

Report for:
City of Alameda
TSM/TDM Plan

Final draft

Prepared for:
City of Alameda
Public Works Department

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City of Alameda
Public Works Department
950 W. Mall Square, Room 100
Alameda, California 94501

Attention: Obaid Khan

Subject: City of Alameda TSM/TDM Plan – Draft Final Report [P10-029]

Dear Mr. Khan:

Dowling Associates, Inc. in association with Mobility Planners LLC is pleased to submit this draft final report on a Transportation System Management/ (TSM) / Transportation Demand Management (TDM) Plan for the City of Alameda. This report presents our findings and recommendations for the City. The project team included Alice Chen, Principal in Charge for Dowling Associates, and Cliff Chambers of Mobility Planners.

We wish to acknowledge the help of the Alameda business community, whose support was essential to the success of the employee survey. We also wish to acknowledge the invaluable help of Gail Payne, Transportation Coordinator for the City of Alameda, throughout this project.

We have enjoyed working with you on this seminal project for the City. If you have any questions or comments about this report, please contact me or Alice Chen, our Principal in Charge for this project.

Sincerely,

Dowling Associates, Inc.

David Reinke
Project Manager

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Executive Summary

This report presents a transportation systems management/transportation demand management (TSM/TDM) plan for the City of Alameda. The goal of the plan is to provide strategies to reduce the use of single-occupant autos for work travel to and from Alameda. The steps in developing this plan were the following:

1. Analyze current commute patterns to and from Alameda
2. Conduct a survey of employees who work in Alameda to determine their current work travel needs and their attitudes toward and awareness of commute alternatives to single-occupant auto use.
3. Assess current best practices for vehicle trip reduction
4. Analyze potential TSM/TDM measures for potential effectiveness and cost
5. Provide recommendations on TSM/TDM measures that could be adopted by new developments in Alameda

Main findings

1. The survey of 955 employees who work in Alameda found that 95% of employees had free parking and only 9.4% used a commute alternative at least once a month. The prevalence of unrestricted and free parking for employment sites in Alameda outside of the Park Street and Webster Street areas is a major constraint to significant vehicle trip reduction (VTR) for existing development, infill development and some MX zone locations.
2. The TDM measures that will have the highest effect on VTR, such as transit availability, are not under the control of individual employers and developers. Parking restrictions and parking fees have a strong influence on VTR, but most individual employers in Alameda move into buildings where the parking conditions and pricing (mostly free as described above) have been established or provided as part of the development entitlement. This is a challenging and complex dynamic to change. There is strong market demand for commercial and retail developments with free and readily available parking. Efforts to restrict off-street parking supply can have spillover effects on neighborhood on-street parking.
3. The Alameda employee survey shows good opportunities for increasing the use of commute alternatives in the City of Alameda such as promoting existing programs and services.
4. While individual companies with at least 100 employees, with good transit availability and some parking restrictions or pricing may achieve a VTR that approaches 20% or more, the average VTR with an excellent TDM program will be closer to 10% in areas without good transit and 15% in areas with good transit. Higher levels of VTR are possible with improved local and regional transit service

levels, improvements in bicycling and pedestrian infrastructure, strategic parking policies and excellent TDM program monitoring and enforcement.

5. Due to the relatively small size of the average employer in Alameda, creating additional scale of effort through a transportation management association (TMA) will help maximize the potential VTR for both residential and work trips.
6. Alameda Point has the scale to plan for a 30% VTR. Site design, density, mixed use, transit availability and convenience, excellent walkability and bicycle access, parking restrictions and parking fees will all need to be considered to achieve the 30% VTR.

Conclusions

1. The objective of 30% vehicle trip reduction from commercial development in the General Plan is not feasible given the imbalance of jobs and housing, relatively segregated residential and commercial land use patterns, existing transit service availability and free and ample parking conditions at job sites in the City of Alameda. Outside of Alameda Point, a more realistic target objective would be a 10-15% VTR, depending on the location within the City of Alameda. The institutional context for the current VTR goals is presented in the next section. The basis for the conclusion that a 30% VTR for commercial development in most areas of Alameda is not feasible is based on nationwide research on TDM program effectiveness.
2. Implementation of an effective TDM program will need to be a shared responsibility of the public and private sectors for both existing and new developments.
3. A citywide TMA is recommended to coordinate all TDM program development, marketing and outreach efforts.
4. Specific TDM program requirements are recommended for development proposal sponsors based on the national research presented in Section 3.

1 Introduction

This report presents a transportation systems management/transportation demand management (TSM/TDM) plan for the City of Alameda. The goal of the plan is to provide strategies to reduce the use of single-occupant autos for work travel to and from Alameda.

The report presents an analysis of commute patterns in Alameda, results of an employee survey conducted as part of this project, an analysis of best practices, an analysis of potential TSM/TDM measures, and recommended TSM/TDM measures for new developments.

Section 2 discusses current work travel in Alameda. Results from US Census journey-to-work data show that single-occupant auto is the dominant commute mode both for persons who work in Alameda and for residents of Alameda who work outside the city. Alameda residents who work within the city show a relatively high propensity to work at home or use non-motorized modes. Transit is the dominant commute mode for Alameda residents who work in San Francisco. Some crossings into/out of Alameda are currently near capacity during the peak hours; almost all crossings are forecast to be at capacity during the peak hour by 2030.

Section 3 presents a review of best TSM/TDM practices. An update of the national study on traveler behavior response to transportation system changes provides a wealth of data on which TSM/TDM measures are most effective and how these can work together. There are also examples from within the Bay Area, including examples from the Peninsula Commute Alliance in San Mateo County, the City of Menlo Park, and the City of South San Francisco.

A web-based employee survey of persons who work in Alameda was conducted as part of this study. A total of 955 workers responded. Section 4 presents the results from the survey and the main findings. One significant result is that over four-fifths of those responding were not aware of the Guaranteed Ride Home Program, the City Car Share Program, or the 511 RideMatch Program.

Section 5 presents an analysis of potential TDM measures that were considered in this study. An assessment of potential effectiveness of these measures and planning-level estimates of their costs are provided.

Section 6 presents a set of recommended TSM/TDM strategies for the City of Alameda. The section includes a discussion of transportation management agencies (TMAs), strategies for new development, and funding considerations for TDM measures and monitoring of TDM programs by employers.

The steps in developing this plan were the following:

1. Analyze current commute patterns to and from Alameda

2. Conduct a survey of employees who work in Alameda to determine their current work travel needs and their attitudes toward and awareness of commute alternatives to single-occupant auto use
3. Assess current best practices for vehicle trip reduction
4. Analyze potential TSM/TDM measures for potential effectiveness and cost
5. Provide recommendations on TSM/TDM measures that could be adopted by new developments in Alameda

2 Work travel characteristics in Alameda

2.1 Introduction

This section discusses work travel characteristics in Alameda. Section 2.2 presents data on work travel to Alameda. Section 2.3 discusses work travel by Alameda residents. Section 2.4 presents estimated current and projected future peak-hour traffic volumes on bridges and tunnels between Alameda and the mainland.

2.2 Work travel to Alameda

2.2.1 Current employment in Alameda

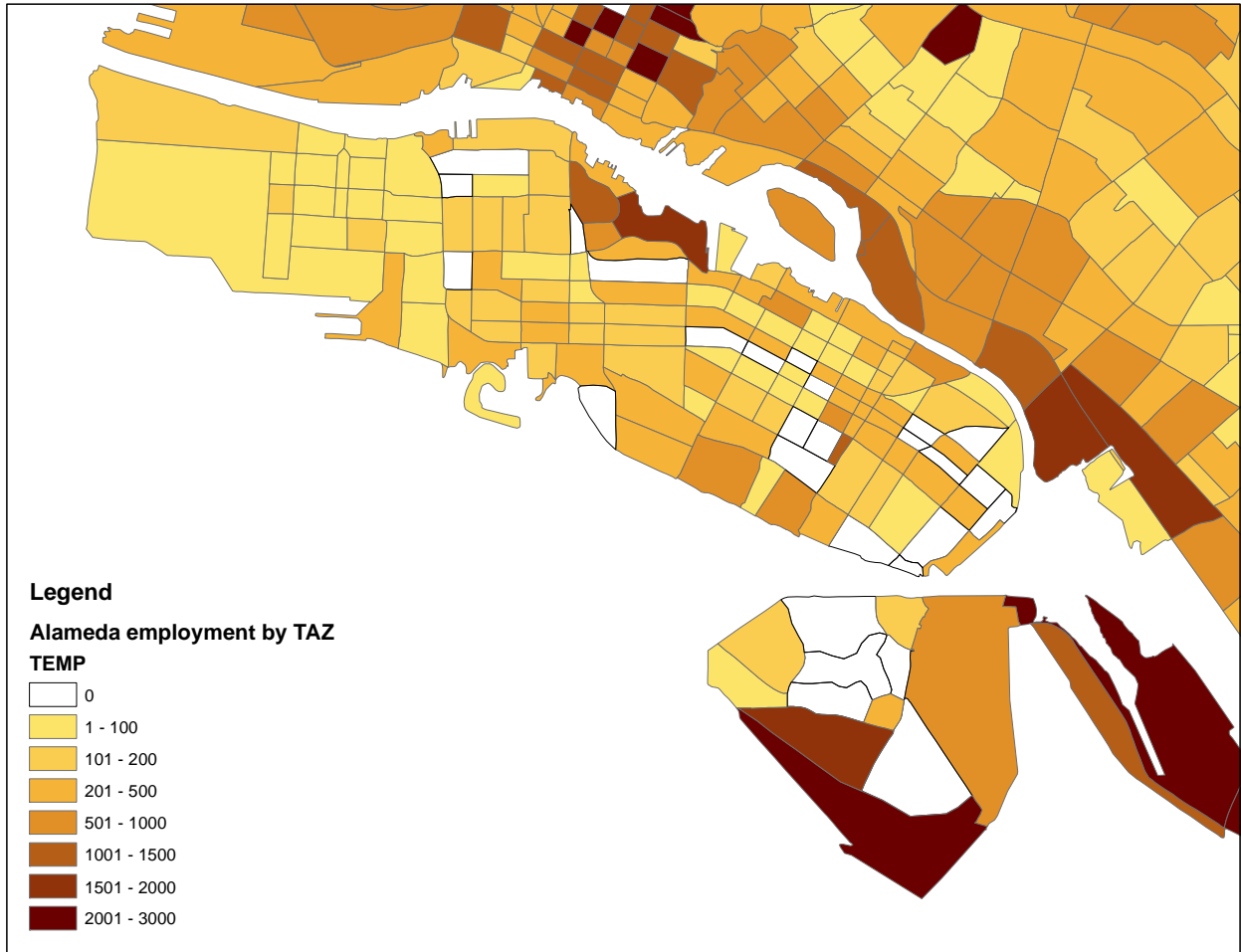
The Association of Bay Area Governments (ABAG) Projections 2009 estimate total employment in Alameda at about 25,000. Figure 2.1 shows estimated employment by transportation analysis zone (TAZ) for the year 2007 land use inputs to the Alameda General Plan Model.

There are currently four major employment areas in Alameda:

- Marina Village/Webster Street
- Park Street Central Business District
- Harbor Bay Business Park
- Alameda South Shore Center

2.2.2 Work travel to Alameda

Table 2.1 shows the distribution of workers in Alameda by mode to work from the 2000 Census journey-to-work tables. Almost 70% of workers who work in the City of Alameda drove alone to work.



Source: City of Alameda General Plan Model, land use inputs.

Figure 2.1 Employment in Alameda by transportation analysis zone

Means	% of workers	
	All workers	Workers who travel
Drive alone	69.2	73.6
Shared ride, occupancy 2	8.7	9.2
Shared ride, occupancy 3+	3.1	3.3
Bus	3.6	3.8
Rail	1.7	1.9
Ferry	0.1	0.1
Bike	2.0	2.1
Walk	4.2	4.5
Other means	1.4	1.5
Work at home	6.0	—

Source: US Census, 2000.

Table 2.1 Means of travel to work for workers in Alameda

The 2005 – 2007 PUMS/ACS tabulations for journey to work recently became available at the place level.¹ Table 2.2 shows the distribution of residence locations for persons who work in Alameda and the estimated number of workers from each area based on the total number of workers in the ABAG Projections 2009 estimate for Alameda.² Table 2.3 shows distributions of mode to work by residence location.

Location	% of workers in Alameda	Number
Alameda city	42	10,500
Oakland	15	3,800
San Leandro, San Lorenzo, Ashland	8	2,000
Berkeley	3	800
South Alameda County	9	2,300
Other Alameda County	3	800
West Contra Costa County	1	300
Other Contra Costa County	8	2,000
San Francisco	4	1,000
San Mateo County	3	800
Santa Clara County	1	300
Bay Area North Counties	3	800
Total	100	25,000

Source: PUMS/ACS 2005 – 2007 place-to-place journey to work tabulations. Estimated number of workers by origin rounded to nearest 100; total number of workers from ABAG Projections 2009.

Table 2.2 Distribution of residence locations for workers in Alameda

¹ PUMS/ACS refers to the Public Use Microdata Sample (PUMS) of the American Community Survey (ACS). Through the 2000 Census, the “long form”, which sought detailed information on socioeconomic characteristics of households, was sent to 6% of all households. Individual long form records were available as the Public Use Microdata Sample. After 2000, the long form was replaced by the American Community Survey (ACS), a survey of household socioeconomic characteristics that is conducted continuously. Both the

² Tabulations exclude persons who reside outside the nine-county Bay Area.

Mode	Residence location					
	Alameda city		Oakland, San Leandro, San Lorenzo	Other Alameda and Contra Costa Counties	Other Bay Area	Total
	All workers	Excluding work at home				
Drive alone	57.9	72.8	81.2	72.3	74.1	68.4
Shared ride 2	3.5	4.3	4.6	7.5	16.5	6.1
Shared ride 3+	1.8	2.3	3.0	3.6	3.3	2.7
Bus	3.1	3.9	6.7	2.4	0.0	3.4
Rail	0.7	0.8	0.6	8.3	5.0	3.0
Ferry	0.0	0.0	0.0	0.0	1.1	0.1
Bike	1.9	2.4	2.2	0.6	0.0	1.4
Walk	10.6	13.3	0.5	4.6	0.0	5.7
Other means	0.1	0.2	1.3	0.7	0.0	0.5
Work at home	20.5	NA	0.0	0.0	0.0	8.7

Source: PUMS/ACS 2005 – 2007 place-to-place journey to work tabulations. All figures are percentages. Column totals sum to 100%.

Table 2.3. Distribution of mode to work for persons working in Alameda by residence location

The results of the 2005 – 2007 PUMS/ACS tabulations must be evaluated carefully in view of the smaller sample size compared to the 2000 Census. Nonetheless, the results show several interesting characteristics of commuters to Alameda including the following:

- Walking accounts for a significant portion of work trips for persons who reside in Alameda.
- About one-fifth of Alameda residents who work in Alameda worked at home.
- BART accounts for a significant fraction of trips for workers who do not live in Alameda or in the communities immediately adjacent to Alameda.
- Bus is the most often used transit mode for residents of Alameda and adjacent communities.
- Longer work trips to Alameda are more likely to occur by ridesharing.

2.3 Work travel by Alameda residents

About 30% of Alameda residents work in Alameda (Table 2.4). Of the remainder, almost half work in adjacent cities.

Alameda residents who work in Alameda are much more likely to work at home or use a non-motorized mode (Table 2.5). Fewer than one-third of Alameda residents who work in San Francisco travel by car.

Work location	% of Alameda residents	Number
Alameda	30%	10,430
Oakland, San Leandro, San Lorenzo	30%	10,640
Other East Bay	15%	5,395
San Francisco	17%	5,855
Other Bay Area	6%	2,205
Other	1%	490
Total	100%	35,015

Source: PUMS/ACS 2005 – 2007 place-to-place journey to work tabulations

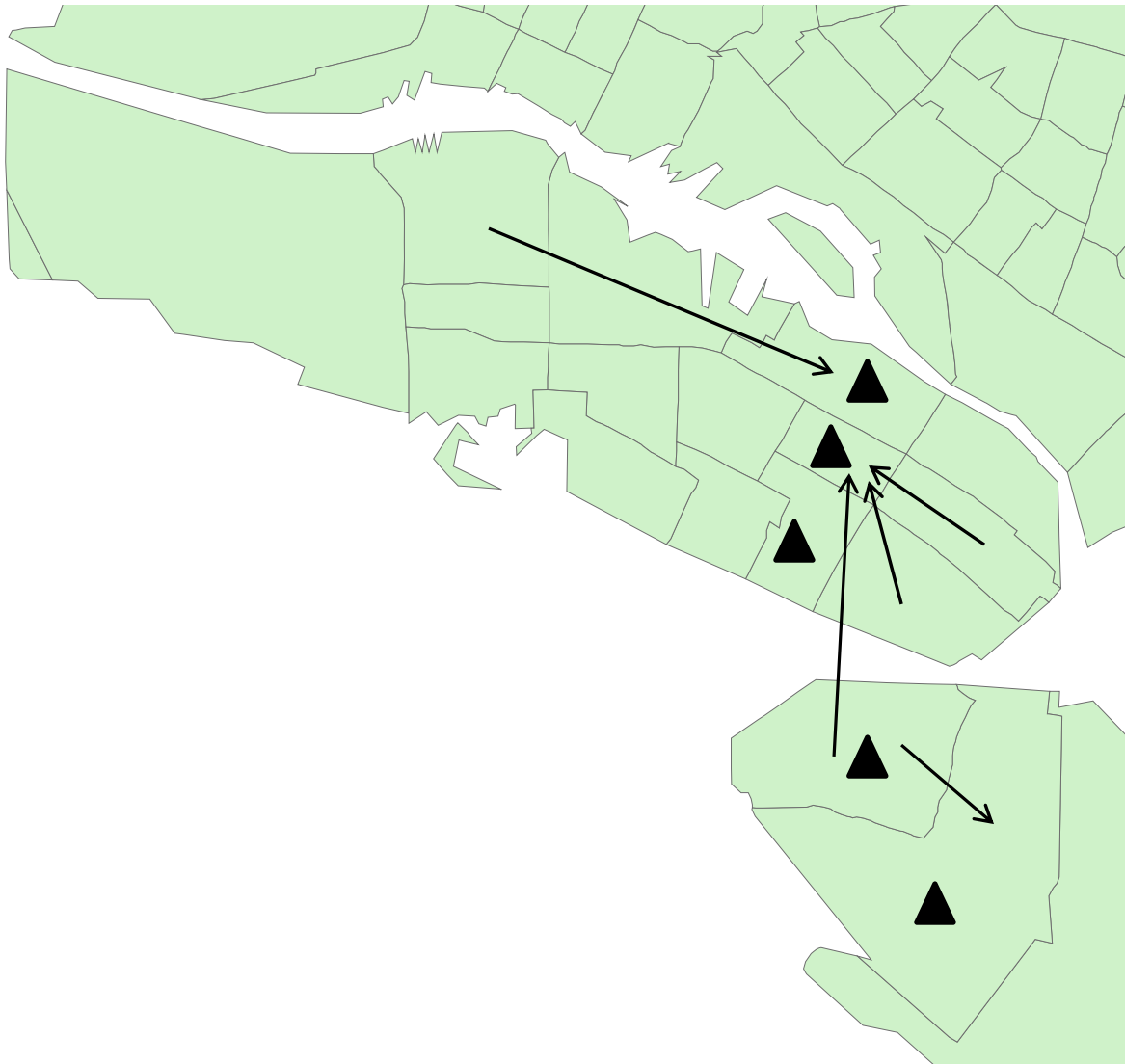
Table 2.4 Workplace locations for Alameda residents

Mode	Work location						Total
	Alameda	Oakland San Leandro San Lorenzo	Other East Bay	San Francisco	Other Bay Area	Other	
Drive alone	58	73	88	20	70	86	64
Carpool	5	10	6	11	22	0	10
Transit - ferry	0	0	0	14	1	0	3
Transit – other	5	12	5	52	3	0	19
Bike, walk	12	2	0	2	0	4	1
Work at home	20	0	0	0	0	0	6
Other	0	3	1	1	3	10	2

Source: PUMS/ACS 2005 – 2007 place-to-place journey to work tabulations. Columns sum to 100%.

Table 2.5 Commute modes for Alameda residents

Figure 2.2 shows the main home to work commute patterns for Alameda residents who work in Alameda for the year 2000; movements are shown by census tract. The main commute patterns are to the Park Street Central Business District. There is also a significant amount of work travel within Harbor Bay Isle. Census data show that Alameda residents who live and work in the same census tract are much more likely to bike or walk to work than other Alameda residents, whose primary commute mode is single-occupant auto.



Source: US Census 2010 journey-to-work tabulations by census tract. Arrows show inter-tract commutes; triangles show intra-tract commutes. Highest density commute patterns only are shown.

Figure 2.2 Home to work commuting within Alameda by census tract, 2000

2.4 Peak-hour traffic on access routes to Alameda

Table 2.6 on the next page shows model runs produced by Dowling and Associates, Inc. for 2007 conditions and with full implementation of the City of Alameda General Plan in 2030. The exhibit shows substantial increase in traffic, with many bridge and tube crossings exceeding capacity. The Webster St./ Posey Tubes and Park St. Bridge crossings would have volume/capacity (V/C) ratios of 1.08 to 1.16 in both directions in both the am and pm peak hour directions. The red indicates V/C ratios above 1.00. The highest impact would be inbound to Alameda on all crossings except the currently congested High Street Bridge

crossing. For example, the Webster Street Tube inbound direction would increase during the AM peak hour from 0.72 in 2007 to 1.12 in 2030, an increase of 57%.

Alameda model runs

Peak 1 hr

2030 runs are for

Year	Crossing	Dir	Lanes	Capacity	AM		PM	
					Vol	V/C	Vol	V/C
2007	Posey Tube	In	2	3,000	2,149	0.72	3,060	1.02
		Out	2	2,900	2,925	1.01	2,182	0.75
	Park St	In	2	1,900	1,384	0.73	1,925	1.01
		Out	2	1,900	1,922	1.01	1,517	0.80
	Fruitvale Ave	In	2	1,800	1,206	0.67	1,460	0.81
		Out	2	1,800	951	0.53	988	0.55
	High St	In	1	900	881	0.98	886	0.98
		Out	1	900	873	0.97	726	0.81
	Bay Farm Is	In	2	2,600	2,075	0.80	1,675	0.64
		Out	2	2,600	1,710	0.66	2,057	0.79
2030 General Plan	Posey Tube	In	2	3,000	3,364	1.12	3,477	1.16
		Out	2	2,900	3,131	1.08	3,123	1.08
	Park St	In	2	1,900	2,172	1.14	2,123	1.12
		Out	2	1,900	2,104	1.11	2,189	1.15
	Fruitvale Ave	In	2	1,800	1,679	0.93	1,740	0.97
		Out	2	1,800	1,765	0.98	1,678	0.93
	High St	In	1	900	1,056	1.17	1,090	1.21
		Out	1	900	997	1.11	1,017	1.13
	Bay Farm Is	In	2	2,600	2,636	1.01	2,737	1.05
		Out	2	2,600	2,710	1.04	2,472	0.95

Note: The capacities shown are taken directly from the Alameda CTC Countywide Model, which was used to develop the Alameda Citywide Model. These capacities are for the purposes of the demand model and should not be confused with theoretical capacity based on traffic operations.

Table 2.6 Peak hour traffic at crossings to/from Alameda, 2007 and 2030

2.5 Summary

This section has presented an analysis of current commute patterns in Alameda. Single occupant auto is the dominant mode of travel both for workers who commute to Alameda and for Alameda residents who work outside the city. While a significant number of Alameda residents who work in Alameda – over 20% – work at home, single-occupant auto is still used by a majority of Alameda residents who work in the city.

Some crossings into and out of Alameda appear to be near capacity during the peak hour; traffic projections for 2030 indicate that almost all of these crossings will be at capacity during the peak hour by that year.

3 Review of Best Practices

3.1 Introduction

This section presents a review of best TSM/TDM practices within Alameda and for other areas. The review in this section provided a foundation for work on the analysis of TSM/TDM strategies, and recommended TSM/TDM strategies.

Section 3.2 discusses existing studies and practices for the City of Alameda. Section 3.3 discusses best practices for other cities. Section 3.4 identifies further data sources that were consulted for developing the citywide TSM/TDM plan.

3.2 Studies within the City of Alameda

3.2.1 Alameda Traffic Capacity Management Procedures (2000)

The Traffic Capacity Management Procedure (TCMP) was adopted by the City on June 19, 2001, to address the potential deficiency of the Posey and Webster Tubes. The TCMP requires monitoring of traffic to evaluate the remaining capacity of the tubes. The TCMP requires preparation of a traffic report by any development project west of Grand Street that is projected to generate peak hour trips through the tubes in excess of 1% of the current estimated reserve capacity. The traffic report would identify the remaining capacity and the projected reduction to the remaining capacity and would propose feasible measures to reduce the number of peak hour trips generated by at least 10% for residential development and 30% for non-residential development.

3.2.2 Alameda West End Transportation System Management/Transportation Demand Management Plan (2003)¹

The Transportation System Management/Transportation Demand Management Plan was developed to identify transportation strategies to reduce the number of peak period trips through the Webster and Posey Tubes. Although the strategies focused on the upcoming development of Alameda Point, many of the strategies can apply to existing development in the West End of Alameda as well as in other portions of Alameda. Through a series of public workshops and outreach, 11 TSM/TDM strategies were identified for potential implementation. The recommended strategies include financial incentives for alternative mode use, subsidizing shuttles to/from BART, increased frequency of transit connection at

¹ Memo received from City of Alameda, undated. File reference:
G:\PUBWORKS\LANDTRN\TRANSPORTATION\TSM\FINALS\Final Memo.doc

ferry terminals, carpool programs, flextime, and daily parking charges at worksites. The report concludes:

The exact percentage to use when combining strategies is unique to the characteristics of each site. As a general rule, it is reasonable to expect that an employer that offers all three financial incentives included in the first strategy could expect a potential trip reduction of 7% – 12%.

