FINAL SAR 98-2
STRATEGIC ANALYSIS REPORT on TRAFFIC IMPACTS in SOMA

Initiated by Commissioner Leno
Accepted by the Authority Board
on November 15, 1999

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I. INTRODUCTION

Purpose of Document

This report provides the SFCTA Board with a brief but comprehensive summary of transportation-related issues in the South of Market Area (SOMA). This Strategic Analysis Report, or SAR for short, highlights for the Board the significance of these issues in areas of SFCTA jurisdiction, and identifies implications for future policy decisions by the Board in its capacity as administrator of Proposition B (sales tax) funds and Congestion Management Agency for San Francisco. Every effort was made to make this a factual document, avoiding speculation, and leaving judgment to the reader. This document was designed to inform policy-level decision-making, and its abbreviated length (only 14 pages plus attachments) optimizes its usefulness to Authority Board members. Technical discussion has been condensed and only facts deemed essential to outline the policy-level issues are included. Additional information is available from the sources cited, or by calling Carmen C. Clark, Executive Director, at (415) 522-4802.

Executive Summary

South of Market (SOMA) is the most dynamic growth area in the City. Once a warehousing district, it is a geographic area larger than downtown, and it is called to play a number of distinct roles. It includes housing, industry, office buildings, retail areas, and major entertainment and cultural destinations. SOMA is also the gateway to the regional freeway system for a large portion of the City, including the Bay Bridge, I-80 (the West Approach), US 101 and I-280. It is also the location of the CalTrain Depot and the Transbay Terminal, which are served by regional transit operators from the North, South and East Bay. This means that as new land uses take hold, SOMA's streets must continue to act as a critical physical link to the regional transportation system, handling through traffic to and from the freeways as well as SOMA's own growing internal traffic and balancing regional connectivity, the economic vitality of the City and neighborhood livability concerns.

A number of significant transportation projects are either planned or already underway in SOMA, including the replacement of the West Approach to the Bay Bridge (estimated by CalTrans to be a 6-year project), the seismic retrofit of the Bayshore Viaduct (US 101), the Mid-Embarcadero Roadway, the Third Street Light Rail Line and Central Subway, the extension of CalTrain to Downtown and the replacement of the Transbay Terminal.

In order to succeed in meeting the challenge of absorbing growth and freeway construction impacts at the same time, the City must set out to answer three key questions. First, it must decide what it wants SOMA to look like in the future. No matter what scenario, there will be more people living and working in SOMA, and many more visiting the area. Many more trips will be made every day in and out of, and within SOMA. So, inevitably, there will be more congestion, more demands on the transit system, more pedestrians and cyclists on the streets, and more competition for parking. Depending on how the land use is structured, there may be opportunities to absorb significant numbers of trips by transit, walking and biking. Second, the City must decide what transportation conditions or standards it wants for SOMA: how much congestion on the streets, what levels of delay, how much crowding on transit vehicles, etc. Third, the City must put in place improvements to the transportation system to ensure that the desired standards can be met. The City must do all this while working around a large CalTrans construction site for the next six years.

During this period, the City faces several challenges and opportunities. From a transportation system performance perspective, the challenge will be to put in place interim solutions that help minimize construction impacts and keep the City moving and SOMA growing throughout the freeway reconstruction period. From a fiscal perspective, the challenge will be to find and put in place interim

and the Yerba Buena Center/Metreon; as the location of new housing throughout the area, and of residential enclaves like South Beach; and as the incubator of hi-tech and multimedia start-up firms in the area now known as Multimedia Gulch. While located outside of the study area designated for this report, the new UCSF campus and Mission Bay will also have impacts on the local SOMA transportation system and the regional transportation system, which is accessed through SOMA. The analysis of the transportation problems affecting SOMA, and the formulation of short and long-term responses, must recognize the need to support and balance all of these roles.

B. Previous Transportation Studies

Strategic Analysis Report on China Basin Ballpark
This section summarizes the findings of the Authority's China Basin Ballpark SAR. The City's Ballpark/Mission Bay Transportation Coordination Committee has subsequently developed a transportation mitigation plan that addresses many of the issues discussed below.

The ballpark SAR looked primarily at transit capacity, roadway capacity and parking issues related to the proposed ballpark. The analysis estimated system performance based on travel assumptions provided by the Giants. At the time of the SAR analysis, the Giants estimated about 73 weeknight and weekend games and 8 weekday games per year. Maximum capacity of the ballpark was estimated at 42,000.

The Giants assumed a conservative transit mode split of 14% to 20%, although they indicated that the ultimate goal was a 50% transit share. Based on the Giants' assumptions, the SAR estimated that additional passenger capacity ranging from 1,800 to 4,000 passengers would be needed on MUNI to meet demand for weeknight and weekend games, but noted that the additional vehicles required might be available from the existing MUNI fleet. However, this would not be the case for weekday games if they end later than 3 p.m., since they would overlap with the p.m. peak when all of MUNI's available service is deployed. Possible ways to respond to the capacity deficits include reducing service elsewhere in the MUNI system, acquiring additional vehicles, or allowing AC Transit and Golden Gate Transit to provide direct service to the ballpark.

Given the available information, the roadway capacity analysis was done at an order of magnitude level. The SAR concluded that there would be significant congestion in the area around the ballpark, and on city arterials leading to and from I-280 and I-80, probably for an hour before and after a game.

The Giants parking analysis estimated sufficient parking available for weekend and weeknight games, but also projected a 1,400-space deficit for the 8 weekday games each year. Clearly, addressing this issue will require an amount of creativity, because it doesn't make sense to size transportation facilities for an event that only takes place 8 days a year. The Giants did assume use of on-street, off-street, public and private parking for fans.

