ENTRIPS

EASTERN NEIGHBORHOODS

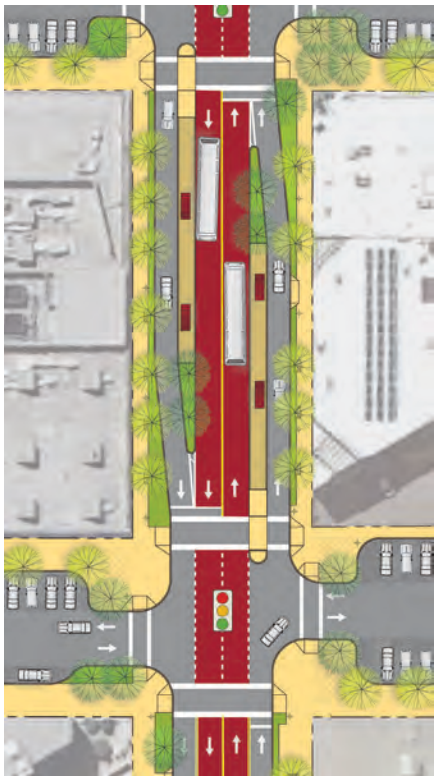
TRANSPORTATION IMPLEMENTATION PLANNING STUDY

7 MOVING FORWARD

7.1 A VISION FOR TRANSPORTATION AND THE PUBLIC REALM IN THE EASTERN NEIGHBORHOODS

The priority projects presented in this plan were selected not only to meet needs on individual streets, but also because their lessons have the potential to be applied more broadly. Along with their associated circulation concepts, the projects advance a set of strategies for addressing the major transportation challenges that the city will face in the coming decades. Based on wider application of those strategies to address recurring transportation challenges, this chapter introduces a long-term vision for transportation and the public realm in the Eastern Neighborhoods.

Capacity for Movement of People and Goods



Roadway capacity for private vehicles in the Eastern Neighborhoods cannot be expanded to meet future transportation demand. In order to allow efficient movement of people and goods while maintaining and enhancing livable neighborhoods, most of the forecast growth will have to be accommodated by prioritizing modes of travel that can move more people in less space. This is not a matter of ideology, but geometry: it takes up more than ten times as much roadway area to move a person in a private car than by any other mode of transportation. While vehicles will remain an important mode of transportation, peak period vehicular capacity will be reduced somewhat in order to increase streets' ability to move people and goods. Vehicles will move at safe and moderate speeds, and curb space will be carefully managed to ensure that private vehicle parking does not negatively affect other modes and delivery vehicles have efficient access to businesses. Major steps toward achieving this vision will include:

Create "no compromise" rapid transit corridors

In the future Eastern Neighborhoods transportation system, SFMTA transit services will be fast, reliable, and cost-effective. The key to this strategy will be a commitment to transit priority for the most important major transit corridors. On these streets, measures to reduce delay and ensure

the reliability of transit service will be implemented to maximize the movement of people, even if they require reductions in vehicular capacity. Bicycle facilities will be designed so they do not compete with transit on these streets; as proposed for 16th Street in this plan, high-quality, well-connected bicycle facilities will be provided on parallel corridors. Sixteenth Street, Mission Street and the T Third corridor (operating on the surface of Third Street south of Bryant Street and then in a tunnel to the north) will be primary transit spines for the Eastern Neighborhoods: these corridors will be upgraded to the highest level of transit priority for their full length.

In many cases the optimal configuration for transit will be similar to the median transitway concept that this plan proposes for 16th Street, where transit vehicles have their own right-of-way and are unimpeded by turning or parking vehicles. As transit efficiencies are achieved, savings can be reinvested by increasing service levels on these and other core routes. In the long run, the other designated 'rapid' transit corridors in the study area, including Third and Fourth Streets in the South of Market, Potrero Avenue, Division Street, and Townsend Street should be considered for this highest level of transit priority.

Establish a network of bicycle facilities to serve people of all ages and abilities

Establishing a fully connected network of bicycle routes as outlined in the San Francisco Bicycle Plan is a vital step toward allowing bicycle trips to serve more of the area's transportation demand. Facilities should be designed so that people of all ages and abilities feel comfortable using them.

On major arterial streets, it will sometimes be necessary to physically buffer cyclists from moving vehicles. The bicycle facilities developed for Folsom, Seventh, and Eighth Streets in this plan work toward this goal. Eventually, separated facilities should be extended to encompass longer segments of these corridors, and other arterial corridors in the South of Market may become strong candidates for separated bikeways as demand grows. Separated bicycle lanes must always be carefully designed so that they don't compromise safe and comfortable use of streets by people with disabilities.

Some important corridors should evolve into neighborhood greenways, where pedestrians and cyclists are prioritized and traffic is calmed and/or diverted to other streets. The 17th Street bikeway described in Chapter 4 of this report is a strong candidate for such a treatment. The Mission Creek Bikeway and Blue Greenway along the Eastern Waterfront will create fully separated multi-use pathways.

Manage vehicle system capacity

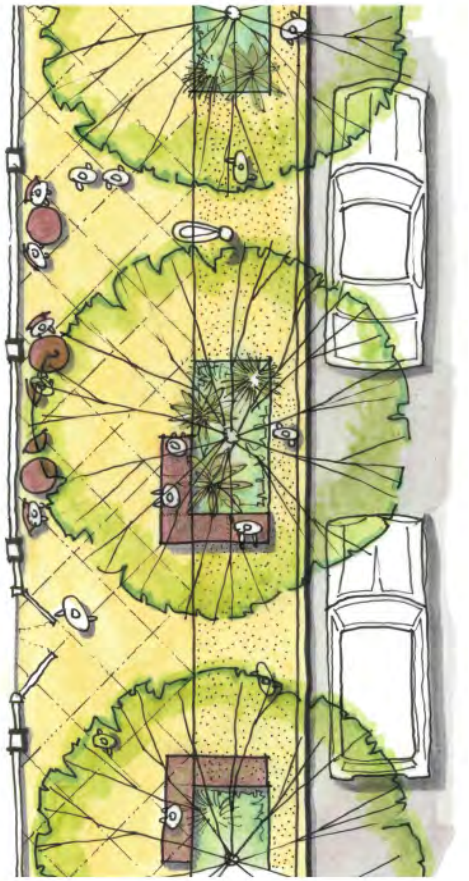
Private vehicles will remain an important mode of transportation in the Eastern Neighborhoods, but careful system management will reduce impacts on livability and travel by other modes. The two keys to this approach will be managing parking capacity and roadway capacity.

- *Parking management.* Pricing strategies will be used to manage the demand for on-street and publicly available off-street parking. Appropriately priced parking spaces will be easy to find, so drivers don't use valuable roadway capacity circling for parking. Curb space will be made available for parking and loading where necessary for businesses. The SFMTA's SF*park* initiative has begun this work through a pilot program in the South of Market and new parking management plans at Mission Bay and the 17th and Folsom area. These efforts will be expanded into high demand areas throughout the Eastern Neighborhoods.

- *Roadway capacity management.* In the long run, the City may also consider a pricing approach to managing roadway capacity. In the interim, however, when it is necessary to reduce vehicle network capacity to make additional space for other uses, capacity reductions will be implemented strategically so that they do not negatively affect other modes or diminish livability. For example, strategic road diets, signal-retiming, and transit-only lanes on the North of Market arterials may be used to meter traffic flows southbound across Market Street in the PM peak, allowing the City to add pedestrian space, bicycle facilities, and transit priority on the South of Market number streets without the risk of disrupting transit service on Market.

Livability

The pedestrian and public realm will be enhanced to make the Eastern Neighborhoods better places to walk and healthier, safer, and more delightful places to live. Streets will also contribute to a healthier natural environment by managing stormwater. While the 'green connector' streets and the 'civic boulevard' identified in the Eastern Neighborhoods plans, are priorities for upgrades, streets throughout the Eastern Neighborhoods can benefit from these types of investments.



Prioritize the pedestrian

Pedestrian facilities will be upgraded such that, in combination with the complete neighborhoods envisioned in the Eastern Neighborhoods land use plans, more of neighborhood residents' daily travel needs can be met by walking. In accordance with the Better Streets Plan vision, improvements will include improved sidewalks and crossings, lighting, landscaping, and amenities on streets. These investments are an essential and fully integrated part of the transportation system.

In developing a new street grid for the historically industrial areas, including parts of SOMA, Showplace Square, and the Central Waterfront, Better Streets Plan principles will be applied.

Commit to safe, healthy, and humane streets in the South of Market

South of Market arterial streets, most of which are now prioritized for vehicle through-travel, will be upgraded so that they are more hospitable places to walk, bike, take transit, and spend time. An essential part of this effort will be retiming SOMA signals to favor vehicle speeds that are compatible with pedestrian safety and comfort. The city will undertake an effort to retime north-south and east-west South of Market signals in a comprehensive way, targeting moderate vehicle progression speeds. The addition of mid-block signals on SOMA's long blocks as envisioned in Chapters 5 and 6 of this report will both improve pedestrian safety and connectivity and help to

encourage vehicle progression through the network at safe speeds. While this plan proposes specific locations for new signals, the same treatment can be applied elsewhere in the South of Market. Freeway ramp touchdowns intersections, particularly those along Harrison and Bryant streets, will be prioritized for traffic calming and perhaps eventual reconfiguration.

Besides Folsom, Howard, Seventh, and Eighth streets, the numbered streets from Second to Sixth are all high priority for investment. Because improving livability on the north-south SOMA arterials will require repurposing space on streets that are already at or near capacity for vehicles during peak periods, these projects must be carefully coordinated with efforts to manage vehicular system capacity. Brannan Street, an east-west SOMA street that currently has low volumes of traffic and is undesignated in any of the City's major transportation networks, can be retrofitted with an improved pedestrian realm as development occurs in the southern parts of SOMA. SOMA alleys will also be upgraded to better serve as pedestrian spaces. An important complement to the Folsom Street corridor project will be a focused economic development effort to foster a neighborhood commercial district for the South of Market on Folsom Street.

Invest in Eastern Neighborhoods streets as public spaces and stormwater management facilities

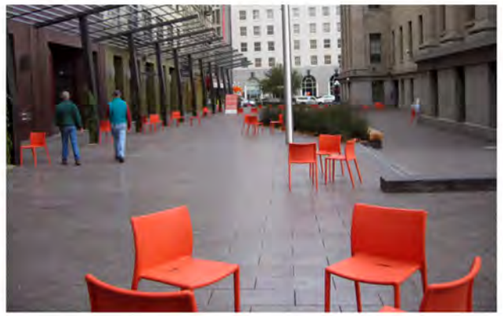
The Eastern Neighborhoods Area Plans describe an overall deficiency of public open space serving neighborhoods. The East SoMa Plan, for example, states the need for an additional 4.2 acres. The plans recognize that small open spaces with street rights-of-way are one way of achieving this goal. Meanwhile, the Open Space Vision for San Francisco emphasizes local-serving open spaces that serve the needs of their immediate area communities. Building on the Better Streets Plan, Eastern Neighborhoods streets will also help to manage stormwater as it collects in street rights-of-way. Specific approaches to small public spaces and stormwater management are summarized on the next two pages.

Small Public Spaces for Eastern Neighborhoods Streets

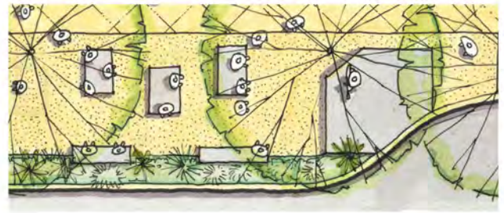
The EN TRIPS project presents several different ways public space can be integrated into the Eastern Neighborhoods' street rights-of-way. These concepts emphasize major streets such as the three corridors studied, but they could be modified to apply to a variety of streets and locations within the Eastern Neighborhoods area.

Context-sensitive public spaces. Land uses in the Eastern Neighborhoods vary dramatically, sometimes within the same block. Likewise, the needs for public space among people associated with these different land uses also varies. While a more residential enclave may have the need and community resources to care for a pocket park or community garden (below left), an area heavy in employment may desire a place for food trucks to park and/or for workers to sit and eat (right). While solitary or smaller seating areas may be appropriate for quieter areas (below right), spaces for gathering or performance may be appropriate for more active streets (below center).

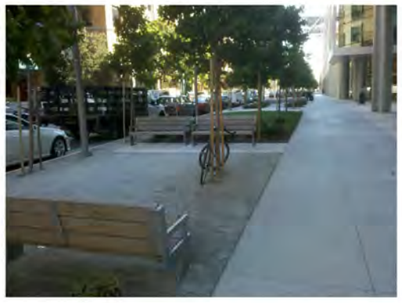
Flexibility in public spaces. The mixed-use nature of the Eastern Neighborhoods creates the need for flexibility in use of public space. This flexibility could be between daytime use for workers and evening and weekend use for residents, but could also be between vehicular uses such as loading and repair and people uses.



Extended bulb-outs. Bulb-outs at street intersections and mid-block crossings can reduce street crossing distances, but they are also the excellent opportunities for public space in most street rights-of-way. Particular opportunities encountered in the EN TRIPS planing process include intersections of major streets and alleys in SoMa, and where 90-degree parking creates the opportunity for a deep bulb-out, such as at many intersecting streets with 16th Street.



Use of the Furnishings zone. Within the typical street cross section, the furnishings zone is often wide enough to accommodate public space uses such as seating, landscaping, and alternative paving treatments. This approach should be taken particularly in more active pedestrian areas like Folsom Street or 8th Street.



Flexible use of parking lane. The parking lane provides opportunities to expand the public space of the street, especially on streets that will not be rebuilt or extensively landscaped. Uses of the parking lane could include seating, landscape, restaurant use, or bicycle parking.

Stormwater Management on Eastern Neighborhoods Streets

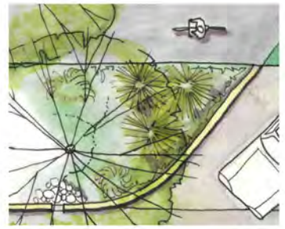
The EN TRIPS project presents several different ways stormwater management or Low Impact Development (LID)* can be integrated into the Eastern Neighborhoods' street rights-of-way. These improvements not only help covey, slow, filter and absorb rainwater runoff, but also soften the street environment by reducing the amount of impermeable paved surface, provide space for greening, and complement public space. These concepts should be considered with the built conditions of underground utilities and road crowning to determine the best approach. For more information on stormwater management, see Better Streets Plan Chapter 6.2.