3.2.3 City of Alameda Transportation Element – TSM/TDM Policies (January 2009)

The City of Alameda Transportation Element specifies goals, objectives, and policies that aim to balance the following goals:

1. Circulation: maintaining mobility
2. Livability: balancing mobility needs with the objective of creating a livable human and natural environment
3. Transportation choice: encourage use of alternatives to the single-occupant automobile
4. Implementation: coordinated and cost-effective implementation and maintenance of the transportation system

The following cites those goals, objectives, and policies that are relevant to development of this city-wide TSM/TDM plan.

Circulation goal

4.1 Plan, develop and maintain a safe, barrier-free and efficient transportation system to provide the community with adequate present and future mobility.

From the Circulation Goal, Objective 4.1.6 recognizes the use of TSM and TDM techniques to increase the efficiency of the existing transportation system:

Objective 4.1.6: Increase the efficiency of the existing transportation system by emphasizing Transportation System Management (TSM) strategies and Transportation Demand Management (TDM) techniques.

Policies

- 4.1.6.a Identify, develop, and implement travel demand management strategies to reduce demand on the existing transportation system.
1. Establish peak hour trip reduction goals for all new developments as follows:
 - 10 percent peak hour trip reduction for new residential developments
 - 30 percent peak hour trip reduction for new commercial developments
 2. Develop a TDM toolbox that identifies a menu of specific TDM measures and their associated trip reduction percentages.
 3. Develop a citywide ITS infrastructure assessment using a Systems Engineering approach to determine capital investment needs.
 4. Require implementation of ITS infrastructure as part of all new developments.

- 4.1.6.b Identify locations where signal coordination could be employed to improve traffic flow and reduce vehicle emissions.
- 4.1.6.c
 1. Coordinate with the appropriate agencies to utilize emerging technologies and Smart Corridor techniques (e.g. transit-priority systems for traffic signals and real-time information to enable travelers to choose the best routes) for the bridges and tubes.
 2. Integrate with existing regional ITS initiatives such as SMARTCORRIDORS.org, 511.org, Integrated Congestion management for the I-880 corridor, etc., to improve capacity at the bridges, tubes and corridors.
 3. Collaborate with neighboring jurisdictions such as Oakland and San Leandro to ensure a coordinated approach to ITS implementation.
 4. Work with transit agencies in linking their ITS infrastructure to enhance operational efficiency along the City's egress and ingress corridors.
- 4.1.6.d Minimize the cross-island portion of regional vehicular trips by providing alternative connections to Oakland, such as Water Taxis, shuttles, and a Bicycle Pedestrian Bridge and by encouraging Transportation Systems Management (TSM) and Transportation Demand Management (TDM) techniques.
- 4.1.6.e Support and maintain an up-to-date Transportation System Management (TSM) and Transportation Demand Management (TDM) plan consistent with state law to provide adequate traffic flow to maintain established LOS.
 1. Develop a TDM plan which would include specific requirements for new developments to implement measures to mitigate their traffic impacts based on an applicable nexus.
 2. Develop one or more sub-area TDM plans to help address the unique conditions of different areas within Alameda
- 4.1.6.f Require monitoring programs to ensure that TSM and TDM measures mitigate impacts.
 1. Develop thresholds of significance for ongoing monitoring and evaluation of TSM/TDM measures.
- 4.1.6.g Maximize the integration and coordination of various individual modes of transportation to enhance systemwide efficiency.
 1. Work with various local and regional transit agencies in integrating their schedules.

Transportation choice goal

4.3 Encourage the use of transportation modes, especially at peak-period, other than the single-occupant automobile in such a way as to allow all modes to be mutually supportive and to function together as one transportation system.

Objective 4.3.1 and its associated policies are directed at reducing SOV use, and is relevant to development of the city-wide TSM/TDM plan:

Objective 4.3.1: Develop programs and infrastructure to encourage the use of high occupancy vehicles (HOVs), such as buses, ferries, vans and carpools.

Policies

- 4.3.1.a Update and implement the recommendations of the Alameda Long Range Transit Plan.
- 4.3.1.b Consider the use of strategies to give priority to high occupancy vehicles at the bridges and tubes.
- 4.3.1.c Actively encourage increases in public transit, including frequency and geographic coverage.
- 4.3.1.d Encourage and support efforts to provide information to use environmentally-friendly transportation modes.
- 4.3.1.e Provide amenities or support programs to make using alternative modes a more attractive option.
- 4.3.1.f Reduce vehicle trips through telecommuting or other options.
- 4.3.1.g Establish targets for increasing mode share of non-SOV transportation modes.
 - 1. Increase daily non-SOV mode share (transit, walking, bicycling) by 10 percentage points by 2015 as compared to 2000.
 - 2. Increase the share of children who walk or bicycle to school by 10 percentage points by 2015 as compared to 2000.
- 4.3.1.i Develop parking management strategies for both new development projects and, as appropriate, for existing development.
 - 1. Establish maximum parking requirements for both new development and, as appropriate, for existing development.
- 4.3.1.j Implement queue jump lanes and other strategies for improving transit operations.

Another objective under this goal is to use TDM program to manage demand, which is essentially the policy that directs the preparation of this citywide TSM-TDM Plan.

Objective 4.3.4: Manage demand placed on the street system through a TDM program to be developed with available funding in accordance with state law.

Policies

- 4.3.4.a Work with major employers to accommodate and promote alternative transportation modes, flexible work hours, and other travel demand management techniques and require that appropriate mitigation be funded through new development if a nexus exists.

Implementation goal

4.4 Implement and maintain the planned transportation system in a coordinated and cost-effective manner.

Three objectives under this goal specify policies that include TDM:

Objective 4.4.2: Ensure that new development implement approved transportation plans, including the goals, objectives, and policies of the Transportation Element of the General Plan and provide the transportation

improvements needed to accommodate that development and cumulative development.

Policies

- 4.4.2.f Transportation related mitigations for future development should first implement TDM measures with appropriate regular monitoring; transit, bicycle and pedestrian capital projects; and more efficient use of existing infrastructure such as traffic signal re-timing in order to reduce the negative environmental effects of development, rather than attempting to accommodate them. Should appropriate regular monitoring indicate that these mitigations are unable to provide the predicted peak-hour vehicle trip reductions, additional TDM measures, development specific traffic caps, or mitigations through physical improvements of streets and intersections, consistent with policy 4.4.2a and policy 4.4.2.b, may be implemented.
- 4.4.2.g After the implementation of quantifiable/verifiable TDM measures (verified through appropriate regular monitoring), and mitigation measures consistent with 4.4.2.f and identification of how multimodal infrastructure relates to congestion concerns, some congestion may be identified in an EIR process as not possible to mitigate. This unmitigated congestion should be evaluated and disclosed (including intersection delay length of time) during the EIR process, and acknowledged as a by-product of the development and accepted with the on-going funding of TDM measures.

Objective 4.4.6: Work with area employers and other stakeholders to develop one or more TMAs to implement TDM programs

Policies

- 4.4.6.1 For new development projects, require residential, business associations, property owners, and lessees to be dues-paying members in the TMA, as allowed by law.
- 4.4.6.2 Encourage existing and previously approved developments to join a TMA, through which they would contribute toward, and benefit from, TDM programs.

Objective 4.4.7: Require developers to contribute toward the implementation of appropriate TSM/TDM measures to mitigate the impacts of their projects on the bridges, tubes, specific intersections, and corridors.

Policies

- 4.4.7.a Develop standardized method for calculating the appropriate financial contribution for TSM/TDM fees.
- 4.4.7.b Develop TSM/TDM fee collection mechanism.

3.3 Related studies in other areas

3.3.1 TCRP Report 95 – Traveler Response to Transportation System Changes

The Transit Cooperative Research Program (TCRP) Report 95, *Traveler Response to Transportation System Changes*, provides the results of extensive research on commuter

responses to transportation system changes.¹ This subsection presents the main results from the research as they apply to this project. The research cited is from commuter responses from an 82-program sample that the researchers used to calculate vehicle trip reduction (VTR) based on the implementation of one or more TDM strategies.

There are several categories of TDM measures. For purposes here, the discussion is divided into two main categories:

1. External variables typically outside the control of the individual employer, developer/property manager or commuters.
2. Variables that are under direct control of the employer, developer/property manager or commuter.

1. External variables typically outside the control of the individual employer, developer or commuters

Parking Management and Fees

Overview

The combination of parking restrictions and parking fees has the most significant impact on peak period VTR for commute trips. Those employers in the national 82-program sample that were accompanied by restricted parking had average vehicle trip reductions of 25%. If the parking was also priced with parking fees, the average vehicle reduction increased to 28% and if discounts were offered to carpools and vanpools, the average VTR was 30%.

Existing conditions

In the web-based survey of 955 employees in Alameda, 95% of the employees have free parking. The primary exception for paid parking is along the Park St. corridor. Stakeholder interviews pointed out that many areas promote the availability of readily available, free parking for economic vitality. Recently approved projects such as Alameda Landing have plentiful parking built into the project design, which is partly due to the limited transit service in the vicinity of the project and the needs of the type of tenants at the site.

Evidence of effectiveness

Table 3.1 illustrates the importance of parking availability and parking pricing in combination with TDM program implementation. The results, shown on the left side of the table, exhibit an obvious distinction in vehicle trip rates relative to parking supply. Based on a sample of 49 sites with good TDM program implementation, the vehicle trip rate for ample parking averaged 7.1% below the ambient trip rates to results of 28.6% where parking was scarce.

Differences in trip rates according to pricing are shown in the right side of Table 3.1. Here the effects range from vehicle trip rate averaging 8.4% below baseline condition for TDM

¹ <http://www.trb.org/Publications/Blurbs/162432.aspx>

program sites with “free” parking to trip rates averaging 32.2% below baseline conditions with market rates for parking.

Parking availability	Number of sites	Veh. trip rate vs. ambient*	Parking pricing	Number of sites	Veh. trip rate vs. ambient
Ample	16	7.1%	Free	29	8.4%
Limited	18	11.2%	Nominal	10	17.9%
Scarce	15	28.6%	Market	10	32.2%

* Ambient is defined as baseline conditions without TDM.

Source: Transit Cooperative Research Program Report 95, Chapter 18: Parking Management and Supply. Washington: Transportation Research Board, 2003.

Table 3.1 Comparison of TDM program vehicle trip reductions under different conditions of parking supply availability and parking pricing levels

National research indicates that even with very high employer support for TDM programs, the amount of trip reduction is 12.5% without parking fees or parking restrictions. With parking fees and restrictions, the trip reduction is about double. The national TDM research found that adding a financial incentive such as transit and vanpool subsidies can boost the employer’s trip reductions by another 4% – 6%.

Further national research has shown that parking restrictions and fees are highly important even with strong employer support programs and financial incentives. Of 11 test sites:

- For 3 sites that had ample parking, trip rates were reduced by an average of 15.6%
- For 4 programs at sites where parking was scarce, the average trip rate reduction was 34%

As shown in Table 3.2, employers with high employer support had a 24.4% VTR compared to 12.5% VTR for employers with no parking fees. Employers that are located where parking restrictions are present, there is a 29.9% VTR compared to 12.5% when no parking restrictions are present.

Employer Support	Description	Parking Fees		Parking Restrictions	
		Yes	No	Yes	No
High	Employer appears to be applying just about every strategy possible.	24.4%	12.5%	29.9%	12.5%
Medium	Employer has commute coordinator and provides active promotion of available services.	27.3%	12.0%	23.8%	12%
Low	Employer shows little or no active effort in promoting alternative commuting habits to employees.	22.0%	9.6%	18.0%	9.6%

Source: Transit TCRP Report 95.

Table 3.2 Employer support and parking fees and restrictions

Transit Availability

Overview

The availability and convenience of public transportation service is beyond the control of the individual employers, developers, and commuters desiring a daily trip by transit to his or her worksite.

Existing conditions

Section 5.2.1 describes transit availability in the City of Alameda. Briefly, Route 51A provides high-frequency service between downtown Oakland and the Fruitvale BART station via Webster Street, Santa Clara Avenue, and Broadway. Service is operated every 10-12 minutes during the day. Service to Marina Village, South Shore/Towne Center and Harbor Bay is limited with 30-minute service. In general, transit service within Alameda is oriented along the length of the island. There is little or no cross-town service except along Webster Street and Park Street.

Harbor Bay Business Park operates a shuttle between the Harbor Bay Ferry Terminal and the Coliseum BART station. This service has extended the availability of transit to a major employment area. The shuttle carries about 180 passengers per day.

The employee survey found that 3.0% of the Alameda employees use public transit to get to work. This mode share is more typical of a suburban area than an urbanized area.

The PUMS/ACS 2005-2007 data show a higher transit mode share¹. For Alameda residents, 4.7% use transit to get to work. For Oakland area residents, the figure jumps up to 7.3%. Overall, 3.4% of workers in the PUMS/ACS sample rode the bus to work and 3.0% used rail. With AC Transit service reductions, it is likely that the mode shares for transit have dropped. Again, the availability of convenient and frequent transit service is a very important variable for achieving VTR objectives.

Evidence of effectiveness

The variable of transit availability has a significant effect on VTR levels. With low levels of transit service availability, the national research on TDM effectiveness shown in Table 3.3 found that VTR ranged from 8.6% with low levels of TDM employer support to 15.9% for employers who do everything possible to encourage commute alternatives. Contrasted to when high levels of transit service is available, even employers with low levels of support have 24.3% VTR. Employers with high levels of TDM support have an average of 28.4% VTR.

¹ PUMS/ACS is the public use microdata sample from the American Community Survey conducted by the US Census.

Employer Support	Description	Transit availability: VTR %		
		High	Medium	Low
High	Employer appears to be applying just about every strategy possible.	28.4% (10)	10.1% (5)	15.9% (17)
Medium	Employer has commute coordinator and provides active promotion of available services.	28.2% (6)	15.3% (10)	3.2% (3)
Low	Employer shows little or no active effort in promoting alternative commuting habits to employees.	24.3% (8)	13.6% (17)	8.6% (6)

Source: Transit TCRP Report 95. Entries in parentheses indicate number of sites.

Table 3.3 Employer TDM support and transit availability

Transit availability shown in Table 3.3 is based on proximity to transit and transit service levels serving a work site. The data is not mode specific, meaning that transit availability can be bus, rail or ferry. In general, the greater frequency, directness of travel and longer hours of operation will result in higher VTR levels.

Land use and access to basic services

Overview

A work site or residence located in an attractive setting with good walkability, good access to transit and convenient proximity to attractions and basic services would make it easier for a commuter to make the decision to choose a non-auto trip to travel to/from work. In most market research studies, one of the major reasons given on why people drive to work is the worksite is located in an area that is isolated from any other activities, requiring a personal vehicle to tend to midday needs for lunch, errands or going to meetings.

Existing conditions

Overall, many parts of Alameda have land use patterns that have good access to services. Significant sections of Park St, Santa Clara Ave, and Webster St. corridors not only have good access to transit, but also are walkable and have a good mix of services. The Harbor Bay Isle Business Park is a good example of where many employees would feel isolated and would most need a car to conduct midday lunch errands.

Evidence of effectiveness

There have been a growing number of research studies investigating the link between transportation and land use at the residential end of the trip, but fewer have probed the synergy between travel behavior and land use at the destination. TCRP B-4, an early national research study on TDM program effectiveness, obtained information via survey from 50 different employers on their TDM programs and employer and site characteristics. With this information, an attempt was made to determine the approximate number of

services reachable within a 5-minute walk. Correspondence between this local accessibility and calculated vehicle trip reduction was found to be surprisingly strong. The 11 employment sites rated as having “poor” access to services (2 or less) averaged a VTR of only 5.3%. The 11 sites rated as having “fair access” (3 to 5 services) averaged an 8.3% VTR, while the 25 sites with “good” access (more than 5 services) averaged 21.5%. A cautionary note is provided, as the accessibility can be a surrogate for urban conditions with better transit availability, restricted parking and often parking fees.

2. Variables under the control of the developer, employer or individual commuter

Incentives to Commute Alternative Use

Overview

Incentives can be separated categorically into non-monetary incentives and monetary incentives. Non-monetary incentives include strategies such as preferential parking, awards or other special treatment, while monetary incentives are those that have a tangible dollar value to the employee or resident. The most tangible financial incentives are either modal subsidies or travel allowances, where the association between the incentive and the behavior is visible and direct.

Existing conditions

AC Transit offers EasyPass, a program that allows employers to provide an annual pass to employees at a cost of \$41 to \$115 per year per employee, depending on the quality of the transit and the number of participating employees. The College of Alameda participates in the AC Transit EasyPass program.

The federal commuter tax benefit program allows employers to pay for tax-free commute benefits up to \$230 per month per employee for transit and vanpooling, and up to \$20 per month per employee for bicycling.

Evidence of effectiveness

Transit fare subsidies were the most commonly offered incentive, seen in over one-half of the 82 program examples from the national research. Programs with transit subsidies have the third largest impact in terms of VTR (after parking and transit availability), with such programs exhibiting an average VTR of 20.6%, 7.5 percentage points higher than the 13.1% VTR in those programs not offering transit fare subsidies. This is an average figure for sites both with and without parking restrictions and fees.

As discussed earlier, it is generally acknowledged that parking conditions at a work site have a major underlying effect on the success of TDM programs. Where parking supply is limited or restricted or where it is not free, the desire of employees to find and use alternatives is demonstrably more urgent. To test this effect in the analysis of incentive measures, Table 3.4 summarizes the performance of those 27 programs that offered incentives but had no restrictions on parking. As a group, these 27 programs have an

average VTR of 14.3%, which is less than the overall average for the 82-program sample of 16.9%.

On the other hand, the 14.3% overall average VTR for the 27 programs without restricted/priced parking is greater than the average VTR of 7.0% for the 14 programs that had unrestricted parking and also did not offer subsidies. The four employers in the 82-program sample who had restricted/priced parking but did not offer subsidies have an average VTR of only 11.5%. The 37 employers who had both restricted/priced parking and offered subsidies had an average 23.3% VTR. Table 3.4 provides additional details.

Other Incentive	Vanpool Subsidy	Carpool Subsidy	Bike/walk Subsidy	Travel Allowance	Other Monetary	ALL
Transit Subsidy	8.7% (8)	12.1% (1)	12.1% (2)	18.3% (3)	18.5% (5)	13.5% (21)
Vanpool Subsidy		12.1% (1)	12.1% (1)	5.6% (1)	9.7% (2)	8.4% (9)
Carpool Subsidy			21.3 (2)	n/a	n/a	21.3% (2)
Bike/ Walk Subsidy				n/a	12.1% (1)	18.2% (3)
Travel Allowance					26.2% (4)	14.8% (12)
Other Monetary						21.7% (9)

Source: Transit TCRP Report 95. Entries in parentheses indicate number of sites. Overall average VTR is 14.3% for those 27 programs who offered financial incentives without restricted or priced parking. Number of samples/sites=27. Pairwise comparison.

Table 3.4 Effects of multiple financial incentive offered for employers without parking restriction and no parking fees

There are a few cases where trip reduction combinations that include incentives can achieve more than 30% vehicle trip reduction. Two employers who had a transit shuttle and transit subsidy and two employers that had transit and vanpool subsidies and a transit shuttle were able to achieve up to a 35% trip reduction.

Employer Support Actions

Employer support actions are by far the most commonly applied TDM strategies, providing a necessary ingredient for TDM program success. Such actions include providing better information on commute alternative actions to employees, offering assistance in seeking out and using those alternatives, and marketing and promotional activity to persuade experimentation and use. Common measures in this group include commuter information service, employer transportation coordinators, ridesharing matching, transportation fair, on-site transit pass sales, and guaranteed ride home programs.

An important variable that unfortunately has not been adequately statistically analyzed is employer characteristics, including the type of employer and employer size. In general, certain industries tend to be able to show greater VTR results than others.

Employer size can be quite important, but research is not available to fully support the claim. In general, experience has shown that firms with more than 500 employees have a support structure network that enables a more robust commute alternatives program. Very large companies with employee recruitment and retention incentives have been the leaders in the Bay Area in commute alternative implementation, including Genentech, Google, Yahoo, Apple Computer and Stanford University. Overall, scale is very important in providing an array of attractive commute alternative programs. Larger employers generally have more resources to pay for the fixed cost of implementing TDM programs, as the average fixed cost per employee is much lower than smaller employees. Due to its size and company culture, Abbott Industries with employment in Alameda of approximately 200 is able to actively promote commute alternatives.

Existing conditions

While there are a few employers in Alameda who provide employer support actions, active promotional programs are the exception and not the rule. Abbott Laboratories and Wind River are two companies who have been actively providing their employees with support actions.

The Alameda employee survey provides evidence that the overall awareness of commute alternatives is very low, and that existing employers are not actively engaged in providing alternatives. Only 18% of employees surveyed were aware of the existing 511 rideshare matching programs and just 17% of the City Car Share program.

Evidence of effectiveness

The average empirically based estimate of site-specific trip reduction impact for full-scale employer support programs alone is on the order of magnitude of 4% to 5% vehicle trip reduction. These results are typically from exemplary ongoing program efforts. Where program efforts ebb and flow, the impact on vehicle trip reduction is often negligible. Employer support programs are most effective when they are coupled with a combination of parking restrictions, parking fees, good transit availability and financial incentives. The effectiveness of those combinations was shown earlier in Table 3.2 and Table 3.3..

Guaranteed Ride Home Program

A strategy appearing to address an important concern of employees considering use of an alternative commute mode to reach a work site is Guaranteed Ride Home (GRH). Numerous surveys have suggested that having the assurance of a back-up mode that can be used in the event of a personal emergency or unplanned schedule change can be the “deal clincher” in getting an employee to switch from driving alone.

Existing conditions

Throughout Alameda County, for employees who regularly commute to work by carpool, transit, walking or biking, a GRH program is available through the Alameda County Transportation Commission. It guarantees users of alternative transportation a ride home from work when unexpected circumstances such as a family illness, unscheduled overtime or the ridesharing vehicle break down. Depending on the commute distance, a rental car or

taxi voucher is made available for the ride home. All Alameda County employers are eligible for the program, regardless of employer size. Employers and employees must enroll in the program. Employees may use the program a maximum of six times per calendar year and no more than twice in any month. In discussions with Alameda employers, there was very little awareness that this program was available to them and their employees. In the Alameda employee survey, 81% were not aware of the existing guaranteed ride home program.

Evidence of effectiveness

An examination of 11 GRH programs throughout the United States, representing many different program types, scales, and settings, found—in general—strong intuitive support for GRH among the program managers. The evaluation was, however, unable to statistically support or reject the contention that GRH services actually encourage ridesharing. This situation was attributed to a frequent lack of adequate before and after data and the fact that GRH usually was implemented concurrently with other incentive programs, making it difficult to attribute changes in alternative mode use exclusively to the GRH service.

An evaluation of the impact of trip reduction requirements for the City of Sacramento suggests a direct correlation between the availability of GRH and VTR reduction. Looking at annual employer and employee travel survey data compiled by the city, covering 58 employers and roughly 26,000 employees, vehicle trip rates were compared for the 38 employers who offered GRH with the rates of the 20 employers who did not. An increase in carpool mode share by an average of 4.6% was found at the employers offering GRH as compared to only 1.6% at those where it was not offered. Similarly, an increase in vanpool share of 1.7% was found in the presence of GRH versus a decline of 0.2% otherwise, along with an increase in transit share of 1.2% when GRH was offered versus a no-GRH decline of 0.1%. These findings correspond to an average VTR of 7.3% in the programs where GRH was offered versus only 1.7% in those where it was not, suggesting a net VTR effect of 5.6 percentage points for GRH. However, it must be stressed that other factors such as transit availability and parking availability, as shown above have significant impact on VTR goals.

Employer Transportation Services

It is relatively uncommon for employers or institutions in the United States to become involved in the physical transportation of their employees, and more likely that they will simply encourage them to use alternatives that are available in the marketplace. In some circumstances, however, no meaningful travel alternatives are available, such as at a remote business campus where transit does not directly serve the site. In such cases, some employers have taken the initiative to provide tangible transportation services for their employees. They may do this by one or more of the following:

- Arranging for bus service to the site under contract or other agreement with a public or private transit provider, or paying to augment the level or quality of a pre-existing service.
- Arranging for shuttle service to connect with a rail transit station beyond walking distance.

- Assisting in the startup, operation, maintenance, or cost sharing of a vanpool program.
- Making company fleet vehicles available for use by employees for ridesharing or site-based uses, such as travel to business meetings, errand running, or emergency trips home.

Other potential employer services might be contracting with AC Transit or other transportation providers to supplement existing service levels.

Existing conditions

The existing Harbor Bay Business Park shuttle is an exemplary example of a business park association provided transportation service. Approximately 180 passenger trips a day are made to the ferry and BART.

Evidence of effectiveness

In the 82-program sample, those TDM programs that directly provided transportation services were considerably more effective as a group in reducing vehicle trips; with a 22% VTR with employer provided transportation over those that did not and with 14% average VTR, an 8 percentage point difference. Providing transportation service and high transit availability, restricted parking and parking fees all have a significant impact with a 35% VTR, but the sample was only for two employment sites.

Alternative Work Arrangements

Alternative work arrangements constitute the final category of TDM strategies. They include flexible work hours, staggered work hours, compressed work hours and telecommuting.

Existing conditions

Nearly three-quarters of the respondents to the Alameda employee survey arrive to work between 7:00 am and 10:00 am and leave between 4:00 pm and 7:00 pm. In the Alameda employee survey, 42% of the respondents said that their work schedule was not flexible. Only 2% of respondents stated that they telecommuted at least once a month.

Evidence of effectiveness

In the 82-program sample, employer programs that include flexible work hours average a VTR of 20% compared to 13% for other programs, a difference that may or may not be wholly attributable to the work hour's strategy.

Compressed workweeks and telecommuting are the only TDM strategies intended to lead to outright elimination of commute trip by whatever travel mode. Telecommuting effects have been difficult to assess and the national research on the subject has been mixed.

