

Comprehensive County Expressway Planning Study

Implementation Plan

County of Santa Clara

Roads and Airports Department
101 Skyport Drive
San Jose, CA 95110
408-573-2400
www.sccgov.org
www.expressways.info

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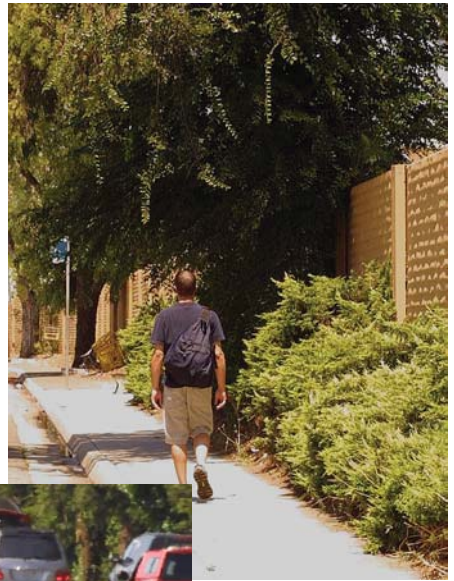
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EXECUTIVE SUMMARY



EXPRESSWAY STUDY IMPLEMENTATION PLAN

EXECUTIVE SUMMARY

The Comprehensive County Expressway Planning Study was undertaken to provide a long-term plan for the improvement and maintenance of the County Expressway System. The study took almost two years to complete and culminated in the development of the *Implementation Plan*. The *Implementation Plan* provides a basis for and guides the investment of money and other resources in the expressways. The plan:

- ❖ Projects conditions and evaluates need over a 30-year timeframe to be compatible with other regional planning documents and to provide a long-term perspective on expressway system needs.
 - ❖ Identifies capital improvement project needs ranging from short sidewalk segments to extensive expressway segment improvements to freeway interchange reconstruction.
 - ❖ Identifies maintenance and operational improvement needs varying from signal coordination expansion to enhanced street sweeping intervals to infrastructure replacement.
 - ❖ Provides immediately useful information by including recommendations for improvements to signal timing plans and modifications to high-occupancy vehicle (HOV) lane operations, and by recommending design guidelines for bicycle accommodation on the expressways.
 - ❖ Relates project benefits and potential for delivery to priorities expressed through a tier structure, with the highest priority Tier1A roadway projects expected to be funded through existing revenue sources.
 - ❖ Proposes a funding strategy to achieve plan implementation.
 - ❖ Considers roadway improvement needs in South County, where Gilroy is constructing Santa Teresa Boulevard to expressway standards.
-

Expressway Study Process

A collaborative planning process was used during the study to ensure the local cities and their residents would support the *Implementation Plan*. The foundation for the collaborative process was a solid technical analysis process. The study collected traffic data; provided analysis of existing conditions; projected 2025 traffic conditions; developed conceptual improvement strategies and designs; and used experts for block-by-block evaluation of study elements for pedestrian, bicycle, and sound wall needs and proposed improvements.

Study progress and direction was monitored and guided by a Policy Advisory Board (PAB). PAB membership consisted of two county supervisors, one councilmember each from twelve cities, two VTA board members, and two members of the County Roads Commission. The PAB met as a whole every two to three months to discuss study and systemwide issues and met twice in small groups to discuss issues and recommendations for individual expressways. County Supervisor James T. Beall, Jr., a leading advocate of the Expressway Study, served as the chair of the PAB.

A Technical Working Group (TWG) provided review and input to both study staff and the PAB. The TWG members included staff from twelve cities, Caltrans, Metropolitan Transportation Commission (MTC), and Santa Clara Valley Transportation Authority (VTA). TWG meetings occurred every one to two months to prepare for PAB meetings, address specific issues, and achieve technical and administrative consensus.

Expressway System Overview

The expressways were designed to relieve local streets and supplement the freeway system. In addition to single-occupant automobiles, bicycles, pedestrians, carpools, and transit use the expressways. Key statistics about the system include:

- ❖ **8** expressways, **5** of which have HOV lanes
- ❖ **62** centerline miles of expressway, traveling through **11** cities
- ❖ **134** signalized intersections
- ❖ **55** bridges

- ❖ **150,000** feet of existing sound walls
- ❖ **1.5 million** vehicles use expressways daily
- ❖ **55%** of Santa Clara County residents use an expressway daily (based on 2001 telephone survey)



Key findings about expressway characteristics and traffic conditions include:

- ❖ The highest use expressways are Capitol, Lawrence, and Montague with 280,000 to 300,000 daily users. San Tomas is close behind at 220,000. Central, Foothill, and Almaden are in the mid-range (110,000 to 150,000) and Oregon-Page Mill is the lowest used expressway at 50,000.
- ❖ The posted speed limit is 45 or 50 miles per hour (mph) for all but Oregon-Page Mill Expressway. However, due to congestion and signal wait times, the average speed during commute hours is generally much lower. Montague and Lawrence experience the lowest average speeds (12 and 17 mph, respectively) due to high demand, limited capacity, and the resulting congestion levels.
- ❖ Residential land uses, mixed with some commercial, are predominant along three of the expressways while one expressway is surrounded mostly by industrial uses. The remaining four expressways serve a fairly equal mix of residential/commercial and industrial land uses.
- ❖ Almaden, Capitol, Lawrence, Montague, and San Tomas users expressed the greatest dissatisfaction with congestion levels (over 70% of surveyed respondents), while Foothill and Central were seen as less of a congestion problem (around 55%), and Oregon-Page Mill fell in the middle (61%). (2001 telephone survey)
- ❖ Out of the 134 signalized intersections, 30 intersections were operating at level of service (LOS) F in 2001. The number of LOS F intersections is projected to increase to 50 by 2025. San Tomas has the highest number of existing LOS F intersections (9 intersections) with Montague close behind (8). Lawrence and San Tomas tied for the highest number of 2025 LOS F intersections (12 each).

- ❖ Montague Expressway currently operates at LOS F corridor-wide and portions of Capitol and Central expressways are expected to degrade to corridor LOS F conditions by 2025.

Expansion of the Expressway System

Almaden Expressway – Almaden will eventually be extended to Bailey Avenue. The timing of the extension will be determined by San Jose land use decisions with the likely trigger being development of Coyote Valley.

South County – The City of Gilroy is constructing Santa Teresa Boulevard to expressway standards. The City of Morgan Hill does not support having expressways within Morgan Hill. The PAB South County representatives arrived at a consensus that a regional transportation plan is needed for the South County area. The “South County Circulation Study” will be managed by VTA and will involve the County, Gilroy, Morgan Hill, and San Jose. The results of this study will help facilitate the decision making about whether Santa Teresa Boulevard in Gilroy should be part of the County’s expressway system.

Expressway Vision Statements

A key finding from the data gathering and city/community outreach is that each expressway has its own unique character, function, and community relationship. Therefore, the ultimate build-out of each expressway must vary to meet community needs. To guide the expressway plans, a vision was developed for each expressway, through a collaborative process involving the cities, TWG, and PAB.

Capital Improvement Program

The Capital Improvement Program includes roadway, bicycle, pedestrian, sound wall, and landscaping improvements.

Roadway Capacity and Operational Improvements

Seventy-two (72) roadway improvement projects are identified for the expressway system. Figure ES-1 illustrates the following types of projects:

Capacity Projects – Roadway widening, new turning lanes at intersections, and new or reconfigured interchanges/grade separations.

Operational and Safety Improvements – Auxiliary lanes, median/access closures, and bridge replacements.

Signal Operational Improvements – Traffic Operations System (TOS) equipment using advanced technologies to monitor and improve traffic flow, replacement of outdated equipment, and expanded coordination with city signal systems.

In addition to the projects shown in Figure ES-1, the roadway Capital Improvement Program includes:

HOV System Projects – Improves effectiveness of HOV system. Includes adding one new HOV lane segment, removing HOV lanes experiencing operational problems, and adding expressway-freeway HOV direct connector ramps.

Roadway Improvements Costs and Priorities

The total cost for the roadway improvement capital program is \$1.64 to 1.94 billion. To determine priorities for funding and implementation, the roadway projects were divided into tiers using specific criteria. Table ES-1 summarizes the tiers.

Figure ES-1: Capacity/Operational Improvements

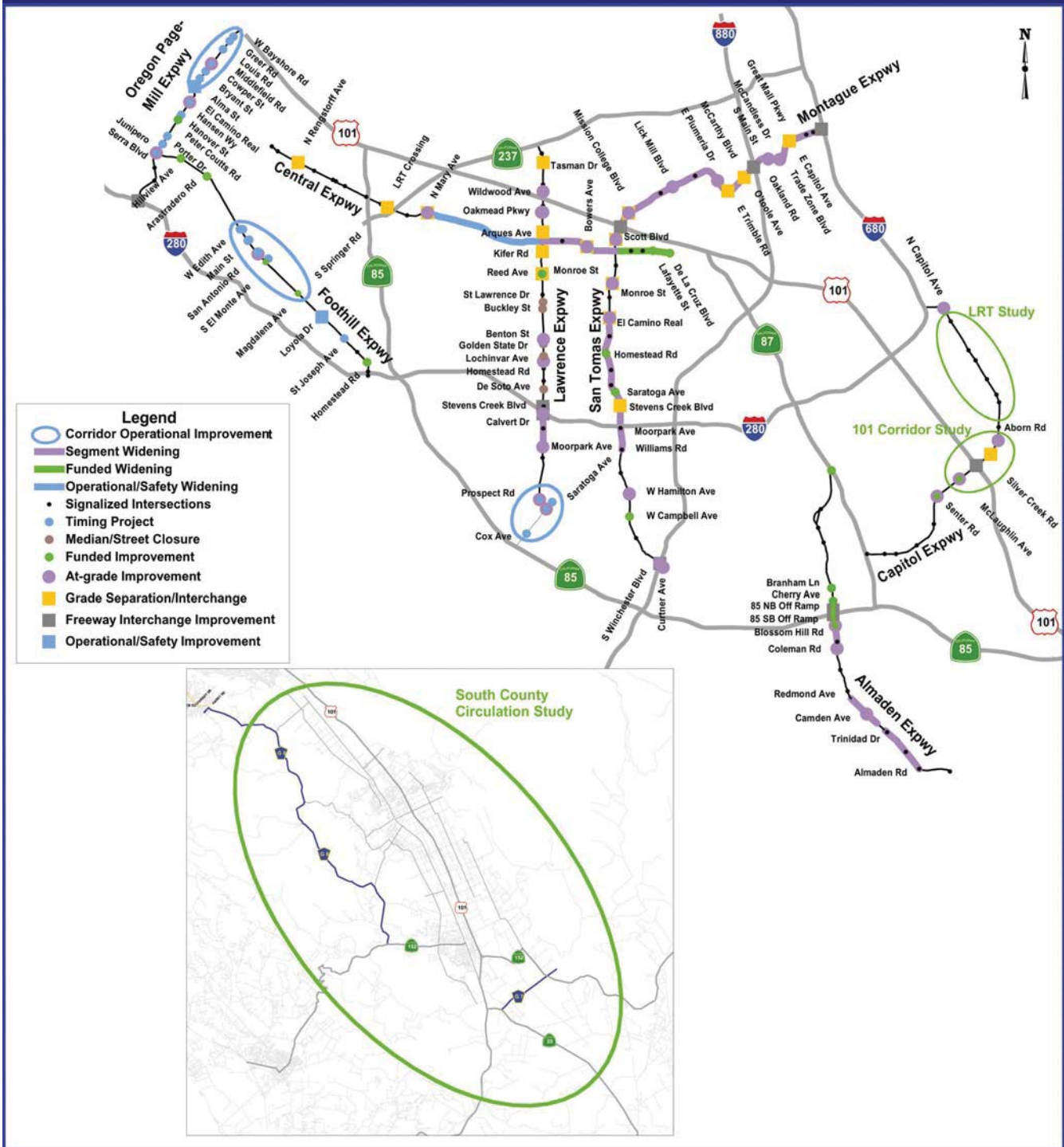


Table ES-1: Roadway Projects Tier Summary

Tier	Tier Criteria	# of Projects	Capital Cost (millions)
1A	Improves 2001 LOS F intersections, provides operational improvements, or conducts key feasibility studies	28	\$149-151
1B	Constructs interchanges at 2001 LOS F intersections	7	\$261-271
1C	Improves 2025 projected LOS F intersections	13	\$49-53
2	Provides other expressway capacity improvements or new technologies	15	\$585-671
3	Reconstructs major existing facilities or constructs new facilities	9	\$593-795
	Totals	72	\$1,637-1,941

Consistent with the long-term view and expressway vision statements, the plan includes some large-scale improvement projects. While proceeding with the projects now is not economically feasible, the plan does allow for progress by recommending early feasibility studies to better quantify project benefits, costs, and impacts. The plan also emphasizes flexibility and the needs for continued close coordination with the cities and neighborhood outreach when project funds are actually in place.

The 28 projects in Tier 1A address the top priorities for each expressway and improve most of the current LOS and operational problem areas for a total cost of \$150 million. These low-cost improvements can be delivered relatively quickly once funds are secured. Table ES-2 lists the Tier 1A projects.

Table ES-2 Tier 1A Capacity and Operational Improvement Projects

Projects are listed by expressway and proceed from south to north or west to east for each expressway

Expressway	Project Description <i>(When funding is obtained, each project will undergo design, environmental review, and community outreach as appropriate. Project description may be changed based on the results of these activities.)</i>	Cost (millions)
Almaden	Widen to 8 lanes between Coleman and Blossom Hill including an additional left-turn lane from SB Almaden to Coleman and from EB and WB Coleman to Almaden, and a right-turn lane from WB Coleman to NB Almaden; a 4th SB and NB through lane on Almaden at Via Monte; and an additional left-turn (a total of three) from SB Almaden to EB Blossom Hill and an additional SB through lane at Blossom Hill intersection	\$6-8
	Initiate a Caltrans Project Study Report (PSR)/Project Development Study (PDS) to reconfigure SR 85/Almaden interchange	\$0.25
	Provide interim operational improvements at SR 85/Almaden: widen SB Almaden to provide a 5th lane between the Best Buy driveway and SB loop on-ramp serving as auxiliary lane for weaving vehicles; widen SB SR 85 off-ramp to add a third left-turn; provide an additional EB approach lane resulting in two left-turn, one through/right shared, and two right-turn lanes	\$2
Central	Widen between Mary and Lawrence to provide auxiliary and/or acceleration/deceleration lanes to improve ramp operations and safety	\$13
	Widen to 6 lanes between Lawrence and San Tomas Expressways without HOV lane operations	\$10
	Convert the Measure B HOV lane widening between San Tomas and De La Cruz to mixed flow and remove the HOV queue jump lanes at Scott, if unsuccessful after a 3 to 5-year trial period	\$0.1
Foothill	Signal operational improvements between Edith and El Monte including adjacent side street intersections and at Grant/St. Joseph	\$1.5
	Extend existing WB deceleration lane at San Antonio by 250 feet	\$0.5
	Replace Loyola Bridge (This improvement project will also provide necessary bicycle and pedestrian facilities, and channelization and operational improvements at adjacent intersections.)	\$10
Lawrence	Optimize signal coordination along Lawrence-Saratoga Avenue corridor including Lawrence/Prospect, Lawrence/Saratoga, Saratoga/Prospect, and Saratoga/Cox intersections	\$0.1
	Widen to 8 lanes between Moorpark/Bollinger and south of Calvert with additional WB through lane at Moorpark	\$4
	Coordinate and optimize signal phasing and timing plans at I-280/Lawrence interchange area including City of Santa Clara signals along Stevens Creek and County's signal at Lawrence/Calvert/I-280 SB ramp	\$0.1
	Prepare Caltrans PSR for Tier 1C project at the Lawrence/Calvert/I-280 interchange area	\$0.5
	Close median at Lochinvar and right-in-and-out access at DeSoto, Golden State, Granada, Buckley, and St. Lawrence/Lawrence Station on-ramp	\$0.5
	Convert HOV to mixed-flow lanes between US 101 and Elko due to high violation rates & operational problems	\$0.1

Table ES-2 Tier 1A Capacity and Operational Improvement Projects (continued)

Projects are listed by expressway and proceed from south to north or west to east for each expressway

Expressway	Project Description <i>(When funding is obtained, each project will undergo design, environmental review, and community outreach as appropriate. Project description may be changed based on the results of these activities.)</i>	Cost (millions)
Montague	Convert HOV lanes on 6-lane facility to mixed-flow use between I-880 and I-680 due to operational and safety problems	\$0.1
	Baseline project consisting of 8-lane widening and I-880 par-clo interchange with at-grade improvements at Lick Mill, Plumeria/River Oaks, Main/Old Oakland, and McCandless/Trade Zone; designate new lanes between I-880 and I-680 as HOV for a 3 to 5-year trial period	\$38.5
Oregon-Page Mill	I-280/Page Mill interchange modification: remove SB loop on-ramp and construct SB diagonal on-ramp with signal operations; signalize NB off-ramp intersection; and provide proper channelization for pedestrians and bicycles	\$5
	Alma Bridge Replacement Feasibility Study	\$0.25
	Oregon corridor improvements: <ul style="list-style-type: none"> • Replace signal poles and optimize timing plan avoiding impacts on safety at unsignalized intersections • Construct pedestrian ramps with relocation of traffic signal poles at signalized intersections • Study operational changes at the unsignalized intersections at Waverley, Ross, and Indian that avoid increasing traffic impacts on cross and parallel streets, enhance bicycle and pedestrian safety, and maintain vehicle safety • Conduct feasibility study of adding turn lane at Middlefield Road and converting to 8-phase signal operation to enhance efficiency and safety without taking right-of-way 	\$5
San Tomas	At grade improvements at SR 17/San Tomas: <ul style="list-style-type: none"> • Restripe the EB through lane on White Oaks to provide an optional left as 3rd left-turn lane • Provide second right-turn lane on SB off-ramp • Study potential operational & safety improvements in the interchange area 	\$2
	Provide a 2nd left-turn lane from EB and WB Hamilton to San Tomas and a 2nd left-turn lane from NB San Tomas to WB Hamilton	\$2
	Widen to 8 lanes between Williams and El Camino Real with additional left-turn lane from EB and WB El Camino Real to San Tomas	\$28
	Provide an additional right-turn lane from WB Monroe to NB San Tomas	\$1
Signals/TOS Capital Projects	Traffic information outlets such as electronic information signs, advisory radio, cable TV feeds, and a web page	\$5
	Install equipment to coordinate expressway signals with city signals on perpendicular streets	\$10
	Install equipment to connect with Sunnyvale, Palo Alto, Mountain View, and Los Altos traffic signal interconnect systems	\$2.5
	Upgrade traffic signal system to allow automatic traffic count collection	\$0.5
	Total Tier 1A	148.5 -150.5

