pedestrians relative to other users of the street. The designs also advance two innovative shared space concepts, “flex lanes” and “flex space.” Shared space treatments such as flex lanes, while identified in the City’s Better Streets Plan and in existence in other California and US cities, are only beginning to gain traction as formal street design solutions in San Francisco.

ALTERNATIVE I – FLEX LANES

Alternative I retains existing traffic circulation and striping configurations, while seeking to expand pedestrian space and improve pedestrian conditions at intersections. While Alternative I does not widen the Columbus Avenue sidewalks, corner bulbs and bus bulbs would be provided. Instead of altering the curb line, Alternative I would institute “flex lanes,” an opt-in permitting system allowing use of the parking lane for café seating.

ALTERNATIVE II – ROAD DIET

Alternative II seeks to permanently widen the Columbus Avenue sidewalks. To accomplish this in the constrained right of way, the design would reduce the number of mixed traffic lanes from two in each direction to one (a “road diet”). At the key intersection of Columbus, Green and Stockton streets, diagonal crosswalks would be added in order to enhance pedestrian connectivity and calm traffic. In addition to allowing for wider (12 to 14 feet instead of the current 10 feet), the road diet would allow for future dedicated space for bicyclists (Columbus is a designated bike route).

ALTERNATIVE III – PARKING TO SIDEWALK CONVERSION

Alternative III also seeks to permanently widen the Columbus Avenue sidewalks, but instead of accomplishing this by removing a mixed traffic lane, Alternative III would replace the parallel parking. The sidewalk extension would create a significant amount of new usable space. Alternative III also proposes a signature plaza design treatment for the Columbus, Green and Stockton intersection.

Because Alternative III would eliminate parallel parking from those segments of Columbus where sidewalks are widened, the study’s parking management recommendations are an especially important part of the package. Parking management strategies include variable pricing consistent with the MTA’s proposed SFpark pilot program, as well as creation of Parking Benefit Districts which could allocate some portion of net parking fee revenues back to the area to fund Columbus Avenue enhancements. In addition, loading and unloading activity would be accommodated either through designated cutout parking spaces (such as on Market Street), or via a “flex space.” A flex space is a form of shared space in which a mountable outer sidewalk zone allows neighborhood delivery vehicles to park temporarily for loading/unloading activities. This outer zone of the sidewalk, the “flex space,” would be differentiated from the inner portion of the sidewalk via

textured, color-contrasting pavement.

Alternative III could be implemented either with the current circulation pattern and lane striping, or with a road diet.

Figures ES-6 though ES-8 depict the Columbus / Stockton / Green intersection as existing and as proposed under Alternatives II and III.

FIGURE 4-18 RENDERING OF COLUMBUS, GREEN, AND STOCKTON INTERSECTION
EXISTING CONDITIONS (TOP) AND WITH DIAGONAL CROSSWALKS (BOTTOM)

Images from CD+A

Image from CD+A

Figure ES-10 illustrates key benefits and impacts of each alternative, as well as likely order-of-magnitude costs. Key findings of evaluation of the alternatives can be summarized as follows:

- **Traffic Benefits and Impacts.** Alternative I would have little effect on traffic, while Alternatives II and III would increase delays moderately, with some hot spot turning movements that would require targeted mitigation strategies.

- **Parking Benefits and Impacts.** Alternatives I and II would have little effect on parking, while Alternative III would remove the on-street parking supply on Columbus Avenue itself. The effect of this reduction in on-street supply would be mitigated by a package of parking management recommendations intended to increase the overall availability of parking in the Columbus vicinity, particularly during peak parking demand periods.

- **Transit Benefits and Impacts.** Mitigation measures are required to avoid increased delays to transit under Alternatives II and III.

- **Pedestrian Benefits and Impacts.** While all alternatives would greatly improve pedestrian safety, Alternative II offers greater benefits for pedestrian comfort, and Alternative III greater benefits still.

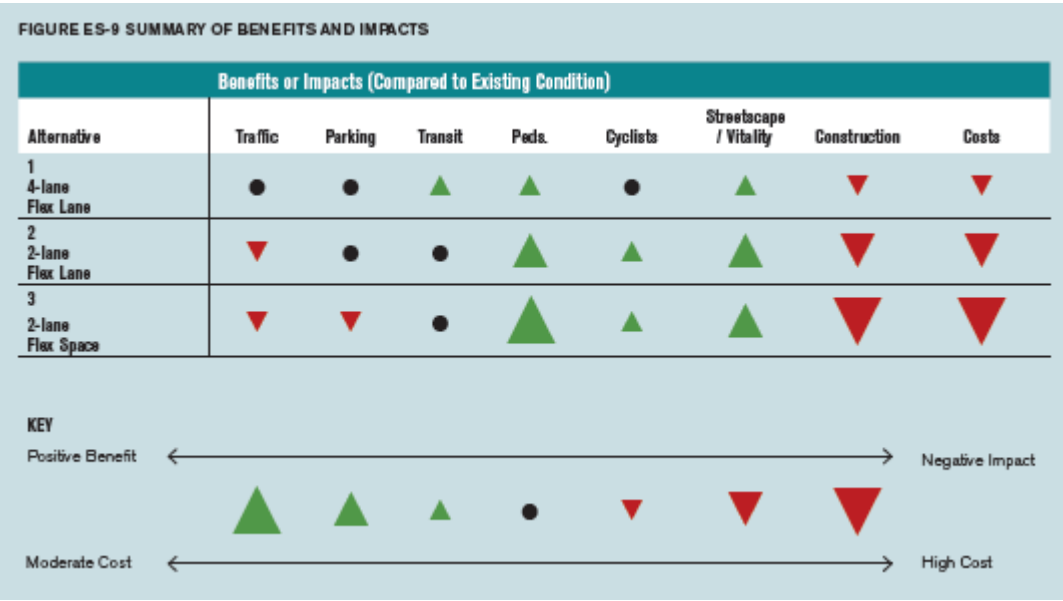
- **Bicycle Benefits and Impacts.** Alternative I would provide little benefit for bicyclists, while Alternatives II and III would provide significant benefits.

- **Streetscape Benefits and Impacts.** All alternatives would improve the streetscape, adding trees and sidewalk space in which to locate amenities. Alternative III would allow significantly more landscaping and street furniture. Alternative III would also add usable public open space in the form of a mini-plaza at Stockton and Green.

  Likewise, Alternatives I and II would benefit businesses by allowing cafes and restaurants to add seating in the parking lane, but Alternative III would convert the entire existing parking lane to sidewalk space available for seating or other uses.

- **Construction Impacts.** Alternative II would require more extensive construction, and Alternative III more extensive construction still.
- **Costs.** Alternative I, by retaining much of the existing curb line (and thus not requiring significant utility relocation or reconstruction of the roadbed), would be significantly less expensive than Alternative II, while Alternative III would present the greatest capital cost, estimated at $10M.

FIGURE ES-9 SUMMARY OF BENEFITS AND IMPACTS



ES.4 DESIGN RECOMMENDATIONS & IMPLEMENTATION

The Study recommendations are based on:

- Community-identified transportation needs and priorities;
- Technical analysis of transportation performance on Columbus Avenue; and
- Community feedback on the design alternatives.

The study team recommends five categories of improvements for the Columbus Avenue:

A – IMPROVED PARKING MANAGEMENT

The study's parking management recommendations aim to make parking more readily available for both short-term and long-term parkers, and to make more efficient use of the existing parking supply. Because the widened sidewalk would displace parallel parking for passenger cars along where the Columbus Avenue sidewalk is widened, a comprehensive package of parking management strategies is recommended along with Alternative III to improve the overall availability on- and off-street parking in the vicinity of the street:

- Increase visibility of off-street parking through real-time information signs;
- Use pricing to reduce on-street parking occupancy rates to 85%, and begin to regulate parking during peak demand periods, such as by implementing future cycles of the SFpark program in North Beach;
- Encourage merchants to establish a "universal valet" program;

Seek to form a Parking Benefits District to help manage parking with benefits for the neighborhood..

B – PEDESTRIAN PRIORITY MEASURES: DESIGN ALTERNATIVE III, INCLUDING SIDEWALK WIDENING AND THE RE-DESIGN OF THE COLUMBUS / GREEN / STOCKTON INTERSECTION

The featured recommendations of this Study are those that focus on prioritizing space along Columbus for pedestrians. Following technical evaluation of benefits and impacts, input from a Technical Advisory Committee including the MTA, and community outreach, the study recommends design Alternative III for Columbus Avenue. This concept provides significant new usable pedestrian space between intersections, and has the flexibility to be phased in over time based on merchant support. Additionally, Alternative III may be implemented with or without a road diet.

C – TRANSIT PRIORITY MEASURES

Three key transit recommendations are offered: 1) Construct bus bulbouts as necessary or as part of sidewalk widening (see above), and upgrade station furnishings and amenities, consistent with TEP recommendations. 2) Consolidate bus stops, per the recommendations of SFMTA's Transit Effectiveness Project, in order to reduce transit delays. SFMTA is planning for a systemwide implementation of TEP recommendations, including stop consolidation recommendations, in [month] 2010; consolidations along the Columbus Avenue routes should be implemented as part of this action. Finally, 3) Install transit signal priority at the intersection of Columbus / Stockton / Green as part of SFMTA's SFgo program.

D – BICYCLE PRIORITY MEASURES

Alternative III may be implemented with or without a road diet. The benefit of the road diet is creation of significant space for bicyclists; however, a circulation plan and transit delay mitigation strategies would need to be developed in coordination with the MTA to ensure no impacts to transit operations (travel times and reliability).

he cost of sidewalk widening and intersection treatments, encompassing the stretch of Columbus Avenue from Union to Broadway Streets, is estimated at about $10 million. Implementation will rely on competitive applications for regional and local grant programs including:

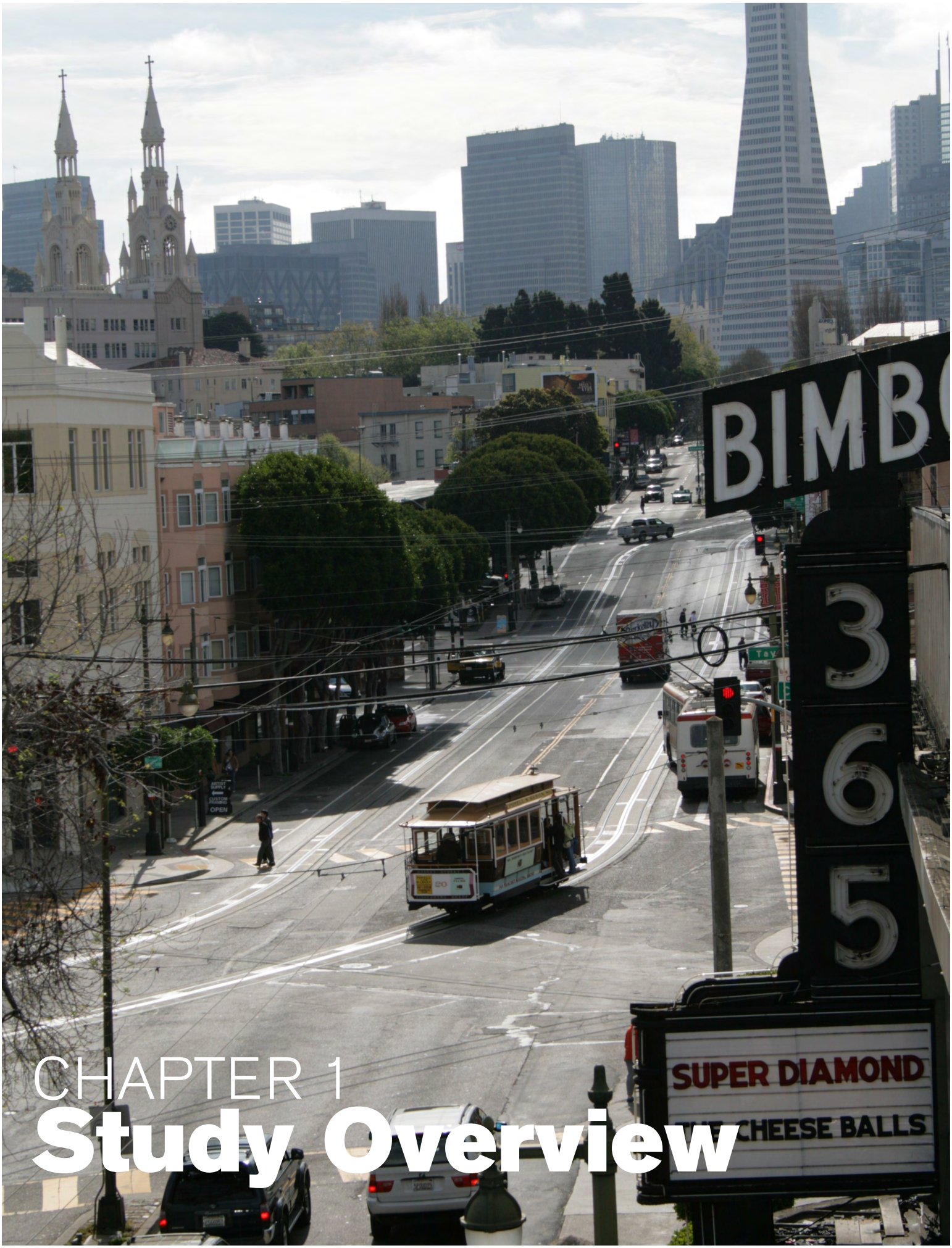
- Safe Routes to Transit
- Transportation for Livable Communities

- Lifeline Transportation Program

Ongoing community support and outreach is also essential for successful implementation, particularly, outreach by community members to merchants along blocks proposed for wider sidewalks in lieu of parking.

1Credit Robert Mittelstadt

FIGURE 4-26 GREEN/STOCKTON PLAZA: BEFORE & AFTER, SHOWING VIEWS TO THE SOUTH



CHAPTER 1
Study Overview

CHAPTER 1

Study Overview

A community-based transportation planning effort, the Columbus Avenue Neighborhood Transportation Study was a joint effort of Revitalize and Energize the Northeast and Waterfront of San Francisco (RENEW SF), the San Francisco County Transportation Authority (the Authority), and a consulting team including Nelson\Nygaard Consulting Associates, Fehr & Peers Transportation Consultants, and Community Design + Architecture. The Study was funded by the California Department of Transportation (Caltrans) and San Francisco's Proposition K Neighborhood Transportation Planning program.

Its objective: to identify changes to transportation infrastructure and policies that could enhance the livability and economic vitality of Columbus Avenue, benefit residents, merchants and visitors, and enjoy broad community support. The Study team sought to leverage the existing assets that led the American Planning Association in 2007 to declare the neighborhood surrounding the central segment of Columbus, North Beach, one of "10 Great Neighborhoods in America."

The Study included two major rounds of public outreach, extensive data collection, development of three conceptual design alternatives, and extensive city agency review. In the first round of public outreach, in Fall 2007, the community's transportation desires and priorities for change were identified. The study team engaged the community to consider areas where right-of-way constraints might result in conflicts between different users of the street, such as pedestrians and motorists. The results of this comunity dialogue are further discussed in **Chapter 5** and can be viewed in the **Appendix**.

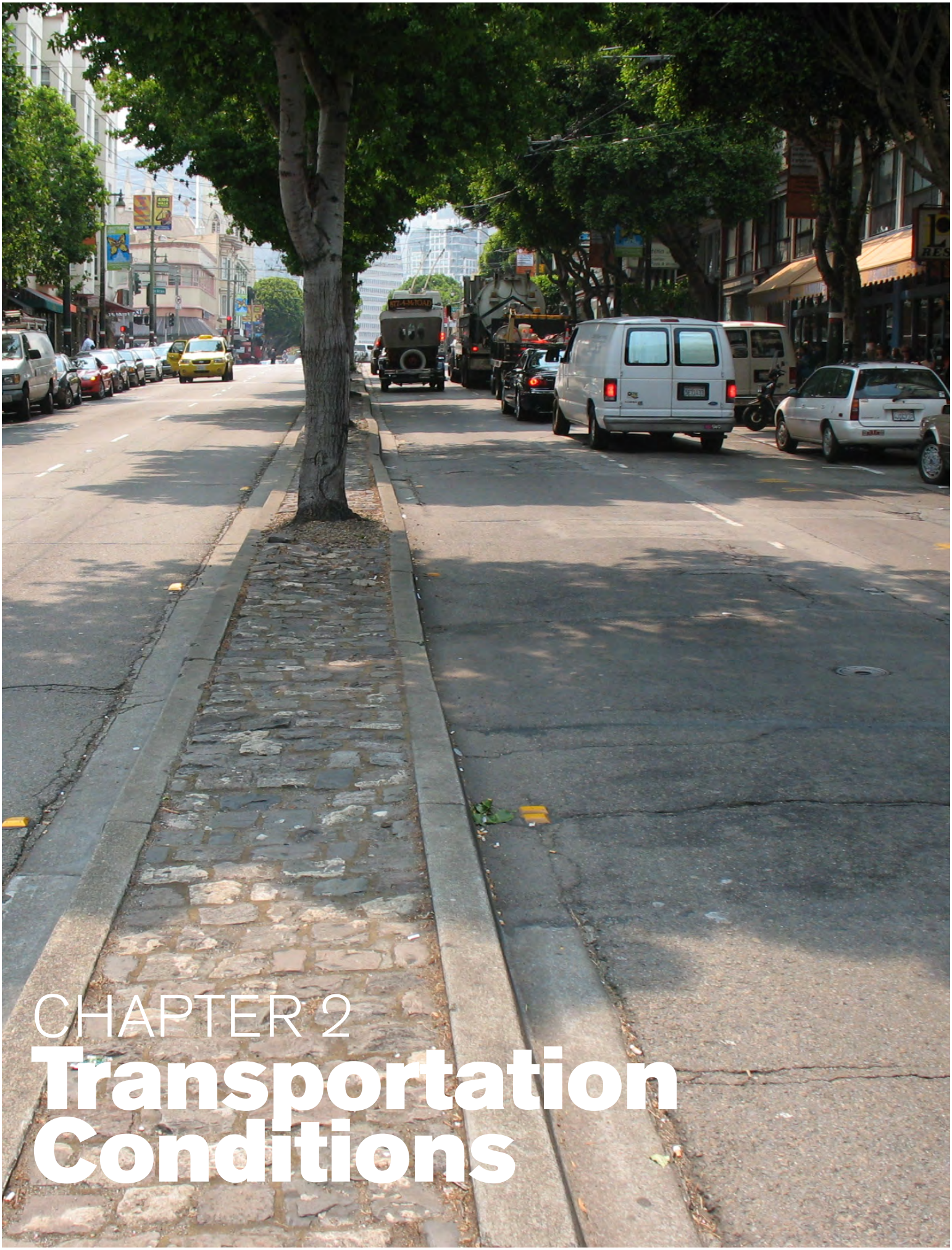
Following this, the project team collected data on existing conditions, conducting observation and analysis of trends in parking occupancy and turnover as well as a survey of pedestrians including questions on travel and shopping behavior. The project team then held a "design charrette" to develop preliminary design concepts. The preliminary alternatives were reviewed by community members and city officials, expanded, and refined. These concepts can be viewed in **Chapter 4**.

The study team evaluated the ability of each alternative to advance the community priorities for improving the street, while meeting functional objectives. The results of the benefit/impact analysis are also in **Chapter 4**.

These alternatives were then presented to the larger community during the second round of outreach in Winter 2008. At this stage, the project team sought feedback on the relative benefits and impacts of each alternative and the community's preferred approach. The results are in **Chapter 5**. Following this, the alternatives were further refined and an implementation plan and final recommendations were developed.

This report largely consists of description and evaluation of the three final alternatives, although findings of the parking and pedestrian surveys are included here as resources for the community to use in design decisions still to be made. This report does not recommend a single alternative; rather, it recommends that elements of two alternatives be implemented based on block-specific context according to community preferences, as well as a phasing strategy that includes elements of the third alternative. The final recommendations and implementation plan are provided in **Chapter 6**. Next steps in the process, including remaining decision points, are also identified in the final chapter of the report, **Chapter 6**.

Chapters 2 and **3** review existing conditions in the Study area. Based on community input and technical evaluation, the study team prioritized the complex and problematic intersections of Columbus with Broadway, with Stockton and Green, with Union, and with Filbert, all in the central segment of Columbus. As the areas immediately around these intersections account for much of the distance between the intersections of Columbus with Kearny and Pacific and with Mason and Greenwich, the entire length of Columbus between these intersections, a distance of just over 2,000 feet, comprises the Study area.



CHAPTER 2

Transportation Conditions

CHAPTER 2

Transportation Conditions

This chapter begins with a description of Columbus Avenue's design as a key San Francisco street. The chapter then describes existing conditions of Columbus Avenue for all users of the street, including motorists, transit passengers, pedestrians, and cyclists.

2.1 Street Design

Along with Market Street, Columbus Avenue is one of two diagonal arteries bisecting San Francisco's street grid. Unlike Market, Columbus is relatively narrow: its right-of-way of 80 feet is only slightly more generous than the standard north-of-Market street width of 68 feet, 9 inches. While occasional ceremonial treatments and its primacy for users of all modes (see below) bestow on the street some measure of importance, it could hardly be described, functionally or in urban design terms, as a grand boulevard.

Nonetheless, this constrained artery enjoys (or rather suffers from) relatively heavy use by motorists, delivery trucks, tour buses, transit vehicles, cyclists and pedestrians (as will be detailed in the sections to follow). It is well-used by vehicles and cyclists for reasons of geography: it serves as a southeast-to-northwest "shortcut" between the Financial District and northern waterfront (and along the way, connects to several major cross streets, most importantly Broadway, Stockton, Union and Bay), and it lies in a valley between two steep hills, Telegraph and Russian. The street itself is relatively flat, with gentle descents on either side of a low east-west saddle in the vicinity of its intersection with Green and Stockton streets.Intersections

Because Columbus does not bisect the north-of-Market grid at a perfect 45-degree angle, and because the grid's east-west blocks are somewhat longer than its north-south blocks, Columbus does not "cleanly" intersect its north-south and east-west cross streets, resulting in a series of uniquely configured six-legged intersections and intersections of north-south and east-west streets that are slightly offset from Columbus. Within the Study area, from the Kearny/Pacific intersection in the south to the Mason/Greenwich intersection in the north, the following streets intersect Columbus (**Figure 2-1**, **2-2**, and **2-3**):

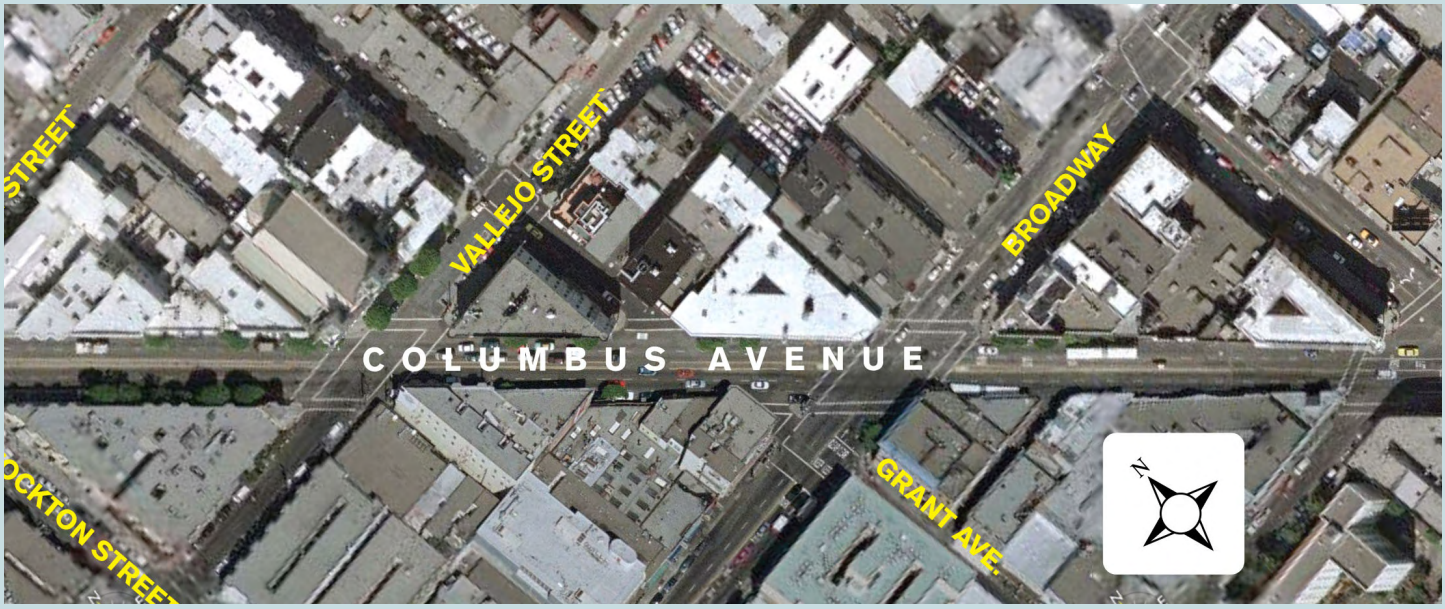
- **Grant Avenue and Broadway.** Grant (a north-south street) intersects Broadway (an east-west street) approximately 95 feet west of the intersection of Broadway and Columbus, as measured centerline to centerline. Grant then intersects Columbus approximately 155 feet north of the intersection of Broadway and Columbus. Because Grant is much narrower than Broadway and generates much less auto traffic, it is not continuous for either autos or pedestrians through its intersections with Columbus and Broadway despite a clear line-of-sight interrupted only by a triangular sidewalk extension now under construction. (Because Grant has been designated a one-way street, northbound traffic must turn right at Broadway, and only traffic northbound on Columbus can turn on to Grant; pedestrians must travel out of direction by crossing Columbus east-west on the north side of

FIGURE 2-1 AERIAL VIEW OF INTERSECTIONS ALONG COLUMBUS AVENUE

Images from Nelson\Nygaard

FIGURE 2-2 VIEWS ALONG COLUMBUS AVENUE, SOUTH TO NORTH. TOP, LEFT TO RIGHT: SOUTH OF VALLEJO, SOUTH OF GREEN, NORTH OF GREEN. LEFT: SOUTH OF UNION.

FIGURE 2-3 COLUMBUS & BROADWAY INTERSECTION



Broadway.) Despite this offset, the "intersection" of Columbus, Broadway and Grant is generally considered to be a single, large and frustratingly complex crossing, and it has been treated as a single intersection for purposes of this exercise.

- **Vallejo Street.** An east-west street, intersecting Columbus at roughly a 45-degree angle. At this point, Grant is well to the east, and Stockton Street well to the west. The Vallejo/Columbus intersection presents fewer design problems than others in the study area and thus has received less attention than the remaining intersections.

- **Stockton and Green.** Stockton (north-south) and Green (east-west) Streets very nearly "cleanly" intersect Columbus. However, the functional operation of this intersection is complex. Southbound vehicles on Stockton are forced to make an acute "hard" right turn onto Columbus (at an approximate 135-degree angle) and westbound vehicles on Green are legally prohibited from continuing across Columbus, although a median extending halfway into the intersection has the practical effect of encouraging drivers to "slalom" into the opposite lane. Articulated Muni buses cross and turn through the intersection at rates of one or more buses every minute during the PM peak. Furthermore, pedestrians must cross up to three separate legs of the intersection to proceed along any street.

- **Powell, Union, and Filbert Streets.** Powell (north-south) intersects Union (east-west) approximately 180 feet west of the intersection of Union and Columbus. It then intersects Filbert (east-west) approximately 105 feet east of the intersection of Filbert and Columbus. Powell is not continuous, although both vehicles and pedestrians may "zig-zag" through the area. Between Powell, Union, and Columbus is a triangle of open space that serves as a visual, if not functional, extension of Washington Square Park on the east side of Columbus between Union and Filbert. Between Powell, Filbert and Columbus is a much smaller triangle that serves as a pedestrian refuge. The short block of Powell between Columbus and Union is one-way southbound (accessible only by a "soft" 45-degree right turn from the southbound lanes of Columbus), and Powell between Columbus and Filbert is effectively a "soft" right-turn lane from northbound Columbus, separated from the Columbus/Filbert intersection only by the small triangular island.

As non-right angled intersections, all intersections along Columbus require out-of-direction travel for pedestrians moving northeast or southwest (an approximate 135-degree, acute or "hard" turn for the second crossing), and many crossings (typically of connecting streets) are significantly longer than the width of the street.

TYPICAL SECTIONS

Figure 2-4 gives an overview of existing conditions in the study area for different users. Columbus Avenue has two typical cross sections, divided at Green Street (see **Figure 2-5**).

- **North of Green.** Two northbound and two southbound 10-foot travel lanes with a 4-foot median, 8-foot curbside parking lanes, and 10-foot sidewalks.

- **South of Green.** Two northbound and two southbound 11-foot travel lanes with no median. (There are no left-turn lanes, and left turns are generally prohibited). 8-foot curbside parking lanes, and 10-foot sidewalks.

Historically, the right-of-way included cable car, then streetcar tracks in the center travel lanes, and no median (**Figure 2-6**). Parking lanes were added and the sidewalks narrowed in the early 20th century, and the partial median was added in the late 20th century. The streetscape along Columbus includes large numbers of mature trees, although some species are not well suited

FIGURE 2-4 EXISTING CONDITIONS ON COLUMBUS AVENUE

Aerial photography from Freebairn-Smith & Crane Architecture

to an urban environment and long stretches exist with no greenery. Utilities and street furniture tend to clutter the already-narrow sidewalk (**Figure 2-7**).

The 10-foot sidewalks on Columbus Avenue are, like all urban sidewalks, effectively divided into zones that reduce the space available for pedestrians, as shown in **Figure 2-8**.The 3 feet closest to the curb and closest to buildings are used primarily for utilities and other street furniture and for the opening and closing of car and building doors on Columbus; only 4 feet remains for walking. This is insufficient for two pedestrians to walk abreast or pass eachother and does not meet American Disabilities Act (ADA) requirements for an adequate clear path of travel. In the Study area, this space is not only heavily used, but further reduced at chokepoints. Many of North Beach's cafes and restaurants also use sidewalk space for seating. The result is that pedestrians are often forced to form a single-file line, and navigate their way past those passing in the opposite direction. The 10-foot sidewalks along Columbus are well below the minimum standard of 12 feet for neighborhood commercial streets as described in the city's *Better Streets Plan*, and further still below the recommended width of 15 feet.

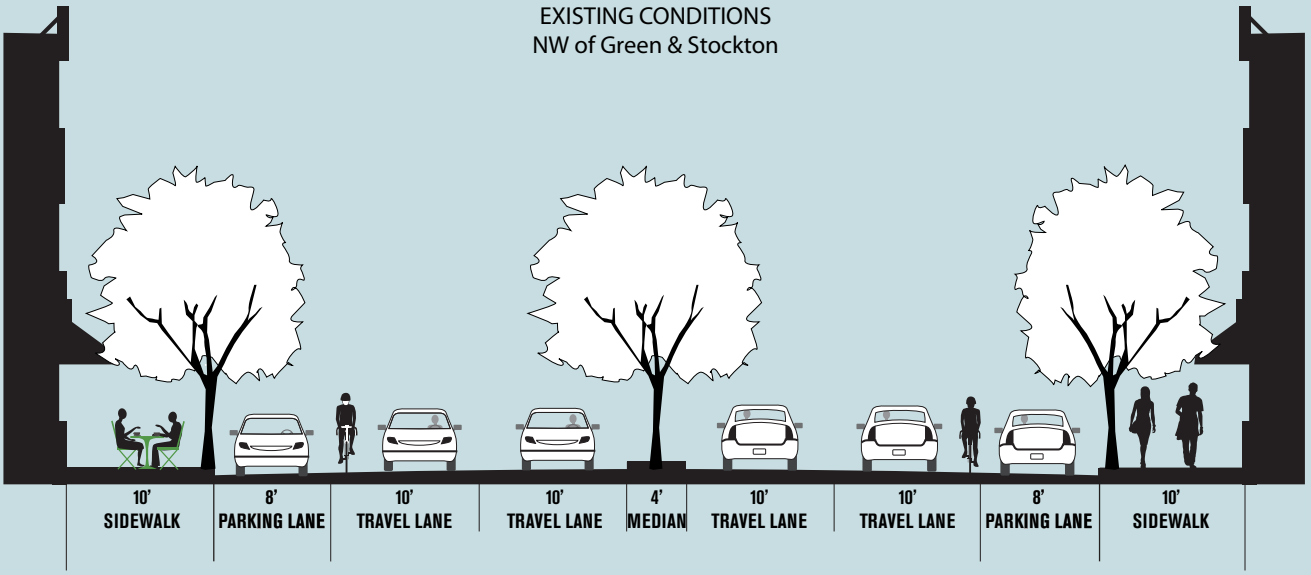
2.2 Traffic Conditions

As a four-lane, diagonal street connecting North Beach to neighborhoods across the city and the Financial District to neighborhoods on the city's north side (primarily via the Broadway Tunnel, which funnels traffic onto lower Columbus), Columbus is popular with motorists. Nonetheless, its four through lanes provide sufficient capacity to keep driver delays relatively low.

Figure 2-9 shows traffic levels at intersections along Columbus during the busiest hour of the afternoon rush. The figures are estimates based on historic turning movement counts that were updated using hose count data.

Notably, there are relatively few left turns from Columbus onto cross streets—left turns are restricted at Broadway, Union, and Filbert—and even where left turns are allowed, there are relatively few. While movements were not analyzed at the intersection of Columbus and Vallejo, at the intersection of Columbus, Stockton and Green there were just 13 left turns off of Columbus (4 southbound, and 9 northbound) during the PM peak hour. By contrast, there were 257 right turns off of Columbus.

FIGURE 2-5 TYPICAL CROSS SECTIONS



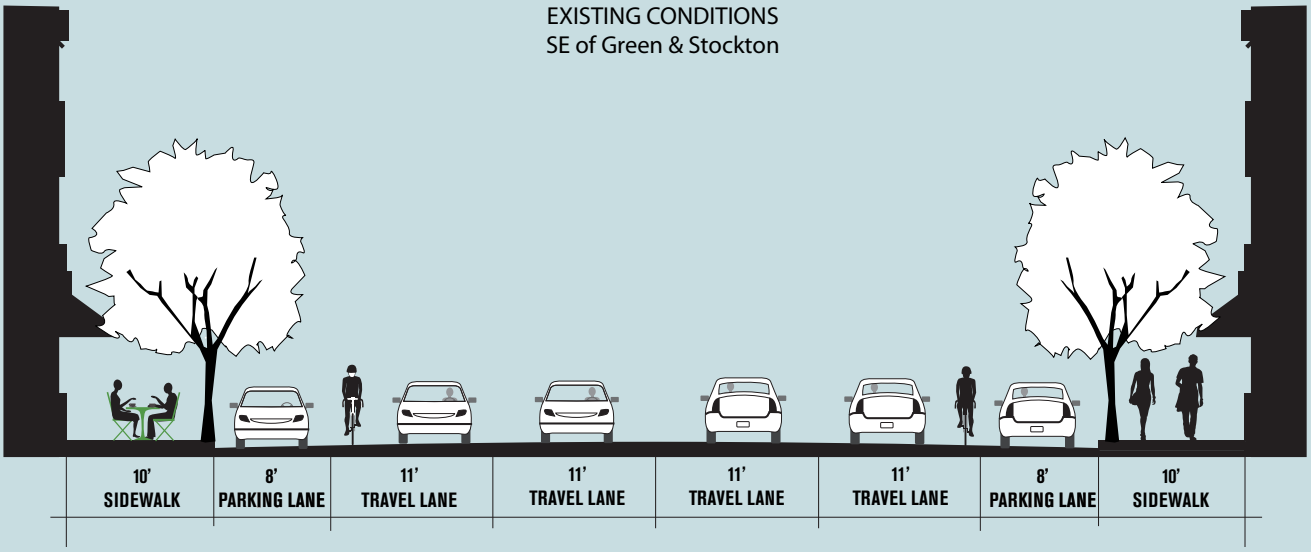
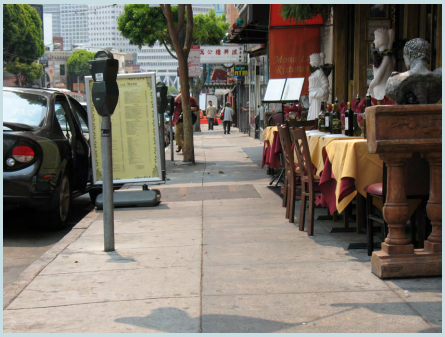
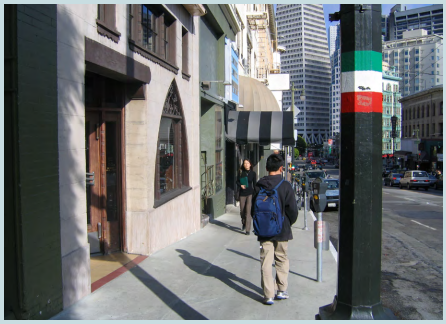


FIGURE 2-6 PHOTOS OF COLUMBUS AVENUE FROM LOWER COLUMBUS, CIRCA 1890 AND 1929

Images from San Francisco History Center, San Francisco Public Library

FIGURES 2-7 COLUMBUS AVENUE SIDEWALK — TYPICAL CONDITIONS





Images from Nelson\Nygaard

FIGURE 2-8 DIAGRAM OF SIDEWALK "ZONES"

FIGURE 2-9 VEHICLE VOLUMES (PM PEAK HOUR)

	All Movements	Through on Columbus	Turns Off Columbus	Turns Onto Columbus
at Broadway	3,124	1,111	67	313
at Stockton/Green	1,391	873	270	173
at Union	1,378	889	30	212
at Filbert	1,511	1,003	116	285

Available traffic counts for the first block of Columbus south of Broadway, meanwhile, suggest that peak volumes are somewhat higher in the southbound direction on this block, as left turns from northbound Columbus onto westbound Broadway are prohibited, leading motorists bound for the Broadway tunnel to use Kearny instead.