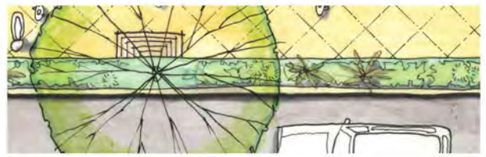
Stormwater management tools for every size. Because of their variation in street type and surrounding land use, Eastern Neighborhoods streets present many opportunities to integrate stormwater management, but they vary in their size and shape. While some streets and their contexts present the opportunity for a major piece of stormwater management infrastructure (right), other streets' opportunities are smaller rain gardens, planters (below), or permeable paving.

Stormwater management infrastructure serves other functions. In the Eastern Neighborhoods, as in other places, LID features and treatments can provide additional benefits users of a given street. These include buffering from moving traffic, an attractive street environment (right), or integration with public space (below).

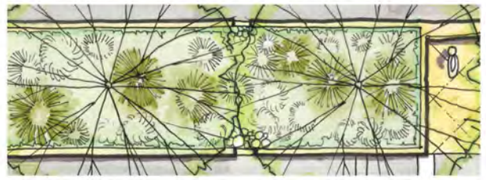
* LID is a landscape-based approach to on-site stormwater management that prioritizes the use of Best Management Practices (BMPs) integrated into a building, site or street to treat stormwater and detain stormwater runoff. BMPs are strategies or structural devices used to reduce volume, peak flows, and/ or pollutant concentrations of stormwater runoff through one or more of the following processes: evapotranspiration, infiltration, detention, filtration and biological and chemical actions.

Bioretention in strategic locations along active streets. Bioretention is a good approach for many of the Eastern Neighborhoods' most active streets because it can occur in a variety of forms to suit small spaces, and it adds landscape to streets. Opportunities include bulb-outs, especially those that are less accessible to pedestrians, such as bulb-outs separated from the sidewalk by a cycletrack (right above), and flow-through planters in the furnishings zone (right below).





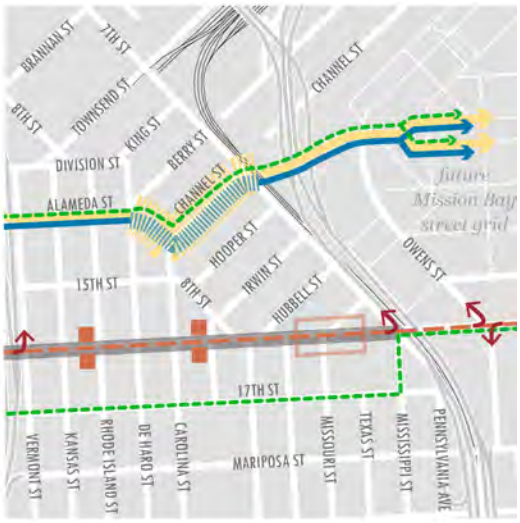
Swales in less constrained areas. Some Eastern Neighborhoods streets have long stretches where no vehicular access is needed and parking is not as in demand as it is in other parts of San Francisco. These areas could be candidates for swales, which collect and convey stormwater, while filtering the water before it is discharged (right). Medians, such as that planned for Howard Street, may also be designed to accommodate swales (below).



Permeable paving. Different parts of streets present opportunities for permeable surfaces. A furnishings zone paved with permeable pavers, cobblestones, or decomposed granite (above right) can provide more water to trees. Additionally, the parking lane can be treated with a permeable material such as pavers, permeable concrete or permeable asphalt (below right).

Connectivity

The Eastern Neighborhoods transportation networks are disrupted by multiple barriers. While some of these barriers, such as Potrero Hill's steep topography, are here to stay, others can be overcome. San Francisco will engage in a gradual, opportunistic, but fully coordinated effort to reconnect the grid and improve connectivity for all modes.



Improve east-west connectivity between Division and Mariposa Streets.

The future transportation system in the Eastern Neighborhoods will provide additional paths of travel between the Mission District and Mission Bay. Fourteenth, Alameda and 15th Streets will be made continuous east of Harrison Street as development occurs. Seventeenth Street will become a continuous high-quality bicycle route between the Castro and Mission Bay. These continuous corridors will improve access for all modes and reduce pressure on 16th Street as the primary through street. Crossings of the I-280 right-of-way will be improved: at a minimum, this will include improved connectivity between Mission Bay and streets to the west using either the existing crossing at Channel Street or a relocated crossing connecting to Mission Bay Boulevard. Strategic new crossings could also be added, such as a pedestrian and bicycle bridge at 17th Street. In the long-term future, this corridor may be transformed more fully: through the California High Speed Rail project, rail service may be transitioned underground. The City may ultimately consider removing parts of the I-280 freeway viaduct and transitioning vehicles to an at-grade boulevard. While a variety of approaches to this corridor will be considered, east-west connectivity between the Eastern Neighborhoods will be a major goal.

Add connections in the South of Market and Central Waterfront pedestrian grids

Pedestrian connectivity in the South of Market will be substantially upgraded. Arterial streets will be narrowed, and signalized mid-block crossings added to ensure that arterials are not a barrier to pedestrian travel. Intersections with freeway-ramp touchdowns will be retrofitted to ensure that they do not interrupt pedestrian paths of travel. Chapter 5 of this plan proposes continuing to upgrade Minna and Natoma alleys as continuous pedestrian paths of travel. In the long-term future, Minna Street may offer an uninterrupted path from Ninth Street all the way to the Transbay Transit Center.

The network of sidewalks between I-280 and Illinois Street, now marked by numerous gaps and obstructions, will be upgraded to a fully connected network as development occurs. In Mission Bay and at Pier 70, redevelopment will create entirely new pedestrian networks. Along with new open space and completion of the Blue Greenway, these new grids will help open the eastern Waterfront to public enjoyment.

Upgrade transit connectivity between Showplace Square, Potrero Hill, and downtown.

As development occurs in Showplace Square and along the 16th and 17th Street corridors in Potrero Hill, it may become necessary to create a more robust transit connection between these

areas and downtown neighborhoods including the Financial District and Union Square. Currently, Route 10 Townsend provides a direct connection; however, it is a relatively slow, infrequent bus service, and the TEP recommended that it be realigned to the east. The 19 Polk provides similar service along the Seventh and Eighth Street corridors to Market Street in the Civic Center area, where connections can be made to routes serving downtown. Reconfigured service (perhaps connecting directly to downtown via the Mission Street transitway), enhanced transit priority, and additional frequency will be considered as development and demand warrant.

Integrate fully with the regional transit system.

The Eastern Neighborhoods transportation system will provide efficient access to upgraded and expanded regional transit hubs. To achieve this objective, Market Street will be reinforced and upgraded in its role as San Francisco's transit spine, ensuring the strongest possible link between SFMTA bus lines and BART. Pedestrian paths of travel and transit connections to the Transbay Transit Center will be reinforced by full implementation of the Transit Center District Plan. To maximize connectivity to the Fourth and King rail station, the City will complete the Central Subway, upgrade the pedestrian environment on Fourth Street between Market and King, and add new sidewalks and pedestrian amenities on Townsend Street. It may also be necessary to implement transit priority treatments for the 47 Townsend on both Division and Townsend Streets (including potential reconfiguration of the Eighth-Townsend-Division traffic circle). Enhanced east-west connectivity, re-alignment of the 22 Fillmore, and improvements to 16th Street as proposed in Chapter 4 of this plan will help connect Mission Bay and Showplace Square to the 16th Street Mission BART station.

7.2 NEXT STEPS

The SFMTA and its partner agencies will work toward this vision on several tracks. In the first, the City will work toward implementing the EN TRIPS priority projects. The EN TRIPS Funding and Implementation plan, to be published under a separate cover, will detail the specific steps to be taken to realize the priority projects. It will include:

- A strategy for environmental review.
- Itemized project cost estimates.
- A timeline and phasing plan to ensure that the most pressing needs can be met as quickly and cost-effectively as possible.

In addition, realizing the vision will require ongoing effort through existing planning programs. SFMTA and its partner agencies will continue to work towards meeting the needs expressed in this planning effort.

APPENDIX A

EN TRIPS Project Alternatives
Operations and Circulation Analysis

EN TRIPS Project Alternatives Operations and Circulation Analysis

This Appendix summarizes the circulation and operational analysis of the EN TRIPS corridor project alternatives. Fehr & Peers has reviewed the proposed corridor alternatives for Folsom, Howard, 7th and 8th Streets for the following four issues, which also correspond to the five sections of this memorandum:

1. Traffic Impacts
2. Network Impacts
3. Transit Delay
4. Signal Timing

The following corridor project alternatives were analyzed for this task:

TABLE 1: CORRIDOR PROJECT ALTERNATIVES

Alternative	Description
Folsom and Howard Streets	
1	1-Way: 2 Lanes + Buffered Bike Lane
3	2-Way: 2 Lanes one way, 1 Lane other + Buffered Bike Lane
4	1-Way/2-Way: 2 Lanes one way + 1 Lane other (Folsom), 2 Lanes one way + Cycletrack (Howard)
5*	2-Way: 2 Lanes one way, 1 Lane other + Buffered Bike Lane, + Turn Pockets
7th and 8th Streets	
1	1-Way; 2 Lanes + BusWay and Cycle Track (7/8)
2*	1-Way; 3 Lanes + Cycle Track (7/8)
3	1-Way; 3 Lanes + Bike Lane (7/8)
5	2-Way: 2 Lanes SB + 2 Lanes NB (8); 1 Lane SB + 2 Lanes NB (7)

Note: *Recommended Alternative

Source: Nelson\Nyygard, 2011

TRAFFIC IMPACTS

Each of the proposed corridor project alternatives was analyzed to determine how they would affect traffic operations along the study roadway segments. Traffic impacts were evaluated using the weighted average volume-to-capacity (v/c) ratio and delay over each corridor. The overall weighted average was used to allow each of the Alternatives to be evaluated based on how they affected corridor-wide conditions. Calculations were completed using Synchro analysis software[1].

[1] Peak hour Synchro models were developed for each Project Alternative. Synchro is a sophisticated traffic software application that is based on procedures outlined in the Transportation Research Board's *2000 Highway Capacity Manual* and used to optimize traffic signal timing and perform capacity analysis. Synchro models were coded with the existing and forecast peak hour traffic and pedestrian volumes, vehicle mix, and signal timings. Adjustments to the Synchro models were made to account for specific attributes of each Project Alternative, i.e. lane configurations (one-way vs. two-way

To be conservative, all existing and future forecasted traffic on the roadways was assumed to remain within the roadway system – that is, no traffic on Howard, Folsom, 7th or 8th Streets was assumed to divert to adjacent roadways because of proposed capacity reductions. In Alternatives where one-way roadway couplets were converted to two, two-way roadways, traffic was assumed to split between the two roadways in the couplet proportional to the capacity available. For example in Alternatives 3 and 5, one-third of eastbound traffic on Folsom Street would divert to the new eastbound lane on Howard Street and two-thirds would remain on Folsom Street since two-thirds of the total eastbound capacity would remain.

Tables 2A to **C** and **3A** to **C** present change in corridor delay and v/c ratios, with existing and future volumes, respectively, for each of the corridors under each Alternative. As shown in the Tables, v/c and delay increases under all Alternatives. Delay and v/c would generally increase more substantially on Howard and Folsom since the proposed Alternatives would generally reduce capacity more on those streets (with the exception of 7th/8th Alternatives 1 and 5). The v/c ratio and delay in the northbound/southbound direction on 7th and 8th Streets would increase slightly under Alternatives 2 and 3, whereas Alternatives 1 and 5 would lead to larger increases because of the overall capacity reduction.

traffic), integration of turn prohibitions, integration of turn pockets at intersections, etc. A figure showing the intersections included in the Project Alternative Synchro models is included on the last page of this memorandum.

TABLE 2A: HOWARD AND FOLSOM CORRIDOR DELAY AND VOLUME-TO-CAPACITY RATIOS (EXISTING VOLUMES)

Alternative	Volume-to-Capacity Ratio			Delay (in seconds)		
	Intersection	EB	WB	Intersection	EB	WB
Howard						
Existing Config.	0.73	--	0.56	25	--	15
Alt. 1	0.81	--	0.68	28	--	17
Alt. 3	0.80	0.63	0.45	34	16	29
Alt. 4	0.72	--	0.51	27	--	11
Alt. 5	0.87	0.74	0.43	46	26	23
Folsom						
Existing Config.	0.73	0.65	--	12	11	--
Alt. 1	0.90	1.01	--	24	39	--
Alt. 3	0.80	0.67	0.42	14	15	31
Alt. 4	0.90	1.01	0.40	26	41	11
Alt. 5	0.69	0.60	0.40	14	14	14

Note: All Folsom/Howard Alternatives assume implementation of 7th/8th recommended alternative.
Source: Fehr & Peers, 2011

TABLE 2B: 7TH AND 8TH STREETS CORRIDOR DELAY AND VOLUME-TO-CAPACITY RATIOS (EXISTING VOLUMES)

Alternative	Volume-to-Capacity Ratio			Delay (in seconds)		
	Intersection	NB	SB	Intersection	NB	SB
7th						
Existing Config.	0.71	0.83	--	15	14	--
Alt. 1	0.95	1.29	--	74	>80	--
Alt. 2	0.76	0.94	--	31	42	--
Alt. 3	0.76	0.94	--	31	42	--
Alt. 5	1.17	1.61	1.55	>80	>80	>80
8th						
Existing Config.	0.77	--	0.95	32	--	42
Alt. 1	0.99	--	1.36	>80	--	>80
Alt. 2	0.79	--	0.95	30	--	40
Alt. 3	0.79	--	0.95	30	--	40
Alt. 5	0.93	1.20	0.82	>80	>80	35

Note: All 7th/8th Alternatives assume implementation of Folsom/Howard recommended alternative.
Source: Fehr & Peers, 2011

TABLE 3A: HOWARD AND FOLSOM CORRIDOR DELAY AND VOLUME-TO-CAPACITY RATIOS (FUTURE VOLUMES)