Some of the SAR's suggestions for more efficiently managing the ballpark travel demand included: aggressive marketing so that fans know they have travel options when they buy their ballgame tickets; charging for parking as an add-on to the price of admission as a disincentive to driving and as a potential source of revenues to subsidize transit services; striping transit preferential lanes on SOMA streets so that MUNI could run dependable service to and from the ballpark; and pedestrian improvements such as overcrossings and sidewalk widenings to handle the flood of pedestrian traffic after games.

Strategic Analysis Report on Multimedia Gulch
The Gulch SAR focused on two main issues: unmet transportation needs in the Multimedia Gulch and potential solutions, and the impact of transportation issues on multimedia business retention. The SAR noted that the Gulch is one of the most accessible areas of the City, well served by freeways and regional transit. However, traveling *within* the Gulch by transit can be difficult. North/south service in the area between 5th and 8th Streets is the most limited in the greater downtown area and there is a gap in east/west service between Bryant and 16th Streets. There also is no direct connection from the Mission District to the Caltrain Depot. The SAR pointed out that a number of MUNI improvements are planned or underway that will improve transit service in the Gulch such as the Third Street light rail line. The most important improvement in regional transit access to the Gulch is improving MUNI service between Gulch destinations and regional transit.

The SAR pointed out that alternatives to both transit and automobiles could fill some gaps in the transportation picture. Taxis could play a role in improving Gulch transportation options, particularly during the midday or evening when transit service is less frequent. The relative lack of transit service in some areas of the Gulch and parking and congestion problems make bicycle travel a comparatively attractive option. Furthermore, the Gulch is quite flat, making travel by bicycle relatively easy and fast compared to other parts of the City. Both cyclists and

In addition to the construction impacts associated with some of these projects, there will also be system performance benefits such as increases in capacity, efficiency and safety. These are accounted for in the travel demand analysis section.

The West Approach and Bayshore Viaduct Projects
There is not a formal traffic management plan (TMP) for the Bayshore Viaduct seismic retrofit project since Caltrans is able to do most of the work beneath the overhead freeway structure without disrupting the flow of traffic. The work has required the temporary removal of parking under the Bayshore Freeway (about 1500 spaces total, up to 500 spaces at a time), but most of that is expected to return after the seismic work is completed. All the Bayshore-related contracts are already under construction.

The West Approach, which is more of a replacement project than a retrofit, will have a San Francisco TMP to address impacts on city streets and a regional TMP to address impacts on the Bay Bridge/I-80 corridor. Caltrans has been meeting regularly with City staff to discuss the San Francisco TMP. Some key issues have already been resolved. For instance, Caltrans and the City, under the lead of DPT, have agreed on time windows for construction work, to minimize traffic disruptions during weekday peak traffic periods and minimize noise impacts on residents during nighttime hours. For these reasons, Caltrans intends to schedule construction-related closures in the vicinity of the bridge anchorage area on weekends only.

Caltrans has prepared draft plans for construction staging that provide a preliminary schedule for the sequence of construction, approximate time frames for each project phase and identification of local street, on/off-ramp and freeway lane closures. The preliminary schedule shows a six-stage project lasting approximately six years. Due to the complex nature of the project, which includes demolition and reconstruction of a significant portion of the West Approach, the plans include a number of arterial and ramp closures that will require some sort of mitigation in the TMP. Some of these closures include:

- Transbay Terminal bus on-ramp — closed 20 weekends over a period of six years.
- Essex Street on-ramp — closed 50 weekends and up to 18 months during Stage 5. The Essex Street traffic will be routed onto the Sterling Street on-ramp, which will be widened to provide an exclusive lane on the bridge.
- Harrison Street off-ramp — potentially closed for 4.5 years. A new Folsom Street off-ramp, temporarily striped with three lanes and including a new branch touching down at Folsom (known as the Folsom leg), will carry this traffic. The Folsom leg will be constructed during the first phase of the West Approach project.

The City and Caltrans are working together to develop detours, as appropriate, for all of these closures. While Caltrans is making an effort to minimize impacts on local streets, particularly during the weekday peak periods, it is clear that there will be impacts on local streets. For instance, some of the detours associated with ramp and street closures effectively reduce capacity on local streets, and while a widened Sterling Street on-ramp will facilitate better absorption of traffic detoured from the closed Essex Street on-ramp, there will still be less capacity than if both the Essex Street and Sterling Street on-ramps were open.

The complex nature of the West Approach project, involving demolition and construction of temporary and permanent structures, will require the temporary loss of approximately 4,000 spaces, all at once, for the duration of the project. While these spaces are all expected to be restored at the end of the project, the effect of their temporary loss is unknown. The City is considering ways to address this issue through the TMP process.

One way to provide a context for understanding the relative magnitude of this loss is to compare the 4,000 spaces to the number of currently available parking spaces in SOMA. Unfortunately, this number is not available at this time, but an estimate should be available after the Department of Parking and Traffic completes the SOMA parking study that is currently underway. In the meantime, we do know that there are approximately 125,000 parking spaces located in the northeast quadrant, which encompasses the area east of Van Ness Avenue and north of the Central Freeway and Townsend Street. This includes almost the entire South of Market Area as defined for this report (see Attachment 1) as well as downtown, Chinatown and Fisherman's Wharf. Although SOMA (approx. 1.9 sq. miles) represents about 50% of the area of the northeast quadrant (approx. 4 sq. miles), other factors such as the type and density of land use and the distribution of parking supply should be considered to get a more complete understanding of this parking issue.