Figure 2-10 shows posted speed limits and 85th-percentile speeds observed by SFMTA on a late Tuesday morning in December 2007 at locations on either end of the Study area. Notably, while vehicles travel faster on less-congested upper Columbus, farther from the Financial District, 85th-percentile speeds on lower Columbus are at or just over the speed limit.

FIGURE 2-10 VEHICLE SPEED LIMITS AND OBSERVED 85TH PERCENTILE SPEEDS

	Speed Limit	85th Percentile Speed
between Pacific & Broadway		
Northbound	25	27
Southbound	25	25
between Greenwich & Lombard		
Northbound	25	30
Southbound	25	32

Figure 2-11 displays PM Peak Hour Intersection Levels of Service (a measure of average delay) for each of the intersections that are the focus of this Study. The City of San Francisco's recommended minimum level of service is "D"; at no point are levels of service in the Study Area lower than "C," and only at the complex, six-legged intersection of Columbus, Green and Stockton is LOS less than "B."

FIGURE 2-11 PM PEAK HOUR INTERSECTION LEVELS OF SERVICE

Motor Vehicle Level of Service	
at Broadway & Grant	B
at Stockton & Green	C
at Union & Powell	B
at Filbert & Powell	A

The worst LOS of "C," at the intersection of Columbus, Stockton, and Green, is due to several factors. Most of the delay is caused by movements westbound on Green, where one westbound lane must accommodate five different possible movements; this one lane has an individual LOS of "D." The majority of the vehicles on westbound Green want to make one of two possible left turns -- onto Columbus or Stockton -- thus causing back-ups on the intersection approach.

At the same intersection, movements northbound and southbound on Stockton are both LOS C. The delays in northbound traffic are due to the high number of possible turning movements (four); the reasons for the southbound delays are less clear. While movements southbound on Stockton are restricted to right turns onto Columbus, this movement only has 3 protected phases and 3 permitted phases, a fact that may cause the delay.

2.3 Parking Conditions

Parking conditions in the corridor were studied in depth, and are described in detail in **Chapter 3**.

2.4 Transit Conditions

TRANSIT SUPPLY AND DEMAND

Between Pacific and Filbert, a total of 10 San Francisco Municipal Railway (Muni) bus routes operate on or cross Columbus, as shown in **Figures 2-12** and **2-13**.

The segment of Columbus in the Study area most heavily used by transit is southbound between Union and Stockton, where the total number of buses operating per hour in the AM peak period averages 41.4, or roughly one bus every 90 seconds. The peak number of turn movements is from southbound Columbus right on to Stockton, at 25.7 per hour in the PM peak period. There are no left-turn movements from Columbus on to other streets.

A total of 15 bus stops, some including shelters and some designated merely by signage, are located along Columbus in the Study area or on cross streets immediately adjacent to Columbus. Daily, AM peak period (7 to 9 a.m.) and PM peak period (4 to 6 p.m.) boardings and alightings at these stops are shown in **Figure 2-14**.

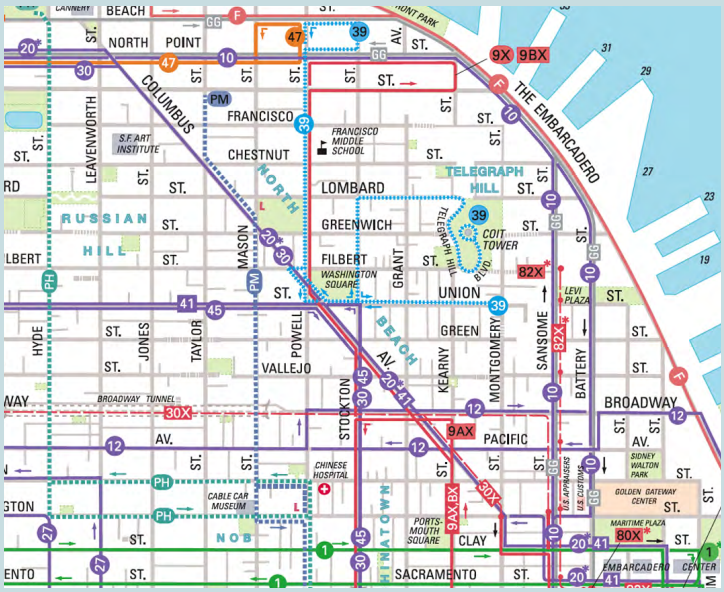
Notably, the stops on either side of Stockton just south of Columbus—the first (southbound) and last (northbound) stops in Chinatown for Routes 30 and 45, and in the northbound direction for the 9X—are by a large margin the busiest bus stops in the Study area. As stop amenities are most important to those waiting to board a bus, it is the southbound stop on the west side of Stockton that clearly should receive the most attention from planners: it claims roughly three times more daily boardings than any other stop in the area.

Many of the routes in the Study area operate 60-foot articulated buses, rather than standard 40-foot models. Many are also electric trolleybus routes, and catenary extends along the entire length of Columbus through the Study area.

Transit operations in the area may be significantly altered as early as summer 2009,

FIGURE 2-12 MUNI BUS

FIGURE 2-13 LOCATIONS AND HEADWAYS OF BUS ROUTES OPERATING ON OR ACROSS COLUMBUS



Map from the Municipal Railway

Route	Interface with Columbus	Headway	Notes
9X - San Bruno Express	City College to Fisherman's Wharf Columbus northbound between Kearny and Powell, and southbound from Powell to Stockton.	10 Minutes (peak)	
9AX - San Bruno "A" Express	City College to Chinatown crosses Columbus westbound at Broadway.	10 Minutes (peak)	Peak-only, unidirectional (north mornings, south evenings) service
9BX - Sun Bruno "B" Express	City College to Fisherman's Wharf	15-minute (mornings), 10-minute (evenings)	Follows the 9X alignment through the Study Area. Peak-only, unidirectional (north mornings, and south evenings) service
12 - Folsom	Mission District to Pacific Heights crosses Columbus westbound at Pacific and eastbound at Broadway.	10 Minutes (peak)	
20 - Columbus	Fisherman's Wharf to the Financial District in both directions along the entire length of Columbus in the Study Area.	10 Minutes (peak)	Does not operate in the afternoon peak period, evenings, or weekends.
30 - Stockton	Marina District to South of Market in both directions on Columbus north of Stockton.	4-6 Minutes (peak)	Short runs turn left from westbound Union onto southbound Columbus.
30X - Marina Express	southbound on Columbus south of Broadway and crosses Columbus westbound at Broadway, but does not stop in the Study Area.	5-minute (mornings), 10-minute (evenings)	Peak-only, unidirectional (east and south mornings, north and west evenings) service
39 - Coit	Fisherman's Wharf to Telegraph Hill southbound on Columbus between Filbert and Powell, then crosses Columbus eastbound at Union. Northbound on Columbus between Union and Powell.	20-minute (mid-day and afternoon peak period)	
41 - Union	Cow Hollow to the Financial District northbound on Columbus to Stockton, then crosses Columbus westbound at Union. Southbound on Columbus from Union south.	5-minute mornings, 10-minute evenings	Peak-only, unidirectional (east and south mornings, north and west evenings) service
45 - Stockton/ Union	Cow Hollow to South of Market crosses Columbus northbound at Stockton, then westbound at Union. Southbound on Columbus between Union and Stockton.	9-minute (peak)	

FIGURE 2-14 BOARDINGS & ALIGHTINGS BY TIME PERIOD & LOCATION

	Weekday			AM Peak			PM Peak		
	On	Off	Total	On	Off	Total	On	Off	Total
SB Stockton S of Columbus	2,611	780	3,391	315	82	397	454	166	620
NB Stockton S of Columbus	894	1,931	2,825	135	204	339	156	409	565
NB Columbus N of Union	479	887	1,366	89	269	358	64	188	252
SB Columbus N of Union	885	263	1,148	186	33	219	148	51	199
WB Union E of Columbus	570	395	965	104	73	177	166	120	286
NB Columbus S of Green	219	676	895	47	144	191	42	144	186
EB Union W of Columbus	327	407	734	112	95	207	76	100	176
NB Columbus N of Broadway	111	550	661	31	111	142	17	107	124
NB Columbus N of Pacific	128	502	630	51	131	182	24	78	102
SB Columbus N of Filbert	266	92	378	54	17	71	48	18	66
SB Columbus S of Green	143	208	351	69	46	115	30	27	57
SB Columbus S of Broadway	68	98	166	25	45	70	16	13	29
EB Broadway E of Columbus	108	54	162	23	13	36	16	14	30
SB Powell N of Filbert	88	52	140	9	5	14	17	15	32
WB Broadway W of Grant	121	4	125	-	-	-	112	3	115

BUS BOARDING & ALIGHTING PASSENGER VOLUME BY TIME PERIOD & LOCATION

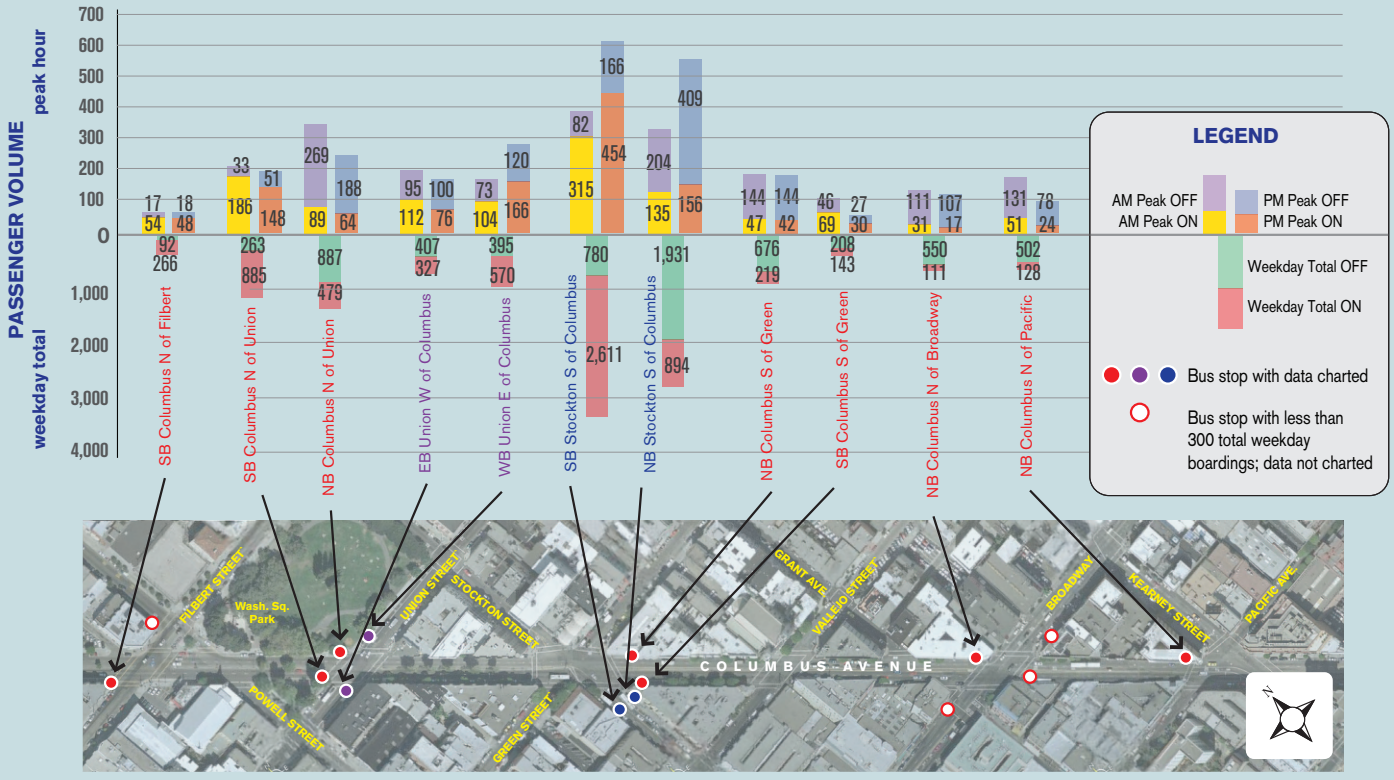
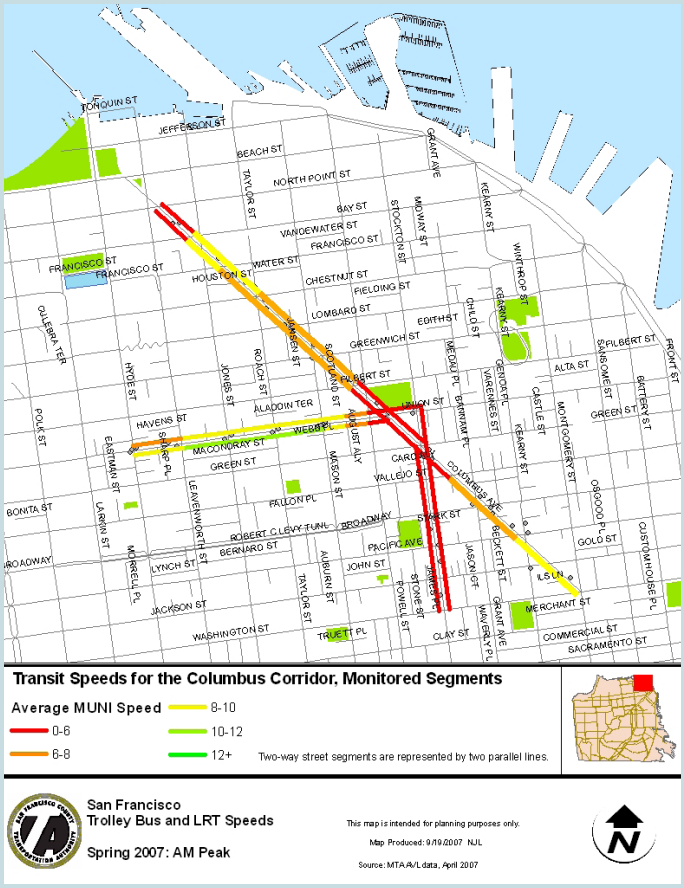
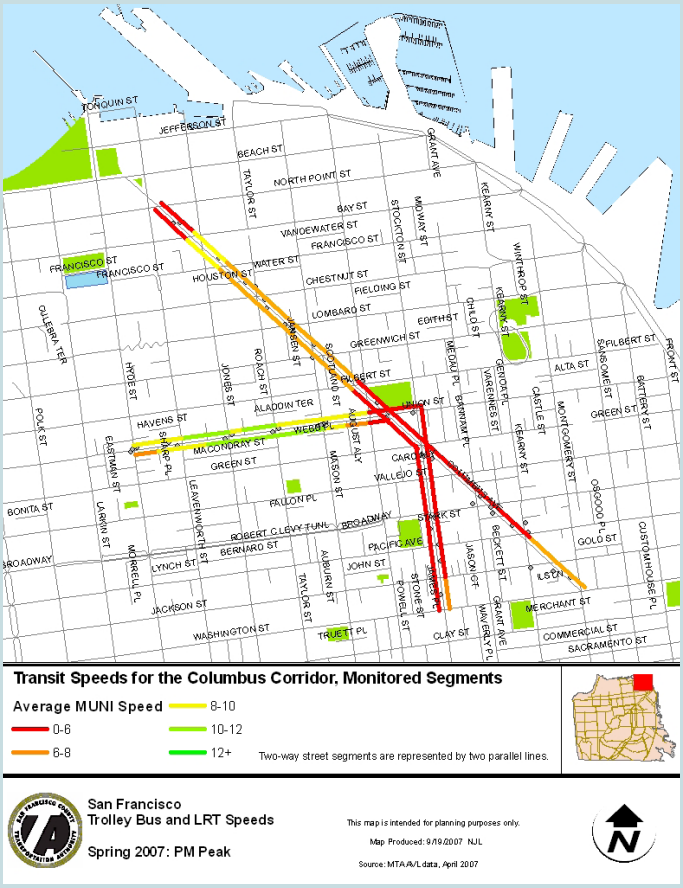


FIGURE 2-15 AM & PM PEAK PERIOD AVERAGE TRANSIT SPEEDS





based on implementation of SFMTA Transit Effectiveness Project (TEP) recommendations. These include:

- Relocation of the northern terminus of Routes 9X and 9BX to Broadway;
- Elimination of the 20-Columbus;
- Replacement of key segments of both routes by a new 11-Downtown Connector operating primarily along Folsom Street south of Market, then north on Sansome, Clay and Montgomery (southbound) and Washington (northbound), Columbus, Powell, and North Point west to Van Ness;
- Exclusive operation of 60-foot articulated vehicles on the 30-Stockton.

TRANSIT PERFORMANCE

In developing its recommendations, the TEP conducted an extensive analysis of Muni operations. Its observations of travel times found average speeds in the study area as low as 3 mph, at the Stockton/Green intersection, and up to 12 mph on eastbound Union (**Figure 2-15**). The average speed of buses in the area depicted was just 7 mph. TEP also found overcrowded conditions: On the 30-Stockton, the peak hour unidirectional load (total number of passengers on board in one direction) on the 30-Stockton at a point just past the Stockton/Columbus stop was 910.

Muni's most recent quarterly report (Fall 2009) provide a couple of useful metrics for evaluating transit service:

- **Percent of AM peak trips with load factors exceeding 125 percent of standard.** For this metric, routes 30 and 45 had the highest observed percentages in the entire Muni system: 33 percent.
- **Reliability.** This is measured by rates of schedule adherence, based on a standard of no more than one minute early or four minutes late. As shown in **Figure 2-16**, buses in the Study area were relatively close to the systemwide average. However, no route in the area achieved Muni's goal of 85 percent schedule adherence.

FIGURE 2-16 BUS RELIABILITY

Reliability: Rates of Schedule Adherence	
30-Stockton	80%
45 Union/Stockton	71%
9X San Bruno Express	60%
Systemwide Average	71%
Muni Goal	85%

FIGURE 2-17 CROWDED CONDITIONS AT BUS STOPS IN THE STUDY AREA

While transit levels of service have not been analyzed quantitatively for this exercise, the quantitative findings above as well as qualitative assessment suggest that at present, transit LOS is low by practically any standard. Travel times are slow; reliability is relatively low; load factors are high; and the space available for waiting and loading on narrow sidewalk stops is limited (**Figure 2-17**).

2.5 Pedestrian Conditions

PEDESTRIAN SUPPLY AND DEMAND

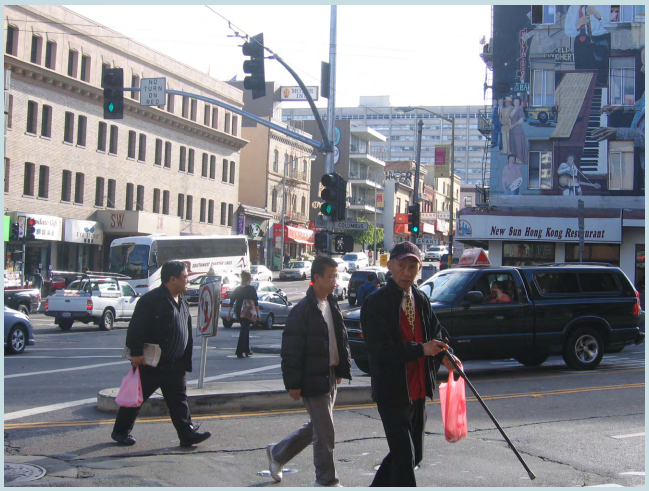
As discussed on **page ES-1**, sidewalk widths along Columbus are deficient. Further, many crosswalks, because they are aligned at angles of approximately 45 percent to the perpendicular, are significantly longer than the widths of the streets they traverse. At the intersection of Broadway and Columbus, crossings on three of the four sides are about 85 feet long.

The study team collected pedestrian counts on weekdays in June 2008 between 5 and 6 p.m. at four of the five intersections in the Study area. Pedestrian volumes are summarized in **Figure 2-18**. Notably, the intersection of Columbus, Green and Stockton experiences the highest volumes of both pedestrians (4,176 in a single hour, or slightly more than one per second) and bicyclists (see next section). Observed numbers of pedestrians at the intersection of Columbus, Broadway and Grant were nearly as high (3,476 in an hour). Both pedestrian volumes climb going north from the Broadway and Grant intersection to the "summit" at Green and Stockton, then decline, along with the terrain, to the north past Washington Square Park. The most common movements through all intersections for pedestrians were through movements on Columbus itself.

FIGURE 2-18 PM PEAK HOUR PEDESTRIAN VOLUMES & LOS

	Volume (Per Hr.)	Level of Service
at Broadway & Grant	3,476	C
at Stockton & Green	4,176	E
at Union & Powell	1,980	C
at Filbert & Powell	1,966	C

FIGURE 2-19 PEDESTRIANS



PEDESTRIAN PERFORMANCE

The study team calculated pedestrian levels of service (LOS) for each intersection using a formula relying primarily on crossing distances and signal cycle times, with assumptions derived from the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) and the Institute of Transportation Engineers' (ITE) Highway Capacity Manual (HCM). In these methodologies, the pedestrian levels of service are measures of how much time is available to cross a street and of intersection geometry, and not of the space available for maneuvering on sidewalks, or mobility in terms of either speed or comfort. They are primarily measures of safety. **Figure 2-19** shows pedestrians crossing at Broadway and Columbus.

Pedestrian levels of service are summarized in **Figure 2-20**. Pedestrian LOS for the Columbus, Green, and Stockton intersection are lower than at other intersections because the separate crossings of Green and Stockton on each side of Columbus have been analyzed as a single crossing. This is because in order to continue north or south along Columbus, one must cross both, with only a few feet of sidewalk acting as a refuge. Considered separately, the level of service for each crossing would be "C."

Overall, the FHWA/ITE methodology finds that pedestrian LOS in the study area is moderately high. However, the methodology merely addresses safety at intersections, and not sidewalk mobility. Standard pedestrian LOS measurements often do not accurately represent localized pedestrian areas or activities. While pedestrian LOS is a good general measurement, it doesn't effectively integrate certain attributes such as the high level of café seating along Columbus or the complexities of the multi-leg intersection crossings. Therefore, it should not be relied on alone to determine overall pedestrian conditions. Development of design alternatives will take into account the unique local conditions of Columbus Avenue, such as the cafe seating and complex crossings, as well as community input, which rates pedestrian conditions poorly.

Figure 2-21 details collision information for intersections in the study area and illuminates the most common types of collisions. The most common vehicle movement preceeding the collision was going straight, followed by making turns. Furthermore, even though most pedestrians were in the crosswalk, they were still hit. The map in **Figure 2-22** shows the locations of collisions.

FIGURE 2-20 PEDESTRIAN ACTION PRECEDING COLLISION ON COLUMBUS, 1998-2006

	Number of Incidences	Pct.
Crossing (in crosswalk)	39	59%
Crossing (not in crosswalk)	20	30%
In Street	7	11%
Total	66	100%

FIGURE 2-21 VEHICLE MOVEMENT PRECEDING COLLISION ON COLUMBUS, 1998-2003

	Number of Incidences	Pct.
Stopped	1	2%
Proceeding straight	22	51%
Making right turn	7	16%
Making left turn	9	21%
Backing up	2	5%
Slowing/ stopping	1	2%
Entering traffic	1	2%
Total	43	100%

FIGURE 2-22 COLLISIONS INVOLVING PEDESTRIANS, 1998-2006

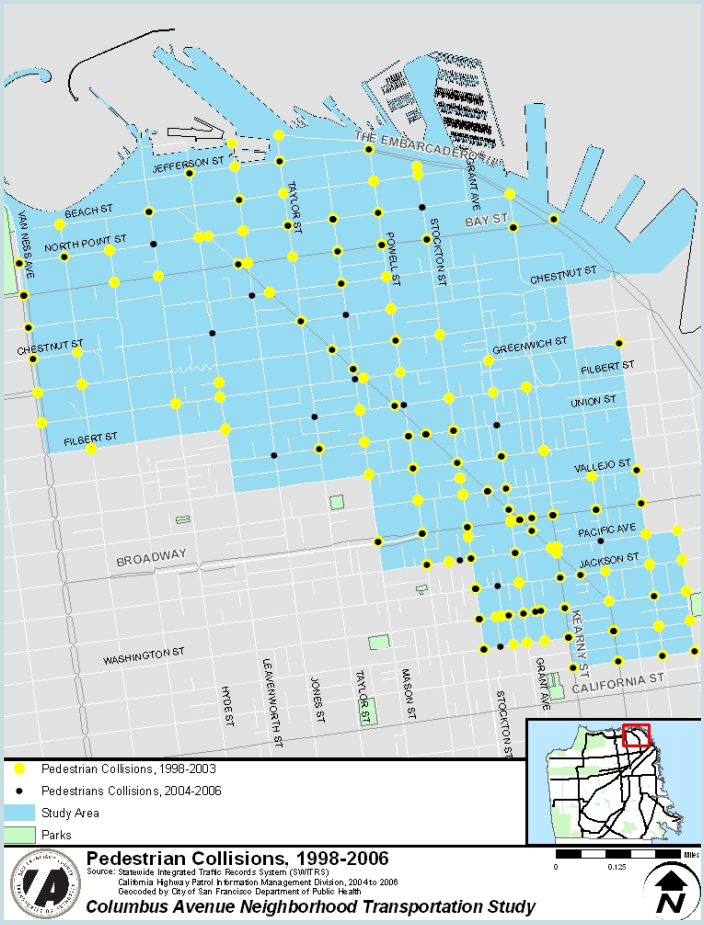


FIGURE 2-23 SHARED ROUTE MARKINGS ON COLUMBUS

2.6 Bicycle Conditions

BICYCLE SUPPLY AND DEMAND

The high volumes of traffic and narrow travel lanes on Columbus make it a challenging space to navigate for cyclists. Despite policy that allows bicyclists to use the full travel lane, the combination of turning vehicles, merging transit buses and fast moving traffic present opportunities for improvement.

Both Columbus (Route 11) and Broadway (Route 10), meanwhile, are designated city bicycle routes. Columbus is a relatively important route for cyclists for many of the same reasons it is popular with motorists: it is direct, connects to other major routes and, most importantly for cyclists, it is relatively flat. However, both streets are Class III routes, meaning cyclists must share travel lanes with motorized vehicles (**Figure 2-23**).

As with pedestrian counts, the study team collected bicycle counts on weekdays in June 2008 between 5 and 6 PM at four of the five intersections in the Study area. The results of the counts can be seen in **Figure 2-24**. The highest cyclist volumes were observed at the intersection of Columbus, Stockton and Green (130 cyclists in a single hour). Similar to pedestrian volumes, cycling volumes were observed to increase going north from the Broadway and Grant intersection to the "summit" at Green and Stockton, then decline, along with the terrain, to the north past Washington Square Park. The most common movement for cyclists was through movement on Columbus Avenue itself.

FIGURE 2-25 EXISTING ALLOCATION OF STREET SPACE

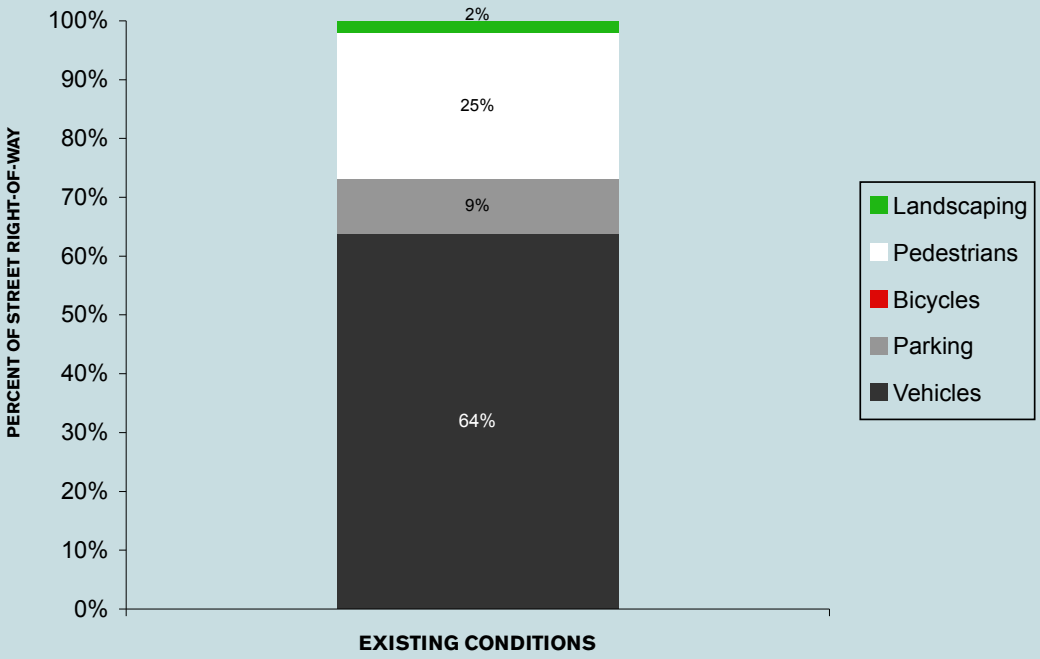


FIGURE 2-24 PM PEAK HOUR BICYCLE VOLUMES & LOS

	Volume (Per Hr.)	Level of Service
at Broadway & Grant	62	
between Broadway & Vallejo		E
between Vallejo & Green		E
at Stockton & Green	130	
between Green & Union		E
at Union & Powell	62	
between Union & Filbert		E
at Filbert & Powell	38	

Bicycle levels of service were calculated using the Bicycle Compatibility Index (BCI) developed by the Federal Highway Administration (FHWA), which takes into account the availability of bicycle lanes, bicycle and auto lane dimensions, 85th-percentile auto speeds, parking occupancy and other factors. The unit of bicycle LOS, then, is the block and not the intersection, and is a measure of both safety and comfort.

Bicycle levels of service are low mainly due to the absense of dedicated right-of-way.

2.7 Transportation Supply vs. Demand

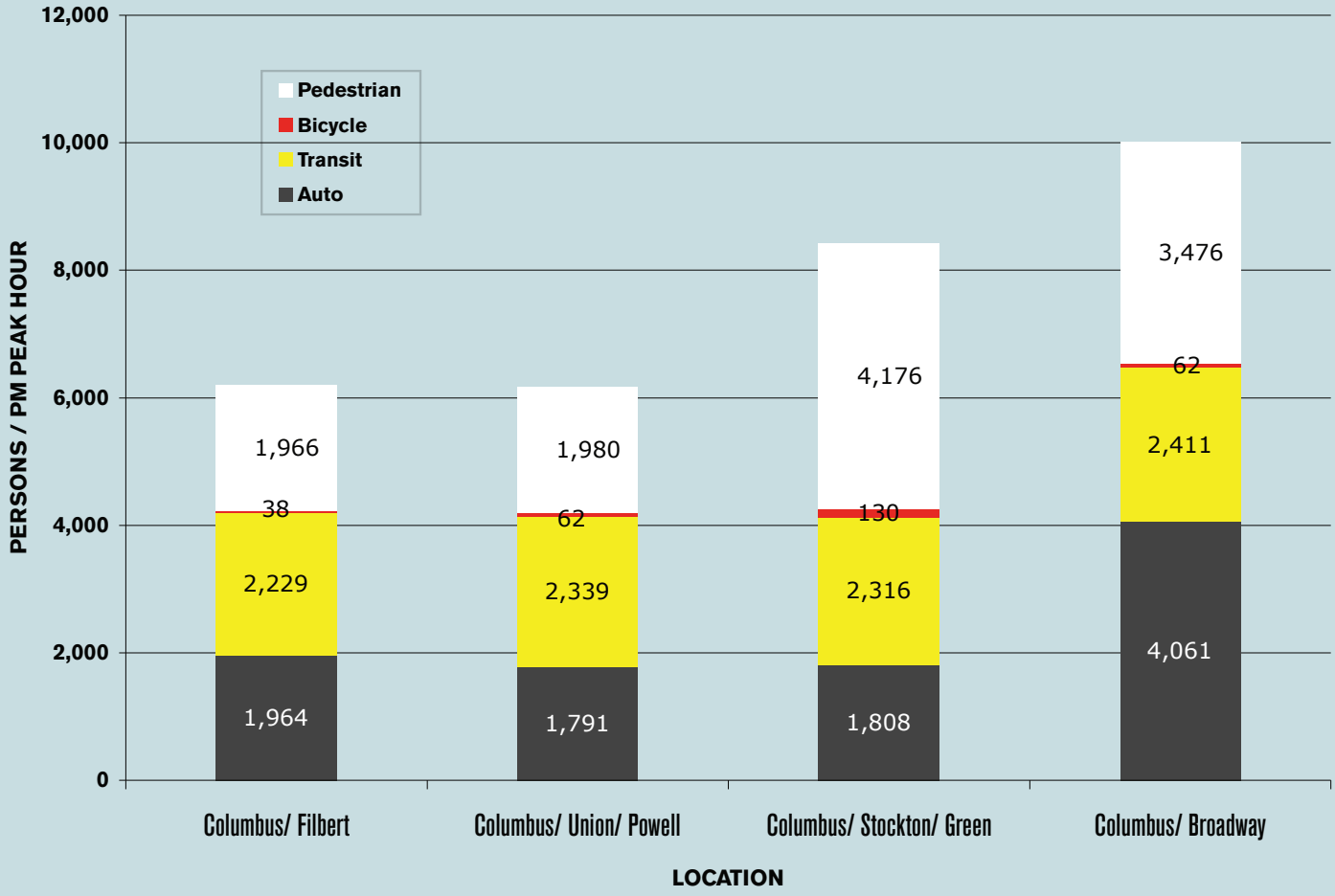
On Columbus, as on most North American streets, more space is allotted to automobile movement and storage—traffic and parking—than to other uses. This is partly because each car, which more often than not has just one occupant, requires more space than a rider aboard a transit vehicle, a bicyclist or a pedestrian. On many streets, motorists also outnumber other users. On Columbus, however, the share of space currently allotted to motorists is disproportionate to their share of all users.

Figure 2-25 illustrates the percentage of square footage within the right-of-way between Broadway and Filbert currently allocated to each mode. Note that sidewalk street furniture and door zones are defined as pedestrian space despite their limited utility for pedestrians; the actual space available for walking would be significantly less.