Figure ES-2: Corridor Level of Service for No Project

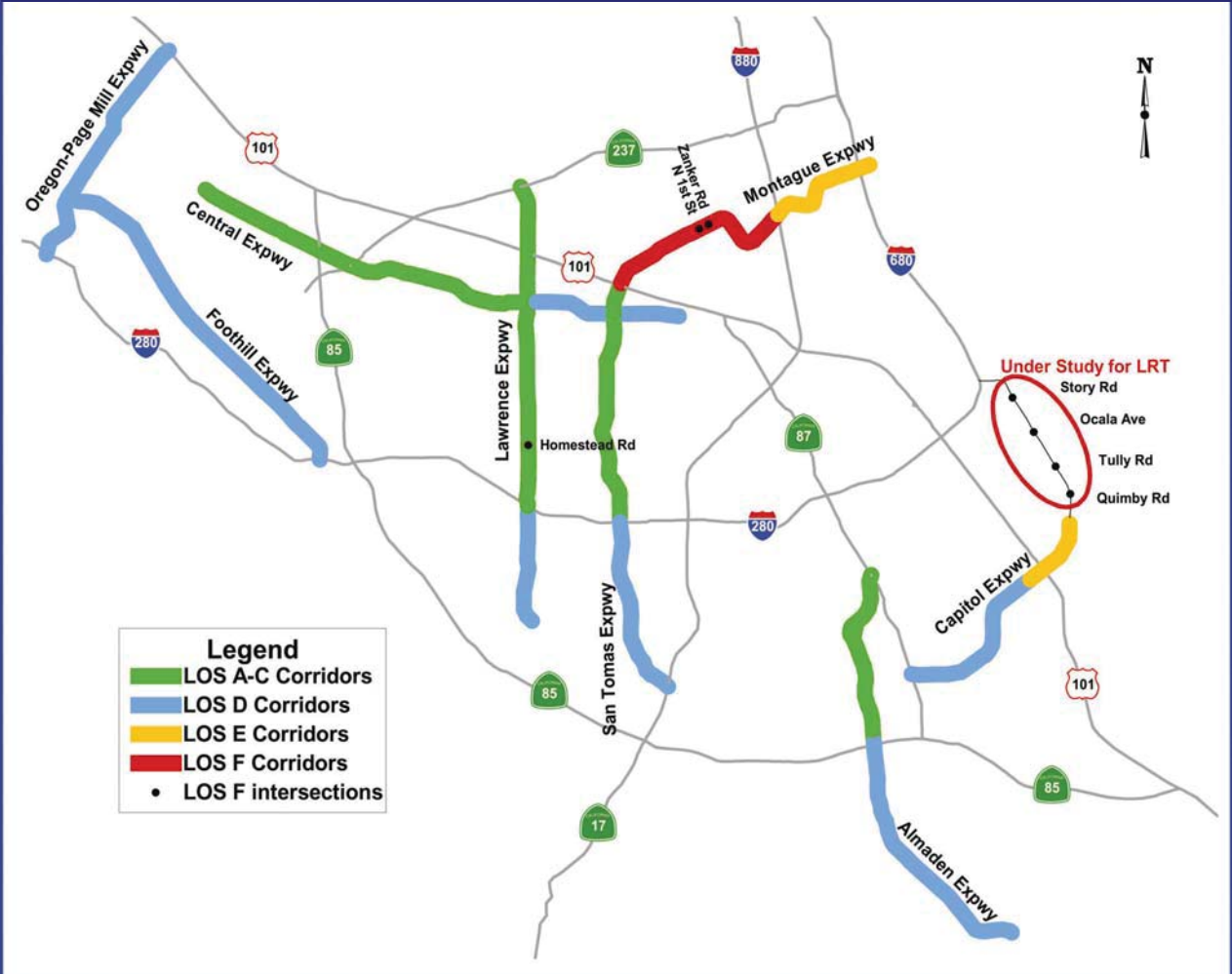


Effectiveness of Roadway Improvements

Figures ES-2 and ES-3 illustrate the LOS benefits of the recommended capacity and operational improvements for the planning year 2025. Figure ES-2 indicates projected corridor LOS and Intersection LOS F locations in 2025 if no improvements are made. Figure ES-3 indicates 2025 LOS conditions with full implementation of all recommendations. Key findings include:

- ❖ 6 of the 8 expressways would operate at corridor LOS D or better.
- ❖ Montague Expressway would have LOS E and F corridor segments but queuing and overall delay would be reduced significantly over existing levels.

Figure ES-3: Corridor Level of Service for All Projects



- ❖ Capitol Expressway may have LOS E or F segments northeast of US 101; however, a light rail line is planned for this expressway providing a travel alternative.
- ❖ 28 existing LOS F intersections and 43 projected 2025 LOS F intersections would be improved to at least LOS E, with most improved to LOS D or better.
- ❖ The Tier 1A list of projects improves 18 existing and 24 projected 2025 LOS F intersections.



Other Capital Improvements

Bicycle Projects – Bicycles are accommodated on all expressways. Bicycle improvement recommendations were identified based on bringing all expressways into compliance with the Bicycle Accommodation Guidelines (BAG). The BAG includes guidelines on bicycle travel area widths, striping, signage, trail connections, maintenance, and several other design treatments. Specific capital projects identified include striping improvements and shoulder widening.

Pedestrian Facilities – A pedestrian facilities plan was developed covering the entire length of each expressway. Recommended pedestrian improvements for traveling along the expressways vary along sections of the expressways based on physical conditions, pedestrian needs, fronting land use, and community development plans. New sidewalks are recommended to close gaps in otherwise continuous sidewalks, to access transit stops, and to provide access to land uses fronting on the expressways. Recommendations also include improved connections and directional signage to parallel pedestrian facilities, such as trails and frontage roads.

For expressway crossing needs, high-demand crossing locations were identified for potential crossing enhancements ranging from reconfiguring intersections to make them more pedestrian-friendly to installing pedestrian countdown timers and pedestrian ramps. Two new pedestrian overcrossings (POCs) are also recommended – one on Almaden near Coleman Road and one on San Tomas near Latimer Avenue.

Finishing Program: Sound Walls – An assessment of sound wall needs was conducted according to the guidelines of Caltrans and the Federal Highway Administration (FHWA). Overall, the plan recommends 63,500 feet of new sound walls and replacing 36,000 feet of existing walls with higher walls. The plan also acknowledges that sound walls are not always the preferred method of noise abatement for the local community and recommends that the preferred level and type of noise abatement (including sound wall height) be based on noise analysis, community outreach, and city coordination when funding is available.



Finishing Program: Landscaping – The following level of landscaping is recommended for the expressways: trees and limited shrubs; median finishes, such as decomposed granite; sound walls covered with vines; and, automated irrigation system. However, the plan also recommends continuing with the County’s current landscaping policy to not install new landscaping unless funds are available for maintaining it.

Table ES-3 summarizes the costs for these recommended capital improvements by expressway.

Table ES-3: Other Capital Improvements				
Expressway	Bicycle (millions)	Pedestrian (millions)	Sound Wall/ Noise Abatement (millions)	Expressway Total (millions)
Almaden	\$0.40	\$6.35	\$5.60	\$12.35
Capitol ⁽¹⁾	\$0.20	\$3.83	\$3.74	\$7.77
Central	--	\$2.67	\$5.10	\$7.77
Foothill	\$0.50	\$0.45	\$8.84	\$9.79
Lawrence	-- ⁽²⁾	\$2.81	\$3.59	\$6.40
Montague	-- ⁽³⁾	\$0.40 ⁽³⁾	\$2.06	\$2.46
Oregon-Page Mill	--	\$1.20	\$5.70	\$6.90
San Tomas	\$0.45	\$5.29	\$13.09	\$18.83
Systemwide Improvements	\$0.10	\$0.20	--	\$0.30
Landscaping Installation				\$21.00
System Total				\$93.57
Part of Roadway Projects ⁽⁴⁾				\$18.14
Net Additional Cost				\$75.43

Notes:

- (1) Bicycle, pedestrian, and sound wall needs for Capitol between Nieman and Story will be determined by VTA’s light rail project.
- (2) Bicycle improvement needs for Lawrence will be completed as part of the 2003 pavement resurfacing project.
- (3) The 8-lane widening for Montague includes all bicycle improvements and sidewalks.
- (4) Roadway capacity/operational projects include pedestrian, bicycle, and sound wall improvements within project limits.

Maintenance & Operations

Maintenance and operations include all activities and materials necessary to keep the expressways functioning safely and efficiently while looking presentable. Based on comments received from the public, cities, and



and policymakers, the overall goal for expressway maintenance and operations can be summed up as: “The expressways should be cleaner and greener with smooth pavement and synchronized signals.”

The County’s current practices are limited by available revenue. However, to meet the desired goal, the plan recommends levels of effort comparable to the cities’ current practices. Table ES-4 lists the estimated costs for the recommended levels of effort. The operating costs for the recommended levels of effort exceed existing available revenues.

Table ES-4: Recommended Maintenance/Operations Levels of Effort	
Category	Annual Operating Cost (millions)
Signal Operations/TOS	\$1.5
Sweeping	\$0.6
Landscape Maintenance	\$4.0
Pavement Maintenance	\$3.8
Infrastructure Replacement (all types)	\$6.6
All Other	\$1.5
Total	\$18.0

Funding Strategy

The *Implementation Plan* has laid out a comprehensive program for the improvement and maintenance of the expressways over the next 30 years. The plan identifies a total capital program approaching \$2 billion as well as needs of \$18 million annually for maintenance and operations. In addition, delivery of the entire capital program would require \$11.4 – 13.5 million in annualized matching funds, assuming the projects are subject to VTA’s 20% local match requirements. Funding such a program requires both aggressively pursuing existing revenue sources and finding new revenue sources.

Capital Improvements Fund Sources

The primary funding sources for the capital improvement program are federal and state grants. These grants are allocated through VTA’s Valley Transportation Plan (VTP) 2020. Currently, out of a \$2 billion roadway funding program, VTP 2020 allocates \$80 million for expressways. VTP 2020 also includes competitive grant programs for bicycle, pedestrian, TOS, and sound wall improvements.

The County remains financially challenged to provide a significant local match for expressway projects given that existing roadway revenue sources are needed for maintenance and operations. The most significant existing and potential source of local match funds are developer traffic impact fees. The County cannot directly collect developer traffic impact fees in the incorporated city areas through which the expressways run. Developer contributions are determined and collected by the cities. It is unlikely that even an aggressive impact fee program pursued by all cities would raise enough funds for the full 20% local match for every project given the magnitude of the needs and the limited development opportunities along many of the expressways.

Maintenance and Operations Fund Sources

The only continuous sources of expressway maintenance and operating funds are the County’s share of the state gas tax and future Proposition 42 (sales tax on gas tax) funds. These funds must be divided among the expressways and the 635 miles of county

unincorporated roads. The *predictable sustainable* revenue available for expressway maintenance/operations ranges from \$5.2 million in 2003 to \$7.9 million in 2009 . If enacted, current state and federal proposals to index gas taxes for inflation would provide some additional revenue and would help sustain current levels of effort since the gas tax does not currently keep pace with increased costs due to inflation and higher traffic demand.

Supplementing the gas tax revenues are landscape maintenance agreements where cities and private developers pay for routine landscaping maintenance. There are also occasional one-time funding sources, most notably for pavement maintenance. The current expressway pavement resurfacing projects are funded through the Measure B sales tax program. VTP 2020 also provides pavement management grants. These special funding sources cannot be counted on to be available for scheduled routine maintenance necessary to extend pavement life.

Funding Strategy Recommendations

Taking into consideration all the existing, potential, and possible new funding sources, a funding strategy has been developed addressing each major area of need. Key recommendations from that funding strategy include the following:

- ❖ As part of the VTP 2030 process, request that VTA increase the expressway allocation from \$80 million to at least \$150 million to allow full implementation of Tier 1A projects. Tier 1A roadway projects have highest priority for VTP 2030 Expressway Program funding allocations.
- ❖ Jointly with VTA, pursue additional revenue for meeting both the transit operating needs and the expressway maintenance/operations needs, including capital program local match requirements.
- ❖ Resolve the expressway local match issue during VTA's VTP 2030 process, especially if a new funding source cannot be secured. Strategies include continuing to work with the cities to secure developer impact fees where appropriate, exchanging federal/state funds for local funds with no match requirements, and using other non-county sources as match.

- ❖ Work with the cities to collect expressway traffic mitigations, and expressway pedestrian, sound wall, and landscaping improvements through land development approval processes.
- ❖ Pursue grants and partnerships for non-roadway capacity projects, such as pedestrian, bicycle, sound wall, and TOS projects.

Next Steps

The *Implementation Plan* will be submitted to VTA for inclusion in VTP 2030 – an update of VTP 2020. It is anticipated that VTP 2030 will incorporate all projects and priorities as identified in the plan. VTP 2030 will also determine the amount of federal and state funding that will be allocated to the expressway program over the next 30 years.

Based on key recommendations in the *Implementation Plan*, there are several activities and improvements for the County to pursue in the near term that do not require large financial outlays, including:

- ❖ Participate in the development of the South County Circulation Study.
- ❖ Implement new signal timing plans developed as part of the Expressway Study.
- ❖ Conduct the environmental review for converting the Lawrence HOV lane north of US 101 and the Montague HOV lanes east of I-880 to mixed-flow lanes.
- ❖ Update County policies regarding bicycle and pedestrian access on the expressways to be consistent with the plan.
- ❖ Work closely with VTA and the cities to pursue the *Implementation Plan* funding strategy.

The County will update the *Implementation Plan* every three years in conjunction with the triennial updates of VTA's VTP plans to reflect changing traffic and financial conditions. In addition, an interim update will be prepared in 2004 if VTA does not fully fund the Tier 1A list of roadway projects in VTP 2030. This interim update will focus on using the plan's collaborative process to establish Tier 1A priorities.



SECTION ONE

INTRODUCTION

In September 2001, the County of Santa Clara Roads and Airports Department began work on the Comprehensive County Expressway Planning Study. The study's purpose was to provide a long-range plan for the improvement and maintenance of the expressways in Santa Clara County. It took almost two years to complete and culminated in the development of the *Implementation Plan*.

The *Implementation Plan* details the policies, improvement recommendations, priorities, and funding strategy for the expressway system. It is comprehensive and considers the needs of each expressway and the expressway system as a whole. Specific areas addressed in the plan include:

- ❖ Capital improvement program – consists of roadway, signal system enhancements, high-occupancy vehicle (HOV) facilities, bicycle, pedestrian, landscaping, and sound wall projects. Project lists vary from short sidewalk segments to extensive expressway segment improvements to freeway interchange reconstruction. The projects include both capacity needs and operational/safety improvements.
 - ❖ Maintenance and operations– identifies all activities and materials necessary to keep the expressways functioning and looking presentable. Improvements vary from signal coordination expansion to enhanced street sweeping intervals to pavement maintenance to infrastructure replacement.
-

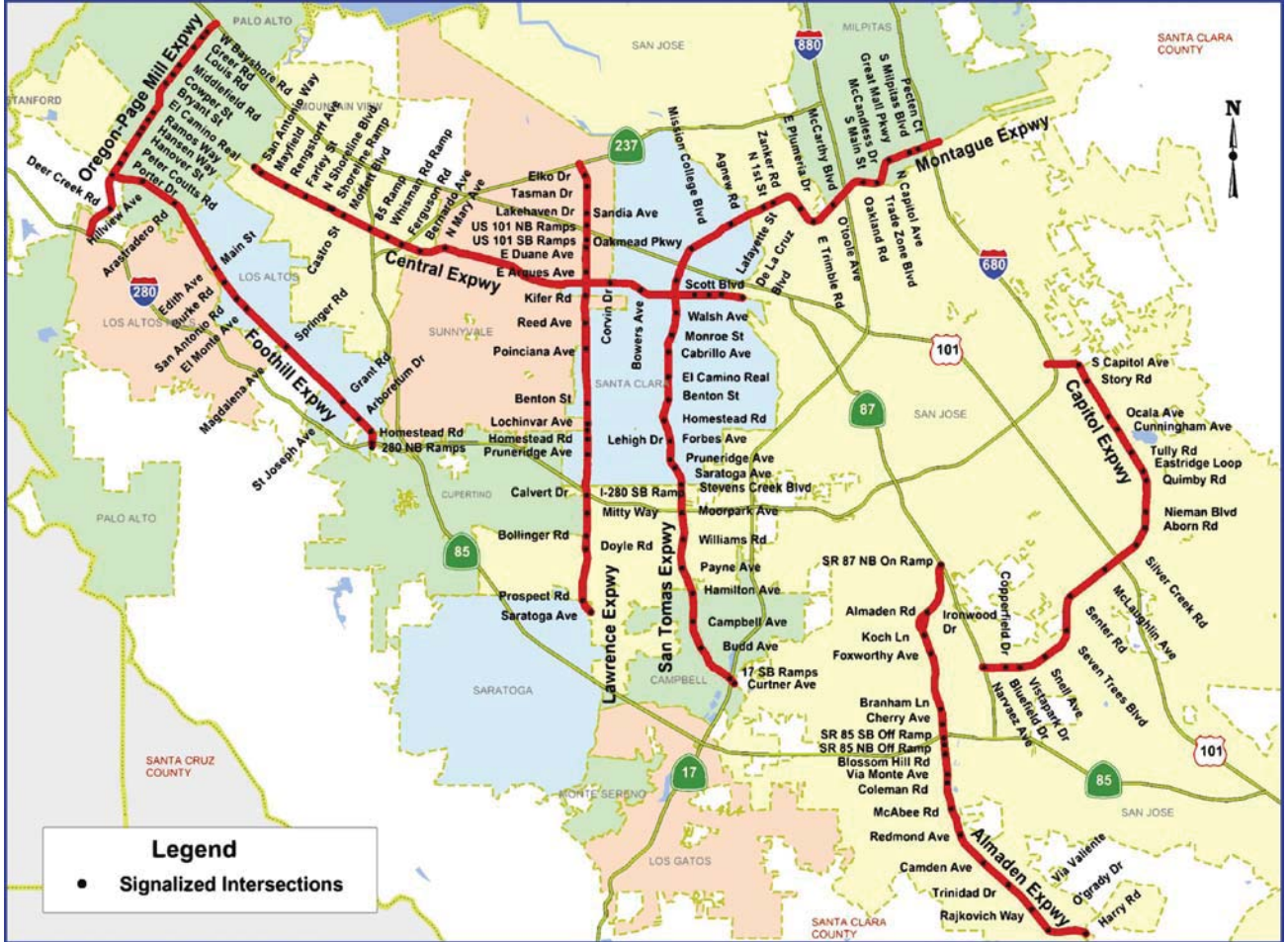
- ❖ Funding strategy – summarizes the costs of the recommendations included in the plan and describes existing, potential, and new funding sources for funding these recommendations. A list of funding strategies to pursue are recommended.
- ❖ Roadway improvement needs in South County, where Gilroy is constructing Santa Teresa Boulevard to expressway standards, were also considered during the study, and the *Implementation Plan* includes a recommendation for a separate South County Circulation Study.

Description of Expressway System

There are eight expressways operated by Santa Clara County: Almaden, Capitol, Central, Foothill, Lawrence, Montague, Oregon-Page Mill, and San Tomas (see Figure 1-1). Southwest Expressway was never part of the county system and is maintained as a city street. Santa Teresa Boulevard was originally planned to be a continuous expressway between South San Jose and US 101 south of Gilroy, but much of the alignment has been relinquished or annexed into San Jose, Morgan Hill, and Gilroy as those cities have grown and established their own circulation plans. The portion of Capitol Expressway between Almaden Expressway and State Route (SR) 85 was relinquished to San Jose as part of an auto dealer assessment district improvement plan.

The eight expressways provide significant capacity for local trips, with 1.5 million vehicle trips made on a daily basis. In a 2001 survey of county residents, 55% reported using an expressway on a daily basis. While providing for intracity trips (Almaden and Capitol are entirely within San Jose; Oregon-Page Mill is mostly within Palo Alto), the expressways are also important intercity facilities. Montague-San Tomas connects Milpitas to Campbell and terminates near Los Gatos; Central connects Palo Alto to San Jose; and, Lawrence connects Sunnyvale to Saratoga. Sixty-two (62) centerline miles in length, the expressways provide a vital connection among residential areas, industrial centers, and commercial districts.

Figure 1-1: Santa Clara County Expressway System



Previous Expressway Planning Efforts

The origin of the expressways dates back to 1956, when the Santa Clara County Board of Supervisors initiated a study to define future transportation needs for the county. The January 1959 *Trafficways Plan for Santa Clara County* concluded that the existing highways would not be able to handle projected vehicular traffic and recommended constructing various facilities, including the expressway system. To build the expressways, a \$70 million bond proposal was put to the voters and approved on March 28, 1961. As a result, the County of Santa Clara became the only county in the state to operate a high capacity roadway system through incorporated city areas.