Alternative	Volume-to-Capacity Ratio			Delay (in seconds)		
	Intersection	EB	WB	Intersection	EB	WB
Howard						
Existing Config.	0.83	--	0.71	36	--	18
Alt. 1	0.94	--	0.91	52	--	43
Alt. 3	1.05	0.90	0.70	54	55	35
Alt. 4	0.81	--	0.63	43	--	12
Alt. 5	1.11	0.89	0.56	69	56	29
Folsom						
Existing Config.	0.87	0.80	--	22	14	--
Alt. 1	1.11	1.26	--	>80	>80	--
Alt. 3	1.02	0.84	0.64	38	21	54
Alt. 4	1.12	1.26	0.53	79	>80	24
Alt. 5	0.87	0.75	0.53	33	18	17

Note: All Folsom/Howard Alternatives assume implementation of 7th/8th recommended alternative.
Source: Fehr & Peers, 2011

TABLE 3B: 7TH AND 8TH STREETS CORRIDOR DELAY AND VOLUME-TO-CAPACITY RATIOS (FUTURE VOLUMES)

Alternative	Volume-to-Capacity Ratio			Delay (in seconds)		
	Intersection	NB	SB	Intersection	NB	SB
7th						
Existing Config.	0.88	1.07	--	39	75	--
Alt. 1	1.25	1.57	--	>80	>80	--
Alt. 2	1.03	1.25	--	74	>80	--
Alt. 3	1.03	1.25	--	74	>80	--
Alt. 5	1.49	2.03	1.93	>80	>80	>80
8th						
Existing Config.	0.90	--	1.12	63	--	98
Alt. 1	1.17	--	1.61	>80	--	>80
Alt. 2	0.97	--	1.12	>80	--	>80
Alt. 3	0.97	--	1.12	>80	--	>80
Alt. 5	1.28	2.43	0.96	>80	>80	55

Note: All 7th/8th Alternatives assume implementation of Folsom/Howard recommended alternative.
Source: Fehr & Peers, 2011

NETWORK IMPACTS

To assess the potential for the corridor project alternatives to divert traffic from the project streets and impact adjacent streets, Fehr & Peers reviewed vehicle queues and turn restrictions resulting from implementation of the alternatives. **Table 4** summarizes the 95th percentile vehicle queues on Folsom, Howard, 7th and 8th Streets under each Alternative.

Alternatives 1 through 5 would reduce capacity. As shown in **Table 4**, eastbound and westbound vehicle queues on Folsom and Howard would increase, substantially for some Alternatives; however, queues would not exceed available storage length on Folsom or Howard Street. Under Alternative 5, southbound vehicle queues on 7th Street at Howard Street would extend 1,067 feet, which is longer than the block between Howard and Mission Streets. Also under alternative 5, northbound vehicle queues on 8th Street at Folsom and Howard Streets would extend 673 feet and 597 feet, respectively, and affect upstream intersections (e.g., Harrison). Since most southbound traffic would be headed to the I-80 on-ramp at 8th Street, some traffic may divert from 7th Street to 8th Street. Likewise, most of the northbound vehicle queue on 8th Street would be from traffic coming from the freeway off-ramp at 7th Street; therefore, if diversion occurred, it would remain in the couplet and not divert to adjacent streets (e.g., 9th Street or 6th Street).

TABLE 4: VEHICLE QUEUE LENGTHS[1] (COMBINED ALTERNATIVES)[4]

Roadway	Approach	Intersection	Block Length (ft)	Existing Queue (ft)	Alternative 1 (7th/8th)		Alternative 2 (7th/8th)		Alternative 3 (Folsom/Howard)		Alternative 4 (Folsom/Howard)		Alternative 5 (Folsom/Howard)	
					Lanes	95th PCT (ft)	Lanes	95th PCT (ft)	Lanes	95th PCT (ft)	Lanes	95th PCT (ft)	Lanes	95th PCT (ft)
Howard	WB	7th Street	860	21	2	32	2	337[2,3]	2	41	2	32	2	336[3]
		8th Street	860	34	2	22	2	374	2	90	2	22	2	144
	EB	7th Street	860	-	1	462[3]	-	-	-	--	1	462[3]	1	701[3]
		8th Street	580	-	1	141[2]	-	-	-	-	1	141[2]	1	378[3]
Folsom	WB	7th Street	860	-	1	150	-	-	1	203	1	150	1	150
		8th Street	860	-	1	271	-	-	1	265	1	271	1	371[3]
	EB	7th Street	860	79	2	25	2	201[2,3]	2	66[2]	2	25	2	25
		8th Street	580	45[2]	2	246[2]	2	324[2,3]	2	174[2,3]	2	246[2]	2	394[3]
7th Street	NB	Folsom	580	40[2]	2	290[2,3]	3	210[2]	3	144[2]	3	31[2]	2	152
		Howard	580	13[2]	2	12[2]	3	235[2]	3	23[2]	3	12[2]	2	207
	SB	Folsom	580	-	-	-	-	-	-	-	-	-	1	549[3]
		Howard	580	-	-	-	-	-	-	-	-	-	1	**1067[3]**
8th Street	NB	Folsom	580	-	-	-	-	-	-	-	-	-	2	**673[3]**
		Howard	580	-	-	-	-	-	-	-	-	-	2	**597[3]**
	SB	Folsom	580	19[2]	2	18[2]	3	7[2]	3	9[2]	3	16[2]	2	266
		Howard	580	280[2,3]	2	**794[3]**	3	447[3]	3	442[3]	3	484[3]	2	306[3]

Notes:

Bold indicated that 95th percentile queue length is longer than block length

[1] Queue lengths based on cumulative volumes

[2] Volume for 95th percentile queue is metered by upstream signal

[3] 95th percentile volume exceeds capacity, queue may be longer (queue shown is maximum after two cycles)

[4] All Alternatives shown with corresponding recommended alternative

Source: Fehr & Peers, 2011

TRANSIT DELAY

As part of the proposed Alternatives, transit lines on Howard, Folsom, 7th and 8th Streets would be consolidated onto certain transit priority streets. All streets would have new transit stop amenities to reduce bus stop dwell time, such as bus curb extensions and prepaid boarding stations. Therefore, the net increase in transit delay would be roughly equivalent to the net increase in vehicle delay for each of the corridors. In some cases, the effect may be negligible, since the bus stop amenities may decrease transit delay, but the change in roadway configuration may increase vehicle delay.

SIGNAL TIMING

The approach taken to signal timing along 7th, 8th, Howard, and Folsom Streets is as follows. First, the link speeds on these streets in the Synchro model were reduced to 18 mph within the study area. Following this, the signal timing for all midblock crossings was set to pre-timed with the reference phase changed from the pedestrian phase to the through-traffic phase (e.g. southbound through, westbound through). For all midblock crossings, yellow time for the pedestrian phase was set to two seconds and the flash-don't walk phase reduced by two seconds accordingly. To ensure consistency throughout the model, volumes were added at each midblock crossing adhering to the principle of conservation of flow. Thus, the volume entering the block at the upstream intersection would be carried through to the midblock intersection without any losses. Similarly, volumes at the downstream intersection could also be carried through to the midblock crossing without any losses. The final step was the optimization of the offsets at each intersection along 7th, 8th, Howard, and Folsom Streets. Each intersection was optimized individually, with each street being optimized in turn.

CONTRAFLOW WESTBOUND FOLSOM TRANSIT LANE (2ND TO 5TH)

The recommended alternative for Folsom Street would convert the roadway to two-way operations between 5th and 11th Streets. This would allow Muni Route 27, which currently operates westbound on Harrison Street west of 5th Street, to operate westbound on Folsom instead[2]. It would also allow current Route 12 and the Transit Effectiveness Project-recommended Route 11[3] to operate westbound on Folsom between 5th and 11th Streets. However, unless Folsom Street is reconfigured east of 5th Street, both Route 12 and future Route 11 would be unable to operate westbound on Folsom between 2nd and 5th Streets. Indeed, Muni might choose to forego westbound operations on Folsom altogether rather than have buses travel three blocks on Harrison before "doubling back" to Folsom[4].

Current and projected traffic volumes on Folsom increase as one moves to the east. During the PM peak period, Folsom serves as a primary access route to the Bay Bridge. Vehicles turn right at Essex Street, so much of this traffic is on the right side of the street. Between 2nd and 3rd Streets, Muni avoids the Bay Bridge queue by operating in the left lane, with a boarding island far-side at 3rd Street.

[2] Line 27 currently operates eastbound on Bryant Street, but the Transit Effectiveness Project recommended eastbound operation on Folsom.
[3] Line 12 would be discontinued upon introduction of Line 11.
[4] Alternately, Lines 12 and 11 could operate westbound on Howard between 2nd and 5th, but this would reduce access to and from areas to the south and would lengthen travel times, as two additional turns would be required, including a left turn from Howard onto 5th.

Preliminary traffic analysis was done to determine the potential impact to delay and capacity the conversion of one of the eastbound travel lanes into a transit-only lane would have on auto and transit delay along Folsom Street between 2nd Street and 5th Street.

As shown in **Table 5**, the project would cause a minimal increase v/c along Folsom Street, primarily because the eastbound Folsom Street approach at 5th Street would have a left-turn pocket to allow through vehicles to bypass vehicles queued to make a turn onto northbound 5th Street. A similar change would occur at 2nd Street. The changes to these approaches would decrease overall delay along the corridor slightly. The other intersections between 2nd and 5th Streets would experience increases in eastbound delay. Overall, westbound transit would experience about 11 seconds of delay per intersection along the corridor between 2nd and 5th Streets, which is less than one minute of total delay for the segment.

TABLE 5: FOLSOM STREET CORRIDOR DELAY AND VOLUME-TO-CAPACITY RATIOS

	Net Change Over Existing Configuration					
	Volume-to-Capacity Ratio			Delay (in seconds)		
	Intersection	EB	WB	Intersection	EB	WB
Folsom (Existing Volumes)						
2nd	+0.06	+0.17	+0.02	-4	-6	+12
3rd	+0.04	+0.09	+0.04	+14	+28	+11
4th	+0.10	+0.22	+0.03	+15	+31	+22
5th	-0.03	-0.19	+0.61	-41	-88	+16
Folsom (Weighted Average)						
	+0.02	+0.07	+0.34	-4	-8	+11