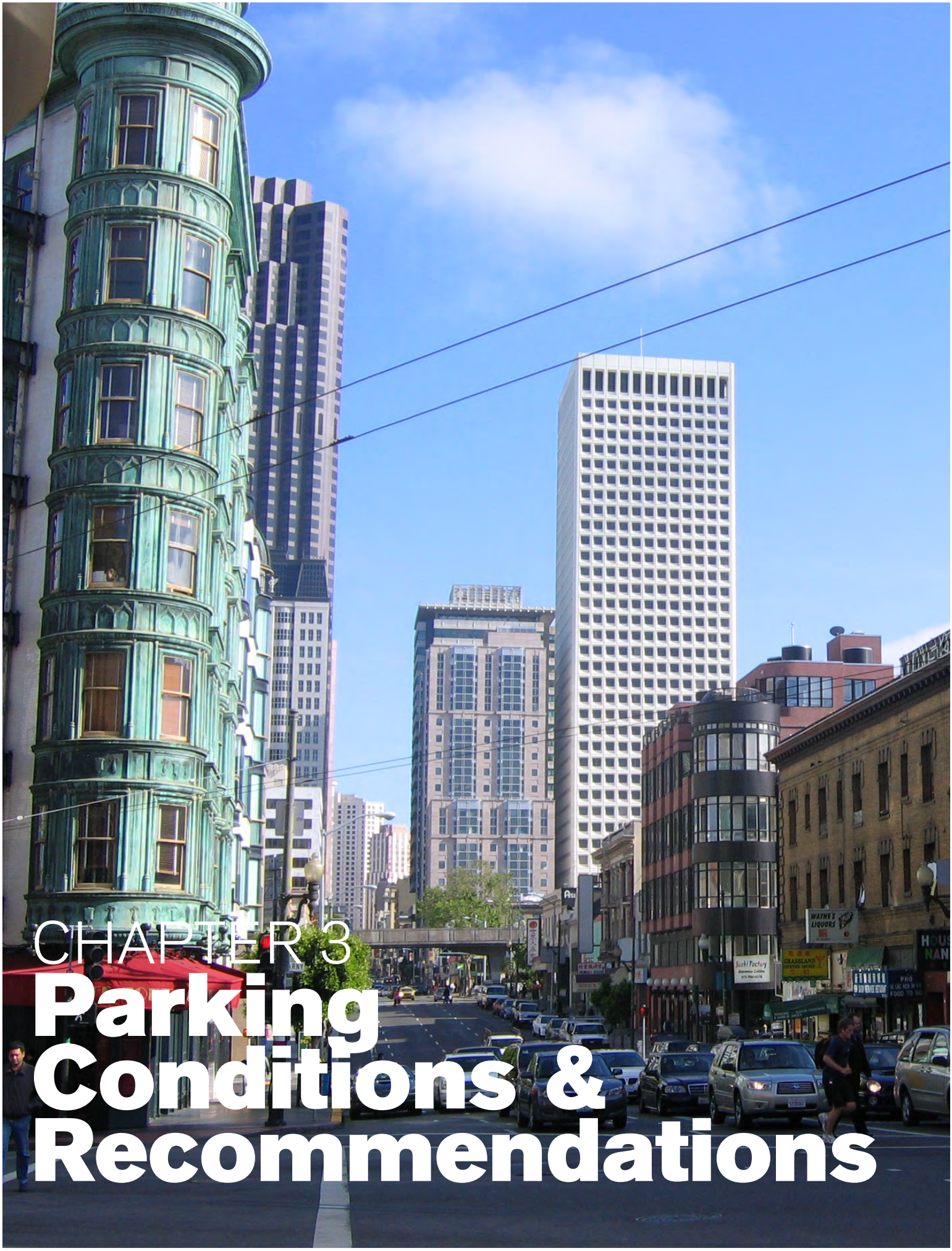
Figures 2-26 illustrates mode shares for each intersection in the Study area. Numbers of vehicles have been multiplied by an average occupancy of 1.3 to arrive at an approximate total of persons in automobiles.

As these graphics illustrate, a more proportionate allocation of space along Columbus would increase the area available to pedestrians. However, because all transit users in the corridor are bus riders, narrowing the roadway might have negative impacts for not just motorists, but nearly half of the street's users.

FIGURE 2-26 PM PEAK HOUR PERSON VOLUMES BY MODE AT DIFFERENT INTERSECTIONS



- *Key findings*
- *Over 2/3 of Columbus Avenue is vehicle space, yet people in cars are only 1/3 of the users of Columbus Avenue.*
- *More people are on transit on Columbus Avenue than in cars, yet transit has no dedicated space, and must compete with cars.*
- *Pedestrians outnumber people in cars on Columbus, yet cars have nearly 3x the space that pedestrians do.*
- *Key implications for design*
- *Vehicles enjoy a disproportionate share of Columbus Avenue's right of way.*
- *Transit riders would benefit from allocating some mixed vehicle space to dedicated support of transit operations.*
- *Pedestrian space has been sacrificed to provide space for vehicles and parking.*



CHAPTER 3

Parking Conditions & Recommendations

CHAPTER 3

Parking Conditions & Recommendations

This chapter presents the findings of a survey of parking occupancy and turnover rates and accompanying inventory of parking supply conducted in the Columbus Avenue corridor as part of the Study. The description and analysis of existing parking conditions in this chapter served to inform the conceptual designs to be presented in the following chapter.

The parking inventory and survey were conducted by members of the consultant team and temporary surveyors under their supervision. The inventory was completed in stages during spring 2008, and the survey was conducted Friday and Saturday, April 4 and 5, 2008.

3.1 Background

PARKING STUDY AREA

A map of the parking study area (**Figure 3-1**) can be found on the following pages. In general, the area includes Columbus Avenue from its intersection with Pacific Avenue northwest to Greenwich Street, as well as at least one full block on each side of all cross streets and alleys intersecting those streets. Most of the area is generally considered to be within the boundaries of the North Beach neighborhood; to the southwest, the area extends into Chinatown.

The parking study area was defined by the project team using the following criteria:

- It includes each of the "priority intersections" previously selected for conceptual redesign (Columbus and Broadway, Columbus and Stockton, and Columbus and Union, as shown in **Figure 3-1**), and extends an additional block in each direction beyond the northern- and southernmost priority intersections. To the north, it extends one more block, to a point one block past the northwestern corner of Washington Square, which is generally regarded as the "center" of North Beach.
- It includes at least one block of all streets intersecting with Columbus Avenue on both sides of Columbus. Because Columbus diagonally bisects the generally cardinal north-of-Market Street grid, some side blocks are significantly shorter than the standard for north-of-Market blocks (275' east to west, and 412'-6" north-south). In these cases, the parking study area was extended an additional block.
- It includes on-street parking spaces on both sides of all streets, including those streets along the edges of the study area.
- Finally, it includes off-street parking sites both within and bordering the study area. These are also shown within **Figure 3-1**.

For purposes of analysis, the study area has been divided into four quadrants, also shown in **Figure 3-1**.

- **Northwest.** Southwest of the centerline of Columbus Avenue and north of the centerline of Green Street.
- **Northeast**. Northeast of the centerline of Columbus Avenue and west of the centerline of Stockton Street.
- **Southeast**. Northeast of the centerline of Columbus Avenue and east of the centerline of Stockton Street.
- **Southwest**. Southwest of the centerline of Columbus Avenue and south of the centerline of Green Street.

The combined linear distance of all 108 block faces within the survey area is 21,320 feet, or 4.04 miles. Within or adjacent to the parking study area are an additional 12 off-street sites[1] providing public, non-reserved, short-term parking.

A number of characteristics of the study area are noteworthy:

- The study area includes parts of neighborhoods with relatively little private off-

1 Because the project team was denied access to one off-street site, that site was not included in the occupancy and turnover survey and is not shown in the map on the following page.

FIGURE 3-1 PARKING STUDY AREA MAP

street parking and high residential densities – gross residential densities in census tracts 106 and 107, which incorporate almost all of the survey area, are approximately 60 units per acre.

- The study area includes part of four major commercial corridors – Columbus, Broadway, Stockton Street, and Grant Avenue – and is characterized by destination retail, including many restaurants, cafes, and bars.

- Auto ownership rates are low, and pedestrian activity and transit use are relatively high. Forty-eight percent of the households in North Beach are zero-car households, relative to 29 percent citywide.

DEFINITIONS

Some of the terms used throughout this chapter are defined below for clarification.

Parking Time Frame

- **Parking peak period.** The hour of the day with greatest demand for parking. May be a different hour than the peak period of traffic volumes or the peak period of congestion.

- **Short term parking**. Less than two hours.

- **Long term parking.** Greater than two hours.

Parking Type

- **Regular metered spaces.** Metered spaces that are not for motorcycles, loading, or short-term – less than 30 minutes – parking.

- **Loading spaces.** For the purposes of this study, part-time commercial and passenger loading zones, as well as "green" short-term metered spaces, are counted as loading rather than metered spaces.

- **General use spaces.** When referring to on-street spaces, general use includes regular metered and residential permit spaces; it excludes on-street spaces that are color-coded or for motorcycles. When referring to off-street parking spaces, general use spaces excludes spaces that are for monthly parkers or otherwise reserved.

Parking Pricing & Use

- **Visitor.** Someone from outside San Francisco.

- **Market rate parking.** Parking priced at a level encouraging 85% occupancy. At this level of occupancy, at even the busiest hour about one out of every seven spaces will be available. This provides enough vacancies so that visitors can easily find a spot near their destination when they first arrive.

- **"Available" parking / undersubscribed parking supply.** Supply at or below 80% occupancy.

- **"Unavailable" parking / oversubscribed parking supply.** Supply above 90% occupancy.

- **Illegal parker in a residential permit area.** A non-permit holder who remains for more than two hours during permit hours (8 a.m. to 9 p.m.).

- **Illegal parker at a metered space.** A parker who remains in the space for longer than the time limit, not paying the fee.

RELEVANT STUDIES & PROGRAMS

A number of recent and current planning processes in the city and survey area offer insights relevant to the evaluation of parking conditions.

- In spring 2008, a few weeks before the occupancy and turnover survey was conducted, Authority staff conducted a *Neighborhood Transportation Survey*. A memorandum summarizing findings of the survey

is included in the **Appendix F**. A total of 777 pedestrians along Columbus Avenue were interviewed between 4:15 and 8 p.m. on both weekdays and weekends, and findings related to parking included:

- Those who drive to Columbus Avenue are most likely to be visitors from outside San Francisco, and top reasons they drive to Columbus Avenue are because they come in large groups or there is no transit near their homes.
- Weekday respondents indicated to the same degree that they dislike the street congestion, the slow transit speeds and the difficulty of finding parking. Weekend respondents mainly commented on the difficulty of finding parking.
- While approximately 40 percent of respondents who drove to the area did not pay for parking, nearly 25 percent on weekdays and nearly 35 percent on weekends paid more than $10 to park.

- In summer 2007, the Municipal Transportation Agency conducted a three-month evaluation of a temporary installation of multispace parking meters installed at locations along Columbus Avenue.The evaluation ultimately did not provide conclusive recommendations for alternate meter technologies and parking pricing strategies; however, a number of its findings are germane to this effort:
  - Occupancy rates were found to be highest in evenings, just after meter enforcement hours ended, and on Sundays, when there was no metering.
  - During a week-long intensive study of usage by vehicle type, 50 percent of all parked passenger vehicles were found to be in violation of either time limits, meter payment or both. Sessions lasting longer than two hours by vehicles displaying disabled placards accounted for 1.8 percent of total capacity.
  - Parking availability and turnover both improved slightly after multi-space meters replaced single-space meters, and these trends continued even after single-space meters were reinstalled.
  - Revenues fell by about 25 percent due to a combination of lower occupancy rates caused by shorter stays and lower rates of compliance with regulations. This was partially offset by prevention of meter feeding.
  - In a survey, approximately 64 percent of respondents found the multispace meters easy to use, and 51 percent preferred them to traditional single-space meters. Twenty-five percent of meter revenues were paid by credit card, as compared to 75 percent by coin.
- The MTA's *SFpark* program is a new effort to manage the city's parking supply using best-practice approaches and new technologies. With citywide implementation of new policies and equipment as the long-term goal, the program currently consists of pilot projects in a select number of areas, not including the survey area. This *Study's* recommendations (see "**Summary**") are consistent with *SFpark* principles, including application of pricing strategies to maintain availability targets.

3.2 Parking Supply: Inventory & Policies

METHODOLOGY

The project team developed an inventory of all on- and off-street parking spaces within the survey area primarily through visual observation. The team first developed a preliminary inventory by reviewing Department of Parking and Traffic diagrams, then observed conditions firsthand in the field. A team of surveyors then submitted adjustments to inventory counts based on their observations. Further minor adjustments were made based on survey results (e.g., if six cars were consistently found to occupy metered spaces on a block reported to have seven metered spaces, it was assumed that the actual number of available metered spaces on the block was six). Finally, a member of the project team made follow-up site visits to confirm details.

Some minor discrepancies may exist because of: the complexity of on-street parking regulations in the parking study area, temporary restrictions (typically related to construction), vandalization of meters, and individual spaces not always being clearly delineated.

FINDINGS

Parking Supply Policies

As part of the inventory, the project team also researched regulations related to parking in the survey area.

Metered Spaces

A small portion of the survey area – the blocks south of Broadway – are in the Department of Parking and Traffic's parking meter Area 2, the "**downtown periphery**." Hourly rates within this zone are $2.50. The remainder of the survey area north of Broadway is within Area 3, the zone that includes the great majority of the city's metered spaces. Hourly rates within this zone are $1.50. Hours of operation are generally from 9 a.m. to 6 p.m. Monday through Saturday (no full-time general metered spaces were identified as operating under different hours). Time limits are typically one or two hours. Outside of restricted hours (i.e., after 6 p.m. Monday through Saturday, and all day Sunday), metered spaces are free and time-unlimited.

Residential Parking Permit Spaces

The Department of Parking and Traffic's Residential Parking Permit program allows residents of Permit Areas to purchase up to four permits per household (or four per business, including three for delivery vehicles). These permits grant the holder unlimited parking rights in all permit zones (that is, spaces in otherwise unregulated spaces) within their areas. Annual permits cost $60 per vehicle, or approximately 16 cents per day. Residential parking permit areas are otherwise unregulated in terms of parking; those without residential parking permits may park in these spaces for up to two hours between 8 a.m. and 9 p.m. As with metered spaces, the residential permit areas are divided by Broadway: to the south is residential parking permit Area C, and to the north is Area A.

FIGURE 3-2 YELLOW CURB

FIGURE 3-3 MOTORCYCLE PARKING

Color Curbs & Motorcycle Spaces

DPT "color curb" spaces are sometimes indicated by actual painted curbs, and sometimes by color-coding on meters themselves. They include the following categories:

- **Red.** No stopping.
- **Yellow.** Commercial loading, up to 30 minutes for vehicles with commercial plates. Times vary, and some spaces revert to general metered spaces outside restricted hours (**Figure 3-2**).
- **White.** Passenger loading. Drivers may not leave their vehicles unattended, and must move on within 5 minutes. Times vary, and some spaces revert to general metered spaces outside restricted hours.
- **Green.** Short-term parking, up to 15 or 30 minutes. Hours are the same as for regular meters.
- **Blue.** For vehicles with disabled placards only.

It should be noted that in the inventory, survey, and throughout this document, color-coded spaces are categorized as distinct from "regular" – non-color-coded – metered spaces. This includes both loading spaces which may be available for general use outside of designated hours, and 15- or 30-minute time-limited green metered spaces. (The latter, it could be argued, are effectively regular metered spaces; but in any case, there are few of them in the survey area relative to the numbers of regular metered spaces.)

Off-Street Spaces

Of the 12 off-street sites in the survey area, 10 are managed by private operators, and rates and hours vary. Hourly rates for off-street parking are generally much higher than for on-street parking. Prices for short-term parking (less than two hours) at off-street sites range from roughly two to six times higher than meter rates, depending on duration of stay – and when meters are not in effect, the disparity is sometimes even greater, as some off-street sites charge more to park during those same periods. Short-term parking in residential parking permit spaces is always free, and the cost of an annual permit translates to 16 cents per day. Some garages charge flat rates, resulting in short-term prices as high as $20 for 30 minutes. Finally, since prices at some off-street sites continue to rise over time (to as much as $26 for 24 hours), long-term parkers may choose to risk a ticket and park illegally. The cost of a citation for meter violation: $50.

Figure 3-4 show the operating hours and parking rates of the off-street parking sites wtihin the study area.

Parking Supply Inventory

Figure 3-5 is a tally of the peak number of legal parking spaces available in the survey area at any point during the survey period. Where spaces are not clearly marked, totals are generally equivalent to the highest observed count on each block or in each lot (one lot's capacity was set at the total given by a valet, rather than the highest observed total, because the latter likely included some overflow into the street). Project team members were denied access to one large garage, so its stated capacity is an estimate based on building size.

Among the inventory's notable findings are:

- The only available **unrestricted parking** in the survey area is in off-street lots and garages. All other parking is subject to time or use restrictions (colored curbs).
- Parking restricted to residents through **permit parking** accounts for only about 15 percent of total supply, although non-residents may also use these spaces for periods of two hours or less.
- Approximately 76 percent, or about three-quarters, of all curbside parking spaces in the survey area are available for **general use** by all parkers, either in regular metered spaces or within residential parking permit spaces for periods of two hours or less.

FIGURE 3-4 HOURS & RATES ON FRIDAYS & SATURDAYS OF OFF-STREET SITES

ID	Name/ Operator	Quad-rant	Closing Time*	Rates (in dollars up to duration in hours:minutes) 0:30	1:00	1:30	2:00	2:30	3:00	3:30	4:00	Notes
A	Tower Valet (Broadway)	SE	2am	5	8	11	14	17	20	23	25	$25 maximum
B	Tower Valet (Fresno)	SE	1:30am	3	6	9	12	15	18	21	24	$25 maximum
C	North Beach Restaurant	SE	12am	15	15	15	15	15	15	15	15	Friday
				20	20	20	20	20	20	20	20	Saturday
D	Alan F. Coe	NW	24 hrs	10	10	10	10	10	10	10	10	
E	Priority Parking	NW	24 hrs	12	12	12	12	15	15	15	15	up to 2 hours
F	Filbert Street Garage	NW	1am	2.50	2.50	2.50	2.50	2.50	2.50	15	15	… up to 8 hours, then $17.50 up to 12 hours, then $20 up to 24 hours (until 3pm)
				10	10	10	10	15	15	15	15	… up to 8 hours, then $17.50 up to 12 hours (after 3pm)
G	Powell Street Garage	NW	N/A	N/A								access denied; rates unavailable
H	Green Street Mortuary	SW	10pm	15	15	15	15	15	15	15	15	
I	Bank of America	SW	24 hrs	15	15	15	15	15	15	15	15	discount for BofA customers
J	**Vallejo Street Garage**	SW	2am	2.50	2.50	5	5	7.50	7.50	9	9	4-5 hours, $12; 5-6 hours, $15; 6-7 hours, $18; 7-8 hours, $22; 8-24 hours, $26
K	**North Beach Garage**	SW	24 hrs	2.50	2.50	5	5	7.50	7.50	9	9	4-5 hours, $12; 5-6 hours, $15; 6-7 hours, $18; 7-8 hours, $22; 8-24 hours, $26
L	Robel Auto Parks	SW	10-11pm**	4	4	6	8	10	12	14	15	$15 maximum

Notes
Public garages are shown in bold.

* *Opening times are not included in this chart because they are typically much earlier than peak occupancy periods for parking in the survey area (see subsequent sections on Parking Occupancy and Turnover). However, one exception should be noted: a staffed surface lot across from the North Beach Restaurant on Green Street did not open until some time after noon on the Saturday it was surveyed.*

** *At operator's discretion*

- Of these "general use" spaces approximately 61 percent are metered spaces, and approximately 39 percent are permit spaces.
- While metered spaces are distributed relatively evenly throughout the survey area, permit spaces are concentrated in the relatively residential corner of the survey area north of Green and west of Columbus, and there are no permit spaces in the Chinatown section of the survey area.

- Approximately 24 percent, or less than a quarter, are "color curbs" or metered motorcycle spaces (Figure 3-3).
- When the on-street and off-street parking supplies are considered together, a majority of the parking study area's general use spaces – approximately 56 percent – are located in off-street lots and garages.

Figure 3-6 lists each of the 12 off-street parking sites identified by the project team as providing public, non-reserved parking during the survey period (a Friday evening and Saturday afternoon).

Most notably, 52 percent of all general use off-street spaces – or 29 percent of all general use spaces in the survey area – are located at just two adjacent sites, the city-owned North Beach and Vallejo Street garages on Vallejo between Stockton and Powell.

FIGURE 3-5 NON-MONTHLY/NON-RESERVED PARKING SPACES BY CATEGORY & QUADRANT

On-Street					
General Use Parking Spaces, by Quadrant					
	NW	**NE**	**SE**	**SW**	**TOTAL**
Parking Meter	62	86	82	70	300
Residential Parking Permit (approx.)	95	58	42	0	195
Total General Use	157	144	124	70	**495**
Color-Coded and Motorcycle Spaces, Study Area Overall					
	Commercial Loading	Passenger Loading	Disabled	Motorcycle	TOTAL
	67	46	4	41	**158**
Total On-Street					**653**
Off-Street, Study Area Overall					
	Non-Reserved	Motorcycle	Carshare		Off-Street TOTAL
	634	7	20		661
Combined TOTAL					**1,314**

FIGURE 3-6 CAPACITY OF OFF-STREET SITES

ID	Name/Operator	Quadrant	Location	Garage/Lot	General Use Spaces
A	Tower Valet	SE	Broadway btwn. Kearny & Romolo, north side	L	35
B	Tower Valet	SE	Romolo & Fresno, SW corner	L	21
C	North Beach Restaurant	SE	Green btwn. Columbus & Grant, south side	L	36
D	Alan F. Coe	NW	Green btwn. Columbus & Powell, north side	L	14
E	Priority Parking	NW	Filbert & Columbus, SW corner	L	18
F	Filbert Street Garage	NW	Filbert btwn. Columbus & Mason, south side	G	30
G	Powell Street Garage	SW	Powell btwn. Green & Union, west side	G	60 ***
H	Green Street Mortuary	SW	Green btwn. Columbus & Powell, south side	L	23 *
I	Bank of America	SW	Green btwn. Columbus & Powell, south side	L	22
J	**Vallejo Street Garage**	**SW**	**Vallejo btwn. Stockton & Powell, north side**	**G**	**156 ** **
K	**North Beach Garage**	**SW**	**Vallejo btwn. Stockton & Powell, south side**	**G**	**175 ** **
L	Robel Auto Parks	SW	Broadway btwn. Grant & Stockton, south side	G	44

Notes
Public garages are shown in bold.

* *Public access limited during funerals.*
** *According to the Department of Parking and Traffic website (http://www.sfmta.com/cms/pgar/garages.htm), the total capacity, including carshare and other spaces, of the North Beach Garage is 203 spaces, and the total capacity of the Vallejo Street Garage is 163. The counts reported above are based on visual observations by the project team; if higher figures were used, occupancy rates for each garage and for all off-street parking would be slightly lower.*
*** *Not included in estimate of capacity because data collectors were not allowed in the garage. Estimate of number of spaces based on building size.*

3.3 Parking Demand: Occupancy & Turnover Rates

METHODOLOGY

On Friday and Saturday, April 4 and 5, 2008, surveyors under supervision of the consultant conducted an occupancy and turnover survey of all public parking spaces within the survey area. On Friday, the survey was carried out between 3 and 11 p.m., and on Saturday, between 10 a.m. and 6 p.m. The criteria used in selecting these times included:

- Because design and policy decisions should be based on conservative assumptions, the survey should take place largely during times in which parking conditions are likely to be constrained. While periods of peak parking occupancy in most commercial districts occur during weekday business hours (and parking meter hours are set accordingly), North Beach's reputation is that of a "destination retail" district attractive to not just tourists but visitors from other parts of the city and region, who are more likely to drive, and characterized by restaurants, cafes and nightlife establishments. The demand data and the business hours and price structure of off-street parking supply further indicate that the peak period for parking in North Beach does indeed occur on weekends, and in particular weekend evenings.
- To confirm that demand for parking in the survey area is indeed higher outside of weekday business hours, the survey should partly take place during weekday business hours.
- In order to assess the impacts of parking pricing on occupancy, the survey should take place both during hours in which parking meters are in effect (9 a.m. to 6 p.m., Monday through Saturday) and outside those hours.
- The dates chosen for the survey should be free of special events, such as community festivals, and, if possible, of inclement weather that might skew demand. (Fortunately, it did not rain on the early-spring weekend that was finally selected.)

The survey team consisted of five members. Four – one in each quadrant – were assigned to on-street parking, while the fifth was responsible for off-street sites. Each was given preprinted forms, including inventory information and blank spaces in which to record observations, for each block face or off-street site; on-street forms included the different categories of curbside parking. Surveyors "made rounds" every two hours, and in order to track turnover, on-street surveyors recorded the last three digits of license places for all vehicles that appeared to be parked legally (they did not, however, check for expired meters; methods for determining illegal parking will be discussed later in this section). Vehicles that appeared to be parked illegally on the street and all vehicles parked at off-street sites were simply counted.

FINDINGS

Occupancy

Maps illustrating occupancy rates for meter, permit, and off-street spaces, for each time period, on every block face and at each lot or garage, can be found in the **Appendix X**. This section will summarize the findings.

Figure 3-7 displays average occupancy rates for regular metered and residential permit spaces by quadrant and for all off-street sites during each two-hour time period. Also note that the Powell Street Garage, which the project team was unable to access, is not included in the calculations for off-street sites. Areas less than 80 percent occupied can be assumed to have good parking availability. However, those areas that are greater than 90 percent occupied are essentially fully occupied and are shaded black in the table; those between 80 percent and 90 percent are constrained and are shaded gray.

Figures 3-8 aggregates the data for on-street parking from **Figure 3-7** to illustrate variations in occupancy rates for general use on-street versus off-street spaces.

Among the survey's notable findings related to occupancy are:

- **Broadly speaking, the Columbus Avenue parking study area generally has available parking, but the available supplies (located off-street) are oriented toward visits of two or more hours.** Relatively little on-street parking – those unmetered or otherwise unrestricted spaces in residential parking permit zones, which account for fewer than one-third of all on-street spaces in the survey area – is available for long-term parking, and then only by permit holders. Off-street parking sites, however, are universally available for long-term parking, and it is off-street where significant availability exists.
- **On-street spaces are largely full, while off-street facilities are below capacity.** A significant disparity exists between on- and off-street rates of occupancy. Over the survey period, the difference in occupancy rates between meter/permit and off-street spaces ranged from 13 to as many as 43 percentage points (between 5 and 7 p.m. on Friday, nearly all meter and permit spaces were occupied, while barely half of spaces in lots and garages were full). Even during periods of peak demand when off-street occupancy rates rose to 85 percent, they remained well below on-street rates, which hovered close to 100 percent Friday evening (when, notably, meter spaces are free) and remained above 90 percent through Saturday.
- **On-street parking remains near capacity on Saturday, when it is priced.** This suggests that even when meters are in operation, on-street parking is underpriced. Additionally, off street facilities are well below capacity during this period. This further indicates that the discrepancy in price between on- and off-street parking encourages those driving to the neighborhood to "hunt" for cheaper on-street spaces. It may also indicate a visibility problem for off-street lots and garages.
- **On-street parking is not priced at all during its peak period.** This results in significant oversubscription during the peak visiting times on weekend evenings.

FIGURE 3-7 OCCUPANCY RATES BY CATEGORY, SUB-AREA, & TIME OF DAY

	Friday				Saturday			
	3-5pm	5-7pm	7-9pm	9-11pm	10am-12pm	12-2pm	2-4pm	4-6pm
On-Street								
General Metered								
NW	76%	94%	98%	100%	79%	87%	94%	95%
NE	71%	100%	100%	100%	94%	99%	95%	94%
SE	90%	99%	99%	95%	90%	98%	91%	95%
SW	90%	91%	93%	93%	93%	90%	88%	90%
Parking Study Area	82%	96%	98%	97%	90%	94%	92%	94%
Residential Permit								
NW	98%	96%	97%	99%	94%	93%	93%	95%
NE	93%	98%	98%	100%	90%	90%	88%	90%
SE	80%	98%	98%	98%	90%	98%	100%	100%
SW	--	--	--	--	--	--	--	--
Parking Study Area	93%	97%	97%	99%	92%	93%	93%	94%
Meter & Permit Combined								
NW	89%	95%	97%	99%	88%	90%	93%	95%
NE	80%	99%	99%	100%	92%	95%	92%	93%
SE	87%	98%	98%	96%	90%	98%	94%	97%
SW	90%	91%	93%	93%	93%	90%	88%	90%
Parking Study Area	86%	97%	98%	98%	90%	94%	92%	94%
Off-Street								
Parking Study Area	53%	54%	77%	85%	55%	71%	66%	60%

- **Parking availability is a greater problem on weekends than on weekdays.** The data reinforce the perception, identified in the Transportation Authority's *Neighborhood Transportation Survey*, that parking availability is a greater problem on weekends than on weekdays.

- **Location also influences parking decisions, and when combined with price considerations, results in greater numbers of people circling for cheap and convenient on-street parking rather than using available, but more expensive and less convenient off-street lots and garages.** On Friday night, occupancy at a garage on Broadway in Chinatown was lower than at sites nearer most North Beach destinations; on Saturday, occupancy at two lots along and just off of Broadway east of Columbus was lower than at the Chinatown garage or at sites closer to the core of North Beach.

- **The Vallejo Street Garage is significantly underutilized.** During the lowest-demand hours, a significant disparity was found to exist between occupancy rates at the two largest off-street parking sites, the North Beach and Vallejo Street Garages, which together account for fully half of all off-street spaces in the survey area. While the North Beach Garage's occupancy rates generally remained above 80 percent, the Vallejo Street Garage was nearly empty (as low as 15 percent occupancy) much of the time. (Three minor differences might help explain this disparity: While their rates are identical and their locations virtually across the street from one another, the North Beach Garage is the first one encounters when driving west from Columbus Avenue, its interior is generally more pleasant than that of the Vallejo Street Garage, and rather than closing at 2 a.m. on weekend nights like the Vallejo Street Garage, it remains open 24 hours.)

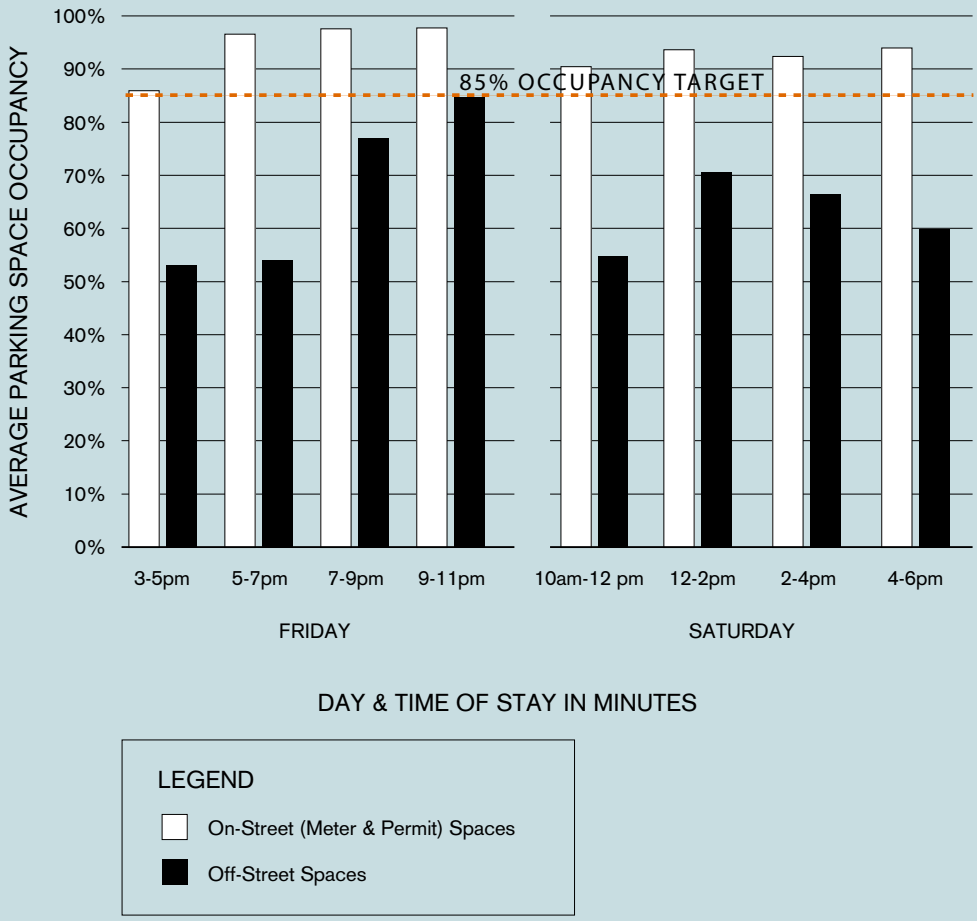
The data also reveal other interesting trends:

- During the period of peak occupancy Friday evening, on-street occupancy rates were slightly lower in the southwest (Chinatown) section of the survey area, where there are only metered spaces, than in the remaining North Beach segments, where there are nearly as many residential permit as meter spaces. This suggests that long-term parking by residents contributes to the shortage of available short-term parking.

- During business hours, on the south side of the survey area closest to downtown, occupancy rates for metered spaces were relatively high and occupancy rates for permit spaces were relatively low compared to the north side of the survey area farther from downtown.

- On Saturday morning, occupancy rates for metered spaces in the northwest quadrant were relatively low.

FIGURE 3-8 AVERAGE PARKING SPACE OCCUPANCY RATES BY CATEGORY, DAY, & TIME OF STAY



- While occupancy rates for color-coded spaces were not calculated (due in part to the common practice of illegal parking in loading zones, which makes it difficult to determine what the rate of *A* occupancy for such spaces might be were they available for their intended use), all on-street spaces were heavily used.
- Occupancy rates for the area's 41 motorcycle-only metered spaces were low, ranging from 37 percent Saturday morning to 49 percent between 7 and 9 p.m. Friday. At the same time, many motorcycles were observed parked in permit zones, in regular metered spaces, or illegally (e.g., between metered spaces).

Turnover

A secondary purpose of the survey was to assess on-street turnover rates, or the lengths of time that vehicles remain parked in the same space. The practice of "meter-feeding," endemic in many commercial districts where long-term parking for employees is limited or costly, reduces availability; likewise, areas with limited availability of on-street parking are often characterized by illegal long-term parking in loading zones, as well as other parking violations to be addressed later in this section.

Surveyors were instructed not to check for expired meters because this could potentially subject them to risk. Also, expired meters are of limited utility in determining whether vehicles are parked illegally, as meters that have been "fed" past their time limit cannot be distinguished from those that haven't. Surveyors were not asked to note whether vehicles parked in residential permit zones displayed permits. As time limits on metered spaces in the survey area are generally one or two hours, a stay of more than two hours during hours of meter operation can be taken to indicate illegal behavior; however, without checking for permits, it is impossible to determine whether vehicles parked in permit zones have done so legally. Thus, turnover rates in permit areas are of limited utility.

Turnover rates in metered spaces are instructive for a number of reasons: first, long stays during hours of operation are an indication of illegal behavior; but more importantly, low turnover rates suggest that existing supply might be better managed to increase short-term availability for customers in support of the district's economic vitality.

FIGURE 3-10 MOTORCYCLE PARKED ILLEGALLY

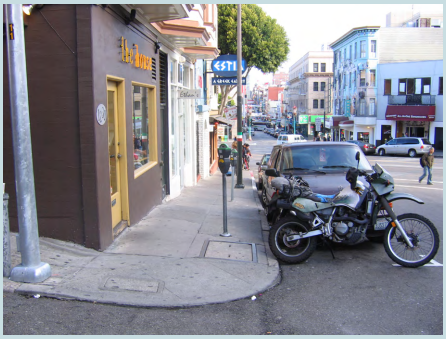


Figure 3-9 displays percentages of all parked vehicles remaining in the same space for less than two hours, two to four hours, four to six hours, and six to eight hours. As surveyors made rounds approximately every two hours (starting each circuit on time, but sometimes completing them more quickly than other times), figures are approximate (e.g., a vehicle observed to have remained in place two to four hours may actually have stayed a few minutes less than two hours).

The turnover study concludes that a significant percentage of motorists parking on-street – somewhat in excess of 20 percent – are either feeding meters or using disabled placards to park longer than the allowed time. Among the survey's specific findings related to turnover are:

- **Meter violation rates are in excess of 20 percent.** On Saturday, when one- or two-hour time limits were in effect for regular metered spaces over the duration of the day, one in five vehicles in metered spaces remained in place longer than two hours. Since time limits on some meters are just one hour, this suggests a violation rate greater than 20 percent. This shows that some proportion of long-term parkers are improperly using on-street parking that is intended to be short-term; parking policies should aim to shift these violators to garages and lots.

- **Most demand for parking is short-term in nature.** On Friday, when meter regulations were in effect for only the first three of the eight hours observed, slightly more than two in five vehicles in metered spaces remained in place longer than two hours. This suggests that the majority of demand (nearly 60 percent) for parking in the survey area is relatively short-term in nature, and therefore, that providing adequate short-term parking should be a goal. Even in permit zones, which provide unlimited parking for permit holders, approximately two in five cars remained in the same place less than two hours. Demand for short-term parking is not likely to derive from non-San Francisco residents; visitors from outside San Francisco are likely to stay more than two hours. This suggests that many of the on-street parking spaces are being used by San Francisco residents.