The City is reviewing the construction staging information and providing comments to Caltrans on potential mitigation measures such as traffic and transit detour routes, traffic control officers to help direct traffic at key

depending on what data is available and at what level of reliability. Our entire analysis was performed for the p.m. peak hour, because we wanted to be certain that we could address the most challenging scenario. Key assumptions for our analysis process are highlighted in the sections that follow.

Development Projections

The demand analysis for year 2005 was based on an evaluation of development projects already in the approval pipeline, rather than on regionally modeled growth projections. The process and assumptions that went into the development of the land use inventory were discussed previously in Section III. A. under 'Private Sector Projects.' The one significant project in the SOMA study area that was not included in the demand analysis is the Giants Ballpark because the performance analysis focuses on the *typical* weekday p.m. peak period (4 to 6 p.m.), whereas the Giant's weekday games are scheduled to either end by 3 p.m. or begin at 7:30 p.m. Ballpark congestion will occur primarily for one hour preceding and following ballgames, and is outside the time window we are examining. Nevertheless, the potential overlap of ballpark events with peak periods is a concern, and it is being addressed by the City's Ballpark/Mission Bay Transportation Coordination Committee. In addition, coordination between the Ballpark and West Approach TMPs is recommended as one of the follow-ups to this study.

To put the demand projections resulting from this methodology into perspective, our consultant compared the land use calculations to ABAG's modeled projections for Year 2005. The comparison indicated that the actual development projects in the pipeline for the next five years far surpasses ABAG's projections, which are based on regional economic competition for new jobs and population. This being the case, and given that for the sake of the analysis we are assuming that 100% of the pipeline projects would actually materialize (which is never the case), we opted to not add a background growth factor.

Travel Demand Projections

Trip generation rates based on land use types were derived from the Planning Department's current transportation impact guidelines as were the percentage of trips coming into the area versus the percentage leaving the area. The transportation impact guidelines showed a roughly 50/50 split between work and non-work trips for daily trips. Since non-work trips are discretionary and more likely to be foregone during the congested peak period, we adjusted the split to 60% work trip vs. 40% non-work for the peak hour.

The *trip purpose* was taken from the MTC trip tables, which include work and non-work trips. Non-work trips combine shopping, social/recreational, and non-home-based trips.

Origin-destination figures came from the MTC model as well. Inside San Francisco, we grouped the origins into San Francisco's four superdistricts. Outside of San Francisco, we grouped the origins into South Bay (San Mateo and Santa Clara counties), East Bay (Alameda, Contra Costa and Solano counties) and North Bay (Marin, Sonoma and Napa counties).

Mode Splits

The current mode splits for both work and non-work trips to SOMA are based on year 2000 MTC Trip Tables. The tables are for all daily trips, not just for peak period trips. Therefore we adjusted them for peak period factoring.

Work trips — Transit, rideshare and auto trips were based on the MTC trip tables. Since the trip tables don't include bike or walk trips, we adjusted them to include a 3.7% bike mode split for work trips with San Francisco origins, based on a Binder research poll from 1997 provided by the San Francisco Bicycle Coalition. Since about half of the work trips are from inside San Francisco and half outside, the overall bike mode split for all work trips to San Francisco reduces to 2%. The mode split distribution (e.g. origin/destination information) for bicycle trips within San Francisco was based on the 1992 Citywide Travel Behavior Survey (CTBS). The walk mode split was based on the 92 CTBS for superdistrict 1 (e.g. the northeast quadrant, including SOMA).

Taxi trips are considered under different categories (e.g. transit, rideshare, other) depending on the source. For purposes of this SAR, we assumed that taxi trips were included under the rideshare mode.

Non-work trips — Transit, drive alone and rideshare mode splits were based on the MTC trip tables. The bike and walk mode splits were based on the 1990 MTC Travel Survey Working Paper #4, Table 5.3.

Forecast Mode Split Scenarios

In order to provide a context for SOMA travel demand projections, we developed two potential future mode split scenarios as policy objectives against which we evaluated transportation system capacity and performance. The scenarios were developed by first looking at existing travel and land use patterns in SOMA, both for the area as a whole and within the various subzones that we defined

2. Interpretation of Analysis Results

Demand Analysis *— New trips by land use & subzone*

The total *new* p.m. peak hour demand in South of Market created by the pipeline land use projects through year 2005 is projected to be 47,150 person trips, using all modes of transportation.

Figure 1
New Person Trips by Land Use

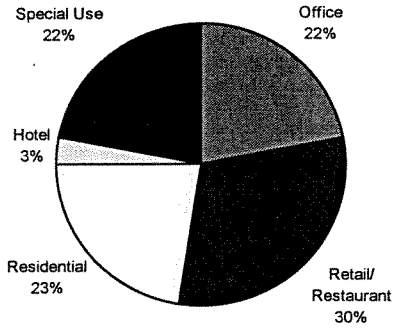
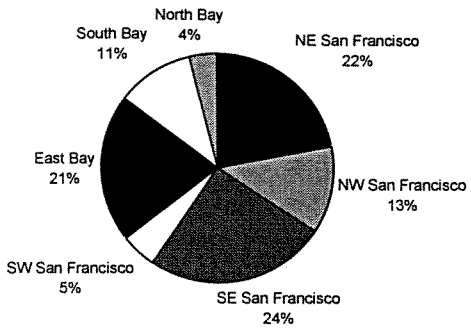


Figure 1 shows these total new trips in the SOMA study area by type of land use. The analysis indicates that there is a roughly even distribution of new development over the five-year time frame of office, retail, residential and special-use projects (such as entertainment, cultural, and convention facilities).