Source: Fehr & Peers, 2011

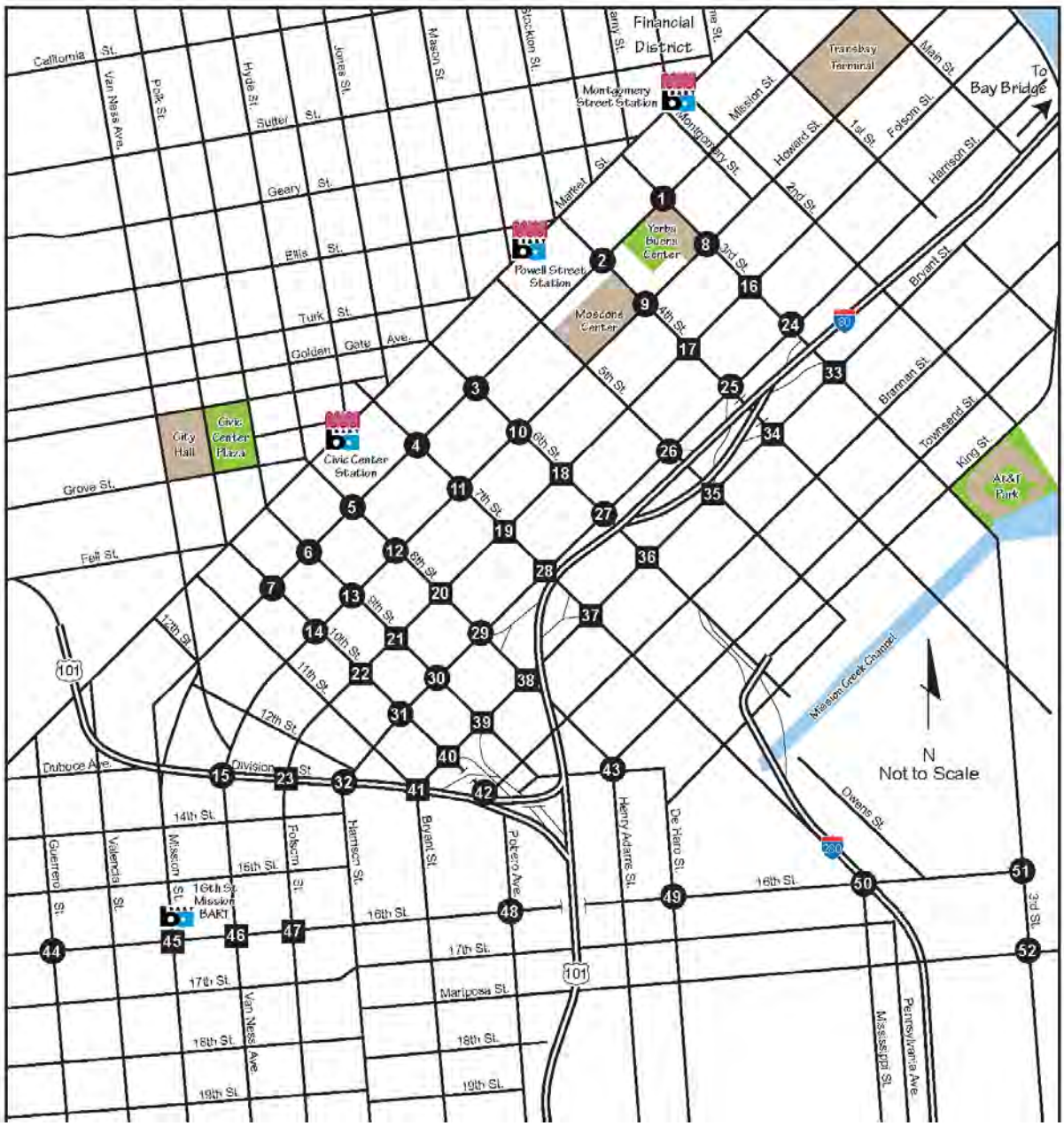
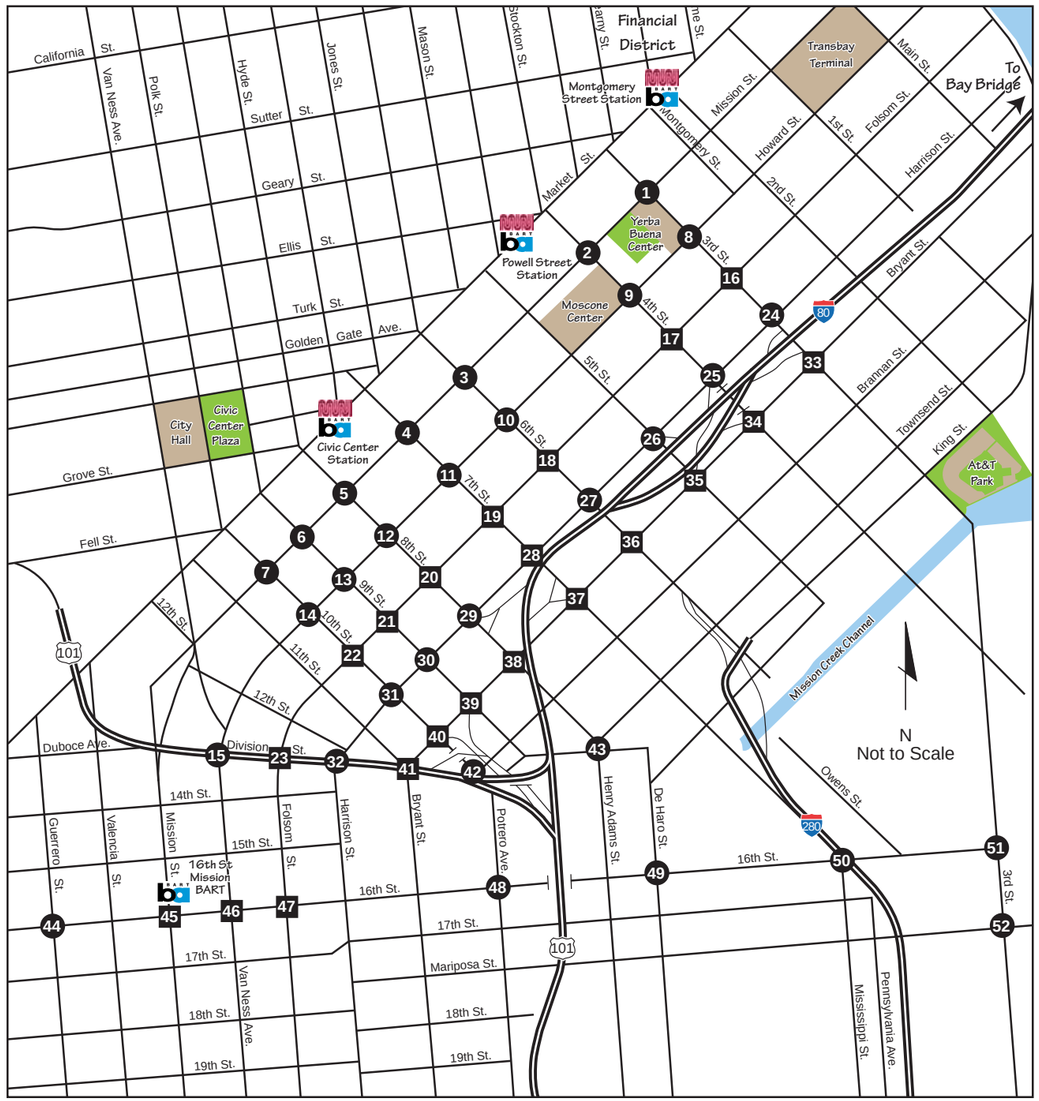
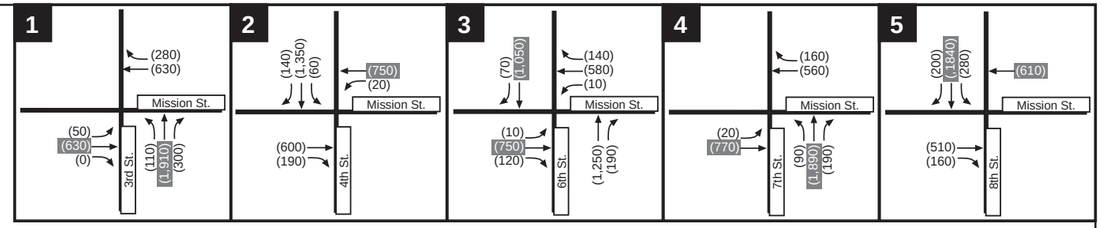


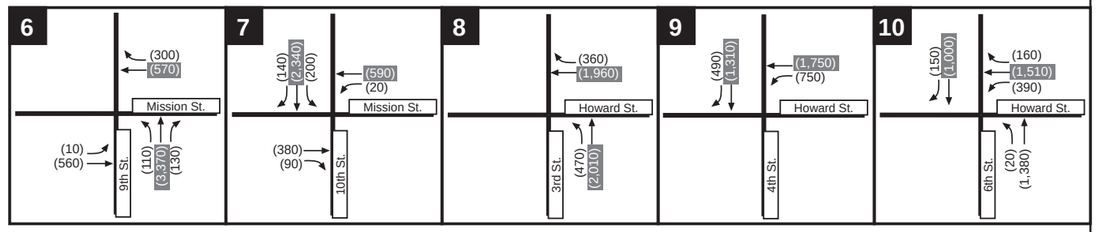
Figure 1: Study Intersections included in Project Alternative Synchro Models.
Source: Fehr & Peers, 2011

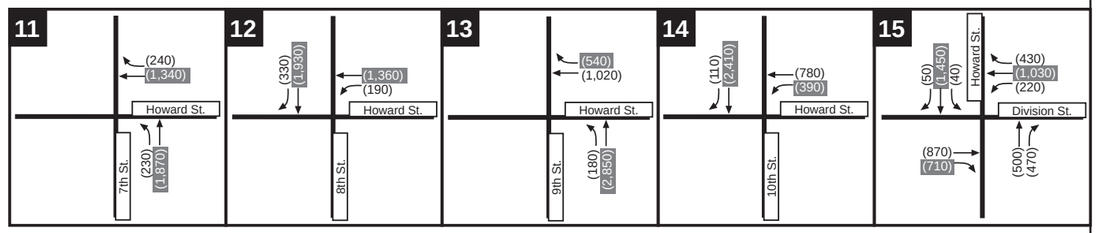
APPENDIX B

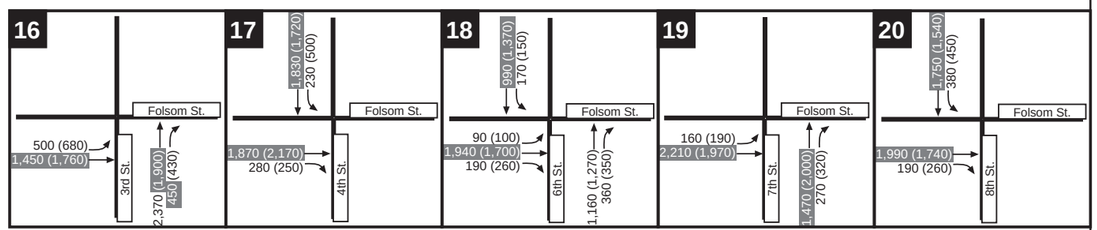
EN TRIPS Traffic Study

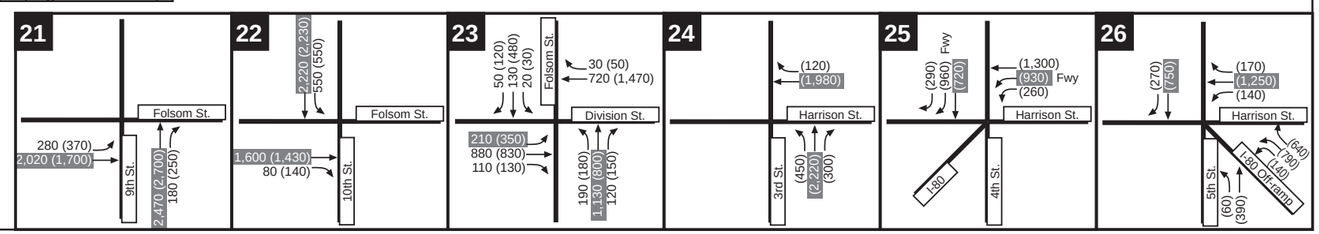












LEGEND:

- 16 = AM and PM Peak Hour Study Intersection
- 1 = PM Peak Hour Study Intersection
- Fwy = Freeway On-ramp Movement
- XX (YY) = AM (PM)
- = Critical Movement

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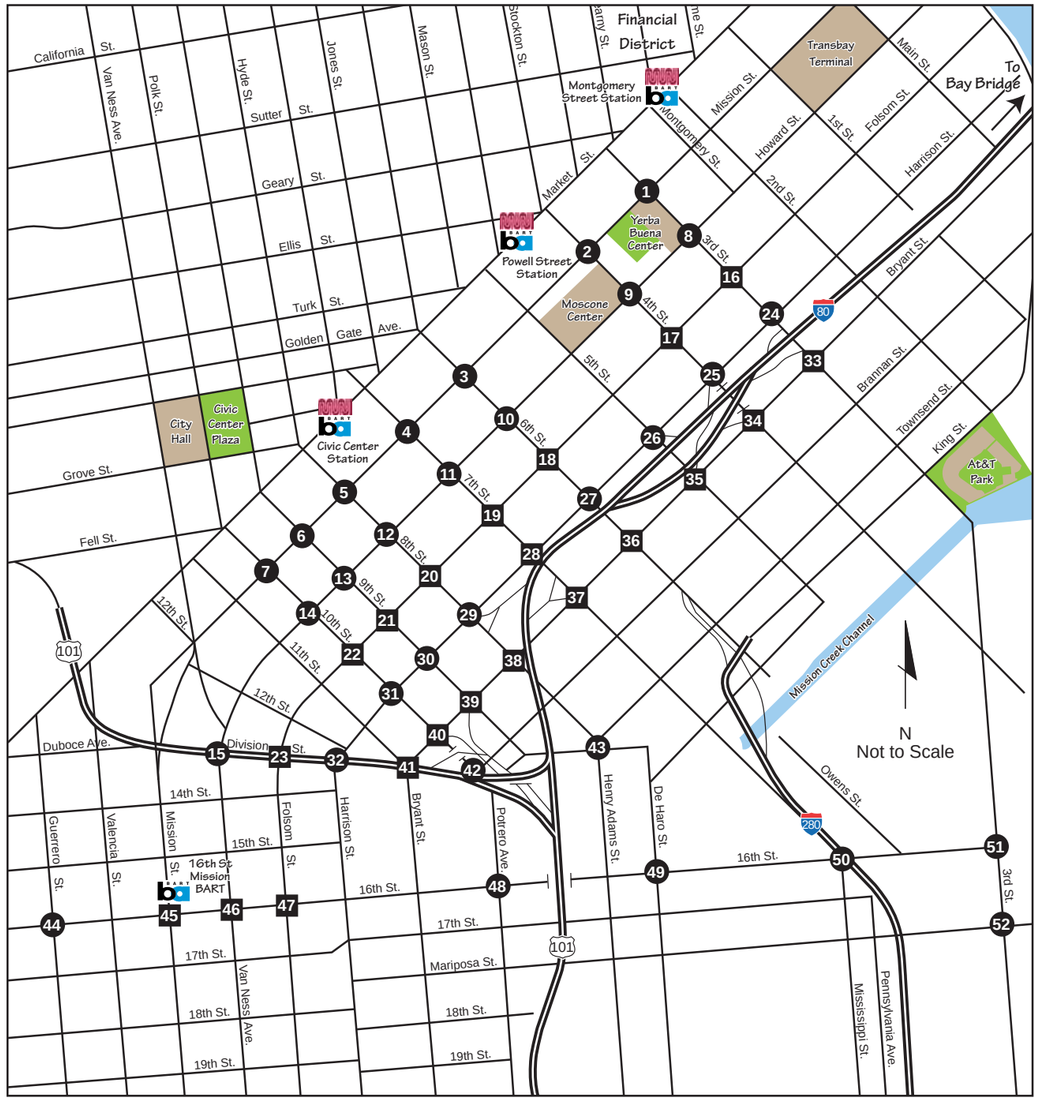
FUTURE YEAR (2035) PEAK HOUR TRAFFIC VOLUMES



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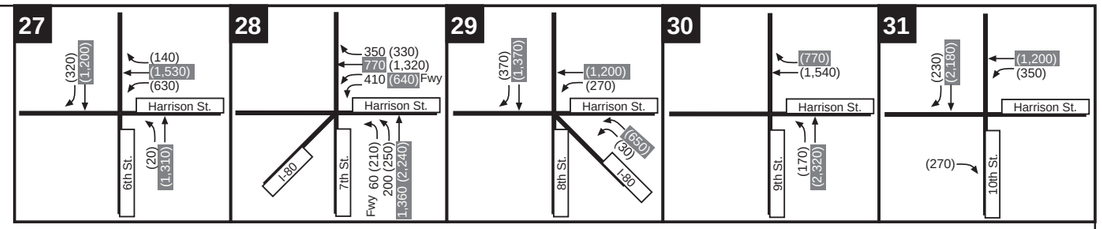