The bond money allowed substantial work to proceed on the expressways, but skyrocketing property values reduced the program's purchasing power, and a Phase 2 funding proposal fell through. Ultimately, the existing system was built out by supplementing the program with federal revenues, by not obtaining full access control in some cases, and by not pursuing some expressway alignments (Hillsdale, for example).

Significant efforts were made to update expressway plans in 1971 (Future Width Line Study) and 1986 (Transportation 2000 or "T2000"). Most of T2000's highest priority, short-term expressway projects have been implemented. However, the long-range elements, especially the interchange projects, are no closer to construction than they were in 1986. The intersection problem areas identified in the T2000 study are essentially the same areas that are experiencing problems today. However, conditions and city plans have changed since T2000 making some of the T2000 recommendations unnecessary or impractical.

The need for a new comprehensive study of the expressway system became apparent during development of the Valley Transportation Plan (VTP) 2020, adopted in 2000 by the Santa Clara Valley Transportation Authority (VTA). The T2000 expressway recommendations were dated. In response to a general call for projects conducted as part of VTP 2020, the cities and County submitted over \$940 million worth of expressway projects. Some of these projects conflicted with another jurisdiction's preferences, some would have major impacts to surrounding neighborhoods, and some would just shift congestion to other expressway locations. What was lacking was a comprehensive approach to identifying, analyzing, and developing consensus on a list of expressway improvement projects.

VTP 2020's expenditure plan, therefore, allocated funding only to projects on Central and Montague Expressways which were considered to have well defined scope. VTP 2020 also recommended that each expressway be studied, similar to the 1999 Montague Expressway Study, to determine improvement needs and priorities for that expressway. The County Board of Supervisors, however, determined that a more comprehensive study was necessary to identify the full range of needs on all expressways and to set priorities in the context of systemwide needs. Consequently, an agreement was reached for the County to conduct the Expressway Study using a planning grant from VTA.

Expressway Study Process

The Expressway Study proceeded in two major phases. The first phase identified needs and resulted in individual expressway vision statements. In Phase 2, improvement strategies were developed and evolved into the *Implementation Plan*.

A collaborative planning process was used during the study to ensure the local cities and their residents would support the *Implementation Plan*. The foundation for the collaborative process was a solid technical analysis process. The study collected traffic data; provided analysis of existing conditions; projected 2025 traffic conditions; developed conceptual improvement strategies and designs; and used experts for block-by-block evaluation of study elements for pedestrian, bicycle, and sound wall needs and proposed improvements.

City and Community Participation

Study progress and direction was monitored and guided by a Policy Advisory Board (PAB). PAB membership consisted of two county supervisors, one council member each from twelve cities, two VTA board members, and two members of the County Roads Commission. The PAB met as a whole every two to three months to discuss study and systemwide issues and met twice in small groups to discuss issues and recommendations for individual expressways. County Supervisor James T. Beall, Jr., a leading advocate of the Expressway Study, served as the chair of the PAB.

A Technical Working Group (TWG) provided review and input to both study staff and the PAB. The TWG members included staff from twelve cities, Caltrans, Metropolitan Transportation Commission (MTC), and VTA. TWG meetings occurred every one to two months to prepare for PAB meetings, address specific issues, and achieve technical and administrative consensus.

Table 1-1 summarizes the study process by time period, activity, and purpose. Also shown are the community outreach activities, including telephone surveys, various neighborhood and business community meetings, and a project open house. Throughout the project, there was a project website with a link for public comment and a project telephone hotline. Comments received were summarized, made available to the PAB, and posted on the web site.

Table 1-1: Expressway Study Collaborative Planning Process

Time Period	Activity	Purpose
Sept. – Nov. 2001	2 TWG meetings; Met with VTA committees	Present and receive comments on Study's draft work scope
Nov. 2001 – Jan. 2002	Interviewed staff from 13 cities, VTA, Caltrans, and CHP	Gather city/agency input on key issues related to the expressways
Dec. 2001	Telephone survey #1	Determine public opinions about and usage of expressways
Jan – Mar. 2002	2 PAB meetings and 2 TWG meetings	Discuss current and projected traffic conditions, other technical information, and city/community input received
Feb. – Mar. 2002	5 project design meetings with cities' staffs	Develop roadway improvement design concepts
Mar. 2002	PAB South County small group workshop #1	Discuss South County's transportation needs
May – June 2002	4 PAB small group workshops	Discuss visions, potential improvements, and key issues for each expressway
June 2002	PAB South County small group workshop #2	Develop consensus for a South County Circulation Study
May – June 2002	1 PAB meeting and 2 TWG meetings	Discuss pedestrian, bicycle, sound wall, and landscaping issues
July – Oct. 2002	Briefed 9 city councils and Board of Supervisors	Review and comment on expressway visions and potential improvements
Sept. – Oct. 2002	4 community meetings	Review and comment on expressway visions and potential improvements
Sept. – Oct. 2002	1 PAB meeting and 1 TWG meeting	Discuss results of city/community outreach and expressway funding needs and options
Oct. – Nov. 2002	4 PAB small group workshops and 4 TWG small group meetings	Discuss recommendations and priorities for each expressway
Nov. 2002	PAB South County small group workshop #3 (part of VTA South County PAB meeting)	Present draft South County Working Paper
Nov. 2002	PAB Capitol small group joint workshop with VTA Downtown East Valley PAB	Develop consensus on proposed vision for Capitol Expressway
Nov. 2002 – Jan. 2003	Met with 3 chambers of commerce	Receive comments on preliminary recommendations and potential new funding sources
Jan. 2003	Telephone survey #2	Evaluate support for proposed improvements and funding sources
Dec. 2002 – Mar. 2003	2 PAB meetings and 4 TWG meetings	Discuss and approve elements of the Draft Implementation Plan

Table 1-1: Expressway Study Collaborative Planning Process (continued)

Time Period	Activity	Purpose
Mar. 2003	Board of Supervisors meeting	Release Draft Implementation Plan for review and comment
Mar. – Apr. 2003	Notified over 350 neighborhood associations/community groups, the Cities' Association, and the NAIOP about the Draft Plan's availability	Invite comments on Draft Plan and offer to meet with their groups upon request
Apr. – August 2003	Met with 10 city councils	Receive comments and request endorsement of Draft Plan
Apr. – July 2003	Met with 3 community groups, 3 VTA advisory committees, 1 chamber of commerce, and SVMG	Receive comments on Draft Plan
May 2003	Expressway Study Open House	Receive comments on Draft Plan
May 2003	1 PAB meeting and 1 TWG meeting	Approve revisions to Draft Plan and recommend approval of proposed Final Plan by Board of Supervisors
August 2003	Board of Supervisors meeting	Approve Final Plan for submittal to VTA for inclusion in the VTP 2020 Update
Throughout Study	Attended 6 meetings of VTA/County BPAC	Receive input during development of the bicycle and pedestrian elements
Throughout Study	Met with VTA staff frequently	Discuss specific issues related to the Study, including traffic modeling, South County, Capitol Expressway, bicycle/pedestrian planning, and transportation funding
Throughout Study	Met with community/business groups, city staff, city committees, and PAB members upon request	Discuss specific issues related to the expressways, including potential improvements, maintenance, signal operations, funding strategies, traffic modeling, and South County needs
Monthly	Attended County Roads Commission meetings	Provide updates on the Study
Continuously	Maintained Study web site and telephone hotline	Provide information and receive comments

BPAC = Bicycle and Pedestrian Advisory Committee
 CHP = California Highway Patrol
 NAIOP = National Association of Industrial and Office Properties
 PAB = Policy Advisory Board
 SVMG = Silicon Valley Manufacturing Group
 TWG = Technical Working Group
 VTA = Santa Clara Valley Transportation Authority
 VTP = Valley Transportation Plan

Process Results

The collaborative planning process was well received. It led to agreements on solid foundation concepts such as the vision statement for each expressway, and generated strong consensus on project scope to satisfy service issues consistent with the vision statements. There was clear and two-way communication of desirable operating standards and maintenance budget limitations, which help strengthen working relationships with all of the agencies involved.

Overall, the study has provided an educational experience for all participants. The lessons learned included:

- ❖ There was a shared desire among all participants that the expressways be “greener and cleaner, with smooth maintained pavement and synchronized traffic signals.”
- ❖ While there is a continuing emphasis on the benefits of signal system enhancements, there is recognition that many expressway segments have or are expected to exceed capacity, and signal timing efforts alone will not provide long-term service improvements.
- ❖ Some previous long-range plan elements are no longer needed or inconsistent with local preferences.
- ❖ In some cases, different types of expressway improvements could conflict, frequently due to limited right-of-way (e.g., sidewalk versus landscaping). Tradeoffs must be made in the context of each expressway’s particular conditions and local preferences.

These lessons helped shape the approach to and recommendations included in the *Implementation Plan*.

Organization of Document

The Expressway Study *Implementation Plan* is organized into specific elements reflecting the different types of improvements, needs, and transportation modes. Each element deals with systemwide needs, listing recommendations for individual expressways as appropriate. The plan also recognizes that there are inter-relationships between the elements. For example, many of the elements have both capital and maintenance/operations needs or can adversely

affect one another, such as mature landscaping infringing on pedestrian and bicycle travel areas.

The next section of the document (Section 2 “Expressway System Characteristics and Needs”) provides key information about the expressway system including current and projected traffic conditions, specific characteristics of each expressway, description of transit services on the expressways, system expansion and South County status, and each expressway’s vision statement.

Sections 3 to 9 detail recommendations for the seven elements: Capacity/Operational Improvements, Signals/Traffic Operations System (TOS), High-Occupancy Vehicle (HOV) System, Bicycle, Pedestrian, Finishing Program (sound walls and landscaping), and Maintenance/Operations. Section 10 provides the funding strategy and Section 11 lists key issues to be addressed in future plan updates. The document also includes three appendices: Appendix A provides a glossary, Appendix B summarizes all element recommendations by expressway, and Appendix C documents plan endorsements.

During the study, a number of technical reports and memorandums were prepared covering a full range of technical and collaborative planning details including traffic analysis, traffic modeling, sound walls, pedestrian facilities, bicycle improvements, funding issues, and community outreach findings. There are also supplemental formal reports available for more information. Table 1-2 lists these reports.

Table 1-2: Additional Reports Available	
Report Title	Content
Summary Brochure	Summarizes the Expressway Study Implementation Plan
South County Working Paper	Documents the study’s work and findings related to expressway planning in South County
Bicycle Accommodation Guidelines (BAG)	Provides detail diagrams and guidelines for bicycle treatments on expressways
Individual Expressway Reports (8 total)	Summarizes key information and all recommendations for each expressway



SECTION TWO

EXPRESSWAY SYSTEM CHARACTERISTICS & NEEDS

To determine potential improvements for the expressways, it was necessary to document current conditions and needs. This included technical research related to traffic conditions and general operating characteristics of the expressways. It also involved collecting information from users of the expressways and the cities/agencies served by the expressways.

This section summarizes the key findings from these efforts. It starts with an overview of the expressway system providing key characteristics of each expressway. Needs are described based on both traffic data and public opinion surveys, followed by findings related to potential expansion of the expressway system. Concluding the section are the vision statements that were developed for each expressway, reflecting that expressway's unique characteristics and needs.

Expressway System Characteristics

The expressways were designed to relieve local streets and supplement the freeway system. The expressway system consists of 8 expressways serving residents and employees in 11 cities and carrying 1.5 million vehicles daily. Table 2-1 lists key characteristics of each expressway ranging from basic statistics such as length and number of users to presence of high-occupancy vehicle (HOV) lanes and surrounding land uses. Key findings include:

- ❖ Length of each expressway varies from a high of 9.6 centerline miles for Central to a low of 4.7 miles for Oregon-Page Mill.
- ❖ Most of the expressways average from 2.1 to 2.6 signals per centerline mile. Central and Foothill have fewer (1.5 to 1.8 signals/mile) reflecting Central's freeway-like segment through Sunnyvale and Foothill's wide spacing between cross streets. The highest ratio is along Oregon-Page Mill (3.0 signals/mile) with the Oregon segment having closely spaced signals.
- ❖ The highest use expressways are Capitol, Lawrence, and Montague with 280,000 to 300,000 daily users. San Tomas is close behind at 220,000. Central, Foothill, and Almaden are in the mid-range (110,000 to 150,000) and Oregon-Page Mill is the lowest used expressway at 50,000.
- ❖ The posted speed limit is 45 or 50 miles per hour (mph) for all but Oregon-Page Mill Expressway. However, due to congestion and signal wait times, the average speed during commute hours is generally much lower. Montague and Lawrence experience the lowest average speeds (12 and 17 mph, respectively) due to high demand, limited capacity, and the resulting congestion levels.
- ❖ Residential land uses, mixed with some commercial, are predominant along three of the expressways while one expressway is surrounded mostly by industrial uses. The remaining four expressways serve a fairly equal mix of residential/commercial and industrial land uses.

Table 2-1: Expressway Characteristics

Expressway	Length (miles)	# of Lanes	HOV Lanes	Signals	Speed Limit	Average Peak Hour Speed ⁽¹⁾	Daily Users ⁽¹⁾	Cities Served	Major Surrounding Land Uses
Almaden	8.5	4-8	None	19	45	25	150,000	1	Predominately residential with some commercial in Blossom Hill area and north of Capitol
Capitol	8.7	6-8	Capitol Ave. to Silver Creek	18	45	24	300,000	1	Predominately residential mixed with commercial throughout
Central	9.6	4-6	Queue jump lanes at Bowers and Scott	17	45/50	27	110,000	5	Residential with commercial on west end; industrial on east end
Foothill	7.3	4	None	11	45	26	110,000	4	Residential with some commercial
Lawrence	8.7	6-8	Stevens Creek to Arques Lakehaven to Tasman	23	50	17	280,000	5	Residential with some commercial on southern and northern ends; industrial in center
Montague	6.0	6-8	Mission College to McCarthy Main to Milpitas Blvd	13	45	12	290,000	3	Mostly industrial with some residential and commercial
Oregon-Page Mill	4.7	4	None	14	35/50	19	50,000	2	Industrial along Page Mill; residential along Oregon with commercial near El Camino Real
San Tomas	8.5	6-8	Budd to Walsh	19	45	23	220,000	3	Residential with some commercial on southern end; industrial on northern end
Expressway System	62	---	---	134	---	---	1.51 million	11	---

(1) Based on 2001 Data



Multimodal Uses

In addition to single-occupant automobiles, bicycles, pedestrians, carools, and transit use the expressways. Bicycles are accommodated on all expressways with Foothill Expressway in particular being a high-use bicycle facility. Pedestrians use the expressways for a variety of reasons, with high pedestrian demand in some areas and only emergency/occasional use in others. Carpools are supported on five of the expressways with HOV lanes. Additional information about the use of these travel modes on the expressways can be found in the Plan's Bicycle, Pedestrian, and HOV System Elements.

Transit services on expressways are provided by the Santa Clara Valley Transportation Valley (VTA). VTA operates bus and shuttle services on the expressways and collects federal fixed guideway funds where buses run in expressway HOV lanes. VTA has plans to extend light rail transit (LRT) into the median of Capitol Expressway. There are also regional transit services that use the expressway system, including one inter-county express bus service.

The County of Santa Clara, governed by the five-member, elected Board of Supervisors, is responsible for improving, operating, and maintaining the expressway system. The VTA, governed by the twelve-member, appointed Board of Directors, is responsible for planning, funding, and operating transit services in the county, including on the expressways. In its role as Congestion Management Agency (CMA), VTA also determines the apportionment of discretionary transportation funding. Therefore, the Expressway Study does not make recommendations related to the amount, routing, or funding of transit services; however, it does include improvements to support transit services.

Table 2-2 provides a description of current and planned transit services using the expressways. In summary, six of the expressways have a bus route or a combination of bus routes that serve almost the entire length of the expressway. Buses on the remaining two expressways only use small segments of the expressways. Many of the bus routes on the expressways are limited stop or express routes providing a few trips each AM and PM commute period rather than all-day service. In addition to the LRT planned for one expressway, there are Caltrain and LRT stations located adjacent to five expressways.

Table 2-2: Transit Services Using Expressways

This information is based on the transit services provided and/or planned as of June 2003 with some notation where appropriate about proposed service cuts that may occur in 2004.

Expressway	Transit Services
Almaden	<ul style="list-style-type: none"> • Bus service is provided along almost the entire corridor with one bus route serving the area from Harry Road to Coleman Road and a second route serving the area from Coleman Road to Lincoln Avenue. Frequency of service ranges from 30 to 60 minutes. • Another line travels a short segment of Almaden from Via Valiente to Camden Avenue.
Capitol	<ul style="list-style-type: none"> • One bus route travels from SR 87 to Eastridge along Capitol every 15 minutes and a peak-period express bus route uses Capitol from Snell Avenue to US 101. • North of Eastridge to the Capitol Avenue/I-680 area, one express route and one limited stop route make a total of 7 trips each peak period, but service could be reduced to 3 trips per peak period in 2004. • Eastridge Transit Center is adjacent to Capitol at Eastridge Mall and has direct access to the expressway. Neighborhood access to the center is across and along the expressway. • The Caltrain and LRT Capitol Stations are easily accessible from Capitol. • LRT is planned to travel the entire length of Capitol Expressway.
Central	<ul style="list-style-type: none"> • Four bus lines use small segments of Central Expressway. There is no bus service along the length of Central. • Caltrain and Tasman LRT run parallel to parts of Central with the rail stations at the Downtown Mountain View Transit Center easily accessible from Central.
Foothill	<ul style="list-style-type: none"> • Three bus lines use small segments of Foothill Expressway. There is no bus service on most of Foothill Expressway.
Lawrence	<ul style="list-style-type: none"> • A limited stop bus route runs one AM and one PM peak hour trip along the entire length of Lawrence Expressway. • Two bus routes use segments of Lawrence south of I-280 and 3 use segments north of US 101, mostly during the peak commute periods. • The Lawrence Caltrain station is easily accessible from Lawrence.
Montague	<ul style="list-style-type: none"> • A limited stop bus route travels the entire length of Montague, providing 3 trips during the peak commute periods. In 2004, a new route that uses Montague from Mission College Boulevard to Great Mall Parkway may replace this route. • Three other bus routes use short segments of Montague (two from US 101 to Mission College Boulevard and one from Trade Zone Boulevard to Milpitas Boulevard) and a LRT shuttle travels on Montague from Mission College Boulevard to North First Street. • A future BART and LRT multimodal station is planned near the Montague/Great Mall Parkway intersection. VTA may route additional bus service on Montague in the future to serve these rail stations.

Table 2-2: Transit Services Using Expressways (continued)

This information is based on the transit services provided and/or planned as of June 2003 with some notation where appropriate about proposed service cuts that may occur in 2004.

Expressway	Transit Services
Oregon-Page Mill	<ul style="list-style-type: none"> • The Dumbarton Express uses almost the entire length of Oregon-Page Mill Expressway. It provides several trips each AM and PM commute period. • Three VTA bus routes travel on segments of the expressway and when combined, they cover almost the entire length. Two of the routes are express peak-period only service. • The California Caltrain Station is accessible from Oregon.
San Tomas	<ul style="list-style-type: none"> • A limited stop route travels the entire length of San Tomas, providing 3 trips each commute period. It may be reduced to two trips in 2004. • Two other routes use a segment of San Tomas near SR 17 during commute periods.

To support transit services, the Expressway Study *Implementation Plan* includes adding sidewalks and intersection pedestrian crossing enhancements to help transit users access stops (see Pedestrian Element). HOV lane and bus stop pavement maintenance costs are included in the Maintenance/Operations Element. The Capacity/Operational Improvements Element lists grade separation projects at LRT/expressway crossings, which would enhance LRT operations.