Attachment V shows that these new trip-generating developments will be concentrated in a few of the study subzones. For instance, subzone 2 is the C-3 downtown district on the south side of Market Street, encompassing the Transbay Terminal area. Not surprisingly, most of the new office growth will occur in this subzone, along with some retail and residential development. It is unlikely a coincidence that most of the new growth is located in subzones 1-4 (along Market Street in the downtown, The Embarcadero, and 4th/King Streets. area near the Caltrain Depot), which are the areas with the highest level of transit service and good connections to both local and regional transit. There is a smaller amount of new growth that is expected in the remaining subzones, in the vicinity of the freeways and the west-southwest parts of SOMA. These areas have relatively lower levels of transit service and consequently, a greater proportion of the new travel demand might be expected to be accommodated by automobiles versus transit, given the current transportation system.

Origin/Destination: Figure 2 summarizes the origins and destinations of these new trips affecting the SOMA landscape. As mentioned earlier, origins and destinations are assumed to remain the same as today and are based on MTC model assumptions. Figure 2 shows that over 60% will be destined for San Francisco locations (Note: destinations are shown since the analysis is based on the p.m. peak). The majority of the remainder of the new trips will be to and from the east bay (21%) and a significant portion will also originate in and be destined to the south bay (11%).

Figure 2
New PM Peak Hour Person Trips by Destination



Mode Split: The demand analysis indicates that under Scenario 1, about 13,000 new vehicle trips would be generated from this total demand, 7,000 of which would be from residents of San Francisco, and approximately 16,000 new transit trips using both local and regional carriers. Of those new vehicle and transit trips, about two-thirds are outbound from SOMA during the p.m. peak hour. Scenario 2, which sets higher goals for transit usage than does Scenario 1, results in about 11,500 vehicle trips from new development, 6,000 of which would be to and from San Francisco locations, and approximately 18,000 new transit trips. Not insignificantly, under both scenarios there is expected to be a large number of new walk trips in the SOMA study area, 5,500 or more during the p.m. peak period. And similarly, there will be a fairly significant number of new bicycle trips on South of Market streets, upwards of 1,150 under Scenario 2 assumptions.

New P.M. Peak Hour Trips by Mode[2]

	Scenario 1	Scenario 2
Vehicle trips (drive alone and rideshare)	13,000 (7,000 from SF)	11,500 (6,000 from SF)
Transit trips	16,000	18,000
Walk trips	5,500	6,000
Bike trips	750	1,150

[2] One vehicle trip may include more than 1 *person* trip, depending on the number of vehicle occupants. Transit, walk and bike trips are all *person* trips.

looking at the possible restructuring of its service within South of Market. There are also several transit projects underway, such as the F Market extension to Fisherman's Wharf and the F line connector (formerly known as the E line connector), that can help better connect the eastern side of SOMA to north of Market.

In order to achieve the transit mode splits forecast by either scenario used in the SAR analysis, the City will have to increase MUNI capacity and improve reliability. The capacity increases don't necessarily need to be achieved by adding new service. For example, reducing bunching, minimizing breakdowns, and ensuring that scheduled vehicles are put in service will all effectively increase capacity. As mentioned above, the replacement of MUNI's entire fleet is currently underway and should result in noticeably improved reliability. Other strategies that need to be considered include improved enforcement of transit-only lanes (perhaps electronically), striping of additional transit-only lanes, transit signal pre-emption and the expansion of MUNI's proof of payment.

Roadway Analysis

Similar to the transit analysis, the total vehicle usage created from new development through year 2005 was distributed to local roadways and the freeway system and analyzed for each of the two scenarios. As Attachment VIII shows, the results of the analysis indicate that the Bay Bridge and I-280 and their street-level connecting ramps will be most severely impacted by the added demand from growth in South of Market through year 2005.

A key finding of the SAR is that a critical factor in determining how many people will drive to SOMA from the east and south bay is the capacity of the freeway ramps. Congestion on the mainline freeway and on the on-ramps backs up traffic onto surface streets, causing gridlock at intersections, and restricting auto and transit mobility during the peak commute periods. For example, traffic control officers (TCOs) are needed at the intersection of First and Market Streets to keep cross-traffic from blocking transit traffic on Market Street because of backups on the Bridge and/or the 1st Street on-ramp. As more demands are placed on the Bay Bridge and freeways, p.m. peak back-ups onto SOMA streets could be exacerbated, resulting in potentially significant impacts on intersections that are key to maintaining a reliable flow of surface transit and traffic.

Key conclusions of this analysis are that given that the Bay Bridge and ramps are already operating at capacity (as evidenced by the regular back-ups of freeway-bound traffic on surface streets) and that the mainline's inability to absorb any substantial number of new trips results in surface street congestion, the projected increase of between 2,700 and 3,000 new p.m. peak hour trips in the Bay Bridge corridor would not realistically be accommodated. Many of those trips would need to shift to off-peak hours, shift to a transit travel mode, or be forgone. A similar situation can be expected with the I-280, though it is somewhat less constrained than the Bay Bridge. Nevertheless, between 3,000 and 3,500 trips to I-280 are expected to enter at the King Street on-ramp, drawing significant surface street traffic *through* SOMA and along the Embarcadero and threatening congestion at the ramps if the capacity on the freeway itself is surpassed.

In addition to the congestion caused by freeway related back-ups, congestion will increase on local SOMA streets as a result of increased demand associated with new developments. The two mode split scenarios used for the SAR analysis estimate between 11,500 and 13,000 new p.m. peak hour vehicle trips. For context, a single lane on an arterial like Folsom can handle between 750 and 900 cars per hour.