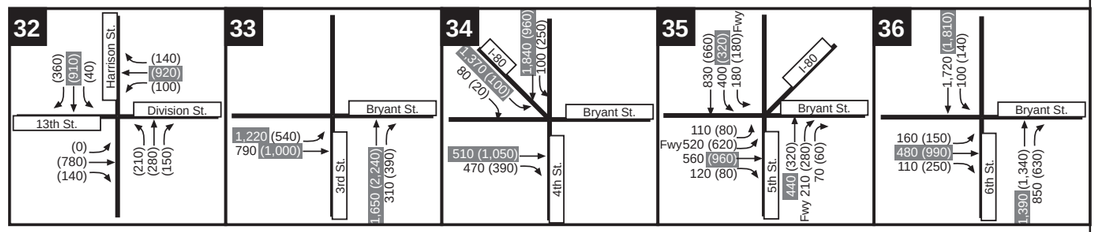

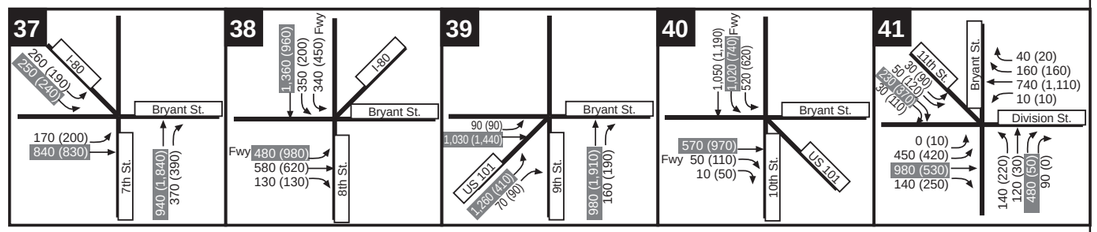

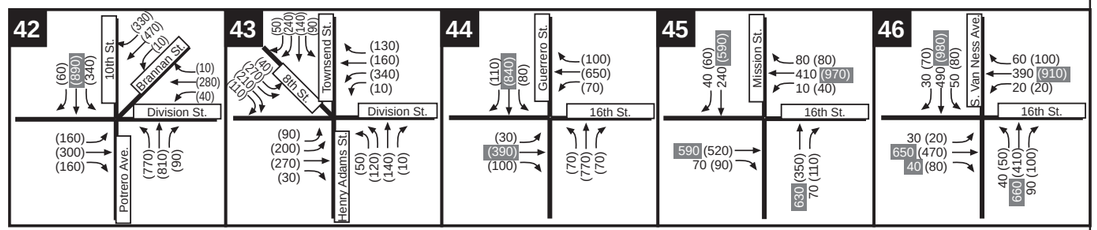

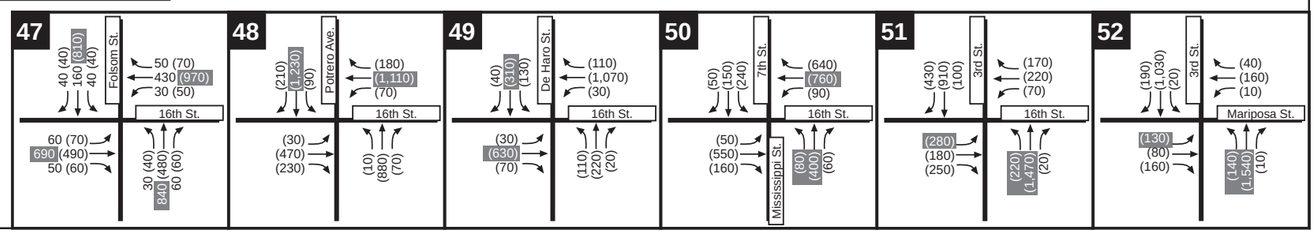

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FUTURE YEAR (2035) PEAK HOUR TRAFFIC VOLUMES

TABLE B-1

EXISTING AND FUTURE YEAR (2035) COMPARISON

Intersection[1]	Peak Hour	Existing		Future Year	
		Delay (V/C)[2]	LOS[3]	Delay (V/C)	LOS
1. Mission Street/3rd Street	PM	45	D	53	D
2. Mission Street/4th Street	PM	**60**	**E**	**>80 (1.17)**	**F**
3. Mission Street/6th Street	PM	24	C	36	D
4. Mission Street/7th Street	PM	25	C	34	C
5. Mission Street/8th Street	PM	27	C	43	D
6. Mission Street/9th Street	PM	25	C	53	D
7. Mission Street/10th Street	PM	25	C	35	C
8. Howard Street/3rd Street	PM	29	C	**75**	**E**
9. Howard Street/4th Street	PM	33	C	42	D
10. Howard Street/6th Street	PM	15	B	21	C
11. Howard Street/7th Street	PM	3	A	4	A
12. Howard Street/8th Street	PM	52	D	**>80 (0.86)**	**F**
13. Howard Street/9th Street	PM	30	C	**76**	**E**
14. Howard Street/10th Street	PM	25	C	29	C
15. Howard Street/13th Street/South Van Ness Avenue	PM	25	C	32	C
16. Folsom Street/3rd Street	AM	**63**	**E**	**>80 (1.43)**	**F**
	PM	**79**	**E**	**>80 (1.47)**	**F**
17. Folsom Street/4th Street	AM	41	D	**68**	**E**
	PM	36	D	**>80 (1.05)**	**F**
18. Folsom Street/6th Street	AM	13	B	33	C
	PM	11	B	19	B
19. Folsom Street//7th Street	AM	14	B	22	C
	PM	9	A	**58**	**E**
20. Folsom Street/8th Street	AM	9	A	14	B
	PM	4	A	5	A
21. Folsom Street/9th Street	AM	23	C	46	D
	PM	23	C	**63**	**E**
22. Folsom Street//10th Street	AM	19	B	30	C
	PM	14	B	15	B
23. Folsom Street//13th Street	AM	26	C	**72**	**E**
	PM	16	B	**>80 (2.42)**	**F**
24. Harrison Street/3rd Street	PM	37	D	**68**	**E**
25. Harrison Street/4th Street	PM	46	D	**>80 (1.24)**	**F**
26. Harrison Street/5th Street	PM	**>80**	**F**	**>80 (1.36)**	**F**
27. Harrison Street/6th Street	PM	20	C	28	C
28. Harrison Street/7th Street	AM	10	B	13	B
	PM	20	C	**76**	**E**

TABLE B-1

EXISTING AND FUTURE YEAR (2035) COMPARISON

Intersection[1]	Peak Hour	Existing		Future Year	
		Delay (V/C)[2]	LOS[3]	Delay (V/C)	LOS
29. Harrison Street/8th Street	PM	45	D	**>80 (1.0)**	**F**
30. Harrison Street/9th Street	PM	12	B	17	B
31. Harrison Street/10th Street	PM	13	B	15	B
32. Harrison Street/13th Street	PM	14	B	30	C
33. Bryant Street/3rd Street	AM	51	D	**65**	**E**
	PM	37	D	**>80 (0.94**	**F**
34. Bryant Street/4th Street	AM	**>80**	**F**	**>80 (1.34)**	**F**
	PM	25	C	**55**	**E**
35. Bryant Street/5th Street	AM	41	D	**>80 (1.99)**	**F**
	PM	**68**	**E**	**>80 (1.73)**	**F**
36. Bryant Street/6th Street	AM	11	B	20	C
	PM	11	B	18	B
37. Bryant Street/7th Street	AM	17	B	21	C
	PM	21	C	**>80 (0.96)**	**F**
38. Bryant Street/8th Street	AM	13	B	30	C
	PM	10	A	10	B
39. Bryant Street/9th Street	AM	23	C	33	C
	PM	38	D	**>80 (0.77)**	**F**
40. Bryant Street/10th Street	AM	10	A	11	B
	PM	16	B	18	B
41. Bryant Street/11th Street/Division Street	AM	**>80**	**F**	**>80 (1.59)**	**F**
	PM	**72**	**E**	**>80 (2.03)**	**F**
42. Brannan Street/10th Street/Division Street	PM	34	C	**>80 (1.14)**	**F**
43. Townsend Street/8th Street/Division Street/Henry Adams[4]	PM	**>50**	**F**	**>50**	**F**
44. Guerrero Street/16th Street	PM	15	B	28	C
45. Mission Street/16th Street	AM	16	B	28	C
	PM	10	A	14	B
46. South Van Ness Avenue/16th Street	AM	11	B	12	B
	PM	12	B	16	B
47. Folsom Street/16th Street	AM	12	B	13	B
	PM	14	B	18	B
48. Potrero Avenue/16th Street	PM	19	B	**>80 (1.15)**	**F**
49. De Haro Street/16th Street	PM	15	B	30	C
50. 7th Street//16th Street	PM	46	D	**>80 (1.00)**	**F**
51. 3rd Street/16th Street	PM	23	C	**>80 (1.00)**	**F**
52. 3rd Street/Mariposa Street	PM	24	C	**>80 (0.83)**	**F**

APPENDIX C

Preliminary Corridor Segment Screening Methodology

APPENDIX C. CORRIDOR SEGMENT SCREENING METHODOLOGY

To determine which street segments in the study area should be the focus of near-term corridor improvement projects, each eligible major transportation corridor in the study area was screened based on the following procedure:

1. Divide the major transportation corridors in the study area segments with consistent function and character.
2. Assess which corridor segments fall in high growth areas.
3. Score each segment based on need for bicycle, pedestrian, and transit improvements.
4. Assess outliers that may represent special challenges and opportunities.
5. Of the 'high growth,' 'high need', and 'outlier' corridor segments, identify opportunities for a near-term corridor improvement projects.
6. Assess capacity constraints and opportunities in the vehicle circulation network.

These steps are outlined in more detail below.

IDENTIFICATION OF MAJOR TRANSPORTATION CORRIDOR SEGMENTS

The project team considered for near-term corridor improvement projects only those streets that are part of one of the city's modal transportation networks as designated through existing policy. These networks are as follows, and are illustrated in Figure C-1:

- Vehicular Network (San Francisco General Plan)
- Truck Routes (SFMTA recommended Truck Routes)
- Bicycle Network (San Francisco Bicycle Plan)
- Transit Priority Streets (SFMTA Transit Effectiveness Project)

For the initial assessment of corridor needs by mode, the streets that belong to one or more of these networks were then divided into segments that have a cohesive character and function. To divide segments, the study team considered:

- *Modal priorities:* for example, some segments of a particular street have transit service, while others do not.
- *Directionality:* where street segments change directionality (for example, shift from one-way to two-way operations), the character of the street changes.
- *Consistency:* Where possible, segments of adjacent and parallel streets are divided at roughly the same point in order to maintain consistency across segments.

The outcome of this balance of priorities is as follows: In the South of Market area, most of the east-west streets (Mission through Brannan) are divided into three parts: a Transbay/Financial District segment from the Embarcadero to either Second or Third street, where the streets have mostly two-way operations; a short mid-Market segment where the streets shift to one-way operations (roughly between Third and Fifth streets); and a longer Western South of Market segment, stretching roughly from Fifth Street to Division Street. King Street, which is much shorter, has been assessed as a single segment. Outside of the South of Market area, most of the North-South streets are divided at 16th Street. Most of the east-west streets have been divided at Potrero Avenue. In Potrero Hill, the analysis considers the full length of any street that has transit service. Based on these designations, the major circulation corridor segments used in the initial needs analysis are listed in Figures C-1 and C-2.

Once the initial needs and growth analyses were completed (Steps 2 and 3), the extents of several corridors segments were further refined in Steps 4 and 5 to respond to specific needs and opportunities. The refined project extents, along with the reasons for refinement, are discussed in more detail below.

Figure C-1 South of Market Area Corridor Segments

Corridor	Segment
SOMA	
East-West	
Mission	Embarcadero - Third
	Third-Fifth
	Fifth - Eleventh
Howard	Embarcadero - Third
	Third-Fifth
	Fifth - Division
Folsom	Embarcadero - Second
	Second-Fifth
	Fifth - Eleventh
Harrison	Embarcadero - Second
	Second-Seventh
	Seventh - Division
Bryant	Embarcadero - Second
	Second-Seventh
	Seventh - Division
Brannan	Embarcadero - Second
	Second-Fifth
	Fifth - Division
Townsend	Embarcadero - Third
	Third-Fifth
	Fifth - Eighth
King	Emb - Fourth
North-South	
Second	N of Bryant
	S of Bryant
Third	N of Bryant
	S of Bryant
Fourth	N of Bryant
	S of Bryant
Fifth	N of Brann
	S of Brann
Sixth	N of Brann
	S of Brann
Seventh	N of Bryant
	S of Bryant
Eighth	N of Bryant
	S of Bryant
Ninth	All
Tenth	All
Eleventh	All

Figure C-2 Mission, Potrero Hill/Showplace Square, and Central Waterfront Corridor Segments

Corridor	Segment
Outside of SOMA	
East-West	
16th	West of Potrero
	East of Potrero
17th	West of Potrero
	East of Potrero
24th	All
26th	All
Cesar Chavez	West of Potrero
	East of Potrero
Division	All
18th	San Bruno to Third
North-South	
Third	King - 16th
	S of 16th
Fourth	King - 16th
	S of 16th
Illinois	N of Mariposa
	S of Marioposa
Guerrero	N of 16th
	S of 16th
Valencia	N of 16th
	S of 16th
Mission	N of 16th
	S of 16th
S Van Ness	N of 16th
	S of 16th
Folsom	N of 16th
	S of 16th
Harrison	N of 16th
	S of 16th
Potrero	N of 16th
	S of 16th
Connecticut	All
Wisconsin	All
De Haro	16th to 23rd
Rhode Island	16th to 25th

IDENTIFICATION OF CORRIDOR SEGMENTS LOCATED IN HIGH GROWTH AREAS

EN TRIPS aims to make transportation investments that address the needs resulting from projected growth in the study area as permitted under the recently adopted land use plans. To address this study goal, each corridor segment was ranked based on forecast growth in residential and employment density by 2035.[1] For each corridor segment, the mean increase in employment (jobs per square acre) and population (persons per square acre) was calculated for the areas adjacent to the corridor segment. The resulting values were then ranked and grouped by quartiles. The quartile scores for population and for employment growth were then added together, to give an overall growth score between 2 and 8.

Figure C-3 shows those segments in the South of Market area that had a growth score of at least six out of eight. This ranking shows that forecast growth in employment and population is widespread in the South of Market area. While the greatest increases in residential density will occur in the Transbay Terminal area, there will also be substantial growth in the western South of Market and around the Caltrain Station. This widespread growth suggests the need for a comprehensive approach to upgrading the area.

[1] Employment and residential densities are given for the base year 2005 and for the future year 2035 in the SF CHAMP travel demand model based on the ABAG 2009 projections. For this analysis, base year densities for each variable are subtracted from the 2035 projected density in each Transportation Analysis Zone (TAZ). Growth forecasts in the 16th and 17th Street corridors were updated at San Francisco Planning Department direction to reflect know pipeline development projects.

