

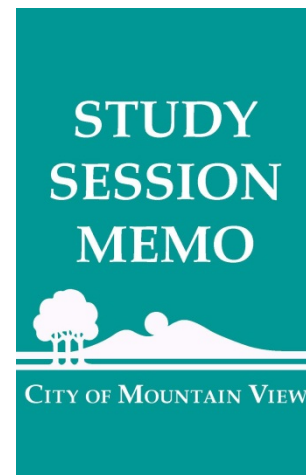
DATE: October 16, 2012

TO: Honorable Mayor and City Council

FROM: James Lightbody, Project Manager
Linda Forsberg, Transportation and Business Manager
Martin Alkire, Principal Planner
Michael A. Fuller, Public Works Director
Randal Tsuda, Community Development Director

VIA: Daniel H. Rich, City Manager

TITLE: Shoreline Regional Park Community Transportation Study Update



PURPOSE

The purpose of this Study Session is to:

1. Provide the City Council with an overview of the progress to date on the Shoreline Regional Park Community Transportation Study (Study).
2. Obtain City Council input/endorsement of the key principles that have guided the development of potential transportation improvement strategies for the Study.
3. Review and solicit City Council input regarding the preliminary list of potential transportation improvement strategies identified as part of the Study, indicating which, if any, strategies should be removed from further consideration, or if any other strategies should be added to the list for additional evaluation during the remainder of the Study.

BACKGROUND

Shoreline Regional Park Community (Shoreline Community)

The Shoreline Community was created by the State Legislature in 1969 to serve as a local government agency to own, maintain, operate, and administer a major regional asset, Shoreline Regional Park, and the public lands and infrastructure in the surrounding North Bayshore Area.

The Shoreline Community is generally bounded by Highway 101 to the south, Stevens Creek to the east, San Francisco Bay to the north, and San Antonio Road/Terminal Boulevard to the west. Within the Shoreline Community is the North Bayshore Area, an area characterized by several large high-technology corporate campuses and suburban-type office parks. The North Bayshore Area serves as an important employment center for the City and region.

Educational Enhancement Reserve Joint Powers Agreement

In January 2006, the Shoreline Community and two school districts serving that portion of Mountain View entered into the Educational Enhancement Reserve Joint Powers Agreement (JPA) as a means for the Shoreline Community to benefit local education in order to attract and retain a quality employment base and future supply of quality employees.

In March 2011, the City Council amended the JPA to provide additional educational enhancement funding to the two school districts through the end of Fiscal Year 2012-13. In approving the funding amendment, it was acknowledged that the Shoreline Community's capacity to fund educational enhancement payments in the future depends on its financial obligations for the ongoing operations of the Shoreline Community and Shoreline Regional Park, including future transportation and circulation improvements, landfill management, and other environmental protections such as flood protection from sea-level rise and upstream creek corridor flooding.

The City agreed to complete three studies prior to the beginning of Fiscal Year 2013-14 to determine the long-term obligation and liabilities of the Shoreline Community and inform future discussions/decisions regarding the Shoreline Community's capacity for providing education enhancement funding to the school districts. These studies include a Landfill Master Plan, Sea-Level Rise Study, and the Shoreline Transportation Study.

Additionally, the preparation of a study to assess/address existing transportation access and circulation limitations in the City's North Bayshore Area was included as a General Plan Action Item (LUD 17.1.2).

2030 General Plan and Vision for the City's North Bayshore Area

The recently adopted 2030 General Plan sets forth the overall vision, policy direction, and actions for change in the City, including the North Bayshore Area. The 2030 General Plan identified the North Bayshore Area portion of the Shoreline Community as a "change area" where significant change and development are anticipated to occur

during the General Plan's 20-year planning horizon. These land use changes will generate an increase in the demand for travel to, from, and within the North Bayshore Area and larger Shoreline Community.

The 2030 General Plan envisions a more intensive mix of commercial office and service uses in the North Bayshore Area, particularly along the North Shoreline Boulevard corridor. This land use policy direction will be studied in the Study to determine how land use intensities and transportation strategies will best complement each other.

The 2030 General Plan envisions the City's North Bayshore Area and its intensified land uses being served by an improved, sustainable, and efficient transportation system. The General Plan provides the following Land-Use Mix, Distribution and Intensity (LUD) goals related to transportation in the North Bayshore Area:

- **LUD 17.1: Connectivity.** Improve connectivity and integrate transportation systems services amongst the North Bayshore Area, downtown, NASA Ames, and other parts of the City.
- **LUD 17.2: Transportation Demand Management strategies.** Require development to include and implement Transportation Demand Management (TDM) strategies.
- **LUD 17.3: Bicycle and pedestrian focus.** Support bicycle and pedestrian improvements and connections to and throughout the North Bayshore Area.
- **LUD 17.4: North Shoreline Boulevard and Rengstorff Avenue enhancements.** Encourage the enhancement of North Shoreline Boulevard, Rengstorff Avenue, and other key streets in the North Bayshore Area through new development and street design standards.

The General Plan also recognizes that greater intensities in the North Bayshore Area will result in more commercial growth and vehicle trips, but will provide new opportunities for both the public and private sectors to help improve the transportation infrastructure and services to and within the area.

Key General Plan actions to address planned growth and transportation improvements include:

- Preparation and completion of the Shoreline Transportation Study.

- Creation of a Sustainability Management Association to implement and manage transportation and sustainability solutions for the North Bayshore Area.
- Consideration of establishing a transportation impact fee to mitigate transportation impacts from new development.

The last two items listed above will be studied in greater depth during the North Bayshore Precise Plan and EIR development process.

Study Scope/Purpose

The Study is evaluating the anticipated impacts of the planned long-term growth envisioned in the recently adopted 2030 General Plan in order to identify a range of recommended strategies to meet the long-term transportation needs of the Shoreline Community, including the North Bayshore Area. The Study will provide cost estimates (at a planning level) for recommended strategies, identify funding options and recommend a phasing/implementation plan, including triggers for additional actions/steps.

Consistent with the General Plan's mobility goals emphasizing future sustainable development and efficient transportation systems connecting the community, while evaluating some potential expansion of existing roadway infrastructure serving the Shoreline Community, the focus of the Study is to identify alternative transportation modes of access, demand management policies and programs, and other innovative transportation solutions within the Shoreline Community and elsewhere in the City to better connect the Shoreline Community/North Bayshore Area with the Downtown Transit Center and planned development in the Bayview portion of Moffett Federal Airfield to minimize the growth of vehicle trips into and out of the Shoreline Community and the North Bayshore Area.

North Bayshore Precise Plan

The results of the Transportation Study, along with the 2030 General Plan, will be used to guide the development of the North Bayshore Precise Plan, which will implement the General Plan's vision, goals, and policies by providing more specific land use and development standards for the North Bayshore Area portion of the Shoreline Community.

The results of the Transportation Study may influence several key elements of the North Bayshore Precise Plan, including:

- The location and intensities of land uses.
- Street design standards and improvements.
- Public/private transportation infrastructure and services.
- Pedestrian, bicycle, transit, and vehicle circulation.
- Parking policies and standards.
- Transportation Demand Management (TDM) strategies.

The North Bayshore Precise Plan will also include development regulations focusing on highly sustainable development. This is a key concept from the General Plan. Greater land use intensities will be allowed by the Precise Plan if highly sustainable project elements (for example, green roofs or "net zero" energy or water site design) are included in new developments. The Study may highlight key sustainable transportation-related elements that could be included in the Precise Plan to help implement this strategy.

Based on direction from the Study, the Precise Plan process will also include a detailed funding strategy for how physical transportation-related improvements will be funded.

DISCUSSION

The Study was initiated in May 2012 following the selection of a consultant team led by CDM Smith. The following discussion summarizes the work conducted to date:

Stakeholder and Community Outreach

The study team has met with North Bayshore Area companies, including Google, Microsoft, Intuit, and LinkedIn; transit agencies (VTA and Caltrain); and provided briefings to other stakeholders, including representatives from smaller North Bayshore Area businesses, NASA Ames, Moffett Federal Airfield, and others. A stakeholder workshop was held on June 15, 2012, to identify key transportation issues and potential solutions. The team also gathered and reviewed public input posted to the North Bayshore Precise Plan web site.

Presentations on the Study were provided to the Bicycle/Pedestrian Advisory Committee in July and to the Parks and Recreation Commission in September. Future stakeholder activities include a second stakeholder workshop scheduled for November. The study team has also coordinated with Sustainable Silicon Valley, a multi-disciplinary collaborative fostering sustainability and environmental innovation, in its own efforts to identify transportation and infrastructure improvements supporting North Bayshore Area businesses.

Existing Transportation Conditions

Initial study activities included the assembly of existing data, and collection of new data, regarding current transportation conditions. This effort included a review of company commuter programs, current transit ridership, traffic conditions, bicycle counts, and other information. Key observations and conclusions include:

- There is a greater than typical concentration of longer-distance commuters, mainly living in San Francisco, to the North Bayshore Area employment area. However, there are also a significant number of commuters living within 10 miles of the North Bayshore Area.
- The North Bayshore Area companies, Google in particular, have greatly reduced drive-alone commuter rates compared to similar business parks. Much of this success has come from the growing availability of company-operated commuter shuttles.
- Direct public transit to the North Bayshore Area is limited, but Caltrain and VTA light rail carry a substantial number of North Bayshore Area commuters, who reach their companies via shuttle buses or bicycle.
- Bicycle commuting is on the rise and now provides over 5 percent of all commute trips, a level that compares favorably with the best bicycle commuting areas in the State.
- Roadway access into the North Bayshore Area is limited to a few points. These points of access have very limited capacity for growth/expansion.

Future Growth and Transportation Goals

Based on information provided by employers, current commute travel is estimated at approximately 61 percent drive alone, 6 percent carpool, 25 percent transit and company shuttles, and 7 percent bicycle/pedestrian. This represents a very effective use of alternative modes, especially transit and bicycle, compared to similar employment areas. However, the number of auto trips in the peak approaches the current capacity of the road system.