- **Residents parking on-street compete with visitors for parking.** On Friday, turnover rates were slightly higher in the southwest (Chinatown) quadrant, where there are no long-term residential permit spaces, and where occupancy rates in metered spaces were slightly lower than in other quadrants.

Other Observed Parking Violations

Finally, surveyors were asked to note vehicles that were:

- parked more than two hours in passenger loading zones (limits on which are significantly shorter than two hours; however, each space was surveyed only once every two hours); or
- parked in commercial loading zones; or
- parked in towaway zones, bus stops, or in travel lanes (double-parked); or
- blocking curb cuts or on sidewalks.

Surveyors also noted motorcycles parked between metered spaces (**Figure 3-10**).

While not all of these behaviors are necessarily illegal (for example, owners of a home may block their own driveway, provided they park parallel to the curb and don't block the sidewalk), survey counts of these "Observed Illegal" parking violations (as opposed to meter violations deduced from turnover rates) offer some insight into just how widespread the phenomenon of illegal parking is in the survey area.

Figure 3-11 shows the numbers of metered or permit parking spaces that were unoccupied ("Meter/Permit Available") in each survey time period, compared to the number of vehicles that were observed parking in violation of any one of the four "other observed parking violations" categories ("Observed Illegal") defined above.

Among the survey's notable findings related to parking violations are:

- The total number of "observed" illegally parked vehicles exceeded the number of general-use (metered or permit) spaces available, suggesting an "actual" occupancy rate for general-use on-street parking in excess of 100 percent, in seven out of eight time periods. As might be expected, illegal parking was generally most common when occupancy rates for legal spaces were highest.
- While not shown in **Figure 3-11**, the surveyors observed many other cars parked with general meter or permit violations, i.e., running out of time on a parking meter or occupying a residential permit space lon-

FIGURE 3-9 TURNOVER RATES BY CATEGORY & SUB-AREA

	Friday				Saturday			
	0 - 2 hours	2 - 4 hours	4 - 6 hours	6 - 8 hours	0 -2 hours	2 - 4 hours	4 - 6 hours	6 - 8 hours
On-Street								
General Metered								
NW	58%	19%	14%	9%	79%	13%	4%	4%
NE	57%	24%	14%	5%	82%	7%	4%	7%
SE	57%	22%	9%	12%	80%	10%	4%	6%
SW	65%	18%	9%	8%	80%	13%	2%	5%
Study Area Overall	**59%**	**21%**	**12%**	**9%**	**80%**	**11%**	**3%**	**6%**
Residential Permit								
NW	29%	21%	9%	41%	34%	18%	11%	37%
NE	52%	21%	13%	15%	44%	16%	11%	29%
SE	44%	14%	26%	15%	48%	42%	9%	31%
SW	--	--	--	--	--	--	--	--
Study Area Overall	**40%**	**19%**	**14%**	**26%**	**41%**	**16%**	**10%**	**33%**
Meter & Permit Combined								
NW	42%	20%	12%	26%	58%	16%	7%	19%
NE	55%	22%	14%	9%	72%	10%	6%	13%
SE	53%	20%	14%	13%	72%	10%	5%	12%
SW	65%	18%	9%	8%	80%	13%	2%	5%
Study Area Overall	**53%**	**20%**	**13%**	**14%**	**70%**	**12%**	**5%**	**13%**

FIGURE 3-11 "OBSERVED" ILLEGAL PARKING TOTALS BY SUBAREA & TIME OF DAY

	Friday				Saturday			
	3-5pm	5-7pm	7-9pm	9-11pm	10am-12pm	12-2pm	2-4pm	4-6pm
NW								
Meter/Permit Available	17	8	4	1	19	15	11	8
Observed Illegal	7	16	18	26	16	19	20	16
NE								
Meter/Permit Available	29	1	1	0	11	7	11	11
Observed Illegal	6	3	2	5	3	5	9	5
SE								
Meter/Permit Available	17	2	1	4	11	2	7	4
Observed Illegal	14	19	13	18	3	7	14	14
SW								
Meter/Permit Available	7	6	6	6	5	7	8	7
Observed Illegal	30	32	33	16	35	33	30	35
Combined								
Meter/Permit Available	70	17	12	11	46	31	38	30
Observed Illegal	57	70	66	65	57	64	73	70

ger than the two-hour limit without a proper permit. These illegal behaviors in effect further compound the shortage of on-street parking. For example, the survey revealed that on Saturday an additional 163 cars remained in metered or residential permit spaces beyond their 2-hour (or shorter) time limits. Combined with the "Observed Illegal" parking totals shown in **Figure 3-11**, this shows that the true demand for legal on-street spaces is even higher. (A comparable count for cars on Friday parked in meter or permit spaces longer than 2 hours was not available, since meter enforcement ends Fridays at 6 PM, in the middle of the 5 to 7 PM survey time period.)

- Observed incidences of illegal parking were most common in the southwest (Chinatown) quadrant, where the supply of on-street general-use parking is most limited. However, high rates of illegal parking in this quadrant can be partly explained by the presence of a funeral home with a limited supply of off-street parking (the lot appears to "overflow" during services, resulting in white-zone and double-parking along the block).

- While double-parked vehicles were not recorded separately from other categories of illegal parking, cars were frequently observed parked in travel lanes. This is noteworthy because cars impeding the flow of traffic are not so much a "parking problem" as a "traffic problem," and when double-parking occurs along transit routes, it becomes a "transit problem."

- High rates of illegal parking suggest that people place a premium on convenience – such a high value, in fact, that they are willing to risk what can be significant penalties. This desire for convenience may, along with pricing, help to explain the relatively low occupancy rates in off-street lots and garages, which can be some distance from destinations (although, it should be said, generally no more than a few blocks). Together, this reluctance to walk and willingness to risk tickets reinforce the notion that increased availability of short-term, on-street parking should be a central goal of future planning for in the survey area, and that long-term parking should be accommodated at off-street sites.

3.4 Summary

Overall conclusions:

- Parking for short-term driving trips is not adequately available. Taken as a whole, the survey area does not suffer from a shortage of parking supply. However, a significant disparity exists in demand for on- and off-street spaces. While peak occupancy rates for on-street spaces are high (above 100 percent, when illegal parking is included), at only one point did surveyors find fewer than 100 public off-street spaces available.

- Parking for visits over two hours is adequately available, but other than during the peak demand period, is not used as well as it should be.

- There is a strong relationship between the price of and demand for parking in the survey area. **Figures 3-12** illustrates the average parking costs of different on-street and off-street parking supplies. **Figure 3-7**, presented earlier, shows occupancy rates for the same perking supplies. Note that even when on-street parking meters are in operation (Friday and Saturday afternoons), the cost per minute of parking in an off-street garage can be up to six times higher than parking on-street, despite the fact that on-street parking is more convenient for most users. Even for fairly long stays, parking off-street is on average more than twice as expensive as on-street.

- If long-term parkers occupying short term (on-street) spaces were shifted to off-street lots and garages, parking for short-term trips could be kept adequately available.

- Policies should be enacted which create sufficient incentive for long-term parkers to stop using on-street spaces and use off-street spaces instead.

- Current policies encourage parkers to circle in search of cheap on-street spaces rather than use available, but more expensive, off-street supplies.

- The disparity between on-and off-street parking costs is reflected in the findings of the *Neighborhood Transportation Survey*. While approximately 40 percent of respondents who drove to the area said they had not paid for parking, nearly 25 percent on weekdays and nearly 35 percent on weekends said that they had paid more than $10 to park. Perhaps unsurprisingly, then, parking availability was identified by respondents as a much greater problem than parking costs: on both weekdays and weekends, and among all groups of respondents (including those from the surrounding area, San Francisco residents and non-San Francisco residents), between 49 and 73 percent of respondents identified availability as a problem, while only 35 to 43 percent identified cost as an issue.

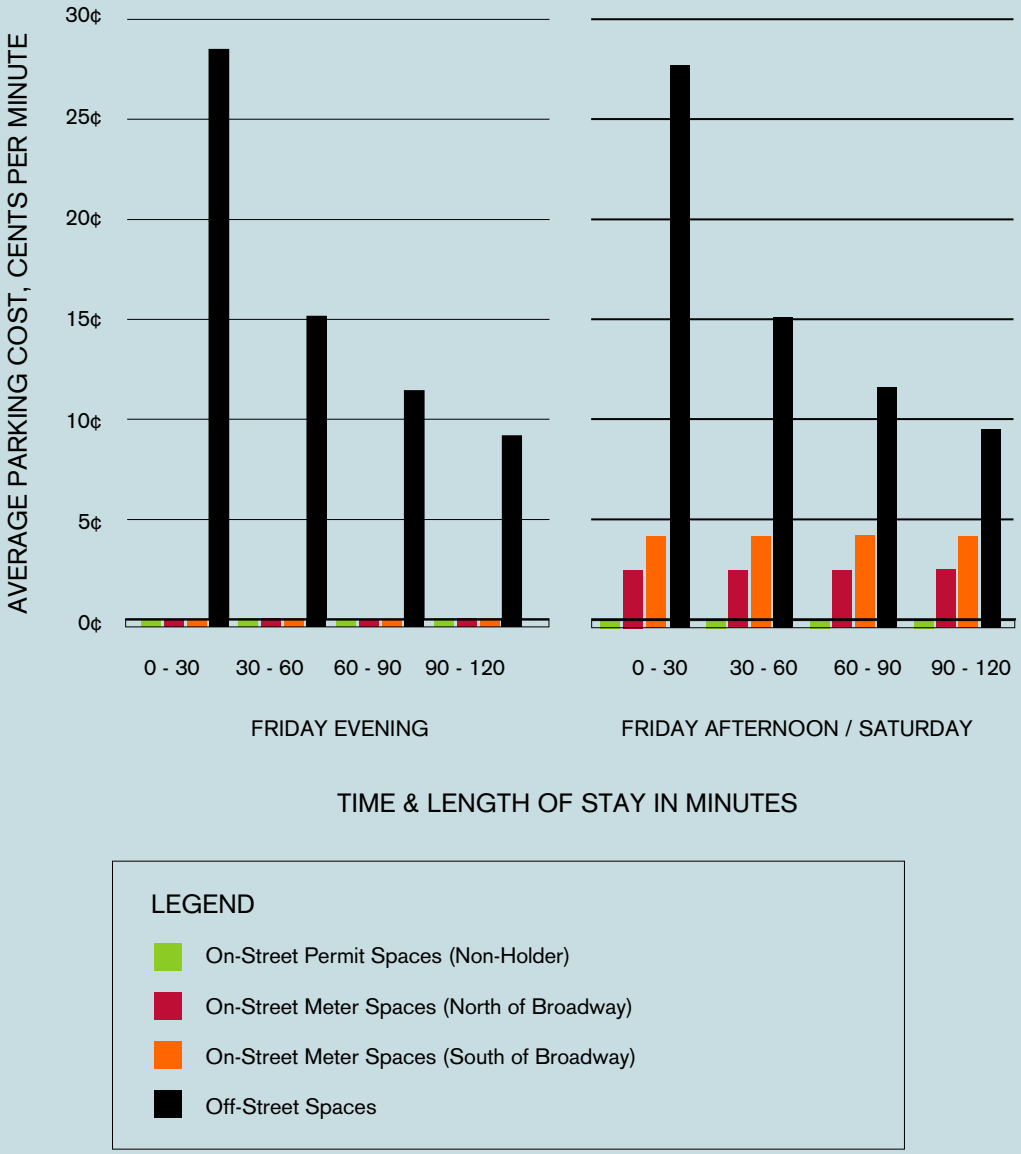
- Off-street parking appears to be considered inconvenient relative to searching for an available on-street space. This seems irrational and suggests that many people don't know about the off-street garages, or that the willingness to pay for spaces is extremely low.

- Expanding the supply of off-street parking will not increase the availability of on-street spaces if the prices of on-street spaces are kept artificially low – even though supplies of off-street parking are sufficient, people prefer to circle for cheap and convenient on-street parking rather than pay for available off-street spots. Notably, off-street sites only approach capacity as fees for on-street parking are lifted, on-street occupancy reaches its maximum point, and drivers are "forced" to seek out the alternative of lots or garages.

- While much of the city's existing parking "management" (in the form of meters) is oriented toward weekday, office-related uses, peak demand in North Beach is recreational in nature, and parking management is most needed during precisely those hours in which it largely does not exist.

- The majority of demand for on-street parking is short-term in nature. Short-term parking is the proper use of on-street supplies; it is only about 20 percent or so of on-street parkers who need to be shifted to off-street facilities. One key priority for improving Columbus Avenue parking availability is to price on-street parking such that parkers with stays of two or more hours have an incentive to use the off-street facilities. This will clear sufficient (up to 20

FIGURE 3-12 COMPARISON OF ON-STREET AND OFF-STREET PARKING COSTS



percent) on-street spaces to attain 85 percent occupancy and target availability rates for short term visitors.

3.5 Recommendations

The following recommendations, while somewhat outside the scope of this *Study*, might be useful to the community by helping to shape future discussions about parking. They are derived from the key finding that parking supplies in the neighborhood are poorly managed, and this negatively impacts the community's quality of life and economy in myriad ways, from traffic congestion to decreased business as shoppers are turned away by a perceived lack of available parking.

NEAR-TERM RECOMMENDATIONS

Increase visibility of off-street parking

Implementation of strategies to increase the visibility of lots and garages would result in:

- Improved service for visitors who are not likely to be aware of their parking options,

FIGURE 3-13 COLUMBUS/GRANT SIGN FOR GARAGE PARKING

FIGURE 3-14 EXAMPLE OF PARKING GARAGE SIGN AT ST. MARY'S GARAGE

and who may wish to stay in the area for longer than two hours; and

- A sense of increased "convenience" associated with off-street parking, which currently appears to be underutilidfdzed at least in part because sites can be difficult to find.

As previously mentioned, fully half of all the public off-street parking in the survey area, and nearly one-third of all spaces available for general use for more than a half-hour, can be found at essentially one location: along Vallejo Street between Stockton and Powell streets, at the city-owned North Beach and Vallejo Street garages, which are almost directly across the street from each other. This location is within a five-minute walk of both the North Beach commercial core and the northern end of Chinatown. Moreover, while rates are somewhat higher than at meters ($2.50 per hour for the first three hours, compared to $1.50 for metered spaces north of Broadway), they are significantly lower than at other off-street parking sites.

Even during the busiest hour late Friday night, surveyors found more than 30 spaces available in the two garages. At most times of day, close to a hundred spaces are available in the Vallejo Street Garage alone. This is perhaps unsurprising given their lack of visibility: the project team could find only one sign along a major artery directing drivers to off-street parking (**Figure 3-13**). In this case, the sign is located at the corner of Columbus and Grant Avenues, but it is not clear to which garage it directs drivers.

Figure 3-14 shows signage at the nearby St. Mary's Garage, located outside the parking study area. As with other municipal facilities, the St. Mary's garage features signs prominently displaying real-time information on numbers of available spaces (unfortunately, the sign at St. Mary's shown in **Figure 3-14** was not in operation when the photograph was taken on a Wednesday afternoon). Similar signs at the North Beach and Vallejo Street garages would improve their visibility; a more comprehensive wayfinding strategy, however, would place signs at various points along Columbus and Broadway. These signs could be similar to the existing format shown in **Figure 3-14**, they could be larger and more visible, or ideally they could be real-time display signs. A sign at Columbus and Broadway might be designed to fit its surroundings, while still calling attention to drivers during the peak period Friday night with an ever-changing, brightly lit display.

In any case, given the composition of those who drive to the neighborhood – a majority of whom are non-San Franciscans, according to the *Neighborhood Transportation Survey* – any effective parking strategy should, at a minimum, seek to raise awareness of existing parking opportunities, whether through wayfinding or other means.

Eliminate "early-bird" parking at city garages

So-called "early-bird" discounts – reduced long-term rates for those who park in lots by a designated time on weekday morn-

ings – encourage both auto use and long-term parking. Early-bird policies at the North Beach and Vallejo garages are especially counterproductive: 12 hours costs just $11, less than the regular rate for four hours, and early-bird parkers may stay as late as 10 p.m. The result: the city both promotes auto use in an area well served by transit – in direct violation of principle 6 of the city's *Transit First Policy* (*City Charter* Section 8A.115) – and it incentivizes long-term parking precisely when demand for short-term parking is at its highest, in the evening.

MID-TERM RECOMMENDATIONS

Even if awareness of off-street parking opportunities is raised, and even if residents are provided with additional alternatives to storing their cars on-street, off-street parking is unlikely to be fully utilized as long as the price of on-street parking in the survey area remains well below its market value. As is demonstrated through the survey findings, undervalued parking both decreases availability and increases congestion, as drivers choose to "circle" in search of cheap parking rather than pay significantly greater amounts for available off-street spaces.[2]

The recommendations below constitute first steps toward a more comprehensive system of setting, monitoring and regularly adjusting meter prices to match demand and maintain 85 percent availability.

Expand the $2.50 per hour meter zone

A first, relatively simple step toward closing the gap between on- and off-street parking rates might be to extend the Department of Parking and Traffic's "downtown periphery" zone a few blocks north. The zone, in which rates are set at $2.50 per hour, ends at Broadway; to the north, meters cost just $1.50 per hour. Any extension should include both Columbus Avenue and side streets extending for a few blocks, so that "spillover" into adjacent residential areas is discouraged. Ultimately, however, higher meter rates would only be effective during the hours meters are in effect.

Extend meter hours to encompass the peak parking demand period

Ironically, demand for parking in the survey area is at its highest when meter rates are cheapest – or free, as it were. While free, time-unlimited parking no doubt generates some demand, it seems likely that it is the area's popular dining and nightlife establishments that make weekends, and especially weekend evenings, "rush hour" in North Beach. Certainly, it is not the difficulty of actually finding an on-street parking space that attracts business to the neighborhood on Friday nights.

Given that occupancy rates for on-street parking remained close to 100 percent through the 9 to 11 p.m. period of the survey, a logical end time for meter operation would likely be at least 10 p.m. on Fridays and Saturdays. Greater than 90 percent occupancy rates during meter hours on Saturday also suggest that meters should remain in effect on Sundays. While late-night meter hours may seem unusual, the Bay Area suburb of Redwood City has recently extended its meter hours to 8 p.m. on Saturdays. A similar policy would merely reflect patterns of parking demand in the area.

Extend or even eliminate time limits for metered spaces

Although $2.50 per hour rates would likely not result in an occupancy rate of 85 percent, increased availability might make it possible to extend or even eliminate time limits on metered spaces. In a recent survey, shoppers in the Bay Area suburb of Burlingame were asked which factors made their parking experience less pleasant. The top response was "difficulty in finding a space," followed by "chance of getting a ticket." "Need to carry change" was third, and the factor that least concerned respondents was "cost of parking." This observation was made in a Redwood City staff report by the city's downtown development manager, Dan Zack, who added that:

> *If we institute market-rate prices, and adequate spaces are made available, then what purpose do time limits serve? None, other than to inconvenience customers. If there is a space or two available on all blocks, then who cares how long each individual car is there?*

With the extension or elimination of time limits, much of the worry and "ticket anxiety" for visitors to the survey area might be eliminated, and visitors to the area could shop and enjoy a leisurely dinner without having to worry about going back to their cars to feed the meter.

Install meters at spaces with non-residential frontage

Finally, while extending meter hours and raising rates would help to bring those spaces more in line with actual market values, close to 200 spaces within the survey area, or approximately 40 percent of all general-use on-street spaces, would remain free, encouraging continued "hunting" by bargain-conscious motorists. Ultimately, then, it may be necessary to convert some residential parking permit spaces in front of non-residential buildings to metered spaces. A good place to start might be on the north side of Filbert Street directly across from Washington Square, where the entire block remains residential parking and there are no residential uses.

LONG-TERM RECOMMENDATIONS

Continue to improve meter technology as recommended by the *SFpark* program (see "Relevant Studies and Programs," in the Introduction) or other city policies

Whatever vendor the city ultimately decides upon, multispace meters that accept credit cards, like those installed as part of the recent multispace meter pilot program (**Figure 3-15**), are preferable for a number of reasons: they enhance convenience for users, simplify enforcement and maintenance, can reduce capital and operating costs, enable more refined data collection, and on more advanced models, rates can be easily

2 "Between 8 and 74% of traffic was searching for parking, and it took between 3.5 and 13.9 minutes to find a curb space" – Donald Shoup, summarizing 20th century studies of cruising in urban areas in *The High Cost of Free Parking*. Chicago: APA Planners Press (2006).

FIGURE 3-15 MULTISPACE PARKING METER

adjusted to reflect site- and time-specific demand on an ongoing basis.

Set meters to charge market rate (the rate which will ensure 85% occupancy rates) for on-street parking supplies

As previously discussed, an ideal occupancy rate is about 85 percent. This means that pricing need not be uniform: the most desirable spaces may need higher prices, while less convenient spaces are less expensive. Prices should also vary by time of day and day of week, and hourly rates might increase in each successive hour in order to encourage use of on-street supply for short-term parking, and off-street supply for longer stays. (Note that this would serve the same function as time limits, but without generating "ticket anxiety" or unduly punishing those who might choose to stay a few minutes longer than anticipated.)

Ideally, parking occupancy for each block should be monitored carefully, and prices adjusted regularly to keep enough spaces available. In short, prices should be set at market rate, according to demand, so that just enough spaces are always available. Professor Donald Shoup of UCLA advocates setting prices for parking according to the "Goldilocks Principle":[3]

> *The price is too high if many spaces are vacant, and too low if no spaces are vacant. Children learn that porridge shouldn't be too hot or too cold, and that beds shouldn't be too soft or too firm. Likewise, the price of curb parking shouldn't be too high or too low. When about 15 percent of curb spaces are vacant, the price is just right. What alternative price could be better?*

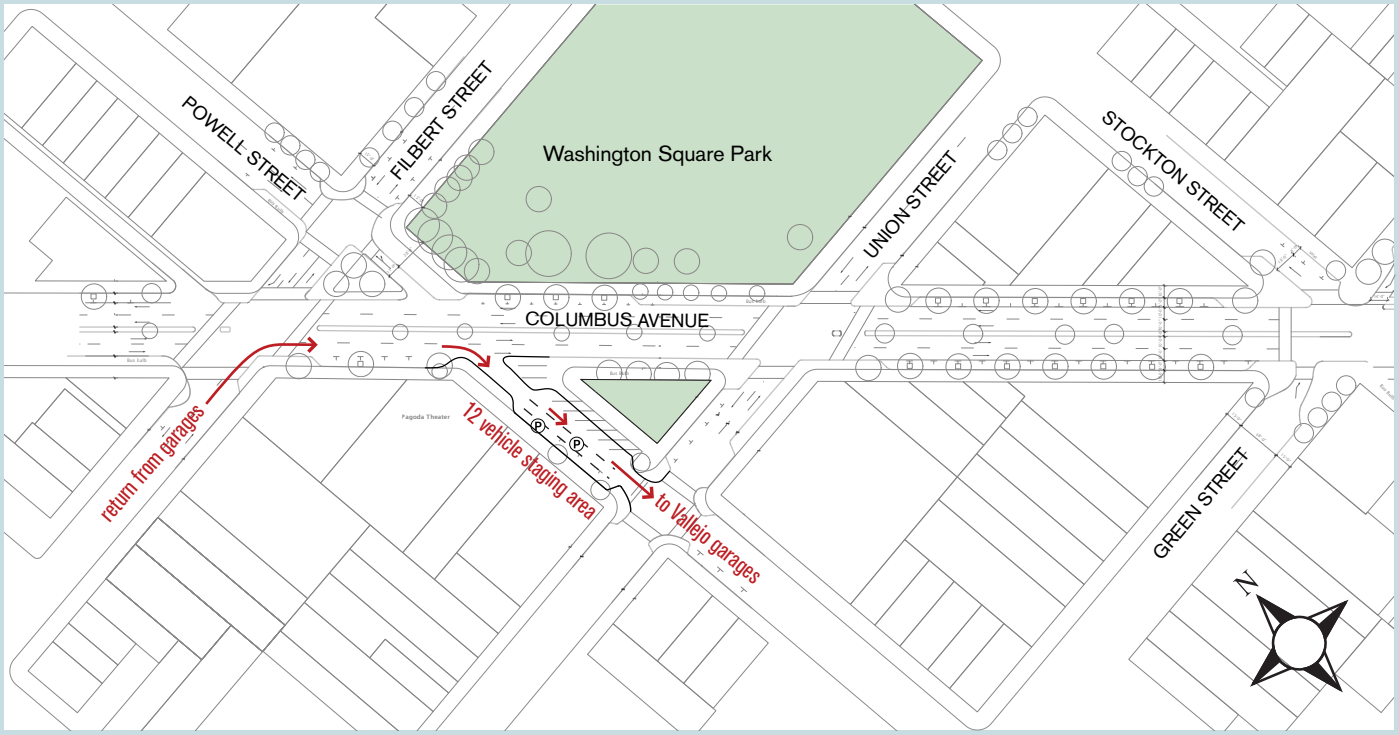
If this principle is followed, then there need be no fear that pricing parking will drive customers away. After all, when the front-door parking spots at the curb are entirely full, under-pricing parking cannot create more curb parking spaces for customers; nor will increased off-street parking supply be used if on-street spaces remain significantly cheaper. If the initial parking meter rate on a block is accidentally set too high, so that there are too many vacancies, then a policy goal of achieving an 85 percent occupancy rate will result in lowering the parking rate until the parking is once again well used.

3 Shoup, Donald. The High Cost of Free Parking. Chicago: APA Planners Press (2006).

Consider refinements to Residential Permit rules

Parking supplies close to Columbus should be oriented toward providing short-term parking for visitors accessing the retail destinations along Columbus, and should discourage long-term parking and storage of residents' vehicles. Changes could include extending the hours of permit enforcement, or reducing or eliminating altogether the two hours of free parking allowed without a permit. Instead, guest permits might be made more easily available, or, preferably, "pay-and-display" meters might be installed allowing visitors to purchase daily or hourly permits valid in the residential zone. More generally, the city may wish to further tighten limits on the number of residential permits allowed for each household, limit the total number of permits based upon spaces available in each zone, increase the cost of permits or charge higher rates for multiple permits issued to a single household. Such changes would require approval by the MTA Board as well as the residents of the permit zone.

FIGURE 3-16 UNIVERSAL VALET CONCEPT



Encourage expanded valet services, or establish a "universal valet" program

One way to more efficiently manage parking supply, and in particular to more fully utilize undercapacity sites, is to use them for valet parking. In the survey area, a large garage on Broadway in Chinatown remained well below capacity during the peak demand period late Friday night; while many people might never walk from Broadway to restaurants near Washington Park, a valet program would overcome this obstacle. Such a program might also make more effective use of underutilized sites closer to the heart of North Beach, such as the Vallejo Street Garage. A "universal" valet program operated by a private party under contract with the city or a Business Improvement District might also offer a significant benefit for users, and an enticement to take advantage of the service: customers could leave their car with a valet in one location, and pick up in an entirely different location.

The Telegraph Hill Dwellers recommend a location on Powell between Columbus and Union, alongside the landscaped "triangle." This block of Powell has a single, extra-wide southbound travel lane and a half-dozen diagonal parking spaces on the east side of the street, adjacent to the triangle. A valet parking stand on this block would eliminate the diagonal parking, but would continue to allow southbound travel and could accommodate simultaneous drop-off of up to a dozen cars. **Figure 3-16** shows what the concept could look like.

From this valet area, access to the Vallejo Street Garage and other off-street lots with excess capacity would be direct. One drawback is that the valet stand could only be entered by southbound traffic coming from the north. Nonetheless, the triangle block is highly visible, centrally located, and provides sufficient space for a large operation while having only a minimal impact on traffic and no effect on circulation patterns.

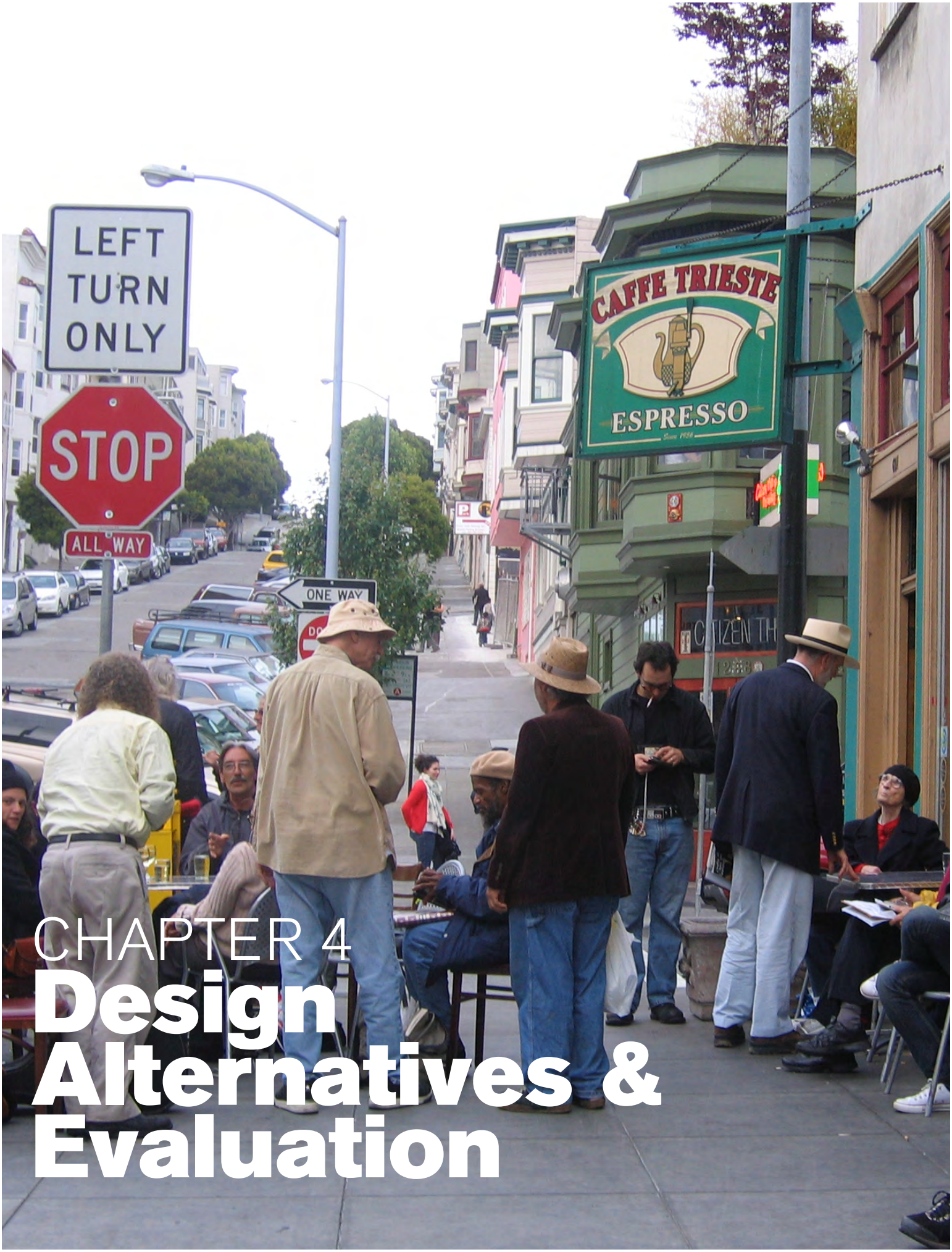
To provide comprehensive valet service to the Columbus study area, a similar valet stand could be created for northbound traffic entering from the south, to be located somewhere in the southern portion of the study area.

Create taxi stands

The Telegraph Hill Dwellers also recommend establishment of a neighborhood taxi stand as a measure to encourage taxi use, discourage use of private automobiles for trips, and reduce "circling" by cab drivers searching for fares. A location on Stockton by Washington Square is highly visible and, were it located along the Square itself, would not require removal of parking or loading spaces immediately adjacent to businesses.

Seek to form a Business Improvement District

To fund a more comprehensive transportation demand management strategy and to locate important decision-making processes within the community, area merchants and property owners should pursue formation of a BID or transportation management association (TMA). One policy such an organization might consider is leasing of parking lots that currently charge a flat rate, so that rates in those lots might be managed to promote availability, and not just to serve the operator's convenience.



CHAPTER 4

Design Alternatives & Evaluation

CHAPTER 4

Discussion & Evaluation of Design Alternatives

This chapter describes the objectives for Columbus Avenue street design alternatives, based on community input and technical analysis; design concepts that apply to all alternatives; and finally, three alternative designs for Columbus Avenue and a variation at the Stockton / Green intersection.

4.1 Design Objectives

The objective for the *Columbus Avenue Neighborhood Transportation Study* is to develop a community-based transportation plan that enhances the livability and vitality of the corridor. The *Study* presents three selected alternatives that each address the physical configuration of Columbus Avenue and adjacent segments of connecting streets between a point just south of Broadway and a point just north of Filbert Street.

COMMUNITY PRIORITIES

Each package addresses the community priorities, identified through the public process, of:

- Pedestrian conditions
- Streetscape vitality
- Transit service efficiency
- Parking management

TECHNICAL PRIORITIES

Each package also achieves technical objectives of:

- Improving pedestrian and bicycle level of service
- Maintaining transit level of service
- Satisfying city standards for motor vehicle level of service
- Each package seeks to enhance the streetscape through high-quality urban design, and to remain consistent with the principles of San Francisco's *Better Streets Plan (BSP)*.
- Each is also designed to accommodate subway station entrances that might be built as part of a proposed Phase Three of the San Francisco Municipal Transportation Agency's (SFMTA) Central Subway project.

CONSTRAINTS

Each of the alternatives was designed to respond as effectively as possible to a number of physical and practical limitations. These include:

- A relatively constricted 80-foot right-of-way, including a curb line just 10 feet from the property line, and a partially constructed four-foot median.
- Competition for limited space among users of many different modes, including large volumes of pedestrians, patrons of cafés and restaurants with sidewalk seating, bicyclists, motorists, delivery trucks and other vehicles.
- The possible existence of subbasements at undetermined points below the sidewalk, potentially impacting the feasibility of some proposed sidewalk bulb-outs (in these cases, it might be preferable to simply build bulbs with trench drains so that curb lines could be extended without requiring relocation of utilities);
- Additional restrictions on sidewalk widening imposed by as-yet-undetermined existing locations of utilities.
- SFMTA's currently under-construction *Broadway Streetscape Improvement Plan*, which while making a number of physical improvements to the corner of Columbus and Broadway, may make funding for additional improvements more difficult to obtain; and
- Limited budgets for maintenance. (However, if area merchants were to establish a Community Benefits District, prospects for sustainable funding would be greatly improved.)
- Intense competition for limited local, state and federal funding for capital projects.

FIGURE 4-1 DESIGN CHARRETTE NOTES

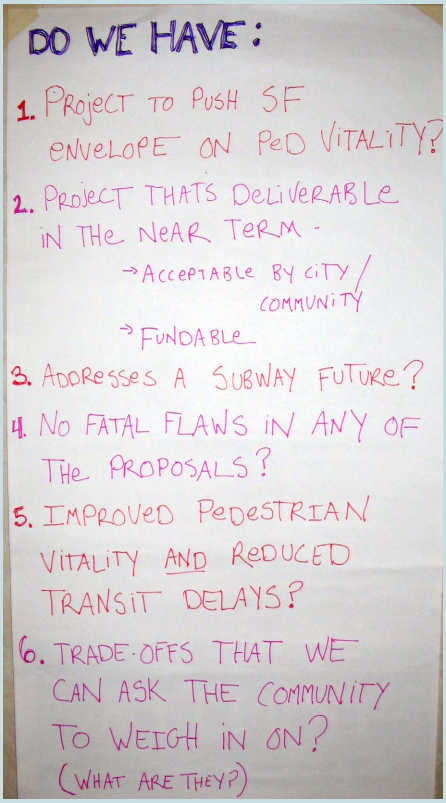


Image from Rachel Hiatt, SFCTA

FIGURE 4-2 DESIGN PROCESS

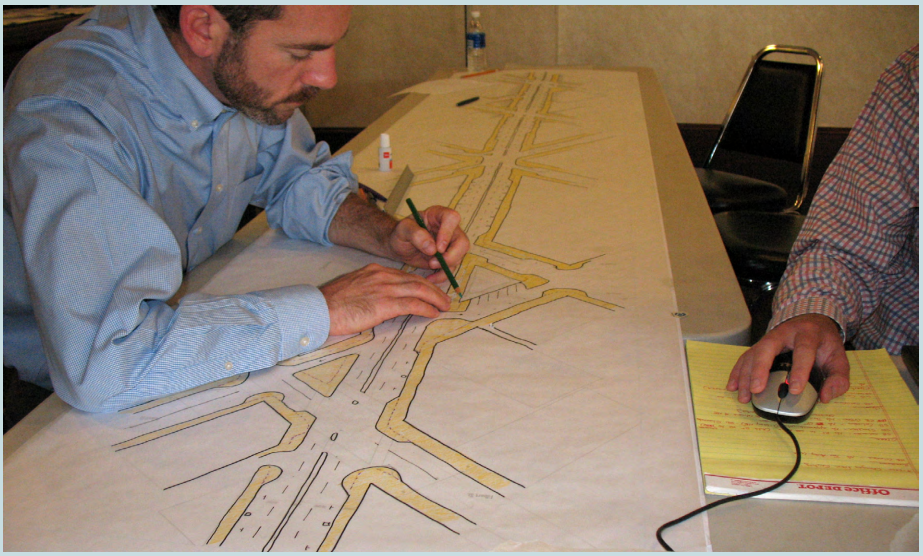


Image from Nelson\Nygaard

4.2 Summary of Design Concepts

The draft designs were developed during a two-day workshop (**Figures 4-1** and **4-2**) that included members of the project team (the Authority and consultants Nelson\Nygaard and Fehr & Peers) as well as community representatives from RENEW SF. At the workshop, the designs were reviewed by the project's Technical Advisory Committee (TAC). Following the workshop, the study team continued to analyze the operations of and refine each alternative, based on further input from the community and TAC.