Figure C-3 High Growth Corridor Segments – South of Market Area

Corridor	Segment	Growth in Residential Density	Growth in Employment Density	Growth Sum
SOMA				
East-West				
Mission	Emb – Third	3	4	7
	Third-Fifth	3	4	7
	Fifth - Eleventh	4	4	8
Howard	Emb - Third	4	4	8
	Third-Fifth	3	4	7
	Fifth - Division	3	3	6
Folsom	Emb - Second	4	4	8
	Second-Fifth	3	4	7
Harrison	Emb - Second	4	3	7
Bryant	Emb - Second	3	3	6
	Second-Seventh	3	3	6
Brannan	Second-Fifth	4	3	7
Townsend	Emb - Third	3	3	6
	Third-Fifth	4	3	7
King	Emb - Fourth	4	2	6
North-South				
Second	N of Bryant	4	4	8
Third	N of Bryant	4	4	8
	S of Bryant	2	4	6
Fourth	N of Bryant	3	3	6
	S of Bryant	4	3	7
Fifth	S of Brann	4	2	6
Sixth	N of Brann	3	3	6
	S of Brann	4	2	6
Eighth	N of Bryant	4	2	6
Eleventh	All	3	3	6

Figure 2-6 lists high-growth segments outside of the South of Market area. Third Street and Fourth Streets make up a particularly high growth corridor, with large population increases expected in the Central Waterfront area, as well as substantial population and employment growth expected through the redevelopment of Mission Bay.

The 16th Street corridor east of Potrero Street will also see major growth. Substantial new residential density is expected at the Potrero Center site at the corner of 16th and Potrero, as well as new residential density between 16th and 17th in Potrero Hill, as much of this corridor now permits residential buildings of 4-6 floors. Notable new employment density is also forecast in Showplace Square. Finally, the growth expected through redevelopment of Mission Bay has major implications for 16th Street, as 16th is the only east-west arterial linking directly to Mission Bay.

Figure C-4 High Growth Corridor Segments - Mission, Potrero Hill/Showplace Square, and Central Waterfront

Corridor	Segment	Growth in Residential Density	Growth in Employment Density	Growth Sum
Outside of SOMA				
East-West				
16th	East of Potrero	2	4	7
North-South				
Third	King - 16th	4	4	8
Fourth	King - 16th	4	4	8
	S of 16th	2	4	6

Growth scores for all segments are provided in Figures C-7 and C-8.

Figure C-5 Growth Score by Eastern Neighborhoods Corridor Segment – South of Market

Corridor	Segment	Growth in Residential Density	Growth in Employment Density	Growth Sum
SOMA				
East-West				
Mission	Emb - Third	3	4	7
	Third-Fifth	3	4	7
	Fifth - Eleventh	4	4	8
Howard	Emb - Third	4	4	8
	Third-Fifth	3	4	7
	Fifth - Division	3	3	6
Folsom	Emb - Second	4	4	8
	Second-Fifth	3	4	7
	Fifth - Eleventh	3	2	5
Harrison	Emb - Second	4	3	7
	Second-Seventh	3	2	5
	Seventh - Division	4	1	5
Bryant	Emb - Second	3	3	6
	Second-Seventh	3	3	6
	Seventh - Division	2	1	3
Brannan	Emb - Second	1	3	4
	Second-Fifth	4	3	7
	Fifth - Division	3	2	5
Townsend	Emb - Third	3	3	6
	Third-Fifth	4	3	7
	Fifth - Eighth	3	2	5
King	Emb - Fourth	4	2	6
North-South				
Second	N of Bryant	4	4	8
	S of Bryant	2	3	5
Third	N of Bryant	4	4	8
	S of Bryant	2	4	6
Fourth	N of Bryant	3	3	6
	S of Bryant	4	3	7

Corridor	Segment	Growth in Residential Density	Growth in Employment Density	Growth Sum
Fifth	N of Brann	2	3	5
	S of Brann	4	2	6
Sixth	N of Brann	3	3	6
	S of Brann	4	2	6
Seventh	N of Bryant	3	2	5
	S of Bryant	3	1	4
Eighth	N of Bryant	4	2	6
	S of Bryant	2	2	4
Ninth	All	1	2	3
Tenth	All	3	2	5
Eleventh	All	3	3	6

Figure C-6 Growth Score by Eastern Neighborhoods Corridor Segment – Mission, Potrero Hill/Showplace Square, and Central Waterfront

Corridor	Segment	Growth in Residential Density	Growth in Employment Density	Growth Sum
Outside of SOMA				
East-West				
16th	West of Potrero	2	2	4
	East of Potrero	2	4	7
17th	West of Potrero	1	2	3
	East of Potrero	1	3	4
24th	All	1	2	3
26th	All	1	2	3
Cesar Chavez	West of Potrero	1	1	2
	East of Potrero	2	1	3
Division	All	2	2	4
18th	San Bruno to Third	1	3	4
North-South				
Third	King - 16th	4	4	8
	S of 16th	1	4	5
Fourth	King - 16th	4	4	8

	S of 16th	2	4	6
Illinois	N of Mariposa	1	4	5
	S of Mariposa	1	4	5
Guerrero	N of 16th	2	1	3
	S of 16th	1	1	2
Valencia	N of 16th	2	1	3
	S of 16th	2	1	3
Mission	N of 16th	2	1	3
	S of 16th	2	1	3
S Van Ness	N of 16th	2	1	3
	S of 16th	2	1	3
Folsom	N of 16th	1	1	2
	S of 16th	1	1	2
Harrison	N of 16th	1	1	2
	S of 16th	1	1	2
Potrero	N of 16th	1	1	2
	S of 16th	1	1	2
Connecticut	All	1	2	3
Wisconsin	All	2	2	4
De Haro	16th to 23rd	2	2	4
Rhode Island	16th to 25th	2	2	4

RATING BICYCLE, PEDESTRIAN, AND TRANSIT IMPROVEMENT NEEDS FOR EACH CORRIDOR SEGMENT

To allow for consistent screening of segments, the project team developed a set of transportation performance measures, which were used to rank the corridor segments and to identify high priority segments. These measures were grouped by mode of transportation, and included criteria related to need for bicycle, pedestrian, and transit improvements. While vehicle circulation need was not considered as a stand-alone category in this stage of the screening, several measures were included related to vehicles, including vehicle volume and vehicle delay.

Most of the quantitative data for this evaluation was drawn from the city's travel demand model, SF CHAMP 4.1 (ABAG projections 2009), which provided estimates of present vehicle and transit conditions, as well as forecasts for 2035. Detailed analysis of vehicle travel in the South of Market area and on 16th Street was performed by the EN TRIPS study team through the South of Market Circulation Study.

For each mode of transportation, four performance measures were chosen. Each measure was given a normalized "score" of 1-4, where a score of 4 represents the greatest need for

improvement and 1 represents the lowest need, compared with the other segments in the study area. The four normalized scores for each mode were then added together and normalized again by mode, and then added together to reach an overall multimodal need score. This technique makes it possible to equitably assess transportation need using a range of variables that are each measured differently. The performance criteria are:

Transit Score

- *Transit Priority Category*
  - *Highest Priority*. Highest Priority transit streets are those that have been designated as part of the TEP Rapid network. These segments were assigned a score of 4.
  - *High Priority*. High Priority Transit streets are those that are served by transit but not designated as part of the TEP rapid network. These segments were assigned a score of 2.
  - *Moderate priority*. These segments are not served by transit. They were assigned a score of 1.
- *Projected PM transit volume:* In this category, segments are ranked based on their projected PM period transit volume in 2035 as forecast using the SF CHAMP model. Segments are given a score from 1-4 based on the quartile they fall into in this rating.
- *Projected transit capacity constraint:* In this category, segments are ranked based on the maximum transit load during the PM period in 2035 as forecast by the SF CHAMP model. The maximum load is the share of transit vehicle capacity utilized on the busiest line. In some cases, the projected transit demand exceeds the available vehicle capacity. Segments are given a score from 1-4 based on the quartile they fall into in this rating.
- *Traffic delay:* Traffic delay can also delay transit vehicles. In this category, segments are ranked based on forecast traffic delay in 2035, based on the average approach delay for all intersections in the segment.[2] Traffic delay data is only available for those segments that were part of the South of Market circulation study – these segments were given a score from 1-4 based on the quartile they fall into in this rating. Segments outside the study area were given a placeholder score of 1.

Pedestrian Score

- *Pedestrian Priority Category*
  - *Highest Priority*. Highest Priority pedestrian streets are those that have neighborhood commercial zoning, downtown commercial zoning, or are important paths to rail transit stations.[3] These segments were assigned a score of 4.
  - *High Priority*. High Priority pedestrian streets are those that have residential zoning but do not meet the criteria listed above for highest priority. These segments were assigned a score of 2.

[2] The SOMA circulation study was completed for this study by Fehr and Peers using SF CHAMP model outputs updated using current traffic counts for designated intersections. More information on this analysis is available in the EN TRIPS Existing and Future Conditions Reports.

[3] Streets segments marked as important paths to rail transit include: Market Street; Third Street; Fourth Street in SOMA; Townsend Street; Eighth Street North of Folsom; Second Street North of Folsom; 16th, 24th, and Mission Street in the Mission District, and 22nd Street.

  - *Moderate Priority*. Segments that do not meet the criteria for Highest or High Priority are assigned a score of 1.

- *Pedestrian injury collisions 2004 – 2008*. In this category, segments are ranked based on the number of pedestrian injury collisions that occurred at or near intersections along the segment between 2004 and 2008, divided by the length of the segment in miles, to arrive at a number of collisions per mile. The data source is the San Francisco Department of Public Health's pedestrian collision data set. Segments are given a score from 1-4 based on the quartile they fall into in this rating.
- *Projected residential density of adjacent areas*. Areas with high residential densities are likely to have high pedestrian volumes. In this category, segments are ranked according to the average of the 2035 residential densities of the adjacent transportation analysis zones. The data source is ABAG Projections 2009.
- *Existing pedestrian facilities below standard*. This category represents a count of deficient pedestrian facilities in the segment. Segments that include none of these deficiencies were given a score of 1. The presence of any of these conditions anywhere on the segment raised the score by 1, with a maximum score of 4. Pedestrian facilities observed include the following:
  - *Sidewalk width*. The Better Streets Plan and the Downtown Plan designate a minimum sidewalk width for each of several types of streets. When the sidewalk width on a segment does not meet this standard, this is noted as a deficiency.
  - *Closed crosswalks and multiple turn lanes*. Crosswalks should be marked and useable by pedestrians in all legs of an intersection. When all legs of an intersection do not have open, marked crosswalks, this condition is noted as a deficiency. Multiple vehicle turn lanes can present a challenge to the safety and comfort of pedestrians. When multiple turn lanes are present in any intersection along the segment, this condition is noted as a deficiency.
  - *Block length*. The Better Streets Plan sets a standard of 500 feet between street crossings for pedestrians. Blocks longer than this that lack mid-block crossings can present a challenge to safe and comfortable pedestrian travel. If a segment has blocks longer than 500 feet without crossings, this condition is noted as a deficiency.

Bicycle Score

- *Bicycle Priority Category*
  - *Highest Priority*. Highest Priority bicycle streets are those that have or will have bicycle lanes or paths as specified in the San Francisco Bicycle Plan. These segments were assigned a score of 4.
  - *High Priority*. High Priority bicycle streets are those that are designated as bicycle routes in the San Francisco Bicycle Plan. These segments were assigned a score of 2.
  - *Moderate Priority*. High Priority bicycle streets are those that are not specified as bicycle lanes or routes in the San Francisco Bicycle Plan. These segments were assigned a score of 1.
- *Bicycle collisions 2004 – 2008:* In this category, segments are ranked based on the number of reported bicycle collisions that occurred along the segment between 2004 and 2008, divided by the length of the segment in miles, to arrive at a number of collisions per mile. The data source is the SFMTA's bicycle collisions dataset. Segments are given a score from 1-4 based on the quartile they fall into in this rating.

- *Completeness of bicycle facilities*. Some corridor segments have been designated for a bicycle path or route in the San Francisco Bicycle Plan, but the specified improvements have not yet been implemented. These corridors are high priority for improvement. If a segment is planned for a bike path that has not yet been completed, it is assigned a score of 4 in this category. If a segment is planned for a bike route that has not yet been marked, it is assigned a score of 2 in this category. All other segments are assigned a score of 1.
- *Projected PM vehicle volume:* High vehicles volumes can present an obstacle for cyclists both in terms of the risk of collisions, and the perception of safety. In this category, segments are ranked based on the projected PM period vehicle volumes 2035. For segments in the South of Market circulation study area, the vehicle volumes are based upon current counts and analysis using Synchro software. For all other segments, values are based on the projected volume at the midpoint of the segment from the SF CHAMP travel demand model. Segments are given a score from 1-4 based on the quartile they fall into in this rating.

High Priority Segments

Using the evaluation method described above, transit, pedestrian, and bicycle need scores were assigned for each corridor segment. The scores are summarized in Figure C-7. For this analysis, segments with multimodal scores in the top quartile were considered “high need.”

This ranking of multimodal needs was assessed alongside other important considerations discussed elsewhere in this analysis, such as expected growth in residential and employment density, and opportunities related to other ongoing plans and projects.

Figure C-7 Modal Need Score for Eastern Neighborhoods 'High Multimodal Need' Segments

Corridor	Segment	Ped Sum	Bike Sum	Transit Sum	Bike, Ped Transit Sum
SOMA					
East-West					
Mission	Third-Fifth	12	8	15	35
Folsom	Second-Fifth	14	11	8	33
	Fifth - Eleventh	15	11	6	32
Townsend	Third-Fifth	13	11	10	34
	Fifth - Eighth	9	12	11	32
North-South					
Second	N of Bryant	13	14	6	33
Third	N of Bryant	14	9	13	36
Fourth	N of Bryant	15	8	10	33
Fifth	N of Brann	13	16	7	36
Sixth	N of Brann	15	10	7	32
Seventh	N of Bryant	14	10	12	36
Eighth	N of Bryant	12	12	8	32
Outside of SOMA					
East-West					
16th	West of Potrero	12	10	13	35
Division	All	6	15	11	32
North-South					
Mission	N of 16th	13	10	13	36
	S of 16th	13	6	13	32

There are widespread needs in the South of Market area. Among the east-west arterials, the segment of Mission Street between 3rd and 5th Streets stands out with high needs for pedestrians and transit riders. The full length of Folsom Street has high needs both for pedestrians and cyclists. Townsend, which is currently an unaccepted street, lacks adequate facilities and has high needs for pedestrians, cyclists, and transit. Nearly all of the north-south SOMA arterials have have a high degree of need for improvement north of the freeway. Most of these streets have narrow sidewalks and limited amenities for pedestrians, as well as high volumes of fast-moving traffic. Second and Fifth Streets are designated bicycle routes, but lanes have not yet been striped. Transit needs stand out on Seventh and Third Streets.