3.3.2 Peninsula Traffic Congestion Relief Alliance Strategic Plan

The Peninsula Traffic Congestion Relief Alliance recently released a strategic plan that was developed in partnership with employers and public agencies throughout San Mateo County. This plan establishes a mission statement and goals, objectives, strategies, and performance measures for four program areas:

1. Working with Employers to Develop and Manage Innovative Partnerships to Reduce Peak Period Commute Trips
2. Working with Commuters to Explore and Utilize Alternative Transportation
3. Working with Public and Private Partners to Collaboratively Develop New Resources and Tools to Expand Transportation Alternatives
4. Strengthening the Organizational Capacity of the Alliance to Achieve its Goals

This plan provides an example of a strategic approach to TSM/TDM planning that can help inform the approach to this project. Each TDM strategy in the plan is associated with a specific goal and objective.

3.3.3 City of South San Francisco TDM Ordinance

The City of South San Francisco has as part of its Zoning Ordinance a section on TDM for new non-residential development expected to generate 100 or more daily trips, based on ITE trip generation rates or a project seeking a floor area ratio bonus. The ordinance states that all projects subject to this requirement shall incorporate measures that have a demonstrable effect of reducing the number of trips generated to achieve a minimum alternative mode use of 28% or greater.¹ Trip reduction measures specified in the ordinance include the following:

- Ride matching services for carpools and vanpools
- Designated employer contact to administer the trip reduction program for that employer
- Provide direct routes to transit
- Guaranteed ride home program
- Information boards and kiosks
- Passenger loading zones
- Pedestrian connections to external streets
- Promotional programs
- Free showers and clothes lockers
- Shuttle program
- Transportation management association

The ordinance also lists additional measures that an applicant may choose from:

- Alternative commute subsidies/parking cash out

¹ Projects requesting higher floor area ratios are required to achieve higher minimum alternative mode use percentages.

- Bicycle connections
- Compressed work week
- Flextime
- Dedicated land for transit/bus shelter
- Onsite amenities: ATM, day care, cafeteria, convenience retail, and other personal business facilities
- Paid parking at prevalent market rates
- Telecommuting
- Other measures not listed above, including child care facilities and an in-lieu fee negotiated with the City

The ordinance also specifies that all projects are subject to an annual survey to determine how well the trip reduction requirements reduce the actual number of trips generated. In addition, all projects that receive a floor area ratio bonus are required to file triennial reports.

3.3.4 City of Menlo Park TDM Guidelines

The City of Menlo Park has adopted a set of TDM guidelines that allow new developments to take “trip credits” for TDM measures that, in some cases, may reduce the net number of trips generated by the project so that the effect on the City’s circulation network is not significant. Table 3.5 shows some examples of measures and the number of trips credited for each:

Measure	Number of credited
Bicycle lockers and racks	One peak hour trip for every 3 new bike lockers/racks installed and maintained
Operation of dedicated shuttle service during the peak to rail station or urban residential area	One peak hour trip for each peak hour round trip seat on the shuttle. Increases to two trips if a guaranteed ride home program is in place.
Charging employees for parking	One peak hour trip for each parking spot charged out at \$35/month for one year.
Implementation of a vanpool program	Seven peak hour trips for each vanpool arranged. Increases to ten if a guaranteed ride home program is also in place.
Implementation of compressed work week program	One peak hour trip for every 5 employees that are offered the opportunity to work four compressed days per week.
Combination of any two elements	Five peak hour trips.

Table 3.5 Example TDM measures and trip credits in Menlo Park

3.3.5 Independent assessment study of transit services

Transit Resource Center conducted a study of community oriented transit best practices for AC Transit District 2 in 2004. These included the following:

- Emery Go Round. Provides shuttle service between BART and Emeryville.
- PRTC OmniLink in Prince William County, Virginia. This service implements route deviation on fixed-route transit service

- Menlo Park Community Service Route. Midday service designed primarily to provide free transit for seniors at senior housing to shopping, medical facilities, library, senior centers, and other recreational facilities.
- Caltrain and SamTrans Shuttle Program. Provides transportation between Caltrain and BART for major employers along the Peninsula.
- Community Transit Network in Boulder, Colorado. A high-frequency community route system that complements regional bus service.
- SMART Family of Transit Services in three suburban counties outside Detroit. A hierarchy of integrated transit services that includes mainline fixed routes, local connector service, and community transit services.
- DART in San Diego. This is a demand-responsive feeder service to fixed route transit that operates in five areas in San Diego and surrounding communities.

The study identified seven key themes of the best practices:

- Matching services to market needs
- Customer service and community orientation
- Low service delivery costs
- Collaborative partnerships to leverage resources and engender local ownership
- Integration with regional transit service backbone
- Flexibility to meet needs
- Entrepreneurial management with leadership of key person

3.3.6 Washington State Department of Transportation Trip Reduction Program¹

Washington State passed a commute trip reduction (CTR) law in 1991 that requires employers to monitor progress on auto work trip reduction by periodically monitoring commute behavior of their employees. The web site provides guidance on how to implement various CTR programs and how to conduct employee surveys to monitor compliance with the law.

3.3.7 National Center for Transit Research TDM

The National Center for Transit Research web site contains summaries of various TSM/TDM programs around the U.S.² It also contains a searchable database of trip reduction ordinances that can be searched according to a number of criteria including goals, city size, and impetus.

¹ <http://www.wsdot.wa.gov/TDM/CTR>

² <http://www.nctr.usf.edu/>

3.3.8 Victoria Transport Policy Institute

The Victoria Transport Policy Institute (VTPI) TDM encyclopedia is a contains a variety of information on TDM measures from other sources, including how to develop a TDM Plan, best practices, and links to other resources for TDM.¹ The following is a brief table of contents of the encyclopedia:

- Overview
- Strategies To Achieve Specific Objectives
- Best Strategies For Various Organizations and Stakeholder Groups
- TDM Strategies
 - Improved Transport Options
 - Incentives To Use Alternative Modes and Reduce Driving
 - Parking and Land Use Management
 - Policy And Institutional Reforms
- TDM Programs and Program Support
- TDM Planning and Evaluation
- Reference Information

The encyclopedia contains extensive examples and references to case studies for each of the measures discussed, plus references to original sources for further reading and data. There are, however, only a few examples cited of actual trip reductions due to various measures.

3.3.9 Work trip reduction research from University of South Florida

The National Center for Transit Research at the University of South Florida has conducted two studies of effects of TDM measures.

The Trip Reduction Impacts for Mobility Management Strategies (TRIMMS) model was developed to quantify effects of various TSM/TDM measures on trip reduction.² The model is an elasticity model that estimates changes in mode shares in response to different TDM strategies. The model is in Excel format and can be downloaded from the web site.

The Worksite Trip Reduction Model and Manual³ presents the results of an extensive empirical study of various TDM measures and their effects on worksite auto trip reduction. The study looked at commute data from 9,000 worksites in Los Angeles, Tucson, and

¹ <http://www.vtppi.org/tdm/index.php>

² Center for Transportation Research, University of South Florida. Economics of Travel Demand Management: Comparative Cost Effectiveness and Public Investment. Florida DOT Report No. FDOT BD549-26. March 2007. Available at <http://www.nctr.usf.edu/abstracts/abs77805.htm>

³ Center for Transportation Research, University of South Florida. Worksite Trip Reduction Model and Manual. Florida DOT Report No. FDOTBC137. April 2004.

Washington State and developed empirical measures of actual vehicle trip reductions due to a variety of programs including flextime, parking management, guaranteed ride home programs, and marketing of commute alternatives; separate analyses were carried out based on existing transit shares of work trips. The results of the study were used to develop a quantitative model of trip reduction in response to various TDM measures. A key feature of this model is that it is sensitive to combinations of TDM measures, explicitly accounting for reinforcing effects of different measures. The model, implemented as an Excel workbook, is freely available online.¹

3.4 Other data sources

3.4.1 Alameda employee survey

The Alameda employee survey was conducted as a web-based survey of employees in Alameda that seeks information on commute behavior and awareness of and attitudes toward alternative modes. Data collection began in early November 2010 and collection was terminated six weeks later. Over 950 usable responses were received. Results from the survey are presented in Section 4 beginning on page 33.

3.4.2 Senate Bill 375 – Research on Impacts of Transportation and Land Use-Related Policies

California Air Resources Board has commissioned a set of research papers at the University of California at Irvine and Davis to identify the effects on vehicle use and greenhouse gas emissions of key transportation and land use policies based on the scientific literature. The results of the draft U.C. research are presented in two papers for each of a number of policies: a policy brief and a more detailed technical background document for practitioners. U.C. researchers are continuing to assess additional policies.² Papers are available on the following policies:

- Parking Pricing
- Road User Pricing
- Employer-Based Trip Reduction
- Pedestrian Strategies
- Bicycle Strategies
- Telecommuting
- Voluntary Travel Behavior Change Programs
- Traffic Incident Clearance Programs

¹ http://www.nctr.usf.edu/worksite/MFrame_All.htm. The model is in the form of a neural network (NN), which is a technique for representing complex relationships where there are interactions between different policy elements. Unfortunately, neural networks do not provide easily interpretable results such as one would find in a simple regression model. And neural network models may not be easily transferable to other areas.

² <http://arb.ca.gov/cc/sb375/policies/policies.htm>

The value of these papers for this project is to provide additional insight into potential effectiveness of different TSM/TDM programs. Some of the papers (e.g., on telecommuting) provided quantitative summaries on potential trip reductions that were useful for this project; other papers either did not provide quantitative effects, or used effectiveness measures that were difficult to apply to this project (e.g., reductions in VMT).

3.5 Summary

This section has presented a summary of studies and data sources that informed the development of the citywide TSM/TDM plan. The information provided by these sources falls into following general categories:

- **Policy guidance.** The current City of Alameda Transportation Element specifies goals, policies, and objectives to which the TSM/TDM plan must conform.
- **Strategy development.** Several studies within Alameda – including the Alameda Point Transportation Strategy and the Alameda West End TSM/TDM plan - identify strategies that have been evaluated specifically for the City of Alameda. The Menlo Park TDM Guidelines and the City of South San Francisco TDM Ordinance also provide a number of strategies for consideration in the TSM/TDM plan development. The Peninsula Traffic Congestion Relief Alliance Strategic Plan is an excellent example of how goals and objectives relate to specific strategies, and how to specify measures of effectiveness for these strategies. The VTPI Encyclopedia also provides examples of numerous TSM/TDM strategies and variations on these.
- **Market segmentation and assessment.** Market segmentation is a key component of developing the TSM/TDM plan, as different strategies will appeal to different types of travelers and businesses. The Alameda Employee Survey was an important data source for segmenting the market by current mode use, workplace location, and travel behavior to and from work.
- **Evaluation of alternatives.** The two models produced by the University of South Florida can help provide quantitative assessment of the effectiveness of alternative TSM/TDM measures, both singly and in combination. The VTPI Encyclopedia contains numerous case studies with quantitative results that can be used as to further inform the cost-effectiveness of alternative TSM/TDM strategies.

4 Alameda Employee Survey

4.1 Introduction

This section presents the results from the Alameda Employee Survey. Section 4.2 discusses the survey method, responses, and processing. Section 4.3 presents the main results from the survey. The remaining sections discuss additional details including parking behavior, awareness of commute alternatives, household and person characteristics, and willingness to consider alternatives to single-occupant auto for commuting.

The survey had the following objectives:

- Determine characteristics of the current commute market for persons who work in the City of Alameda
- Gather information on employees' awareness of commute alternatives
- Assess attitudes toward commute alternatives, particularly conditions that might lead employees to consider alternatives to other modes

4.2 Survey method, responses, and processing

The survey was a web-based survey that was conducted from October 21 to December 1, 2010. A web-based survey provider – SurveyMonkey – was used to design the questionnaire and collect the results.¹

The survey questionnaire was designed to provide for automatic skipping over questions that were not relevant, based on previous answers. For example, if a person indicated that he always drove alone to work, he was not asked if he used transit. This greatly reduced the number of questions asked of any one individual participating in the survey. An important consideration throughout the survey design was minimizing the time needed to complete the survey in order to encourage a high response rate. The median time for completing the survey was less than seven minutes; more than three-quarters of the respondents completed the survey in less than ten minutes.

The survey questionnaire went through several rounds of review and pilot testing by City staff for clarity and ease of completion.

The City of Alameda sent out a flyer and an e-mail to Alameda business informing them of the survey: its purpose and the information being sought from employees. City staff also telephoned and met with business groups to further publicize the survey. Employers were requested to e-mail their employees to ask them to participate in the survey; the e-mail contained a link to the survey web site.

¹ <http://www.surveymonkey.com/>

The survey was fielded on 21 October 2010. There were about 400 responses within the first week. After several weeks, the City sent out a reminder to employers that asked them to remind their employees to respond to the survey. This resulted in a further increase in responses. Figure 4.1 shows the cumulative number of responses over time; 955 responses (954 of which were usable) were received.¹

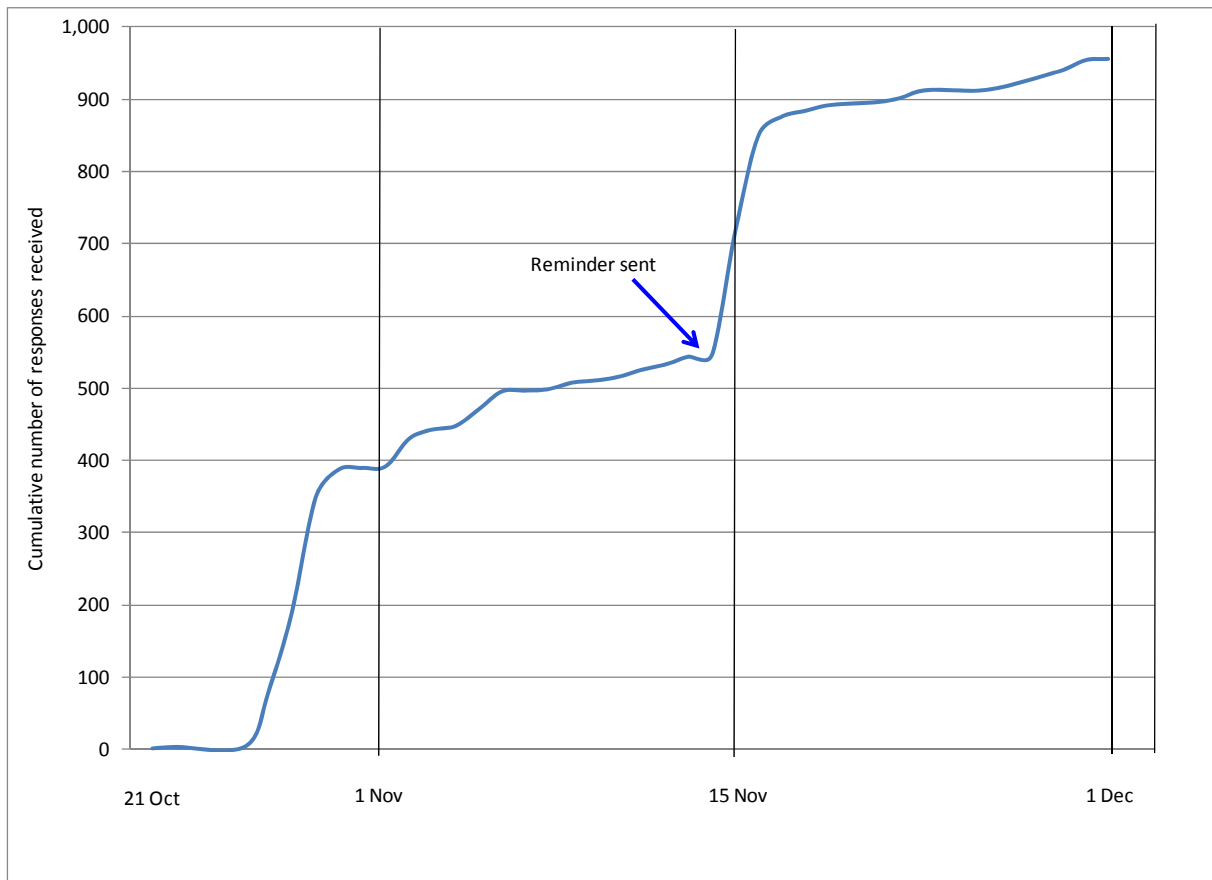


Figure 4.1 Cumulative number of survey responses received by date

Survey data were edited and formatted for input to SPSS². The major edits were the following:

- Home ZIP codes were not provided in a readable format for some responses. In some cases, only the city was provided. For those cases where home ZIP code was not provided, a ZIP code was inferred from the street address or the city.
- Respondents were asked to list their employer. In a number of cases the same employer was listed several different ways (e.g., Alameda Municipal Power, AMP, City of Alameda Municipal Power). Responses were edited so that there was a unique name for each employer.

¹ One respondent indicated that he was retired. This response was deleted from the survey.

² SPSS refers to Statistical Package for the Social Sciences, a software tool for analyzing surveys.

- Missing values were coded two ways:
 - Missing because question was not asked. The survey questionnaire was designed to skip over inappropriate questions. For example, if a respondent indicated that he used transit, that person was not asked the question about which conditions would cause him to consider transit.
 - Missing because of nonresponse.

4.3 Survey results

4.3.1 Work schedule

Employees were asked to provide their usual arrival and departure times at the workplace. Table 4.1 shows the distribution of respondents' arrival and departure times at the workplace. The modal arrival time is 8:00 – 9:00 AM and the modal departure time is 5:00 – 6:00 PM. But less than one-fourth of the respondents indicated they both arrive and leave at the modal times. A more accurate description for purposes of segmenting the commute market would be to say that nearly three-quarters of the respondents responded that they both arrive between 7:00 AM and 10:00 AM and leave between 4:00 PM and 7:00 PM (area outlined by bold rectangle in Table 4.1).

Time arrive at work	Time leave work					Total
	3 – 4 pm	4 – 5 pm	5 – 6 pm	6 – 7 pm	Other time	
6 – 7 am	2.6	1.7	1.5	0.4	0.9	7.1
7 – 8 am	1.4	9.0	9.3	2.6	1.7	24.0
8 – 9 am	1.1	5.7	22.6	8.9	2.6	40.8
9 – 10 am	0.5	1.0	7.8	6.8	2.6	18.7
Other time	0.4	1.2	0.9	0.9	6.0	9.4
Total	6.0	18.6	42.0	19.5	13.8	100.0

Entries indicate percent of respondents who arrive at and leave work at the indicated times; for example, 22.6% of the respondents replied that they arrive at work 8 – 9 AM and leave work 5 – 6 PM. Highlighted values indicate the modal (highest percentage) values in the table, rows, and columns. Area bordered by bold rectangle comprises combination of arrival and departure times for 73.7% of respondents.

Table 4.1 Usual arrival and departure times at workplace

About 58% of respondents replied that their work schedules were at least somewhat flexible (Table 4.2). Of those, about half indicated that they could vary their work schedule by more than 30 minutes (Table 4.3).

Work hours flexible?	% of respondents
Completely flexible	9
Somewhat flexible	49
Not flexible	42
Total	100

Table 4.2. Degree of work hour flexibility

	Arrive/leave early	Arrive/leave late
15 min or less	5	5
16 - 30 min	16	15
31 - 60 min	13	12
More than 1 hr, but less than 2 hr	2	2
2 hr or more	5	5
Total	40	40

Entries indicate percent of all respondents who said they could arrive/leave early or late within the indicated number of minutes.

Table 4.3. Work hour flexibility

4.3.2 Home location of respondents

Figure 4.2 shows the number of survey responses by home location. About one-third of the respondents live in Alameda. Western Alameda and Contra Costa Counties account for about another one-third of the respondents. Fewer than 10% of the respondents live in San Francisco.

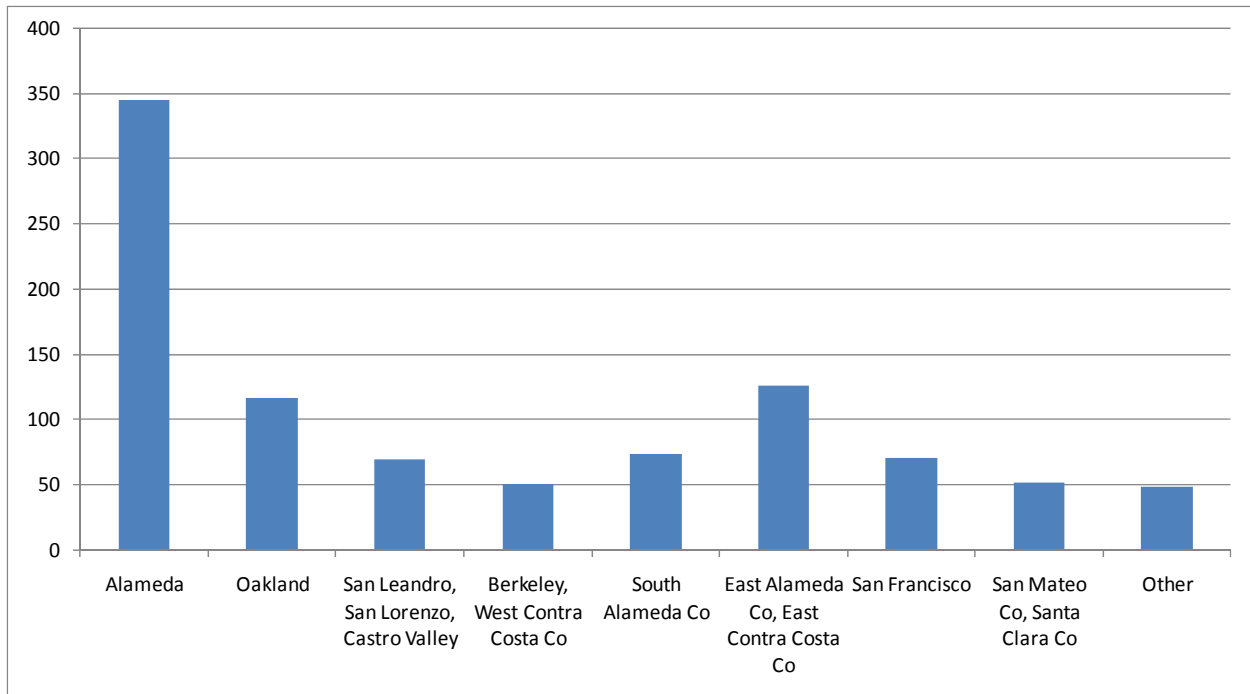


Figure 4.2. Number of survey responses by home location

4.3.3 Mode use

Figure 4.3 shows how frequently respondents said they drive alone to work in Alameda. Alameda and San Francisco residents are more likely to drive alone occasionally rather than all the time. Employees who live farther away indicate that they are more likely to drive alone every day.

Respondents who did not drive alone every day were asked about their use of other modes: whether they used these modes once a week. Table 4.4 shows the percentage of all respondents who said they carpooled, vanpooled, rode transit, telecommuted, or bicycled to work at least once a week.¹ In aggregate, less than 10% of all respondents said that they used alternatives to driving alone.

¹ The question on telecommuting asked if the person telecommuted at least once a *month*.