As discussed in the previous subsection, the primary objective of the design alternatives is to improve pedestrian safety and comfort. In support of this, each alternative seeks to expand pedestrian space, improve pedestrian visibility, and reduce pedestrian conflicts with cars. The primary differences between the alternatives are the amount of space they allot to pedestrians relative to other users of the street.

ALTERNATIVES

The alternatives are described next.

- **Alternative I—Four-lane with "flex lane".** This alternative does not widen the sidewalks except at corners and bus stops. The concept would retain the existing curb line and four-travel lane configuration of the Columbus Avenue. However, bulb-outs would be used to widen the sidewalk at corners and for the full length of bus stops; a permitting system allowing use of the parking lane for café seating would be introduced; and trees would be added to the parking lane.

- **Alternative II—Two-lane with "flex lane".** This concept would permanently widen the existing 10-foot sidewalks to between 12 feet (on blocks with the existing four-foot median) and 14 feet and would reduce the number of travel lanes from two in each direction to one in each direction. These lanes would be sufficiently wide (18 feet) to safely and comfortably accommodate both motorized traffic and bicycles and to provide flexibility to maneuver around double-parked vehicles. As in Alternative I, sidewalk bulb-outs, parking lane trees and flexible use of the parking lane would effectively widen the sidewalk even further, and at the key intersection of Columbus, Green, and Stockton streets, diagonal crosswalks would be added in order to enhance pedestrian connectivity and calm traffic.

- **Alternative III—Two-lane with "flex space".** This concept is mostly identical to Alternative II, with two major differences. First, the flexible parking and café seating lane would be replaced by a permanent extension of the sidewalk to between 20 and 22 feet wide. Sidewalks might be divided

FIGURE 4-3 DESIGN ELEMENTS PROPOSED IN EACH ALTERNATIVE

Design Element	Alternative I	2	3
Café seating in parking lane	y	y	
Trees in parking lane	y	y	
Sidewalk bulb-outs at corners, including NB Columbus and Grant	y	y	y
Sidewalk corner bulb-outs extending into side streets			y
Sidewalk bulb-outs at all bus stops except WB Broadway between Columbus & Grant, and WB Union between Stockton and Powell.			
Removal of 3 parking spaces for sidewalk widening on the north side of Union between Columbus and Powell		y	y
A "soft" right turn from SB Columbus on to SB Powell with a bulb-out, or a hard right-angle turn (without bulb)	y	y	y
Bus bulbs on Stockton just south of Columbus: 8-foot bus bulb on NB Stockton, 3-foot bulb on SB Stockton		y	y
		y	y
Pedestrian Refuges at center medians, at intersections	y	y	y
Creation of triangular pedestrian islands to separate right-turns from SB Columbus onto WB Vallejo, and from NB Columbus onto EB Vallejo	y	y	y
Enlargement of the triangular pedestrian island between Columbus, Filbert and Powell, resulting in removal of four parking spaces.	y		y
Mid-block crosswalk and pedestrian refuge across Columbus, at Grant		y	y
Removal of bus stop on NB Columbus just north of Broadway			
Relocate bus stop at NB Columbus, south of Green, to mid-block between Vallejo and Green		y	y
One 18-foot travel lane on Columbus, north of Broadway		y	y
One NB and 2 SB travel lanes on Columbus, south of Broadway		y	y
Removal of SB travel lane from Stockton between Union and Columbus	y	y	y
Prohibition of all left turns from Columbus (however, left turns may be permited at Vallejo and Lombard)	y	y	y
Prohibition of through movements on Green, with certain turning movements permitted	y		y

NB = northbound, SB = southbound, EB = eastbound WB = westbound.

into inner and outer "zones" using trees and street furniture, with the outer zone available for both pedestrians and loading. This configuration would take advantage of the "natural time-share" arrangement that exists between deliveries, which take place primarily during the day, and periods of heaviest use by pedestrians, which are largely in the evening. The other difference between Alternatives II and III would be in the treatment of the Columbus, Green, and Stockton intersection: taking advantage of the existing setback of the curb line on the intersection's northeast corner, the median could be widened into a pedestrian island spacious enough to accommodate public art and a vendor stall, in effect a small plaza. This element could be "mixed and matched," or incorporated as part of Alternative II.

Detailed design elements and analysis of benefits and impacts may be found in the following sections, and drawings of the alternatives may be found in **Appendix A**. The alternative recommended as the preferred design for Columbus Avenue will be selected on the basis of both technical analysis and public input.

4.3 Elements & Evaluation

COMMON ELEMENTS

Development of the alternatives drew on prior knowledge of and research into best practices. Plan views of each of the three alternatives may can be found in **Appendix A**. As packaged, the three alternatives share a number of elements in common. The following descriptions provide an overview of each element, and where appropriate, specific recommendations for how it could be implemented in the study area. **Figure 4-3** shows which of the various design elements are included within each alternative.

The three alternatives are not necessarily mutually exclusive. Alternatives II and III could be implemented together on a block-by-block basis based on land use context and community support. Likewise, Alternative II could be implemented on part of the street (e.g., south of Vallejo) with Alternatives I and/or II elsewhere (north of Vallejo).

FIGURE 4-4 CAFÉ SEATING IN MOUNTAIN VIEW

FIGURE 4-5 CAFÉ SEATING IN THE PARKING LANE ON COLUMBUS

Flexible / Shared Spaces

Café seating in parking lanes

This concept is recommended in the BSP (the City's *Better Streets Plan*). Local examples can be found on Castro Street in Mountain View (**Figure 4-4**) and on First Street in Livermore. An example of temporary café seating on Columbus Avenue is shown in **Figure 4-5**. This could be implemented at the discretion of adjacent merchants. Essentially, café or restaurant owners may apply to the City for a permit to place tables and chairs in curbside parking spaces in front of their businesses, and the seating areas are kept separate from adjacent spaces and travel lanes using planters or other semi-permanent fixtures. Spaces may be used for parking part of the time, and café seating at other times. As each curbside parking space is approximately 160 square feet, several tables might fit into the space typically occupied by a single car, benefitting business owners as well as pedestrians, who gain additional space on sidewalks where seating is removed or relocated. There are approximately 72 curbside parking and loading spaces along Columbus between Broadway and Filbert.

Trees in parking lanes

Local examples can be found along University Avenue in Palo Alto (**Figure 4-6**). Trees in the parking lane, protected from bumpers by curbs around the basin, serve not only to add greenery to the streetscape, but to calm traffic by narrowing the perceived widths of adjacent travel lanes and to reduce sidewalk crowding. Over time as street trees require replacement, they could be relocated to the parking lane, creating more space for pedestrians. Trees in parking lanes do require increased maintenance cost in the form of hand sweeping that the community would need to provide (discussed further in **Chapter 6**). Trees in parking lanes would be spaced at intervals of approximately 40 feet, or every two parking spaces.

Figure 4-7 shows how Columbus could be transformed with both street trees and café seating in the parking lane.

Shared Streets

Another concept for flexible / shared space informs the design of spaces shared by pedestrians and slow-moving vehicles. Although Columbus Avenue is not suited to be a fully-shared street, some principles from this concept have relevance for the Columbus alternatives. An example is Hotaling Place in San Francisco (**Figure 4-8**). For more information, see the discussion of "flex space" under Alternative III, further below.

Sidewalk Widenings

Sidewalk bulb-outs at corners

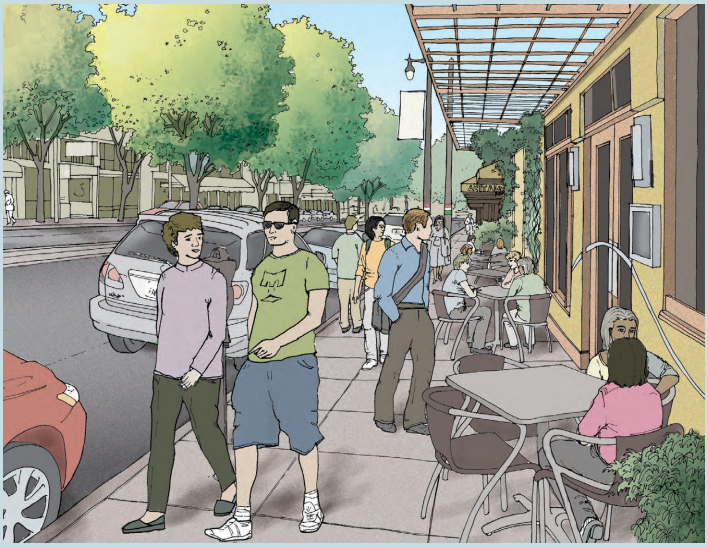
By selectively widening the sidewalk only at those key points where crowds are likely to gather, it is possible to greatly increase the space available to pedestrians, narrow street crossing distances, and thereby improve safety and comfort for pedestrians. Bulb-outs cost much less than full sidewalk widenings. Bulb-outs take advantage of roadway space that is not needed for vehicular movements, and slow turning movements by creating a small turning radius.

All alternatives include sidewalk bulb-outs at certain corners. Bulb-out configurations at the same location sometimes vary slightly by alternative, in order to present different concepts that might work just as well; these elements, like many others, are designed to be "mixed and matched."

- In Alternative III, where Columbus sidewalks would extend to the edge of travel lanes, bulb-outs would also extend into cross streets.
- A sidewalk bulb-out at the corner of northbound Columbus and Grant would

FIGURE 4-6 TREES IN THE PARKING LANE

FIGURE 4-7 EXISTING VIEW OF COLUMBUS SIDEWALK NORTH OF GREEN STREET (LEFT), AND TRANSFORMATION WITH SEATING & TREES IN THE PARKING LANE (RIGHT)



Images from CD+A

maintain the existing "soft" 45-degree right turn, but narrow the street.

- A bulb-out at the corner of Columbus and Powell would maintain the "soft" 45-degree right turn from southbound Columbus on to southbound Powell, but narrow the street.

Sidewalk bulb-outs at Bus Stops

Similar to corner sidewalk bulb-outs, bus bulb-outs create more space for pedestrians where it is most needed. They reduce transit travel times, as buses stopped in a travel lane to pick up and discharge passengers do not have to merge back into traffic. They also cost much less than a full sidewalk widening. Most bus bulb-outs would extend eight feet, the width of the parking lane, out from the sidewalk (**Figure 4-9**). Bus bulbs could be up to 120 feet long (or 960 square feet) depending on whether space for two buses is deemed necessary by SFMTA. Local examples of corner and bus bulbs are now commonplace, for example at bus stops along O'Farrell Street in the Tenderloin.

Bus bulb-outs are proposed at all bus stops except the following locations:

- Westbound Broadway between Columbus and Grant (where, after reconstruction of Broadway, there will be no curbside parking lane)
- Westbound Union between Stockton and Powell (where Muni staff have indicated that the existing configuration offers buses greater maneuverability).

While most bus bulb-outs would extend eight feet out from the sidewalk, depending on the alternative, bulb-outs at stops on Stockton just south of Columbus could vary:

FIGURE 4-8 EXAMPLE OF SHARED STREET: HOTALING PLACE

Image from Flickr user "keenduck" (Creative Commons license: http://creativecommons.org/licenses/by-sa/2.0/)

FIGURE 4-9 BUS STOP SIDEWALK BULB-OUT

Image from Nelson\Nygaard

- Both bulbs could extend just three feet, in order to allow cars to maneuver around buses.
- Alternately, an eight-foot wide bus bulb on northbound Stockton would result in an 11-foot northbound travel lane. The bulb on the opposite, southbound side would remain just three feet wide, and the travel lane 16 feet wide.

Converting Parking Spaces to Sidewalk Space

On the north side of Union between Columbus and Powell, three parking spaces could be removed to provide a wider sidewalk.

Pedestrian Refuges

Pedestrian refuges provide protected pockets between travel lanes for pedestrians unable to complete a street crossing during a single signal cycle. Local examples are now commonplace.

In Medians between Travel Lanes

A pedestrian refuge would ideally be wider than the four feet afforded by the existing median on portions of Columbus. However, even the addition of "thumbnail" extensions of the median projecting beyond the crosswalk into intersections (without impeding turning movements) would provide some additional limited shelter.

To separate right-turn lanes

Triangular pedestrian refuge islands could be added in order to separate right-turn lanes from through traffic lanes on Columbus, decreasing pedestrian crossing distances. They are proposed to be added where southbound Columbus traffic turns right onto westbound Vallejo, and where northbound Columbus traffic turns right onto eastbound Vallejo.

Similarly, the triangular pedestrian island between Columbus, Filbert and Powell would be enlarged, resulting in removal of four parking spaces.

Mid-block crosswalks with refuges

A mid-block crosswalk, with an island and median refuge, would enable mid-block crossings of Columbus between Broadway and Vallejo at Grant. This would allow pedestrians walking on Grant to cross Columbus without having to detour significantly out of direction, to a crosswalk at Broadway).

Changes to Bus Stop Locations

Selective removal of bus stops

In order to reduce transit delays without significantly impacting access to transit, the existing bus stop on northbound Columbus just north of Broadway could be removed.

Selected relocation of bus stops

The existing near-side bus stop on northbound Columbus just south of Green could be relocated to a location mid-block between Vallejo and Green. This would allow buses to access the stop even if traffic queues extend back some distance from the signal at Green.

Changes to Vehicle Movements

Reduce lanes on Columbus

North of Broadway, Columbus could be converted to one travel lane in each direction, with the exception of southbound Columbus between Union and Stockton (where the second, inside lane would be retained for transit use; buses would use a transit-only signal phase to transition from the inside lane, across the outside lane on to southbound Stockton) A single 18-foot travel lane in each direction would reduce auto speeds, provide more space for bicyclists, provide space for bicyclists alongside vehicles, and allow enough room for Muni to navigate around any double-parked cars or delivery vehicles.

South of Broadway, Columbus could have one northbound and two southbound travel lanes. To mitigate transit delays from the removal of a travel lane, buses would be provided with a "queue jump," or short transit-only lane and signal phase, on northbound

Columbus at Kearny, allowing them to go ahead of traffic.

Remove Travel Lane on Stockton

On Stockton Street, the southbound travel lane between Union and Columbus (from which acute right turns onto northbound Columbus are now forced) could be removed in order to expand pedestrian space.

Prohibit Certain Turning and Through Movements

Left turns from Columbus could be prohibited in most locations. (Although modeling for analysis of roadway levels of service assumed prohibition of left turns at all intersections, it might be possible to allow left turns at Vallejo and Lombard without significantly impacting LOS at remaining intersections.)

Through movements on Green across Columbus could be prohibited. The block of Green between Columbus and Powell might become one-way eastbound, or a few parking spaces might be removed in order to allow U-turns.

Turning movements at Green would be permitted only as follows:

- A right-turn lane from northbound Columbus onto eastbound Green
- A left-turn pocket for movements from westbound Green to southbound Columbus (turns onto southbound Stockton would be prohibited)
- A right-turn only lane from eastbound Green onto southbound Columbus.

4.4 Evaluation Criteria

Following are brief descriptions of each alternative, basic dimensions of the cross-section, major elements unique to each alternative, and evaluation of benefits and impacts in the areas of evaluation detailed on the following page. Both complete plan-view drawings of each alternative and annotated plan-view illustrations of a one-block length centering on the intersection of Columbus, Stockton and Green can be found in the appendix.

Each alternative has been evaluated both on its technical merits and for its potential to achieve the community-identified objectives of improvement in the following areas:

- Pedestrian safety and circulation
- Parking availability
- Bicycle amenities
- Transit delays
- Streetscape improvements
- Intersection management

These priorities are reflected both in the areas of technical analysis -- levels of service for each mode -- and in the categories for qualitative evaluation. Criteria for each of the areas of evaluation are further detailed below.

- **Traffic Delays and Driver Convenience.** In addition to intersection level of service, a measure of delays, restrictions on turn movements are a factor. As these restrictions are constant across alternatives, they have not been analyzed below; rather, they are addressed under the "common elements" section in the preceding pages.
- **Parking Availability.** This category addresses likely occupancy rates for both on- and off-street parking as well as the availability of loading zones for deliveries.
- **Transit Performance**. Level of service for this mode is, as explainer earlier, a qualitative assessment combining elements of vehicular level of service, strategies to mitigate delay, and passenger comfort as expressed by available space at stops.
- **Pedestrian Safety, Comfort and Convenience.** This category includes both pedestrian LOS as measured by crossing distance and time to cross, as well as sidewalk conditions such as width, effective buffer zone from traffic, and the extent to which adjacent traffic is calmed.
- **Bicycle Conditions.** This category consists of bicycle LOS, an expression of available right-of-way for cyclists (in travel lanes, or in a separate lane), as well as speed of traffic in the shared lane or adjacent travel lane.
- **Streetscape Experience and Vitality.** This category encompasses criteria such as design identity, the potential of streetscape elements (including open space) to enhance quality of life, and support for adjacent land uses, including access to businesses for both customers and vendors.
- **Construction Impacts.** This category addresses both construction duration and intensity, as well as the potential practicality of application of a phasing strategy.
- **Costs (Capital and Operating).** This category encompasses both capital and long-term maintenance costs, as well as the role of the community in ongoing upkeep.

4.5 Details of Each Alternative

ALTERNATIVE I: FOUR-LANE WITH "FLEX LANE"

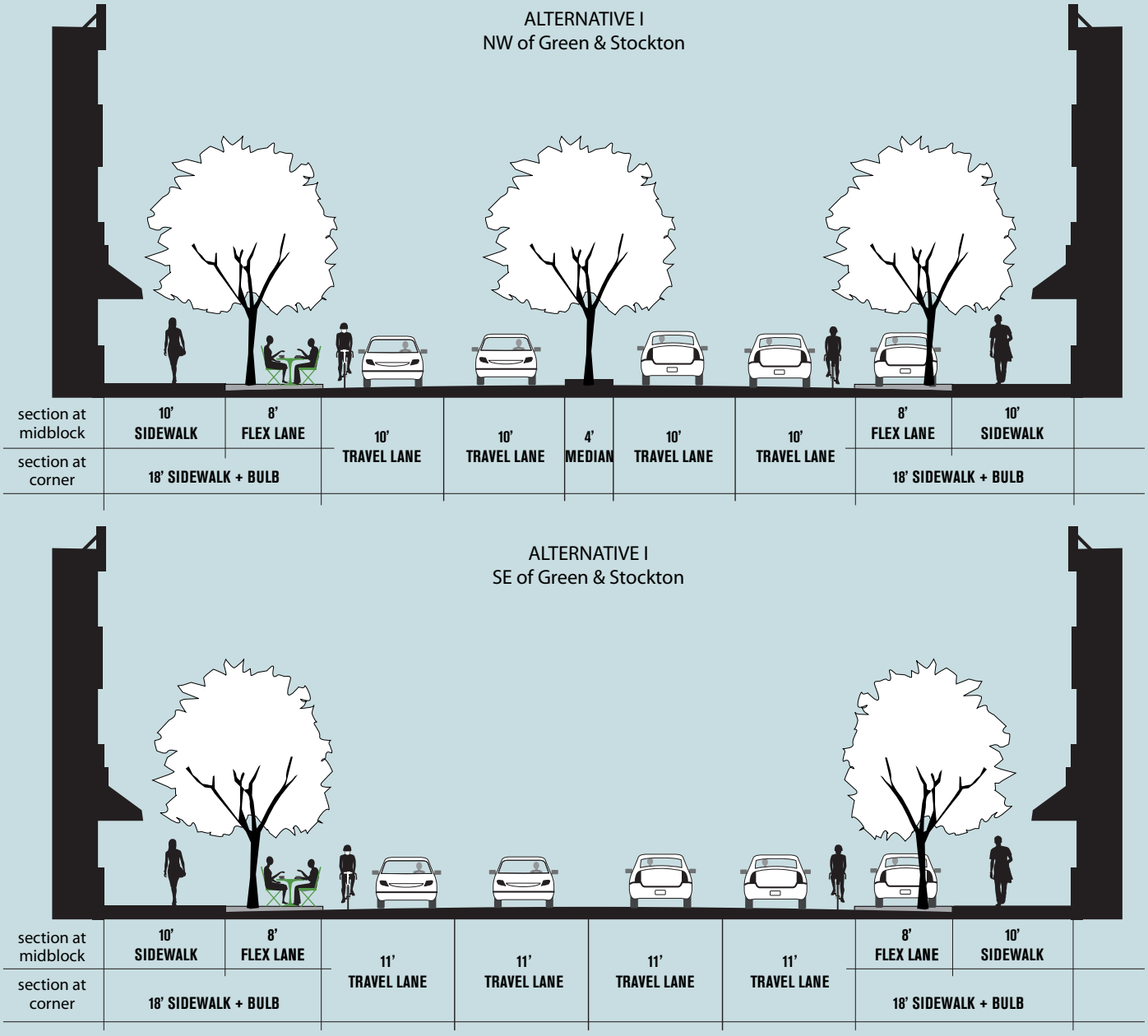
This concept would retain the existing curb line and four-travel lane configuration of the roadway. Pedestrian space would be expanded through corner bulbs and bus bulbs, and through the "flex-lane" concept.

Dimensions

Figure 4-10 shows the typical cross section of Alternative I. Starting from the property line, the basic profile north of Green and Stockton would remain much as it is today, consisting of:

- The existing 10-foot sidewalk
- The existing 8-foot parking lane (with new bulbs extending into the lane, and trees planted at regular intervals)
- The existing two 10-foot travel lanes
- The existing 4-foot median
- The existing two 10-foot travel lanes
- The existing 8-foot parking lane (with new bulbs extending into the lane, and trees planted at regular intervals)
- The existing 10-foot sidewalk

FIGURE 4-10 TYPICAL CROSS SECTION—ALTERNATIVE I



South of Green and Stockton where there is no median, travel lanes would continue to be 11 feet wide.

Major Elements

Design components that are central or unique to this alternative include:

- Retain existing four 10-foot travel lanes.
- Expand pedestrian space through new sidewalk bulb-outs at all corners and most bus stops.
- Expand pedestrian space and support the sidewalk character by permitting flexible use of the parking lane for café seating ("flex lane"), as in the examples shown in **Figures 4-11** and **4-12**.
- Improve pedestrian safety by extending the existing four-foot median into the Stockton/Green intersection. This extension will demarcate vehicle turning movements and create a pedestrian refuge for the crosswalk on the north side of Columbus.
- Calm traffic and expand usable pedestrian space by converting (using a bulb-out) the existing "soft" 45-degree right-turn lane from southbound Columbus onto Powell into a right-angle turn lane. The right-an-

FIGURE 4-11 FLEXIBLE PARKING AREA

FIGURE 4-12 CAFÉ SEATING WITH RAISED PLATFORM & TRENCH DRAINS

gle turn will force turning vehicles to slow down; the bulb out not only provides usable pedestrian space to support adjacent land uses, but increases visibility and reduces the crossing distance for pedestrians at Powell.

Evaluation of Benefits and Impacts

Traffic Delays and Driver Convenience

Alternative I maintains four through travel lanes, and therefore maintains vehicular levels of service (driver delays) at their current levels, generally well above the City-recommended minimum of "D." This is shown in **Figure 4-13**.

FIGURE 4-13 PROJECTED PM PEAK HOUR AUTOMOBILE LEVELS OF SERVICE—ALTERNATIVE I

Vehicular Level of Service	
at Broadway & Grant	B
at Stockton & Green	C
at Union & Powell	B
at Filbert & Powell	A

Parking Availability

Sidewalk bulb-outs at bus stops could result in the loss of about a dozen curbside parking and loading spaces, less than 3 percent of the on-street parking supply in the study area. The recommendations of the *Parking Occupancy and Turnover Survey*, reported in **Chapter 3**, will mitigate this modest loss. Any loss of loading spaces could be mitigated by redesignating metered spaces.

Transit Performance

Muni bus operations would improve relative to the existing condition due to the bus bulbs, which would eliminate the need for buses to merge back into traffic, reducing delays by up to 9 seconds per stop (according to *Highway Capacity Manual* calculations). Conditions for passengers waiting to board would also be improved by more spacious bulb stops. Consolidating an existing bus stop on northbound Columbus (to be discussed in detail under Alternative II) could further reduce transit delays without significantly compromising access.

Pedestrian Safety, Comfort and Convenience

Alternative I would significantly improve pedestrian levels of service by using corner bulbs to shorten crossing distances. Pedestrian LOS would improve most notably at the intersection of Columbus, Green and Stockton, where total crossing distances (including sidewalks between the two crossings on each side) would decrease from approximately 170 feet to 120 on the west side of Columbus, and from approximately 140 feet to 105 on the east side. See **Figure 4-14**.

FIGURE 4-14 PROJECTED PEDESTRIAN LEVELS OF SERVICE—ALTERNATIVE I

Pedestrian Level of Service	
at Broadway & Grant	C
at Stockton & Green	C
at Union & Powell	B
at Filbert & Powell	B

While it would not widen much of the sidewalk, this alternative would also enhance pedestrian comfort by:

- Adding sidewalk bulb-outs at corners and bus stops, where sidewalks are most congested. Street furniture could be relocated to these bulbs, effectively widening the pedestrian through-zone wherever furniture currently encroaches upon it);
- Relocating trees into the parking lane, which would have a calming traffic effect;
- Effectively widening the sidewalk by creating opportunities to move some café seating, which now often constricts the already-narrow four-foot pedestrian through-zone to three feet or less at pinch points, to the parking lane

Bicycle Conditions

In this alternative, levels of service for bicyclists (**Figure 4-15**) are generally unchanged from the existing condition, since cyclists would continue to share a travel lane with motorists.

FIGURE 4-15 PROJECTED BICYCLE LEVELS OF SERVICE—ALTERNATIVE I

Bicycle Level of Service	
Outbound	
between Broadway & Vallejo	E
between Vallejo & Green	E
between Green & Union	E
between Union & Filbert	D
Inbound	
between Filbert & Union	D
between Union & Green	E
between Green & Vallejo	E
between Vallejo & Broadway	E

Streetscape Experience and Vitality

This alternative's most significant contribution to the streetscape would be the relocation of trees into the parking lane. Additionally, the expansive corner bulbs provide an opportunity to reorganize street furniture.

By providing additional space for pedestrians and café seating (approximately 160 square feet per space), this alternative would reinforce the sidewalk character of North Beach.

Construction Impacts

Alternative I would not alter the basic profile of the street, and is both the least expensive and the least disruptive of the alternatives. Construction would only be required at corners and bus stops, and short-term costs and impacts might be further mitigated by interim construction of "trench drains."

Costs

By leaving in place most of Columbus Avenue's existing curb line (and all of the utilities both under and along the sidewalk), the existing four-travel lane, and 10-foot sidewalk, Alternative I would limit construction costs. However, permanent sidewalk bulb-outs are not inexpensive (a single bulb can cost several hundred thousand dollars, depending on size and the extent of utility relocation required). Tree planters in the parking lane trigger increased ongoing maintenance costs; the City requires that communities commit to maintaining such planters, such as through a Community Benefits District, because they cannot be maintained by the automated street-sweeping machines.

Figure 4-16 summarizes the benefits and impacts of Alternative I.

ALTERNATIVE II—TWO-LANE WITH "FLEX LANE"

This concept would widen the existing 10-foot sidewalks to 12 to 14 feet by reducing the number of travel lanes from two in each direction to one each way. These lanes would be sufficiently wide (18 feet) to safely and comfortably accommodate both motorized traffic and bicycles and to provide flexibility to maneuver around double-parked vehicles. As in Alternative I, sidewalk bulbs and parking lane trees would be added. At the central intersection of Columbus, Green and Stockton streets, diagonal crosswalks could be added to enhance pedestrian connectivity and calm traffic.

Dimensions

Figure 4-17 shows the typical cross section of Alternative II. Starting from the property line, the basic profile north of Green and Stockton would consist of:

- 12-foot sidewalk
- 8-foot parking lane (with bulbs extending into the lane, and trees planted at regular intervals)
- 18-foot travel lane
- 4-foot median
- 18-foot travel lane
- 8-foot parking lane (with bulbs extending into the lane, and trees planted at regular intervals)
- 12-foot sidewalk

One exception is the west (southbound) side of Columbus between Union and Stockton, which carries heavy Muni volumes; on this block in the southbound direction, designs provide for an 11-foot inside transit lane, a 10-foot outside travel lane, a 7-foot parking lane, and a 10-foot sidewalk, ensuring that buses would not face increased delays if traffic speeds slow.

Major Elements

Design components that are central or unique to this alternative include:

- Wider sidewalks, 12 to 14 feet wide
- Fewer travel lanes - two 18-foot travel lanes instead of four 10-foot lanes. These wide lanes allow relief from double parking as well as ample space for bicyclists to ride out of traffic.
- Expanded pedestrian space and increased safety through sidewalk bulb-outs at all corners and most bus stops.
- Support for adjacent land uses through flexible use of the parking lane as café seating ("flex lane").
- Retention of two parking spaces on northbound Columbus along the Powell/Filbert "triangle."

At Columbus, Green and Stockton, the existing four-foot median would widen to six feet, and the median would be extended south through the intersection. This six-feet median and the shorter crossing distances afforded by a narrower roadway would allow addition of two diagonal, east-west crosswalks in Columbus along the axis of Green, each protected by a thumbnail and incorporating a standard-width, six-foot median refuge.[1] These are shown in **Figure 4-18**. In this alternative, traffic on Green could cross Columbus, and left turns from westbound Green on to both southbound Columbus and Stockton would be legal (although there would not be a left-turn lane on Green, or right-turn lane from Columbus onto Green). This design concept works as an element either of Alternative II or of Alternative III.[2]

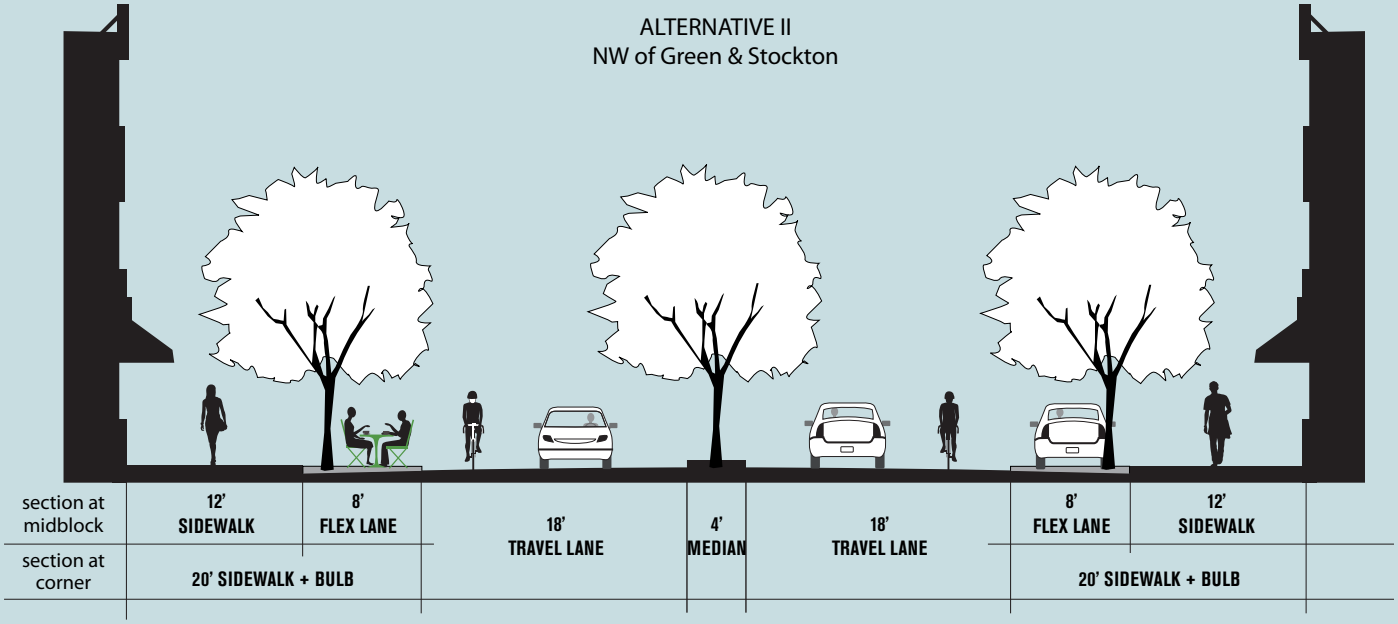
1 Thanks to Jonathan Weiner of Telegraph Hill Dwellers for this design concept.

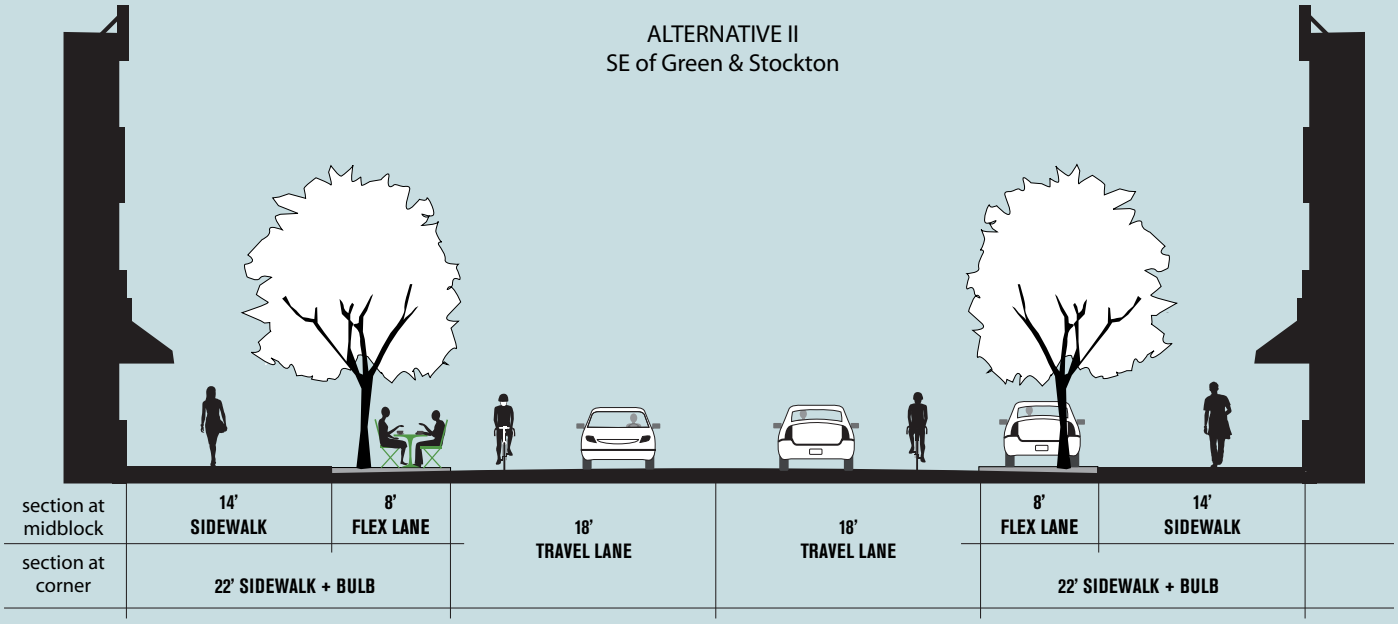
2 Only Alternatives II and III shorten the crossing distance sufficiently to permit this option.