The range of needs on a large number of South of Market arterials, combined with widespread growth in population and employment density in this area, suggest the need for a comprehensive approach to upgrading multimodal facilities in this area. EN TRIPS will respond by recommending improvements to a representative east-west corridor and a representative north-south corridor in SOMA as a first step toward comprehensive upgrades for the SOMA as a whole.

Outside of the South of Market, Division Street stands out with high needs for cyclists and pedestrians. Mission Street in the Mission District has high needs for both for transit and pedestrians. Finally, Sixteenth Street has major needs across all modes. While the segment of 16th Street west of Potrero Avenue segment scores highly in this analysis due to existing high volumes of pedestrian activity, the entire corridor has needs for vehicle, pedestrian, and bicycle travel. More detail on the specific modal needs of each 'high need' segment is provided in the Step 4 section of this memo. The scores for all segments are summarized in Figures 5 and 6 below.

ASSESSMENT OF OUTLIER SEGMENTS

The first three steps of this analysis prioritized streets that have major needs across multiple modes. In Step 4, we gave special attention to those street segments that stand out because they have a particularly urgent need in just one performance measure.

Pedestrian and Bicycle Collisions

Streets in the South of Market area present a number of major challenges for pedestrians. Figures C-8 and C-9 illustrate pedestrian and bicycle collisions on South of Market street segments. These figures show that, with their high volumes of fast-moving traffic, wide rights-of-way, long blocks, and numerous intersections with alleyways, the north-south numbered streets in the South of Market have high rates of pedestrian injury collisions. The north-of-the-freeway segments of these streets, with much higher pedestrian volumes, have far more collisions than the southern segments. Of this group, however, Sixth Street stands out with by far the highest number of pedestrian collisions (97 pedestrian collisions per mile). The next highest street segment is Ninth Street, with 56 collisions per mile.

In addition to the challenges faced on all north-south SOMA streets, Sixth Street may have a high rate of collisions because of the high speeds of traffic traveling to and from the Interstate 280 ramp, and because of the high volumes of pedestrians traveling to and from the single room occupancy hotels that line the northern part of the corridor. This condition suggests that Sixth Street is a particularly strong candidate for very near term pedestrian safety improvements through the ongoing activities of SFMTA's Liveable Streets program. As of October 2011, planning for these improvements is underway.

Transit Service and Capacity

In the multimodal need assessments outlined above, transit capacity utilization is scored by quartile. However, as discussed in the EN TRIPS future conditions report, several Muni routes in the study area are projected to have ridership demands that far exceed the available transit vehicle capacity during the PM peak period.

As illustrated in Figure C-10, the routes with PM peak period loads projected to be in excess of 1.25 (125% of capacity) are: the T-Third (both on the surface in Mission Bay and in the Central Subway); the 47 Van Ness Mission (on the northern Mission District segment of Mission Street);

the 9 San Bruno (in the northern segment of Potrero Avenue); and the 22 Fillmore (in the Mission District segment of 16th Street).

Of these streets with transit capacity constraints, 16th Street and Mission Street are also identified as 'high need' corridors in the multimodal screening. Sixteenth Street transit capacity constraints are particularly notable from the perspective of EN TRIPS because of the vital role that the 22 Fillmore plays providing transit service to link high growth areas in the Mission, Potrero Hill, Showplace Square, and Mission Bay.

Figure C-8 Pedestrian and Bicycle Collisions on South of Market North-South Streets (2004 – 2008)

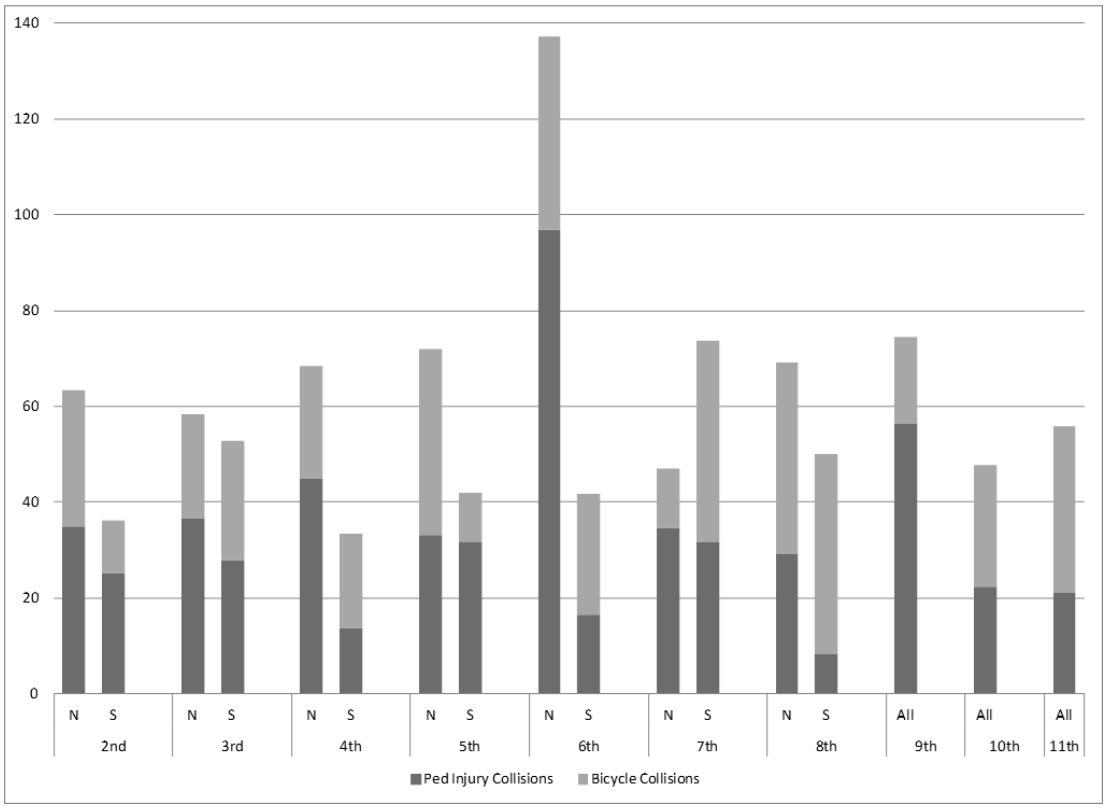
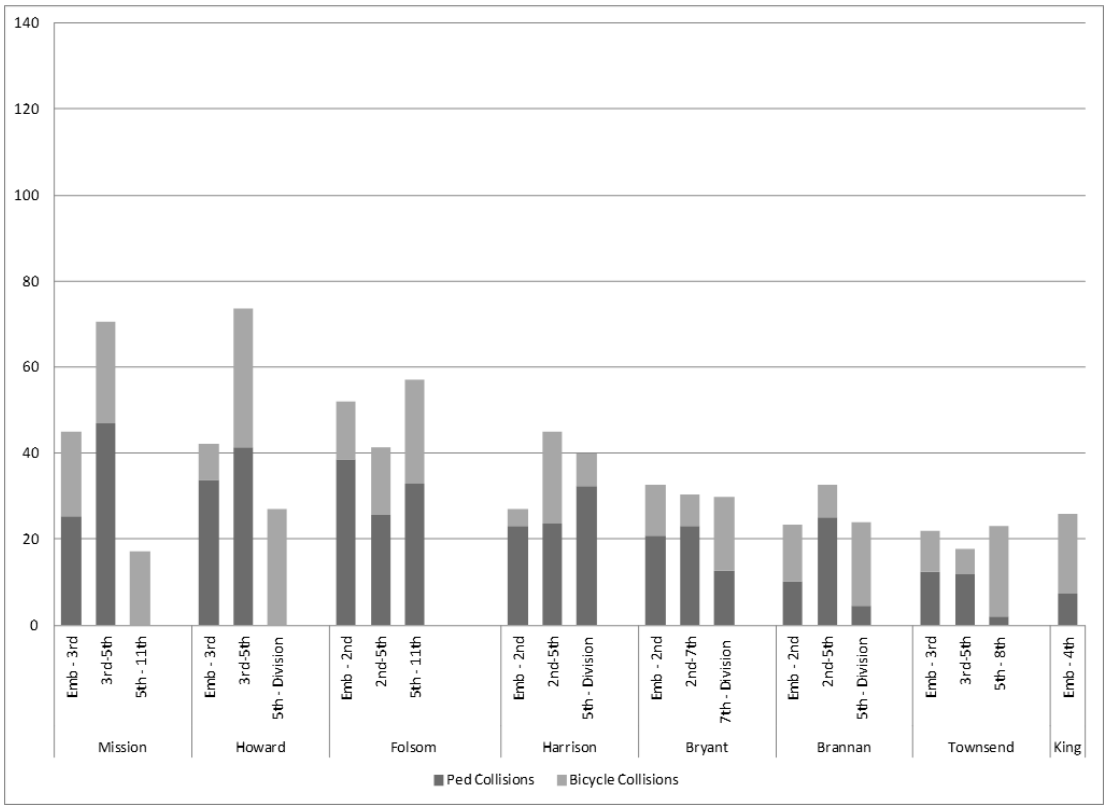


Figure C-9 Pedestrian and Bicycle Collisions on South of Market East-West Streets (2004 – 2008)



IDENTIFICATION OF CAPACITY CONSTRAINTS AND OPPORTUNITIES IN THE VEHICLE CIRCULATION NETWORK

Building on the screening process described above, in Step 6 we assessed the vehicle circulation network in the South of Market area. Based on a comparison of 2035 forecast vehicle volumes and roadway capacity, this assessment identifies street segments forecast to have vehicle demand in excess of available roadway capacity during peak travel periods, as well as segments that may have vehicle capacity than demand. Those segments with excess vehicle capacity may present particularly good opportunities to repurpose some space for use by other modes.

Volume over Capacity (V/C)

The analysis considered the relationship between vehicle volume (the peak hour vehicle demand in a particular direction), and capacity (the number of vehicles that can be accommodated by a particular approach or roadway based on a number of factors). Roadway capacity depends upon the number of travel lanes, signal timing, tow-away lanes, and other factors. A V/C of less than 1.0 represents an approach that is below capacity, a V/C of 1.0 represents “at-capacity” operations, and a V/C greater than 1.0 represents “breakdown”, i.e. stop-and-go operations.

The study team calculated V/C ratios for the forecast year (2035) for the majority of intersection approaches in the study area bounded by 3rd Street, Mission Street, 10th Street, and Bryant Street. The results are summarized in the tables below for north-south and east-west corridors.

Figure C-10 Forecast Volume/Capacity for North-South Corridors (2035)

V/C for North-South Corridors	10th (one-way)	9th (one-way)	8th (one-way)	7th (one-way)	6th (two-way)		4th (one-way)	3rd (one-way)
	SB	NB	SB	NB	NB	SB	SB	NB
Mission	0.96	1.09	1.09	0.86	0.93	1.04	0.81	0.94
Howard	0.88	1.21	1.33	0.87	0.72	0.82	0.95	1.19
Folsom	0.91	1.19	0.83	1.22	0.74	--	0.93	1.65
Harrison	0.72	0.95	1.32	1.27	0.72	1.06	1.11	0.98
Bryant	0.69	1.39	0.65	1.27	0.7	1.15	1.07	1.45

Tenth Street and northbound Sixth Street appear, on aggregate, to have the most roadway capacity available based on a comparison of V/C rations. On aggregate, Third Street appears to be the most oversubscribed north-south roadway in the study area.

Figure C-11 Forecast Volume/Capacity for North-South Corridors (2035)

V/C for East-West Corridors	Mission St (two-way)		Howard (one-way)	Folsom (one-way)	Harrison (one-way)	Bryant (one-way)
	EB	WB	WB	EB	WB	EB
10th	0.72	1.14	0.66	0.72	0.86	0.76
9th	0.99	0.98	0.51	0.82	0.77	0.78
8th	0.87	1.04	0.62	0.82	1.3	0.59
7th	1.23	0.85	0.79	0.7	0.69	0.8
6th	1.12	0.88	0.99	0.95	0.92	0.64
4th	1.05	1.65	0.97	1.24	--	--
3rd	1.47	1.03	1.15	1.41	1.31	0.55

As shown in the Figure C-10, all of the study roadways in the vicinity of Third and Fourth Streets are forecast to be either at or above capacity. Howard Street, Folsom Street, and Bryant Street appear to have excess capacity. Additionally, intersections that included freeway on- or off-ramps generally appear to have higher V/C ratios.

Screenline Comparisons

The study team also performed 'screenline' analysis to determine where excess vehicle capacity may exist in the South of Market vehicle network as a whole in the forecast year. A screenline is a predetermined boundary that can be used to group several segments together for the purposes of determining aggregate volume/capacity for several streets at once.

Screenline locations were selected to capture vehicle demand entering, exiting, and midway through the study area. For the north-south corridors, screenlines on Mission Street and Harrison Street, both from Tenth Street to Sixth Street, respectively and Harrison Street from Third Street to Fourth Street were selected. For the east-west Corridors, Third Street, Sixth Street, and Ninth

Street, all between Mission Street and Bryant Street, respectively were selected. Tables summarizing the development of the screenline v/c aggregation are shown below for both the North-South and East- West corridors and further summarized graphically in Figures 16 and 17.

It is important to note that, although screenline analysis is useful for assessing a general aggregate V/C ratio for a certain segment, there can be considerable variation in the independent V/C approaches that comprise the aggregate. For example the eastbound Mission Street screenline is 0.98, but its component v/c ratios from Mission Street, Folsom Street, and Bryant Street are 1.47, 1.41, and 0.55, respectively.

Further, it is important to note that this analysis represents a dynamic, rather than static condition. Drivers make decisions about which route to take through the street network based on traffic conditions, among other factors. If street configuration and/or traffic conditions change on any one street, drivers may respond to this change with changes to their choice of route.