Further growth in the North Bayshore Area is guided by the 2030 General Plan. Significant intensification of the employment area is anticipated, combined with highly sustainable development practices. The General Plan identified an anticipated level of growth for 2030 that was used for the General Plan analysis. The Community Development Department provided two additional growth projections that could occur in later years, based on the General Plan level of intensification and supported by the plan policies, such as highly sustainable practices. These levels of growth, which are being utilized to estimate future transportation demand, are shown below:

Scenario	Development (square feet in millions)	Estimated Employment
Existing – 2012	7.3	17,000
General Plan – 2030	10.7	28,000
Mid-Growth*	14.3	38,000
High-Growth*	17.3	48,000

* Consistent with General Plan policies.

This potential growth in employment, and employee commute trips, will challenge the capacity of the North Bayshore Area transportation system. While the capacity and utilization of the roadway system could be increased slightly (potentially 20 percent to 25 percent), most of the increase in commuter trips will need to be accommodated by alternative modes. Maintaining the current 61 percent drive-alone rate would result in more than a 50 percent increase in vehicle trips for the 2030 scenario and up to a 300 percent increase with the high-growth scenario, far exceeding the roadway capacity.

If, however, vehicle trips are restricted to the roadway capacity, the use of alternative modes would grow significantly. One example is provided below:

Scenario	Drive Alone	Carpool	Transit	Bicycle/ Pedestrian
General Plan— 2030	47%	8%	35%	9%
Mid-Growth*	34%	10%	44%	12%
High-Growth*	27%	11%	48%	13%

* Consistent with General Plan policies.

The potential levels of transit and bicycle usage will require comprehensive new services and programs in order to support, and allow for, the higher level of growth provided through the General Plan. A significant shift of commute trips away from the peak period or to telecommuting, if supported by employers, could help reduce the high targets for alternative modes.

Key Principles

As a result of stakeholder discussions and the preliminary analysis of current and future transportation demands and issues, several key principles have emerged that provide a foundation for the development of transportation strategies. These include:

- A successful transportation strategy will need to effectively combine public and private roles and responsibilities.
- To adequately serve future travel demands, multiple strategies will be needed, each targeting specific travel markets but working together to provide a layered solution.
- Companies (individually and through a Management Association) must be responsible for managing employee travel and providing transportation services.
- Infrastructure investments should be selected to best support the combined strategies; investments should have the capability to evolve with changes in technology and increased capacity requirements.

Preliminary Alternatives and Strategies

Specific transportation alternatives and strategies were first summarized by category, travel market, and time frame. These ideas and concepts were identified through the stakeholder process and developed to be responsive to the problem definition. A matrix of potential improvements and strategies was developed to summarize the full list of potential ideas. These initial alternatives are further described in Attachment 1.

In response to the key principles, the preliminary list was further integrated into a set of strategies designed to address specific travel markets and combine interrelated improvements. A summary of these strategies is provided below:

- **Improved Roadway Efficiency**

Current access to the North Bayshore Area is limited to a few locations due to the U.S. 101 barrier. Those locations currently operate near capacity and there are few options to expand capacity. This strategy will identify and evaluate opportunities for adding capacity and maximizing the efficiency of the existing roadway system. Potential strategies include:

- Adaptive signal operation, turn restrictions, one-way streets, and other strategies to improve traffic flow.
- Reversible lanes to add peak capacity.
- Freeway ramp modifications to reduce bottlenecks.
- Better street connections and a denser grid in the North Bayshore Area, providing alternate routes for all modes.

- **Commuter Bus and Ridesharing Programs for Mid- to Long-Distance Trips**

North Bayshore Area employers, Google in particular, already operate an effective premium commuter shuttle service, carrying a high percentage of medium- to long-distance commuters. The continued effectiveness of this service, potentially supplemented by VTA express service, will be an important element of the overall transportation strategy supporting continued employment growth. Carpool and vanpool programs supported by company incentives would also play an important role.

This strategy will require a continued and expanded employer commitment to these services. Their effectiveness can be enhanced by ensuring optimum use of the regional high-occupancy vehicle (HOV) system. Strategies to help accomplish that include:

- Development of the planned Highway 101 express lanes to increase HOV capacity.
 - New direct access ramps from the HOV lanes into the North Bayshore Area.
 - Priority parking for carpools and vanpools.
- **Expanded Transit Connections for Mid-Range Trips**

A significant challenge today is the effectiveness of transit in serving mid-range commute trips, especially those trips of 10 miles or less. Planned improvements to regional transit services, including an upgraded and electrified Caltrain, extension of BART to Milpitas/San Jose, and light rail express service, will be capable of carrying substantial numbers of transit riders and provide an opportunity for greatly increased usage.

A remaining challenge is getting these potential transit riders to the North Bayshore Area. Strategies for near term access include:

- Higher-capacity employer shuttles providing direct connections to specific employment zones.
- Dedicated transit lanes and other priority treatments.
- New access points (such as a transit bridge across Stevens Creek).
- Improvements to the Caltrain Station to handle the increase in connecting services.

In the longer term, some combination of light rail extensions, Automated People Movers (APM), Personal Rapid Transit (PRT), or autonomous higher-capacity vehicles would provide greater capacity, potentially with elevated lanes in some locations.

- **Bicycle/Pedestrian Program for Shorter Trips**

Bicycle and pedestrian commuting is already an important element and has been growing. This strategy would add new and improved access points to the North Bayshore Area and other innovative programs to greatly expand the use of active modes for shorter commute trips. Potential strategies include:

- New freeway and creek crossings.
- Improved corridors outside of the North Bayshore Area for safer and higher-capacity use (e.g., buffered lanes, bike boulevards).
- Expanded bike-sharing services, both within the North Bayshore Area and City-wide.
- Company incentives and services for bicycle and pedestrian use.

- **Intercept Parking**

Since there is limited vehicle capacity into the North Bayshore Area, a potential strategy is to intercept vehicles at the periphery of the employment area, near U.S. 101. One or more large parking garages would be developed, potentially with dedicated ramps separate from the current road system. On-site parking for new development in the North Bayshore Area would generally be reserved for special uses such as visitors, carpools, electric vehicles, and car sharing. Distribution of garage parkers to their workplace would be provided by multiple modes, including frequent shuttles, community bikes, electric vehicles, autonomous vehicles, and other innovative technologies. This strategy could focus on shorter vehicle trips that could utilize the local arterials for access.

For several of the strategies outlined above, the planned further analysis will address the potential role of innovative technologies, such as Personal Rapid Transit, larger-capacity Group Rapid Transit and/or autonomous vehicles. The evaluation will address the capability of these systems to serve the potential demand, the cost of the systems, and the ability to evolve and expand along with employment growth and other factors.

The strategies described above are anticipated to work in combination in order to meet the ambitious modal shift targets that will be required in order to accommodate the growth in employment and employee commute trips envisioned in the 2030 General

Plan. The strategies described below focus on different components of the commute travel market, providing options for commuters to reach the North Bayshore Area employment area. They will need to be supported by additional strategies, to be further developed through the Precise Plan, which would address specific programs and services in the North Bayshore Area. These would include:

- **Internal Circulation/Distribution**—Within the North Bayshore Area, multiple services, modal options, and infrastructure improvements would provide for circulation and for distribution of transit riders. In the near term, separated bicycle roadways (green loop) and restricted roadways would be utilized by community bikes, bike-sharing, car-sharing, electric scooters, shuttle buses, and other specialty vehicles. Longer term, innovative technologies such as Personal Rapid Transit or autonomous vehicles with special roadway connections may be added.
- **Transportation Management Association (TMA)**—Establishment of a TMA through a partnership of employers and the City (potentially as a part of a broader Sustainability Management Association) would provide a mechanism to implement many programs, including the operation of shuttles and bike programs.
- **Demand Management and Implementation Strategies**—A cap on peak commute trips or parking for new development, coupled with company incentive programs, would help ensure effectiveness of transit and bicycle programs. New infrastructure could be funded, in part, from traffic impact fees. Monitoring and enforcement programs would also be established.

Fiscal Impact

Depending on the transportation improvement strategies ultimately selected for implementation, the initial capital/implementation costs could range from \$250 million to \$500 million. There would also be additional ongoing/annual expenses. More refined implementation costs, along with an analysis of potential funding strategies and sources (e.g., Shoreline Community, regional/State/Federal funds, developer contributions, etc.), will be provided to the Council when the final set of preferred strategies is presented in January 2013.

Next Steps

The next phase of the Study will further refine the potential strategies that the City Council has identified as worthy of additional evaluation, assess their potential to serve the travel markets effectively and meet modal goals, define a preferred set of strategies,

and develop planning-level costs and funding options for the plan. A second stakeholder workshop to be held in November will help develop a preferred set of strategies. A final set of preferred strategies will be presented to the City Council in January 2013.

It is expected that some of the strategies will need further analysis/development prior to implementation. The details of transportation programs and improvements within the North Bayshore Area will be developed through the North Bayshore Precise Plan process. This may include, for example, establishment of a TMA, trip and/or parking caps, modified street designs, and new access routes across Highway 101. Programs and improvements such as these will require additional engineering and financial analysis. Upon City Council approval of a preferred set of Shoreline transportation improvement strategies, staff will present a modified scope of work for the North Bayshore Precise Plan effort to the City Council for approval and funding.

Other recommended transportation strategies may involve improvements outside of the Shoreline Community, such as new transit corridors or facilities. These strategies could be addressed through separate efforts in the future looking at the detailed feasibility and conceptual design of these improvements. Potential examples are a new plan for the Mountain View Transit Center (to address expected demand), development of Direct Access Ramps to the Highway 101 HOV lanes, and an updated Bicycle/Pedestrian Plan. Several of these efforts will need to be pursued in partnership with other agencies, such as VTA, Caltrain, and Caltrans.

RECOMMENDATIONS

1. Provide input/endorse the key principles that have been used to guide the development of potential transportation improvement strategies for the Study.
2. Provide input regarding the preliminary list of potential transportation improvement strategies identified as part of the Study, indicating which, if any, strategies should be removed from further consideration, or if any other strategies should be added to the list for additional consideration during the remainder of the Study.