Additional transit service needs are difficult to quantify at this time given ongoing transit line rerouting and fleet redeployment; however, the County closely cooperates with VTA's transit plans as they are developed. For example, the County made available a portion of Central Expressway right-of-way for the Tasman LRT line; worked collegially with VTA on at-grade LRT crossings of Montague, Lawrence, and Central; and repairs failed pavement at bus stops. Expressway roadway capacity/operational projects will include transit service needs (e.g., bus stops) when the projects are designed and built.

Usage of Expressways

As noted previously, 1.5 million vehicles use the expressway system daily. The telephone public opinion survey conducted in December 2001 provides some insight into why the expressways are so well used:

- ❖ 55% of respondents used an expressway almost daily and another 29% use an expressway a few times a week.
- ❖ Of several expressway characteristics rated, “convenience” received the highest percentage of “excellent/good” ratings both systemwide and for each expressway. The excellent/good ratings ranged from 91% for Foothill to 74% for Montague with all other expressways over 80%.
- ❖ The primary purposes of using the expressways are work trips (37% of respondents) and shopping trips (27%). Not surprisingly, those expressways serving major employment centers had the highest percentage of work trips, including Montague (60%) and Central (52%). Almaden, which serves some major commercial facilities, had the highest shopping use (41%).

Expressway System Needs

A key finding from the December 2001 telephone survey was that expressways are convenient but congested. Congestion consistently received the highest percentage of “fair/poor” ratings systemwide and for each expressway. Almaden, Capitol, Lawrence, Montague, and San Tomas users expressed the greatest dissatisfaction with congestion levels (over 70%), while Foothill and Central were seen as less of a congestion problem (around 55% rating as fair/poor) and Oregon-Page Mill fell in the middle (61%).

Traffic Conditions

The technical data on level of service (LOS) confirms the users’ perceptions. LOS is a measure of traffic flow and congestion levels. LOS A is the best condition representing freely flowing traffic. LOS F is the worst condition representing excessive delays and jammed conditions. Out of 134 signalized intersections, 30 intersections were operating at LOS F in 2001. The number of LOS F intersections is projected to increase to 50 by 2025.

Figure 2-1: LOS F Intersections



Montague Expressway currently operates at LOS F corridor-wide and portions of Capitol and Central Expressways are expected to degrade to corridor LOS F conditions by 2025. Figure 2-1 illustrates the LOS F intersection locations with Table 2-3 providing a list of the intersections, including seconds of delay.

Table 2-3: Level of Service F Intersections by Expressway (2001& 2025)

Expressway	LOS F Intersection	2001 Existing		2025 Baseline	
		AM Peak	PM Peak	AM Peak	PM Peak
Almaden	Camden Ave (CMP)			F (287)	F (260)
	Coleman Rd (CMP)			F (174)	F (79)
	Blossom Hill Rd (CMP)		F (68)		F (70)
	Hwy. 85 (North Ramp) (CMP)		F (352)		
Capitol	Senter Rd. (CMP)				F (63)
	McLaughlin Ave. (CMP)			F (155)	
	Silver Creek Rd. (CMP)	F (76)	F (75)	F (82)	F (217)
	Aborn Rd. (CMP)				F (74)
	Quimby Rd			F (**) ⁽¹⁾	F (**) ⁽¹⁾
	Tully Rd			F (**) ⁽¹⁾	F (**) ⁽¹⁾
	Ocala Ave			F (85)	F (104)
	Story Rd (CMP)	F (89)	F (66)	F (162)	F (270)
	Capitol Ave (CMP)				F (75)
Central	Bowers Ave. (CMP)	F (80)	F (63)	F (125)	
	Lafayette St. (CMP)		F (62)	F (60)	
	De La Cruz Blvd. (CMP)		F (82)		F (77)
Foothill	Oregon-Page Mill Expressway (CMP) ⁽²⁾		F (90)		F (111)
	El Monte Ave. (CMP)	F (69)		F (181)	F(183)
	Grant Rd./St. Joseph Ave.				F (64)
Lawrence	Saratoga Ave. (CMP)			F (73)	F (206)
	Prospect Rd. (CMP)			F (68)	F (65)
	Moorpark Ave./Bollinger Rd. (CMP)	F (99)		F (96)	F (81)
	Calvert Dr. (CMP)			F (63)	
	Homestead Rd. (CMP)			F (73)	F (92)
	Lochinvar Ave				F (123)
	Benton St				F (160)
	Reed Ave./Monroe Ave. (CMP)		F (66)	F (64)	F (195)
	Kifer Rd.		F (122)		F (107)
	Arques Ave. (CMP)		F (63)		F (67)
	Duane Ave/Oakmead Pkwy				F (67)
	Sandia Dr/Lakehaven Dr.				F (60)

Table 2-3: Level of Service F Intersections by Expressway (2001& 2025) (continued)

Expressway	LOS F Intersection	2001 Existing		2025 Baseline	
		AM Peak	PM Peak	AM Peak	PM Peak
Montague	Mission College Boulevard (CMP)	F(67)		F (78)	F (95)
	First St. (CMP)	F(74)	F (113)	F (133)	F (161)
	Zanker Road (CMP)			F (91)	F (101)
	Trimble Rd. (CMP)	F(148)	F (160)	F (160)	F (149)
	McCarthy Blvd./O'Toole Ave. (CMP)	F(97)	F (137)	F (153)	F (134)
	I-880 SB Ramps			F (112)	F (121)
	Main St./Old Oakland Rd. (CMP)	F(120)	F (94)		F (84)
	McCandless Dr./Trade Zone Blvd. (CMP)	F(88)			
	Great Mall Pkwy/Capitol Ave. (CMP)	F(119)		F (91)	F (68)
	Milpitas Blvd (CMP)	F (104)			
Oregon-Page Mill	Foothill Expressway (CMP) ⁽²⁾		F (90)		F (111)
San Tomas	Curtner Ave. (CMP)	F (82)		F (90)	
	SR 17 SB Ramps (CMP)			F(127)	F(>300)
	Campbell Ave. (CMP)	F(82)			
	Hamilton Ave. (CMP)		F(60)	F(93)	F(74)
	Moorpark Ave. (CMP)			F (62)	
	Stevens Creek Blvd. (CMP)		F (137)		F (143)
	Saratoga Ave. (CMP)		F (109)		F (103)
	Pruneridge Ave.	F (70)	F (63)	F (86)	F (97)
	Homestead Rd. (CMP)	F (79)	F (66)	F (74)	F (92)
	Benton St.				F (74)
	El Camino Real (CMP)	F (92)	F (74)	F (75)	F (103)
	Monroe St. (CMP)	F (113)		F (99)	
	Scott Blvd. (CMP)			F (66)	
	Total LOS F Intersections by Peak Period	19	22	33	42
	Total LOS F Intersections	30		50	

Notes:

(CMP) = Intersection monitored by Congestion Management Program.

F = Indicates which intersections are at LOS F, and (# #) indicates delay (seconds/vehicle)

(1) (**) = Final determination of seconds of delay is pending release of VTA's Capitol LRT environmental document

(2) The LOS for the Foothill and Oregon-Page Mill intersection is listed under both expressways, but is only counted as one LOS F intersection in the totals.

Source: CCS Planning & Engineering, Inc. (2002)

User Opinions

Listed below are the key findings from the December 2001 and January 2003 telephone surveys:

- ❖ After congestion, timing of lights and landscaping received the highest percentage of “fair/poor” ratings (48% and 44% of respondents, respectively). The individual expressway ratings for timing of lights were similar for all expressways. Landscaping on 6 of the expressways was also rated similar to the system results. The exceptions are Foothill and Oregon-Page Mill users who are quite satisfied with landscaping (over 80% rating “excellent/good”). (December 2001 Survey)
- ❖ Synchronizing the traffic signals was the most important proposed change for all expressways in both surveys. In the 2003 survey, 69% of respondents rated synchronizing traffic signals as “very important.”
- ❖ Eliminating dangerous merges and maintaining pavement also received a large amount of “very important” ratings (66% and 62%, respectively). (January 2003 Survey)
- ❖ More landscaping (16% very important), decreasing the number of traffic lights (24%), and building more sound walls (26%) were the least popular of the proposed improvements among respondents. (January 2003 Survey)

Potential Expansion of the System

The 1960’s build-out plan for the expressway system included at least one additional expressway and extending three other existing expressways. The concept was that the expressways should connect with the freeways and with other expressways. In the last 40 years, local plans and policies have changed. In the 1990’s, Capitol Expressway, between State Route (SR) 87 and Almaden Expressway, was relinquished to San Jose to become Auto Mall Parkway. Questions have continued to be asked about other expressway extensions and these issues were discussed with the cities, the Policy Advisory Board (PAB), and the Technical Working Group (TWG) early in the study process. Described below are the key system expansion issues and status.

Almaden Expressway

Almaden Expressway will eventually be extended to Bailey Avenue where people can connect to US 101 via the future Bailey interchange. The timing of the Almaden extension will be determined by San Jose land use decisions. The likely trigger will be Coyote Valley development. It is anticipated that development traffic impact fees will pay for the extension. The trigger may or may not occur within the 30-year timeframe of this study. Future updates of the Expressway Study *Implementation Plan* will include the extension once more is known about the timing and funding.

Central Expressway

The original plans for Central called for it to continue through Palo Alto on Alma Avenue to terminate at Oregon-Page Mill Expressway. Palo Alto does not support extending Central Expressway onto Alma. Alma has four lanes, like Central Expressway, and already connects to Oregon-Page Mill. The land along Alma is completely developed with Caltrain along one side and residences and several residential side streets along the other. Therefore, Palo Alto wants Alma to remain a city arterial with relatively slower speeds and narrower lanes than the expressway. Extending Central through Palo Alto will not be pursued.

Lawrence Expressway

Lawrence was originally slated to continue down Quito Road in Saratoga to connect with the future SR 85 under the assumption that there would be an interchange at Quito. When SR 85 was built, the interchange was moved to Saratoga Avenue. The City of Saratoga does not support converting Saratoga Avenue into an extension of Lawrence Expressway. Extending Lawrence onto Saratoga Avenue will not be pursued. The study does include a signal coordination project for Lawrence Expressway and Saratoga Avenue that will help with traffic flow to the SR 85/Saratoga Avenue interchange.

South County

There have been various plans for a north-south expressway on the west side of US 101 since the 1960's. By the 1980's, County transportation planning documents began to recommend a north-south arterial rather than a formal expressway. These new recommendations

occurred due to a lack of funding for building and maintaining new expressways, and due to conflicting plans and policies at the local cities.

The City of Morgan Hill does not support having expressways in Morgan Hill. The City of Gilroy is in favor of having an expressway. Gilroy's Circulation Element identifies Santa Teresa as an expressway meeting all expressway standards including limited access and no parking. It would be a loop expressway beginning and ending at US 101 at the south and north ends of Gilroy. Gilroy is currently funding and constructing the widening of Santa Teresa Boulevard to expressway standards and will provide for maintenance of the widened facility.

The PAB South County small group arrived at the following agreements:

- ❖ Regional travel demand from south of Gilroy heading into South San Jose should be accommodated on US 101.
- ❖ A South County "local corridor" is needed to facilitate travel between Gilroy and Morgan Hill. It does not necessarily need to be called an "expressway" or fall under single-jurisdiction ownership, but it does need consistent standards and an identifiable alignment.
- ❖ Some kind of regional transportation plan is needed for the South County area – a "South County Circulation Study."
- ❖ All five government agencies need to be involved in the development of a Circulation Study – VTA, County of Santa Clara, and the Cities of Gilroy, Morgan Hill, and San Jose.

VTA has recently established a South County Roadways Policy Advisory Board to discuss roadway projects and issues for the South County area and provide policy input into the proposed South County Circulation Study. Among several other issues, the Circulation Study will determine the need and support for new Santa Teresa Boulevard connections to US 101 in Gilroy. The results of this study will help facilitate the decision making about whether the Santa Teresa loop should be considered part of the County's expressway system. The results of the Circulation Study will be considered in the Valley Transportation Plan (VTP) 2030 and in the next update of the Expressway Study *Implementation Plan*.

Expressway Vision Statements

A key finding from the data gathering and city/community outreach is that each expressway has its own unique character, function, and community relationship. Therefore, the ultimate build-out of each expressway must vary to meet community needs. To guide the expressway plans, a vision was developed for each expressway, through a collaborative process involving the cities, TWG, and PAB.

The visions are listed in Table 2-4. There are three key terms used that are critical to an understanding of the visions:

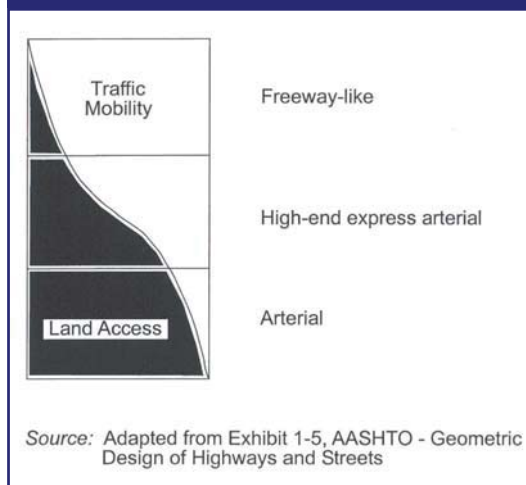
- ❖ Arterial – An expressway that is arterial-like would be similar to a major city street. It will tend to carry relatively less traffic than other expressways and is likely to be 4 to 6 lanes wide. Other potential attributes include more multimodal use (such as a major transit presence or high use bike corridor), higher pedestrian demand, somewhat slower moving traffic, and very few grade separations. It may have commercial or other land uses directly accessed from the expressway.
- ❖ High-end express arterial – These expressways would be similar to how most people define the term “expressway.” They move high volumes of traffic and may be 6 to 8 lanes wide. Most intersections are signalized rather than grade separated. There are few land uses accessed directly from the expressway and less demand for pedestrian travel.
- ❖ Freeway-like – As the name implies, these expressway segments would be similar to a freeway. No expressway is envisioned to be converted completely into a freeway, but some have segments with such high traffic demand, that freeway-like treatments would be warranted. Generally, this means building interchanges to replace congested at-grade intersections. The land uses along these segments tend to be industrial or commercial with buildings fronting on other roadways, not the expressway.

One of the defining features of these three types of roadways is the relationship between traffic mobility and land access. As shown in Figure 2-2, consistent and continuous access control from abutting property is desirable for those expressways which need a high degree of vehicle mobility.

Table 2-4: Expressway Vision Statements

Expressway	Vision Statement
Almaden	High-end express arterial with freeway-like segments.
Capitol	Corridor in transition to high-capacity arterial with light rail transit in median.
Central	High-end express arterial with freeway-like segments.
Foothill	Attractive express arterial, not freeway-like, that also plays an important role as a regional bicycle facility.
Lawrence	Southern end more arterial-like; mid-section more high-end expressway with freeway-like segments; and northern end more high-end express arterial.
Montague	Multimodal, pedestrian friendly arterial roadway in Milpitas east of I-880; west of I-880, high-end express arterial with freeway-like segments.
Oregon-Page Mill	Multimodal, pedestrian friendly arterial roadway with slower, smooth-flowing traffic.
San Tomas	High-end express arterial with freeway-like segments.

Figure 2-2: Proportion of Service





SECTION THREE

CAPACITY & OPERATIONAL IMPROVEMENT ELEMENT

The Capacity and Operational Improvement Element focuses on automobile-related capital improvements. It includes projects that will increase roadway capacities; improve operational and safety conditions; facilitate traffic flow using signal coordination and advanced traffic operations systems (TOS); and provide direct high-occupancy vehicle (HOV) connectors between expressways and freeways where HOV facilities exist or have been planned.

RECOMMENDED IMPROVEMENTS

The process to develop the list of improvements began with a comprehensive traffic analysis, including existing and projected 2025 traffic volumes, intersection level of service (LOS), and intersection collision data. Project lists from other studies, such as the Valley Transportation Plan (VTP) 2020 and city capital improvement programs, were consulted. In addition, discussions were held with staff from the participating cities and agencies to help identify problem areas and locally desired improvements.

A preliminary list of improvements was then developed to address both congestion and operational/safety problems areas. Recognizing that signal timing changes and new technologies can alleviate some congestion problems, adjustments to signal operations were considered first. Capacity improvements to alleviate LOS F conditions were then recommended in those areas where signal operational changes were unable to resolve the congestion problem. Considerations of capacity improvements began with at-grade improvement options (e.g., adding a lane). Grade separations/interchanges were recommended when at-grade options became infeasible. Based on the discussions with local cities and other agencies, the improvements list was further expanded to include desired improvements that will help achieve the vision for each expressway.

Figure 3-1 illustrates the capacity and operational improvements recommended for the expressway system. The types of improvements range from operational improvements such as corridor signal projects, median closures, and safety widenings, to capacity projects such as new lanes, intersection improvements, and new interchanges. The map also recognizes the South County Circulation Study, which will develop improvement recommendations for Rural Commute Routes, such as Santa Teresa Boulevard in Gilroy. Although not technically County expressways, these routes will require funding from the same sources as the expressway projects and could serve the same type of intercity travel needs as the expressways.

The capacity/operational improvements will cost from \$1.64 to \$1.94 billion to implement. The total cost includes approximately \$100-150 million for HOV-related projects and \$83-105 million for signals/Traffic Operations System (TOS) improvements. Detailed descriptions of the signals/TOS and HOV projects can be found in their respective elements.