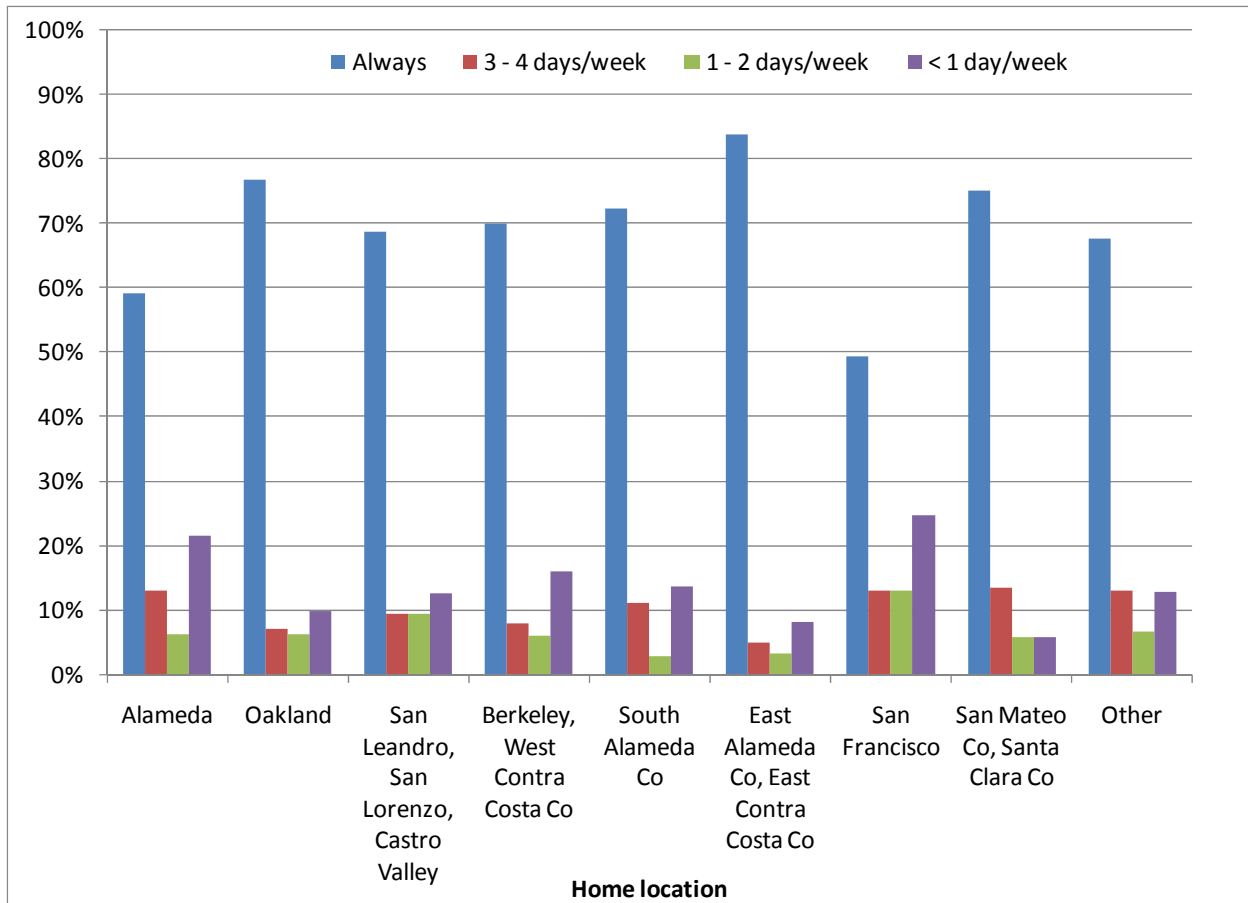


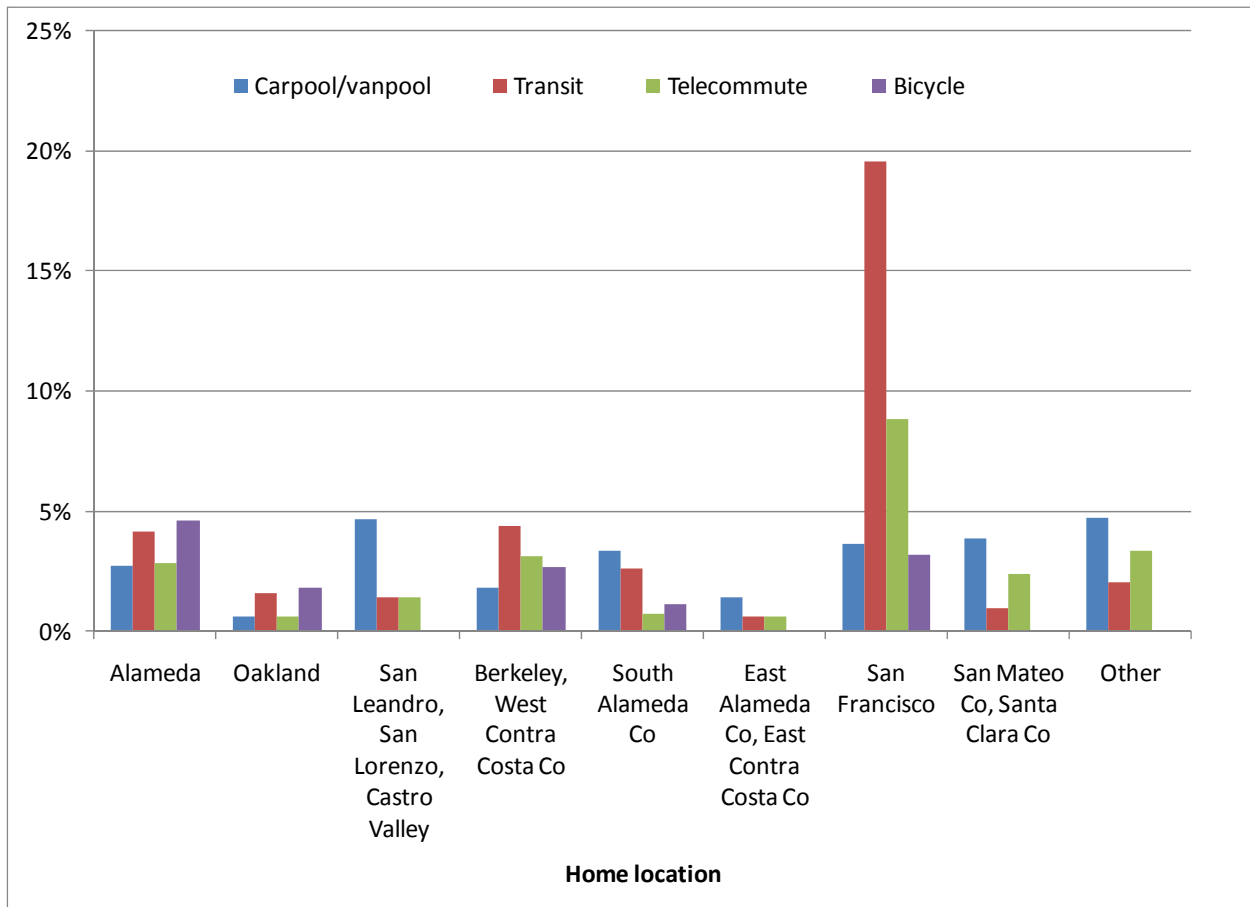
Figure 4.3. Frequency of driving alone to work by home location

Mode to work	% of respondents
Carpool/vanpool	2.5
Transit	3.0
Telecommute*	2.0
Bicycle	1.9

*Persons were asked if they telecommuted once a *month* or more

Table 4.4. Use of alternative modes at least once a week

Use of alternative modes varies considerably by home location. As shown in Figure 4.4, persons who live in San Francisco are much more likely to ride transit or telecommute to get to work. Alameda residents are more likely to bicycle than persons who live in other areas.



Percent of all respondents who use alternative modes at least once a week (once a month for telecommuting).

Figure 4.4. Use of alternatives to driving alone

Use of alternate modes is strongly related to how often employees drive to work. As shown in Figure 4.5, employees who drive alone 3 – 4 days a week are more likely to telecommute or bicycle at least one day a week rather than carpool/vanpool or use transit. Employees who drive alone less than once a week tend to be more likely to use transit or carpool rather than telecommute or bicycle.

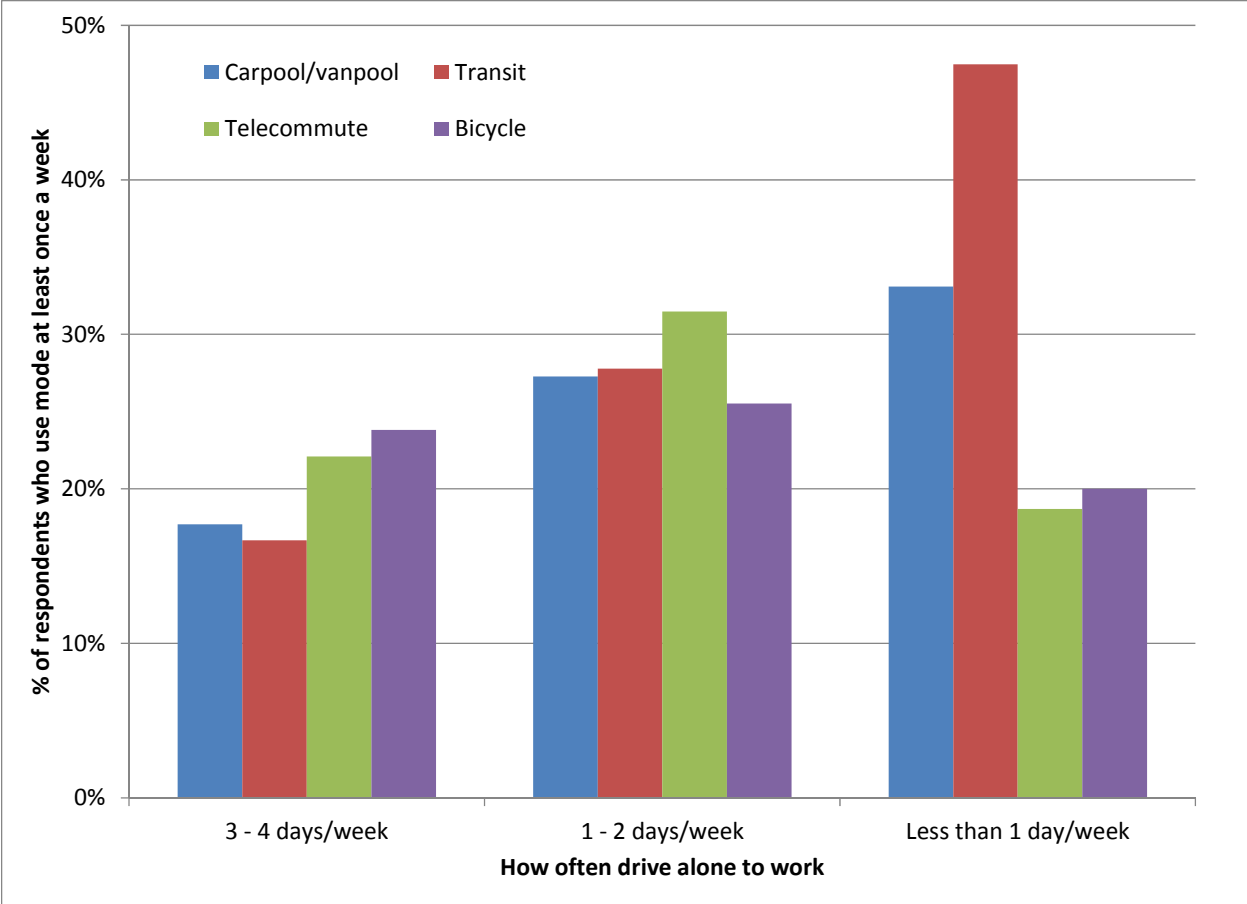


Figure 4.5. Use of alternate modes by respondents who do not drive alone every day

4.3.4 Intermediate stops on the way to/from work

Respondents who said they drove alone at least once a week were asked whether they stopped on the way to or from work and for what purpose; they were also asked if these stops were usually made. As shown in Table 4.5, more than half of all respondents said that they make a stop on the way to or from work; most stops are for personal business.

Purpose of stop on way to/from work	% of respondents
Give ride to family member	17
Work related	6
Personal business	36
Other	13
Any purpose*	57

Percentages for purposes do not add to percentage for “any purpose” because some respondents make stops for more than one purpose

Table 4.5. Stops on the way to or from work by respondents who drive alone

4.4 Parking

Respondents who drove alone or carpooled/vanpooled were asked if they paid to park. Over 95% responded that they parked for free. Over 85% of respondents who parked for free park in a lot at their workplace. Most of the remainder park on the street; a small fraction (about 1%) park on the street but move the car periodically because of parking time limits.

4.5 Awareness of commute alternatives

The survey contained several questions on awareness of commute alternatives to driving alone; responses are summarized in Table 4.6. The responses indicate that employees are aware of transit station locations at home and work, especially BART. But nearly 4 out of 5 employees indicated that they were not aware of the Guaranteed Ride Home Program, the City Car Share Program, and the 511 RideMatch Service.

Are you aware of ...	% of respondents	
	Yes	No
Nearest bus stops at home and work	77	23
Nearest BART stations at home and work	95	5
Nearest ferry terminals at home and work'	81	19
Guaranteed Ride Home Program	19	81
City Car Share Program	17	83
511 RideMatch Program	18	82

Table 4.6. Awareness of commute alternatives

4.6 Household and person characteristics

Table 4.7 summarizes characteristics of employees and their households. Three-quarters of the respondents said they had a bicycle at home. Almost all respondents live in households with cars and have a vehicle available for their own use. And over 60% of employees live in multi-worker households.

Characteristics	% of respondents
Have bicycle at home	75
Have vehicle available for own use	93
Age	
Under 25	2
25 – 44	45
45 – 64	49
65+	3
Number of vehicles at home	
None	3
1	25
2	50
3+	22
Number of workers in household	
1	38
2	50
3	8
4+	4
Children in household under driving age	31

Table 4.7. Other household and employee characteristics

4.7 Consideration of other modes

The survey included questions on whether persons who did not use an alternative to driving alone would consider using alternative modes at least once a week. The responses, shown in Figure 4.6, show that most respondents were willing to consider carpooling, transit, or telecommuting. Persons who live farther away from Alameda are, in general, more likely to consider vanpooling. Residents who live closer to Alameda are, in general, more likely to consider bicycling.

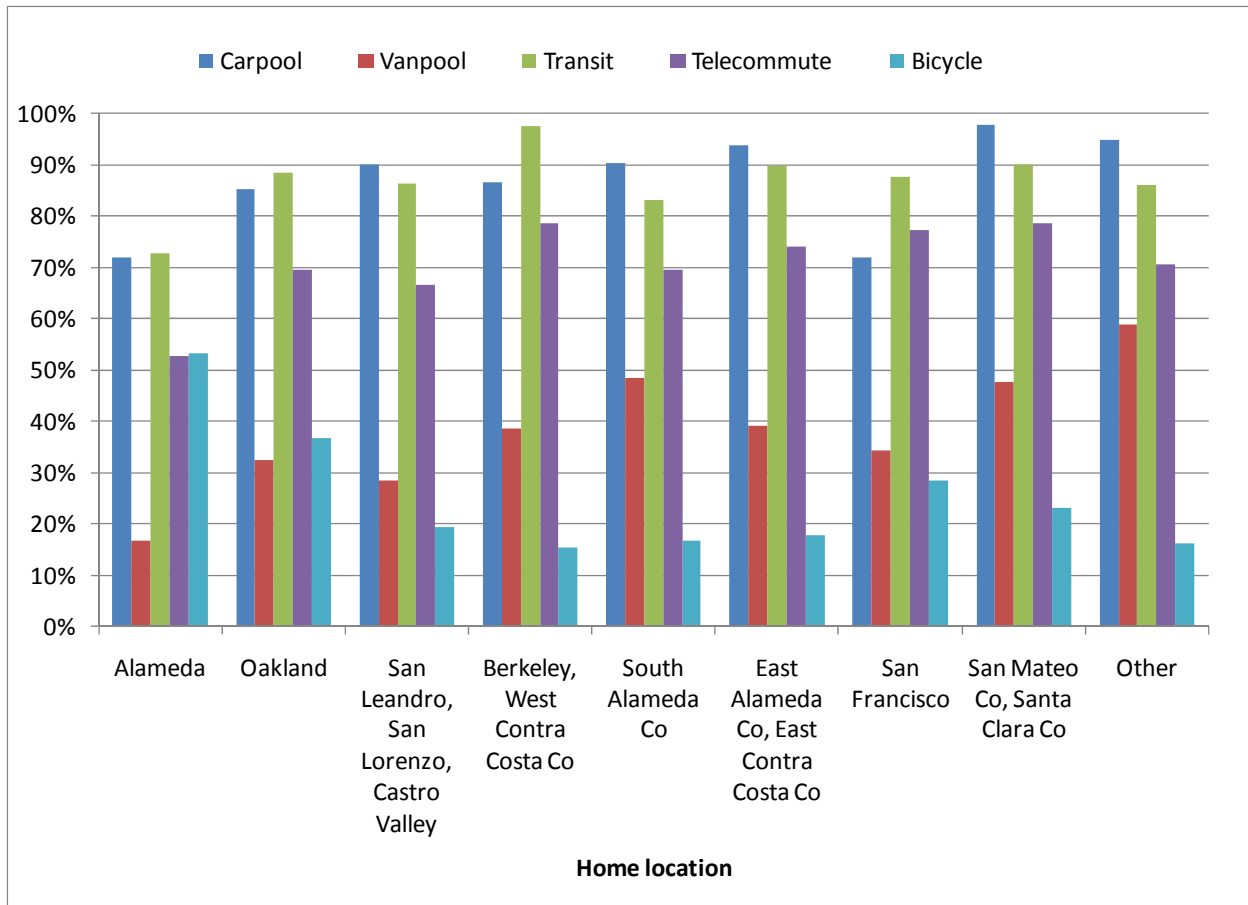


Figure 4.6. Willingness to consider using alternative modes at least once a week

Respondents were asked to indicate under what conditions they would be willing to consider using alternative modes once a week or more. The responses are shown below in Figures 6 – 10. The responses indicate that:

- The main conditions for considering **carpooling** would be if the person could ride with someone from work with the same schedule or were easy to arrange.
- The main conditions for considering **vanpooling** would be if vanpooling were easy to arrange or if the company had a vanpool program.
- The main conditions for considering using **transit** would be if transit took less time, there were a shuttle from BART to the workplace, no transfer were required, service were more frequent, or the employer subsidized the fare.
- The main conditions for considering **telecommuting** were if the employer allowed it or if the person did not have to be at the workplace.
- The main conditions for considering **bicycling** were if the person worked closer to home, there were a shower or changing area at work, or there were secure bike parking at work.

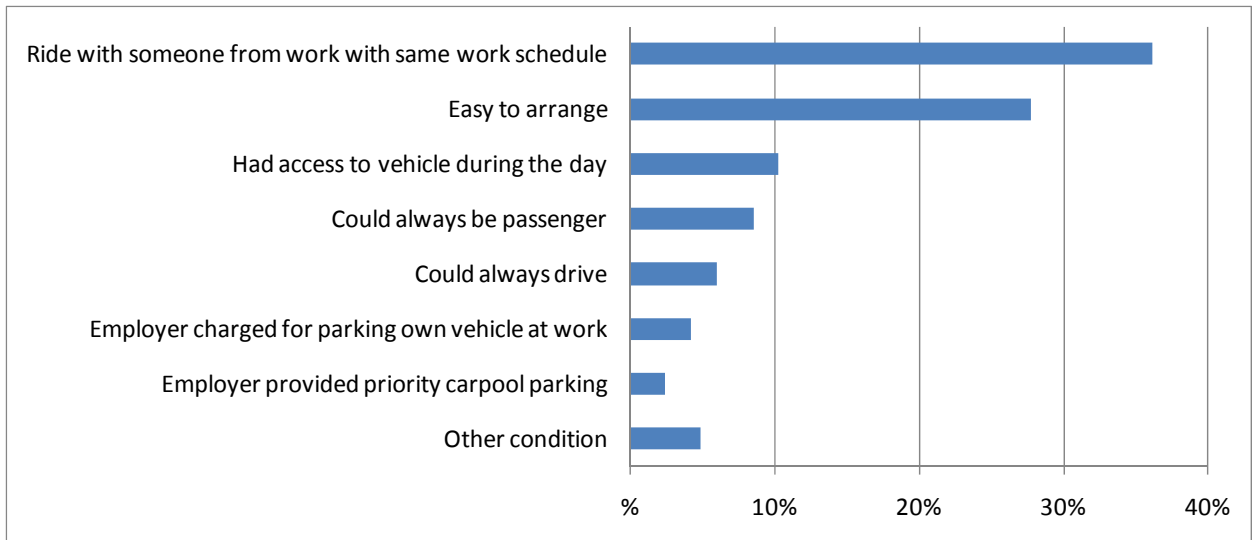


Figure 4.7. Conditions under which respondents would consider carpooling once a week or more

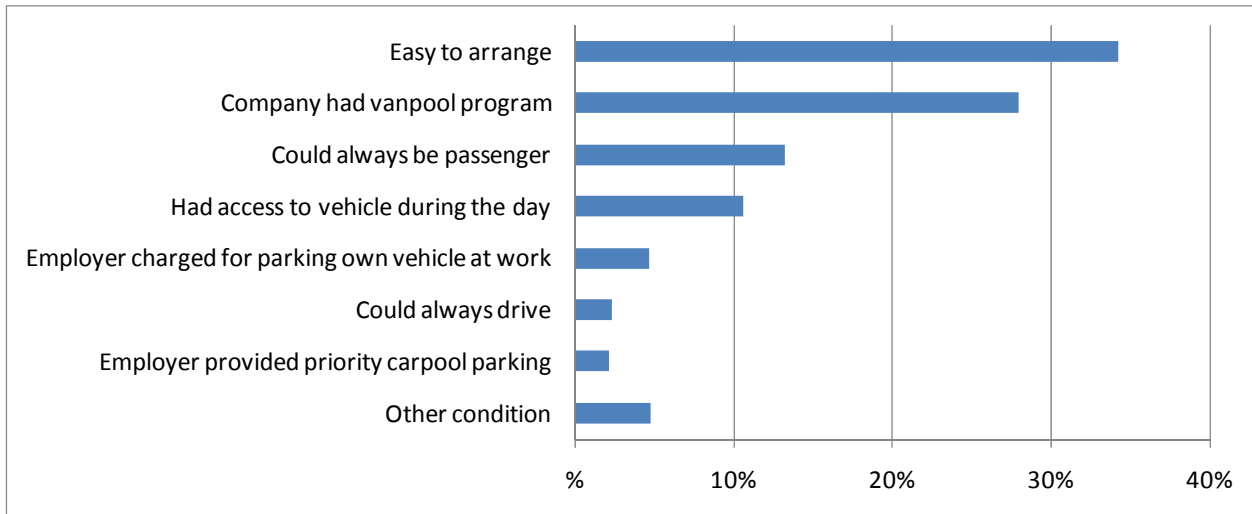


Figure 4.8. Conditions under which respondents would consider vanpooling once a week or more

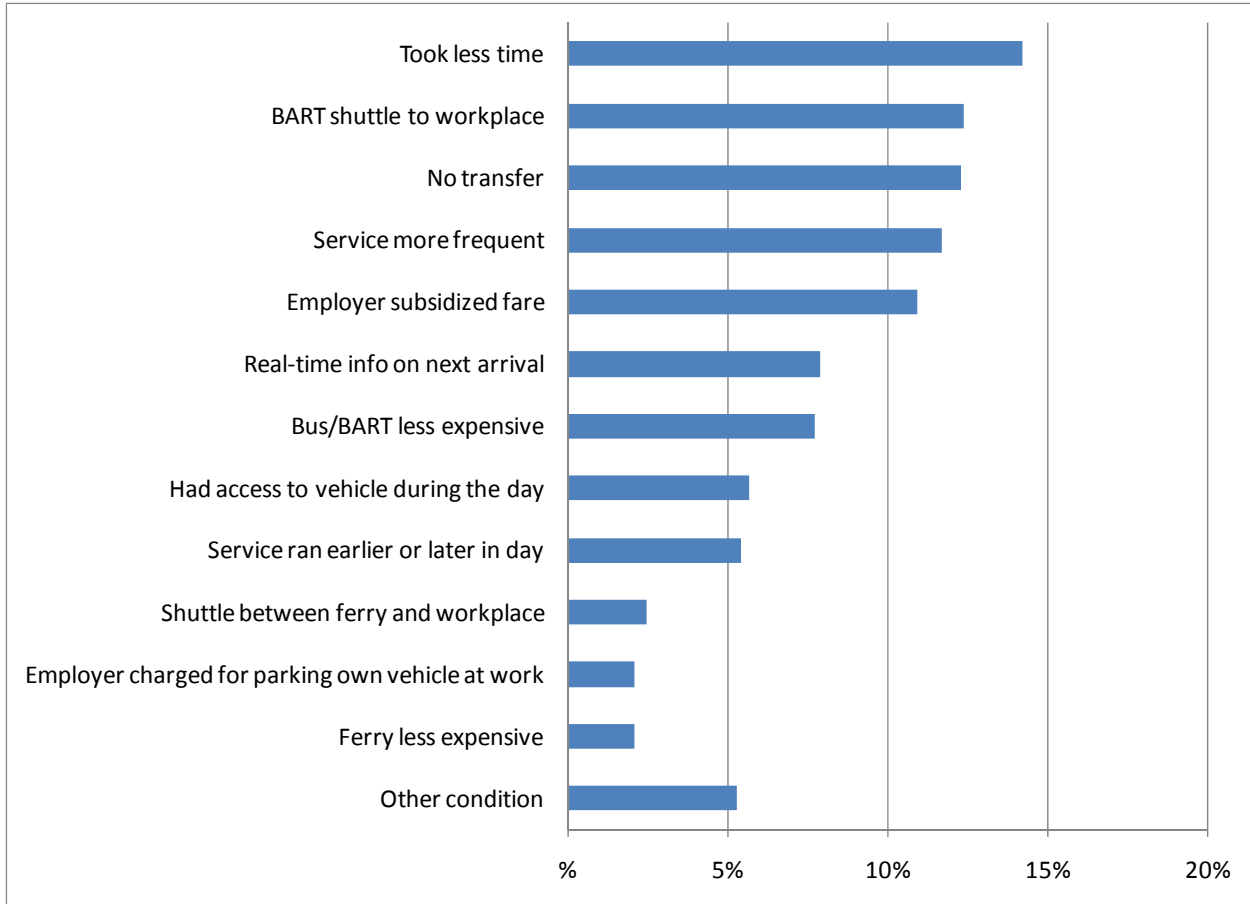


Figure 4.9. Conditions under which respondents would consider riding transit once a week or more

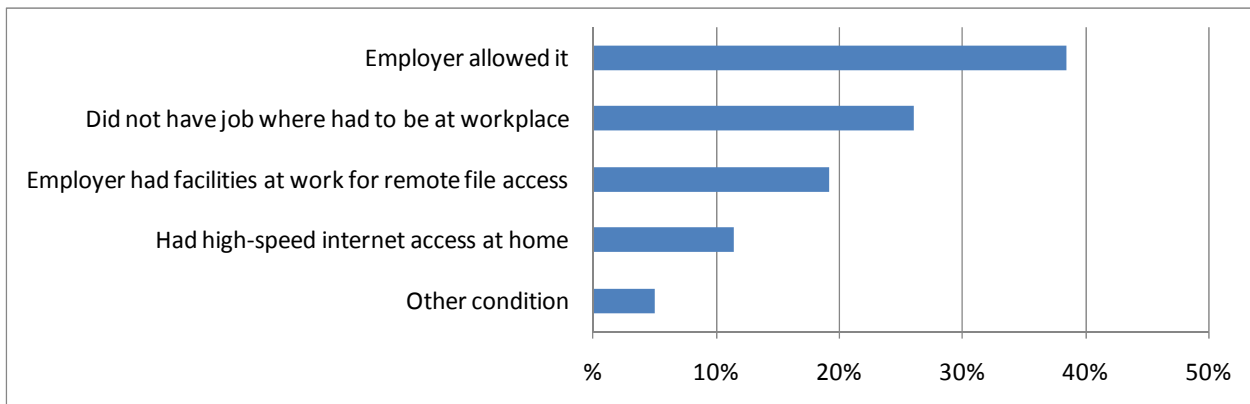


Figure 4.10. Conditions under which respondents would consider telecommuting once a week or more

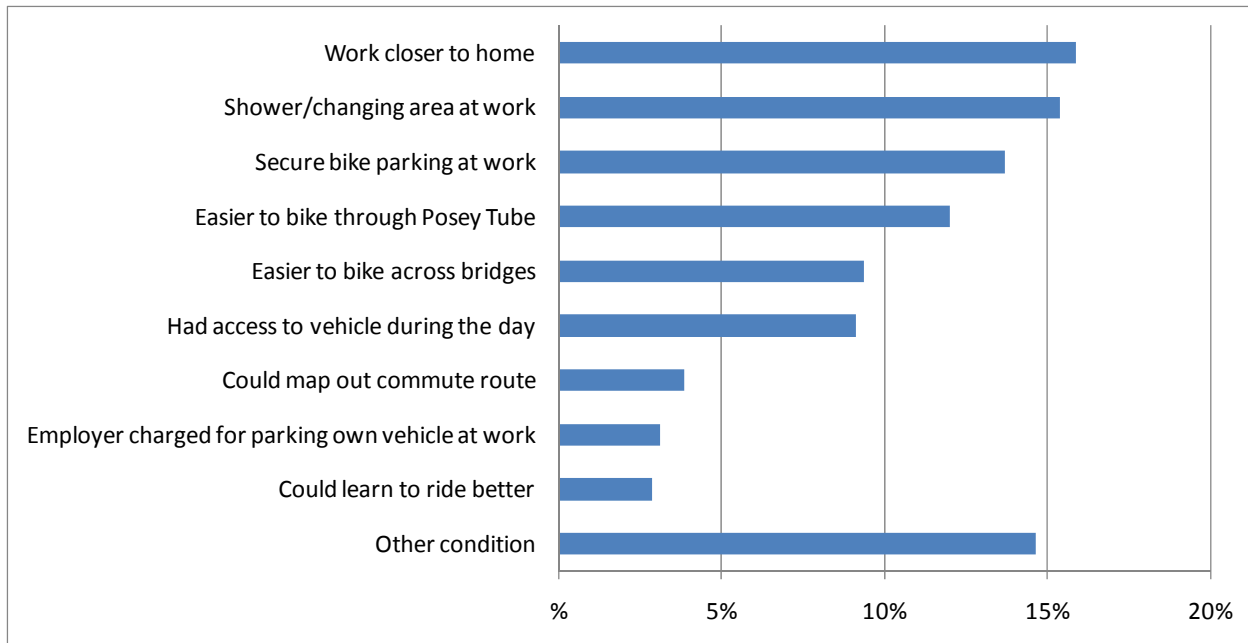


Figure 4.11. Conditions under which respondents would consider bicycling once a week or more

4.8 Comments

About one-third of the respondents had comments on their commute or on the survey; some comments were quite lengthy. City of Alameda staff tabulated the individual comments by category; a detailed summary of comments is presented in Appendix A. The following is a summary of the main results by category:

- **Driving.** A number of respondents commented that they needed their car to pick up or drop off someone on the way to or from work, or for other purposes during the day.
- **Carpooling.** Several respondents said their irregular work schedules make it difficult to carpool. Some others said they need their cars every day.
- **Transit**
 - *BART.* The most frequent comment about BART was that it takes too long. Few respondents said that BART was too expensive.
 - *Ferry.* Some respondents stated that they like the ferry service. Few others said they would like to see more ferry options, including longer hours of service.
 - *Bus.* The main comment about the bus was that it took too long. A number of respondents wanted AC Transit to restore service on lines that were

eliminated: Routes 50 and 19. More frequent service on Route 31 was suggested by some of the respondents.