NEXT STEPS

Based on the input received from the City Council at the Study Session:

1. Complete the evaluation of potential transportation improvement strategies and develop a preliminary set of preferred strategies.
2. Present recommendations to the Council in a separately scheduled Study Session in January 2013 so that the results can be used in discussions regarding the Shoreline Community's capacity for future educational enhancement payments, and as part of the North Bayshore Precise Plan and EIR development processes.
3. Further analyze and engage North Bayshore Precise Plan stakeholders on transportation issues and how they will be addressed within the Precise Plan.

LF/5/CAM
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Attachment: 1. Preliminary Transportation Alternatives and Strategies

2012

Transportation Alternatives



Developed for the
City of Mountain View

10/8/2012

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Section 1

Existing Conditions

The documentation of existing conditions in the North Bayshore Area and Shoreline Community¹ involved the gathering of information from a variety of sources including work already performed as part of the General Plan and North Bayshore Area Precise Plan processes. In addition, there were meetings and interviews with the four largest employers, the transit and transportation agencies, and other key stakeholders to learn about current transportation programs and future plans. This following is summary of some of the key findings:

- There is currently about 7.3 million square feet of development and 17,100 employees in the North Bayshore Area.
- The North Bayshore Area currently generates about 70,600 weekday vehicle trips through the three interchanges that serve the area.
- Over 50% of the traffic enters the area via the Shoreline Boulevard Interchange.
- Based on the employee travel mode shares reported by each of the four largest employers, there are about 110,000 daily persons trips by all modes.
- North Bayshore employers already have innovative and highly effective programs to promote the use of alternatives to the single occupant automobile.

1.1 Employee Travel Characteristics

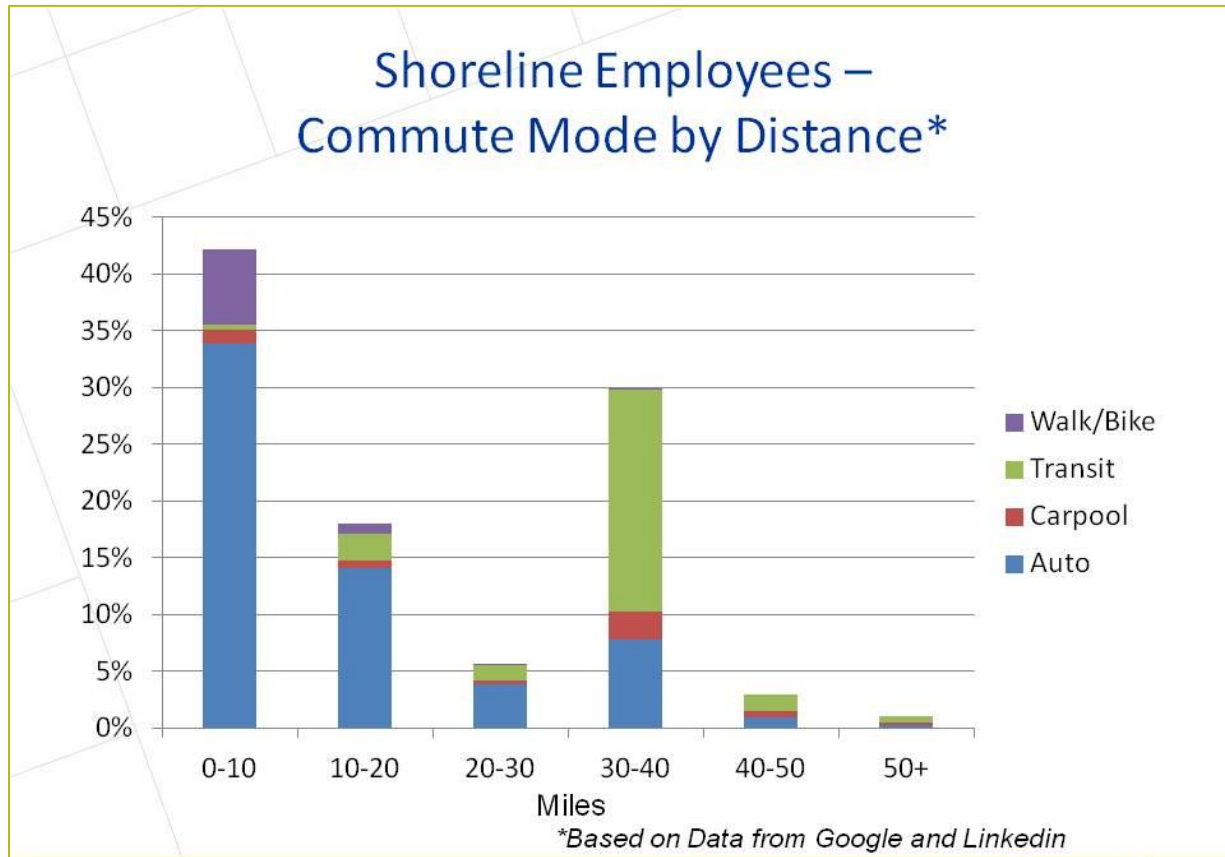
Based on the information obtained from the four largest employers, the following table provides the percentage of the employees that use each travel mode.

Travel Mode	Percent of the Employees
Auto (Single Occupant Vehicle)	61.3%
Carpool/Vanpool	6.4%
Transit/Employer Shuttle	25.4%
Bicycle	5.6%
Pedestrian/Other	1.4%
Total	100.0%

Compared to the typical Bay Area business park where 80% or more of the employees drive alone, the current modal share for the North Bayshore Area shows the effectiveness of the programs the existing employers use to encourage use of alternative travel modes. The graphic on the next page illustrates the commute mode used by the employees based on the distance of their commute. This is based on information provided from Google and LinkedIn employee surveys. Over forty percent of surveyed employees live within ten miles travel distance from their work site and the vast majority of these

¹ North Bayshore refers to the employment area and the Shoreline Community encompasses everything, including Shoreline Regional Park, the Shoreline Ampitheatre and immediate surroundings.

drive to work. This group, however, also accounts for the largest portion of the employees that walk or bike to work.

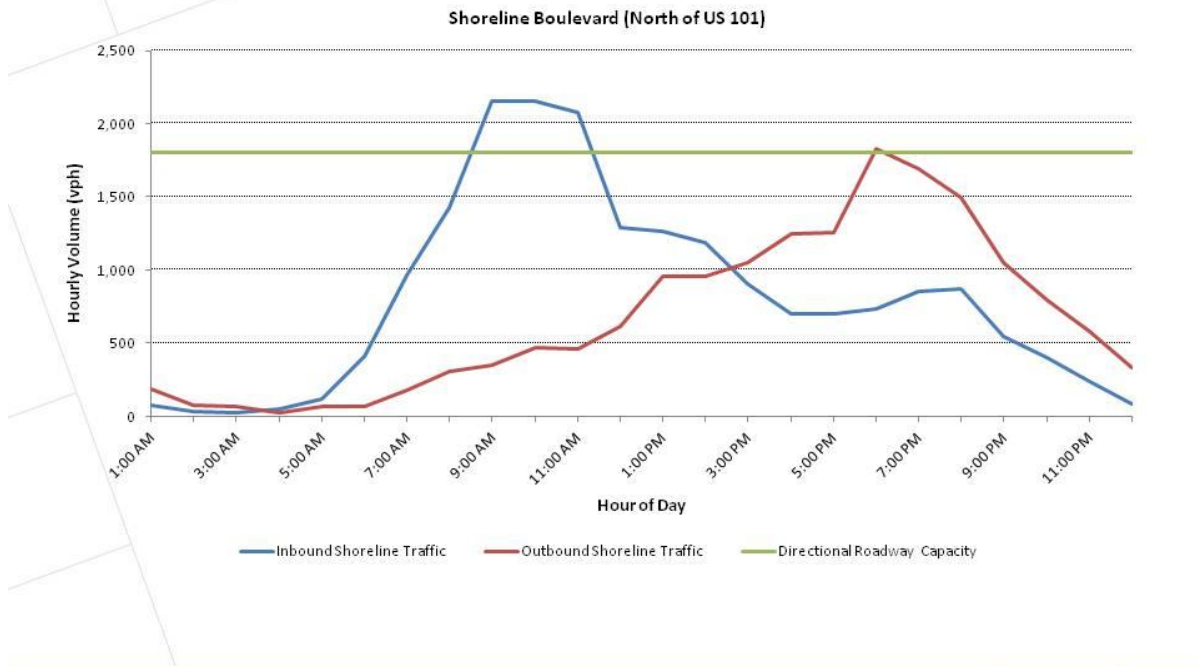


Very few of these employees use transit as the commute distance is too short for transit to be competitive with driving. As the distance from work increases, the number of employees drops off significantly, with the exception that a large number of North Bayshore employees live in San Francisco, 30 – 40 miles from work. Many of these employees use transit, either employer shuttles or Caltrain to commute. In this case, transit use increases with distance, as the time savings advantages of transit tends to increase with travel distance as compared to the auto. Accordingly auto use decreases with distance.

The highway network serving the study area currently experiences very high levels of utilization. In the vicinity of the North Bayshore Area, Highway 101 typically experiences severe peak period congestion with traffic demands that exceed the system's capacity. There are three freeway interchanges which provide access to the area and there is also limited access via East Bayshore Road. The Shoreline Boulevard access point or gateway also currently experiences peak demands in excess of capacity. The other gateways are not used to capacity at present, largely because the congestion on the freeway limits the amount of traffic which can currently use these access points.

The chart on the next page shows the actual hourly distribution of weekday traffic on Shoreline Boulevard just north of Highway 101. The traffic demands exceed capacity from about 8:00 AM to 11:00 AM in the morning and for a short period in the afternoon. Due to traffic congestion and employee work schedule preferences, the peak traffic periods spread over a major portion of the day.

Hourly Traffic Distribution



1.2 Transportation Constraints

Based on the review of existing traffic conditions the following key constraints have been identified:

- The Regional Freeway Network serving the area is currently operating in excess of peak capacity.
- Shoreline Boulevard north of 101 is also operating at capacity in the peak periods.
- The Regional Public Transit Network (Caltrain/VTA light rail (LRT) and bus) does not directly serve the North Bayshore Area and connectivity needs improvement.
- The 101 freeway and Stevens Creek/wetlands form physical barriers which limit transportation access, particularly for bicyclists and pedestrians.
- The internal roadway network serving the North Bayshore Area has missing links and other deficiencies so that it does not effectively meet the needs of motorists, transit, bicyclists, and pedestrians.