FIGURE 4-16 SUMMARY OF BENEFITS AND IMPACTS — ALTERNATIVE I

ALTERNATIVE I: Summary of Benefits and Impacts	
Traffic Delays and Driver Convenience	
Intersection Delay (Level of Service)	▪ Broadway: B ▪ Green/Stockton C ▪ Union: B ▪ Filbert: A
Turn Movements/ Circulation	No through movements on Green; no left from EB Green, or WB Green to SB Stockton; Green btwn. Columbus and Powell possibly one-way EB; Stockton btwn. Union & Columbus one-way NB; no right at Union
Parking Availability	
Curbside/Off-Street Supply	Approx. 12 curbside parking/loading spaces lost to bus bulbs, depending on configuration
Loading/Drop-off Access	Any loss of loading spaces could be mitigated by redesignating metered spaces
Transit Performance	
Travel Time and Reliability	Bulbs at all stops eliminate delays caused by merge back into traffic
Waiting/Boarding Experience	Up to 960 sq. ft. bulbs at all stops separate waiting area from pedestrians, provide space for additional amenities, allow boarding from curb at all times
Pedestrian Safety, Comfort and Convenience	
Crossing Distance/Time to Cross (Level of Service)	▪ Broadway: C ▪ Green/Stockton C ▪ Union: B ▪ Filbert: B
Sidewalk Space	Significant increase at corners, bus stops where congestion is worst; effective increase where café seating moved to parking lane
Buffering from/Calming of Adjacent Traffic	Trees in parking lane would calm traffic; additional buffer where café seating in parking spaces, eliminating auto movements adjacent to sidewalk
Bicycle Conditions	
Availability of Right-of-Way/ Speed of Traffic (Level of Service)	▪ Filbert/Union: D ▪ Union/Green: E ▪ Green/Vallejo: E ▪ Vallejo/Broadway: E Equivalent to existing condition, although trees in parking lane would calm traffic
Streetscape Experience and Vitality	
Identity (recognizable design elements)	Additional trees in parking lane would add greenery; bulbs would allow additional, "branded" street furniture
Public Space/Support for Adjacent Land Uses	As much as 11,500 sq. ft. of additional space for café seating
Construction Impacts	
Duration/Intensity	Moderate/Moderate (construction limited to bulbs; much of curbline would not be moved)
Phasing Potential	Significant (potential to build relatively inexpensive "trench drains" in interim stage); curb bulbs and bus bulbs need not be built together along the length of the street
Costs (Capital and Operating)	
Capital	Moderate (construction limited to bulbs)
Operating/Maintenance	Moderate (gutters between curb and tree basins, trench drains would require hand-sweeping)
Community Ability to Maintain	High (sweeping of gutters and drains would be responsibility of the community, such as through a Community Benefits District)

FIGURE 4-17 TYPICAL CROSS SECTION—ALTERNATIVE II





Evaluation of Benefits and Impacts

Traffic Delays and Driver Convenience

Alternative II reduces the number of through travel lanes in this segment of Columbus from four to two with the exception of the southbound block between Union and Stockton, the busiest block for buses. As a result, Alternative II somewhat reduces vehicular levels of service (**Figure 4-19**). However, even at the challenging intersection of Columbus, Green and Stockton, the city's recommended minimum LOS standard is achieved. Peak delays are well within the acceptable range.

FIGURE 4-19 PROJECTED PM PEAK HOUR AUTOMOBILE LEVELS OF SERVICE—ALTERNATIVE II

Vehicular Level of Service	
at Broadway & Grant	C
at Stockton & Green	D
at Union & Powell	B
at Filbert & Powell	A

FIGURE 4-18 RENDERING OF COLUMBUS, GREEN, AND STOCKTON INTERSECTION
EXISTING CONDITIONS (TOP) AND WITH DIAGONAL CROSSWALKS (BOTTOM)

Images from CD+A

Parking Availability

As for Alternative I, sidewalk bulb-outs at bus stops would result in the loss of about a dozen curbside parking and loading spaces, or less than three percent of the study area's supply of on-street spaces. The recommendations in the *Parking Occupancy and Turnover Survey* would mitigate this modest loss, and any loss of loading spaces could be mitigated by redesignating metered spaces.

Transit Performance

Careful attention has been given in Alternative II to maintaining Muni speeds, and preventing the increased delays to cars from further delaying Muni. Alternative II incorporates a number of transit preferential features designed to mitigate these impacts. The 30-Stockton, the most heavily patronized of the Muni routes that serve Columbus, and a Muni "rapid" route, is not expected to experience increased delays; delays on Stockton approaching Green, and on Columbus north of Green, will not increase as a result of Alternative II.

However, those Muni routes operating on Columbus Avenue south of Stockton would experience increased delays if transit priority measures are not incorporated into the design: Route 41 and the MTA's proposed new Route 11. A number of strategies are proposed to mitigate delay:

- Bus bulbs would remove delays associated with buses merging back into traffic

FIGURE 4-22 "SHARROW" MARKINGS DELINEATE AND PROTECT SPACE FOR CYCLISTS ON A SHARED ROADWAY.

after loading and unloading, reducing delays by up to 9 seconds per stop.

- Eighteen-foot travel lanes would provide sufficient width for buses to maneuver around double-parked vehicles.
- A transit-only lane in the most critical segment for transit operations, southbound Columbus between Union and Stockton, would benefit routes including the 11, 30, 41 and 45 in the southbound direction.

But in order to reduce delays on Routes 11 and 41 in the northbound direction, three additional steps are proposed:

- A "queue jump," or short transit-only lane and signal phase, on northbound Columbus at Kearny. The queue jump would allow buses to proceed ahead of northbound traffic entering Columbus's one-lane segment.
- The existing "near-side" stop on northbound Columbus just south of Green should be extended into mid-block, between Green and Vallejo, reducing the risk that buses would be prevented from reaching the stop by traffic queuing at the signal.
- SFMTA could consider consolidating the existing stop on northbound Columbus just north of Broadway, which could save up to 30 seconds per trip. Although the stop is moderately well-used (660 boardings and alightings per weekday), it is located less than 500 feet north of a stop at Pacific. The likely reason for this is to provide transfers to Muni Route 12 in both the eastbound and westbound directions; however, connections to this route are much more important in the westbound direction (served by the stop at Pacific).

Pedestrian Safety, Comfort and Convenience

Alternative II reduces pedestrian crossing distrances by 4 to 8 feet pert crossing, an improved condition. The diagonal crosswalks at Columbus, Green, and Stockton add another option for pedestrians, improving connectivity; however this crossing is long and registers a pedestrian level of service of "D". **Figure 4-20** shows pedestrian LOS.

FIGURE 4-20 PROJECTED PEDESTRIAN LEVELS OF SERVICE—ALTERNATIVE II

Pedestrian Level of Service	
at Broadway & Grant	B
at Stockton & Green	C
at Union & Powell	B
at Filbert & Powell	B

In addition to the benefits offered by Alternative I—including corner and bus stop bulbs and trees and café seating in the parking lane—Alternative II would widen the sidewalk along the length of Columbus within the study area from 10 to 12 or 14 feet. While this represents an increase of only 20 to 40 percent, and still would leave the sidewalk below the 15-foot standard for commercial zones recommended by the city's Better Streets Plan, it would represent a 50 to 100 percent increase in the crucial pedestrian through-zone used for walking, increasing it from four feet (or less where it is further constricted by café seating) to six or eight feet. Pedestrians would no longer be forced to walk single-file. Additionally, the wide travel lanes will provide an extra six feet or so of "buffer" separation between pedestrians and traffic.

Bicycle Conditions

In this alternative, levels of service for bicyclists (**Figure 4-21**) are significantly improved over the existing condition, due primarily to a 18-foot travel lane (**Figure 4-22 illustrates a "sharrow," another example of providing bicycle space**) that would result in a substantial buffer between moving and parked cars. On southbound Columbus between Union and Stockton, levels of service for cyclists would be reduced somewhat, as they would continue to share a 10-foot travel lane with traffic.

FIGURE 4-21 PROJECTED BICYCLE LEVELS OF SERVICE—ALTERNATIVE II

Bicycle Level of Service	
Outbound	
between Broadway & Vallejo	C
between Vallejo & Green	C
between Green & Union	C
between Union & Filbert	C
Inbound	
between Filbert & Union	C
between Union & Green	D
between Green & Vallejo	C
between Vallejo & Broadway	C

Streetscape Experience and Vitality

Like Alternative I, Alternative II would add greenery and offer an opportunity to consolidate street furniture. Widening sidewalks would also reinforce both the reality and perception of North Beach as a pedestrian-oriented urban neighborhood.

By providing additional space for café seating and pedestrians, as well as bicyclists,

FIGURE 4-23 SUMMARY OF BENEFITS AND IMPACTS — ALTERNATIVE II

ALTERNATIVE II: Summary of Benefits and Impacts	
Traffic Delays and Driver Convenience	
Intersection Delay (Level of Service)	Broadway: C Green/Stockton: D Union: B Filbert: A
Turn Movements/ Circulation	No lefts from Columbus (only allowed currently at Green and Vallejo); no left from EB Green; Green btwn. Columbus and Powell possibly one-way EB; Stockton btwn. Union & Columbus one-way NB; no right at Union
Parking Availability	
Curbside/Off-Street Supply	Approx. 12 curbside parking/loading spaces lost to bus bulbs, depending on configuration
Loading/Drop-off Access	Any loss of loading spaces could be mitigated by redesignating metered spaces
Transit Performance	
Travel Time and Reliability	Bulbs at all stops eliminate delays caused by merge back into traffic; loss of a travel lane on some blocks may increase delays, but mitigated by elimination of need to merge back into traffic at stops, sufficient width (18') to pass stopped vehicles, bus-only lane in critical segment (SB Columbus btwn. Union &Stockton), and additional steps to benefit routes most impacted, including removal of stop on NB Columbus at Broadway
Waiting/Boarding Experience	Up to 960 sq. ft. bulbs at all stops separate waiting area from pedestrians, provide space for additional amenities, allow boarding from curb at all times
Pedestrian Safety, Comfort and Convenience	
Crossing Distance/Time to Cross (Level of Service)	Broadway: B Green/Stockton C Union: B Filbert: B
Sidewalk Space	Significant increase at corners, bus stops where congestion is worst; moderate increase (2'-4') in width of pedestrian through-zone along length of street
Buffering from/Calming of Adjacent Traffic	18' lanes would further separate traffic from pedestrians; reduction in travel lanes, trees in parking lane would calm traffic; additional buffer where café seating uses parking spaces
Bicycle Conditions	
Availability of Right-of-Way/ Speed of Traffic (Level of Service)	Filbert/Union: C Union/Green: C (NB), D (SB) Green/Vallejo: C Vallejo/Broadway: C 18' travel lane allows separation from traffic; reduction of travel lanes, trees in parking lane would calm traffic
Streetscape Experience and Vitality	
Identity (recognizable design elements)	Additional trees in parking lane would add greenery; bulbs, wider sidewalk would allow additional "branded" street furniture;
Public Space/Support for Adjacent Land Uses	As much as 11,500 sq. ft. of additional space for café seating
Construction Impacts	
Duration/Intensity	Long/Intense (entire curbline would be moved)
Phasing Potential	Significant (potential for "trench drains" in first phase, delay of relocation of curbline to second phase)
Costs (Capital and Operating)	
Capital	High (entire curbline would be moved)
Operating/Maintenance	High (hand-sweeping of gutters and drains)
Community Ability to Maintain	Moderate (sweeping of gutters and drains could be responsibility of merchants)

Alternative II would also support the existing sidewalk character of North Beach.

Construction Impacts

Because it would relocate the entire existing curb line, Alternative II would cause significantly more construction disruption than Alternative I. However, Alternative II presents opportunities for staged construction (see the Implementation Plan in **Chapter 6**).

Costs

Relocating the entire existing curb line is also expensive. The maintenance costs of Alternative II would increase over the existing condition if trees are relocated into the parking lane, and would require support from the community through a Community Benefits District or similar commitment.

Figure 4-23 is a summary of the benefits and impacts of Alternative II.

ALTERNATIVE III—"TWO-LANE WITH FLEX SPACE"

Alternative III seeks to provide even more space for pedestrians by permanently widening the sidewalk into what is now the parking lane. The outer 8 feet of sidewalk would provide a "flex space" (**Figure 4-24**) that could serve as loading / unloading and dropoff temporary parking. Alternative III also would create a signature "crown" design at the intersection of Stockton / Green (**Figure 4-25**).

The sidewalks in Alternative III will be between 20 and 22 feet wide, providing additional space for pedestrians while allowing all café seating and streetside trees to remain on the sidewalk. This width is achieved by removing the parallel metered parking along Columbus, about 72 curbside parking and loading spaces between Filbert and Broadway. In order to maintain delivery access, the sidewalk would be divided into "inner" and "outer" zones defined by textured pavement. A beveled or "mountable" curb would enable delivery vehicles to park in the "outer" zone. Much delivery activity occurs during the day, while the period of peak pedestrian activity is in the evening, resulting in a "natural" time-sharing arrangement for this portion of the sidewalk. This "flex lane" design concept allows parked vehicles, café seating, and pedestrians to share part of the sidewalk with relatively few conflicts and a reasonable level of safety and comfort.[3]

Alternative III proposes a signature design treatment at Green/Stockton: a plaza or "crown," as designers have informally described it, which would add about 2,000 square feet of civic space at a central, highly visible and symbolic location, at the midpoint of the Columbus commercial core and atop the Columbus "crest" where views open to the south, along the axis of Columbus, toward the Transamerica Pyramid. (**Figure 4-26**.) While modest in size, the space would be large enough for art, street furniture, and potentially a kiosk or vendor. This plaza design also works with Alternative II (and the diagonal crosswalks proposed as part of Alternative II are also compatible with Alternative III's widened sidewalks).

Dimensions

Figure 4-27 depicts the proposed cross section of Alternative III. Starting from the property line, the basic profile north of Green and Stockton would consist of:

- A 20-foot sidewalk, divided into a 12-foot "inner" and 8-foot "outer" zone ("flex space")
- An 18-foot travel lane
- The existing 4-foot median
- An 18-foot travel lane
- A 20-foot sidewalk, divided into a 12-foot "inner" and 8-foot "outer" zone

South of Green and Stockton where there is no median, sidewalks would be widened to 22 feet (including a 14-foot "inner" zone). On the west (southbound) side of Columbus between Union and Stockton, there would be an 11-foot inside transit lane, a 10-foot outside travel lane, a 7-foot parking lane, and a 10-foot sidewalk.

3 Failing this, a limited number of loading space "cutouts" could be provided at strategic locations.

Major Elements

Design components that are central or unique to this alternative include:

- 20- to 22-foot sidewalks featuring an "outer" zone or "flex space" would accommodate pedestrians, café seating and delivery vehicles.
- Removal of all curbside parallel parking and loading from the reconfigured segment of Columbus Avenue.
- The intersection of Columbus, Green and Stockton Streets becomes the "crown" of the street, with a centerpiece design element: a roughly 2,000-square foot mini-plaza approximately 22 feet across at its widest point, sufficiently generous to accommodate public art, benches and possibly a commercial kiosk. The plaza is located at the heart of the North Beach café strip and at the high point or "summit" of Columbus, and is envisioned as a focal point for the neighborhood.

Evaluation of Benefits and Impacts

Many of the impacts and benefits of Alternative II also apply to Alternative III. The primary difference between the alternatives is conversion of the existing parallel parking lanes into widened sidewalks, and the "crown" plaza in the median of Columbus. See **Figure 4-28** for a summary of benefits and impacts of Alternative III.

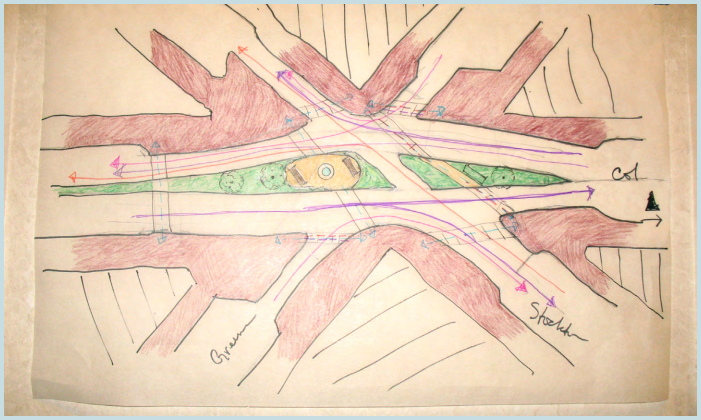
4.6 Automobile, Transit, Pedestrian and Bicycle Levels of Service

With the exception of the Stockton/Green intersection, the lane configurations, turn movements, signal timings and crossing distances in Alternative III are all identical to those in Alternative II. At Stockton/Green, auto and pedestrian level services remain unchanged despite the different

FIGURE 4-24 VIEW OF SIDEWALK NORTH OF GREEN WITH 22-FOOT SIDEWALK INCLUDING "FLEX SPACE"

Image from CD+A

FIGURE 4-25 GREEN/STOCKTON PLAZA: CONCEPTUAL SKETCH, PLAN VIEW, AND RENDERING



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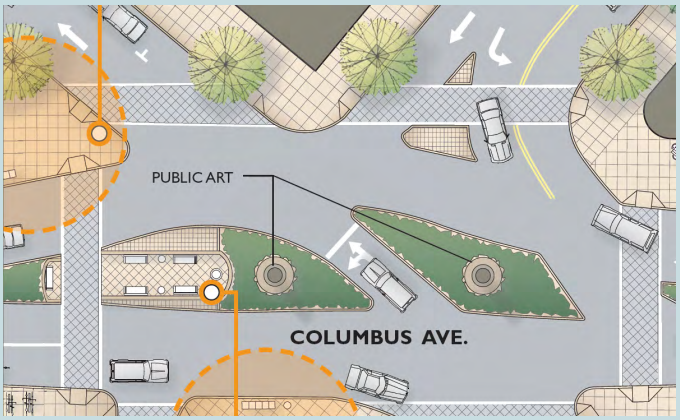


Image from CD+A

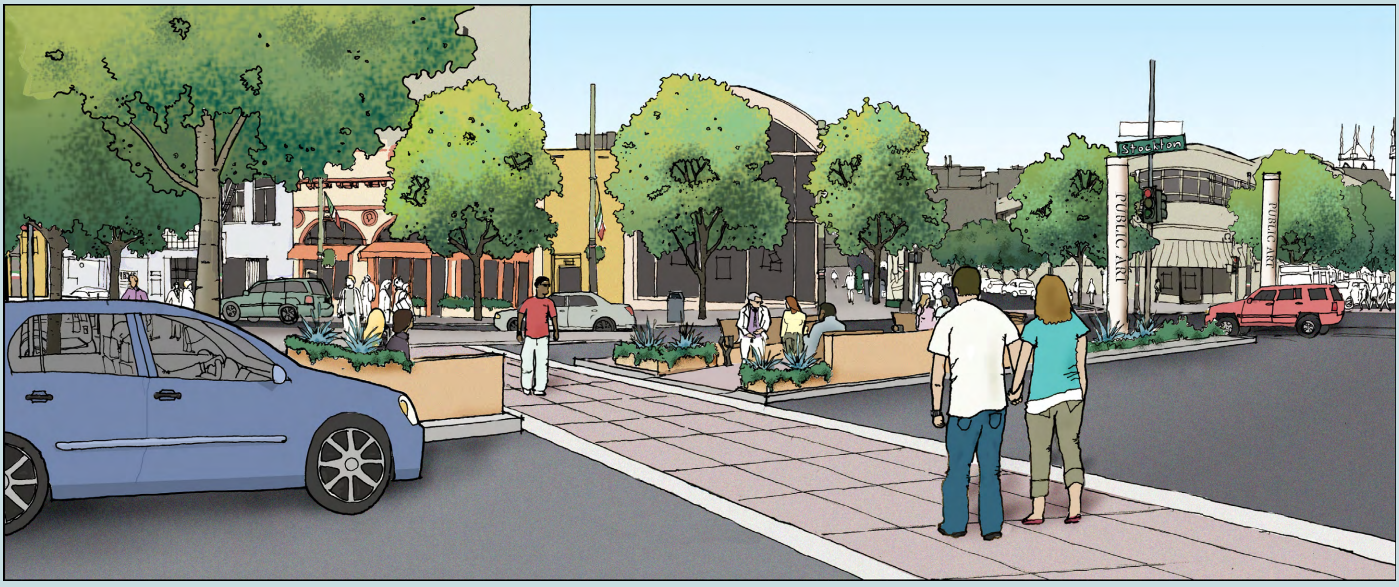
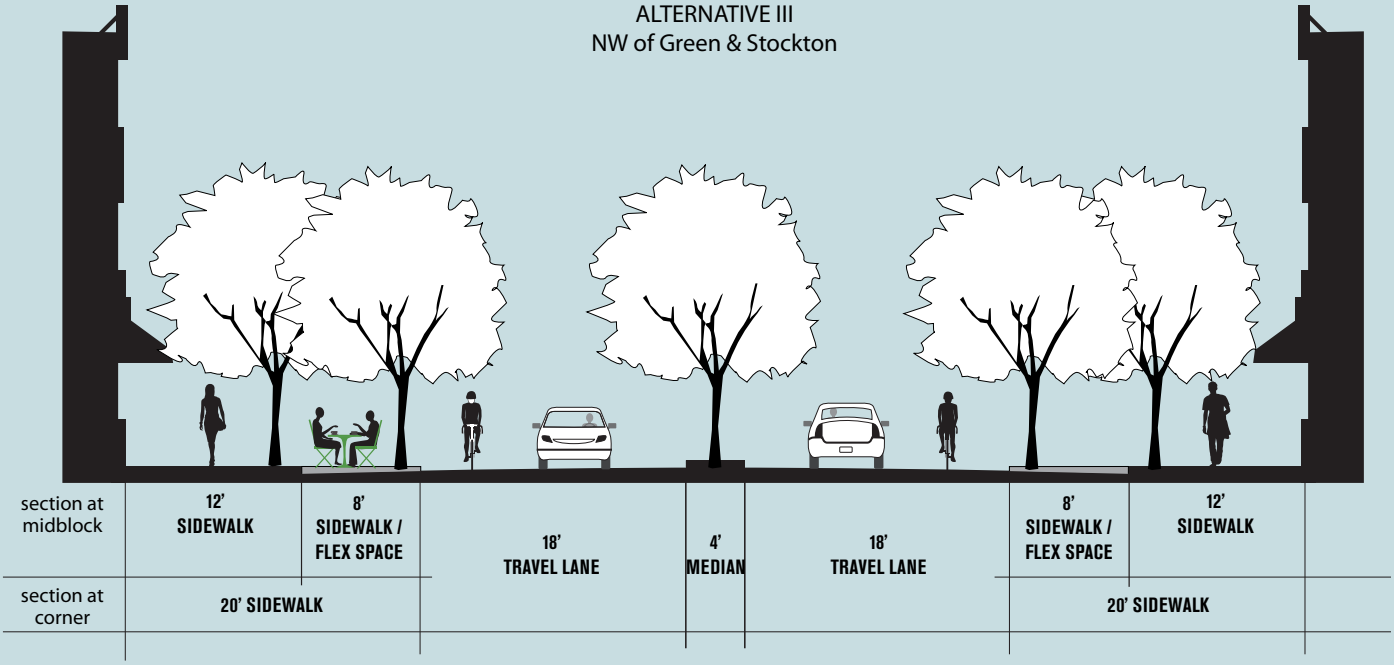


Image from CD+A

FIGURE 4-26 GREEN/STOCKTON PLAZA: BEFORE & AFTER, SHOWING VIEWS TO THE SOUTH

FIGURE 4-27 TYPICAL CROSS SECTION—ALTERNATIVE III



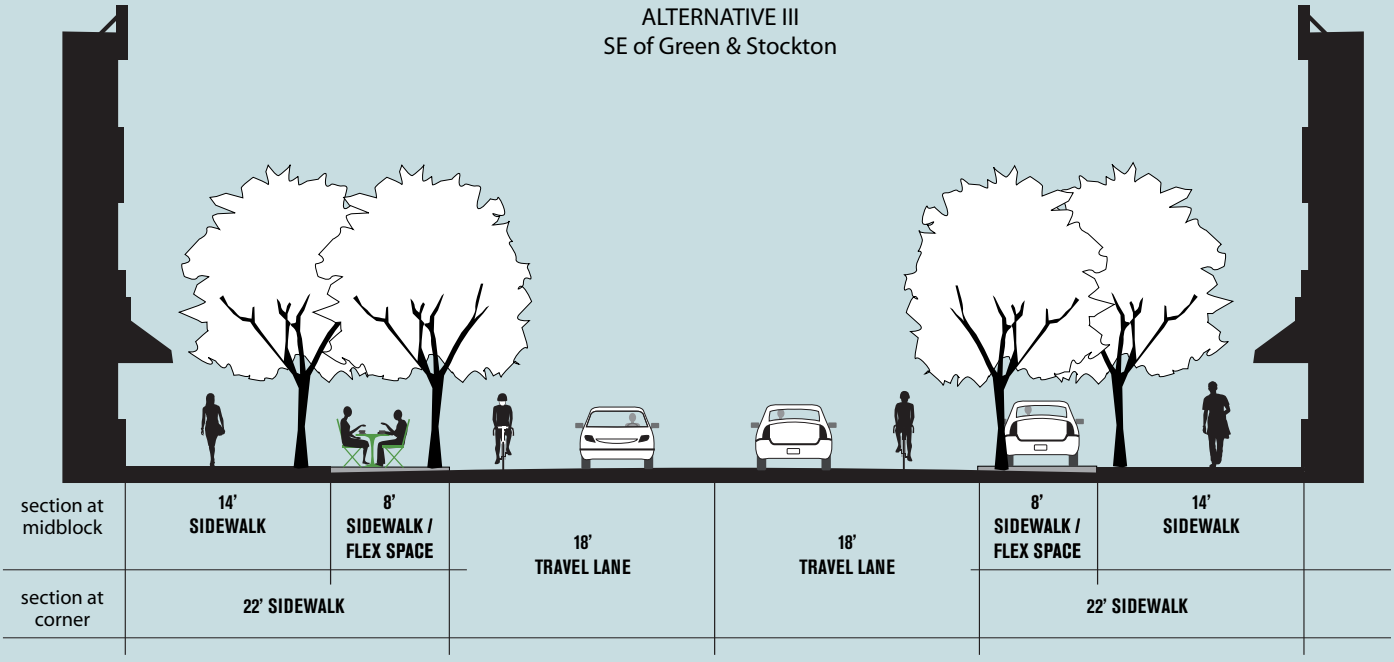


FIGURE 4-28 SUMMARY OF BENEFITS AND IMPACTS —ALTERNATIVE III

ALTERNATIVE III: Summary of Benefits and Impacts	
Traffic Delays and Driver Convenience	
Intersection Delay (Level of Service)	Broadway: C Green/Stockton: D Union: B Filbert: A
Turn Movements/ Circulation	No lefts from Columbus (only allowed currently at Green and Vallejo); no through movements on Green; no left from EB Green, or WB Green to SB Stockton; Green btwn. Columbus and Powell possibly one-way EB; Stockton btwn. Union & Columbus one-way NB; no right at Union
Parking Availability	
Curbside/Off-Street Supply	Approx. 72 curbside parking/loading spaces lost, resulting in 20% reduction in metered spaces, 12% reduction in meter/permit spaces, and 5% reduction in all general-use spaces in corridor (including one block on either side)
Loading/Drop-off Access	Loading and drop off spaces maintained either through use of sidewalk "flex space" or sidewalk cutouts; if latter, possible reduction in loading space
Transit Performance	
Travel Time and Reliability	Bulbs at all stops eliminate delays caused by merge back into traffic; loss of a travel lane on some blocks may increase delays, but mitigated by elimination of need to merge back into traffic at stops, sufficient width (18') to pass stopped vehicles, bus-only lane in critical segment (SB Columbus btwn. Union &Stockton), and additional steps to benefit routes most impacted, including removal of stop on NB Columbus at Broadway
Waiting/Boarding Experience	Wide sidewalks adjacent to travel lane provide waiting area separate from pedestrians, space for additional amenities, and allow boarding from curb at all times
Pedestrian Safety, Comfort and Convenience	
Crossing Distance/Time to Cross (Level of Service)	Broadway: B Green/Stockton C Union: B Filbert: B
Sidewalk Space	Significant increase (10'-12') in width along length of street
Buffering from/Calming of Adjacent Traffic	Sidewalk adjacent to travel lanes; however, wide sidewalks and lanes allow separation between traffic and pedestrians (potential minor impacts from loading vehicle movements on sidewalk)
Bicycle Conditions	
Availability of Right-of-Way/ Speed of Traffic (Level of Service)	Filbert/Union: C Union/Green: C (NB), D (SB) Green/Vallejo: C Vallejo/Broadway: C 18' travel lane allows separation from traffic; reduction of travel lanes, trees in parking lane would calm traffic; elimination of curbside parking might encourage double-parking but would virtually eliminate risk of dooring
Streetscape Experience and Vitality	
Identity (recognizable design elements)	Significantly wider sidewalk would allow double row of trees, significant increase in "branded" street furniture; strong green and pedestrian-oriented identity would build on, enhance existing unique character of North Beach
Public Space/Support for Adjacent Land Uses	As much as 11,500 sq. ft. of additional space for café seating; ~2,000 sq. ft. plaza at Stockton/Green; greatly improved pedestrian and bicycle access, moderate reduction in auto access to businesses
Construction Impacts	
Duration/Intensity	Long/Intense (entire curbline would be moved, plaza constructed in median of roadway)
Phasing Potential	Moderate (travel lane changes must be implemented at once; however, sidewalk widening can be implemented on a block-by-block basis)
Costs (Capital and Operating)	
Capital	High (higher than Alternative II due to structure section / texture pavement in "flex space")
Operating/Maintenance	High (significant increase in sidewalk width and street furniture, new plaza at Green/Stockton)
Community Ability to Maintain	Moderate (Stockton / Green plaza requires community maintenance)

configurations. Vehicular, transit, pedestrian and bicycle levels of service in Alternative III are identical to Alternative II. (See **Figures 4-29**, **4-30**, and **31.**) However, standard LOS analysis cannot quantify the impact of parking-related maneuvers. Removing the parallel parking could either improve or impede traffic flow. On one hand, removal of parallel-parking movements will reduce friction and delays to through traffic and transit; on the other hand, the combination of reduced curbside access to businesses and an unusually wide travel lane might result in an increase in double parking. This double parking would impact cyclists more than traffic and transit.

FIGURE 4-29 PROJECTED PM PEAK HOUR AUTOMOBILE LEVELS OF SERVICE—ALTERNATIVE II

Vehicular Level of Service	
at Broadway & Grant	C
at Stockton & Green	D
at Union & Powell	B
at Filbert & Powell	A

FIGURE 4-30 PROJECTED PEDESTRIAN LEVELS OF SERVICE—ALTERNATIVE III

Pedestrian Level of Service	
at Broadway & Grant	B
at Stockton & Green	C
at Union & Powell	B
at Filbert & Powell	B

FIGURE 4-31 PROJECTED BICYCLE LEVELS OF SERVICE—ALTERNATIVE III

Bicycle Level of Service	
Outbound	
between Broadway & Vallejo	C
between Vallejo & Green	C
between Green & Union	C
between Union & Filbert	C
Inbound	
between Filbert & Union	C
between Union & Green	D
between Green & Vallejo	C
between Vallejo & Broadway	C

Parking Availability, Pedestrian Comfort and Convenience, and Streetscape Experience and Vitality

Alternative III provides superior benefits in the realm of pedestrian space and comfort and functional and aesthetic quality of the streetscape; replacement of the flex lane in Alternative II with approximately 11,500 square feet of additional sidewalk space ("flex space") will greatly improve pedestrian conditions overall, even if part of this space was used on a part-time basis by parked vehicles. However, this high quality pedestrian realm can only be achieved at a cost to on-street parking availability. These interrelated issues are of sufficient importance to require more in-depth assessment, which can be found in the following section, "Additional Analysis of 'Flex Lane' and 'Flex Space' Concepts." Additionally, a central plaza at the Stockton/Green intersection would not change the total space available to pedestrians, but it would move much of it off of sidewalks into the median of the roadway, a "trade-off" that the community will need to carefully consider in choosing a preferred alternative.

Construction Impacts

Alternative III would not be much more intrusive than Alternative II , and Alternative III would virtually double the space available to pedestrians (although Alternative III would greatly reduce the supply of curbside parking; this and other relative impacts and benefits are discussed at length in the following section).

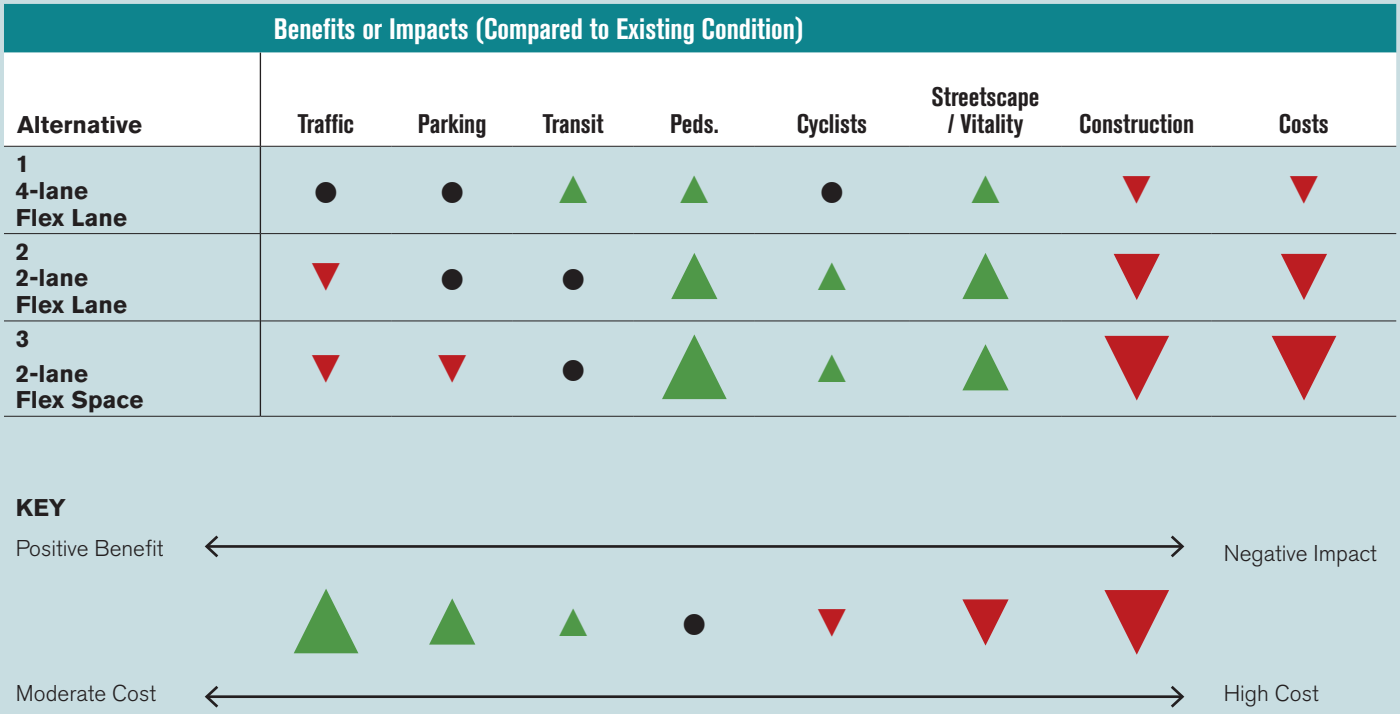
Costs

Capital costs for Alternative III would likely be somewhat higher than the costs for Alternative II, due both to the wider sidewalks and to the Green/Stockton plaza. The "flex lane" portion of the sidewalk would need to be constructed with a more substantial structural section to support delivery vehicles, and with textured pavement to meet ADA requirements. The community would need to establish a mechanism for maintaining the Stockton / Green plaza, an increased maintenance cost to Alternative III.