Although completion of The Embarcadero Roadway (early 2000) may provide some traffic relief to Main, Beale, Fremont and First Streets between Market and Harrison Streets, the SOMA transportation system won't be able to accommodate a significant number of increased vehicles trips during the p.m. peak, nor would it be consistent with current City policy to do so. The City's ability to sustain so many jobs in the downtown is directly dependent on the ability of transit to carry a significant portion of work trips. Any increase in p.m. peak vehicles would be competing with surface transit for limited roadway space, making transit less reliable, slower and a less viable commute option. Given this, the most appropriate roadway improvements might involve better enforcement (e.g. don't block the intersection, traffic control officers) and projects such as the integrated traffic management system which will help improve traffic and transit flow during special events. At the same time, transportation demand strategies could be used, such as encouraging employers to offer staggered work hours and telecommuting options to their employees.

Another finding is that p.m. peak hour crossings of Market Street will have major impacts at the intersections east of 6th Street. About 1,200 to 1,500 vehicles are expected to desire to cross Market at the four intersections between 6th and Montgomery, and 550 to 900 vehicles will use crossings at the five intersections further east to the foot of Market Street.

carry a significant portion of trips. Increasing vehicle trips would result in increased delays to surface transit, making it less reliable and a less viable alternative to travel by autos. Finally, any new parking lots or garages should be located so as to avoid congested spots and to minimize access conflicts with transit traffic.

In this context, the conclusions about future parking demand in SOMA are as follows: 1) After adding up the new spaces expected to be provided by new SOMA developments and subtracting existing spaces expected to be lost, there is an estimated net gain of about 3,000 spaces in SOMA. 2) Even after accounting for the net gain in parking spaces, there may be a need for 2,600 to 3,600 additional parking spaces in SOMA in the next 5 years to meet maximum weekday midday parking demand. 3) There are strong reasons to suggest that any additional new parking be located either south or under I-80/U.S. 101 versus north of the freeways. This would avoid adding increased automobile traffic on streets near the Market Street corridor that carry the highest volume of surface transit in the City, and help maintain access to the freeways from north of Market for existing vehicle volumes. On the other hand, south of the I-80/U.S. 101 there is relatively less auto congestion, lower levels of transit service and lower land use densities so it would be reasonable to expect that a relatively higher proportion of trips would happen by auto, which would benefit from the additional parking.

The decision to provide additional parking needs to be made in conjunction with consideration of ways to better manage parking supply and demand. This can be achieved by *travel demand management strategies* (e.g. offering real-time rideshare matching services, employer-based trip reduction programs), *by making alternatives to automobiles more attractive and viable as travel options* (e.g., designating rideshare parking near key destinations, providing bicycle lanes, rerouting transit service to serve new trip generators, enforcing transit lanes, etc.), and *by making more efficient use of the existing parking supply* (e.g. instituting valet parking or adjusting parking rates to encourage more frequent turnover.)

IV. CONCLUSIONS & RECOMMENDATIONS

A key finding of the SAR is that critical factors in determining how many people will actually drive to SOMA include the capacity of the freeway ramps (particularly for trips to and from the east and south bays), parking supply, parking demand and roadway capacity. As more demands are placed on the Bay Bridge and freeways, p.m. peak back-ups onto SOMA streets could be exacerbated, impacting motorists with both regional and San Francisco destinations, resulting in potentially significant impacts on intersections that are key to maintaining a reliable flow of surface transit, and potentially impacting transit service.

For the next 5 years, assuming that the current pace of development will hold up, this report concludes that:

1. Because of freeway and intersection capacity limitations, only a multimodal approach, relying heavily on transit service, will provide an adequate response to the transportation challenges in SOMA.
2. Congestion on the mainline freeway (US 101) and on the Bay Bridge is responsible for evening peak back-ups onto SOMA streets as traffic is prevented from leaving San Francisco, affecting the functioning of the local street network and the effectiveness of surface transit service. The additional trips in SOMA will exacerbate street network congestion in the vicinity of freeway on-ramps, and in the corridors leading directly to the on-ramps, in the p.m. peak.
3. What is known about the traffic management plans for CalTrans construction work in SOMA suggests that the Caltrans projects will further exacerbate the point made in 2) above, particularly through the closure of on-ramps in San Francisco for extended periods of time. Mitigating these impacts will likely necessitate extensive use of traffic control officers and careful and costly re-structuring and augmentation of transit service.
4. Given the significance of the expected impacts, the City should require that CalTrans demonstrate the adequacy of the traffic management plan and ensure mitigation funding availability to deal with the above issues in advance of proceeding with construction in the Fall of 2000, or modify the schedule to allow sufficient time for implementation of all necessary mitigation measures.
5. After accounting for the net gain of approximately 3,000 spaces as expected to be constructed as part of new developments, there may be a need for 2,600 to 3,600 additional parking spaces in SOMA in the next 5 years, which should be located under or south of I-80/US 101. These numbers are likely to be refined as a result of the Department of Parking and Traffic's parking study, which is currently underway.