1.3 Transportation Opportunities

While transportation access and alternatives for the North Bayshore employment area are constrained today, there are several future opportunities to enhance North Bayshore and overall

Shoreline area transportation conditions. These opportunities provide a foundation for a plan that can serve future growth in the area. They include:

- New Auxiliary and HOV Lanes (and future Express Lanes) on 101 will increase freeway capacity by about 15 -20 percent and provide better travel time for express buses and ridesharing.
- New transit services are being developed that can significantly increase the potential number of transit users, including:
 - The planned BART Extension (Warm Springs and Milpitas/Berryessa) and potential VTA LRT system improvements will enhance connections to the south and east.
 - The Caltrain Electrification program will improve service quality and capacity.
 - Bus Rapid Transit (BRT) services are planned for El Camino Real by VTA and SamTrans.
- Bicycle commuting has been increasing significantly in the past 10 years and, with improved facilities and access points, can play an important role for shorter commute trips. Technology advances such as autonomous vehicles, personal rapid transit (PRT), and intelligent transportation systems, promise improved transportation system efficiencies for all types of travel which will allow capacity increases without significant new facility construction.
- The new General Plan creates incentives and requirements for employers and developers that will motivate them to address the commuting needs of their existing and future employees.
- On-site services, such as daycare, cafes, drycleaning, and the like allow employees to take care of errands that would otherwise require a car, allowing employees to reduce or eliminate unnecessary trips.
- Improved communications tools and other technologies will likely reduce the need for travel over time as more employees work at home or at satellite locations closer to home and the need to travel for meetings and conferences is reduced.

Section 2

Future Growth Projections

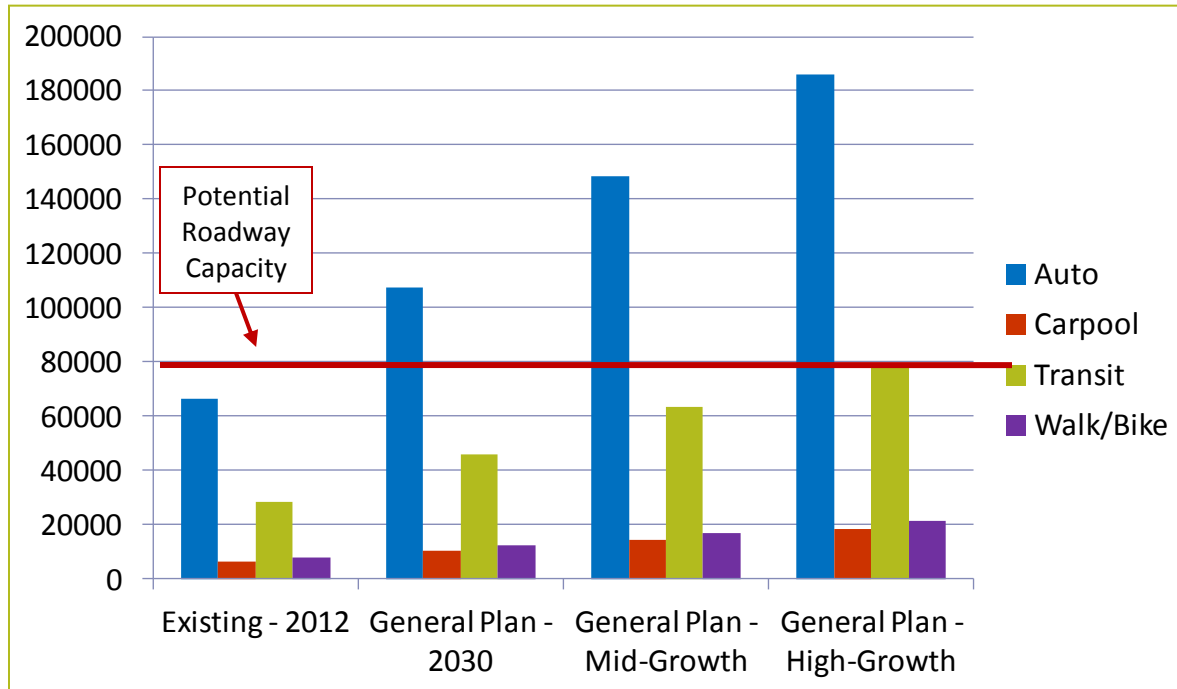
The City of Mountain View has developed growth projections for the North Bayshore Area based on recent decisions made regarding the Mountain View General Plan. The projections are shown in the table below. The information from the City was used to calculate the future number of employees for the mid-growth and high-growth scenarios with the assumption that the current trend of reduced floor area per employee would continue. The current population of 17,100 employees would increase to about 27,600 employees by 2030 under the land use assumptions in the new General Plan. Under the mid-growth assumptions this would increase to 38,100 employee and the high-growth assumptions would yield 47,700 employees. These longer range estimates would occur as employment growth demanded, but are expected to be post 2030.

North Bayshore Area Growth Projections

Scenario	Total Development (Sq.Ft. Millions)	Percent Occupied Sq. Ft.	Employees per 1,000 Occupied Sq. Ft.	Total Employees
Existing – 2012	7.3	93%	2.53	17,100
General Plan – 2030	10.7	93%	2.77	27,600
General Plan - Mid-Growth	14.3	93%	2.87	38,100
General Plan - High-Growth	17.3	93%	2.97	47,700

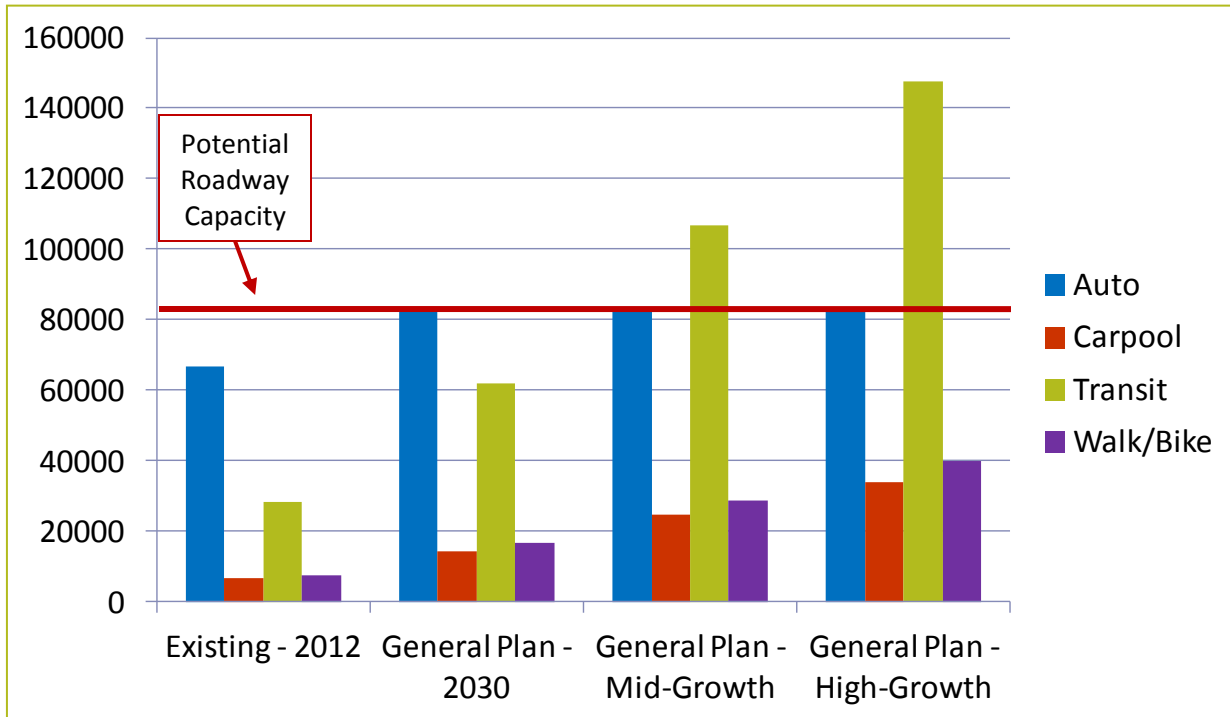
2.1 Future Travel Demand Growth

The chart on the following page shows what would happen in terms of the travel demand growth under each of the employment growth projections for each of the major travel modes. It assumes that the current mode share characteristics would continue in the future. In each case the demand for auto travel would exceed the currently anticipated system capacity (assumes new Highway 101 express lanes and traffic signal system optimization and other minor roadway improvements.) Under the mid-growth and high-growth scenarios auto travel demand would substantially exceed capacity – 179% for the high-growth scenarios. Transit use would also have to increase a similar percentage as would use of the other modes.

Total Weekday Person Trips by Mode – Assuming Current Mode Split (61% SOV)

The following chart looks at what would happen to highway demand growth if constrained to the potential roadway capacity. In this case the use of the other travel modes would have to increase more to offset the lack of highway capacity.

These charts suggest that a single mode focus to address the future growth needs is not practical. For example, transit improvements alone are not likely to achieve the desired outcome. The solution most likely will need to be balanced investment in new facilities for all modes, and in technology and other improvements that maximize the capacity and efficiency of the infrastructure.

Total Weekday Person Trips by Mode – Constrained Highway Capacity

Section 3

Transportation Alternatives

A broad range of options have been identified as potential transportation improvements for the North Bayshore Area. The improvement options fall into the following major categories:

- Traffic and Roadway Improvements
- Transit Improvements
 - Commuter buses on HOV lanes
 - Connections to expanded Caltrain and Light Rail
- Bicycle and Pedestrian Improvements
- Intercept Parking Concept
- Demand Management and Implementation Strategies

The following sections detail a series of strategies which provide more detail as to the nature of the improvements under consideration. The matrix on the following page provides some insight as to the travel markets that would be addressed by each improvement type. It will be important to tailor the overall strategy for transportation so that the improvement identified addresses the travel markets where the potential to induce a change in travel mode is most likely. For example, today about 40 percent of the employees in the North Bayshore Area live within a 10 mile travel distance. Regional transit system improvements tend not to result in an increase in the use of transit by this group because the travel distance is so short that transit is not competitive with auto travel times. However, bicycle/pedestrian improvements, travel demand management measures, and some traffic and roadway improvements can be very effective with this group.