Figure 3-1: Capacity/Operational Improvements

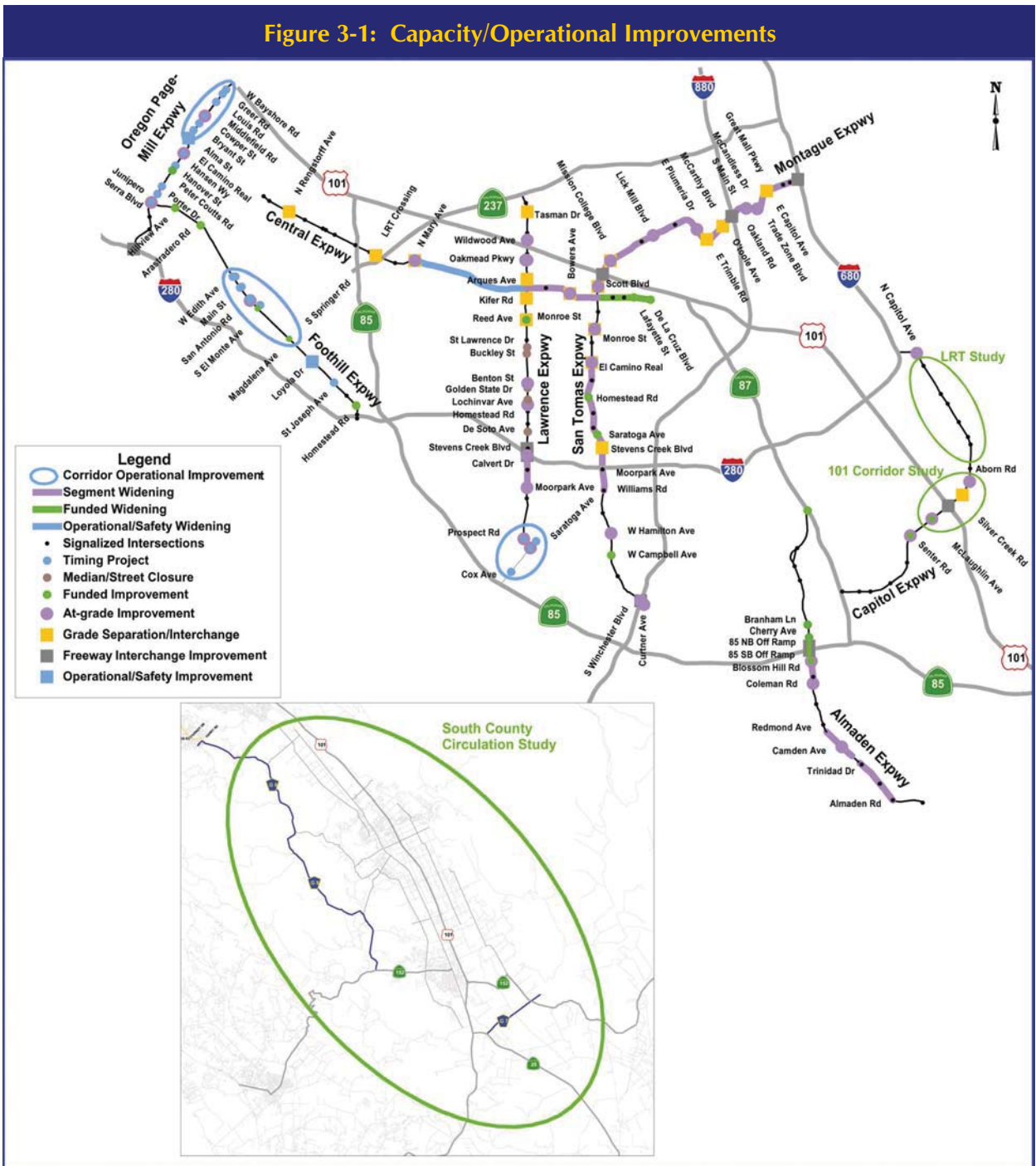


Figure 3-2a: Corridor Level of Service for No Project

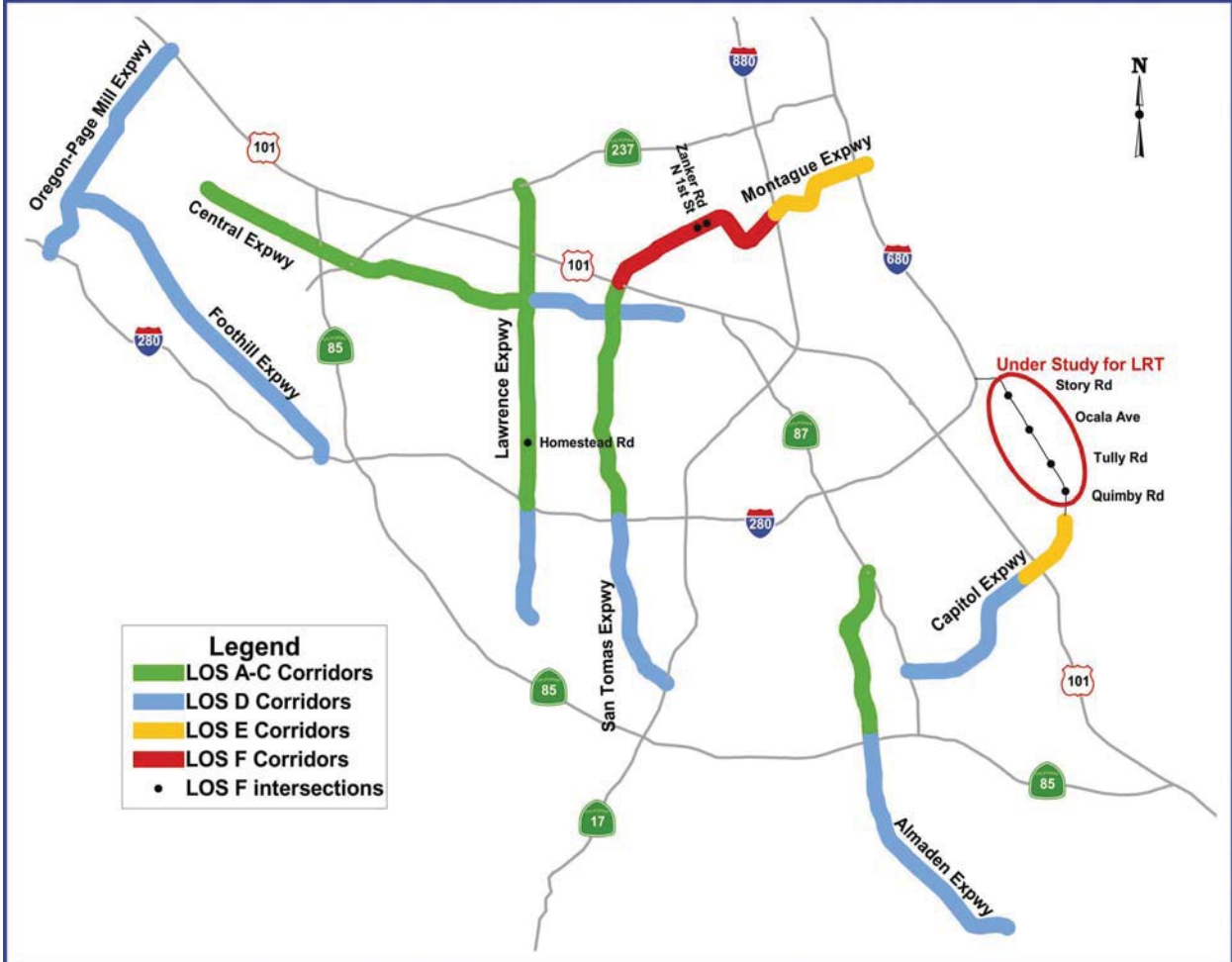


Systemwide Results

Figures 3-2a and 3-2b illustrates the LOS benefits of the recommended capacity and operational improvements for the planning year 2025. Figure 3-2a indicates projected corridor LOS and intersection LOS F locations in 2025 if no improvements are made. Figure 3-2b indicates 2025 LOS conditions with full implementation of all recommendations.

The corridor-wide traffic analysis shows overall corridor LOS to be significantly improved with the implementation of the capacity/operational improvements. Six of the eight

Figure 3-2b: Corridor Level of Service for All Projects



expressways would operate at a minimum of LOS D with some expressway segments achieving LOS C. Montague Expressway, east of I-880, would improve from LOS F to E. West of I-880, Montague would continue to operate at LOS F but the queuing and overall delay would be reduced significantly (25% reduction in delay of all vehicles; 13-minute reduction in travel time). Capitol Expressway from Nieman through the US 101 interchange would improve from LOS F to E and would remain LOS D west of US 101. Projected LOS information for Capitol north of Nieman to I-680 is not available since the future conditions with the planned LRT in place have not yet been fully defined.

Altogether, the capacity and operational projects listed mitigate 28 out of 30 existing LOS F intersections. The remaining 2 existing LOS F intersections are as follows:

- ❖ Capitol/Story – This intersection is part of the initial phase of the Downtown East Valley light rail project. Any potential improvement project for this location will be determined through coordination with the light rail project and San Jose policies.
- ❖ Montague/First – The 1999 Montague Study included a policy decision to accept LOS F conditions at this intersection.

Under 2025 projected conditions, the overall list of projects mitigates 43 out of 50 LOS F intersections, with the following 7 intersections remaining at F:

- ❖ The 2 existing LOS F intersections listed above.
- ❖ Three additional intersections on Capitol Expressway (Ocala, Tully, and Quimby) – Like Capitol/Story, any potential improvement projects for these locations will be determined through coordination with the light rail project and San Jose policies.
- ❖ Montague/Zanker – Like Montague/First, the 1999 Montague Study included a policy decision to also accept LOS F conditions at this intersection.
- ❖ Lawrence/Homestead – An interchange would be required to improve this intersection to LOS E or better, and an interchange at this location is not supported by local cities due to the right-of-way impacts.

In addition to congestion relief, many of the projects provide safety and multimodal benefits. Most of the intersections with the highest collision rates are also those with the worst congestion problems and will be improved through the recommended capacity projects. One of the segment widenings (Central through Sunnyvale) is specifically recommended to improve an area experiencing a high collision rate. Many of the projects include much-needed improvements for bicyclists and pedestrians and a couple of the grade separations have the potential to improve light rail operations.

Systemwide Prioritization

During development of the improvement lists, the top priorities for each expressway were identified based on both technical analysis and city/community preferences. However, with a systemwide capacity/operational improvement list of 72 projects that approach \$2 billion in cost, a systemwide prioritization list was needed.



To start the prioritization process, a technical analysis was conducted ranking intersections by existing and future peak hour delay, highest collision locations, and a cost/benefit ratio for capacity projects. A review of these rankings compared to each expressway's proposed priorities indicated that the top priority projects for each expressway address almost all of the highest ranking locations in terms of delay and accident locations, and are cost-effective. However, it also became apparent that it would be difficult to develop criteria/performance measures to prioritize the operational/safety projects against the LOS projects.

The projects were then grouped into tiers starting with the concept that the top tier should include operational/safety improvements and projects that mitigate LOS F intersections. The remaining projects fell into Tiers 2 and 3 based on the type of project. When Tier 1 projects added up to more than can be expected from existing funding sources, sub-tiers were created dividing up relatively low-cost operational/at-grade improvements, high-cost interchange projects, and projects addressing future LOS F conditions. A key concept in dividing the projects into the Tier 1 sub-tiers was that existing LOS F intersection improvements should receive a higher priority than projected LOS F intersections. Table 3-1 lists the final criteria used for each tier.

Table 3-2 provides a tier summary. Table 3-3 provides a detailed list of the capacity/operational improvement projects divided into the tiers.

Table 3-1: Criteria for Tier Assignment

Tier	Criteria
1A	<ul style="list-style-type: none"> At-grade improvements to mitigate existing LOS F intersections to E or better Operational improvements to eliminate weaving, merging/diverging, and queuing problems, thus improving safety conditions Signal operations improvements that improve traffic flow Low-cost feasibility studies needed to answer critical questions about interchange reconfigurations that have a high level of local support
1B	<ul style="list-style-type: none"> Grade separation/interchange projects to mitigate existing LOS F intersections
1C	<ul style="list-style-type: none"> Improvements (both at-grade and grade separation/interchange projects) needed to mitigate the projected 2025 LOS F intersections Longer term signal operational improvements
2	<ul style="list-style-type: none"> All other expressway capacity improvement projects that can further facilitate traffic flow Enhancements and upgrades to signal systems using new technologies that will become available over the next 30 years
3	<ul style="list-style-type: none"> Major existing facility reconstruction and new facilities such as HOV direct connectors

Table 3-2: Summary of Tier Results

Tier	# of Projects	# of LOS F Intersections Mitigated		Cost (millions)
		2001/2002 Existing	Baseline 2025	
Measure B	N.A.	2	N.A.	N.A.
1A	28	18	24 ⁽¹⁾	\$149-151
1B	7	7	7	\$261-271
1C	13	0	11	\$49-53
2	15	0	0	\$585-671
3	9	1 ⁽²⁾	1	\$593-795
Totals	72	28	43	\$1,637-1,941

Notes:

- (1) Tier 1A also mitigates six projected 2025 LOS F intersections that are not existing LOS F locations. This is attributed to implementation strategies for existing LOS F intersections that benefit adjacent intersections, either with operational or capacity improvements.
- (2) At the local city's request, one existing/future LOS F intersection improvement project has been placed in Tier 3 rather than in Tier 1A.

Table 3-3: Capacity and Operational Improvement Projects

Projects for each tier are listed by expressway and proceed from south to north or west to east for each expressway ⁽¹⁾

Expressway	Project Description ⁽²⁾	Cost (millions)
MEASURE B PROJECTS (FUNDED)		
Almaden	Provide additional NB through lane on Almaden at Blossom Hill and SR 85 NB off-ramp intersections plus additional SB through lane on Almaden at Branham and Cherry intersections with additional left-turn lane at all four approaches at Cherry intersection	N.A.
San Tomas	Provide a 2nd left-turn lane from EB and WB Campbell to San Tomas and a separate right-turn lane from WB Campbell to NB San Tomas	N.A.
Expressway Traffic Operations System (TOS)	Provide TOS improvements including traffic management center upgrades, new loop and video sensors along the expressways, and fiber optic interconnect between traffic signals; and implement Traffic Adaptive System along Lawrence between Oakmead and Kifer	N.A.
TIER 1A PROJECTS		
Almaden	Widen to 8 lanes between Coleman and Blossom Hill including an additional left-turn lane from SB Almaden to Coleman and from EB and WB Coleman to Almaden, and a right-turn lane from WB Coleman to NB Almaden; a 4th SB and NB through lane on Almaden at Via Monte; and an additional left-turn (a total of three) from SB Almaden to EB Blossom Hill and an additional SB through lane at Blossom Hill intersection	\$6-8
	Initiate a Caltrans Project Study Report (PSR)/Project Development Study (PDS) to reconfigure SR 85/Almaden interchange	\$0.25
	Provide interim operational improvements at SR 85/Almaden: widen SB Almaden to provide a 5th lane between the Best Buy driveway and SB loop on-ramp serving as auxiliary lane for weaving vehicles; widen SB SR 85 off-ramp to add a third left-turn; provide an additional EB approach lane resulting in two left-turn, one through/right shared, and two right-turn lanes	\$2
Central	Widen between Mary and Lawrence to provide auxiliary and/or acceleration/deceleration lanes to improve ramp operations and safety ⁽³⁾	\$13
	Widen to 6 lanes between Lawrence and San Tomas Expressways without HOV lane operations ^{(4) (5)}	\$10
	Convert the Measure B HOV lane widening between San Tomas and De La Cruz to mixed flow and remove the HOV queue jump lanes at Scott, if unsuccessful after a 3 to 5-year trial period ^{(4) (5)}	\$0.1

Table 3-3: Capacity and Operational Improvement Projects (continued)

Projects for each tier are listed by expressway and proceed from south to north or west to east for each expressway ⁽¹⁾

Expressway	Project Description ⁽²⁾	Cost (millions)
Foothill	Signal operational improvements between Edith and El Monte including adjacent side street intersections and at Grant/St. Joseph ⁽⁶⁾	\$1.5
	Extend existing WB deceleration lane at San Antonio by 250 feet	\$0.5
	Replace Loyola Bridge (This improvement project will also provide necessary bicycle and pedestrian facilities, and channelization and operational improvements at adjacent intersections.)	\$10
Lawrence	Optimize signal coordination along Lawrence-Saratoga Avenue corridor including Lawrence/Prospect, Lawrence/Saratoga, Saratoga/Prospect, and Saratoga/Cox intersections ⁽⁶⁾	\$0.1
	Widen to 8 lanes between Moorpark/Bollinger and south of Calvert with additional WB through lane at Moorpark	\$4
	Coordinate and optimize signal phasing and timing plans at I-280/Lawrence interchange area including City of Santa Clara signals along Stevens Creek and County's signal at Lawrence/Calvert/I-280 SB ramp ⁽⁶⁾	\$0.1
	Prepare Caltrans PSR for Tier 1C project at the Lawrence/Calvert/I-280 interchange area	\$0.5
	Close median at Lochinvar and right-in-and-out access at DeSoto, Golden State, Granada, Buckley, and St. Lawrence/Lawrence Station on-ramp	\$0.5
	Convert HOV to mixed-flow lanes between US 101 and Elko due to high violation rates & operational problems ⁽⁵⁾	\$0.1
Montague	Convert HOV lanes on 6-lane facility to mixed-flow use between I-880 and I-680 due to operational and safety problems ⁽⁵⁾	\$0.1
	Baseline project consisting of 8-lane widening and I-880 par-clo interchange with at-grade improvements at Lick Mill, Plumeria/River Oaks, Main/Old Oakland, and McCandless/Trade Zone; designate new lanes between I-880 and I-680 as HOV for a 3 to 5-year trial period	\$38.5

Table 3-3: Capacity and Operational Improvement Projects (continued)

Projects for each tier are listed by expressway and proceed from south to north or west to east for each expressway ⁽¹⁾

Expressway	Project Description ⁽²⁾	Cost (millions)
Oregon-Page Mill	I-280/Page Mill interchange modification: remove SB loop on-ramp and construct SB diagonal on-ramp with signal operations; signalize NB off-ramp intersection; and provide proper channelization for pedestrians and bicycles	\$5
	Alma Bridge Replacement Feasibility Study	\$0.25
	Oregon corridor improvements: <ul style="list-style-type: none"> Replace signal poles and optimize timing plan avoiding impacts on safety at unsignalized intersections ⁽⁶⁾ Construct pedestrian ramps with relocation of traffic signal poles at signalized intersections Study operational changes at the unsignalized intersections at Waverley, Ross, and Indian that avoid increasing traffic impacts on cross and parallel streets, enhance bicycle and pedestrian safety, and maintain vehicle safety Conduct feasibility study of adding turn lane at Middlefield Road and converting to 8-phase signal operation to enhance efficiency and safety without taking right-of-way 	\$5
San Tomas	At grade improvements at SR 17/San Tomas: <ul style="list-style-type: none"> Re-stripe the EB through lane on White Oaks to provide an optional left as 3rd left-turn lane Provide second right-turn lane on SB off-ramp Study potential operational & safety improvements in the interchange area 	\$2
	Provide a 2nd left-turn lane from EB and WB Hamilton to San Tomas and a 2nd left-turn lane from NB San Tomas to WB Hamilton	\$2
	Widen to 8 lanes between Williams and El Camino Real with additional left-turn lane from EB and WB El Camino Real to San Tomas	\$28
	Provide an additional right-turn lane from WB Monroe to NB San Tomas	\$1
Signal Operations/ TOS Capital Projects ⁽⁶⁾	Traffic information outlets such as electronic information signs, advisory radio, cable TV feeds, and a web page	\$5
	Install equipment to coordinate expressway signals with city signals on perpendicular streets	\$10
	Install equipment to connect with Sunnyvale, Palo Alto, Mountain View, and Los Altos traffic signal interconnect systems	\$2.5
	Upgrade traffic signal system to allow automatic traffic count collection	\$0.5
	Total Tier 1A	148.5 -150.5

Table 3-3: Capacity and Operational Improvement Projects (continued)

Projects for each tier are listed by expressway and proceed from south to north or west to east for each expressway ⁽¹⁾

Expressway	Project Description ⁽²⁾	Cost (millions)
TIER 1B PROJECTS		
Capitol	Interchange at Silver Creek ⁽⁷⁾	\$50-60
Lawrence	Interchange at Monroe	\$45
	Interchange at Kifer	\$45
	Interchange at Arques with square loops along Kern and Titan	\$35
Montague	At-grade improvements at Mission College and par-clo interchange at US 101	\$11
	Trimble flyover	\$15
	McCarthy-O'Toole square loop interchange	\$60
	TOTAL TIER 1B	\$261 - 271
TIER 1C PROJECTS		
Almaden	Widen to 6 lanes starting south of Camden to conform with the current 6-lane segment south of Redmond with additional left-turn lane from EB and WB Camden to Almaden	\$5-6
Capitol	Provide a third left-turn lane from SB Senter to EB Capitol	\$4.5
	Provide a third left-turn from SB McLaughlin to EB Capitol ⁽⁷⁾	\$3.5
	Provide a third left-turn lane from NB Aborn to WB Capitol and a second right-turn lane from EB Capitol to SB Aborn ⁽⁷⁾	\$5-6
	Provide a third left-turn shared with through lane from SB Capitol Avenue to SB Capitol Expressway	\$2
Lawrence	Provide additional left-turn lane from EB Saratoga to NB Lawrence	\$2
	Provide additional left-turn lane from EB Prospect to NB Lawrence	\$2
	Interim improvements at Lawrence/Calvert/I-280: provide additional SB through lane at Calvert; widen I-280 SB on-ramp to provide additional mixed-flow lane; and construct I-280 SB slip on-ramp from Calvert west of Lawrence and prohibit EB through movement at Calvert/Lawrence intersection (based on results of Tier 1A PSR)	\$8
	Provide additional EB through lane on Homestead ⁽⁸⁾	\$2
	Provide additional left-turn lane from WB Benton to SB Lawrence	\$2
	Provide a 3rd left-turn lane from EB Oakmead/Duane to NB Lawrence	\$2
San Tomas	Provide additional right-turn lane from WB Scott to NB San Tomas	\$1