- *Harbor Bay Business Shuttle.* Several respondents expressed satisfaction with the shuttle. Others expressed a wish for longer service hours in the morning, midday, and evening. Some respondents did not know about the shuttle and would like more information.
- **Telecommuting.** A number of respondents said they would like to telecommute if their employer made it available as an option.
- **Bicycling.** The largest number of comments on bicycling were those that expressed a desire for a more bike-friendly environment, particularly through the Posey Tube. Other comments had to do with concerns relating to road conditions, and lack of showers at work. Several comments were made that Alameda is a great town for bicycle riding.

4.9 Findings

The following are the main findings from the survey:

- **Work schedule.** The highest number of respondents arrive at work between 8 and 9 AM and leave work between 5 and 6 PM. But this accounts for less than one-quarter of the respondents. About three-quarters of respondents arrive at work between 7 and 10 AM and leave work between 4 and 7 PM. Hence, TSM/TDM alternatives that would address a majority of the commute market would have to be tailored to a minimum three-hour peak period in both AM and PM.
- **Commute mode.** Most respondents drive alone to work every day except for those who live in San Francisco. Except for respondents who live in San Francisco, fewer than 5% of respondents indicated that they use alternatives to driving alone at least once a week. As the frequency of driving alone decreases the use of to driving alone increases.
- **Intermediate stops on the way to or from work.** More than half of the respondents who drive alone usually stop on the way to or from work. The most frequent purpose cited was personal business. Nearly one-fifth of the respondents said they usually stop on the way to or from work to give a ride to a family member.
- **Parking.** Over 95% of respondents who said they drive park for free. Most parking is in a lot at the workplace.
- **Awareness of commute alternatives.** Most respondents said they knew the locations of bus stops and BART stations near home and work. But over four-fifths of those responding were not aware of the Guaranteed Ride Home Program, the City Car Share Program, or the 511 RideMatch Program.
- **Household and person characteristics.** Almost all respondents live in households with at least one car; 93% said they have a vehicle available for their

own use. Three-quarters have a bicycle in their household. Over three-fifths of the respondents live in multi-worker households. Nearly one-third of the respondents live in households with children under driving age.

- **Willingness to consider using other commute modes.** The majority of respondents who drive alone at least once a week indicated they were willing to consider using one or more other modes of travel for commuting. Carpooling and transit were most frequently indicated; telecommuting was also indicated frequently. More than half of those who drive alone and live in Alameda were willing to consider bicycling to work.

5 Assessment of TDM Measures

5.1 Introduction

This section presents an analysis of individual TSM/TDM measures. The analysis covers the following:

- Current transportation services and programs (Section 5.2). These services and programs provide the basis on which to develop packages of TSM/TDM measures.
- Commute market segments (Section 5.3). The effects of TSM/TDM measures will depend on characteristics of the particular market segment. Hence, market segmentation is essential to assessing potential effectiveness of these measures. This analysis uses two different market segmentations – by residence location and by workplace location – to help gain a better understanding of which measures are likely to work well.
- TSM/TDM measures (Section 5.4). This section presents TSM/TDM measures grouped by category. Where they are available, planning-level costs are provided for each measure.
- Assessment of effectiveness of TSM/TDM measures (Section 5.5). This section provides estimates of how well individual measures are likely to reduce commuting by single-occupant auto for each market segment defined in Section 4. These estimates were informed by characteristics of the commute market (Section 2) and on the results of the Alameda employee survey (Section 3) For the resident market, existing studies and analyses from other communities were used.
- Criteria for recommending TSM/TDM measures (Section 5.6). This section provides a lead-in to the recommended TSM/TDM strategies in Section 6. It defines a set of evaluation criteria by which various TSM/TDM alternatives were assessed.

This analysis informs the recommendations of strategies for the citywide TSM/TDM Plan. TSM/TDM alternatives are assessed according to how well they help achieve the goal of the TSM/TDM plan: to reduce commute travel by single-occupant auto.

Due to a limited budget for this project, the analysis was concerned primarily with persons who currently work in Alameda. The commuter market for Alameda residents who work outside the city was evaluated using available data from secondary sources. The City of Alameda will develop a separate TSM/TDM plan for Alameda Point and other larger developments that would have their Master Plans as part of the development approval (MX Zoned); where relevant, we note applicability of TSM/TDM measures to Alameda Point and other MX zoned areas in the city.¹

¹ MX zoned areas are areas that require a master plan for development.

5.2 Current services and programs

There are currently a number of existing services and programs that will serve as building blocks for development of a citywide TSM/TDM program.

5.2.1 Current transit service

AC Transit Lines

Existing AC Transit bus routes and ferry routes serving Alameda are summarized in Table 5.1. Line 51A serves as Alameda's trunk line, and provides high-frequency service between downtown Oakland and the Fruitvale BART station via Webster Street, Santa Clara Avenue and Broadway. Transit service to Marina Village, Alameda South Shore Center, and Harbor Bay is limited. In general, transit service within Alameda is oriented along the length (east-west) of the island. There is little or no cross-town (north-south) service except along Webster St. and Park Street. Some of the MX zoned developments may re-route existing or create new transit routes.

Shuttles

The Harbor Bay Business Park Association provides a shuttle service to the Harbor Bay Ferry and to the Coliseum BART station. The shuttle is funded by fees charged to Harbor Bay businesses. There are eight runs in the morning from about 6:00 a.m. to 9:00 a.m. and seven runs in the evening from 3:20 p.m. to 6:20 p.m. The shuttle operator estimates that they carry about 180 passengers per day on the service.

A new estuary Estuary shuttle Crossing Shuttle began service on 15 August 2011. The shuttle provides service from the Lake Merritt BART station to Marina Village and the College of Alameda. The shuttle is funded by the Bay Area Air Quality Management District's Transportation Fund for Clean Air Regional Fund Program with a local match coming from the City's TSM/TDM Fund. The shuttle operates in the mornings from 7 a.m. to 12:07 p.m. and in the afternoons between 3:30 p.m. and 6:30 p.m., and fits up to 12 bicycles on board the bus. As of February 2012, the ridership is at about 200 boardings per day.

Service	Location	Headway (min.)	Hours of service (approx.)
AC Transit Line 20	Dimond District, Oakland, to downtown Oakland via Fruitvale Ave., Fruitvale BART, Park St., Alameda South Shore Center, Shoreline Dr., Grand St., Otis Dr., Westline Dr., Central Ave. and Webster St.	30	5:00 AM – 12:00 AM
AC Transit Line 21	Dimond Dist. to Oakland Airport via Fruitvale Av., Fruitvale BART, Park St., Otis Dr. and Bay Farm Island.	30	6:00 AM – 9:00 PM
AC Transit Line 31	Alameda Point to MacArthur BART via W. Midway Ave., Main St., Pacific Ave./Lincoln Ave., Webster St., Atlantic Ave., Marina Village Pkwy., Webster/Posey tubes, 7 th St./8 th St., Broadway, 11 th St./12 th St., 10th St., West Oakland BART, Peralta St., Hollis St. and 40th St.	30	6:00 AM – 11:00 PM
AC Transit Line 51A	Rockridge BART to Fruitvale BART via College Ave., Broadway (Oakland), Webster St., Santa Clara Ave., Broadway (Alameda), Tilden Way and Fruitvale Ave.	10 – 12 (day)	5:00 AM – 12:30 AM
AC Transit Line O	Fruitvale BART to Transbay Temporary Terminal, San Francisco, via Fruitvale Ave., Tilden Way, Fernside Blvd., High St., Encinal Ave., Broadway, Santa Clara Ave. and Webster St.	30 peak 60 off-peak	5:00 AM – 10:00 PM WB 6:00 AM – 10:45 PM EB
AC Transit Line OX	Bay Farm Island to Transbay Temporary Terminal, San Francisco via Robert Davey Jr. Dr., Aughinbaugh Way, Mecartney Rd., Island Dr., High St., Encinal Ave. and Park St.	30	5:40 AM – 8:40 AM WB 4:15 PM – 8:30 PM EB
AC Transit Line W	Broadway & Blanding Ave., Alameda, to Transbay Temporary Terminal, San Francisco via Fernside Blvd., High St., Otis Dr., Willow St., Shoreline Dr., Grand St., Otis St., 8 th St. and Webster St.	20	5:45 AM – 9:15 AM WB 4:10 PM – 8:40 PM EB

Sources: AC Transit schedules and route descriptions. <http://www.actransit.org/>. East Bay Ferries: <http://www.eastbayferry.com/>

Table 5.1 Current transit services in Alameda

Service	Location	Headway (min.)	Hours of service (approx.)
Alameda / Oakland Ferry	Service from Jack London Square to Alameda Ferry Terminal to San Francisco	60 peak 120 off-peak	6:00 AM – 9:00 PM
Harbor Bay Ferry	Ferry service between San Francisco and Harbor Bay Isle.	<ul style="list-style-type: none"> • Three round-trip AM runs from 6:30 AM – 8:30 AM • Four round-trip PM runs from 4:30 PM to 7:30 PM. • One-hour headway between runs. 	
Estuary Crossing Shuttle	Free shuttle service between Lake Merritt BART, Marina Village, and College of Alameda	30	<ul style="list-style-type: none"> • 7:00 AM – 12:00 AM • 3:30 PM – 6:30 PM

Sources: AC Transit schedules and route descriptions. <http://www.actransit.org/>. East Bay Ferries: <http://www.eastbayferry.com/>

Table 5.1 Current transit services in Alameda (cont)

5.2.2 Guaranteed ride home

For employees who regularly commute to work by carpool, transit, walking, or biking, a guaranteed ride home program enables them to take a taxi or rental car free of charge in the event of an emergency (illness, family crisis, unscheduled overtime). Employees who work in Alameda County, and who use any alternative to driving alone to work (public transit, carpooling, vanpooling, biking, or walking) on the day of the emergency are eligible, regardless of where they live. The free taxi ride or rental car voucher is good on the day an employee uses an alternative commute mode. All Alameda County employers are eligible for the program, regardless of company size. All permanent full-time or part-time employees who live within 100 miles of their worksite are eligible. Both the employer and employee must pre-register in the program. Individual use is limited to twice a month and six times a year.

5.2.3 Car share

Commercial and residential developments can either institute a car-sharing program or allow an existing car-sharing organization to set up in their parking areas. Car-sharing is a membership-based program that allows short-term use of vehicles for hourly or mileage charges. It provides access to vehicles for people who do not regularly use a car to commute or shop. For employees who carpool, use transit, walk, or bicycle to work, it provides access to vehicles for mid-day errands or emergency needs. For residents, car-sharing can provide access to a primary or secondary vehicle on an as-needed basis. In retail areas, car-sharing can provide shoppers the opportunity to haul larger purchases on an as-needed basis due to the ample trunk space of the provided cars. Employers and residential developments can offer complimentary or subsidized car-sharing membership.

City CarShare is a non-profit organization that provides car sharing service in Alameda. Users of the service are required to join by paying an application fee and membership fees. Vehicle use is charged at \$5.50 per hour plus 40 cents per mile up to 40 miles and 10 cents per mile over 40 miles. A car must be returned to the same pod from which it was checked out.

There are currently three City Car Share pods in Alameda:

- Santa Clara Avenue east of Webster Street
- Central Avenue between Oak Street and Park Street in City parking lot
- Santa Clara Avenue east of Park Street in Bank of America parking lot

5.2.4 Parking management

There are currently several parking management programs in Alameda such as shared parking agreements between businesses in Alameda. The Alameda Municipal Code provides for these types of programs.

The West Alameda Business Association (WABA) and Park Street Business Association (PSBA) manage parking permits for workers in their districts in the City parking lots. WABA manages Lot W and PSBA manages Lot A and C. The Public Works Department pays WABA and PSBA for managing the program.

There are also parking in-lieu fees that pay for transit or bicycling improvements. These require employers to purchase EasyPass programs or bike racks as part of entitlements.

5.2.5 Bicycling and walking

The City has bicycle and pedestrian plans in place and is currently implementing them. Bicycling and walking are feasible commute alternatives for persons who live and work in Alameda because of the physical environment (lack of grades) and an increasing network of bicycle paths.

5.3 Commute market segments

5.3.1 Market-based perspective

The analysis of TSM/TDM measures has been based on a *market-based* approach, where the commute market has been segmented according to characteristics that will determine the effectiveness of these measures in reducing single-occupant auto use. Assessing the effectiveness of a particular TSM/TDM measure will, therefore, depend on which market the measure is targeted at, and how well it can penetrate those markets.

5.3.2 Market segmentations

The analysis of commute patterns and employment locations suggests the following dimensions along which to segment the commute market:

- **Residence location** – segmented by whether individuals live in Alameda or not and whether the residence location has good access to transit; there is a further segment for Alameda residents who work outside the city.
- **Work location** – segmented by work location according to the four major locations for employees who work in Alameda and listed in Section 2 above, plus other locations and large development areas, which is also known as “MX zoned areas.” The “other locations” are further subdivided according to whether they are located within walking distance of a premium or exclusive transit corridor: Park Street, Santa Clara Avenue, Lincoln Avenue or Webster Street. Some of the MX zoned developments may re-route existing or create new transit routes; distance to transit is therefore the defining criterion for TSM/TDM measures for those developments.

Market segmentations and estimated market segment sizes are presented in the tables below. Current market segment size estimates are based on journey-to-work data from the American Community Survey and on transportation analysis zone employment estimates for 2007 from the Alameda General Plan Model.¹

Table 5.2 summarizes the market characteristics for residence-based market segmentation. The main criteria for segmentation include whether a person resides in Alameda or outside the city, and whether the workplace location is within Alameda or outside the city. Commuters who reside within Alameda are further segmented by whether or not their workplace location has good access to regional transit.

Table 5.3 summarizes the market characteristics for workplace-based market segmentation. Workplace segmentations are determined by employment groupings, location, and access to transit.

¹ The American Community Survey is a continuous sample survey of the US population that is intended to replace the Census long form, which was discontinued after the 2000 Census.

Residence, work locations	Characteristics	Estimated market segment size*
Alameda, work in Alameda	Transit and ridesharing together account for about 10% of the commute. Walking accounts for larger share than transit and ridesharing. Good transit service along Santa Clara Ave. between Broadway and Webster St.; limited cross-Alameda transit service between the west end and Harbor Bay. Primary commute alternatives employees said they would consider: carpooling, transit, telecommuting and bicycling.	10,000 – 13,000
Outside Alameda, work in Alameda with good access to regional transit	Transit access to Alameda via BART and bus or shuttle, AC Transit, or ferry. Limited connectivity from BART and ferry to Alameda. Limited access points via auto, which are congested during commute times. Includes nearby neighborhoods with BART stations: e.g., Oakland, Berkeley, San Leandro, Hayward, Fremont and areas of Oakland near AC Transit lines to Alameda such as West Oakland (Line 31) and the Dimond District (Lines 20 and 21). Auto parking at regional transit is limited or over capacity	10,000 – 13,000
Outside Alameda, Work in Alameda with poor or no access to regional transit	Limited access points via auto, which are congested during commute. Transit access is poor: either long travel times from home to regional transit, or transit takes too long.	4,000 – 5,000
Alameda, work outside Alameda, good access to regional transit	Live in Alameda, work outside Alameda near regional transit (e.g., one-half mile as a pedestrian) such as in San Francisco or downtown Oakland	N/A
Alameda, work outside Alameda, poor or no access to regional transit	Live in Alameda, work outside Alameda where transit access is poor (e.g., greater than one-half mile as a pedestrian).	N/A

* Estimated market segment size based on PUMS/ACS 2005 – 2007 and Alameda General Plan Model transportation analysis zone employment estimates for 2007.

Table 5.2 Residence-based commute market segmentation

Work location	Characteristics	Estimated market segment size*
Marina Village, Webster Street	Main freeway access is through the Posey/Webster Tubes, which are congested during morning commute leaving Alameda and due to incidents. Bus service runs primarily along Webster St.; limited bus service along Marina Village Pkwy. Connections to BART via AC Transit Lines 20, 31, and 51A.	6,500 – 7,000
Park Street Business District	Access freeway from Park Street, Miller Sweeney (Fruitvale) and High Street bridges. Regional transit connections to Fruitvale BART via AC Transit Lines 20, 21 and 51A. Access to service along length of island (AC Transit Lines O and 51A); limited service across southern end of island via AC Transit Lines W, 20 and 21.	6,500 – 7,000
Harbor Bay	Access from Bay Farm Island. Limited connections to BART via AC Transit Line 21. Harbor Bay development provides a shuttle funded by businesses.	5,000 – 5,500
Southeast/ Alameda South Shore Center area	Access freeway from Park Street and Miller Sweeney, and High Street bridges and Bay Farm Island. Limited transit connections to Fruitvale BART via AC Transit Lines 20 and 21. Frequent north-south transit service exists along Park Street.	2,000 – 2,500
Other, near transit	Other existing areas other than above locations. Within walk access distance (e.g., one-half mile) of premium or exclusive transit corridor with frequent transit service (Park Street, Webster Street, Santa Clara Avenue, and Lincoln Avenue.	2,000 – 2,500
Other, not near transit	Transit service infrequent or not easily accessible by walking (e.g., greater than one-half mile).	3,000 – 4,000

*Estimated market segment size based on current job locations.

Table 5.3 Workplace-based market segmentation

5.4 TSM/TDM measures

This section discusses the TSM/TDM measures that are being considered for the citywide TSM/TDM Plan. These measures fall under the following categories:

- Transit oriented
- Ridesharing
- Parking management
- Bike and walk
- Other measures

5.4.1 Transit measures

Transit demand is affected primarily by travel time differences between auto and transit. In particular, travelers are highly sensitive to how long it takes to access transit, waiting time, and whether or not a transfer is required (also known as *out-of-vehicle time*). Studies of travel behavior have revealed that travelers tend to value out-of-vehicle time from 2 to 7 times as much as *in-vehicle time* (time spent riding in the vehicle) when deciding whether or not to use transit. Transit schedule reliability is also significant in transit choice. Hence, the most effective transit measures are likely to be those that increase service coverage, service frequency, or reliability.

Table 5.4 presents a summary of transit measures and approximate costs.

Extend existing transit service

Due to operating budget shortfalls, AC Transit has had to reduce service throughout its service area, including service to and within Alameda. Bus services, such as the former bus connections to the Alameda Main Street ferry terminal, could be reinstated to better serve the west end of the City. This strategy would require coordination with AC Transit and the Water Emergency Transit Agency to expand and extend services within and for the City of Alameda. The goals for improving transit service are to enhance regional and inter-agency transit service connectivity. Increasing the frequency of the existing service may address the concern expressed by some survey respondents over the additional time required for transit.¹

Real-time transit information

Real-time transit information is available on AC Transit as part of 511.org. A passenger can dial into 511, state the route number and bus stop location, and hear a voice message on when the next several buses will arrive at the stop. AC Transit has also been implementing this feature through message signs at bus stops using NextBus technology.

¹ The City currently is conducting a study of enhanced bus service with various improvements such as signal coordination and pre-emption in connection with proposed new development at Alameda Point.

Measure	Description	Approx. costs
Extend existing transit service	Increase existing service frequency, hours, or coverage; Improve connections between various transit services.	\$160/revenue service hr
Real-time transit information	Informs riders when the next bus will arrive at the stop	Now implemented by AC Transit through 511
Enhanced bus	Improvements to bus movements that increase bus travel speeds such as bus rapid transit. Can include longer stop spacing or exclusive ROW	Wide variation depending on type of improvement and extent
Shuttle service between BART and workplace in Alameda	Additional shuttles to cover areas not well served by AC Transit	\$80/vehicle hr or about \$125,000/yr per vehicle for peak-period service
Shuttle service between Alameda residences and BART		
Shared-ride taxi	Allows commuters to share rides or split fares. Can also provide subscription service.	\$5 - \$10 per commute trip
AC Transit EasyPass	Extend to other employers	\$41 - \$115/yr per employee depending on number of participants and location of site
Try Transit Incentive	Free transit tickets to try transit	\$10 - \$20 per employee

Table 5.4 Transit measures

Enhanced bus service: rapid bus service (RBS)/bus rapid transit (BRT)

The City of Alameda currently is studying several alternatives for enhanced bus service including rapid bus service (RBS) and bus rapid transit (BRT). BRT with exclusive rights of way along Atlantic Avenue, Ralph Appezato Memorial Parkway (RAMP), and Webster Street (north of RAMP) is being considered for future development of Alameda Point. In addition, the City's General Plan designates Lincoln Avenue as a transit priority corridor for future BRT or RBS with shared lane operations. Depending on the type of enhanced bus service proposed, additional TSM measures, such as transit priority signals and queue jump lanes, as described below, would be included. Enhanced bus service entails a tradeoff between transit access and bus speeds, as typical stop spacing is increased from the one-quarter mile spacing of local transit service to up to one-half mile spacing.

Shuttle service between regional transit and Alameda

Shuttle services to regional transit can provide a cost-effective alternative to regular bus transit connections. There is an extensive shuttle program in San Mateo County that provides connections between workplaces and BART and Caltrain; the program has 19 shuttle routes that carry 467,000 passengers per year.¹ This program is operated as a public-private partnership. Private companies contribute from 25% to 50% of the costs. Other funding comes from a mix of Transportation Fund for Clean Air (TFCA) grants, San

¹ The Peninsula Traffic Congestion Relief Alliance. Strategic Plan. December, 2009.

Mateo County Measure A funds, and the City/County Association of Governments of San Mateo County (C/CAG) funds.

Shuttle service can be highly cost-effective compared to regular bus transit. Services provided by a private contractor typically cost about \$80 per vehicle service hour. Hence, a single shuttle vehicle that ran during the three AM peak and three PM peak hours would cost about \$125,000 per year.

Currently, the Park Street area is well-connected to BART via AC Transit Line 51A. Harbor Bay is served by an employer-provided shuttle. Marina Village and Alameda South Shore Center are served by transit, but service is not as frequent as in the Park Street area; hence, additional shuttle or bus services to these areas might be effective. Another possibility for shuttles would be to provide new service between Alameda residences and BART stations for Alameda residents who commute outside the city. MX zones are also good candidates for shuttles if AC Transit service is not available.

Shared-ride taxi service

Shared-ride taxi service can be a cost-effective means of providing a short-distance alternative to driving alone. Alameda currently has several taxi operators that could provide such a service. Rates are \$3.00 per flag drop plus \$2.60 per mile.¹ A shared-ride taxi that carried two persons a distance of two miles would cost about \$4.50 per passenger trip. There would be greater flexibility if taxis were allowed to make multiple stops and allow passengers to share fares instead of each being charged a full fare separately; but this might require a change to the City's municipal code to allow such a fare arrangement. A shared-ride taxi service was demonstrated in San Diego to provide a cost-effective feeder service to transit; the program was so successful that the transit operator subsequently took over funding the service.²

If shared-ride taxi fares were allowed, shared-ride service could be promoted by the City and employers by several methods, including the following:

- Providing taxi fare vouchers to employees as part of a parking cash-out or transit subsidy program.
- Contracting with one or more taxi companies to provide peak-period service to Alameda employees for a reduced fare.
- Instituting a priority subscription service where regular taxi riders would have pre-arranged pickup and drop-off times.