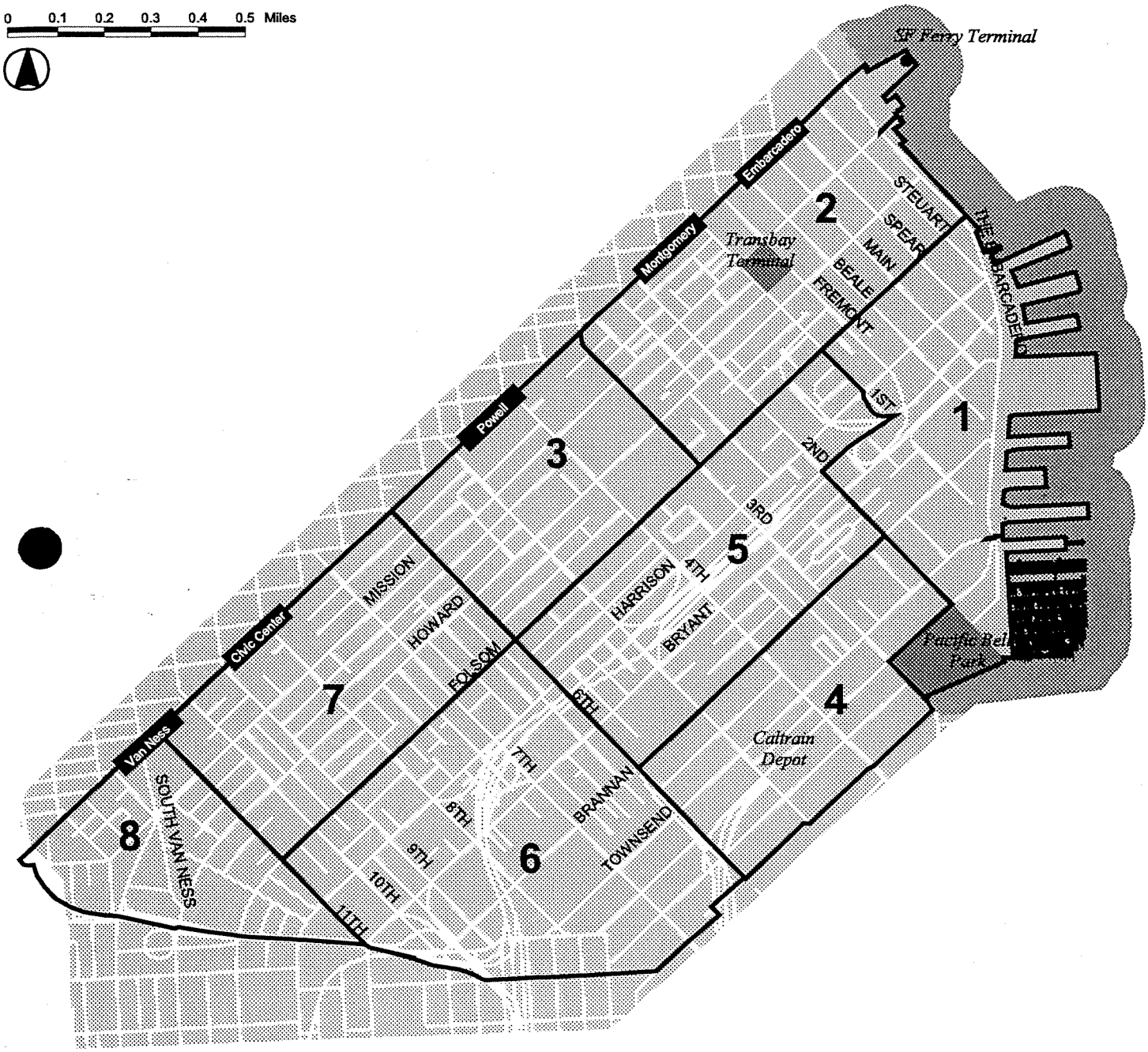
Suggested Follow-Ups

Below is a listing of potential follow-up actions, based on the SAR's findings:

- Muni should complete and implement its South of

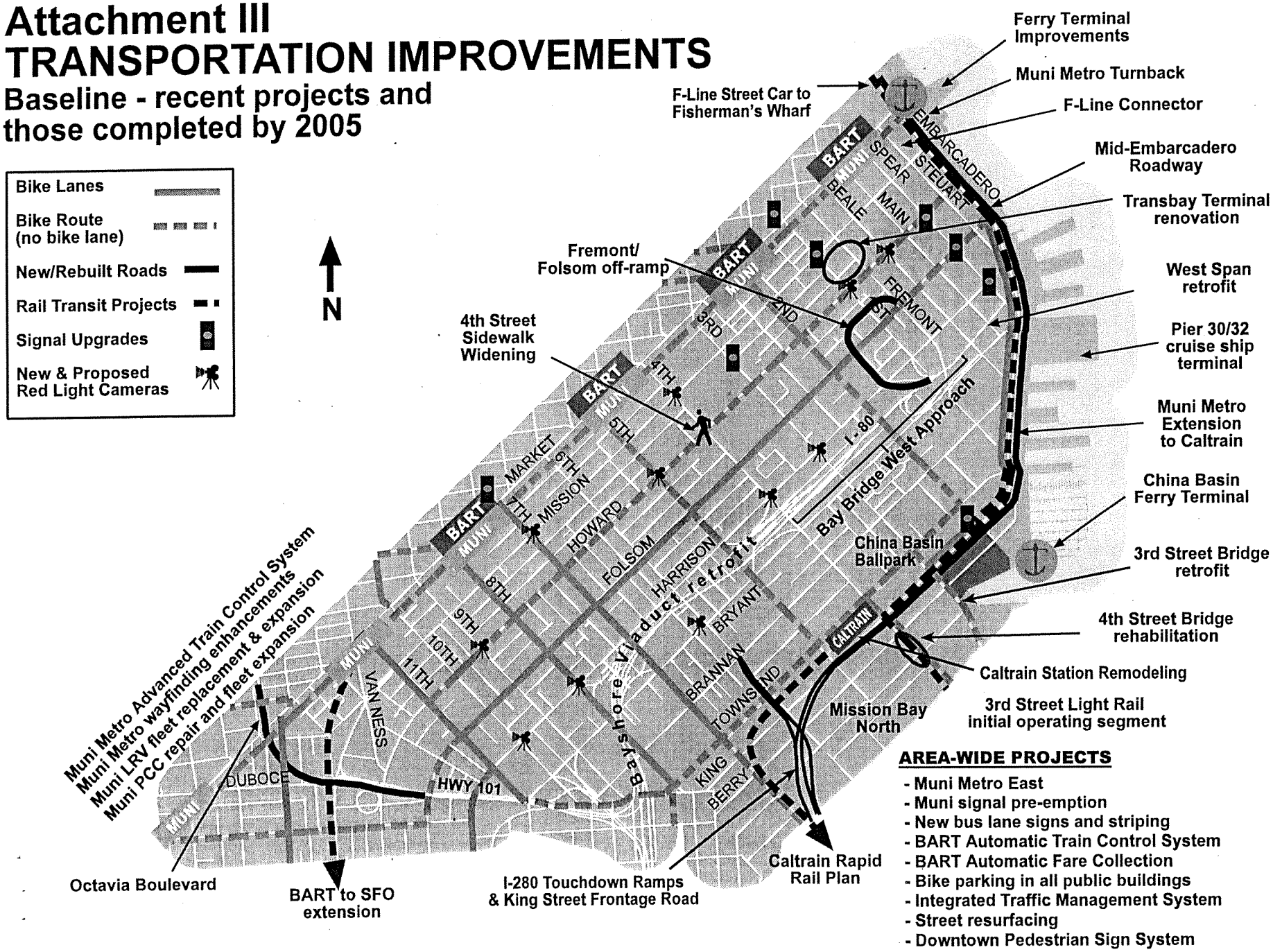
Attachment 1

Study Area Subzones



Source: SFCTA Transportation Analysis Database
Basemap: San Francisco Department of Public Works

Attachment III
TRANSPORTATION IMPROVEMENTS
Baseline - recent projects and those completed by 2005



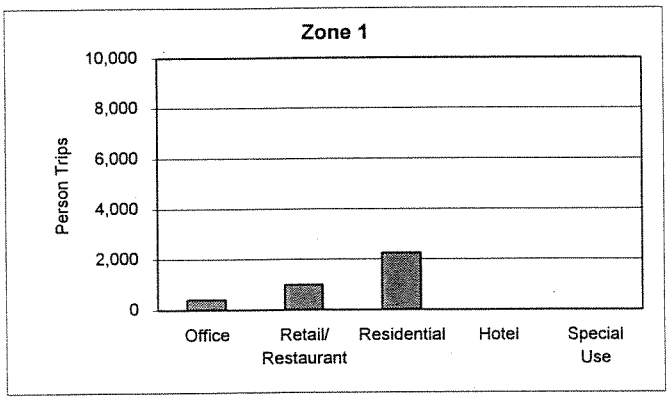
AREA-WIDE PROJECTS

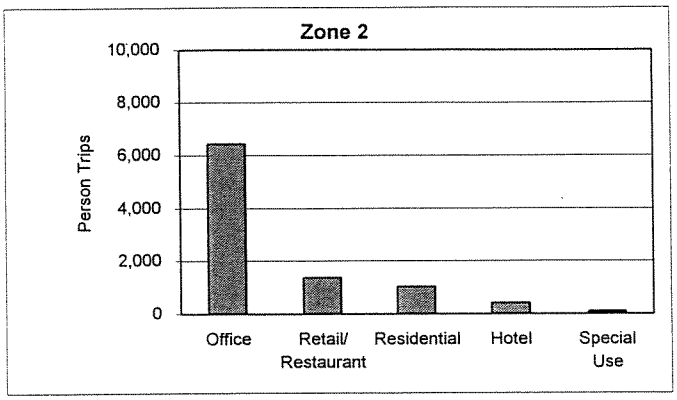
- Muni Metro East
- Muni signal pre-emption
- New bus lane signs and striping
- BART Automatic Train Control System
- BART Automatic Fare Collection
- Bike parking in all public buildings
- Integrated Traffic Management System
- Street resurfacing
- Downtown Pedestrian Sign System

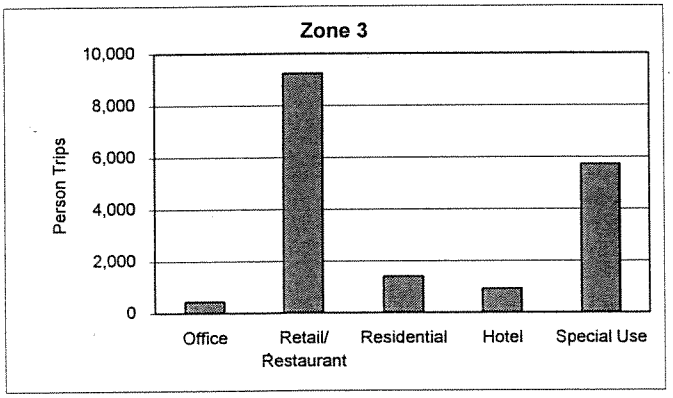
Attachment V

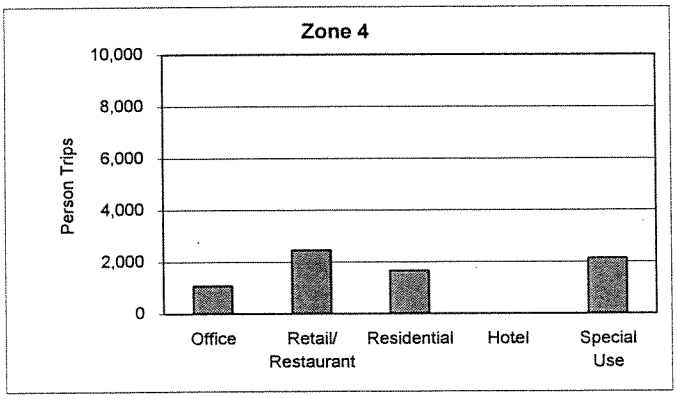
New PM Peak Hour Person Trips by Land Use - 2005