Table 3-3: Capacity and Operational Improvement Projects (continued)

Projects for each tier are listed by expressway and proceed from south to north or west to east for each expressway⁽¹⁾

Expressway	Project Description ⁽²⁾	Cost (Millions)
Signal Operations/ TOS Capital Projects ⁽⁶⁾	Adaptive traffic signal system for selected or all expressways based upon further feasibility study	\$10-12
	Total Tier 1C	\$49 - 53
TIER 2 PROJECTS		
Almaden	Widen to 6 lanes from Almaden Road to south of Camden ⁽⁹⁾	\$10
Central	Interchange at Rengstorff ⁽¹⁰⁾	\$60
	Depress Central at light rail crossing near Whisman	\$35
	At-grade improvements or interchange at Mary ⁽¹¹⁾	\$4-50
	Interchange at Bowers	\$45
Lawrence	Signalize the Wildwood Ave. intersection including opening the median, realigning Wildwood Ave., and re-timing signals between US 101 and Elko	\$4
	Interchange at Tasman ⁽¹²⁾	\$45
Montague	Interchange at Mission College	\$55
	Interchange at Great Mall/Capitol ⁽¹³⁾	\$42
Oregon-Page Mill	Provide a separate right-turn lane from WB Oregon to El Camino Real and lengthen left-turn lane from WB Oregon to El Camino Real ⁽¹⁴⁾	N.A.
San Tomas	Interchange at Stevens Creek	\$50-70
	Interchange at El Camino Real	\$60
	Interchange at Monroe	\$55
	Interchange at Scott	\$65
Signal Operations/ TOS Capital Projects ⁽⁶⁾	New technology/Intelligent Transportation System (ITS) updates over the next 30 years	\$55-75
	Total Tier 2	\$585 - 671

Table 3-3: Capacity and Operational Improvement Projects (continued)

Projects for each tier are listed by expressway and proceed from south to north or west to east for each expressway ⁽¹⁾

Expressway	Project Description ⁽²⁾	Cost (millions)
TIER 3 PROJECTS		
Almaden	Modify the SR 85/Almaden interchange to a par-clo type with loops in the NE and SE quadrants based on results of Tier 1A PSR/PDS	\$20
Lawrence	Initiate a feasibility study to provide direct access between Lawrence, I-280, and Stevens Creek, and HOV direct connectors at this interchange area	\$1
	Reconstruct the interchange to provide direct access ramps between Lawrence, I-280, and Stevens Creek, and HOV direct connectors	\$250-300
Montague	I-680 interchange modification	\$20
Oregon-Page Mill	Add a second SB right-turn lane from Junipero Serra to Page Mill; extend the SB right-turn lane half way to Stanford intersection. Maintain through bike lane, no free right-turn lane, avoid inadvertently inducing traffic shift onto Stanford Avenue ⁽¹⁵⁾	\$2-4
	Alma Bridge reconstruction based on results of Tier 1A feasibility study	\$100
San Tomas	Initiate a study to reconfigure SR 17/San Tomas Interchange	\$0.25
	Reconstruct SR 17/San Tomas Interchange	\$100-200
HOV Direct Connectors	Freeway/expressway direct connector HOV ramps at five locations: Capitol/US 101, Montague/I-880, Lawrence/US 101, Montague/San Tomas/US 101, and San Tomas/I-280	\$100-150
	Total Tier 3	\$593.25 – 795.25
OTHER PROJECTS		
Capitol	Any potential roadway improvements for the Nieman to Story segment of Capitol Expressway will be determined through coordination with VTA's light rail project and San Jose's policies. The light rail project Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) to the Federal Transit Administration (FTA) will be released in late 2003.	TBD
South County	Actual improvements and costs to be determined by a separate South County Circulation Study to be conducted by VTA	TBD
	Grand Total	\$1,636.75 – 1,940.75

Table 3-3: Capacity and Operational Improvement Projects (continued)

Notes:

- (1) Expressway direction:
 - Almaden = south-north
 - Capitol = west-east from SR 87 to Aborn & south-north from Aborn to I-680
 - Central = west-east
 - Foothill = west-east
 - Lawrence = south-north
 - Montague = west-east
 - Oregon-Page Mill = west-east
 - San Tomas = south-north
- (2) When funding is obtained, each project will undergo design, environmental review, and community outreach as appropriate. Project description will be changed as needed based on the results of these activities.
- (3) May also include a turning lane improvement at Central/Mary; need for this improvement will be determined during project design.
- (4) The existing LOS F intersections between Lawrence Expressway and De La Cruz will be mitigated if the widening is operated as mixed-flow. If the new lanes between San Tomas and De La Cruz remain designated as HOV after the trial period and the widening between Lawrence and San Tomas is operated as HOV lanes, then interchanges will be required at 2 of the LOS F intersections (Bowers and Lafayette) and will need to be placed in Tier 1B.
- (5) Please see the HOV System Element for more information about these projects.
- (6) Please see the Signals/TOS Element for more information about these projects.
- (7) Actual improvements and cost estimates for the McLaughlin to Aborn segment of Capitol Expressway will be identified through VTA's US 101 Central Corridor Study to be completed by the end of 2003 or early 2004. Projects for McLaughlin, Silver Creek, and Aborn are listed here as placeholders.
- (8) Additional EB through at the Homestead intersection would not improve the projected 2025 LOS from F to E or better. However, it would reduce average intersection delay significantly.
- (9) Implementation of an extension of Almaden Expressway to Bailey Avenue and additional improvements for the existing Almaden Expressway will be determined by City of San Jose land use decisions.
- (10) The City of Mountain View is pursuing options for grade separating the Caltrain railroad tracks from Rengstorff Avenue. If this project is built, the signalized intersection at Central and Rengstorff may degrade to LOS F, in which case the Central/Rengstorff interchange project will move into Tier 1B.
- (11) Local and regional LOS standards are not projected to be violated at the Central/Mary intersection within the timeframe of the plan.
- (12) Local and regional LOS standards are not projected to be violated at the Lawrence/Tasman intersection within the timeframe of the plan.
- (13) If the new HOV lanes between I-880 and I-680 remain designated as HOV after the trial period, the Great Mall/Capitol interchange may need to be moved into Tier 1B.
- (14) Palo Alto may conduct further studies and minor operational improvements for the Oregon-Page Mill/El Camino Real intersection, as specified in the City's Comprehensive Plan.
- (15) Although this is an existing LOS F intersection, Palo Alto would like to wait on improvements until the benefits of the Sand Hill Road improvements and programs to encourage alternate modes of transportation on the LOS at this location can be evaluated. Should a future evaluation indicate improvements are still needed, the project could be moved into Tier 1 with Palo Alto's concurrence.

Project Completion Timing

The projects in each tier also tend to have similar implementation challenges and project delivery schedules. Listed below are the estimated delivery time for each project once funds become available for that project:

Tier 1A – Most of the projects in this tier can be completed in 3-4 years (including time for environmental review, community outreach, design, right-of-way acquisition, utility relocation, and construction). A couple projects may stretch to 6 years due to structures involved and coordination with other agencies. Projects where right-of-way is available (i.e., no right-of-way impact or acquisition) and complex utility relocation is not needed can be completed within 2 years. The feasibility studies will take 1 to 2 years to complete.

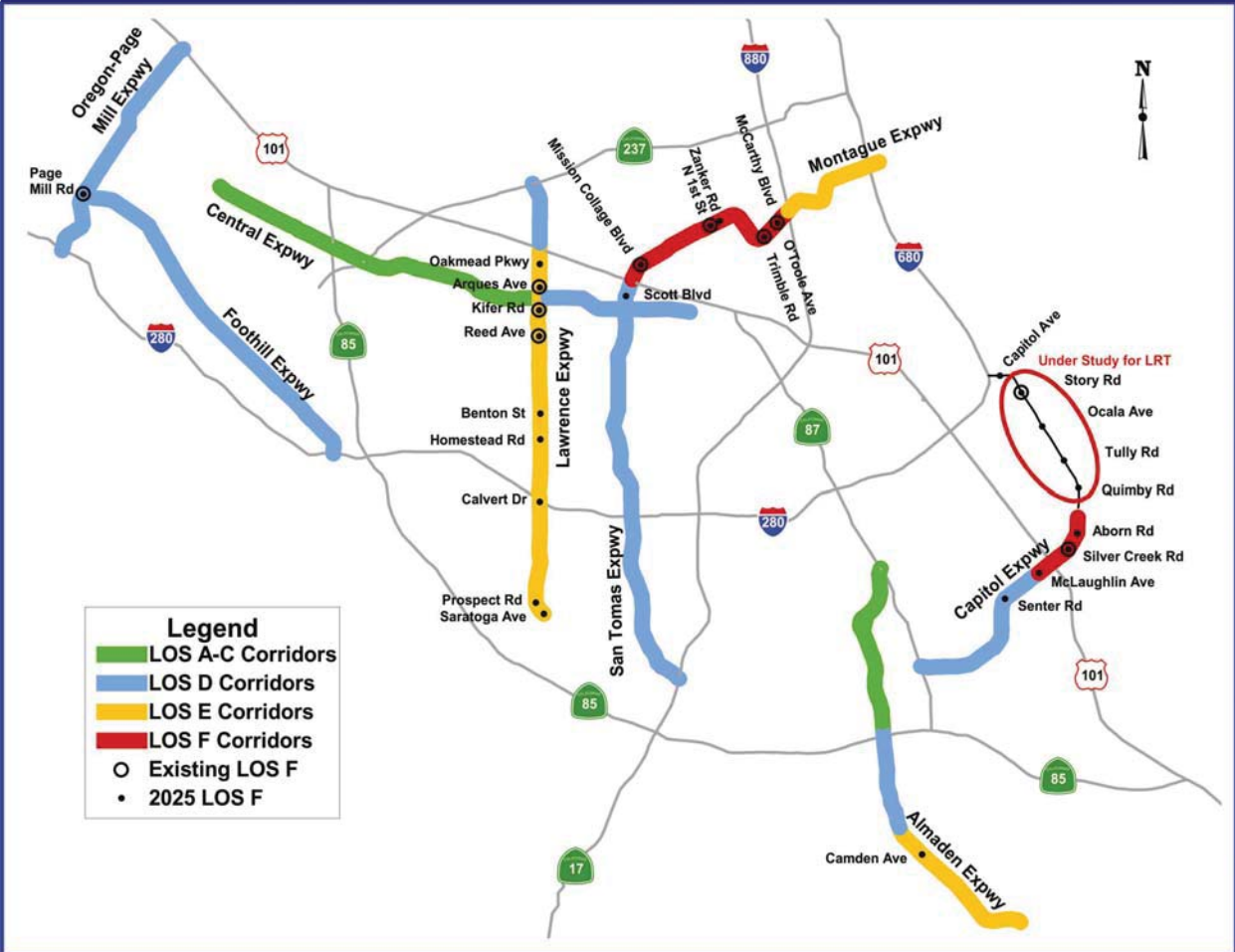
Tier 1B – These projects can typically be completed within 6-8 years. The 6-8 year implementation timeframe anticipates 2 years for environmental clearance and preliminary engineering, 1-2 years for final design, 1-2 years for right-of-way acquisition and utility relocation, and 2 years for construction. The only exception is the Montague/Mission College/101 par-clo interchange project, which will have a similar project schedule as Tier 3 projects (8-10 years) because of Caltrans involvement.

Tier 1C – The at-grade improvement projects in Tier 1C will have a similar implementation timeframe as the Tier 1A projects (1-4 years depending on right-of-way and utility impacts). The grade separation/interchange projects will have schedules similar to the Tier 1B projects (6-8 years).

Tier 2 – Most of these projects are grade separation/interchange projects that will have a similar implementation schedule as Tier 1B projects (6-8 years).

Tier 3 – Tier 3 projects will require significant right-of-way acquisitions and a relatively long project development process that will take 8-10 years to complete. All of these projects, except Alma Bridge reconstruction, involve Caltrans review and approval. The 8-10 year timeframe anticipates 3-4 years for Caltrans Project Study Report (PSR), Project Report (PR) and environmental document, 2 years for final design, 1-2 years for right-of-way acquisition and utility relocation, and 2 years for construction. The Alma Bridge reconstruction will

Figure 3-3: Corridor Level of Service for Tier 1A



involve coordination with the public utility commission (PUC) and Peninsula Corridor Joint Powers Board (JPB) due to the Caltrain tracks. This will affect delivery timing similar to a Caltrans project.

Tier 1A Effectiveness

The 28 Tier 1A projects address the top priorities for each expressway and improve most of the current LOS and operational problem areas for a total cost of \$150 million. These low-cost improvements can be delivered relatively quickly once funds are secured. Figure 3-3 illustrates the LOS effectiveness of the Tier 1A package of projects.

Compared with the “No Project” map in Figure 3-2, significant improvement is seen with Tier 1A:

- ❖ 18 of the existing 30 LOS F intersections and 24 of the 50 projected 2025 LOS F intersections are mitigated.
- ❖ Almaden between Camden Avenue and SR 85 is improved from a corridor LOS E to LOS D.
- ❖ Central east of Lawrence is improved from a corridor LOS F to LOS D.
- ❖ Montague east of I-880 is improved from corridor LOS F to E.
- ❖ San Tomas is improved from corridor LOS E to D.

Implementation Strategies

The following implementation strategies are recommended for the capacity/operational projects:

- ❖ The Tier 1A projects should be funded with existing resources without breaking up the package of improvements. However, not all 28 projects in Tier 1A can be worked on concurrently and the funding will likely not be available all at once. A project delivery schedule will need to be developed once roadway funds become available.
- ❖ The project lists and tier assignments should be revised regularly by the County. Project description/definition, cost, and tier assignments are based on conditions known today. They are also based on the limited design work that is completed in a long-range planning study. As funding becomes available for project development, the project description and cost estimates will be further defined and may require some changes. In addition, it is likely that new land use and transportation system decisions will affect the 2025 traffic projections that were used as the basis for planning in the Expressway Study and will require changes in the project list and tier assignments.
- ❖ When funding is obtained, each capacity improvement project will undergo design, environmental review, and community outreach as appropriate. Operational improvement projects (such as median closures, HOV conversions) will also have

appropriate traffic analysis, community outreach, and environmental review before implementation.

- ❖ All capacity improvement projects will incorporate pedestrian, bicycle, transit support (e.g., bus stops), and sound wall needs into the design and construction of the project. The costs for these improvements are included in the project's cost estimate. Landscaping improvements may also be included where provisions have been made for ongoing maintenance costs.

Recommended actions relating to funding sources are included in Section 10, Funding Strategies.



SECTION FOUR

SIGNALS & TRAFFIC OPERATIONS SYSTEM (TOS) ELEMENT

Traffic signals play a key role in the efficient functioning of the expressways. They regulate traffic flow on the expressways and help balance the mobility needs of users of the expressways and cross streets. Survey respondents have consistently rated timing of lights and synchronizing signals as very important improvements. In many instances, signal timing changes and new signal technologies can alleviate congestion problems as traffic demand grows. For this reason, adjustments to signal operations were considered a key part of the overall improvement strategy.

This element provides a description of current traffic signal operations along the expressways and the funded expressway Traffic Operations System (TOS) Program. It then documents the recommendations and costs for enhancing signal operations and TOS, including capital improvements and operations/maintenance. The costs of the recommended capital projects are incorporated in the Capacity/Operational Improvement Element, while operating costs are folded into the Maintenance and Operations Element.

Current Traffic Signal Synchronization Practice

There are 134 signalized intersections along the eight expressways. Figure 4-1 shows the current groupings of synchronized traffic signals. Intersections that are not included in a group are operating in isolation from other traffic signals. Typically, breaks in the signal groupings occur where the travel patterns change or the signals are controlled by Caltrans, such as at freeway interchanges and El Camino Real. The signals at the western end of Central Expressway and the First Street area of Montague Expressway operate without synchronization due to frequent train pre-emption of the signals.

The goal of synchronization along expressways is to give priority to through traffic on the expressways. It's designed to progress large volumes of through traffic in the peak direction, especially during the peak hour periods, from one end of each group to another. Thus, delays and stops on the expressway are relatively low while delays and stops are relatively high for side street movements.

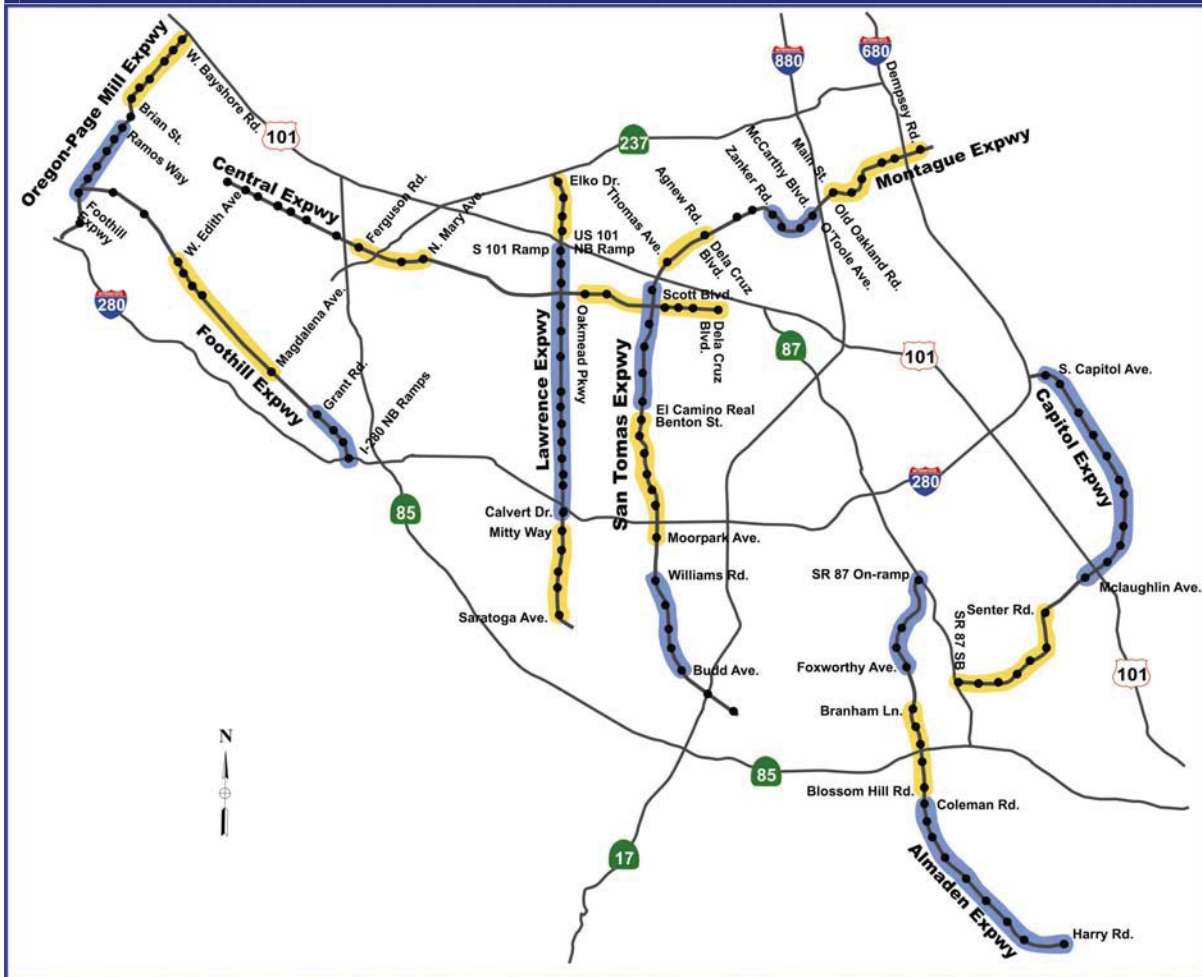
All expressway signal groups are coordinated in the weekday AM and PM peak periods for the commute direction. The exact peak period varies by expressway depending on travel patterns. Some of the expressway signal groups are coordinated for weekday mid-day periods and during the weekends. When not coordinated, the signals are free-running and responsive to the left turns and cross-street activation by approaching vehicles. Current practice is to conduct signal timing studies and re-time the signals as funding allows, which is generally limited to responding to specific requests from cities and the public.