Try Transit Incentive Program

San Mateo County currently has a Try Transit Incentive Program that offers free transit tickets from transit agencies that operate in and around San Mateo County.³ The program

¹ "Flag drop" refers to the initial cost of the taxi ride.

² David Reinke, DART: Taxi Feeder Service in San Diego. UMTA Technical Assistance Program. February 1986.

³ Peninsula Traffic Congestion Relief Alliance, Strategic Plan.

is available to persons who live and work in San Mateo County who have not used public transit for the work commute. Incentives vary by employer; the following are some examples:

- Caltrain (3 round-trip tickets)
- SamTrans (6 one-way tickets)
- BART (one \$9 BART ticket)
- AC Transit Line M (6 one-way tickets)
- Dumbarton Express (6 one-way tickets)

In 2009, the program had 1,070 participants. Of those participants who responded to the follow-up survey, 83% said they would continue to use public transportation after trying transit with the free tickets.

A similar program for Alameda would be oriented toward BART and AC Transit. A convenient way to implement the program would be to provide participants with a free Clipper card that would be charged with enough fare to pay for one or more BART trips plus the fare for the AC Transit connector. The employee could then set up his own arrangement with Clipper to re-charge the card.

5.4.2 Ridesharing

Table 5.5 summarizes potential ridesharing measures. Ridesharing measures are financially attractive because Federal tax law currently allows employers to offer up to \$230 per month per employee in tax-free benefits for vanpooling subsidies.

Measure	Description	Approx. cost
Promote 511 RideMatch	Information campaign to increase awareness of ride matching and vanpool incentives	Depends on level of effort, who does promotion: 511 staff or TSM manager
Additional ridesharing incentives	<ul style="list-style-type: none"> • Employers provide gas cards to employees • Employer vanpool subsidies 	\$50 - \$300 per participant
Casual carpool	Provide formal pick-up locations for casual carpool riders to San Francisco or potentially other locations??	Cost for community outreach, locating pick-up site and promotions

Table 5.5 Ridesharing measures

Promote 511.org RideMatch

Responses to the employee survey show the following:

- One of the most frequent responses was that carpooling and vanpooling would be considered if it were easy to arrange.
- Four out of five respondents to the survey were not aware of the 511 RideMatch program.

These results indicate that a promotional campaign directed at informing employees about the availability of the 511 RideMatch program could be a highly cost-effective means of promoting ridesharing.

Additional ridesharing incentives

Over and above the existing incentives offered by 511.org, the San Mateo Peninsula Traffic Congestion Relief Alliance offers gas cards worth \$60 to commuters who pledge to carpool to work a minimum of two days per week, for an eight week period instead of driving alone.¹ Each member of the carpool is eligible for this offer. In 2009, there were a total of 1,434 commuters who received \$83,640 in gas cards for participation in carpools. In an October 2009 survey of carpool incentive participants, 97% of respondents said they planned to continue in their carpool.

For vanpools, the Alliance will pay for half of the vanpool costs for a new vanpool passenger for the first three months, up to \$100 per month. For new vanpool drivers with 7 or more vanpool participants, participants can receive a \$500 cash bonus. The Alliance provided 130 vanpool passenger incentives and 11 driver incentives for a total of \$35,781 in FY 2008/09.

As noted above, current federal tax law allows employers to offer up to \$230 per month per employee in tax-free benefits for purposes of vanpooling.

Casual carpool

Casual carpooling has been a well-used mode of travel for morning peak westbound transbay trips in the Bay Bridge corridor to downtown San Francisco. It has advantages for both riders and drivers: riders get to their destinations more quickly; drivers pay a reduced toll and are not stopped by the metering lights on the Bay Bridge. But casual carpooling works in only one direction; hence, transbay transit operators get less fare revenue in the morning peak period and have to provide sufficient service to carry returning riders during the evening peak period.

5.4.3 Parking Management

The availability and cost of parking is an essential component influencing the commute mode choice decision. Possible parking measures are listed in Table 5.6. A discussion of each measure follows the Table.

¹ Peninsula Traffic Congestion Relief Alliance, Strategic Plan.

Measure	Description	Approx. cost
Preferential carpool & vanpool parking	Reserved parking spaces nearer to work to promote ridesharing	Minor administrative and signing costs
Parking limitation	Establish maximum off-street parking requirement to be provided; or share parking between businesses	N/A
Unbundle parking charges;	Parking spaces appear as separate line item on lease; number of parking spaces and parking charges to be negotiated between lessor and lessee	Minor administrative costs to lessor and lessee
Other parking charges	Cash-out program to give employee choice of free parking or transit subsidy. Employee has choice of partially subsidized parking or free transit pass.	\$1,500 - \$3,000 per year if employee pays full cost of parking

Table 5.6. Parking measures

Preferential carpool or vanpool parking

Institutions (schools, hospitals, etc.) and commercial developments can designate preferred parking areas for employees and students who regularly carpool. This provides some incentive for ridesharing, as the preferred parking areas are typically close in to the workplace.

Parking limitation

By establishing parking maximums as part of the off-street parking requirements in zoning code, fewer parking spaces would be required with new development and more land could be devoted to other land uses or for pedestrian and bicycle facilities.

The cities of South San Francisco and Menlo Park currently have parking space credits for TSM/TDM measures

Parking pricing

Charging motorists to park decreases parking demand, which in turn reduces vehicle miles traveled, increases carpooling, and encourages access by other modes. It also properly assesses fees to the users (motorists) rather than having the cost to provide uncharged parking incorporated into goods and services purchased by the general population. By reducing parking demand, more land space can be devoted to community-enhancing land-uses and be oriented for access by pedestrians, bicyclists, and transit passengers with compact and mixed-use developments.

Over 95% of the respondents to the employee survey who drove said they parked for free; most at a parking lot at work. Employer-provided free parking is, therefore, a significant factor in the commute decision of most Alameda employees. But free parking on a typical surface lot costs about \$1,500 – \$3,000 per year plus an additional \$300 per year operating

and maintenance costs.¹ This amount works out to about \$7 – \$12 per space per day in hidden costs. Making these costs more transparent could have a significant effect on driving behavior. Hence, one possible measure for the City would be to encourage businesses to price, and unbundle parking by ordinance, incentives, or special taxes on unpriced parking.² Revenues from parking could be used to subsidize commute alternatives. Given that about 70% of Alameda employees drive to work alone, a parking pricing program would generate about \$4 million – \$5 million per year for every dollar per parking space per day charged.

5.4.4 Bicycling and Walking

Bicycling and walking to work is another commute option for consideration, particularly for those who live and work within the same census tract in Alameda. Table 5.7 presents measures to encourage and support bicycling and walking as an alternative to driving alone, and the below text describes these measures in more depth.

Measure	Description	Approx. cost
Bikeway facilities	Require that new developments implement proposed bike facilities in city's Bicycle Master Plan	\$880,000/mile for Class I path \$36,000 - \$135,000/mile for Class II lanes, assuming no need for travel lane removal \$12,000/mile for Class III routes
Bicycle support facilities	<ul style="list-style-type: none"> Showers, changing areas at work Secure bike parking at work 	Costs to building owner, lessees; depends on existing facilities
Bike sharing	Community bike	Approx. \$3,500 – \$5,000 / bicycle plus administrative costs \$2.5 M for 500-bike system
Bike racks on shuttles	Encourage biking to work by employees who use regional transit; limited to two racks per shuttle	\$500 – \$1,000 per rack
Pedestrian access	Pedestrian pushbutton at signals, improved pedestrian crossings and access to transit; education programs; island access; pedestrian districts; safe routes to schools; trails	Depends on the item: sidewalk installation: \$86 per foot; accessible pedestrian signals/countdown signals: \$20,000 per intersection; trails (Class I): \$880,000 per mile

Table 5.7. Bike and walk measures

Bikeway facilities

The Alameda Bicycle Master Plan Update (2010) identifies several high priority bikeway facilities to fill gaps in the bikeway system. These facilities can be provided by developers as part of their entitlement approvals to encourage commute and travel by bicycle

¹ Based on land cost of \$3 million – \$5 million per acre, a 6% interest rate, and current estimates of operating and maintenance costs. See Victoria Transportation Policy Institute, TDM Encyclopedia: <http://www.vtpi.org/tdm/>

² Parking cash-out refers to offering an employee who has subsidized parking a choice between a free parking space or the cash equivalent if he does not choose to park. “Unbundling” parking charges refers to changing current practice where parking is typically included as part of the office lease; unbundling parking charges would result in the cost of providing parking appearing as a separate line item in the cost of the lease, which could potentially be negotiated with the property owner.

The costs for bicycle facilities vary depending upon the type of facility and the site-specific conditions. As planning-level, order of magnitude cost estimates, the costs range from \$12,000 per mile for Class III bike routes that require signing to \$880,000 per mile for Class I bike paths.¹ These costs do not include costs for right-of-way acquisition.

Bicycle support facilities

The following bicycle support facilities can be provided to encourage commute by bicycle:

- Showers/changing areas/clothes lockers at work for cyclists: Institutions and commercial developments can provide areas to change in and out of bicycle clothing, lockers for clothing and toiletry storage, and facilities for bicyclists who would like to shower after commuting to work. If these amenities are not able to be provided on-site, complimentary or subsidized membership at a nearby gym could be substituted. The employee survey found that respondents were more willing to consider bicycling if shower or changing areas were provided at work.
- Secure bicycle parking: Commercial and multi-family developments can provide secure, convenient parking to employees and residents that protects bicycles from inclement weather. Clearly-marked and conveniently located short-term parking also can be provided to visitors. Similarly, survey respondents were more willing to consider bicycling if secure bicycle parking were provided at work.
- Bike racks on shuttles: Bike racks on buses and shuttles provide commuters with the option of accessing the BART station by bicycle; however, there is a limit of two to three bicycles allowed on the front of buses.

Bike-sharing

Bike sharing programs can be implemented as part of commercial and residential developments to provide free or low-cost bikes for short-term use. Bike sharing programs have been implemented in several cities, including Portland and Denver, and a pilot program sponsored by the Bay Area Air Quality Management District has begun in the Bay Area. Cost estimates are derived from the experience of these cities.

Pedestrian facilities

The Alameda Pedestrian Plan identifies high-priority facilities and programs to make the City more pedestrian friendly. The costs vary depending on the enhancement. Pedestrian access and circulation should be considered as part of any improvements to the street system, including the following.

- Access to transit stops
- Education programs
- Island access
- Pedestrian districts
- Safe routes to schools

¹ City of Alameda Bicycle Plan Update, Appendix G: Unit Costs Used to Provide Order-of-Magnitude Cost Estimates, November 2010.

- Improved street crossings
- Improved trails

5.4.5 Transportation System Management (TSM)

Transportation System Management (TSM) programs may reduce vehicle trips and increase vehicle occupancy, and can be an effective way to reduce the need for costly major street improvements. TSM measures draw on technology and other techniques to directly manage traffic flows, and are being used throughout Alameda County. Table 5.8 presents potential TSM measures, primarily on those that would reduce single occupancy vehicle commute travel.

Measure	Description	Approx. cost
Bus priority signals	Provide early or expanded green times for buses	Up to \$40,000 / signal plus costs for central control
Bus queue jump lanes	Allow buses to bypass queues at traffic signals	\$250,000 per lane
Traffic signal coordination	Provide for smooth flow of traffic without having to stop at signals	Depends on existing infrastructure
Incident management	Real time monitoring to provide quicker response and clearance of incidents and traveler information on incidents	Depends on existing infrastructure
HOV lanes	Exclusive travel lanes for buses and carpools	\$300/foot plus right-of-way costs

Table 5.8 Transportation system management measures

Bus priority signals

Bus priority signals provide early green or extended green times to enable the bus to minimize the time spent stopping at traffic signals. These signals are more effective on major streets with minimal cross traffic from side streets. Bus priority at traffic signals is being considered with enhanced bus/bus rapid transit as part of an on-going transit access study.

Costs would need to consider whether the existing signal controller would need to be upgraded as well as the type of vehicle detection system.

Bus queue jump lanes

Queue jump lanes for buses typically include a dedicated lane for buses at the intersection, allowing buses to avoid queues. They are frequently combined with a dedicated signal phase for the bus movement. The queue jump gives priority to buses over other vehicles. The bus queue jump provides better reliability on transit travel time, particularly during congestion peak conditions. A queue jump lane exists at the intersection of Webster Street and Stargell Avenue; the need for one at the intersection of Webster Street and Atlantic Avenue will be studied as part of the future development of Alameda Point.

Traffic signal coordination

Traffic signal coordination provides for the smooth flow of traffic along major corridors, such as Webster Street and Park Street. Traffic signal coordination benefits both buses and autos. From a TDM perspective, traffic signal coordination improves transit service operations by improving schedule adherence.

Incident management

Incident management includes detection and strategies to effectively manage congestion that could occur as a result of an incident. Strategies include special traffic-signal timing plans, changeable message signs, and Advanced Traveler Information Systems (ATIS) to provide travelers with access to real-time traffic information. These measures would be most effective in managing non-recurrent forms of congestion. Some of these newer technologies, such as adaptive signal controls, are in various stages of development.

The Webster Street SMART Corridor project extends from the intersection of Central Avenue and Webster Street to Harrison Street/7th Street in Oakland. The project, which is currently in the design phase, includes several ITS strategies, such as signal coordination, closed circuit television for traffic monitoring, transit signal priority along Webster Street, and real time information on traffic conditions.

HOV lanes

High-Occupancy Vehicle (HOV) lanes provide travel time savings for high-occupancy vehicles including vanpools, shuttles and buses. HOV lanes support rideshare and transit mode choices by providing exclusive and premium peak period lane capacity. Since most of the congestion experienced in Alameda is isolated to the estuary crossings, this option has limited applications as it may require right-of-way acquisition or removal of a travel lane.

5.4.6 Other measures

This category includes potential TSM/TDM measures that do not fall conveniently into the above categories. Table 5.9 lists other potential TSM/TDM measures considered for this study.

Measure	Description	Approx. cost
Promote Guaranteed Ride Home program	Increase awareness of Guaranteed Ride Home program as safety net	Agency staff cost for promotion + potential employer admin. costs
City CarShare Program	Increase awareness of City CarShare Program; encourage businesses to register	\$90/yr + \$15/employee \$5.50/hr + 10¢/mi
Telecommuting	Reduce commute travel by allowing employees to work from home	Software costs for installing virtual private networks (VPN)
Alternative work schedules, flextime	Allow employees to change their work schedules to travel off-peak or to better use transit	Potential administrative costs depending on company policies
Areawide TSM/TDM coordination	Coordinators promote commute alternatives, provide information, coordinate TSM/TDM programs for groups of employers Centralized coordination of TSM/TDM efforts in Alameda	\$100,000/ yr per full-time equivalent staff position
Congestion pricing	Tolling at major corridors of new development to charge for auto trips during peak hour/peak direction of travel.	Infrastructure costs depend on technology + ongoing collection costs. Implement as part of new major development.
Monitoring	Periodic surveying and other data collection to monitor effectiveness of TSM/TDM programs	\$5,000 - \$7,000 setup cost for survey plus \$4,000 - \$6,000 cost per survey for collection and analysis
Park and Ride Lots	Provide park & ride lots adjacent to AC Transit bus stops, shuttle stops and casual carpool sites.	\$6,000 - \$8,000 per space construction cost plus operating and maintenance costs..

Table 5.9 Other TSM/TDM measures

Promote guaranteed ride home program

More than four-fifths of the respondents to the employee survey said that they were not aware of the Guaranteed Ride Home Program. Hence, a promotional program to inform employees and companies about the program could be a highly cost-effective measure to encourage the use of alternate commute modes.

Car share

City CarShare, which is a non-profit organization and a separate entity from the City of Alameda, has located three City CarShare pods or parking spaces with the agency's vehicles in the City of Alameda. Over four-fifths of the survey respondents said that they were not aware of the City CarShare Program. Hence, a promotional campaign to inform Alameda employees about the program, especially those who live in Alameda, could result in additional use.¹

¹ zipcar is a national car rental service that operates in several locations in the Bay Area, including San Francisco, Oakland, Berkeley, Hayward, and Emeryville; but not in Alameda. Rates appear to be somewhat higher than those for City Car Share.

As it works now, the City CarShare Program is mostly for Alameda residents; there is some potential for use by non-residents who need a car in the middle of the day. City CarShare pod locations are convenient for persons who work downtown and on Webster Street, but are not convenient for those who work in Harbor Bay or Alameda South Shore Center. Hence, the potential market for this program currently is limited. Some changes to the City CarShare Program, which will require approval from City CarShare management, might increase the market for this option. Harbor Bay businesses have tried to expand the existing location/number to Harbor Bay but did not have the support of City CarShare. Possible changes include the following:

- Adding new pods in Alameda South Shore Center and Harbor Bay.
- Allowing vehicles checked out at one pod to be returned to any City Car Share pod.¹

Telecommuting

Employers can provide the opportunity to employees to work from home for a certain number of days per week. Although telecommuting reduces commute VMT, it can result in increases in non-commute VMT. Total percent reduction in household VMT due to telecommuting can be estimated as follows:²

$$\begin{aligned} \text{Total percent reduction in household VMT} = & \\ & \text{percent reduction in household VMT per telecommuting day} \\ & \times \text{share of workers telecommuting} \\ & \times \text{share of days telecommuters telecommute} \end{aligned}$$

Responses to the Alameda employee survey indicated that a large number of employees would consider telecommuting, but either do not have the type of job that lends itself to telecommuting, or their employer does not allow it. With the increasing availability of broadband access, telecommuting is becoming more of a managerial and organizational issue rather than a technological issue.

Alternative work schedules and flextime

Employers can offer flexible work schedules to employees so that they have the opportunity to travel to and from work during non-peak commute hours.

Areawide TSM/TDM coordination and promotion

Employers and residential developments can appoint a specific person to the task of managing their TDM program. This person would be responsible for implementing TDM strategies, tracking adherence to the TDM program, and disseminating information and guidance. The City could hire a citywide TDM coordinator, to promote, coordinate, and monitor TSM/TDM requirements and to identify modifications if required trip reductions are not realized.

¹ A similar car share program in Singapore allows users to return a car to any pod.

² Susan Handy et al., Draft Technical Background Document on Impacts of Telecommuting Based on a Review of the Empirical Literature http://www.arb.ca.gov/cc/sb375/policies/telecommuting/telecommuting_bkgd.pdf

The results of the employee survey indicate that there is a significant lack of awareness of potentially effective TSM/TDM programs that are currently in place: 511.org, RideMatch, and the Guaranteed Ride Home Program. Marketing these programs through information campaigns could be a highly cost-effective way to encourage consideration of alternative commute modes.

Congestion pricing

Congestion pricing is a means of charging motorists the full costs of the congestion they cause.¹ Ideally, it would mean charging drivers on congested facilities a toll that increases as congestion increases. Practically, congestion pricing in the U.S. has been applied primarily in the form of high-occupancy toll (HOT) lanes on freeway facilities. MTC currently has plans for an 800-mile HOT lane network in the Bay Area.² Implementation of true congestion pricing would require an extensive infrastructure for monitoring traffic on all facilities and for charging the tolls to drivers. A cordon-pricing scheme where drivers were charged to enter or exit Alameda also would require investment in tolling facilities and is not recommended for existing estuary crossings; however, it could be a viable alternative for self-contained, major new developments such as Alameda Point.

Monitoring

Monitoring is an essential part of any comprehensive TSM/TDM program. Monitoring provides information that can be used to both assess the effectiveness of individual TSM/TDM measures and to identify issues that may need addressing for a particular measure. The Peninsula Traffic Congestion Relief Alliance has conducted a number of surveys to assess the effectiveness of its TSM/TDM programs.³ Washington State passed a commute trip reduction (CTR) law in 1991 that requires employers to monitor progress on auto work trip reduction by periodically monitoring commute behavior of their employees. The web site provides guidance on how to implement various CTR programs and how to conduct employee surveys to monitor compliance with the law.⁴

The recent experience with the Alameda employment survey that is part of this project suggests that the cost of a web-based survey would be about \$5,000 – \$7,000 for initial setup plus about \$4,000 – \$6,000 for each survey deployed and analyzed. For MX zoned developments, on-going monitoring using real-time devices may be required to ensure that TDM reduction goals are met.

Park and Ride Lots

Park and ride lots would be targeted towards Alameda residents who work outside Alameda, and could help make a key transit hub more functional. Park and ride lots would have adequate supplies of secure, long-term bicycle parking and motorcycle parking and potentially could be used as a City Car Share pod.

¹ For example, see Mohring, H., “Congestion,” in Gomez-Ibanez, J. et al., eds. *Essays in Transportation Economics and Policy*. Washington: Brookings Institution Press, 1999.

² <http://www.mtc.ca.gov/planning/hov/>

³ Peninsula Traffic Congestion Relief Alliance, Strategic Plan.

⁴ <http://www.wsdot.wa.gov/TDM/CTR>

5.5 Assessment of TSM/TDM measures by market segment

While a number of the measures discussed above are applicable to all employees, the effectiveness of the measures depends to a large degree on where the employee lives or works. Based on the above discussion of TSM/TDM measures, this section presents an initial assessment of estimated effectiveness of TSM/TDM measures based on residential segmentation (Table 5.10 through Table 5.15) and workplace market segmentation (Table 5.16 through Table 5.21). Assessment criteria include the following:

- Estimated likelihood that a given measure will influence commuters to use other commute modes (i.e., other than driving alone).
- Current commute patterns in Alameda.
- Results from the Alameda employee survey on current commute behavior, willingness to consider other commute modes, and under which conditions they would be willing to consider using other commute modes.
- Past experience with implementations of TSM/TDM measures in other places.
- Current state of knowledge of travel behavior and likely behavioral responses to transportation system changes.

While many of the TSM/TDM measures cut across all markets, some are more appropriate for particular markets. In particular:

- **Transit-oriented measures.** These measures will be applicable to the approximately 85% of Alameda employees who live either in Alameda or other locations accessible to regional transit and to Alameda residents living and working near regional transit. Shuttle connectors to regional transit also have potential for serving the Alameda South Shore Center and Marina Village/Webster Street areas.
- **Ridesharing measures.** Most of these measures would be applicable to all markets.
- **Bike and walk measures.** Most of these measures would be applicable to employees who live in Alameda and Oakland and to Alameda residents who work in Alameda or Oakland.
- **Other measures.** The City Car Share program as it operates currently is appropriate primarily for Alameda residents and for those who work in the Marina Village/Webster Street and Park Street Business District areas; although suggested changes to the program could broaden the market.