FIGURE 4-32 RELATIVE BENEFITS AND IMPACTS OF FLEX LANE AND FLEX SPACE ALTERNATIVES

RELATIVE BENEFITS & IMPACTS	Flex Lane (Alternative II)	Flex Space (Alternative III)
Pedestrian Conditions		
Walking "Through-Zone"	Minimum 2-4' mid-block increase in width of effective walking space; more where tables are relocated to parking lane (max. total of 6-8' wide effective walking space)	Up to 10-12' mid-block increase in width of effective walking space; less where tables remain on sidewalk, or loading vehicles use sidewalk (max. total of 14-16' wide effective walking space)
Café Seating Areas	Some of the tables currently occupying ~3-5' of sidewalk relocated to 8' wide off-curb table space; parking lane grades may require level platforms	Some of the tables currently occupying ~3-5' of sidewalk relocated to 8' wide sidewalk table space
Pedestrian Comfort and Safety	Café seating buffered by wide travel lanes	Buffer provided by wide travel lanes from traffic for pedestrians in "outer" zone; loading vehicle movements in outer zone could have modest negative impact on comfort and safety
Parking Availability		
Curbside Parking	Roughly equivalent to existing condition	20% reduction in curbside metered spaces along corridor including one block on either side
Loading / Drop-Off Access	Roughly equivalent to existing condition	Loading and drop off space maintained either through use of sidewalk "outer zone" or sidewalk cutouts; if latter, possible reduction in loading space
Streetscape and Economic Impacts		
Streetscape	Additional trees in parking lane where no conflicts with existing trees	Potential for double rows of trees, location of benches and other furniture away from vehicles
Economic Impacts	Additional space for café seating; improved pedestrian and bicycle access to businesses; slight reduction in auto access	Greatly expanded space for café seating; greatly improved pedestrian and bicycle access to businesses; moderate reduction in auto access
Disabled Access		
ADA Access to Café Seating	Parking lane grades may require level platforms to ensure ADA access	Provided
ADA Access to Businesses	Equivalent to existing condition	No curbside parking along Columbus; ADA access relocated to cross streets
ADA Safety Requirements	Retention of ~6" curb would ensure safety for visibility-impaired	Use of "outer" zone of sidewalk by vehicles would require textured, contrasting pavement to meet ADA requirements for the visually impaired
Vehicular Levels of Service (Automobile, Transit and Bicycle)	Various impacts; see Alternative II analysis	Roughly equivalent to Alternative II; however, loss of curbside parking, combined with wide travel lane, might result in increase in double-parking and increased congestion across modes
Construction Impacts	See Alternative II analysis	Somewhat greater than Alternative II
Costs		
Capital	See Alternative II analysis	Slightly higher than Alternative II
Maintenance	See Alternative II analysis	Less than in Alternative II due to lack of need to hand-sweep parking lane

FIGURE 4-33 SUMMARY OF BENEFITS AND IMPACTS



4.7 Additional Analysis of "Flex Lane" and "Flex Space" Concepts

The difference between Alternatives II and III is that Alternative II expands the sidewalk through use of a "flex lane," that is, establishes the eight feet of right-of-way in both directions between the travel lanes and sidewalk as used primarily for parking, with some café seating; while Alternative III permanently widens the sidewalk into this space and establishes "flex space," with the primary use for pedestrians, with some parking.

The 72 existing curbside parking and loading spaces along Columbus between Broadway and Filbert provide about 11,500 square feet of space.

The *Parking Occupancy and Turnover Survey*, summarized in **Chapter 3**, identified an existing deficit of available short-term parking. While the study recommended a number of management strategies rather than an increase in built capacity, if all curbside spaces on Columbus were removed, it would amount to a 20 percent reduction in the number of on-street metered spaces in the Survey area (which includes cross streets extending one block on either side of Columbus) and a 12 percent reduction in curbside spaces available for general use (including permit spaces). Even if it were possible to mitigate this loss through more aggressive management of remaining parking supply, parking availability has been identified both through public meetings and the *Neighborhood Transportation Survey* as a top priority of both residents and visitors.

That said, at public workshops attended primarily by residents, greater concern was expressed about pedestrian conditions. In an exercise at the September 2007 public workshop, participants were asked to choose between "ease of parking" and "ease of walking." Eighty percent prioritized walking, while 13 percent took a neutral position, leaving just 7 percent in favor of prioritizing parking over pedestrian space. In a June 2007 meeting with community stakeholders, 70 percent prioritized pedestrian space, while 10 percent remained neutral and 20 percent preferred parking.

Figure 4-32 presents key considerations associated with establishing this flex lane/space for the primary use by parking or by pedestrians.

Like Alternatives I and II, Alternative III would reinforce the existing neighborhood commercial character of North Beach. Indeed, its pleasantly generous and leafy sidewalks and calm traffic could provide a neighborhood shopping experience quite unlike any other in San Francisco. However, measures to mitigate decreased availability of short-term parking would be required. Primarily, long-term parkers currently using on-street spaces need to be shifted to off-street garage parking.

Alternatives II and III are not mutually exclusive, and it is not necessary to "choose"

FIGURE 4-34 EXISTING AND PROJECTED LEVELS OF SERVICE BY MODE

NOTES:

* The first letter refers to northbound travel, the second to southbound.

** Transit LOS is qualitative for the corridor, and expressed relative to the existing condition. 'N/A' means 'not applicable,' because this is the baseline. 'N/C' means no change, while '+' means a positive change / improvement.

one or the other as the prefered alternative. The flexible lane in Alternative II can be alternated on a block-by-block basis with the flexible sidewalk space in Alternative III, balancing the needs of adjacent land uses and competing desires for greater sidewalk space vs. parking availability.

4.8 Summary Evaluation

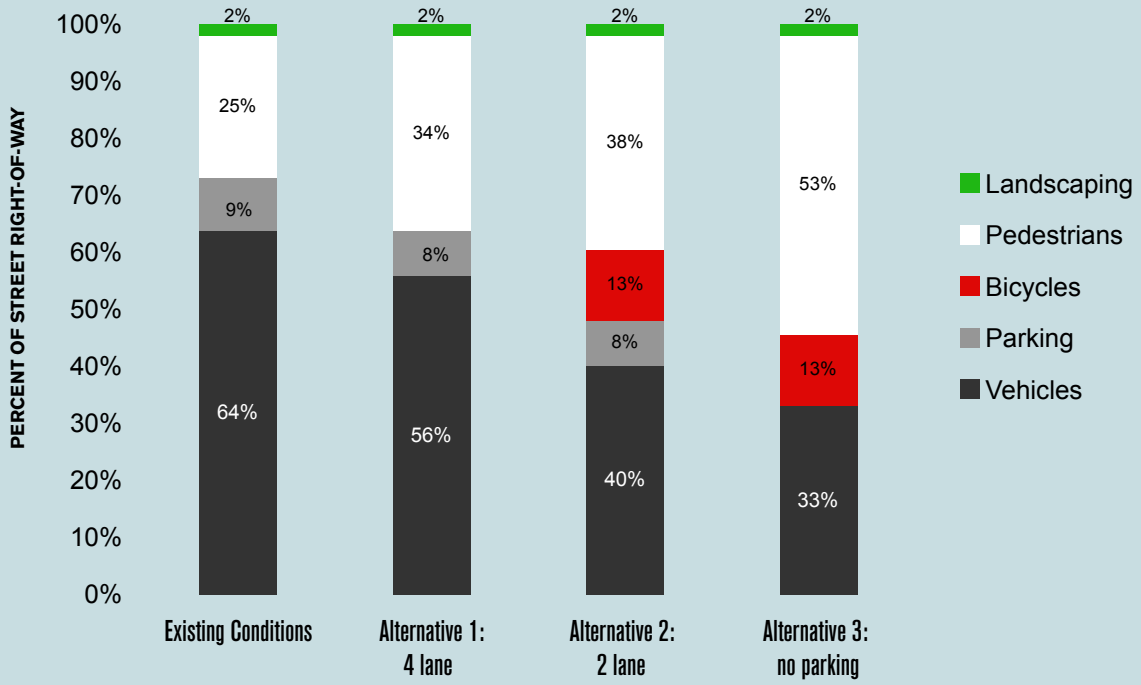
KEY FINDINGS

Figure 4-33 illustrates key benefits and impacts, as well as likely order-of-magnitude costs.

Key findings can be summarized as follows:

- Alternative I would have little effect on traffic, while Alternatives II and III would increase delay modestly.
- Alternatives I and II would have little effect on parking. Although Alternative III would reduce the number of on-street parking spaces, this design is intended to be combined with the parking management measures identified in Chapter 3, resulting in an overall improvement of on- and off-street parking availability in the vicinity of Columbus Avenue.
- Transit conditions would be improved somewhat under Alternative I, but Alternatives II and III require mitigation measures to maintain transit speeds.
- While all alternatives would greatly improve pedestrian safety, Alternative II offers greater benefits for pedestrian comfort, and Alternative III greater benefits still.
- Alternative I would provide little change in cycling conditions, while Alternatives II and III would provide significant benefits.
- While all alternatives would improve the streetscape, Alternative III would allow significantly more landscaping and street furniture. Alternative III would also add public open space in the form of a mini-plaza at Stockton and Green.
- While Alternatives I and II would benefit businesses by allowing cafés and restaurants to add seating in the parking lane, Alternative III would provide the greatest benefits, by permanently converting the en-

FIGURE 4-35 ALLOCATION OF STREET SPACE UNDER EACH ALTERNATIVE



tire existing parking lane to sidewalk space available for seating or other uses.

- Alternative II would require more extensive construction, and Alternative III more extensive construction still.
- By retaining much of the existing curb line (and thus not requiring significant utility relocation or reconstruction of the roadbed), Alternative I would be significantly less expensive than Alternatives II and III.

The transportation benefits or impacts of the alternatives have been quantitatively evaluated using "level of service" (LOS) analysis for each mode. LOS standards vary by mode:

- For vehicles, LOS is a measure of average delay at intersections.
- For pedestrians, LOS is a function of the distance required and available time to cross streets. It is an expression of safety at crossings, and not of comfort or mobility on sidewalks.
- For cyclists, it depends on the degree to which cyclists are separated from traffic, and the speed of that traffic. It is determined for blocks, i.e., between intersections.
- For transit, in this analysis, LOS is a qualitative assessment for the Columbus Avenue corridor, taking into account vehicular LOS, strategies to reduce delay, and passenger comfort as expressed by available space at stops.

Figure 4-34 summarizes the results of level-of-service analyses conducted for each intersection or block (depending on mode) for each mode under existing conditions and under each of the alternatives.

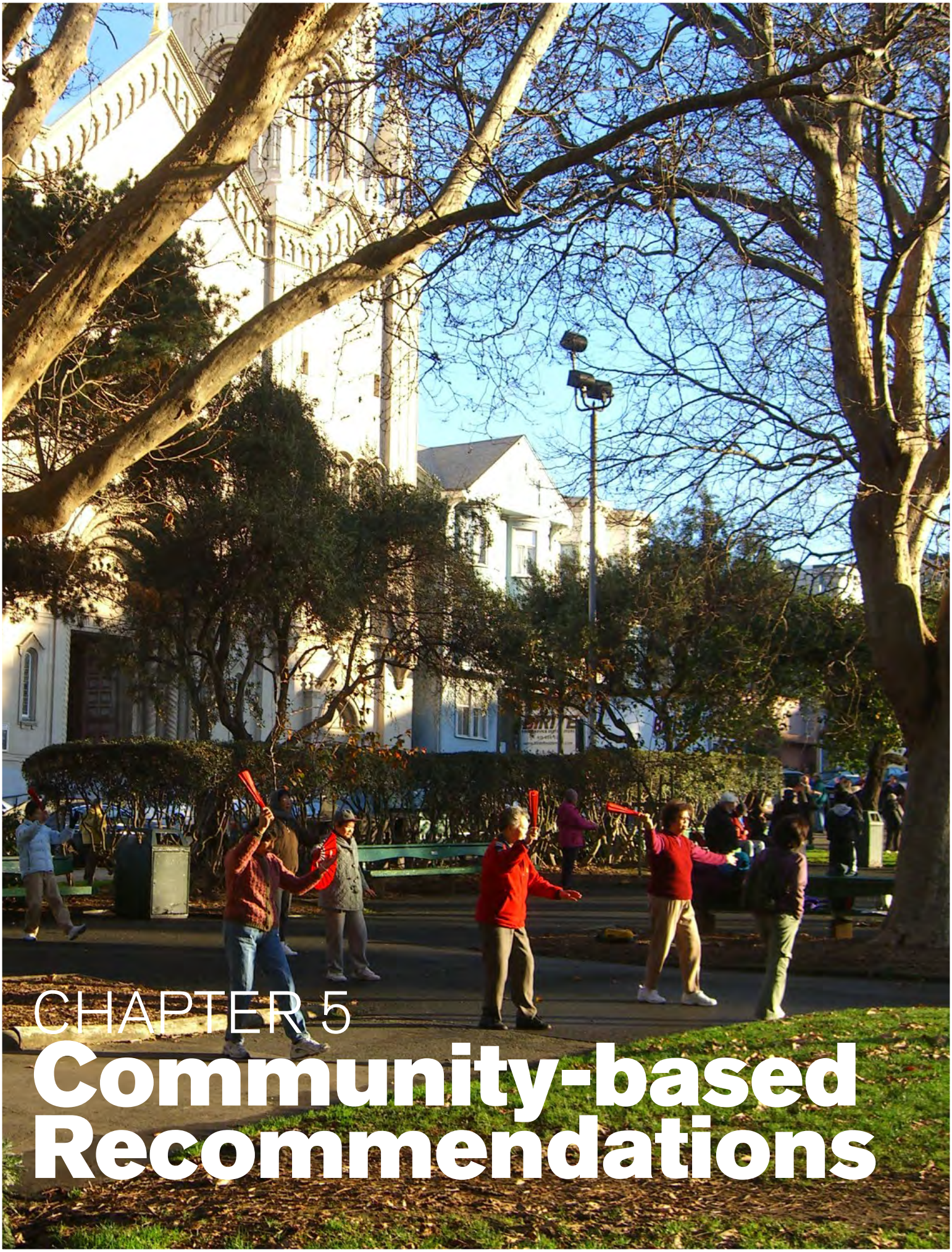
The differences between Alternatives I, II, and III are differences in the allocation of right-of-way for each mode. The choice of a preferred alternative is a prioritization exercise: is additional curbside parking space or greater pedestrian space more important? Must traffic flow be maintained at current levels, or is a moderate increase in driver delay an acceptable trade-off for more pedestrian space? When community members were asked these questions in the abstract, pedestrian comfort and safety were prioritized over parking; however, at what cost an improvement in pedestrian conditions? Where does the proper balance lie between competing uses of limited space? And how much capital cost is too much in a competitive funding environment?

Figure 4-35 illustrates the percentage of square footage within the right-of-way between Broadway and Filbert allocated to each mode under each Alternative. Note that sidewalk street furniture and door zones are defined as pedestrian space despite their limited utility for pedestrians. The flex lane is assigned to parking in Alternatives I and II, and the flex space is assigned to pedestrians in Alternative III. **Figure 4-36** summarizes findings in all of the evaluation areas.

FIGURE 4-36 SUMMARY OF BENEFITS AND IMPACTS FOR EACH ALTERNATIVE

SUMMARY OF BENEFITS & IMPACTS	Alternative I—Four-Lane with "Flex Lane"	Alternative II—Two-Lane with "Flex Lane"	Alternative III—Two-Lane with "Flex Space"
Traffic Delays and Driver Convenience			
Intersection Delay (Level of Service)	▪ Broadway: B ▪ Green/Stockton C ▪ Union: B ▪ Filbert: A	▪ Broadway: C ▪ Green/Stockton: D ▪ Union: B ▪ Filbert: A	▪ Broadway: C ▪ Green/Stockton: D ▪ Union: B ▪ Filbert: A
Turn Movements/ Circulation	No through movements on Green; no left from EB Green, or WB Green to SB Stockton; Green btwn. Columbus and Powell possibly one-way EB; Stockton btwn. Union & Columbus one-way NB; no right at Union	No lefts from Columbus (only allowed currently at Green and Vallejo); no left from EB Green; Green btwn. Columbus and Powell possibly one-way EB; Stockton btwn. Union & Columbus one-way NB; no right at Union	No lefts from Columbus (only allowed currently at Green and Vallejo); no through movements on Green; no left from EB Green, or WB Green to SB Stockton; Green btwn. Columbus and Powell possibly one-way EB; Stockton btwn. Union & Columbus one-way NB; no right at Union
Parking Availability			
Curbside/Off-Street Supply	Approx. 12 curbside parking/ loading spaces lost to bus bulbs, depending on configuration	Approx. 12 curbside parking/loading spaces lost to bus bulbs, depending on configuration	Approx. 72 curbside parking/loading spaces lost, resulting in 20% reduction in metered spaces, 12% reduction in meter/ permit spaces, and 5% reduction in all general-use spaces in corridor (incl. one block on either side); also loss of direct access to businesses on Columbus
Loading/Drop-off Access	Any loss of loading spaces could be mitigated by redesignating metered spaces	Any loss of loading spaces could be mitigated by redesignating metered spaces	Loading spaces maintained either through use of sidewalk "flex space" or sidewalk cutouts; if latter, possible reduction in loading space
Transit Performance			
Travel Time and Reliability	Bulbs at all stops eliminate delays caused by merge back into traffic	Bulbs at all stops eliminate delays caused by merge back into traffic; increased delays mitigated by bus bulbs, bus-only lane in critical segment (SB Columbus between Union & Stockton), a queue jump, and stop relocation.	Bulbs at all stops eliminate delays caused by merge back into traffic; increased delays mitigated by bus bulbs, wide travel lanes, a bus-only lane in critical segment (SB Columbus between Union &Stockton), a queue jump, and stop relocation.
Waiting/Boarding Experience	Up to 960 sq. ft. bulbs at all stops separate waiting area from pedestrians, provide space for additional amenities, allow boarding from curb at all times	Up to 960 sq. ft. bulbs at all stops separate waiting area from pedestrians, provide space for additional amenities, allow boarding from curb at all times	Wide sidewalks adjacent to travel lane provide waiting area separate from pedestrians, space for additional amenities, and allow boarding from curb at all times
Pedestrian Safety, Comfort and Convenience			
Crossing Distance/ Time to Cross (Level of Service)	▪ Broadway: C ▪ Green/Stockton C ▪ Union: B ▪ Filbert: B	▪ Broadway: B ▪ Green/Stockton C ▪ Union: B ▪ Filbert: B	▪ Broadway: B ▪ Green/Stockton C ▪ Union: B ▪ Filbert: B
Sidewalk Space	Significant increase at corners, bus stops where congestion is worst; effective increase where café seating moved to parking lane	Significant increase at corners, bus stops where congestion is worst; moderate increase (2'-4') in width of pedestrian through-zone along length of street	Significant increase (10'-12') in width along length of street
Buffering from/ Calming of Adjacent Traffic	Trees in parking lane would calm traffic; additional buffer where café seating in parking spaces, eliminating auto movements adjacent to sidewalk	18' lanes would further separate traffic from pedestrians and café seating; reduction in travel lanes, trees in parking lane would calm traffic	18' lanes would further separate traffic from pedestrians and café seating; reduction in travel lanes would calm traffic

SUMMARY OF BENEFITS & IMPACTS	Alternative I—Four-Lane with "Flex Lane"	Alternative II—Two-Lane with "Flex Lane"	Alternative III—Two-Lane with "Flex Space"
Bicycle Conditions			
Availability of Right-of-Way/Speed of Traffic (Level of Service)	▪ Filbert/Union: D ▪ Union/Green: E ▪ Green/Vallejo: E ▪ Vallejo/Broadway: E Roughly equivalent to existing condition, although trees in parking lane would calm traffic	▪ Filbert/Union: C ▪ Union/Green: C (NB), D (SB) ▪ Green/Vallejo: C ▪ Vallejo/Broadway: C 18' travel lane allows separation from traffic; reduction of travel lanes, trees in parking lane would calm traffic	▪ Filbert/Union: C ▪ Union/Green: C (NB), D (SB) ▪ Green/Vallejo: C ▪ Vallejo/Broadway: C 18' travel lane allows separation from traffic; reduction of travel lanes, trees in parking lane would calm traffic; elimination of curbside parking might encourage double-parking but would virtually eliminate risk of dooring
Streetscape Experience and Vitality			
Identity (recognizable design elements)	Additional trees in parking lane would add greenery; bulbs would allow additional, "branded" street furniture	Additional trees in parking lane would add greenery; bulbs, wider sidewalk would allow additional "branded" street furniture;	Significantly wider sidewalk would allow double row of trees, significant increase in "branded" street furniture; strong green and pedestrian-oriented identity would build on, enhance existing unique character of North Beach
Public Space/ Support for Adjacent Land Uses	As much as 11,500 sq. ft. of additional space for café seating	As much as 11,500 sq. ft. of additional space for café seating	As much as 11,500 sq. ft. of additional space for café seating; ~2,000 sq. ft. plaza at Stockton/Green; greatly improved pedestrian and bicycle access, moderate reduction in auto access to businesses
Construction Impacts			
Duration/Intensity	Moderate/Moderate (construction limited to bulbs; much of curbline would not be moved)	Long/Intense (entire curbline would be moved)	Long/Intense (entire curbline would be moved, plaza constructed in median of roadway)
Phasing Potential	Moderate (potential to build relatively inexpensive "trench drains" in interim stage)	Moderate (change in travel lane configuration must be implemented at once; corner and bus bulbs, as well as sidewalk widening, can be implemented on a block by block basis)	Moderate (change in travel lane configuration must be implemented at once; corner and bus bulbs, as well as sidewalk widening, can be implemented on a block by block basis)
Costs (Capital and Operating)			
Capital	Moderate (construction limited to bulbs)	High (entire curbline would be moved)	High (slightly higher than Alt II)
Operating/ Maintenance	Moderate (gutters between curb and tree basins, trench drains would require hand-sweeping by the community)	Moderate (gutters between curb and tree basins, trench drains would require hand-sweeping by the community)	Moderate (Stockton / Green plaza would require community maintenance)



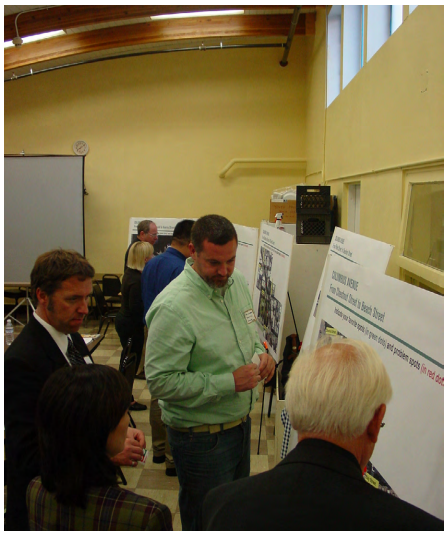
CHAPTER 5

Community-based Recommendations

CHAPTER 5

Community Involvement

This Chapter describes the approach to community involvement in the Columbus Avenue Neighborhood Transportation Study. A key objective of the Study was to identify and prioritize transportation needs from the community's perspective, and work with community partners to develop transportation improvements. RENEW SF served as the primary liaison between the Transportation Authority and the many stakeholders with an interest in transportation issues in the study area by helping with publicity efforts, conducting event logistics, and co-hosting outreach events. The Chinatown Community Development Center provided a link to the Chinese-speaking stakeholders of Columbus Avenue, providing translation services and organizing outreach events for Chinese speakers.



The Study team endeavored to include key stakeholders early and throughout the study to ensure that (1) the community was broadly represented; (2) the proposed improvements responded to community needs and priorities, and (3) the proposed projects would enjoy community support in the implementation phase. Section 5.1 describes the approach, activities and tools for public outreach. Section 5.2 describes the community input to identify and prioritize transportation needs, and Section 5.3 describes the community input to developing and prioritizing improvement projects.

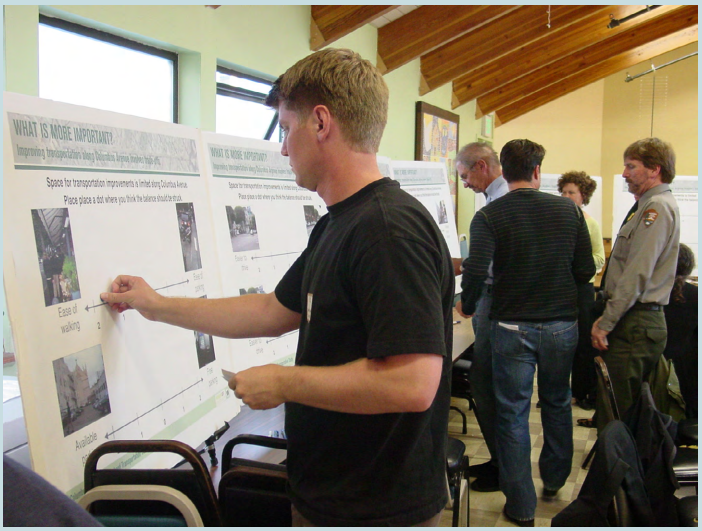
5.1 Community-based Outreach Approach

The Columbus Avenue study area is home to a diverse community culturally, linguistically, and economically. Almost half of study area residents are Asian/Pacific Islander, and approximately 50 percent speak a language other than English at home. The Study's Outreach Plan intended to reach a broad array of stakeholders, including residents' organizations, merchants, neighborhood institutions and nonprofit service providers, non-English speakers, and visitors.

The study outreach strategy included:

- Visits and presentations directly to neighborhood organizations and associations;
- Print and presentation materials translated into Chinese;
- Outreach efforts targeted to specific users, e.g., transit riders, pedestrians, motorists, and bicyclists;
- Open houses and public workshops;
- Surveys;
- Media publicity; and
- A Study website.

FIGURE 5-1 COMMUNITY MEETING



The Study sought the involvement of a wide array of community organizations with an interest in Columbus Avenue, including:

- A Better Chinatown Tomorrow
- Aquatic Park Neighbors
- Asian Neighborhood Design
- Café Roma
- Canessa Park
- City Lights Bookstore
- Community Educational Services
- Fisherman Wharf Association
- Fisherman's Wharf CBD
- Friends of DiMaggio Playground
- Friends of Mason St.
- Friends of Washington Park
- Greenbelt Alliance
- Jackson Square Preservation Association
- Maritime Park Association
- National Park Service
- North Beach Aquarium
- North Beach Citizens
- North Beach Neighbors
- Russian Hill Neighbors
- San Francisco Planning & Urban Research (SPUR)
- SF Art Institute
- SF Beautiful
- SF Bicycle Coalition
- Telegraph Hill Dwellers
- Telegraph Hill Neighborhood Center
- The Chambers of Commerce of Chinatown and North Beach
- The Chinatown Community Development Center
- The North Beach Merchant's Association
- Transportation for a Livable City
- Urban Forest Council

5.2 Community Involvement in Needs Identification

During the first phase of the study, the study team sought community input to identify the top transportation needs and issues along Columbus Avenue. Key forums for obtaining this input included two public workshops and a shopper survey, as well as discussions at the regular meetings of numerous community associations (**Figure 5-1**).

PUBLIC WORKSHOPS

Two public workshops were held to obtain community input into the transportation issues that would be the focus of the Study. The first workshop was held at the Telegraph Hill Neighborhood Center and the second at Jean Parker Elementary School.

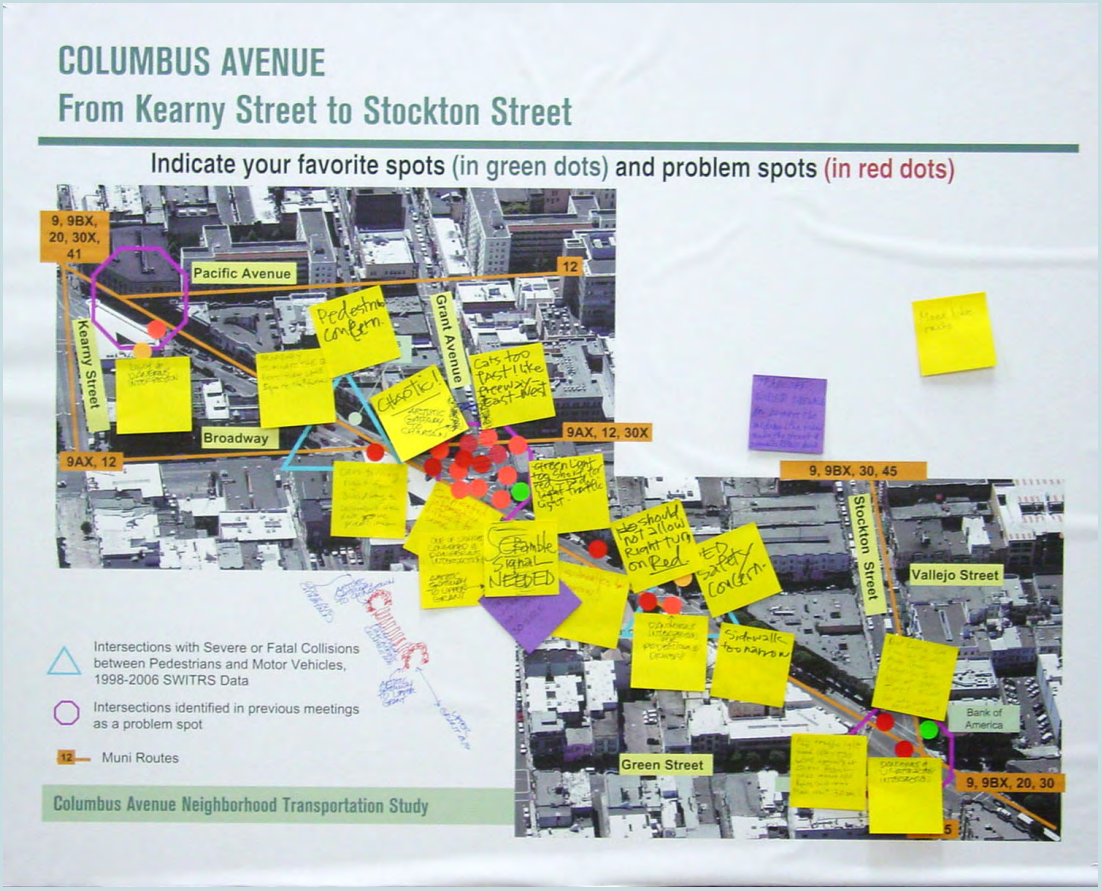
At each workshop, stakeholders were invited to share and exchange views on transportation priorities and issues to be included in the study. The stations were designed to obtain participant input on (1) transportation issues in the study area, (2) the specific locations where transportation problems exist along Columbus Avenue, and (3) community views on the tradeoffs between different and competing transportation needs.

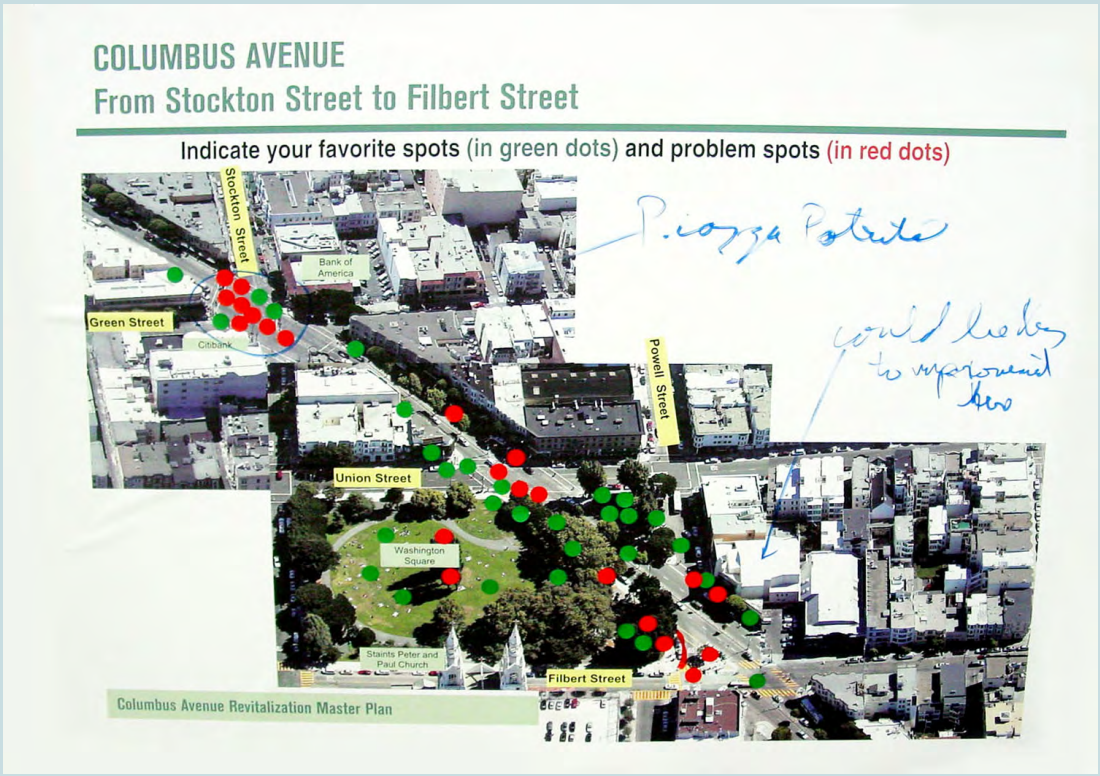
Priorities

Through these workshops, the enhancement of pedestrian safety, culture, and circulation emerged as a top priority for participants, though differences in priorities also emerged. Many participants suggested widening sidewalks. Others called for making Columbus Avenue's complex intersections easier for pedestrians to navigate, such as by retiming signals to reduce pedestrian waiting times. Some participants also identified parking issues as a top priority, suggesting pricing parking to manage demand, or providing easier access to park-

FIGURE 5-2 TRADE-OFF BOARDS

FIGURE 5-3 MAPPING EXERCISE BOARDS





ing for merchants, shoppers and deliveries. Another top priority listed by participants was the improvement of bicycle conditions in the study area and specifically along Columbus. Other priorities voiced by workshop participants included:

- Connecting cultural and institutional centers to transit
- Developing wayfinding and placemaking/identity features on Columbus Avenue and North Beach
- Use of transportation improvements to enhance neighborhood characteristics and ambience, e.g., through streetscape treatments
- Intersection management and enhancement
- Conrad Square traffic calming
- Improved parking management, through managing delivery sites and hours to reduce delivery-related parking congestion; adjusting the Residential Permit Parking program to address conflicts between demands for visitor and residential parking; and providing valet parking to manage parking demand by visitors.
- Improving the accessibility to Columbus Avenue by transit:
    - In the short term, improving Muni performance and amenity
    - In the long term, incorporating the Central Subway project into the planning of Columbus Avenue

In addition to stating their top priorities, the workshop participants engaged in two interactive exercises that further clarified the transportation priorities and concerns in the study area. The exercises were mounted on boards on which dots could be placed to indicate transportation priorities and problem areas along the corridor.

Tradeoffs

The first exercise consisted of a series of trade-offs (**Figure 5-2**) developed by the project team and the participants. Since the number of transportation improvements that can be implemented along Columbus Avenue is limited due to physical constraints, the trade-off exercise was designed to determine where the balance should be achieved between two priorities.

The results of the tradeoff exercise from both workshops were the following:

- **Trade-Off #1.** Reduce Driving Delays vs. Reduce Transit Delays

Participants overwhelmingly favored reducing transit delays over driving delays.

- **Trade-Off #2, More Median Space vs More Sidewalk Space.** Participants overwhelmingly favored more sidewalk space rather than more space in the landscaped median of Columbus Avenue.
- **Trade-Off #3, Open Space vs Parking Space.** In the first workshop, the results of this trade-off favored open space over parking, while in the second workshop the results of this trade-off were mixed.
- **Trade-Off #4, Easier to Drive vs Easier to Bicycle.** In the first workshop, for the most part, participants remained neutral when asked to prioritize between driving and biking. In the second workshop, participants' views on were highly polarized.
- **Trade-Off #5, Easier to Drive vs Easier to Walk.** Participants overwhelmingly chose improvements to walking over driving.
- **Trade-Off #6, Ease of Walking vs Ease of Parking.** Though participants were clearly in favor of pedestrian improvements, parking is still an important concern. Seventy to eighty percent favored better walking conditions while ten to thirteen percent remained neutral on the subject.
- **Trade-Off #7, Available Parking vs Free Parking.** In the first workshop, mixed results were received showing the need for more focused parking solutions in the area. In the second workshop, participants prefer to make parking available on Columbus, rather than providing free parking.

Where to Focus

The second interactive exercise consisted of a set of aerial photographs of Columbus Avenue between the Transamerica Pyramid and the waterfront, stitched together to form the entire corridor (**Figure 5-3**). Participants were asked (1) to place green dots on spots they favored and red dots on areas they considered to be problematic and (2) to explain by writing on the map why they designated the area one way or the other.