SUMMARY OF CAPACITY ANALYSIS FINDINGS

This analysis finds that all the study roadways in the vicinity of Third and Fourth Streets are forecast to be either at or above capacity during the PM peak in 2035. Howard Street, Folsom Street, and Bryant Street appear to have excess capacity west of Fifth Street.

For the north-south SOMA arterials, the western SOMA street network appears to have some available capacity in the northbound direction at Harrison Street and at Mission Street screenlines. In the southbound travel direction, this portion of the street network is forecast to be above capacity at Mission Street, but just under capacity at Harrison Street. In the eastern SOMA area, the network is well above capacity in the southbound direction, but has capacity available in the northbound direction. This reflects the PM peak period commute pattern, with drivers traveling towards the freeway.

For the east-west SOMA arterials, the network appears to have available capacity in both directions for screenlines in the western SOMA area. At the Third Street screenline, however, vehicle volumes are forecast to be well above capacity in the westbound direction.

These findings suggest that changes could be made to streets in several parts of the SOMA street network without major disruption to vehicle circulation. It is important to note that while forecasts of traffic conditions are one important factor in choosing corridor improvement projects, a forecast that vehicle volumes may exceed available capacity does not necessarily rule out a corridor improvement project for that street segment.

Figure C-12 Forecast Volume/Capacity for South of Market Screenlines

Screenline	Cross-Street	Segment V/C	Aggregate V/C	Segment V/C	Aggregate V/C
SOMA					
East-West		EB		WB	
3rd	Mission	1.47	0.98	1.03	1.19
	Howard	--		1.15	
	Folsom	1.41		--	
	Harrison	--		1.31	
	Bryant	0.55		--	
6th	Mission	1.12	0.84	0.88	0.94
	Howard	--		0.99	
	Folsom	0.95		--	
	Harrison	--		0.92	
	Bryant	0.64		--	
9th	Mission	0.99	0.82	0.98	0.69
	Howard	--		0.51	
	Folsom	0.82		--	
	Harrison	--		0.77	
	Bryant	0.78		--	
North-South		NB		SB	
Mission	6th	0.93	0.98	1.04	1.02
	7th	0.86		--	
	8th	--		1.09	
	9th	1.09		--	
	10th	--		0.96	
Harrison	3rd	0.98	0.98	--	1.11
	4th	--		1.11	
Harrison	6th	0.72	0.98	1.06	0.93
	7th	1.27		--	
	8th	--		1.32	
	9th	0.95		--	
	10th	--		0.72	

EN TRIPS PRELIMINARY CORRIDOR SCREENING - INDICATORS OF NEED BY MODE

Mode/Category	Indicator	Unit	Data Source
Pedestrian	Pedestrian priority category	Category Based on Zoning	San Francisco zoning code
	Pedestrian injury collisions (2004 - 2008)	Quartile	DPH dataset
	2035 Projected residential density (adjacent TAZ's)	Quartile	ABAG Projections 2009
	Existing pedestrian facilities below standard (sidewalk width below BSP plan standard; closed crosswalks or multiple turn lanes; blocks >500 ft with no crossing.	Count of conditions present	Observation
Bicycle	Bicycle priority	Category based on SF Bicycle Plan	SF Bicycle Plan
	Bicycle collisions (2004 - 2008)	Quartile	SFMTA dataset
	Proposed bicycle facility incomplete	Category based on SF Bicycle Plan	SF Bicycle plan
	Projected PM vehicle volume (2035)	Quartile	SF CHAMP 4.1 and Fehr and Peers model
Transit	Transit priority category	Category based on SF TEP	SF TEP
	Projected PM transit volume	Quartile	SF CHAMP 4.1
	Transit capacity constraint	Quartile	SF CHAMP 4.1
	Traffic delay	Quartile	SF CHAMP 4.1 and Fehr and Peers model

EN TRIPS PRELIMINARY CORRIDOR SCREENING – MODAL PRIORITY CLASSIFICATIONS

Most of the corridors in the study area play important circulation roles for multiple modes of transportation. In order to properly consider the demands on each street segment, we have assigned to each a priority level for each mode.

In addition to motor vehicle, transit, pedestrian, and bicycle through travel, many of these streets also play important roles as living environments and public gathering places for residents, workers, and visitors the Eastern Neighborhoods.

Modal priority classifications are as follows:

Mode	Highest Priority	High Priority	Moderate Priority
Motor Vehicle	▪ General Plan Major Arterial	▪ General Plan Secondary Arterial	▪ All other streets
Transit	▪ TEP Rapid Network	▪ Served by transit	▪ All other streets
Freight	▪ General Plan Major or Secondary Arterial ▪ SFMTA Designated Freight Traffic Route ▪ Industrial Zoning (M1 or M2)	▪ Light Industrial Zoning (All PDR, SLR, SLI)	▪ All other streets
Bicycles	▪ Bicycle lane or path in the SF Bicycle Plan	▪ Bicycle Route in the SF Bicycle Plan	▪ All other streets
Pedestrian	▪ Neighborhood Commercial Zoning (All NC) ▪ Paths to Transit: Market Street; Third Street; Fourth Street in SOMA; Townsend Street; Eighth Street North of Folsom; Second Street North of Folsom; 16th, 2Fourth, and Mission Streets near Mission District BART stations, 2Second Street	▪ Residential Zoning (RH, RM, RC, RTO, RED) ▪ South of Market Alleys ▪ Mission Bay	▪ All Other Streets

EN TRIPS PRELIMINARY CORRIDOR SCREENING – DETAILED EVALUATION

Corridor	Segment	Ped Priority	Ped Injury Collisions	2035 Residential Density	Ped facilities below standard	Ped Sum		Bike Priority	Bike Collisions	Proposed Facility Incomplete	Vehicle volume	Bike Sum		Transit Priority Category	Transit Volume	PM Peak Transit Capacity Constrained (2035)	Traffic Delay	Transit Sum		Bike, Ped Transit Sum		Overall Ped-Bike-Transit Quartile
SOMA																						
East-West																						
Mission	Emb - Third	4	3	2	1	10		1	3	4	2	10		4	3	2	1	10		30		3
	Third-Fifth	4	4	1	3	12		1	3	1	3	8		4	4	3	4	15		35		4
	Fifth - Eleventh	4	1	4	2	11		1	2	1	3	7		4	4	2	2	12		30		3
Howard	Emb - Third	4	4	4	2	14		4	1	1	2	8		1	1	1	1	4		26		2
	Third-Fifth	4	4	2	3	13		4	4	1	4	13		1	1	1	1	4		30		3
	Fifth - Division	1	1	4	3	9		4	3	1	3	11		1	1	1	1	4		24		2
Folsom	Emb - Second	4	4	4	1	13		4	2	1	2	9		2	1	1	1	5		27		3
	Second-Fifth	4	3	4	3	14		4	2	1	4	11		2	1	1	4	8		33		4
	Fifth - Eleventh	4	4	3	4	15		4	3	1	3	11		2	2	1	1	6		32		4
Harrison	Emb - Second	1	3	4	2	10		1	1	1	3	6		1	1	1	1	4		20		1
	Second-Seventh	1	3	3	4	11		1	3	1	3	8		1	3	1	1	6		25		2
	Seventh - Division	1	3	3	4	11		1	1	1	3	6		1	1	1	1	4		21		1
Bryant	Emb - Second	2	2	3	1	8		1	2	1	1	5		1	1	1	1	4		17		1
	Second-Seventh	1	3	2	4	10		1	1	1	3	6		2	2	1	4	9		25		2
	Seventh - Division	1	2	1	4	8		1	2	1	3	7		1	1	1	2	5		20		1
Brannan	Emb - Second	2	2	3	2	9		1	2	1	1	5		1	1	1	1	4		18		1
	Second-Fifth	1	3	3	3	10		1	1	1	2	5		1	1	1	1	4		19		1
	Fifth - Division	1	1	1	4	7		1	3	1	2	7		1	1	1	1	4		18		1
Townsend	Emb - Third	4	2	2	3	11		4	2	4	2	12		2	3	2	1	8		31		3
	Third-Fifth	4	2	4	3	13		4	1	4	2	11		4	3	2	1	10		34		4
	Fifth - Eighth	4	1	1	3	9		4	3	4	1	12		4	3	3	1	11		32		4
King	Emb - Fourth	4	1	3	2	10		4	2	1	4	11		2	1	1	1	5		26		2
North-South														0								
Second	N of Bryant	4	4	3	2	13		4	4	4	2	14		2	2	1	1	6		33		4
	S of Bryant	1	3	2	2	8		4	2	4	2	12		2	2	2	1	7		27		3
Third	N of Bryant	4	4	3	3	14		1	3	1	4	9		4	3	3	3	13		36		4
	S of Bryant	4	3	2	4	13		1	3	1	4	9		4	2	2	1	9		31		3
Fourth	N of Bryant	4	4	3	4	15		1	3	1	3	8		4	3	1	2	10		33		4
	S of Bryant	4	2	4	4	14		1	3	1	3	8		4	2	1	1	8		30		3
Fifth	N of Brann	4	4	2	3	13		4	4	4	4	16		4	1	1	1	7		36		4
	S of Brann	1	3	4	3	11		4	2	4	2	12		1	1	1	1	4		27		3
Sixth	N of Brann	4	4	3	4	15		1	4	1	4	10		4	1	1	1	7		32		4
	S of Brann	1	2	2	4	9		1	3	1	1	6		1	1	1	1	4		19		1
Seventh	N of Bryant	2	4	4	4	14		4	2	1	3	10		4	2	3	3	12		36		4
	S of Bryant	1	3	2	3	9		4	4	1	3	12		2	2	2	1	7		28		3
Eighth	N of Bryant	1	3	4	4	12		4	4	1	3	12		4	2	1	1	8		32		4
	S of Bryant	1	1	1	3	6		4	4	1	2	11		1	2	1	1	5		22		2
Ninth	All	1	4	1	4	10		1	2	1	4	8		1	1	1	3	6		24		2
Tenth	All	1	2	2	4	9		4	3	1	4	12		1	1	1	1	4		25		2
Eleventh	All	1	2	2	3	8		4	4	1	2	11		4	4	3	1	12		31		3

Corridor	Segment	Ped Priority	Ped Injury Collisions	2035 Residential Density	Ped facilities below standard	Ped Sum		Bike Priority	5 Year Bike Collisions	Proposed Facility Incomplete	Vehicle volume	Bike Sum		Transit Priority Category	Transit Volume Ratio	PM Peak Transit Capacity Constrained (2035)	Traffic Delay	Transit Sum		Total		Overall Ped-Bike-Transit Quartile
Outside of SOMA																						
East-West																						
16th	West of Potrero	4	4	2	2	12		4	4	1	1	10		4	4	4	1	13		35		4
	East of Potrero	1	1	1	2	5		1	1	4	1	7		4	3	4	3	14		26		2
17th	West of Potrero	4	4	2	2	12		1	3	4	1	9		1	1	3	1	6		27		3
	East of Potrero	1	1	1	2	5		4	1	1	4	10		2	1	1	1	5		20		1
24th	All	4	3	3	1	11		1	3	1	3	8		2	3	4	1	10		29		3
26th	All	2	2	3	1	8		1	1	4	4	10		1	1	1	1	4		22		2
Cesar Chavez	West of Potrero	2	3	3	2	10		4	2	4	1	11		1	1	1	1	4		25		2
	East of Potrero	1	1	1	2	5		4	1	4	4	13		1	1	1	1	4		22		2
Division	All	1	2	1	2	6		4	3	4	4	15		4	3	3	1	11		32		4
18th	San Bruno to Third	2	1	1	1	5		1	1	4	1	7		2	1	1	1	5		17		1
North-South																						
Third	King - 16th	4	1	2	2	9		1	1	1	1	4		4	4	4	4	16		29		3
	S of 16th	4	1	1	1	7		1	1	1	1	4		4	4	3	4	15		26		2
Fourth	King - 16th	4	1	2	1	8		4	1	4	1	10		1	1	1	1	4		22		2
	S of 16th	4	1	1	2	8		1	1	1	4	7		1	1	1	1	4		19		1
Illinois	N of Mariposa	1	1	1	1	4		4	1	4	2	11		1	1	1	1	4		19		1
	S of Mariposa	4	1	1	2	8		4	1	4	1	10		1	1	1	1	4		22		2
Guerrero	N of 16th	2	3	4	2	11		1	4	1	1	7		1	1	1	1	4		22		2
	S of 16th	2	2	3	3	10		1	2	1	2	6		1	1	1	1	4		20		1
Valencia	N of 16th	4	3	4	1	12		4	4	1	2	11		2	1	2	1	6		29		3
	S of 16th	4	2	3	1	10		4	4	1	4	13		1	1	1	1	4		27		3
Mission	N of 16th	4	4	4	1	13		1	4	1	4	10		4	4	4	1	13		36		4
	S of 16th	4	4	4	1	13		1	3	1	1	6		4	4	4	1	13		32		4
S Van Ness	N of 16th	1	4	2	1	8		1	4	1	1	7		1	1	1	1	4		19		1
	S of 16th	2	3	4	1	10		1	2	1	2	6		1	1	1	1	4		20		1
Folsom	N of 16th	1	1	1	1	4		1	4	1	1	7		2	1	1	1	5		16		1
	S of 16th	2	2	3	1	8		1	1	1	4	7		2	1	1	1	5		20		1
Harrison	N of 16th	1	2	1	1	5		4	4	1	3	12		1	1	1	1	4		21		1
	S of 16th	2	1	3	1	7		4	2	1	1	8		1	1	1	1	4		19		1
Potrero	N of 16th	1	2	1	1	5		1	4	1	1	7		4	4	4	1	13		25		2
	S of 16th	2	2	2	1	7		1	2	1	1	5		4	4	4	1	13		25		2
Connecticut	All	2	1	1	2	6		1	1	1	1	4		2	1	2	1	6		16		1
Wisconsin	All	2	1	1	2	6		1	1	1	1	4		2	1	1	1	5		15		1
De Haro	16th to 23rd	2	1	1	1	5		1	1	1	1	4		2	1	2	1	6		15		1
Rhode Island	16th to 25th	2	1	1	1	5		1	1	1	1	4		2	1	1	1	5		14		1