	Strategy	Travel Market					Timeline		
		North Bayshore Circulation	Local Trips (0-10 miles)	Regional Trips (10+ miles)	Last Mile Connection (Caltrain, VTA)	Supporting Actions	Near Term	Mid Term (2030)	Long Term
Traffic and Roadway	Real-Time Signal System Optimization	✓	✓				✓		
	Reversible Lanes	✓	✓				✓		
	Improved Internal Circulation	✓					✓		
	Increased Gateway Capacity		✓	✓				✓	
	Charleston East/West Tunnel (restricted to transit and/or Bike/Ped)		✓					✓	
	Other New Crossings of 101 (restricted to transit and/or Bike/Ped)		✓					✓	
	Direct Access Connectors to Highway-101 Express Lanes (including Moffett and San Antonio)			✓				✓	
	Direct Ramp Connections to Remote Parking Structures		✓	✓				✓	
	Reconfigure San Antonio Interchange		✓	✓				✓	
	Reconfigure Old Middlefield Road Ramp to Connect into Shoreline Area		✓	✓				✓	
	Stevens Creek Trail Transit / Ped/Bike Bridge			✓			✓	✓	
Transit	Transit Only Lanes on Moffett Boulevard and/or Shoreline Boulevard		✓	✓	✓		✓		
	Transit Bridge/Tunnel across 101 (At Shoreline, Moffett, or Charleston)		✓	✓	✓			✓	
	Stevens Creek Transit Bridge		✓	✓	✓		✓		
	Shared Shuttle Service from Mountain View Caltrain Station (color coded based on destination)		✓	✓	✓		✓		
	Shuttle Connections through Shoreline Area and across Stevens Creek to NASA area and Bayshore LRT		✓	✓	✓		✓		
	High-Frequency, Branded Internal Shuttle in Shoreline Area	✓			✓		✓		
	BRT Connection to Mountain View and/or San Antonio Caltrain Station from Shoreline Area		✓	✓	✓		✓		
	LRT Extension from Bayshore NASA LRT station to Shoreline area		✓	✓	✓			✓	✓
	LRT Extension from Bayshore NASA through Shoreline area to San Antonio Caltrain station		✓	✓	✓			✓	✓
	LRT Loop from Mountain View Caltrain, via Shoreline and east through NASA to Bayshore LRT station.		✓	✓	✓			✓	✓
	Complete Double Tracking of Existing LRT		✓	✓			✓	✓	
	Shoreline/NASA/Caltrain Streetcar Loop		✓	✓	✓			✓	✓
	Automated Guideway Transit or PRT System within Shoreline Area	✓						✓	✓
	Automated Guideway Transit or PRT System within Shoreline/NASA Area	✓	✓	✓				✓	✓
	Automated Guideway Transit or PRT System with Caltrain Connection	✓	✓	✓	✓			✓	✓
	Autonomous On-Demand Vehicle System (Shared, Semi-exclusive, or Fully-exclusive)	✓	✓	✓	✓			✓	✓
	Caltrain Transit Station Improvements (to accommodate above solutions)		✓	✓	✓	✓		✓	✓
	Central Shoreline Transit Station/Hub	✓	✓	✓	✓		✓	✓	
	Multiple Shoreline Transit Nodes	✓	✓	✓	✓		✓	✓	

Legend	
Travel market	Description
North Bayshore Circulation	Daily point to point internal trips within North Bayshore employment area and Shoreline
Local Trips (0-10 miles)	Short commute trips for local residents within 10 miles of the study area
Regional Trips (10+ miles)	Long distance commutes over 10 miles that can be diverted to long haul transit and shuttle service
Last Mile Connections	Connections from the Downtown Mountain View, San Antonio Caltrain Stations and NASA Light Rail to North Bayshore
Supporting Actions	Transportation projects that support all commuters and travel markets

	Strategy	Travel Market					Timeline		
		North Bayshore Circulation	Local Trips (0-10 miles)	Regional Trips (10+ miles)	Last Mile Connection (Caltrain, VTA)	Supporting Actions	Near Term	Mid Term (2030)	Long Term
Bicycle and Pedestrian	Green Lanes/Buffered Lanes/Bicycle Boulevards	✓	✓		✓		✓		
	Separated Internal Bicycle/Pedestrian Trail System	✓			✓		✓		
	Area-Wide Bicycle Sharing	✓			✓		✓		
	GPS Install on Shared Bikes for Trip Data					✓	✓		
	Digital Display Boards for Rolling Total of Cyclists (Updates as you pass by it)					✓	✓		
	Bike Repair Station (Drop off for servicing or self serve)		✓			✓	✓		
	Wayfinding and Signage from Caltrain to Bicycle Network		✓				✓		
	Shared Space Alleys	✓					✓		
	Reconfiguring Parking lots with Pedestrian Walkways	✓					✓		
	Shared Space Alleys	✓					✓		
	Fitness zones at trail heads					✓	✓		
	Complete Streets -Street Redesign		✓				✓	✓	
	Northern/Bay Trail Access Improvements		✓				✓	✓	
	Permanente Creek Trail Improvements		✓				✓	✓	
	Shoreline Boulevard Improvements		✓				✓	✓	
	Stevens Creek Trail Improvements		✓				✓	✓	
	Downtown Access/ East-West Improvements		✓				✓	✓	
	Stevens Creek Bicycle/Pedestrian Bridge		✓				✓	✓	
Parking Management and Supply	Intercept Parking Structures		✓	✓			✓	✓	
	Priority Parking for Carpools/Vanpools		✓	✓			✓		
	Parking Requirements reduced reduced to fit long term development needs		✓	✓		✓	✓		
	Area-wide parking cap		✓	✓		✓	✓		
Transportation Demand Management	Real-Time Dynamic Matching Carpool Program		✓	✓			✓		
	Car Sharing Programs		✓	✓			✓		
	Shoreline Employee Universal Free Transit Pass					✓	✓		
	Transportation Management Association (TMA)		✓	✓		✓	✓		
	Personal Real-Time Taxi Service (employee operated)		✓				✓		
	Vanpools (with subsidies or incentives)			✓			✓		
	Local Pickup Service for Employees (similar to dial-a-ride service)		✓				✓		
	Cash out Program for Employees (employees receive incentives to use alternate modes)		✓	✓			✓		

Legend	
Travel market	Description
North Bayshore Circulation	Daily point to point internal trips within North Bayshore employment area and Shoreline
Local Trips (0-10 miles)	Short commute trips for local residents within 10 miles of the study area
Regional Trips (10+ miles)	Long distance commutes over 10 miles that can be diverted to long haul transit and shuttle service
Last Mile Connections	Connections from the Downtown Mountain View, San Antonio Caltrain Stations and NASA Light Rail to North Bayshore
Supporting Actions	Transportation projects that support all commuters and travel markets

3.1 Traffic and Roadway Improvements

The regional roadway network which provides access to the North Bayshore Area is heavily utilized and congested in the vicinity of Mountain View. The access to the area is constrained to the three freeway interchange locations along Highway 101 at San Antonio Road, Rengstorff Avenue, and Shoreline Boulevard as well as Bayshore Road. The planned addition of a second HOV lane in each direction and the conversion of the HOV lanes to tolled Express Lanes will result in increased capacity in the short to mid term. A major increase in freeway and local road roadway capacity would be difficult to achieve. However, there are a number of traffic and roadway improvements which could improve the accessibility to the North Bayshore Area.

3.1.1 Real-Time Signal System Optimization (Adaptive System)

Adaptive signal control technology involves a system which adjusts the timing of the traffic signals in response to real-time measurements of traffic density and speeds throughout the roadway network. In this way the system changes signal operations to accommodate changing traffic patterns and ease traffic congestion and reduce vehicular emissions. These systems optimize the operation of the existing roadway infrastructure without any physical construction.

3.1.2 Reversible Lanes

A reversible lane is a lane in which traffic may travel in either direction, depending on certain conditions. Typically, it is meant to improve traffic flow during rush hours, by having overhead traffic lights and lighted street signs notifying drivers which lanes are open or closed to driving or turning. Reversible lanes work well in situation where the flow of traffic is heavy in one direction and light in the other, which allows the reduction of the number of lanes serving the off-peak travel direction.

3.1.3 Improved Internal Circulation

The internal roadway system serving the North Bayshore Area currently has bottlenecks which limit traffic flow. There are also locations where traffic, transit vehicles, bicycles and pedestrian come into conflict. The internal roadway network could be redesigned to better separate travel modes and to more efficiently move traffic to the major parking areas. This would involve a loop system of roadways designed specifically for traffic circulation and those intended for high density transit activity with separate paths for major bicycle and pedestrian movements.

3.1.4 Improved Gateway Capacity

Selective roadway improvements or widening at the existing gateways to the North Bayshore Area could increase capacity resulting in improved access to and from the study area and reduced congestion. The function of the gateways, however, may be controlled largely by the ability of the freeway network to deliver and accept traffic to and from the area.

3.1.5 East West Crossings across Highway 101

Highway 101 forms a barrier which separates the North Bayshore Area from the rest of Mountain View and from Palo Alto. It makes it difficult for traffic, transit vehicles, bicycles and pedestrians to access the area. To the extent that new crossings of Highway 101 can be provided, this barrier effect will be reduced. For example Charleston Road, which dead-ends at the freeway, could be reconnected via a tunnel under 101 providing additional local circulation in this area.

3.1.6 Stevens Creek Crossing

A crossing of Stevens Creek would provide an additional linkage between the North Bayshore Area and the NASA/Ames area. This crossing (crossings) could be limited to transit vehicles and bicyclists/pedestrians, and possibly other special category vehicles (e.g. electric scooters, car-sharing) or expanded to serve more transportation modes.

3.1.7 Direct Access Connectors to Highway 101

The benefits of the creation of an additional HOV lane in each direction on Highway 101 and the conversion of the HOV lanes to Express Lanes could be further enhanced by the creation of direct connections between the Express Lanes and North Bayshore Area so that the users of the Express Lanes could avoid the congested on and off-ramps and intersections used by general traffic. Candidate locations include the San Antonio and Moffett interchanges. There are several examples of these direct connectors in the Bay Area including one to the Richmond Parkway off of I-80 in North Richmond which serves a transit center.