The potential locations of improvements identified in the mapping exercise (in order of number of red dots received) are summarized below, compiled for both Workshops. The first five (below) were identified as top priorities.

- Grant Avenue, Broadway and Columbus Avenue intersection (including pedestrian continuity along Grant Avenue from Chinatown to North Beach)
- Green Street, Stockton Street and Columbus Avenue intersection
- Washington Street, Montgomery Street and Columbus Avenue intersection
- Francisco Street and Columbus Avenue intersection
- Mason Street, Greenwich Street and Columbus Avenue intersection

The final selection of intersections to focus on in the study was a combination of these community priorities as well as technical transportation needs.

SHOPPER SURVEY

The purpose of the Shopper Survey was to understand the travel patterns, area preferences and preferred transportation improvements of Columbus Avenue corridor visitors and residents.

The survey was conducted during two weeks in March 2008 on both the weekday and weekend time periods. The survey was conducted at the Columbus/Stockton/Union intersection and the Powell/Columbus intersection between 4:15 and 8 PM to catch the after-work and recreational crowd on all survey days. To catch a diverse set of respondents, surveyors intercepted every fifth visitor who looked over the age of sixteen. Nearly 400 surveys were collected for each time period.

On both weekdays and weekends, the survey respondents represented a mix of resident backgrounds. About half of the respondents were from North Beach and the surrounding neighborhoods and about two-thirds were from the City of San Francisco. The remaining respondents were from the rest of the Bay Area, the rest of California, the rest of the country, and even other countries.

The main survey findings are outlined below:

- Transit and walking are the main two modes used by both visitors and residents of the area (**Figure 5-4**), regardless of income (almost 80% during the weekend and almost 90% on weekdays).
- For both weekday and weekend respondents, transit use decreases with income, but walking rates are fairly consistent for all income levels.
- Those who drive to Columbus Avenue are most likely to be visitors from outside San Francisco (**Figure 5-5**). The top reasons why they drive to Columbus Avenue are because they come in large groups or there is no transit near their homes.
- The most frequent visitors are transit riders and walkers, while auto users are most likely to rarely or never visit North Beach. The majority of respondents indicated that they come to the area at least once a week, and half of all respondents indicated that they come to the area at least five times a week. Weekday respondents are more likely to visit 5+ times a week, while weekend visitors are more likely to visit monthly or rarely.
- Transit users and walkers spend less on average per visit than auto users ($36 compared to $52), but come to the area at twice the frequency for recreational purposes (**Figure 5-6**).
- Because of the higher frequency of visits, transit riders and pedestrians spend more than drivers on recreational activities on a monthly basis ($252 and $360/month compared to $208/month), as shown in **Figure 5-6** again.
- The majority of respondents indicated that what they liked the most about the area is the pleasant atmosphere and the restaurants. This indicates that enhancing Columbus Avenue's sidewalk culture is key to attracting visitors as well as San Franciscans to the area.
- Weekday respondents indicated to the same degree that they dislike the street congestion, the slow transit speeds and the difficulty of finding parking. Weekend respondents mainly commented on the difficulty of finding parking.
- More than half of respondents would choose to invest new transportation funds in faster and more reliable transit service, followed by "parking availability and accessibility" and "pedestrian and bicycle facilities"; less than one fifth of respondents would choose each of these options.
- While approximately 40 percent of respondents who drove to the area did not pay for parking, nearly 25 percent on weekdays and nearly 35 percent on weekends paid more than $10 to park. This indicates that parking supply consists of both underpriced on-street parking and higher-priced off-street parking (up to nine times higher than on-street parking).

FIGURE 5-4 SHOPPER SURVEY: MODE SHARE

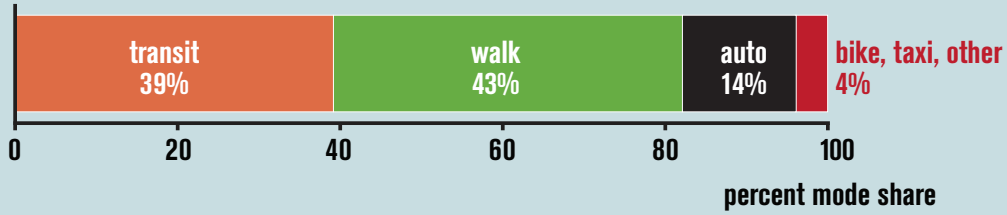


FIGURE 5-5 SHOPPER SURVEY: PROPORTION OF TRAVELERS BY MODE & PLACE OF RESIDENCE -- ALL RESPONDENTS

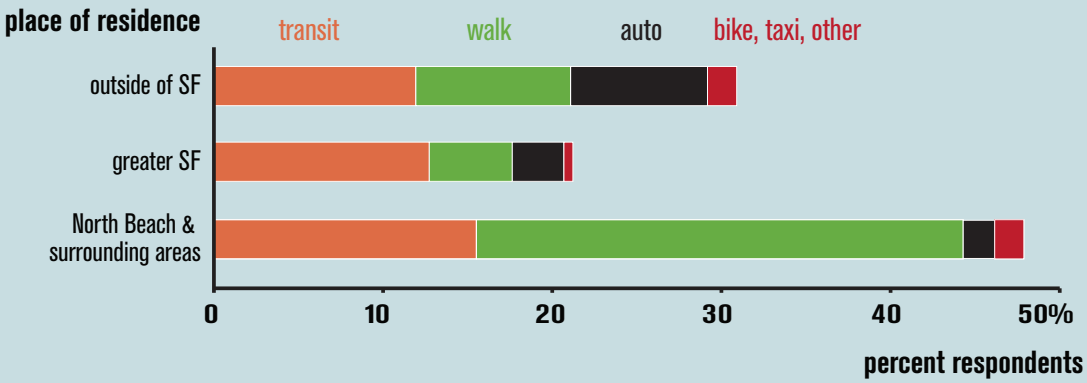
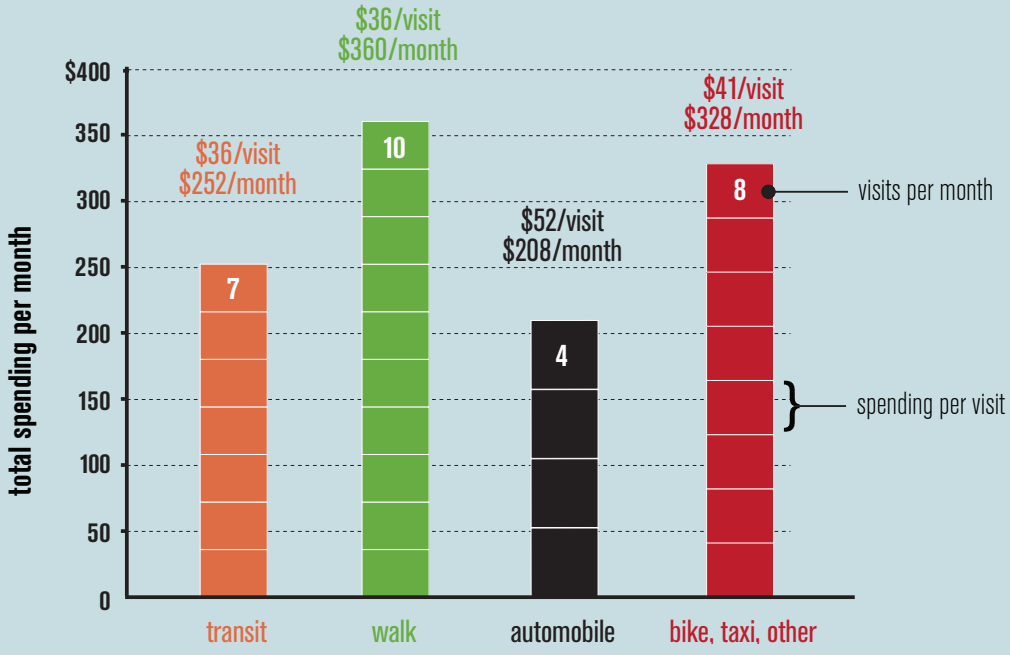


FIGURE 5-6 SHOPPER SURVEY: FREQUENCY OF RECREATIONAL TRIPS & SPENDING BY MODE OF ACCESS -- ALL RESPONDENTS (WEEKDAY & WEEKEND)



5.3 Community Input for Design Development

The second major phase of the study involved developing transportation improvement concepts and obtaining community input to refine and prioritize them. This section discusses the community involvement in the improvements development and prioritization phase of the study. Key input strategies included visits to the regular meetings of community organizations and associations, a public workshop, a project prioritization survey, and a design review session. In October, 2009, RENEW SF and Great Streets collaborated with Columbus Avenue and Grant Avenue merchants to host an event featuring flex use of the parallel parking spaces for outdoor seating.

A number of recommendations originally conceived by community members were evaluated by the Study's technical team, and incorporated into the design alternatives or parking recommendations by the project team. They are:

- Green/Stockton diagonal crosswalks
- Green Street traffic operations: through movements and left turns from westbound Green
- "Universal" valet parking at the Columbus / Union / Powell "triangle"

The design alternatives discussed in Chapter 4 reflect these community concepts.

PUBLIC WORKSHOP

At this Workshop, held at the San Francisco Italian Athletic Club, the Study Team sought comments from the community on the three alternative design concepts for Columbus Avenue as well as tradeoffs posed by specific design elements.

Participants split into groups to provide feedback on their likes and concerns regarding each alternative design, as well as opinions on a number of tradeoffs posed by the individual design elements including: bus bulbs, trees in the parking lane, the number of travel lanes, the inclusion of a median plaza, and the provision of parking. The tradeoff exercise suggested that the majority of participants support Alternative III's wider sidewalks, but discussion indicated that participants had no clear preference for the treatment of the Stockton / Green intersection in Alternative II vs. Alternative III.

The discussion of the tradeoffs involved with different project alternatives revealed that:

- Almost all participants were strongly in favor of bus bulbs.
- Almost all participants were strongly in favor of widening sidewalks; a few preferred maintaining that space in a second vehicle lane.
- All participants were in favor of moving trees to the parking lane (or neutral).
- A majority of participants were in favor of using the extra road space to provide a median plaza, though a few participants were opposed.-
- A majority of participants were in favor of removing metered parking; only one participant was opposed.

ADDITIONAL OUTREACH PROGRAMS

Additional public input was collected through a suite of activities designed to involve neighborhood stakeholders who were not sufficiently represented at the Workshops: additional community surveying (a Project Prioritization Survey; a design review session with volunteering local designers; and an event featuring the flex use of parking spaces for café seating, organized by RENEW SF and Great Streets. These activities are summarized below.

Project Prioritization Survey

The on-line and paper Project Prioritization Survey presented the same questions posed at Workshop 3 and was available in English and Chinese. This section summarizes the results of the paper-based Mandarin language survey, which was administered by the CCDC. The survey consisted of several questions intended to understand how participants viewed the tradeoffs in the alternatives being explored for Columbus Avenue.

The most significant theme characterizing the responses to the surveys in Chinese was neutrality. Though answers to most questions were overwhelmingly neutral, four of the six respondents who answered the final question indicated a strong preference for removing metered parking, and five of seven non-neutral respondents indicated a strong preference for maintaining two travel lanes in each direction.

Design Review Session

RENEW SF organized a design review session with Bay Area urban designers Allan Jacobs and Michael Smiley, who volunteered to provide their input on the Columbus Avenue design concepts. In addition to study team members from the Authority, RENEW SF, and Nelson Nygaard, additional participants included David Alumbaugh (Planning); June Frapps; Todd Gilens; Andres Power (Planning); Tom Radulovich (Livable City); Dave Snyder (SPUR); Gail Switzer (Telegraph Hill Dwellers); and Jonathan Weiner (Telegraph Hill Dwellers).

The designers expressed a preference for the "more consistent, elegant curb line" of Alternative III over the bulbing curb line of Alternatives I and II. However, the group discussed whether the 20-foot sidewalks would be too wide; one view was that Columbus sidewalks would not be too wide at 20 feet because the land uses would generate significant latent demand for additional sidewalk activity.

The designers discussed the proposed Stockton / Green plaza at length. One concern was that the plaza may not truly accommodate activity, and whether pedestrians would feel comfortable sitting in the space. Although some felt that the plaza was an appropriate scale and appropriately located at the "crown" of Columbus, because the plaza is "cut" to accommodate left turning vehicles, another view is that the form of the design is not strong enough. The designers generally seemed to conclude that the space may be more usable if on the sidewalk, à la Alternative II.

Although the designers concurred that the Alternative III sidewalks would not be excessively wide, Allan Jacobs also felt that all sidewalk activities could be accommodated in the 14-foot sidewalks offered in Alternative II.

One issue the group discussed at length was the tradeoffs associated with locating café seating in the parking lane rather than against the buildings. The designers generally viewed building-adjacent seating as preferred, noting that merchants may not wish to require waiters to cross pedestrian traffic and concerns with liability and other expenses of providing shade and heat in the parking lane. On the other hand, the designers pointed to successful examples of non-adjacent café seating in Europe, such as the Ramblas in Barcelona, which is consistent with a multi-use street scene.

Participants also noted the likely need to phase the project implementation or consider the designs as a progression of improvements. Participants seemed to endorse beginning with implementation of Alternative II (the flexible use of parking lane), and phasing in Alternative III (permanent sidewalk widening) where appropriate and consistent with the "episodic" nature of Columbus Avenue, such as on the block between Union and Stockton.

At the end of the session, the group took a straw poll of (1) the preferred alternative, and (2) the preferred design for the Stockton / Green intersection. Design Review participants favored Alternative III's permanently widened sidewalk as the preferred design for Columbus Avenue, but were split on the design for the Stockton / Green intersection, with 8 participants in favor of a "no plaza" option and 5 in support of the plaza.

Event Featuring Flex Use of Parking Spaces

The event, organized by RENEW SF and Great Streets, took place in September 18, 2009 on Columbus Avenue and neighboring streets. Some café participants used wooden platforms placed in the parallel parking spaces to support tables and chairs; other café participants created festive seating installations directly in the parking lane. On Upper Grant some artisans brought their work out into public view; others simply replaced a parked car with music, astroturf, seating, and trees. RENEW SF estimated that during the experiment, some cafes served $400 worth of food in the lunch hour alone.

Additional community involvement activities will be essential to support implementation of the transportation improvement recommendations. The ways that stakeholders can continue to be involved in supporting Study recommendations are discussed in the next Chapter.

CHAPTER 6

Design Recommendations & Implementation

6 DESIGN RECOMMENDATIONS & IMPLEMENTATION

This Chapter outlines the strategy for funding and implementing the Columbus Avenue Study design recommendations. The conceptual recommendations developed through this study will undergo the following next steps in project development and implementation: (1) preliminary engineering and environmental assessment; (2) design review and SFMTA approvals; (3) final engineering design; and (4) legislation and construction. This Chapter identifies potential funding sources, required to support each phase of work, and also identifies the lead agency for each of the next steps. Community stakeholders will play an essential role in supporting the recommendations through next steps; this Chapter describes how the community can help facilitate improvements on the ground for Columbus Avenue.

6.1 Recommendations and Phasing

The Study recommendations are based on:

- Community-identified transportation needs and priorities,
- Technical analysis of transportation performance on Columbus Avenue; and
- Community feedback on the design alternatives.

The study team recommends five categories of improvements for the Columbus Avenue:

A – Improved parking management

B– Pedestrian priority measures, including sidewalk widening and the re-design of the Columbus / Green / Stockton intersection

C – Transit priority measures

D – Bicycle priority measures

E – Community Support for Implementation

The featured recommendation is the strategic widening of the Columbus Avenue sidewalks over time (Alternative 3), along with the redesign of the Columbus / Green / Stockton intersection. The recommendations within the Pedestrian Priority Measures section identify short-term steps to expand pedestrian space until funding is available to permanently widen the sidewalks.

The Study team has grouped the recommendations into three implementation phases.

Phase I (< 1 year)

Phase II (2 to 5 years)

Phase III (5+ years)

The delivery schedule of each phase depends largely on available funding.

For each recommendation, the following steps in project implementation generally apply:

Conceptual engineering and outreach. This Study completes the conceptual planning phase, which identifies both technical and community needs and priorities, develops a range of improvements designed to address those priorities, and screens the alternatives through a technical and community evaluation process. The result of the conceptual engineering phase are 5% engineering designs for one or more alternatives that emerge from analysis with no fatal flaws, technical feasibility, and community support.

Preliminary engineering, outreach, and environmental impact analysis. This phase involves working

closely with SFMTA and SFDPW staff to refine the community's preferred design concept(s). In this phase, engineering designs are developed to a 12% level in order to support environmental impact analysis and transportation performance analysis, and develop more refined cost estimates. Technical work in this stage likely involves a more detailed traffic and transit operations analysis as well as a review of cost estimates.

Design review and SFMTA approvals. Depending on the project, recommendations require staff approvals from SFMTA's Pre-TASC review body as well as the full TASC, which includes representatives from other departments and city agencies.

Final engineering design. Detailed engineering designs of the projects are developed during this stage, which is typically led by SFMTA or SFDPW.

Legislative approvals and Construction, led by SFMTA or SFDPW. Most transportation improvements involve legislative action from the SFMTA Board or the Board of Supervisors.

The following subsections outline the next implementation steps for recommendation sets A through D. Figure 1 graphically depicts the funding and implementation plan.

6.2 Parking Management Recommendations

The Study Team proposes three key recommendations for improving parking management along Columbus Avenue: making parking more readily available for both short-term and long-term parkers, and utilizing the existing supply of parking more efficiently. The recommendations are intended to implement the findings of the parking study documented in Chapter 3. The ultimate goal is to make parking more readily available for both short-term and long-term parkers, and utilize the existing supply of parking more efficiently.

6.2.1 Increase Visibility of Off-Street Parking. One of this Study's key technical findings is that several off-street garages are underutilized. Through outreach, the Study team found that many community members don't have accurate / sufficient awareness of the off-street garages availability, and that long-term parkers are using the scarce supply of on-street spaces. The study team recommends three steps to increase the visibility of off-street parking:

- Install directional signs. In spring 2009, SFMTA installed additional parking garage directional signs throughout North Beach.
- Monitor the effectiveness of the real-time parking information sign the City installed at Broadway and Columbus. If needed, identify additional locations for signs.

6.2.2 Reduce Occupancy Rates for On-Street Parking to 85%. On-street parking is over-subscribed, especially during peak demand periods on Friday and Saturday evenings. Based on the findings of Chapter X, the study team recommends several steps to discourage long-term parkers from using on-street spaces, in order to free up those spaces for short-term needs. As identified in Chapter X, the objective is to maintain an average 85% occupancy level; in other words, to maintain approximately 1 out of 7 spaces available at any given time.

- Track the implementation of the Fishermen's Wharf SFPark pilot project. Chapter X describes the SFMTA's emerging SFPark program, which is designed to achieve 85% occupancy rates in key commercial corridors of San Francisco. The current SFPark trials include implementation in Fisherman's Wharf. If successful, the SFPark area should be extended to include Columbus Avenue as an SF park pilot / implementation area in the next round of SFPark implementation.

Through SFPark, the City could eventually determine the market rate for metered parking in North Beach.

- Expand the $2.50 / hour meter zone north of Broadway into North Beach. SFMTA can draw upon analysis conducted as part of their recent Parking Meter Study to determine the appropriate boundaries.
- Extend meter hours until midnight during peak demand periods. This recommendation was included in the SFMTA's Parking Meter Study, released in late 2009, but the recommendations are not currently under consideration by the SFMTA Board.

6.2.3 Institute Universal Valet Parking. A universal valet parking program can be instituted by Columbus Avenue merchants in partnership with Columbus Avenue stakeholder groups. One strategy and a design for valet parking is shown on page x. A mechanism to help fund the valet operations would be a community benefits district or a business improvement district (discussed further in section 6.7 below)

6.2.4 Parking Benefit District.

6.3 Pedestrian Priority Measures

The featured recommendations of this Study are those that focus on prioritizing space along Columbus for pedestrians. The Study Team makes four key recommendations:

6.3.1 Reduce pedestrian crossing distances and improve visibility at corners by installing bulbouts as identified in Alternative 3. Two sets of bulbouts are the top priority:

- Columbus / Stockton / Green. The implementation of these bulbouts needs to proceed through the project development steps following conceptual design, as outlined in section 6.1. The technical work will be conducted in collaboration with MTA and will test the operations of the intersection and identify measures to reduce any potential delay effects on Muni in particular. This phase could be led by SFMTA or the Authority, depending on which agency is able to secure funding, but should be coordinated between the two agencies. Obtaining pre-TASC and TASC support for the design is a critical next step in implementation.

  Additional in-reach to City departments is also required before the TASC will likely approve the Columbus / Stockton / Green designs, relating to fire code conformity.

  Many cities in the United States, including San Francisco, have adopted fire code requiring a 20-foot clear area on streets, so that emergency vehicles can pass one another and other vehicles on their way to emergencies, and so that firefighting apparatus can deploy stabilizers with enough room for personnel to use equipment and ladders. On the blocks of Columbus where there is a median, Alternatives II and III would leave only 18 feet clear—sufficient space for fire trucks and Muni buses to pass cars that have pulled over, but a width that would not be in compliance with the code (Alternative III might comply with the code by counting a portion of the flex space). Adherence to modern fire codes in street design has tended to result in wider streets, placing fire safety in conflict with traffic safety. The U.S. Environmental Protection Agency and Congress for the New Urbanism, then, are working with firefighters, traffic engineers and planners to forge a consensus on street design that is both fire-safe and traffic-safe. Project planners will likewise need to work with the San Francisco Fire Department to address any concerns SFFP staff may have with the design.

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- Bulbouts along Washington Square Park, Columbus between Union and Filbert. The design of these bulbs is relatively simpler than for the Stockton / Green intersection, but the effects of the design on transit operations need to be reviewed with SFMTA. This segment of Columbus will be under construction in 201X when the Central Subway construction is completed. As the lead agency, the SFMTA can incorporate the bulbouts' final design and construction in the reconstruction process that will follow the Central Subway tunnel boring machine extraction. The community would have the role of asking the SFMTA to proceed in this fashion. The Authority should work with the SFMTA in order to ensure that the bulbouts can be accommodated. Coordination with larger projects is typically a prioritization criterion for local grants, so this opportunity increases funding chances for the project.

6.3.2 Expand sidewalk space temporarily and in the short-term by allowing flexible use of the parking lane for café seating. In order to implement this, the approach to ADA accommodation needs to be determined. The Authority proposes accommodating persons with disabilities on sidewalk seating alongside the parking lane (see Appendix X). The City of San Francisco Planning Department is currently leading policy discussions on the codification of shared public ways, including determining the strategy for ADA accommodation. The City is also advancing the flex-lane concept through its Pavement to Parks program, led by the Planning Department, DPW, and the Mayor's Office of Greening. Columbus Avenue will be included in the City's next round of Pavement to Parks trials, expected in January 2010.

6.1.2.3 Expand sidewalk space permanently by widening the sidewalk into the existing parking lane and creating a shared space or Flex lane. In order to implement this, ADA accommodation needs to be addressed. As discussed in detail in Appendix X, the Authority proposes that flex spaces be identified similarly to a driveway, and not as a "hazardous vehicular way." This will avoid the need for truncated dome detection between the pedestrian-only sidewalk and the flex space. Instead of yellow truncated domes, the flex space can be delineated with a textured, contrast-color pavement to provide detection for persons with disabilities. Finalizing the ADA approach can be coordinated with the Planning Department's codification of shared public ways (see bullet above).

The locations for sidewalk widening should be strategically determined due to funding constraints, with the block of Columbus between Union and Stockton/Green as the highest priority. Community support along the stretches of Columbus Ave where widening is proposed is also essential. The community has a role to play by bolstering local support, especially among merchants along Columbus Ave, and helping identify the first stretches of Columbus Ave to be widened. The popular and visible PARKing day event led by RENEW SF and the Great Streets project could become an annual occurrence, which would strengthen grass roots support for permanent widening while the City completes preliminary engineering and environmental analysis and seeks funding.

6.1.2.4 Expand path of travel on sidewalk by replanting trees in parking lane as they require replacement over time.

6.4 Transit Priority Measures

Three key transit recommendations are offered:

6.4.1 Construct bus bulbouts. Each Muni stop along Columbus Avenue, as well as stops at Stockton and Union Streets, is proposed for bulbouts. Segments of Columbus where the sidewalk is permanently widened (Alternative 3) do not require bulbouts, but other locations should receive them. Along with

bulbouts, station platforms should be upgraded per TEP recommendations for Rapid routes, with furnishings and amenities and NextMuni real time arrival information.

6.4.2 Consolidate bus stops, per the recommendations of SFMTA's Transit Effectiveness Project, in order to reduce transit delays. SFMTA is planning for a systemwide implementation of TEP recommendations, including stop consolidation recommendations, in 2010; consolidations along the Columbus Avenue routes should be implemented as part of this action.

6.4.3 Install transit signal priority at Stockton / Green. The Authority should obtain information from TEP's transit engineering group on the costs and other issues related to this measure. The 5YPP for SFgo has a category set aside for "spot" signal controller treatments on the Muni Rapid network.

6.5 Bicycle Priority Measures

The key recommendation related to bicycling is the reduction of traffic lanes from two in each direction to one (also called the "road diet"), as one of the effects of the road diet will be to enable cyclists to ride alongside traffic in the wide lane.

A number of steps are required to implement the road diet:

- SFMTA peer review and coordination. The Authority will meet with SFMTA's Transit Engineering team to review the transportation modeling results for the road diet, focusing in particular on any impacts to transit, and measures to mitigate any effects on transit. The SFMTA Transit Engineering group will need to concur with modeling results and proposed transit mitigations before the road diet can move forward.
- Design and carry out a pilot project designed to allow the City to evaluate the effect of the road diet on .traffic and transit operations. A pilot, similar to a Market Street pilot project, is currently under development by the Authority and SFMTA.
- Develop circulation plan and engineering design for pilot. The Authority is currently working with the Nelson/Nygaard team and with SFMTA to develop an engineering design involving striping and temporary bulbs.

An issue for further in-reach with the Department of Public Works relates to drainage and street crowning. The relatively steep grade of the cross-section of some segments of Columbus—the "crowning" of the roadway—raises a number of issues. Key among these is whether even modest relocation of the curb line would require partial or complete reconstruction of the street from curb to curb in order to maintain adequate drainage. City staff have indicated that regardless of a street's ability to accommodate runoff (roadways are typically designed to volumes typical of a 100-year storm, while drains and sewers are designed to a five-year storm standard), curb heights of six inches are standard. Without regrading, Alternative III would almost certainly result in curbs less than six inches high in most locations. Use of the parking lane for cafe seating, however, should not require new structural elements.

6.6 Funding Sources

Funding sources include a package of local and regional and funding.

6.6.1 Safe Routes to Transit. Safe Routes to Transit is a regional grant program that supports planning and capital project implementation. Administered by the Metropolitan Transportation Commission (MTC), The Safe Routes to Transit (SR2T) Program awards grants to facilitate walking and bicycling to regional transit.

The most recent round of Safe Routes to Transit grants were awarded in 2009. $4.2M was available for the 9-county Bay Area. The Authority, in partnership with SFMTA, submitted a grant that would fund final design work for Columbus Avenue. Because Columbus Avenue is less directly connected to regional transit (in comparison to other competing applications for the Balboa and Glen Park BART station areas in San Francisco), this application was not funded. However, the application performed well and was ranked highly, indicating that Columbus Avenue may be a strong candidate for future cycles of this grant program.

The next call for Safe Routes to Transit will be issued in 2011.

6.6.2 Transportation for Livable Communities. The Columbus Avenue project will be a strong candidate for Transportation for Livable Communities (TLC) grants. TLC has grants awarded and administered both by MTC and by counties; the Authority administers the county program. Grants are awarded approximately every 2 years. Funds are intended to support projects that encourage multimodal travel, more livable neighborhoods, and the development of jobs and housing in existing town centers. Successful projects improve walking and bicycle access to public transit hubs and stations, major activity centers and neighborhood commercial districts as a way of fostering community vitality.

The next cycle of TLC funding will be a regionally-competitive call for projects in late January or early February, 2010. Grants will likely be awarded by June, 2010. Beginning with this round of funding, MTC is scoring applications more highly the further they are in engineering design. To compete well this round, the community will need to commit to a Columbus / Stockton / Green design and/or specific blocks of Columbus Avenue to be widened (and parking removed), and the Authority and SFMTA will need to concur on project engineering design, traffic and transit mitigations, and initiate engineering design to bring a project as close to a 35% level as practicable.

6.7 Community Involvement

Another critical part of implementation is ongoing community support, including:

- Letters of support for construction grants and legislative changes.
- Community contribution to funding non-conventional projects / higher levels of maintenance and operation. The ideal approach is the creation of a Business Improvement District (BID) or Central Business District (CBD). BID funds can help pay permitting and liability costs, or special event costs, or the cost of developing custom-made risers, associated with the ongoing flex-use-of-parking-space program).

RENEW SF will be in charge of coordinating and funding the efforts to gain community support.

Vocal support from community members is necessary in order to:

- Help pay for the costlier designs
- Identify strategic blocks, along which to widen the sidewalks with merchants' support
- Lobby local decision makers (SFMTA and Authority boards) in favor of the community's preferred alternative

Columbus Avenue Neighborhood Transportation Study
Implementation and Funding Plan

	Recommendations	Phase I (<1 year)	Cost	Funding Source	Responsible Party	Phase 2 (1 to 5 years)	Cost	Funding Source	Responsible Party	Phase 3 (>5 years)	Cost	Funding Source	Responsible Party
A	**Manage Parking**												
I	**Increase visibility of off-street parking**												
a		Install parking directional signs	COMPLETE,	MARCH 09	SFMTA								
b		Montior real-time parking information sign at Broadway; identify additional locations for real-time parking information signs (e.g., for the Vallejo and North Beach garages)	N/A	N/A	SFMTA								
c		Develop cost estimate for additional parking signs and identify funding.	N/A	N/A	SFMTA	Install additional real time parking information signs.	TBD	TBD	SFMTA				
II	**Reduce occupancy rates for on-street parking to 85%**												
a		Track the implementation of the Fishermans' Wharf SFpark pilot project. Include Columbus Avenue as an SFpark pilot / implementation area in the next round of SFPark implementation.	N/A	N/A	SFMTA	Install SfPark technology - multispace meters that accept credit cards; sensors at parking spaces; etc.	Self-funding	Self-funding	SFMTA / DPT or SFPark program				
b		Expand the $2.50 / hour meter zone north of Broadway:				Determine market rate for the metered zone by time of day (using Sfgo technology and testing)	N/A	N/A	SFMTA SFPark program				
		determine boundaries, conduct outreach, adopt legislation.	N/A	N/A	SFMTA								
		Construction / Implementation	TBD	TBD	SFMTA								
c		Expand meter hours to encompass peak parking demand period - Midnight on Friday and Saturday evenings, and Sundays											
		Recommended as part of SFMTA Parking meter study; conduct outreach, adopt legislation	N/A	N/A	SFMTA								
		Re-program meters	TBD	SFMTA	SFMTA								
d		Install meters at on-street spaces with non-residential frontage by converting those spaces from RPP to meter (e.g., north side of Filbert across from Washington Square)											
		Outreach	N/A	N/A	RENEW-SF								
		Legislation	N/A	N/A	SFMTA								
		Construction / Installation	TBD	TBD	SFMTA								
III	**Valet**	Develop merchants agreement on consolidated valet at Powell and Columbus	N/A	N/A	RENEW-SF								
IV	**Parking Benefit Distirct**	requires legislation											

B	Pedestrian Priority Measures												
I	**Flex Lanes: Expand sidewalk space via flexible use of the parking lane for café seating.**												
	a	Conduct a pilot / trial of flex lane installation	COMPLETE, SEPT 2009		RENEW SF								
	b	Demonstrate flex lane concept as part of City Pavement to Parks program	TBD	TBD	SF Planning								
	c	Obtain MOD concurrence sidewalk-edge ADA seating accommodation.	N/A	N/A	Better Streets Plan team								
	d					Formalize city program: develop a template permit application; develop boilerplate liabiltiy language; develop template design with barriers.	N/A	N/A	Pavement to Parks Program			
II	**Design Alternative III: Expand sidewalk space permanent expansion into the parking lane**												
	a	Finalize design approach: identify textured pavement design and color contrast that can serve as detectable warning between ADA path of travel (existing sidewalk) and flex lane.	**N/A**	N/A	Better Streets Plan team								
	b	Finalize policy defining "hazardous vehicular way" as a through street with speeds above 10 mph	N/A	N/A	Better Streets Plan team								
	c					Identify locations - work with businesses block-to-block to obtain letters of support and/or petition for sidewalk widening, either partially or into the parking lane.	N/A	N/A	RENEW SF				
										Develop engineering designs		Transportation for Livable Communities	SFMTA
										Construction	$4,105,000 *	Transportation for Livable Communities	SFMTA
III	**Design Alternative III: Columbus / Stockton / Green Re-Design**												
		TAC input on benefits / impacts of Alt 3 and refine design	N/A	N/A	Authority								
		TASC review	N/A	N/A	Authority	Engineering design	N/A	Prop K	Authority / SFMTA				
						Legislative process	N/A	N/A	SFMTA				
						Construction	1,563,000	Transportation for Livable Communities	SFMTA				
III	**Design Alternative III: Reduce crossing distances and improve pedestrian visibility at corners**												
	a					Develop engineering designs for Columbus / Stockton / Green corner bulbs (see below)		Transportation for Livable Communities	MTA Livable Streets				
						Construction	$950,000 *	Transportation for Livable Communities	SFMTA				
	b					Develop engineering designs for Filbert / Union / Powell curb bulbs as part of Final Design for the Central Subway project		Central Subway / Safe Routes to Transit grant	Central Subway / Safe Routes to Transit grant				
										Construction as part of the Central Subway project	$2,382,000	Central Subway project / Safe Routes to Transit grant	Central Subway Project / Safe Routes to Transit grant
IV	**Expand path of travel on sidewalk by replanting trees in parking lane as they require replacement over time**												
	a	Develop prototypical design for tree in parking lane curb that accommodates street sweepers	--	staff time from DPW	DPW								
	b	If an existing tree dies, seek to implement the strategies for permanent sidewalk widening above (line B.II), and plant new tree in widened sidewalk. If sidewalk is not a candidate for permanent widening, then plant tree in parking lane. Outreach / legislation / Construction.	TBD	TBD	DPW BUF with MTA Livable Streets and Community (RENEW SF)								

C	**Transit Priority Measures**											
	I	**Reduce transit delays / mitigate transit impacts**										
		a	Consolidate bus stop at locations identified in the TEP									
				outreach	N/A	N/A	RENEW SF					
				Legislative process	N/A	N/A	SFMTA					
		b	Construct bus bulbs					Develop engineering design. For each bulb, when initiating design, implement the steps to consider permanent sidewalk widening (line BII).	See BIIc	Safe Routes to Transit	Authority / SFMTA	
								Construction	[Obtain from DPW]	Safe Routes to Transit	Authority / SFMTA	
		c	Install transit signal priority at Stockton / Green									Design and construction ~ $50,000 Lifeline Transportation Program SFMTA
												Legislative process N/A N/A SFMTA
D	Bicycle Priority Measures											
	I	**Expand safe space for bicycling**										
		a	Change lane configuration to one traffic lane in each direction									
				Develop circulation plan and refine / test transit mitigations	~ $50,000	Authority	Authority / SFMTA					
				Design and implement pilot project to evaluate one traffic lane per direction	~ $50,000	Authority	Authority / SFMTA					
				Develop transition design (intersection / lane configurations where reverts back to two in each direction)	N/A	N/A	Authority / SFMTA					
				Prepare environmental assessment	N/A	N/A	Authority / SFMTA					
												Develop engineering design Prop K Authority / SFMTA
												Legislative process: lane conversion; turn restrictions. N/A N/A SFMTA
												Construction TBD Transportation for Livable Communities SFMTA
E	**Community Support for Implemetation**											
	I	**Demonstrated community support for recommendations and implementation**	**Letters of support for construction grants and legislative changes**		**N/A**	**N/A**	**RENEW SF**					
	II	**Community contribution to funding nonconventional projects / higher levels of maintenance and operation**	**Adopt BID or CID (e.g., BID funds can support the permitting and liability costs, or costs of developing custom risers, associated with ongoing flex use of parking space program, or special event implementation).**		**N/A**	**N/A**	**RENEW SF**					

Appendix