Traffic Operations System Program

TOS is an operational system for managing and operating transportation systems with technologies. It is a system made up of various Intelligent Transportation System (ITS) components such as surveillance (loop detectors, closed-circuit TV, etc.), monitoring equipment, highway advisory radio, and changeable message signs (CMS).

In the mid-1990s, the County embarked on a cooperative effort with other agencies to study the Silicon Valley Smart Corridor along I-880 and State Route (SR) 17. A Smart Corridor is one where various public agencies' traffic management activities are coordinated to more

Figure 4-1: Current Traffic Signal Coordination Grouping



effectively manage traffic in that corridor. These are typically achieved using advanced technologies or ITS while partnerships between jurisdictions are necessary to develop procedures and measures for coordination. The first phase of the I-880/SR 17 Smart Corridor project was deployed in 2000 and included improvements on San Tomas and Montague Expressways. The project's components enable local and regional agencies to respond to traffic incidents and to better manage traffic operations in the corridor. Initial installations included intersection and freeway cameras, changeable message signs, a new traffic data collection station, a new highway advisory radio transmitter, and central traffic signal system enhancements.

The County has also developed a TOS Master Plan that includes \$42 million in TOS improvements along the expressways. The 1996 Measure B Sales Tax Program allocated \$24.5 million for expressway TOS allowing implementation of over half of the TOS Master Plan. Funded improvements include traffic management center upgrades, new loop and video sensors along the various expressways, and fiber optic interconnect between traffic signals. As the first step, a countywide review of traffic signal equipment and operations, including synchronization, was completed in 2000. Construction of initial TOS improvements on Central and Lawrence Expressways is now underway, and construction of improvements on Oregon-Page Mill, Foothill, and Almaden Expressways is scheduled over the next two years.

Additionally, a demonstration Traffic Adaptive System project is in progress along Lawrence Expressway between Oakmead Parkway and Kifer Road intersections. The adaptive module optimizes the timing split based on current conditions. If all the cars in a phase do not make it through the intersection, then a set amount of time is automatically added to that phase in the next cycle. If significant gaps develop in the flow of cars, then a set amount of time is removed from that phase in the next cycle.

Recommended Signal Operations/TOS Projects

Table 4-1 summarizes the funded TOS projects and the recommended signal operations and TOS improvement projects that will require additional funding.

Signal Operations Projects

The following projects totaling \$6.7 million have been included in the Tier 1A capacity/operational improvements list. These projects were selected because they have the potential to improve LOS problems and facilitate traffic flow along specific expressway segments as described below:

- ❖ Foothill operational corridor improvement (\$1.5 million) - Signalized intersections along Foothill between Edith Avenue and El Monte Avenue are closely spaced with the adjacent local intersections in the City of Los Altos. This project includes upgrading signal controllers at the local intersections, providing communication

between the expressway and local signals, and developing timing plans to facilitate traffic flow within the corridor.

Table 4-1: Signal Operations and TOS Project Summary			
Category	Status/ Recommended Tier	Project Description	Cost (millions)
Capital Improvements (Funded)	Measure B Program	TOS improvements including traffic management center upgrades, new loop and video sensors along the expressways, and fiber optic interconnect between traffic signals	\$23.0
		Traffic Adaptive System implementation along Lawrence between Oakmead and Kifer	\$1.5
	Total Funded		\$24.5
Capital Improvements – Signal Operations (Unfunded)	Listed as Tier 1A Capacity/Operational Improvement Projects	Foothill operational corridor improvements between Edith and El Monte including adjacent side street intersections & at Grant/St. Joseph	\$1.5
		Lawrence/I-280/Stevens Creek: optimize signal phasing and timing plans including City of Santa Clara signals at Stevens Creek and County's signal at Lawrence/Calvert/I-280 SB on-ramp	\$0.1
		Lawrence-Saratoga corridor signal optimization between Prospect and SR 85	\$0.1
		Oregon corridor improvements, including replacing signal standards and re-timing accordingly	\$5.0
	Total Tier 1A Signal Operations Projects		\$6.7
Capital Improvements – TOS (Unfunded)	Included in TOS Master Plan but not funded	1A Traffic information outlets such as electronic information signs, advisory radio, cable TV feeds, and a web page	\$5.0
		1A Install equipment to coordinate expressway signals with city signals on perpendicular streets	\$10.0
		1A Install equipment to connect with Sunnyvale, Palo Alto, Mountain View, and Los Altos traffic signal interconnect systems	\$2.5

Table 4-1: Signal Operations and TOS Project Summary (continued)

Category	Status/ Recommended Tier	Project Description	Cost (millions)	
Capital Improvements – TOS (Unfunded) (continued)	Additional TOS projects	1A	Upgrade traffic signal system to allow automatic traffic count collection	\$0.5
		1C	Adaptive traffic signal system for selected or all expressways based upon further feasibility study	\$10-12
		2	New technology/ITS update over the next 30 years	\$55-75
	Total Unfunded TOS			\$83-105
Operations/Maintenance	Conducted by Expressway Study	Update signal timing plans along the following three expressway corridors: <ul style="list-style-type: none"> • Oregon between El Camino Real and Indian • Foothill from Magdalena to Edith • San Tomas from Moorpark to Scott • San Tomas from Hamilton to Budd and coordination with Hamilton system 	N.A	
	Potential needs	Annual maintenance of TOS equipment	\$0.5 annually	
		Develop & update multiple timing plans for different times of days and days of week for all expressways	\$1.0 annually	
	Total Operations/Maintenance			\$1.5 annually

- ❖ Lawrence/I-280/Stevens Creek signal optimization study (\$0.1 million) - This study will develop optimal signal phasing and timing plans for operations during different times of the day and/or different days of the week to facilitate traffic flow in the interchange area. The study will include three traffic signals along Stevens Creek Boulevard being operated by the City of Santa Clara and the County's signal at Lawrence/Calvert/I-280 southbound on-ramp.
- ❖ Lawrence-Saratoga corridor signal operations study (\$0.1 million) - This study will develop multiple timing plans to facilitate traffic flow between SR 85 and Lawrence Expressway during the peak hour periods.
- ❖ Oregon corridor improvement project (\$5.0 million) - This study includes replacing and relocating the traffic signal standards at signalized intersections between El Camino Real and US 101, constructing pedestrian ramps when the standards are relocated, potentially adding a southbound left-turn lane at Middlefield Road for 8-phase signal operations, studying operational/safety improvements at the unsignalized intersections at Waverley Street, Ross Road, and Indian Drive, and developing new timing plans based on the corridor improvements.

TOS Improvements

A total of \$83-105 million has been identified for continuous update of the expressway TOS using available and new technologies over the next 30 years.

As shown in Table 4-1, the unfunded items of the current TOS Master Plan (\$17.5 million) and upgrades to the County's standard signal controllers to allow for automatic traffic count collection (\$0.5 million) are recommended as Tier 1A projects. The automated count collection system can help identify trouble spots in the signal operations/TOS and aid in future design.

The County is already deploying a trial installation of a fully adaptive system on three intersections on Lawrence Expressway. Depending on the success of this trial, the adaptive module can be added to the current County signal timing toolbox. Depending on the feasibility and the number of intersections, implementation of a more extensive adaptive signal system would cost \$10-12 million. This project has the potential to provide



operational improvements in the longer term and is, therefore, prioritized as a Tier 1C project.

Additionally, \$55-75 million has been estimated and prioritized in Tier 2 to provide TOS enhancements and update the system as new technologies become available over the next 30 years. The availability and cost of new technologies over a 30-year period cannot be predicted with any accuracy. To arrive at a reasonable cost estimate as a placeholder, it was assumed that a sum equal to the current TOS project recommendations (approximately \$55 million including both funded and unfunded elements) will be needed to replace the TOS over the 30-year period. Another \$20 million has been added to account for further enhancements to the current TOS, such as incident management and communications with systems in other agencies.

Operations and Maintenance

Currently, the County adjusts the signal timing plans along the expressways in response to requests or complaints from the local agencies and the public and as monies allow. During the Expressway Study, it became clear that a more proactive approach to adjusting signal timing was desired and needed. Traffic conditions are constantly changing in response to the economy and new land uses. These changes affect the length and times of peak period flows, cross-street traffic demand, and the overall volume of traffic. Most of all, they affect signal synchronization, which requires regular timing adjustments for maximum effectiveness.

In response to concerns expressed regarding signal timing on specific expressway segments, four signal timing studies were initiated as part of the Expressway Study. The scope and purpose of these studies are as follows:

- ❖ Oregon between El Camino Real and Indian Drive - Validate the need to include the Caltrans operated El Camino Real signal for coordination with the Page Mill system in the PM peak hours and with the Oregon system in the AM peak hour to facilitate traffic flow along Oregon-Page Mill during the commute peak hours. Coordination is required with Caltrans and the City of Palo Alto staff.

- ❖ Foothill from Magdalena Avenue to Edith Avenue - Facilitate traffic flow between El Monte Avenue and San Antonio Road and balance this movement with the through traffic flow on Foothill Expressway during the commute peak hours.
- ❖ San Tomas from Moorpark Avenue to Scott Boulevard - Optimize timing plans to balance expressway and side street delays during the peak hours.
- ❖ San Tomas between Budd Avenue and Hamilton Avenue - Optimize timing plans for this coordinated system and provide coordination with the City of Campbell's signal system on Hamilton Avenue.

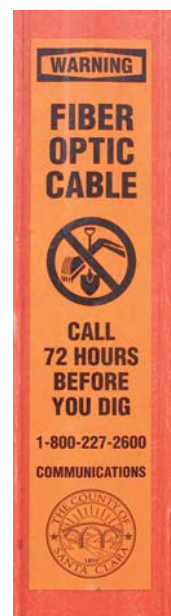
These studies address currently identified problem areas. To develop a regularly scheduled signal retiming program for the entire expressway system, a total of \$1.5 million annually is needed for signal operations and maintenance. The estimated cost includes \$1.0 million to develop and optimize variable timing plans for different times of the day and days of the week for all expressways annually and another \$0.5 million to operate and maintain the TOS.

Inter-Agency Signal Coordination

As shown on Figure 4-1, the expressway signal synchronization system is disrupted by Caltrans-operated signals along the expressways and by train crossings receiving signal pre-emption. Currently, there are railroad crossings on Montague Expressway and light rail transit (LRT) crossings on Montague, Lawrence, and Central Expressways.

Traffic flow along local streets and on the expressways can also be impaired when there are city-controlled signals at local intersections closely spaced with expressway signals. Several of the signal projects listed in this element involve improved coordination between the County's and other agencies' signals and/or incorporating the other agencies' signals into the expressway signal system.

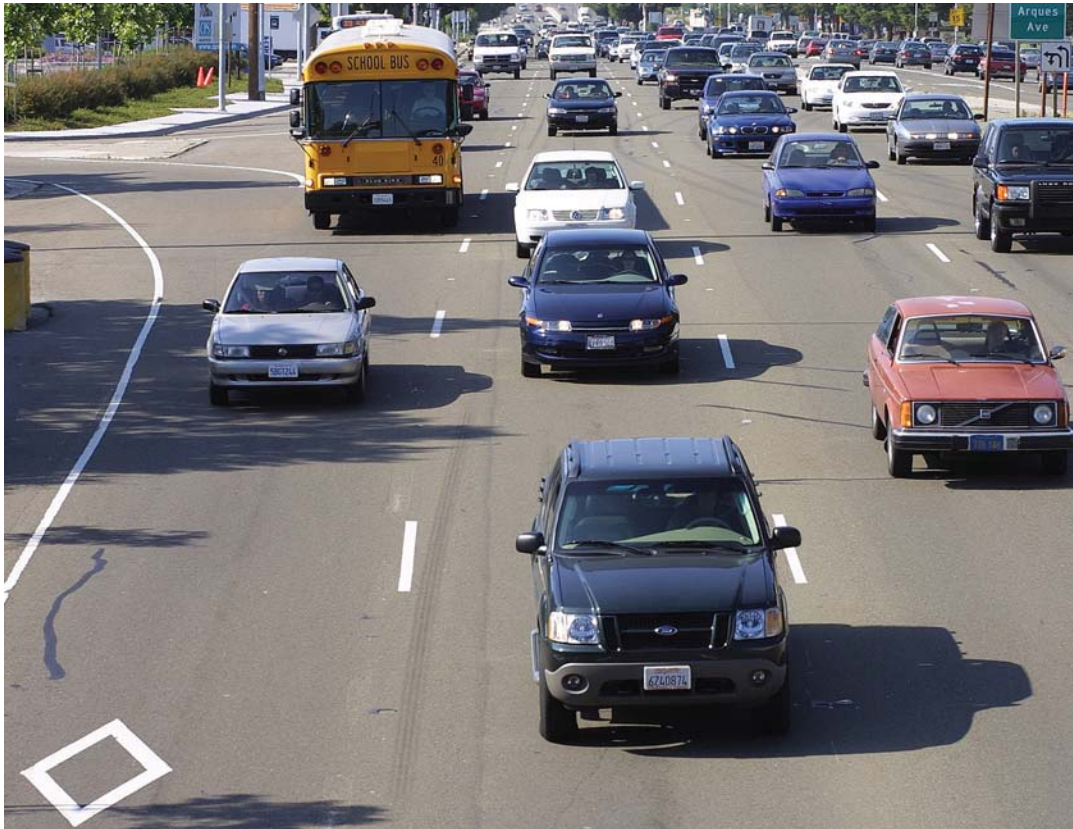
In addition, VTP 2020 recommends broader countywide planning efforts to define and develop new ITS projects. These efforts require ongoing multi-agency partnerships. The expressways, as major travel corridors, will likely play key roles in new Smart Corridor ITS projects.



Specific recommendations for continuing to improve inter-agency signal coordination include:

- ❖ Work with Caltrans to bring more Caltrans-operated signals along the expressways into the expressways' synchronized signal system.
- ❖ Work with Caltrans on optimal ramp meter operations to ensure ramp queues do not negatively impact expressway operations.
- ❖ Explore additional opportunities to increase coordination between city-operated signals on major cross streets with expressway signals to help optimize traffic flow on both roadways.
- ❖ Continue coordination efforts with rail operators to minimize expressway traffic impacts, and where appropriate, support grade separation of the facilities. A potential instrument for expressway coordination with LRT operations would be a joint operation agreement to optimize peak commute operations for users of the crossing, both on the expressway and LRT.
- ❖ Continue to participate in VTA's ITS planning efforts and in the Silicon Valley (SV)-ITS Program Partnership. VTP 2020 recommends that the SV-ITS partnership be expanded to implement three additional ITS projects in Santa Clara and Southern Alameda Counties.





 RIGHT LANE
BUSES AND
CARPOOLS
ONLY
6AM - 9AM
3PM - 7PM
MON - FRI

SECTION FIVE

HIGH-OCCUPANCY VEHICLE (HOV) SYSTEM ELEMENT

The first expressway high-occupancy vehicle (HOV) lanes opened on San Tomas Expressway in 1982 and the Montague HOV lanes opened one year later. Since then, HOV lanes have been added to Capitol and Lawrence Expressways and HOV queue jump lanes to Central Expressway. Other improvements have included adding electronic signage, moving HOV lanes off the shoulders, and expanding operating hours. Following the County's lead, the state has added a significant number of HOV lane miles on the freeway system, and more are planned. Today, we have 50 miles of expressway HOV lanes and 187 miles of freeway HOV lanes, existing and planned. The total miles of HOV lanes make Santa Clara County the most HOV-friendly county in the San Francisco Bay Area.

The purpose of this element is to take a comprehensive look at the expressway HOV system, including the performance of existing HOV lanes and potential expansion of the HOV system. The goal is to establish an expressway HOV system that is truly effective and functions well with the freeway HOV system.

Table 5-1: Existing Expressway HOV Lanes

Expressway	Expressway HOV Limits	Nearby Freeway
Capitol	Silver Creek Road to Capitol Avenue	US 101, I-680
Central	Bowers Avenue, Scott Boulevard queue jump lanes	N/A
Lawrence	Stevens Creek Boulevard to Arques Avenue	I-280, US 101
	Lakehaven Drive to Tasman Drive	US 101, SR 237
Montague	Mission College Boulevard to McCarthy/O'Toole	US 101, I-880
	Main Street to Milpitas Boulevard	I-880, I-680
San Tomas	Budd Avenue to Walsh Avenue	SR 17, US 101

Expressway HOV System Overview

Table 5-1 lists the existing expressway HOV lanes. Caltrans does not allow the HOV lanes to continue through freeway interchange areas due to concerns about the continuous weaving through the right hand lanes necessary to enter and exit the freeway ramps. For that reason, the HOV lanes usually start and/or end at least one signalized intersection away from the interchange area. This creates gaps in the system for the Lawrence Expressway and San Tomas/Montague Expressway HOV lanes.

Current Plans for Expressway HOV Lanes

Other planning efforts and recommendations that relate to potential changes in the expressway HOV lanes include:

- ❖ The Valley Transportation Plan (VTP) 2020 and the Metropolitan Transportation Commission's (MTC) Regional Transportation Plan (RTP) include adding HOV lanes on Central Expressway from De La Cruz Boulevard to State Route (SR) 237 and a 1990 environmental clearance document includes HOV lanes through to Shoreline Boulevard.
- ❖ San Jose's Evergreen Specific Plan Infrastructure Improvements called for the Capitol Expressway HOV lane to be replaced by light rail service. VTA is currently proceeding with environmental clearance for the light rail extension on Capitol Expressway.

Expressway HOV Lane Operational Characteristics



- ❖ Two or more people per vehicle are required. This is consistent with the freeway HOV lane requirements.
- ❖ Operating periods are 6:00 to 9:00 AM and 3:00 to 7:00 PM. These times are comparable to the freeway HOV lanes, although some freeway lanes start as early 5:00 AM and others end at 10:00 AM.
- ❖ All expressway HOV lanes are bi-directional during peak periods, except San Tomas south of El Camino Real and Montague, where the HOV lanes currently operate only in the peak direction during peak periods. The 8-lane widening projects for San Tomas and Montague Expressways will allow operation of the HOV lanes as bi-directional in each peak period.
- ❖ HOV is in the right lane next to the shoulder. This is to allow transit to access bus stops along the expressway. This location has a secondary advantage of creating acceleration and deceleration lanes for all vehicles entering and exiting the expressway using right turns.
- ❖ Violations are defined as single-occupant vehicles proceeding straight through a signalized intersection rather than turning off the expressway.

Evaluating HOV Lane Performance

In 2002, traffic counts were conducted at select locations for each expressway HOV lane. These locations were selected based on maximum traffic volumes and stopped queues, providing an incentive to carpool. The counts included number and types of vehicles in the HOV lane, number of violations, and number of vehicles in the mixed-flow lanes. In addition, travel time surveys were conducted for the length of each HOV lane.

Performance Measures

To evaluate the performance of the expressway HOV lanes, five performance measures were used. These performance measures were based on similar measures used by Caltrans and MTC to evaluate freeway HOV lanes. The performance measures are described in Table 5-2 including how they were adjusted from freeway to expressway HOV lanes.