3.1.8 Direct Connections to Intercept Parking Structures

A system of parking hubs located close to Highway 101 is a potential strategy for intercepting traffic before it enters the core of the North Bayshore Area. Linking these parking structures directly to or across Highway 101 would provide additional access and egress capacity.

3.1.9 Interchange Modifications

The existing interchanges could be enhanced through modifications to increase capacity, improve the efficiency of the traffic movements and better serve other travel modes. One example of this would be to reconfigure the Old Middlefield Road Ramp to connect into the North Bayshore Area. The San Antonio and Moffett interchanges are also candidates for modification or replacement.

3.2 Transit Alternatives

Currently the Shoreline area is not directly served by any regional public transit services with the exception of two VTA bus routes. Transit access to the area generally requires a transfer to public or privately sponsored shuttle services which provide a linkage to Caltrain, VTA LRT service, and ACE. Google offers its employees an extensive regional transit shuttle service which is customized to serve their travel needs. Some of the other employers offer similar services, but on a more limited basis. There are a variety of transit technology options and transit improvement concepts that could be applied or expanded to serve the Shoreline Area.

3.2.1 Transit Only Lanes and Crossings

Transit only corridors and crossings can provide an effective near term solution for access to and connections between existing local/regional transit and the Shoreline Area. The designated corridors for transit only lanes would be those best connecting the local LRT and Caltrain stations with the Shoreline Area such as Shoreline Blvd and Moffett Blvd. In addition, new transit only crossings at Highway 101 and Stevens Creek can allow for more direct transit access into the Shoreline Area. Transit only lanes and crossings can be used for conventional bus or shuttle service, which would allow buses/shuttles to bypass most traffic congestion and provide for more reliable service. There is also a possibility to open these lanes to HOV and autonomous cars (which have the ability to manage traffic flow more efficiently than standard vehicles).

3.2.2 Shuttle/Bus Connections and Shoreline Area Circulation

Improved connections between the Mountain View Caltrain Station and/or the Bayshore/NASA LRT station and Shoreline Area can be provided in the near term with buses/shuttles. Strategies include providing for more direct service (less stops) between the regional transit station(s) and a passenger's destination point within the Shoreline Area. Developed in conjunction with transit only lanes, service times and reliability can be improved. In addition to more direct transit connections, a high-frequency, branded shuttle service focused within the Shoreline Area and color coded by destination/employment zone can provide employees and visitors an effective way to travel between key areas in Shoreline.

3.2.3 Light Rail Transit (LRT) Extension

Expanded LRT service into the Shoreline Area can provide an additional direct transit connection. Extending LRT allows passengers to minimize transfers between transit modes and can provide sufficient capacity for transferring Caltrain riders. Expansion could include a single or dual lane extension from the Bayshore/NASA LRT station through the Moffett/Ames area and into Shoreline, and potentially to the San Antonio Caltrain Station. Another extension strategy could include an end of the line loop connecting the Bayshore/NASA and Mountain View LRT stations by way of the Shoreline and Moffett/Ames. As part of the implementation plan for this LRT extension strategy, the transit only lane strategy discussed above can be used to preserve ROW in the near term for a future rail extension.

3.2.4 Automated People Mover (APM) and Personal Rapid Transit (PRT) Connections and Shoreline Area Network

Exclusive ROW (tunnel or elevated guideway) automated transit systems such as a typical APM system or a PRT system provides for reliable service due to the capability to bypass all traffic congestion. These technologies can provide direct connections between existing local/regional transit

and the Shoreline Area, as well as circulation within the Shoreline Area. PRT is a technology category that is intended to operate in a network system directly between a passenger's origin and destination with short headways between vehicles. APM service and GRT (Group Rapid Transit) provide similar automated service with larger vehicles for multiple users. These strategies would benefit from the implementation of transit only lanes in the near term to secure ROW for a more efficient future transition.

3.2.5 Autonomous On-Demand Vehicles

Autonomous on-demand vehicles could be considered as part of a long term implementation plan, potentially supplemental to another strategy. This technology is currently under development and testing and requires more time to show service proven capabilities. Autonomous vehicles (cars, small vans, small buses) can provide employees/visitors of the Shoreline Area a means of traveling to/from the area as well as moving around within the area. Autonomous vehicles can be implemented as a car sharing service, where users can "call" for a vehicle when needed for door-to-door type service. When not in use, vehicles can park themselves off-site to minimize the need for on-site parking. In addition, autonomous vehicles can theoretically manage traffic flow more efficiently, reducing traffic congestion, particularly when not operating in mixed traffic. Allowing for the use of transit only/HOV lanes can optimize the benefits anticipated by autonomous vehicles.

3.2.6 Mountain View Transit Center Improvements

Along with the implementation of some of the strategies discussed above, improvements to the existing Mountain View Transit Center and Caltrain Station will be needed to accommodate the increased number of Caltrain and LRT riders and provide facilities for better connections to other transit modes at the station site (or in close vicinity). In addition, space may be needed for bike and car sharing services, expanded parking and future APM, PRT or autonomous vehicle facilities.








3.2.7 North Bayshore Station Hub or Transit Nodes

There are different strategies regarding the type of access passengers can have to transit serving the North Bayshore area. One strategy is to provide for a primary transit hub, which could serve multiple transit modes. Another method would be to provide for multiple transit nodes located at key points throughout the area. Multiple nodes result in more convenient access to transit with short walking/biking distances. The amount of transit stations/nodes will depend on the overall transit improvement plan and technology selected.

As discussed, the transit improvement strategies being considered do not necessarily stand alone. Multiple strategies can be used to provide a cohesive network that integrates effectively into the community to serve the North Bayshore employment area. In addition, a well thought out, long-term implementation strategy can allow for near-term improvements while preparing for transition to higher capacity transit, and without precluding the possibility of advanced transit (transit which is still under development or is not yet service proven).

The existing transit services are mapped below and the range of potential transit technologies are presented on the following page. Following that is a map showing the key transit linkages to be considered in the study.

Existing Transit Connections in the Study Area

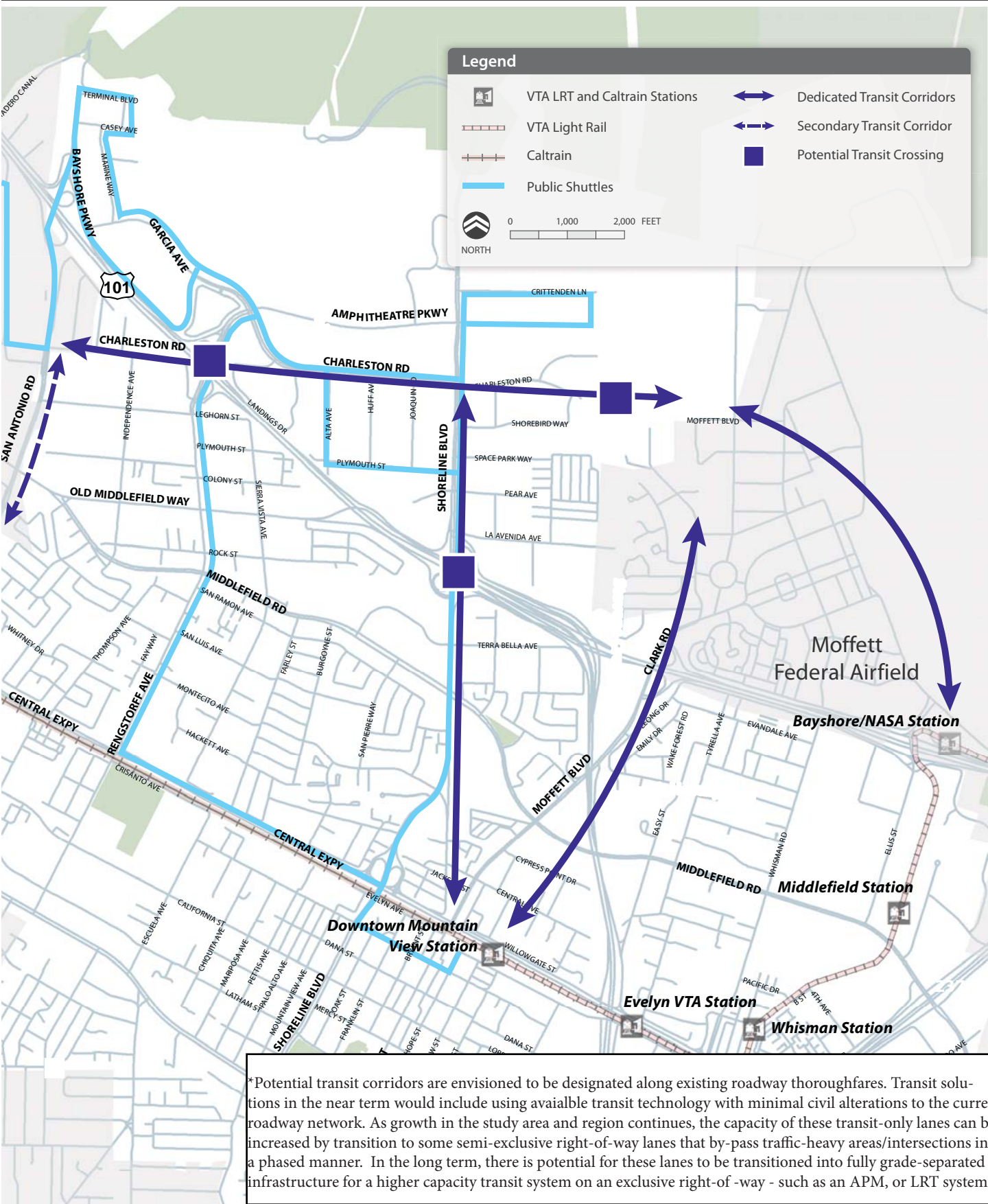
Public Transit Technology Summary					
Technology	Description		Functions	Capacity	Speed
Light Rail Transit (LRT)	Steel rail-based vehicles that can operate in mixed traffic or in exclusive right-of-ways		Local and regional connections	Moderate to high line capacity	Low / moderate speed, limited mixed traffic
Automated People Mover (APM)*	Automated vehicles that operate on an exclusive guideway		Local connections	High line capacity	Moderate speed, exclusive right-of-way
Group Rapid Transit (GRT)	A technology that uses medium sized, automated vehicles on exclusive guideways that provide direct service between a group of passenger's origin and destination		Local connections and circulation	Moderate capacity **	Moderate speed, exclusive right-of-way
Personal Rapid Transit (PRT)	A technology that uses small, automated vehicles on exclusive guideways that provide direct service between a passenger's origin and destination		Local connections and circulation	Low to moderate capacity **	Moderate speed, exclusive right-of-way
Autonomous Vehicles	Automated road-based vehicles (e.g., cars, small vans, small buses) that can operate in mixed traffic or exclusive right-of-ways		Local connections and circulation	Low capacity ***	Low / moderate speed, limited mixed traffic
Shuttle Bus	Shuttles serve specific locations and can operate in mixed traffic or in exclusive right-of-ways		Local connections and circulation	Low line capacity	Low speed, mixed traffic
Conventional Bus	Typical single unit and articulated transit buses, operate in mixed traffic or in exclusive right-of-ways		Local and regional connections	Low to moderate line capacity ***	Low to moderate speed ***