Measure	Home location			
	Alameda		Outside Alameda	
	Work in Alameda	Work outside Alameda	Transit access	No transit access
Extend existing transit service	●	●	●	—
Real-time transit information	●	●	●	—
Enhanced bus	○	○	●	—
Shuttle service to BART	—	●	●	—
Shared-ride taxi	○	○	○	○
AC Transit EasyPass	●	●	●	—
Try Transit Incentive	●	●	●	—

Key to this and following tables:

- = high potential effectiveness
- = moderate potential effectiveness
- = low or no potential effectiveness
- N/A = not applicable

Table 5.10 Assessment of effectiveness by residential market segment – transit measures

Measure	Home location			
	Alameda		Outside Alameda	
	Work in Alameda	Work outside Alameda	Transit access	No transit access
Promote 511 RideMatch	●	●	●	—
Additional ridesharing incentives	○	○	○	—
Casual Carpool	—	○	—	—

Table 5.11. Assessment of effectiveness by residential market segment – ridesharing measures

Measure	Home location			
	Alameda		Outside Alameda	
	Work in Alameda	Work outside Alameda	Transit access	No transit access
Preferential carpool & vanpool parking	○	○	○	○
Parking limitation	●	●	●	●
Parking charges	●	●	●	●

Table 5.12. Assessment of effectiveness by residential market segment – parking measures

Measure	Home location			
	Alameda		Outside Alameda	
	Work in Alameda	Work outside Alameda	Transit access	No transit access
Bikeway facilities	●	○	○	—
Bicycle support facilities	●	○	○	—
Bike sharing	○	—	—	—
Bike racks on shuttles	○	—	○	—
Pedestrian improvements	○	○	—	—

Table 5.13. Assessment of effectiveness by residential market segment – bike and walk measures

Measure	Home location			
	Alameda		Outside Alameda	
	Work in Alameda	Work outside Alameda	Transit access	No transit access
Bus priority signal	○	○	○	—
Bus queue jump lane	○	○	○	—
Traffic signal coordination	○	○	○	—
Incident management	—	○	○	—
HOV lanes	○	○	○	—

Table 5.14. Assessment of effectiveness by residential market segment – TSM measures

Measure	Home location			
	Alameda		Outside Alameda	
	Work in Alameda	Work outside Alameda	Transit access	No transit access
Promote Guaranteed Ride Home program	○	○	○	○
City Car Share Program	○	—	—	—
Telecommuting	○	○	○	○
Alternative work schedules, flextime	○	○	○	○
Areawide TSM/TDM coordination	●	●	●	●
Congestion pricing	—	●	●	●
Monitoring/Modifications	○	○	○	○
Park and Ride Lots		○		

Table 5.15. Assessment of effectiveness by residential market segment – other measures

Measure	Work location						
	Marina, Webster	Park St	Harbor Bay	South-east	Other Alameda		MX zoned
					Transit access	Other	
Extend existing transit service	●	●	●	●	●	●	●
Real-time transit information	○	○	○	○	○	—	○
Enhanced bus	○	○	○	○	○	—	○
Shuttle service to BART	●	—	—	○	—	●	●
Shared-ride taxi	○	○	○	○	○	○	○
AC Transit EasyPass	●	●	—	●	●	—	●
Try Transit Incentive	○	○	○	○	○	—	○

Table 5.16. Assessment of effectiveness by workplace market segment – transit measures

Measure	Work location						
	Marina, Webster	Park St	Harbor Bay	South-east	Other Alameda		MX zoned
					Transit access	Other	
Promote 511 RideMatch	●	●	●	●	●	●	●
Additional ridesharing incentives	●	●	●	●	●	●	●
Casual carpool	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 5.17. Assessment of effectiveness by workplace market segment – ridesharing measures

Measure	Work location						
	Marina, Webster	Park St	Harbor Bay	South-east	Other Alameda		MX zoned
					Transit access	Other	
Preferential carpool & vanpool parking	○	○	○	○	○	○	○
Parking limitation	●	●	●	●	●	●	●
Parking charges	●	●	●	●	●	●	●

Table 5.18. Assessment of effectiveness by workplace market segment – parking measures

Measure	Work location						
	Marina, Webster	Park St	Harbor Bay	South-east	Other Alameda		sdMX zoned
					Transit access	Other	
Bikeway facilities	○	○	○	○	○	○	○
Bicycle support facilities	○	○	○	○	○	○	○
Bike sharing	○	○	○	○	○	○	○
Bike racks on shuttles	○	○	○	○	○	—	○
Pedestrian improvements	○	○	○	○	○	○	○

Table 5.19. Assessment of effectiveness by workplace market segment – bike and walk measures

Measure	Work location						
	Marina, Webster	Park St	Harbor Bay	South-east	Other Alameda		MX zoned
					Transit access	Other	
Bus priority signal	○	○	○	○	○	—	○
Bus queue jump lane	○	○	○	○	○	—	○
Traffic signal coordination	○	○	○	○	○	—	○
Incident management	○	○	○	○	○	—	○
HOV lanes	○	○	○	○	○	○	○

Table 5.20. Assessment of effectiveness by workplace market segment – TSM measures

Measure	Work location						
	Marina, Webster	Park St	Harbor Bay	South-east	Other Alameda		MX zoned
					Transit access	Other	
Promote Guaranteed Ride Home program	○	○	○	○	○	○	○
City CarShare Program	—	—	—	—	—	—	—
Telecommuting	○	○	○	○	○	○	○
Alternative work schedules, flextime	○	○	○	○	○	○	○
Areawide TSM/TDM coordination	●	●	●	●	●	●	●
Congestion pricing	●	●	●	●	●	●	●
Monitoring/Modifications	○	○	○	○	○	○	○

Table 5.21. Assessment of effectiveness by workplace market segment – other measures

5.6 Criteria for recommending TSM/TDM strategies

The following are the criteria for developing a recommended set of TSM/TDM measures in Chapter 6:

- **Single-occupancy vehicle trip reduction.** This criterion is the ultimate goal of the TSM/TDM plan. The effectiveness of an individual TSM/TDM measure in this regard will depend on the number of markets it can penetrate, the size of the markets, and the degree to which it can penetrate each market.
- **Reinforcement/conflict with other TSM/TDM measures.** Some measures may be much more effective when combined with others; for example, having a guaranteed ride home program in place has been shown to increase the potential for carpooling, vanpooling, and transit use.¹
- **Flexibility.** A number of conditions that influence the effectiveness of TSM/TDM measures may change over time. For example, rising fuel prices have in the past led to increasing demand for transit, which would lead to increasing demand for providing connecting service to regional transit systems. Better economic conditions lead to increasing employment, which in turn causes more work trip demand and, therefore, more congestion on streets, increasing the desirability of transit. TSM/TDM measures that can adapt to changing conditions will have a lower life-cycle cost than those that need to be terminated or replaced with other programs as conditions change.
- **Sustainability.** This criterion deals with the likelihood that a particular measure can be kept in place over time. For example, some measures such as transit and

¹ National Center for Transit Research, Center for Urban Transportation Research, University of South Florida. Worksite Trip Reduction Model and Manual. Report BC-137-41. April 2004.

shuttle operations will require continuous funding sources. Without a guaranteed, sustainable funding source it will be difficult to maintain existing and new services.

- **Potential for employer participation.** The extent to which TSM/TDM measures can succeed will depend to a large extent on the degree to which employers can partner with the City and other public agencies to promote commute alternatives.
- **Applicability to new development and existing employment.** Although the City can set conditions on new development that may include TSM/TDM alternatives, this requirement will affect only a small portion of the employees in the city.¹ TSM programs that serve all employees are much more likely to succeed. Since the City cannot retroactively set conditions on existing development, it will be necessary to persuade employers to partner with the City in implementing TSM/TDM measures.
- **Scalability to different employer sizes.** Several TSM/TDM measures – e.g., commuter benefits, employer-sponsored vanpooling, and employer participation in car sharing – may be more difficult for smaller employers to participate in due to the administrative and monetary cost. TSM/TDM programs that impose a lesser burden on smaller employers are more likely to be successful.
- **Cost per vehicle trip reduced.** This criterion is the ultimate measure of cost-effectiveness: how much must be expended versus how many vehicle trips are reduced from an economic standpoint.
- **Cost per ton of emissions reduced.** The Bay Area Air Quality Management District (BAAQMD) has a standard that the cost per ton of emissions reduced should be below \$90,000. This measure should be considered if BAAQMD is to be considered a potential funding source for one or more TSM/TDM measures.

5.7 Summary

This section has presented an analysis of potential TSM/TDM measures with respect to the markets. The results of this analysis were used to develop recommended TSM/TDM strategies for the City of Alameda, which are presented in the next section.

There are currently a number of programs and services available that can serve as building blocks for a citywide TSM/TDM Plan. These programs include:

- Existing bus and ferry service.
- Shuttle services: Harbor Bay Shuttle and the Estuary Crossing Shuttle
- Guaranteed Ride Home Program.
- 511.org RideMatch Program

¹ This excludes Alameda Point development, which is being addressed separately in another project.

The Alameda employee survey provided important information on which TSM/TDM measures are likely to be most effective. In particular:

- Most respondents said they would be willing to consider **carpooling or transit** at least once a week. Hence, carpooling and transit-oriented measures appear to be indicated for all market segments.
- The main condition under which respondents would consider using **transit** is that it take less time. Part of this perception may be due to not having taken transit, and a lack of familiarity with how long it takes compared to driving. It also indicates that improved transit service should be considered. Alameda residents indicated a need for better cross-island (east-west) transit service between the west end of Alameda and Bay Farm Island; shared-ride taxis could be a cost-effective means of providing such a service.
- One of the most cited conditions for considering **carpooling** was that it be easy to arrange. This, coupled with the lack of awareness of the 511.org RideMatch program, indicates that an information campaign to promote awareness of the service could be cost-effective.
- Most respondents would also be willing to **telecommute** at least once a week. The key conditions for considering telecommuting would be that the type of job did not require the person to be at the job site and that the employer allowed it.
- The majority of employees who live in Alameda would be willing to consider **bicycling** if there were more support facilities such as showers or secure bike parking facilities at the workplace.
- There is a significant lack of awareness of key TSM/TDM support programs such as 511.org RideMatch and the Guaranteed Ride Home Program. As stated above, an **information campaign** to promote awareness of the program could remove some of the barriers to ridesharing. And promotion of awareness of the Guaranteed Ride Program could provide further incentives to consider alternative commute modes.

6 Recommended TSM/TDM Strategies

6.1 Introduction

This section presents the recommended TSM/TDM strategies for the City of Alameda. Section 6.2 provides a recommended definition of vehicle trip reduction. Section 6.3 provides an overview of TDM program implementation. Section 6.4 presents a discussion of transportation management associations (TMAs) including considerations when forming a TMA and functions of a TMA. Section 6.5 presents a set of recommended TDM strategies for development proposal sponsors with detailed prescriptions for achieving various levels of vehicle trip reduction. Section 6.6 discusses funding considerations for TDM measures. Section 6.7 discusses monitoring of TDM programs by employers.

6.2 Recommended definition of vehicle trip reduction

For vehicle trip reduction the current language used by the City of Alameda is: “would propose feasible measures to reduce the number of peak hour trips generated by at least 10% for residential development and 30% for non-residential development.” The problem to be addressed is the reduction of peak period vehicle trips, not just “peak hour trips.” When future capacity analysis and the policies are reconsidered, peak period trips should be considered in the future. Nevertheless, since the current policies and available capacity of the tunnels and bridge crossings currently are expressed in peak one hour, the TDM program requirements in this plan also express vehicle trip reductions in the peak one hour for consistency purposes at this time.

The following definition is used in the Transit Cooperative Research Program (TCRP), a research unit of the National Academy of Sciences Report 95, Chapter 19 on TDM:

"Vehicle trip reduction (VTR), a term commonly used in both analytical studies of TDM and travel mitigation legislation, is the percentage of vehicles removed (actual, presumed, or estimated) from a site's commute traffic load. More specifically, it is the incremental reduction achieved in the vehicle trip rate, expressed as a percentage of the starting-point trip rate. Planned and apparently successful trip reductions are reported as positive VTRs. A negative VTR indicates that the travel change appears to have been an increase in the vehicle trip rate."

The above definition is easy to understand and is recommended for use in the City of Alameda. The focus of Alameda vehicle trip reduction efforts is the vehicle trip reduction on the bridge and tube crossings and the intersections in close proximity of the bridges and the tubes in the AM and PM peak hours. The existing and 2030 forecasts for these crossings are shown in Section 2.4, Table 2.6.

6.3 Overview of TDM program implementation

Successful implementation and sustainability of TDM requires a shared responsibility from the City of Alameda, existing employers, future employers, developers, AC Transit, the Water Emergency Transportation Authority, property managers, and the Alameda County Transportation Commission.

Due to the relative small size of existing employers in the City of Alameda, a transportation management association (TMA) if funded could provide the primary lead for TDM program development implementation in the City of Alameda. A good TMA provides opportunities for collaboration of all key stakeholders described above in implementing an array of TDM programs through a public/private partnership. Section 6.4 provides further detail on the potential development of TMAs in Alameda. Some development proposal sponsors will have TDM program strategy requirements. Section 6.5 provides details on five key steps for determining the requirements for an individual program sponsor:

1. Determine if the development proposal is required to address the TDM program strategies based on the City of Alameda TDM plan.
2. Determine the applicable vehicle trip reduction (VTR) requirement for the development proposal sponsor.
3. Decide if the development proposal sponsor will join the City of Alameda TMA or another TDM program approved by the City of Alameda.
4. Decide on the TDM strategies for its particular environment and circumstance to meet any applicable VTR requirements.
5. Determine if the development proposal sponsor needs to pay a TMA management fee.

Other partners in the TDM program implementation process all have an important role for effective TDM programs in the City of Alameda. Active participation by these partners would be required to achieve a citywide reduction of 10% or more. The following are some of the actions that various partners have taken or could take in the future to facilitate TDM program implementation:

6.3.1 Actions by partners

Existing Employers

- Appoint a Commute Coordinator to regularly distribute hard copy and electronic information of commute alternatives available to Alameda commuters and visitors.
- Join the TMA in Alameda described further below in Section 6.4 (in the future if a TMA is implemented)
- Distribute quarterly promotional information provided by Alameda TMA including information on ridesharing, AC Transit, and Guaranteed Ride Home Program
- Subscribe to use transit, carpool and vanpool incentives sponsored by Alameda TMA.

- Promote telecommuting and alternative work schedules that result in a net reduction of vehicle trips.
- Enable employees to use City CarShare for business appointments instead of requiring personal car.
- Implement an AC Transit EasyPass Transit Subsidy in collaboration with neighboring employers or Commuter Tax Benefit Program, described further below. This is generally applicable to larger employers of 50 or more in geographic areas within a ¼ mile of an AC Transit route.
- Bicycle parking, changing areas/showers.

Property Managers of Existing Developments

- Appoint a Commute Coordinator to represent tenants with fewer than 25 employees.
- Provide sufficient bicycle parking at multi-tenant office buildings.
- Allow commuter bicycles into offices when bicycles can be stored safely.
- Harbor Bay: Actively promote shuttle to association members.
- Consider sharing parking with multiple tenants.

City of Alameda

- Implement and administer legally enforceable elements of the Alameda Municipal Code. This includes the requirement for TDM program implementation for new development and voluntary implementation by existing businesses. Other relevant sections of the Alameda Municipal Code that have an impact on the success of TDM program implementation are land use and parking code requirements.
- Consider establishing/convening area wide TMAs. A TMA will be formed as part of the Alameda Landing project approval process. A TMA could be established when Alameda Point is developed.
- Continue to implement actions in Bicycle and Pedestrian Master Plan as funding allows.
- Pursue additional funding sources outside City funds to continue to implement the Estuary Crossing Shuttle.
- Implement the Webster Street SMART Corridor. The project extends from the intersection of Central Avenue and Webster Street to Harrison Street/7th Street in Oakland. The project, which is currently in the design phase, includes several ITS strategies, such as signal coordination, closed circuit television for traffic monitoring, transit signal priority along Webster Street, and real time information on traffic conditions.
- Implement similar SMART Corridors project along other Arterials in the City.

AC Transit

- Improve service levels and frequency of transit service. Improved service will have a very positive impact on VTR objectives. Restoration of 2009 transit service levels in the City of Alameda should be a priority and would have a very positive impact on VTR objectives. Significant comments were received in the online employee survey on problems associated with service cutbacks on Route 50 and Route 19 in particular. Transit availability is a key variable in vehicle trip reduction efforts and would most likely be necessary to achieve 20 percent vehicle trip reductions levels.

Water Emergency Transportation Authority

- Continue 2011 service levels with expansion to South San Francisco.
- Continue the bus bridges when the Alameda Ferry breaks down.

Alameda County Transportation Commission

- Continue Guaranteed Ride Home Program
- Provide discretionary funding to support transit-oriented development.
- Maintain funding levels for various transportation programs in the County.

6.3.2 Additional considerations for achieving the 30% VTR objective

The achievement of a 30% VTR is most likely only applicable to Alameda Point. The following are some additional considerations for achieving the 30% VTR objective.

Additional convenient and frequent transit service with good connections to regional services.

- A study is currently underway for exclusive rights of way along Atlantic Avenue, Ralph Appezato Memorial Parkway (RAMP), and Webster Street (north of RAMP). These streets are being considered to assist the future development of Alameda Point. The proposed transit service may be enhanced bus service or bus rapid transit depending on the outcome of the study. Implementation of this service would be required.
- A community circulator with connections to the College of Alameda and Webster Street, Park Street and the Alameda South Shore Center with 15 minute frequencies during peak times and 30 minute off-peak frequencies.

A mixed-use development with sufficient densities to support frequent and reliable transit.

- A work site or residence located in an attractive mixed use setting with good walkability, good access to transit and convenient proximity to attractions and basic services would make it easier for a commuter to make the decision to choose a non-auto trip to get to and from work.

- A mixed use setting would allow residents and commuters to walk or bicycle to local eating, shopping, or recreation activities.
- National research consistently has shown a correlation to residential and commercial density to alternative mode use when those alternative modes are safe, frequent and convenient. In particular, zoning incentives to encourage higher density will facilitate increased transit use.

Pedestrian and bicycle networks using complete street concepts as defined in the Complete Street Act of 2008.

The design of the street network needs to have a multi-modal bias to accommodate multiple modes and good access to available transit services with direct pedestrian and bicyclist linkages to regional transit hubs.

Parking restrictions and paid parking are essential to achieving high VTR objectives

The research presented earlier in this plan documents the critical importance of parking restrictions and parking pricing to the achievement of trip reduction objectives of 15 percent and above. Parking supply and pricing should be key elements of the MX Zoned development designs. Parking fees could be used to offset the costs of TDM measures.

6.4 Transportation Management Associations

6.4.1 Transportation Management Associations (TMA) Background

The first TMAs created in the early 1980s, such as the Greater Princeton TMA in New Jersey, were initiated by groups of employers that banded together to advocate for local transportation issues. Others, like the Rideshare Company in Connecticut, were formed to save money through cooperative delivery of transportation services. Some, like the Bishop Ranch Transportation Association in California, were started by developers who were required to mitigate trips as a condition of a development agreement with a local government planning agency.

The growth in TMAs over the past 20 years stems from the knowledge that business influence and resources can be more effective when collectively applied. The development of a properly conceived, efficiently operated and adequately funded TMA can be an important component of an area's efforts to address a wide variety of transportation-related problems.

6.4.2 TMA considerations

TMA considerations include the following:

1. *Transportation (meaning the business of transporting passengers, goods, materials or the like): is the organization's focus on moving people and goods?*

TMAs in Alameda should focus on the General Plan goal of reducing peak hour trips for residential trips by 10 percent and for commercial trips by 10- 30 percent depending on

the location in Alameda. The 30 percent VTR goal would be limited to MX zoned areas like Alameda Point. The focus is typically on the home-based work trip. TMAs would be focused on peak period trips for residents living in Alameda and for workers commuting to Alameda.

2. *Management (meaning the act, manner or practice of managing, handling, or controlling something): is the emphasis on taking control of the existing methods or approaches for handling transportation problems?*

Alameda has some large business parks with their own management associations. If a citywide TMA were formed, it could be the clearinghouse of information, provider of fresh marketing approaches, and coordinator of TSM and TDM efforts. The management principles should be the following:

- The recommended management style for the TMA should be one of facilitation and not one of controlling.
- Any TMA in Alameda should be a true public-private partnership. Participation in promoting commute alternatives and developing more non drive alone commute options would include the City of Alameda, private companies, developers, property managers, and business associations.
- The intent is to build on existing program efforts and to enable future developments to more easily focus their participation in a meaningful way.

3. *Association (meaning an organized body of people who have some common interest, activity or purpose in common)*

The institutional structure for the TMA will need further discussion and input from key partners. The development approval process for Alameda Point will likely result in a TMA for that sub-area of Alameda. Key partners in that project should be involved in the TMA from the outset. Many TMA start-ups have failed in the past because too much time is spent on organizing and fund-raising (including grants) in order to sustain an Executive Director. Successful TMAs have developed transportation services that members see as a direct benefit.

Membership in the TMA can be existing employers, business associations, property managers, developers, the City of Alameda and transportation service providers. Again, a primary rationale for a TMA is that TDM programs can be more effective when collectively applied. It is particularly true in Alameda where there are many small employers and existing business associations. One potential option for staffing the TMA is for the City of Alameda to establish a position to provide this function. Staffing for a TMA is normally through a private non-profit, business association, business improvement district, or a large property manager. The City of Santa Monica is an example of a city sponsored TMA.

6.4.3 Functions of a TMA

The following are key functions of a transportation management association:

Information clearinghouse

Nearly all TMAs effectively serve as providers of information to businesses on important transportation issues and options for engaging in dialogue. TMAs also provide information regarding local requirements and regulations, as well as the availability of services.

Forum for consensus building

Through its membership, the TMA serves the role of a forum for consensus building regarding the nature of the problem and steps to address it. This consensus-building role empowers the TMA membership to act effectively and as one voice.

Advocate

Many TMAs fulfill the advocacy role on behalf of the goals of the TMA for addressing transportation issues, within various venues, such as participation in local transportation planning and economic development processes. Many TMAs have developed credibility with local planning agencies, enabling TMAs to promote better long-term transportation and land use planning. TMAs that have made this a priority are often a persuasive voice in local planning, resulting in improvements in local transportation services and facilities. A Private Sector Council of the TMA could provide the advocacy role. Such a council would provide a voice to private sector interests.

Educator

TMAs can serve the role of educator to benefit a broad audience of employers, developers, public agencies and customers about the nature of transportation problems that exist in the service area, and the range of solutions and strategies that can be employed to address them. As educator, the TMA is in a good position to focus attention on the links between transportation and land use, air quality, workforce accessibility and related topics.

Service facilitator

A TMA formed in Alameda could be responsible for the following:

- Development and implementation of a TDM marketing effort. The survey and meetings with employers point to the lack of knowledge of basic TDM services such as the 511 ridematch program. The latter is probably the most cost-effective TDM strategy that the TMA can implement.
- Expansion of the car share program, with a long-term goal of pods in each employment area with electric vehicles. The ability to return cars to different pods helps to increase use.
- Sponsorship and development of a shared-ride taxi program.
- Development of an Alameda circulator shuttle to supplement and not duplicate AC Transit service. Development of a funding strategy will be the major barrier to such a service.

- Exploration of a neighborhood based AC Transit EasyPass program for neighborhoods for employees working and residents living within ½ mile of Route 51A. The College of Alameda is the existing anchor “tenant” for the program. This would require some revenue to implement and may need to be considered in conjunction with a parking pricing policy.
- Continuation of the implementation of Alameda Pedestrian and Bicycle Master Plan. Increasing the bicycle and walk mode share have significant potential for residents living and working in Alameda.
- Implementation of additional financial incentives for carpools, bicycling, and vanpools, and for transit for those not eligible for the AC Transit EasyPass program in the Route 51A corridor.
- Coordination of information and programs by the various business and development associations in Alameda.

A citywide TMA in Alameda would be desirable to support TDM efforts of both existing and future development, but funding is currently not available to support one. A TMA is part of the Alameda Landing project. Alameda Point would also be a good opportunity for a TMA as development begins to occur there.

Projects that would be subject to TDM requirements in Alameda could contribute a TMA management fee to either support a TMA for a specific development or a citywide TMA. This would be established as a city policy and implemented as part of the development approval process.

6.5 TDM strategies for development proposal sponsors

This section provides a stepwise approach to determining the TDM requirements and choices available to development proposal sponsors in the City of Alameda. There are five recommended steps to this process:

1. Determine if the development proposal is required to address the TDM program strategies based on the City of Alameda TDM plan.
2. Determine the applicable vehicle trip reduction (VTR) requirement for the development proposal sponsor.
3. Decide if the development proposal sponsor will join the City of Alameda TMA or another TDM program approved by the City of Alameda.
4. Decide on the TDM strategies for its particular environment and circumstance to meet any applicable VTR requirements.
5. Determine if a TMA management fee is applicable based on the project approval process.

1. Determine if the development proposal is required to address the TDM program strategies based on the City of Alameda TDM Plan

A project sponsor is exempt from the requirement to implement TDM program strategies if the development proposal sponsor:

- A. Is governed by the terms and conditions of an existing executed development agreement in the City of Alameda. This development proposal sponsor has no further TDM requirements.
- B. Is located in an MX zone development that will produce a separate TSM/TDM plan that will be adopted by the City of Alameda. This project sponsor will be required to implement TDM measures prescribed in the MX zone TDM development plan. Development proposals in MX zones that are not required to develop a separate TDM plan are subject to the provision of the City of Alameda TDM Plan.
- C. Is able to fully mitigate its transportation impacts.

Note that a development proposal sponsor will be expected to mitigate impacts according to requirements in the City of Alameda General Plan.

2. Determine the applicable vehicle trip reduction requirement for the development proposal sponsor

If the development proposal will not be able to mitigate its transportation impacts and is not exempt based on the criteria described in 1A, then the development proposal sponsor is responsible for implementing TDM program strategies as additional mitigations. VTR will be determined as part of the project approval. As clearly shown by the national research on VTR rates in Section 3, transit availability, parking fees, and parking restrictions are often external variables not in the control of an individual project sponsor. Outside actions by other parties such as the public sector would be needed to support greater trip reductions. Achieving VTR rates above 10 percent by a project sponsor will require public sector support to be considered during the development approval process.

3. Decide if the development proposal sponsor will join a transportation management association or another TDM program approved by City of Alameda

Section 6.4 describes the benefits of joining a TMA. If the development proposal sponsor would like to join a TMA or other TDM program approved by the City of Alameda to implement TDM strategies – as is encouraged by the City of Alameda - then a plan will be developed in collaboration with TMA staff and an annual monitoring report will be required. An annual TMA management fee for the life of the project could be negotiated with the City of Alameda. The option of a lump sum payment could also be available.

4. Decide on the TDM strategies for its particular environment and circumstance to meet any applicable VTR requirements

If the development proposal sponsor would like to implement its own TDM program, then the project sponsor must choose the TDM strategies required depending on the VTR

objective of the plan. The TDM program would be comprised of a combination of TDM strategies that can be grouped into the following categories:

- Group A - Information distribution
- Group B – TDM Program development
- Group C - Financial incentives
- Group D - Parking restrictions and parking fees

For each of the VTR objectives (5 percent, 10 percent, 15 percent, 20 percent, 30 percent), a set of TDM strategies, including requirements (shown in **bold**) and options, are presented in the subsections below.

5 percent VTR

For a **5 percent VTR**, the development proposal sponsor will implement the following Group A action:

- **Promote and distribute hard copy information quarterly to all employees (or tenants, in the case of developers) on 511 Ridematch, Guaranteed Ride Home Program, AC Transit, shuttles to regional transit, and Alameda Harbor Bay Ferry and the existing City CarShare programs.**

And one of the following two Group B actions

- Provide sufficient bicycle parking at multi-tenant office buildings.
- Allow commuter bicycles into offices when bicycles can be stored safely.

10 percent VTR

For a **10 percent VTR**, the development proposal sponsor will implement the following two (2) required Group A actions:

- **Appoint Commute Coordinator (coordinates information distribution).**
- **Attend semi-annual meeting with City of Alameda Public Works to receive updates on commute options.**

And choose two (2) additional strategies from the following Group B strategies:

- Annual monitoring reports on TDM program implementation.
- Implement a 4/10 or 9/80 work schedule for 100% of employees
- Provide opportunities for a minimum of 10% of employees the option to telecommute at least one day a week.
- Provide bicycle parking facilities for 10% of employees or a number approved by the City of Alameda that exceeds the number of bicycle parking spaces required by the City of Alameda Municipal Code.

- Join City Car Share as a “Biz Prime” member and pay for membership of a minimum of 7 employees.
- Contribute annually to a fund to support the operation of an Alameda Circulator Shuttle or a similar shuttle program. A funding agreement including the development proposal sponsor costs of at least 10 years would be required to be approved by the City of Alameda.
- Contribute annually to support a shuttle to regional transit. A funding agreement including the development proposal sponsor costs of at least 10 years would be required.
- Contribute annually to support a shuttle to a transit hub of the development proposal. A funding agreement of at least 10 years would be required.