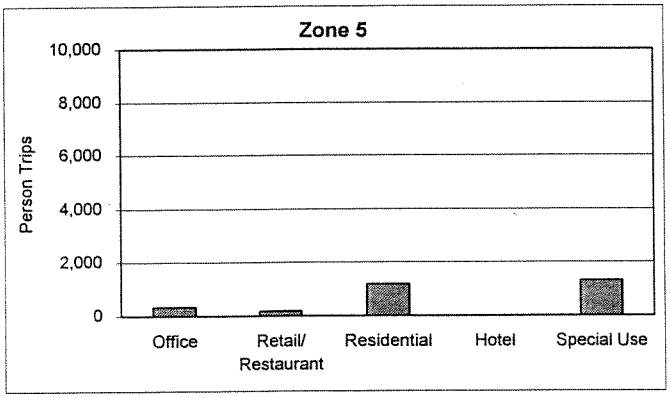
(see Attachment I for subzone locations)

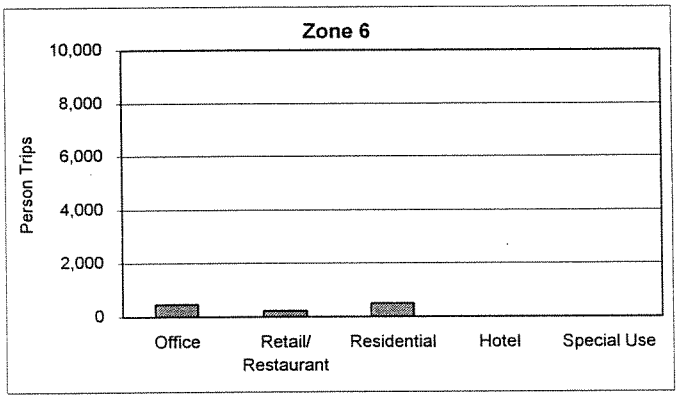


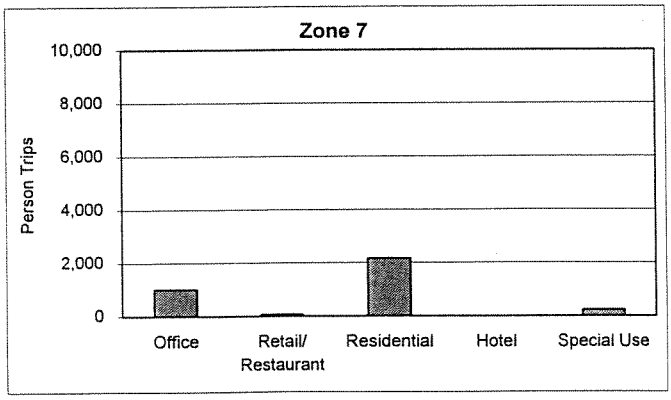


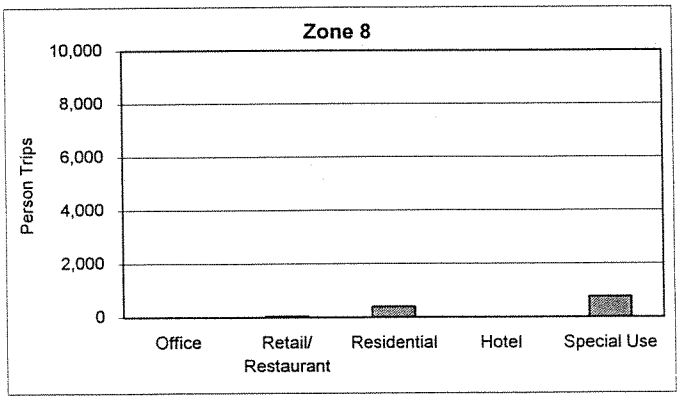












Attachment VII

Transit Screenline Analysis for pm peak hour

Screenline	Existing Ridership	Existing Capacity*	Estimated Unused Capacity*	Projected New Riders (outbound trips only) 2005		% Increase	
				Scenario 1	Scenario 2	Scenario 1	Scenario 2
Muni**							
Northeast SF***	4,016	6,838	2,822	2,188	2,481	54%	62%
Northwest SF	8,365	10,733	2,368	1,599	1,820	19%	22%
Southeast SF	4,746	5,654	908	2,331	2,693	49%	57%
Southwest SF	6,909	7,690	781	539	605	8%	9%
Muni Total	24,036	30,915	6,879	6,657	7,598	28%	32%
East Bay							
BART - E. Bay	21,560	26,600	5,040	1,373	1,504	6%	7%
AC Transit	2,766	5,050	2,284	1,373	1,504	50%	54%
Ferries	684	1,857	1,173	686	752	100%	110%
Peninsula							
BART - W. Bay	11,592	19,152	7,560	1,099	1,264	9%	11%
Caltrain	1,787	2,880	1,093	477	550	27%	31%
SamTrans	572	1,409	837	239	275	42%	48%
North Bay							
GGT Buses	3,155	4,620	1,465	261	295	8%	9%
GGT Ferries	716	3,150	2,434	261	295	36%	41%

* Capacity is based on frequency, policy load factors, and vehicle capacities as referenced in transit operators' Short Range Transit Plans and/or provided by transit operators.

** Screenline analysis does not match projected trips with specific routes, but rather indicates ridership and capacity at an order of magnitude level.

*** Northeast SF projected new riders figures include transfers via Muni to regional carriers.