* Assumes self-propelled, rubber-tired APM technology for discussion purposes

** Depends on design and configuration

*** Depends on degree of shared right-of-way with conventional vehicles and how large a vehicle is used

**** Capability of transitioning from/to another technology type by means of civil improvements (mixed traffic —shared/exclusive ROW —grade separated lanes/guideways



3.3 Pedestrian/Bike Improvement Alternatives

Key improvements to the multi-modal transportation network will be needed to substantially increase the percentage of transportation trips to/from Shoreline Regional Park Community by walking and bicycling. To make walking and bicycling attractive mode choices for trips from home, work, and/or transportation hubs, a full menu of pedestrian/bike improvements will be required to meet the widest range of users. These improvements should be deployed along pre-existing bicycle/pedestrian corridors to create easy, continuous, and safe options for walking and biking.

3.3.1 Bike Lane Improvements

Most of the major thoroughfares in Mountain View are already equipped with standard bike lanes. To encourage more bicycling, additional steps will need to be taken to make on-street facilities more enticing. The City should also consider expanding the existing on-street bicycle network, which may require lane reduction (road diets) in some locations. Low-impact improvements could include pavement coloring on the entirety of the bike lane, using pavement coloring to highlight lane merges or conflict zones, and widening bike lanes to include a painted “buffer space” between travel lanes and bicyclists. High-impact improvements could include providing buffer-separated bike lanes, bike lanes on the interior of the parking lane (cycletracks), or bike lanes on raised pavement (vertical separation) with a rolled curb between the bike lane and travel lane. Intersection improvements for bike lanes could include dedicated bicycle signal phases, intersection crossing markings, painted bike boxes, and two-stage turn queue boxes.

3.3.2 Multi-Use Path Improvements

The current system of multi-use paths (specifically the Stevens Creek Trail, the Permanente Creek Trail, and the Bay Trail) provides an off-street option for bicyclists and pedestrians accessing the Shoreline Regional Park Community. To turn these trails into major corridors for active transportation, the City may need to revisit the deficiencies of the current trail system. This includes construction of trail extensions to better connect with the on-street bicycle network, increasing trail capacity, introducing a striping scheme to reduce bicycle & pedestrian conflicts, addressing trail closures during winter commute hours (e.g. lighting the path), increasing and improving access points to trails, constructing enlarged and enhanced trailheads, addressing flooding and sight-line issues on the current trails, retrofitting existing on-trail speed deterrents to better accommodate bicycle travel, and installing wayfinding signage on trails and at trailheads.

3.3.3 Bicycle Boulevard Improvements

Mountain View currently has two Bicycle Boulevards, the Mayfield-Whisman corridor (approximately 3 miles along Central Avenue, Stierlin Road, and Montecito Avenue) and the Dale-Transit Center corridor (3 miles from Dale to the downtown). Bicycle Boulevards provide a low-stress, low-volume option for casual bicyclists. If properly incorporated into a greater bicycle network, bicycle boulevards can act as effective “feeders” to Mountain View’s extensive trail system. Current bicycle boulevards could be upgraded with more advanced treatments and additional low-stress routes for bicycle boulevards should be considered. Bicycle boulevard treatments could include enhanced signage and pavement markings, physical interventions (such as speed tables or roundabouts) to reduce vehicle speeds, traffic diverters (partial or full) that allow through bicycle traffic, and enhanced crossing treatments at intersections with major roadways.

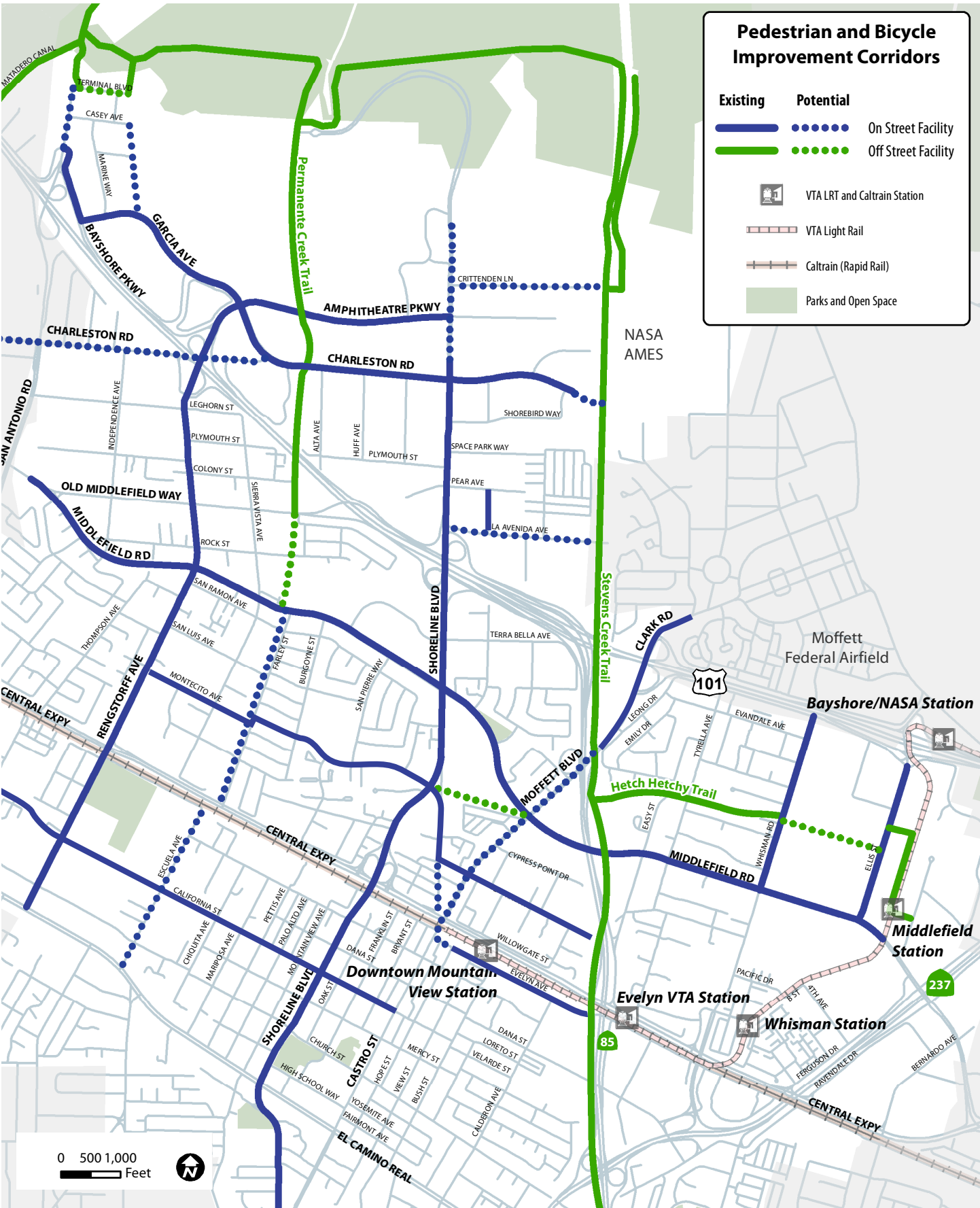
3.3.4 Wayfinding

Providing certainty and reinforcement for new pedestrians and bicyclists can often reinforce their choice to use an active transportation mode. Wayfinding signage not only helps direct bicyclists and pedestrians along preferred routes, it also raises the profile of bicyclists and pedestrians along those routes, normalizing their presence for automobile drivers. Such wayfinding signage should include major destinations, directional arrows, and miles to the destination. As an alternative to mileage, wayfinding signage could instead include approximate walking or biking time from the sign to the destination identified. Wayfinding should be prioritized at key destinations and along key routes (Stevens Creek Trail, Charleston Road, Shoreline Boulevard, etc.).

3.3.5 Connectivity

Physical barriers and overly-circuitous detours present a greater deterrent to walking and biking than for other modes of transportation. Barriers such as the Central Expressway, the Caltrain ROW, and Highway 101, all present barriers to greater north/south connectivity in central Mountain View. The existing roadway crossings of these physical barriers present multiple challenges to bicyclists and pedestrians. The City could consider long-term projects, such as dedicated bicycle & pedestrian crossings of the Central Expressway or Highway 101, to create direct connections between established bicycle networks to the north and south. Connectivity to the trail system should also be prioritized, with enhanced treatments reserved for bike lanes feeding to and from the trail network.

A map of the potential pedestrian and bike improvement locations is provided on the following page.