15 percent VTR

For a **15 percent VTR**, the development proposal sponsor will need to implement three (3) TDM strategies from Group A:

- **Appoint Commute Coordinator (coordinates information distribution).**
- **Attend semi-annual meeting with City of Alameda Public Works to receive updates on commute options.**
- Promote and distribute hard copy information quarterly to all employees on 511 Ridematch, Guaranteed Ride Home Program, AC Transit, shuttles to regional transit, and Alameda Harbor Bay Ferry and the existing City CarShare programs.
- Promote and distribute information on above by quarterly email blast by project sponsor or designee.
- Co-sponsor subarea transportation fairs once a year with at least three adjacent employers in the area. Invite AC Transit, 511.org, and at least two other commute alternative service providers to attend and distribute commute alternative information. Provide refreshments to participants. Sponsor prizes/incentives of at least \$500 for participation.

And implement three (3) TDM strategies from Group B:

- **Annual monitoring reports on TDM program implementation.**
- Implement a 4/10 or 9/80 work schedule
- Provide opportunities for a minimum of 10% of employees to telecommute at least one day a week.

- Provide bicycle parking facilities for 10 percent of employees or a number approved by the City of Alameda that exceeds the number of bicycle parking spaces required by the City of Alameda Municipal Code.
- Join City Car Share as a “Biz Prime” member and pay for membership of a minimum of 7 employees.
- Contribute annually to a fund to support the operation of an Alameda Circulator Shuttle or a similar shuttle program. A funding agreement including the development proposal sponsor costs of at least 10 years would be required to be approved by the City of Alameda.
- Contribute annually to support a shuttle to regional transit. A funding agreement including the development proposal sponsor costs of at least 10 years would be required.
- Contribute annually to support a shuttle to a transit hub of the development proposal. A funding agreement of at least 10 years would be required.

and implement one (1) TDM strategy from Group C :

- Provide an AC Transit EasyPass Transit Subsidy program. The AC Transit EasyPass program provides discounted bus passes, valid at any time on all AC Transit local and transbay buses, to employers with 100 or more employees. If the development proposal sponsor will have fewer employees, then a partnership agreement with neighboring businesses, residents or the Alameda TMA will need to be established and approved by the City of Alameda.
- Implement a Commuter Tax Benefit Program or equivalent. Under Section 132(F) of federal tax code, an employer can offer its employees up to \$230 per month for qualified transit, vanpool or parking costs. Or, an employer may offer \$20 per month for bicycling costs. Full information is available at: http://rideshare.511.org/rewards/tax_benefits.aspx

And implement one (1) TDM strategy from Group D:

- Provide preferential parking for carpools and vanpools as part of off-street parking requirements.
- Per Subsection 30-7.13 of the Municipal code, the development proposal sponsor will reduce the required parking spaces for off-street parking taking into account the achievement of the VTR goals. A shared parking agreement with an adjacent business also could achieve the same objective.
- Per Subsection 30-7.6 of the Municipal Code, choose the minimum parking ratio for off-street parking and make a minimum of 25 percent of the parking spaces available for public parking.

- Unbundle parking costs for leases and charge employees for parking at market rates.

20 percent VTR

For a **20 percent VTR**, the development proposal sponsor will need to choose four (4) TDM strategies from Group A:

- **Appoint Commute Coordinator (coordinates information distribution).**
- **Attend semi-annual meeting with City of Alameda Public Works to receive updates on commute options.**
- Promote and distribute hard copy information quarterly to all employees on 511 Ridematch, Guaranteed Ride Home Program, AC Transit, shuttles to regional transit, and Alameda Harbor Bay Ferry and the existing City CarShare programs.
- Promote and distribute information on above by quarterly email blast by project sponsor or designee.
- Co-sponsor subarea transportation fairs once a year with at least three adjacent employers in the area. Invite AC Transit, 511.org, and at least two other commute alternative service providers to attend and distribute commute alternative information. Provide refreshments to participants. Sponsor prizes/incentives of at least \$500 for participation.

And four (4) TDM strategies from Group B:

- **Annual monitoring reports on TDM program implementation.**
- Implement a 4/10 or 9/80 work schedule
- Provide opportunities for a minimum of 10% of employees the option to telecommute at least one day a week.
- Provide bicycle parking facilities for 10% of employees or a number approved by the City of Alameda that exceeds the number of bicycle parking spaces required by the City of Alameda Municipal Code.
- Join City Car Share as a “Biz Prime” member and pay for membership of a minimum of 7 employees.
- Contribute annually to a fund to support the operation of an Alameda Circulator Shuttle or a similar shuttle program. A funding agreement including the development proposal sponsor costs of at least 10 years would be required to be approved by the City of Alameda.

- Contribute annually to support a shuttle to regional transit. A funding agreement including the development proposal sponsor costs of at least 10 years would be required.
- Contribute annually to support a shuttle to a transit hub of the development proposal. A funding agreement of at least 10 years would be required.

And one (1) TDM strategy from Group C:

- Provide an AC Transit EasyPass Transit Subsidy program. Applicable to employers of 100 or more employees. If the development proposal sponsor will have fewer employees, then a partnership agreement with neighboring businesses, residents or the Alameda TMA will need to be established and approved by the City of Alameda.
- Implement a Commuter Tax Benefit Program or equivalent. Under Section 132(F) of federal tax code, an employer can offer its employees up to \$230 per month for qualified transit, vanpool or parking costs. Or, an employer may offer \$20 per month for bicycling costs. Full information is available at: http://rideshare.511.org/rewards/tax_benefits.aspx

And two (2) TDM strategies from Group D:

- Provide preferential parking for carpools and vanpools as part of off-street parking requirements.
- Per Subsection 30-7.13 of the Municipal code, the development proposal sponsor will reduce the required parking spaces for off-street parking taking into account the achievement of the VTR goals. A shared parking agreement with an adjacent business also could achieve the same objective.
- Per Subsection 30-7.6 of the Municipal Code, choose the minimum parking ratio for off-street parking and make a minimum of 25 percent of the parking spaces available for public parking.
- Unbundle parking costs for leases and charge employees for parking at market rates.

30 percent VTR

For a **30 percent VTR**, the development proposal sponsor will need to choose four (4) TDM strategies from Group A:

- **Appoint Commute Coordinator (coordinates information distribution).**
- **Attend semi-annual meeting with City of Alameda Public Works to receive updates on commute options.**

- Promote and distribute hard copy information quarterly to all employees on 511 Ridematch, Guaranteed Ride Home Program, AC Transit, shuttles to regional transit, and Alameda Harbor Bay Ferry and the existing City CarShare programs.
- Promote and distribute information on above by quarterly email blast by project sponsor or designee.
- Co-sponsor subarea transportation fairs once a year with at least three adjacent employers in the area. Invite AC Transit, 511.org, and at least two other commute alternative service providers to attend and distribute commute alternative information. Provide refreshments to participants. Sponsor prizes/incentives of at least \$500 for participation.

And five (5) TDM strategies from Group B:

- **Annual monitoring reports on TDM program implementation.**
- Implement a 4/10 or 9/80 work schedule
- Provide opportunities for a minimum 10% of employees to telecommute at least one day a week.
- Provide bicycle parking facilities for 10% of employees or a number approved by the City of Alameda that exceeds the number of bicycle parking spaces required by the City of Alameda Municipal Code.
- Join City Car Share as a “Biz Prime” member and pay for membership of a minimum of 7 employees.
- Contribute annually to a fund to support the operation of an Alameda Circulator Shuttle or a similar shuttle program. A funding agreement including the development proposal sponsor costs of at least 10 years would be required to be approved by the City of Alameda.
- Contribute annually to support a shuttle to regional transit. A funding agreement including the development proposal sponsor costs of at least 10 years would be required.
- Contribute annually to support a shuttle to a transit hub of the development proposal. A funding agreement of at least 10 years would be required.

And one (1) TDM strategy from Group C:

- Provide an AC Transit EasyPass Transit Subsidy program. Applicable to employers of 100 or more employees. If the development proposal sponsor will have fewer employees, then a partnership agreement with neighboring businesses, residents or the Alameda TMA will need to be established and approved by the City of Alameda.
- Implement a Commuter Tax Benefit Program or equivalent. Under Section 132(F) of federal tax code, an employer can offer its employees up to \$230 per month for qualified transit, vanpool or parking costs. Or, an employer may offer \$20 per month

for bicycling costs. Full information is available at:
http://rideshare.511.org/rewards/tax_benefits.aspx

And three (3) TDM strategies from Group D:

- Provide preferential parking for carpools and vanpools as part of off-street parking requirements.
- Per Subsection 30-7.13 of the Municipal code, the development proposal sponsor will reduce the required parking spaces for off-street parking taking into account the achievement of the VTR goals. A shared parking agreement with an adjacent business also could achieve the same objective.
- Per Subsection 30-7.6 of the Municipal Code, choose the minimum parking ratio for off-street parking and make a minimum of 25% of the parking spaces available for public parking.
- Unbundle parking costs for leases and charge employees for parking at market rates.

5. Determine if a TMA management fee is applicable based on the project approval process

In some areas of the City of Alameda such as MX zones and special improvement districts, the City of Alameda may establish a TDM management fee to offset the costs of TDM program implementation. If the development proposal sponsor were in such an area, the development proposal sponsor would need to pay the applicable TDM management fees.

6.6 Funding considerations

This section reviews the funding consideration for a TDM program in the City of Alameda. The section starts with key funding principles, and then provides an overview of government and private funding sources used for TDM programs. Finally, the section elaborates on three key funding considerations for the City of Alameda TDM program:

1. Transportation Management Association
2. Annual and lump sum fees for the Alameda TMA
3. Alameda Circulator Shuttle

6.6.1 Funding guiding principles for TDM/TSM options

The best funding options for a TDM program reflect these attributes:

- Stable and predictable.
- Considered equitable.
- Supports TDM objectives (reduces peak-period vehicle travel, encourages shifts to more efficient modes, supports Smart Growth, etc.).

- As easy as possible to administrate.

6.6.2 Overview of funding sources for TDM and TSM program implementation

Local funds

City of Alameda funds

Existing programs

- Traffic Capacity Management Program: several TDM programs are eligible for mitigation purposes
- Conditions on development approvals/developer agreements
- Measure B discretionary grants

Potential other program used by other jurisdictions

- Special taxes: a few jurisdictions such as Portland use payroll taxes and some have formed improvement districts for TDM and transit projects.
- Property Based Business Improvement District: this is how the Emery Go Round is primarily funded.
- Parking fee or fee surcharge: Stanford funds much of its TDM program with parking fees.

Alameda County Transportation Commission funds

Existing programs (Measure B dollars are for the life of Measure B through 2022)

- Guaranteed Ride Program
- Safe Routes to Schools
- Bicycle and Pedestrian Infrastructure (\$4 million)
- Senior and Disabled Transportation Program (\$5 million)
- Transportation Fund for Clean Air – Program Manager

AC Transit

Existing programs

- Existing routes
- Real-time transit information systemwide
- EasyPass program for employers and residential areas

Proposed project

- Bus Rapid Transit or Enhanced Bus Services

Regional funds

Metropolitan Transportation Commission Programs

- Lifeline Transportation Program (parts of Alameda qualify as a community of concern)
- State Transit Assistance (limited availability)
- Proposition 1B
- Job Access Reverse Commute (5316 funding)
- 511: regional rideshare matching and vanpool incentives

Bay Area Air Quality Management District funding

- Transportation Fund for Clean Air (60% regional grants, demonstration funding – currently funds the Estuary Crossing Shuttle)
- Regional Bicycle and Pedestrian Program (County 75%, Competitive 25%)
- New initiatives under way

Regional Measure 1

Existing program

- Provides subsidy to the Alameda Ferry

Regional Measure 2

Existing programs

- Safe Routes to Transit

Water Emergency Transportation Authority

Existing program

- Provides funding to the Alameda Ferry

State funds

Caltrans

- Community Based Transportation Planning Grant (funding current TSM/TDM study)
- Partnership Planning Grant
- Safe Routes to School
- Transit planning

Other potential funding

- Safe Routes to School (Caltrans funded)

Federal funds (subject to change with Federal Reauthorization)

Congestion Mitigation and Air Quality (CMAQ)

- Eligible projects relevant to Alameda TDM (eligibility only up to 3 years, need sustainable funding source after grant)
- Pedestrian/bicycle facilities
- Traffic management/monitoring/congestion relief strategies,
- Transit (new system/service expansion or operations),
- Alternative fuel projects (including vehicle refueling infrastructure, clean fuel fleet programs and conversions),
- Telework/telecommuting programs
- Travel demand management,
- Public education and outreach activities,
- Rideshare programs,
- Establishing/contracting with transportation management associations (TMAs),
- Fare/fee subsidy programs (operating subsidies have a 3-year limit),
- HOV programs, including HOT lanes
- Experimental pilot projects
- Other transportation projects with air quality benefits.

Private funds

- Business or employee assessments: Typically tied to transportation management associations with a dues structure.
- Shuttle service employer/developer contributions: Harbor Bay Business Association pays for shuttle to Alameda Ferry and BART
- Most Caltrain and BART shuttle on Peninsula have 25% – 50% employer funding
- Private foundations: Silicon Valley Community Foundation has funded a number of TDM and smart growth initiatives in the past.
- Employer based TDM efforts

6.7 Monitoring

Monitoring is an important element of any TDM implementation. It can inform the City and employers in Alameda on the effectiveness of TDM measures and indicate where further action is needed. We recommend that businesses that wish to monitor commute behavior by their employees conduct a web-based survey at least every three years. At a minimum the survey should cover current and previous commute behavior of the employee as well as attitudes toward and awareness of alternatives to commuting by single-occupant auto

The survey questionnaire could be modeled on that used for the Alameda employee survey conducted as part of this project, with some modifications. The City should develop a survey questionnaire template that can be easily tailored to the needs of an individual company

(e.g., to account for different TDM programs in place). The following are the types of questions that should be included:

- Current home and work locations
- Previous home and work locations (“previous” referring to the time of the last survey, or three years ago).
- Current and previous commute modes. This question should allow for responses by employees who use more than one mode: e.g., persons who use transit once a week or more and use auto on the remaining days.
- Awareness of citywide or countywide commute programs such as Guaranteed Ride Home or vanpooling assistance.
- Awareness of alternative commute modes (e.g., location off bus stop nearest to work, location of BART station nearest to home, existing transit and shuttle services within Alameda)
- Awareness and use of company-sponsored TDM programs.

Those employers who are required to monitor their employees’ commute modes should be required to ensure that at least 80% of their employees complete the survey. Individual questionnaire responses and simple frequency tabulations of responses should be provided directly to the City in an electronic format such as an Excel spreadsheet.

Additional monitoring may be required for MX developments. These would include periodic traffic counts at entry and exit points; annual traffic counts during the fall or spring should be taken at a minimum of three-year intervals for these larger developments.

7 Summary and Conclusions

This report presented a transportation systems management/transportation demand (TSM/TDM) management plan for the City of Alameda.

Main findings

1. The survey of 955 employees who work in Alameda found that 95% of employees had free parking and only 9.4% used a commute alternative at least once a month. The prevalence of unrestricted and free parking for employment sites in Alameda outside of the Park Street and Webster Street areas is a major constraint to significant vehicle trip reduction (VTR) for existing development, infill development and some MX zone locations.
2. The TDM measures that will have the highest effect on VTR, such as transit availability, are not under the control of individual employers and developers. Parking restrictions and parking fees have a strong influence on VTR, but most individual employers in Alameda move into buildings where the parking conditions and pricing (mostly free as described above) have been established or provided as part of the development entitlement. This is a challenging and complex dynamic to change. There is strong market demand for commercial and retail developments with free and readily available parking. Efforts to restrict off-street parking supply can have spillover effects on neighborhood on-street parking.
3. The Alameda employee survey shows good opportunities for increasing the use of commute alternatives in the City of Alameda such as promoting existing programs and services.
4. While individual companies with at least 100 employees, with good transit availability and some parking restrictions or pricing may achieve a VTR that approaches 20% or more, the average VTR with an excellent TDM program will be closer to 10% in areas without good transit and 15% in areas with good transit. Higher levels of VTR are possible with improved local and regional transit service levels, improvements in bicycling and pedestrian infrastructure, strategic parking policies and excellent TDM program monitoring and enforcement.
5. Due to the relatively small size of the average employer in Alameda, creating additional scale of effort through a transportation management association will help maximize the potential VTR for both residential and work trips.
6. Alameda Point has the scale to plan for a 30% VTR. Site design, density, mixed use, transit availability and convenience, excellent walkability and bicycle access, parking restrictions and parking fees will all need to be considered to achieve the 30% VTR.

Conclusions

1. The objective of 30% vehicle trip reduction from commercial development in the General Plan is not feasible given the imbalance of jobs and housing, relatively segregated residential and commercial land use patterns, existing transit service availability and free and ample parking conditions at job sites in the City of Alameda. Outside of Alameda Point, a more realistic target objective would be a 10-15% VTR, depending on the location within the City of Alameda. The institutional context for the current VTR goals is presented in the next section. The basis for the conclusion that a 30% VTR for commercial development in most areas of Alameda is not feasible is based on nationwide research on TDM program effectiveness presented in Section 3 of this plan.
2. Implementation of an effective TDM program will need to be a shared responsibility of the public and private sectors for both existing and new developments.
3. A citywide TMA is recommended to coordinate all TDM program development, marketing and outreach efforts.
4. Specific TDM program requirements are recommended for development proposal sponsors based on national research on effectiveness of TDM measures.

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David Reinke, Project Manager
Alice Chen, Principal in Charge

Mobility Planners LLC

Cliff Chambers, Principal

Appendix A – Detailed summary of Alameda Employee survey comments

The following is a detailed summary of comments as tabulated by City of Alameda staff.

Appreciation of efforts

- Thank you! (total respondents = 22)
- Good luck! (total respondents = 1)

BART

- BART takes too long (total respondents = 10)
- BART is too expensive (total respondents = 4)
- Want BART extension to:
 - San Jose (total respondents = 2)
 - Peninsula (total respondents = 1)
 - Vallejo, Martinez and Tracy (total respondents = 1)
- BART takes longer but is less stressful (total respondents = 1)
- Want more parking at BART stations (total respondents = 1)
- Suggest using WageWorks through TriNet for tickets (total respondents = 1)
- Want a month pass for BART (total respondents = 1)
- Want BART to allow bicycles during commute times (total respondents = 1)

Bicycling

- Want more bicycle-friendly:
 - Tube (total respondents = 29)
 - Streets (total respondents = 14)
 - Bridges (total respondents = 4)
 - Parking (total respondents = 2)
 - Intersections/signals (total respondents = 1)
- Safety concerns (total respondents = 6)
 - More bicycle law awareness (total respondents = 2)
 - More enforcement of child helmet laws (total respondents = 1)
 - Want completely separate bike lanes as in Holland (total respondents = 1)
- Unpleasant in the winter/bad weather days (total respondents = 6)
- Poor road conditions (total respondents = 4)
 - Harbor Bay Parkway needs resurfacing (total respondents = 3)
- Alameda is a great town for bicycle riding (total respondents = 3)
- No showers at work building (total respondents = 2)
- Distance is too great (total respondents = 1)

- Difficult to cross Harbor Bay Parkway (total respondents = 1)
- Should encourage bicycle riding instead of cars (total respondents = 1)
- Make it cheaper compared to driving (total respondents = 1)
- Stop pushing riding bicycle to work (total respondents = 1)

Buses

- Buses take too long (total respondents = 25)
- Bring back Line 50 to/from Harbor Bay business park (total respondents = 16)
- Bring back Line 19 to/from Marina Village (total respondents = 11)
- Bus runs late – not reliable (total respondents = 11)
- Make it cheaper – less expensive than driving (total respondents = 6)
- Want more frequent Line 31 service (total respondents = 4)
- Want cross Alameda bus line (total respondents = 3)
- Want more security and to feel safer (total respondents = 3)
- Do not know bus schedule or how it works (total respondents = 2)
- Want more comfortable seats on buses (total respondents = 1)
- Want fewer stairs on the bus (total respondents = 1)
- Unpleasant in the winter (total respondents = 1)
- Want increased bus service, not decreased service (total respondents = 1)
- Want more kids to walk/bike to school, not parents driving (total respondents = 1)
- Want more convenient bus service to/from:
 - San Joaquin County (total respondents = 1)
 - Oakland and work (total respondents = 1)
 - North Berkeley (total respondents = 1)
 - Fremont (total respondents = 1)
 - Via High Street (total respondents = 1)
- 511.org was not too accommodating (total respondents = 1)
- EasyPass replacement card does not work; attempts communicating with AC Transit have been unsuccessful (total respondents = 1)
- Want more courteous and better informed drivers (total respondents = 1)
- Want better student bus between Alameda High School and Bay Farm Island (total respondents = 1)

Carpooling

- Irregular work schedule makes it difficult to carpool (total respondents = 9)
- Need car everyday making it difficult to carpool (total respondents = 4)
- Do not agree with carpool toll of \$2 (total respondents = 1)
- Want carpool lanes (total respondents = 1)
- Should encourage ride share/carpooling (total respondents = 1)
- Difficult to find a commuter living in Brentwood (total respondents = 1)

City CarShare

- Expand City CarShare to the Harbor Bay (total respondents = 2)

City of Alameda employees

- EasyPass – Free AC Transit bus pass program
 - Appreciate EasyPass bus pass program (total respondents = 3)
 - Provide EasyPass to City public safety employees. (total respondents = 1)
 - Want EasyPass for part-time Recreation staff (total respondents = 2)
- Want improved motorcycle parking downtown (total respondents = 3)
- Want free BART pass similar to EasyPass (total respondents = 1)
- Bike parking at City Hall is not optimum (total respondents = 1)
- Want to start work at 7 a.m. Monday through Friday (total respondents = 1)
- Appreciate free parking in the parking structure (total respondents = 1)

Driving

- Need to drive due to kid drop-off/pick-up duties (total respondents = 17)
- Need personal vehicle (total respondents = 14)
- Increase the speed limit (total respondents = 5)
- Want Tube alternative if develop Alameda Point (total respondents = 4)
- Want traffic signal detection to reduce wait at red lights (total respondents = 4)
 - Eighth Street/Constitution Way (total respondents = 1)
 - Central Avenue/Central Avenue/Sherman Street (total respondents = 1)
 - Fernside Drive at Otis Drive (total respondents = 1)
- Want traffic signal synchronization (total respondents = 4)
- Fix potholes in the road (total respondents = 2)
 - Harbor Bay Parkway off Doolittle (total respondents = 1)
- Want better traffic law enforcement (total respondents = 2)
 - Amelia Earhart Elementary School (total respondents = 1)
 - Eagle Avenue at Webster Street – pedestrian right-of-way (total respondents = 1)
 - Constitution Way at Marina Village Parkway – ped ROW (total respondents = 1)
 - Webster Street at Stargell – ped ROW (total respondents = 1)
- Difficult commute with Posey Tube, especially when it closes (total respondents = 2)
- Respond quicker to accidents in the Webster/Posey Tubes (total respondents = 2)
- Want stop sign at:
 - S. Loop Road and Harbor Bay Parkway (total respondents = 1)
 - Santa Clara Avenue and Sherman Street (total respondents = 1)
 - Fewer locations (total respondents = 1)
- Want signal at:
 - Harbor Bay Parkway and B Street (total respondents = 1)
- Change the light for the merge to Webster Street from Constitution Way when leaving town so that it is not triggered red by a car which then turns right on that red, and leaves traffic stopped at the light for many seconds (total respondents = 1)

Ferry

- Ferry is great! (total respondents = 5)
- Do not know ferry schedule or how it works (total respondents = 1)
- Want more options available:
 - Harbor Bay ferry between 4:10 p.m. and 5:20 p.m. (total respondents = 1)
 - Ferry between Harbor Bay and Redwood Shores/S. San Francisco (total respondents = 2)
 - Direct ferry between Alameda and Marin (total respondents = 1)
 - Earlier arrival in the morning to Alameda (total respondents = 1)
- Ferry is expensive (total respondents = 1)
- Get both ferry companies to accept Clipper cards (total respondents = 1)
- Drop off Alameda first, THEN Oakland (total respondents = 1)

Flextime

- If we could leave at 4 pm it would be great (total respondents = 1)

Harbor Bay Business Shuttle

- Office-park supported shuttle is great (total respondents = 5)
- Want later shuttle runs (total respondents = 5)
- Want mid-day shuttle runs (total respondents = 5)
- Want more frequent shuttle runs (total respondents = 5)
- Want Harbor Bay shuttle bus to/from the Fruitvale BART (total respondents = 4)
- Want early morning shuttle runs (total respondents = 3)
- Respondent unaware of shuttle/needs more information (total respondents = 3)
- No time savings – takes longer - compared to driving (total respondents = 3)
- Want service the day after Thanksgiving and Christmas (total respondents = 2)
- Want shuttle to stop next to Harbor Bay work location (total respondents = 2)
- Want revised schedule (total respondents = 2)
 - Employees are let out of work at 3:30pm, 2 minutes after the shuttle leaves (total respondents = 1)
 - Needs to coordinate better with the early morning BART trains (total respondents = 1)
- Want more shuttles between the Harbor Bay business park and the ferry terminal (total respondents = 1)
- No money savings compared to driving (total respondents = 1)

Motorcycles

- Want more motorcycle parking spaces (total respondents = 4)

Shuttle

- Want BART shuttle (total respondents = 7)
 - Marina Village and BART (total respondents = 3)
 - Marina Village and ferry (total respondents = 2)
- Want shuttle between Park Street and Webster Street (total respondents = 1)

Telecommuting

- Would be excellent if available through my employer (total respondents = 9)

Vanpooling

- Want vanpool to/from Oakland home (total respondents = 1)

Walking

- This survey does not ask about pedestrians (total respondents = 7)
- Improve street lighting between Grand St. and Challenger Dr. (total respondents = 1)

Miscellaneous

- Want more flexible work hours (total respondents = 4)
- Want to see Pacer Pay return (total respondents = 1)
- Trucks need their own lane or must stay in the slower lane (total respondents = 1)
- Survey should have asked about electric cars (total respondents = 1)
- There are too many independent, disjointed public transportation programs, especially for south to north bay commuters (total respondents = 1)

Appendix B – Employee survey questionnaire

(PROVIDED AS A SEPARATE DOCUMENT DUE TO LENGTH OF QUESTIONNAIRE)