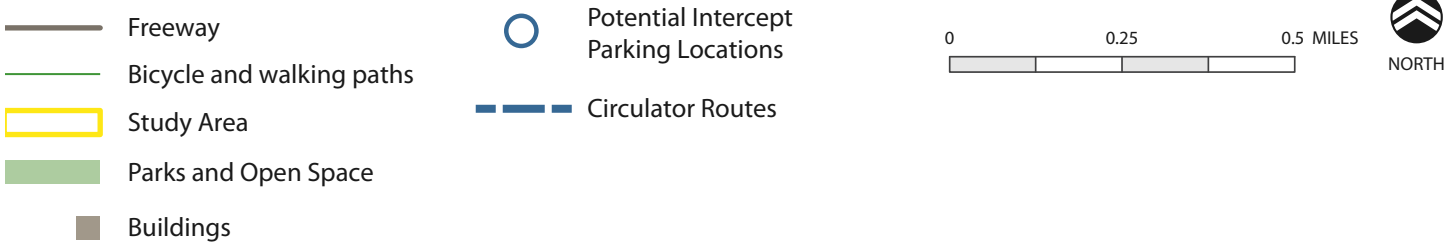
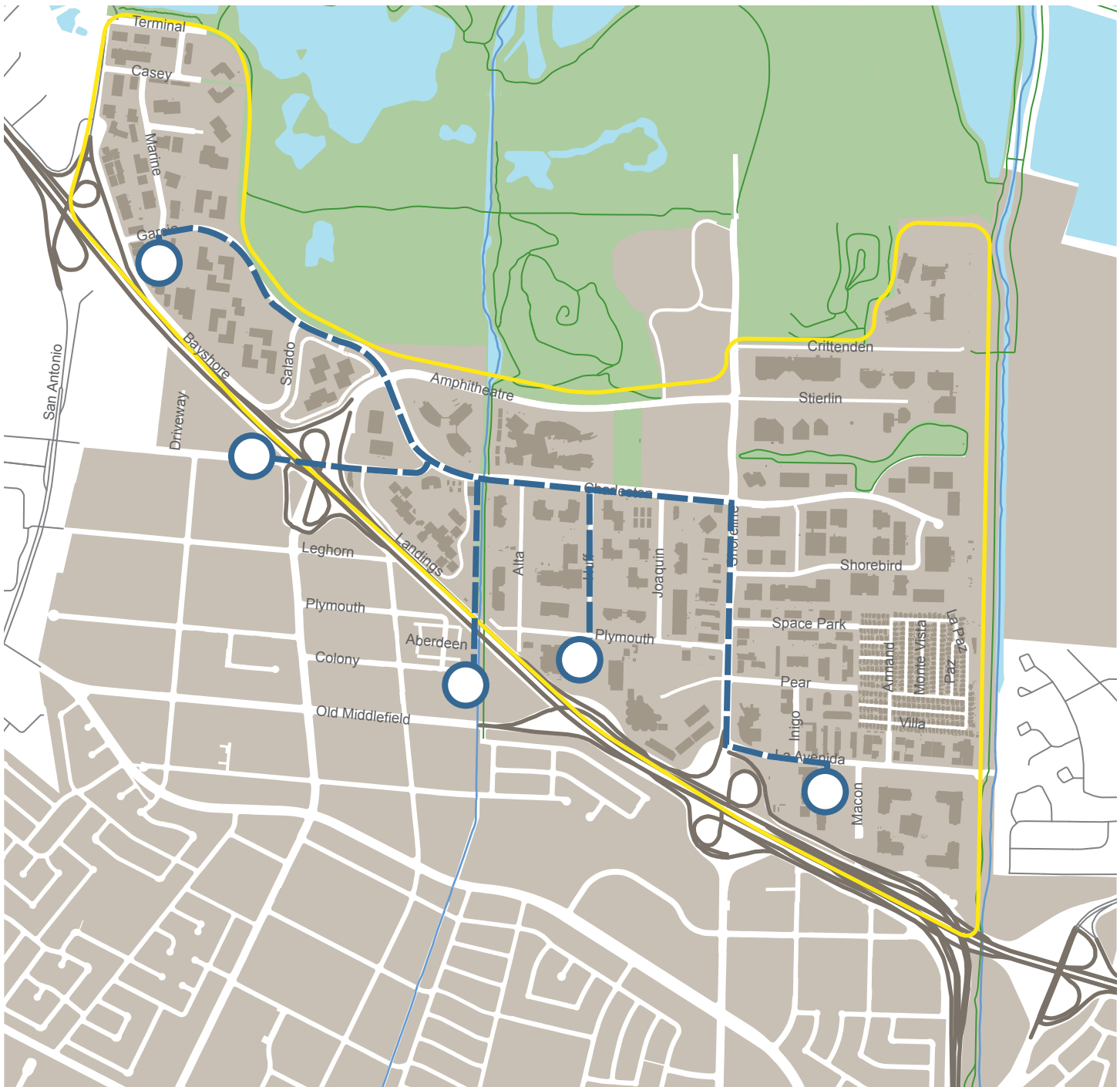


Potential Bicycle and Pedestrian Improvements

3.4 Intercept Parking Hubs

This concept would involve the development of several large parking structures located adjacent to Highway 101. Employees and visitors to the North Bayshore Area would be encouraged to park in these structures and then walk, ride a bike, or use a local transit shuttle or PRT service to reach their destination. The parking structures could also serve as hubs for connections to the regional transit network and for car-sharing. The parking facilities would accommodate shared parking. For example visitors to Shoreline Amphitheatre evening events could park in these structures sharing them with daytime employees. This would avoid duplication of parking supply. Creation of the hubs would substantially reduce the amount of auto traffic internal to the North Bayshore Area allowing the creation of a transit friendly pedestrian and bicycle oriented environment. The hubs could be designed to adapt for use by an autonomous vehicle fleet and could also be designed to allow eventual conversion to office/R&D space as the need for parking diminishes over time.

A figure illustrating the proposed remote/intercept parking hub concept is provided on the following page.



3.5 Demand Management and Implementation Strategies

Travel Demand Management (TDM) covers a broad range of policies and programs which can be used to encourage employees and other travelers to use options other than the single occupant automobile. Many of the employers in the North Bayshore Area already have travel demand management programs in place. Some of the key elements of successful TDM programs include:

3.5.1 Parking Management

Parking Management Programs focus on the effective management of the available parking supply. These programs recognize the high cost and impact of providing parking and the fact that the price and availability of parking is a key factor in the employee choice of whether to drive or to seek an alternative to driving and parking. Potential options include:

- **Parking Supply Management** is an alternative to pricing. One example would involve a cap on the amount of parking provided on either an areawide basis or on a project by project basis (parking maximums). A strict cap on the number of parking spaces can prove very challenging in an area that is striving to increase the availability of viable alternatives to the automobile. One solution to this problem is to phase in the parking limitations over time to keep pace with the implementation of transit and other mobility improvements. The amount of parking allowed would be “right-sized” to match the demand for parking as individuals shift away from the automobile to take advantage of improved transit or other travel options. In some cases parking that was originally built to serve the demand can be phased out or converted to other uses as the need for parking diminishes.
- **Shared Parking** is another key parking management technique is shared parking. Centralized shared parking facilities that serve a variety of destinations can reduce the overall need for parking and they encourage walking and bicycling, and they can reduce the amount of local auto circulation.
- **Preferential parking** for those using carpools and vanpools is also an effective option, particularly if the overall parking supply is constrained.

3.5.2 Transit Incentives

Employers can encourage the use of transit by offering free or discounted transit passes or offering the Commute Check or other flexible benefit programs. Employers can also provide transit shuttle services to make “last-mile” connections or to provide door-to-door services. In some cases, such as Stanford University, a subsidy is provided to the public transit operator to fund improved transit services to the campus and the surrounding area.

3.5.3 Carpooling/Vanpooling

Employers can offer services which assist the employees with finding and arranging carpools. They can also offer subsidies to those employees who agree to carpools, or they can even provide the vehicle, which is the case with many vanpools.

3.5.4 Bicycling/Walking Incentives

The provision of a well designed network of bicycle and pedestrian paths, lanes and facilities offers a convenient and safe environment for those who desire to bicycle or walk. Bicyclists also need a secure place to store their bicycle and ideally showers and changing facilities. The shared bike program that

has been used so effectively by Google, and the citywide shared bike program that Mountain View is implementing, offer individuals the ability to have access to a bicycle at their convenience which can dramatically increase the use of bicycles. Access to bicycle repair services and supplies is also a consideration.

3.5.5 Car Sharing

One of the more common reasons people do not bicycle or use transit to get to work is that they have a need to travel during the day. Car sharing programs solve this problem in a very efficient way. A guaranteed ride home program is another way of making employees comfortable using alternative travel modes.

3.5.6 Flexible Work Schedules/Telecommuting

Allowing employees to adopt flexible work schedules and/or to work at home can help to lessen the demand for travel during the peak travel periods.

3.5.7 Transportation Management Associations

A Transportation Management Association (TMA) is a way for employers to pool their resources to implement an employee TDM program. TMAs help to avoid the potential duplication of services and inefficiencies that result when individual employers run their own TDM programs. TMA also offer the smaller employers a more cost effective means of providing TDM benefits to their employees. TMAs are fairly common in the Bay Area. Some were formed voluntarily, but many were required by the local jurisdiction as a condition of development. TMAs also allow for better coordination between property owners, businesses and other venues in a given area. For example the Mission Bay TMA in San Francisco participates in the Ballpark Transportation Coordination Committee which is charged with advance planning for all events at the Giants Ballpark.

A North Bayshore TMA could be responsible for operating and managing a number of the demand management programs discussed above and funded by employer membership dues. The TMA would keep apprised of its membership's evolving transportation needs with periodic membership surveys. Programs that a local TMA may operate and manage would include:

- **Caltrain and internal circulator shuttles** – Currently there are multiple employer shuttles and buses connecting the downtown Caltrain Station and North Bayshore Area. Consolidation of operations under the TMA would allow optimized service coverage and streamlined Caltrain station transfers.
- **Public bikeshare management** – Providing shared bikes across North Bayshore would allow the expansion of the successful program that Google has developed and that the city of Mountain View is piloting to all employers in the area. The TMA would be responsible for management and operation of the shared bike fleet. This includes expansion of the fleet to additional locations in North Bayshore if warranted.
- **Public carshare management** – Carshare programs like Zipcar will bring a carshare fleet to a city for a guaranteed minimum monthly usage. The consolidated employee population under the TMA, would serve as a guarantee for this minimum. The TMA would facilitate this membership process, and negotiate convenient carshare pods in the NorthBayshore Area based on the TMA member's needs.