Table 5-2: HOV Lane Performance Measures

Performance Measure	Freeway Standard	Expressway Standard	How Expressway Standard Determined
Total vehicles per peak hour	Minimum of 800	Minimum of 400	Converted the freeway standard to take into account the lower capacity on expressways due to slower speeds and signals.
Total persons per peak hour	Minimum of 1,800	Minimum of 880	Based on the average occupancy of 2.2 people per vehicle in the expressway HOV lanes.
Lane Productivity (ratio of people in HOV lane to mixed-flow lane)	No standard set; however, could be considered at least 1.0 ⁽¹⁾	Minimum of 0.80 to 0.90	Around this range of productivity, the impact of converting the HOV lane to mixed flow would lead to no net increase in capacity if a significant number of HOV users return to single-occupant vehicles.
Violation Rates	No higher than 10%	No higher than 15%	A higher violation rate standard was set due to the right lane position of the HOV lane.
Travel Time Savings	At least 1 minute per mile savings over mixed-flow lane	Travel time to be equal or better than mixed-flow lane	Due to differing operating conditions, a minimum travel time savings standard comparable to the freeway standard cannot be established. ⁽²⁾ However, lack of any travel time benefit is indicative of operational problems.

Notes:

- 1) The "Lane Productivity" measure was established by MTC for use in the regional *2002 HOV Lane Master Plan Update*. The report notes that all freeways in the Bay Area, except one, has a productivity ratio of at least 1.0 and several of the freeway HOV lanes have productivity ratios of 2.0 and 3.0 (i.e., double and triple the people in an HOV lane compared to a mixed-flow lane).
- 2) With signals approximately every half mile, the primary benefit of expressway HOV lanes is shorter queues at the signal as opposed to freeway travel where the primary benefit is being able to travel at a faster speed.

Key Findings

Tables 5-3 and 5-4 summarize the performance of the expressway HOV lanes using the performance measures. All measures must be considered to obtain a full view of the lane's performance. Key findings include:

- ❖ Capitol Expressway is the best performing HOV lane and has relatively low violation rates.

- ❖ Lawrence and San Tomas Expressways south of US 101 are performing acceptably. This is likely due to no parallel freeway so these expressways provide the primary central county north-south travel corridors. San Tomas has the most solid and consistent travel time savings.
- ❖ Lawrence north of US 101 performs poorly and has excessively high violation rates. This is due to operational problems created by the early merging of single-occupant vehicles into the lane to prepare for entry onto SR 237.
- ❖ Montague Expressway's performance is marginal to under performing. The area between I-680 and Great Mall Parkway has high violation rates, generally due to the lack of access control along the expressway (i.e., driveways between intersections). Operational problems at the I-880 interchange combined with street connections and driveways immediately east of this interchange slow down travel in the eastbound direction so significantly that the travel time for the Montague HOV lane is higher than in the adjacent mixed-flow lane.
- ❖ Central Expressway's queue jump lanes at Bowers Avenue and Scott Boulevard perform very poorly even though the intersection evaluated operates at level of service (LOS) F. Being closely parallel to the US 101 HOV lane probably accounts for the poor performance.

In summary, the key problems with the under-performing HOV lanes are:

- ❖ Operational problems created by lack of access control and close spacing of intersections/on-ramps leading to weaving conflicts and high violation rates.
- ❖ Parallel freeway HOV lanes that offer more travel time savings and convenience for longer commutes.
- ❖ The right-hand HOV lane concept does not provide an incentive where a large volume of right-turning vehicles must share the lane.

**Table 5-3: Summary of HOV Lane Performance by Expressway
Existing Conditions for Peak Direction of Travel**

Expressway	Intersection	Peak Hour	Direction of Travel	Mixed- Flow Thru Lanes	HOV Violation Rate	Persons/Lane		Productivity Ratio ⁽³⁾	HOV Vehicles Peak Hour
						HOV ⁽¹⁾	Mixed Flow ⁽²⁾		
Capitol	Story	AM	Northbound	3	16%	1,060	973	1.09	556
		PM	Southbound	3	17%	1,219	892	1.37	633
Central	Bowers	AM	Westbound	2	38%	205	998	0.21	88
		PM	Eastbound	2	32%	245	947	0.26	94
Lawrence	Monroe	AM	Northbound	3	38%	853	1,323	0.64	376
		PM	Southbound	3	22%	1,070	1,038	1.03	461
	Homestead	AM	Northbound	3	35%	767	961	0.80	340
		PM	Southbound	3	28%	678	1,052	0.64	297
	Tasman	AM	Northbound	3	82%	275	637	0.43	98
		PM	Southbound	3	39%	326	525	0.62	124
Montague	Trade Zone	AM	Westbound	2	61%	427	1,059	0.40	208
		PM	Eastbound	2	64%	315	892	0.35	103
	Zanker	AM	Westbound	2	34%	426	866	0.49	188
		PM	Eastbound	2	22%	557	668	0.83	235
San Tomas	Monroe	AM	Northbound	3	30%	702	1,243	0.56	369
		PM	Southbound	3	15%	903	980	0.92	448

Notes:

HOV = High-Occupancy Vehicle

SOV = Single-Occupancy Vehicle

Performance values shaded are the ones exceeding the following performance measure standards:

Violation Rate < = 15%.

Persons/ HOV Lane > = 880

Productivity Ratio > = 0.80.

HOV vehicles > = 400 vph.

- 1) Based on actual counts conducted by CCS and County (Capitol Expwy.) in 2002. The HOV volume also includes bus and truck volumes observed or estimated.
- 2) The values shown assume that all vehicles on mixed-flow lanes are SOV's.
- 3) Productivity Ratio = (HOV persons) / (avg. mixed-flow persons/lane)

Table 5-4: Expressway HOV Lane Travel Time Comparison ⁽¹⁾

Expressway HOV Lane	Lane Length (miles)	Peak Hour	Peak Direction	Seconds Saved per Mile ⁽²⁾	
				2001	2002
Capitol	3.8	AM	North/Eastbound	19	18
		PM	South/Westbound	0	6
Lawrence	6.1	AM	Northbound	6	7
		PM	Southbound	3	12
Montague ⁽³⁾	5.4	AM	Westbound	3	36
		PM	Eastbound	1	- 7
San Tomas	7.2	AM	Northbound	26	26
		PM	Southbound	3	24

Notes:

- 1) Based on travel time surveys conducted by County Roads and Airports Department.
- 2) The "Seconds Saved per Mile" represents the average over the entire length of each HOV lane. The standard for freeway HOV lanes is a minimum of 1 minute per mile.
- 3) The 2001 data for Montague was collected while various construction projects were underway, which affected overall travel time for all lanes.

Operational Improvement Strategies

Looking more closely at the operational problems experienced by Lawrence north of US 101 and Montague between I-880 and I-680, a preliminary identification and assessment of potential solutions was conducted. As described below, none of the options present encouraging results in terms of effectiveness and general feasibility.

Potential operational improvement strategies include:

- ❖ Remove access/right turn movement – This is the most direct solution, but it has limited application, could result in whole takes of properties lacking alternative access, and does not address freeway connections, a typical problem area. This strategy has application at other locations along the expressway, consistent with the discussion in Section 2 regarding access vs. mobility. It is proposed for several

locations along Lawrence between I-280 and US 101, where HOV lanes are to be maintained.

- ❖ Add auxiliary lanes – This strategy would widen the expressway to add outside auxiliary lanes in the hopes that this would allow separation of HOV through traffic from right turning traffic, but it would result in an unenforceable center lane operation for the HOV lanes; require costly widening, property acquisition and other impacts; and risk safety impacts associated with unsafe driver lane change movements because of unfamiliarity with this design and the legal restrictions.
- ❖ Construct frontage roads – Frontage roads address some of the safety issues associated with the auxiliary lanes, but adds others by intensifying and concentrating weaving movements at frontage road access points which would be expected to be near signalized cross streets (the worst location from perspective of HOV operation), and would be more costly and have more construction impacts.
- ❖ Construct braided ramps – Braided ramps would apply a freeway design concept to the expressways, with freeway project level costs and impacts. It would require substantial property takes and potentially introduce other environmental impacts (particularly in residential areas as along Lawrence).

New HOV Facilities

No new expressway HOV lanes or extensions to existing lanes are recommended except for a funded project on part of Central Expressway (discussed further below). The expressway segments without HOV lanes all meet at least two of the following conditions which are not supportive of widening the expressway for HOV lanes:

- ❖ The projected traffic congestion levels for the corridor are not high enough to provide incentives to carpool.
- ❖ The local community has other priorities for the right-of-way that would be used for an HOV lane (e.g., bike travel, landscaping, and safety enhancements).
- ❖ There would be operational problems due to lack of access control or intersection/ramp configurations.
- ❖ There are competing parallel freeway HOV lanes existing or planned.

The most significant enhancement that can be made to the expressway HOV system is constructing direct ramp connections from the right-hand expressway HOV lane to the median freeway HOV lane. These would be one-way connectors: from expressway to freeway in the peak direction. The direct connector ramps could provide significant time savings for carpoolers. They would avoid the ramp meter and meter queues and avoid having to cross 2 to 3 lanes of congested freeway to reach the median HOV lane. They would also help resolve existing ramp conflict areas for bicyclists as described in Section 6, “Bicycle Element”. Six locations are recommended for potential HOV direct connector ramps.

Project Recommendations

HOV lane recommendations are illustrated in Figure 5-1 and described below.

Capitol Expressway

- ❖ Retain the HOV lane on Capitol Expressway from Nieman Boulevard to Silver Creek Road pending completion of the US 101 Central Corridor Study. Should the results of the US 101 Central Corridor Study confirm that the HOV lane should be retained after the light rail project is built, consider connecting it to US 101 by constructing an HOV direct connector ramp onto US 101 to encourage carpool use in this highly congested corridor.
- ❖ Removal of the HOV lane between Quimby Road and Capitol Avenue to provide for LRT construction will be the subject of a VTA project environmental analysis.

Central Expressway

- ❖ Complete the currently funded project to build a new HOV lane on Central Expressway from De La Cruz Boulevard to San Tomas Expressway. Operate this HOV lane and the Bowers Avenue queue jump lane on a trial basis for 3 to 5 years with regular monitoring based on the performance measures.
 - If the HOV lane is not successful by the end of the trial period, convert it and the Bowers Avenue queue jump lane to mixed flow to mitigate the LOS F intersections along this section of the expressway.

Figure 5-1: HOV System Recommendations



- If the HOV lane is successful, extend it to Lawrence Expressway when funds allow. If the HOV lane is retained, two interchange projects will be needed to mitigate existing LOS F intersections, adding \$80 to 90 million to the Tier 1B list of projects.
- ❖ Do not construct the HOV lane on Central Expressway from Lawrence Expressway to Shoreline Boulevard for the following reasons:
 - West of Lawrence Expressway, Central Expressway has no existing or projected LOS F intersections and overall traffic congestion is not severe.

- Central Expressway closely parallels a freeway HOV lane.
- Ramp safety improvements are needed between Lawrence Expressway and Mary Avenue in Sunnyvale.
- From Mary Avenue to Shoreline Boulevard in Mountain View, there is local opposition to removing the existing landscaping to construct an HOV lane, especially since there is not a need for the lane based on traffic demand and traffic congestion levels.

Lawrence Expressway

- ❖ Convert the Lawrence Expressway HOV lane north of US 101 between Lakehaven Drive to Tasman Drive to mixed-flow lanes due to poor performance and operational problems, and to mitigate projected traffic conditions.

Montague Expressway

- ❖ Convert the existing Montague Expressway HOV lanes between Main Street and Milpitas Boulevard (i.e., between I-880 and I-680) to mixed-flow lanes, after the appropriate environmental review and revisions to the Regional Transportation Plan (RTP). The conversion is due to poor performance and operational problems. It will also mitigate LOS F conditions.
- ❖ When the 4th lane in each direction is added, designate it as an HOV lane on a trial basis for 3 to 5 years with regular monitoring based on the performance measures. The design of the 4th lane should address the operational problems to the greatest extent feasible. The 680 – 880 Cross-Connector Study should include funding for correcting the operational problems should Montague be designated the primary HOV connector.
 - If the HOV lane is not successful after the trial period and continues to experience significant operational problems, convert it to mixed flow.
 - If the HOV lane is retained, an interchange project at Great Mall/Capitol Avenue may be needed to mitigate an existing LOS F, adding \$42 million to the Tier 1B list of projects.

HOV Direct Connector Ramps

- ❖ Candidate locations for expressway to freeway HOV direct connector ramps are as follows:
 - Capitol Expressway and US 101 (subject to 101 Central Corridor Study)
 - Lawrence Expressway and I-280 (would be part of the overall interchange reconfiguration for Lawrence Expressway/Stevens Creek Boulevard/I-280)
 - Lawrence Expressway and US 101
 - Montague Expressway and I-880
 - San Tomas Expressway and I-280 (would be a stand-alone connection without an interchange)
 - San Tomas Expressway/Montague Expressway and US 101

Costs and Project Delivery

- ❖ Converting HOV lanes to mixed flow – Funding is required for environmental review and for removing signage and pavement markings. These costs are estimated at \$0.1 million per conversion project. Tier 1A of the Capacity and Operational Improvement Projects includes three expressway conversions for a total of \$0.3 million. Once funds are available, these projects could be completed in about one year.
- ❖ Fixed Guideway Funds – VTA receives federal Fixed Guideway Funds for operating buses in HOV lanes. Converting HOV lanes will result in lost operating revenue for VTA, estimated at \$40,000 per year for the Lawrence HOV lane north of US 101 and \$220,000 per year for the Montague HOV lane between I-880 and I-680.
- ❖ HOV direct connector ramps – The estimated cost is \$20 – 30 million for each location assuming a one-way connection from the expressway to the freeway based on the peak flow of traffic. The Lawrence Expressway/280 direct connector is included in the Tier 3 project to reconfigure the entire interchange area. Another \$100-150 million has been allocated to Tier 3 for the remaining five locations

recommended. Once funds become available, these projects will take approximately 8 to 10 years to deliver.

Operational Recommendations

- ❖ Continue the regular monitoring program for the expressway HOV lanes to determine performance using the performance measures. If not performing up to standards, take appropriate corrective action. Some guidelines for corrective action include:
 - High violation rates – If the violation rate is over 15% and less than 50%, enforcement should be increased. Violation rates over 50% typically indicate a problem with the usability of the lane. The operational problem should be identified and, if feasible, eliminated. If it cannot be eliminated, consideration should be given to converting the HOV lane to mixed flow.
 - Under-performing – If there is an incentive to use the HOV lanes due to high levels of congestion and LOS F intersections, focus should be on what more can be done to encourage carpool use. If the performance cannot be improved and corridor level of service is poor, consideration should be given to converting the HOV lane to mixed flow to relieve the congestion problems.
- ❖ Work with Caltrans to determine what is needed to continue the expressway HOV lanes across the freeways, especially for the San Tomas Expressway/Montague Expressway/US 101 interchange.
- ❖ Continue to coordinate with Caltrans for consistency on operational policies for the freeway and expressway HOV lanes



SECTION SIX

BICYCLE ELEMENT

On August 13, 1991, the Santa Clara County Board of Supervisors adopted a “Policy for Bicycle and Pedestrian Usage of the Expressways.” This policy led to the removal of bicycle prohibitions for all expressways. Over the last ten years, the presence of bicycles on the expressways has grown. Foothill Expressway is such a major bicycle travel corridor that the Expressway’s vision includes the statement that it “plays an important role as a regional bicycle facility.”

For bicyclists the expressways offer convenient and direct travel routes with few driveways and well-spaced intersections. They are ideal for bicyclists commuting to work or making other long-distance trips. However, there has been general agreement among the public, policymakers, and technical staff that only advanced-skilled bicyclists should be encouraged to use the expressways. Given the high speeds and freeway-like merging and crossing movements, the expressways are not for children or occasional recreational bicyclists.

Therefore, the Bicycle Element is based on the following two principles:

- ❖ Bicycle travel will be accommodated on all expressways.
 - ❖ The expressways should only be used by advanced-skilled bicyclists and should not be used by children or novice bicyclists.
-



Bicycle Accommodation Guidelines

County Roads now has over ten years of experience with unregulated bicycle travel on all expressways, and several more years of experience with bicycles on some expressways. During this time, County Roads staff, working closely with the cities and the County Bicycle and Pedestrian Advisory Committee (BPAC), has been continuously modifying and improving striping and signage along the expressways for bicycles.

The first step in developing the Expressway Study's Bicycle Element was to document standard bicycle treatments by creating Bicycle Accommodation Guidelines (BAG). The BAG consists of detail diagrams that will be applied to the entire length of all expressways. It includes guidelines on bicycle travel area widths, striping, signage, trail connections, maintenance, and several other design treatments. The BAG is consistent with the Caltrans Highway Design Manual (HDM) and will be updated as needed when changes are made to bicycle treatments in the HDM. Listed below are the objectives and guidelines used to formulate the BAG.

Objectives

1. Provide safer accommodation for bicyclists along all expressways.
2. Be consistent along the entire length of each expressway and among the expressways for the benefit of both motorists and cyclists, to the extent possible.

Guidelines

1. Travel width – Provide adequate continuous travel width for use by bicyclists on the expressways.
2. Delineation – Delineate the bicycle travel width with shoulder stripes and other striping as needed.

3. Entrance and exit ramps – On county facility, signalize exiting or merging movements with two or more lanes. In Caltrans’ jurisdiction, work with Caltrans to improve situations where bicyclists must cross more than one conflicting vehicle lane at a time.
4. Safe passage across intersections – Provide intersection design treatments and operations that enhance safe passage for bicyclists.
5. Trail connectivity – Wherever feasible, work with trail operators to plan for and provide direct connections between trail over and undercrossings and both directions of expressways.
6. Maintenance – Maintain clear and clean shoulder areas on the expressways.

Bicycle Improvement Projects

The bicycle improvements identified here are needed to bring all expressways into full compliance with the BAG. There are four categories of improvements. They are described below, along with costs and implementation recommendations as appropriate.

Pavement Delineation

This category includes improvements related to striping, such as replacing dashes with solid stripes, providing a bike through slot between through and right-turn or auxiliary lanes, and installing a dash stripe across driveways. Due to the current resurfacing program funded by the Measure B Sales Tax, many of the expressways have recently been or will soon be re-striped in compliance with the BAG at no extra cost. It is estimated that \$0.6 million is needed for re-striping treatments at key spots that are not due to be resurfaced in the near future. A bicycle grant for \$0.5 million has been received, leaving \$0.1 million unfunded.

Figure 6-1: Bicycle Facility Improvements



Ramp Conflicts

This category deals with freeway/expressway interchanges where there are double-right on-ramps (one lane is usually an HOV bypass lane) which forces a bicyclist to cross more than one conflicting vehicle lane at a time. The ramp conflict locations, shown in Figure 6-1, are as follows:

- ❖ Almaden/State Route (SR) 85
- ❖ Capitol/US 101
- ❖ Lawrence/US 101
- ❖ Lawrence/SR 237

- ❖ Montague/San Tomas/US 101
- ❖ Oregon-Page Mill/I-280
- ❖ San Tomas/SR 17

Potential solutions for these conflicts include reducing the entrance point of the on-ramp to one lane and then widening to 2 or 3 lanes on the ramp itself; adding a stop signal light at the on-ramp; or creating a bike through slot when both lanes are exit-only lanes. Any design change, however, must receive Caltrans approval and be supported in the HDM. County staff will continue to work with Caltrans staff to study design options that can improve the situation yet still meet traffic demand requirements. No project costs are provided because the improvements are still to be determined.

There is a roadway project recommended that will eliminate one of the ramp conflicts. The Page Mill/I-280 interchange project will reconfigure the west side of the interchange into a half diamond and will cost \$5 million. Since it provides operational benefits, it is included in the Tier 1A list of projects in the Capacity/Operational Improvement Element.

There may also be opportunities to work with Caltrans to resolve some ramp conflict locations as part of other projects recommended in the Capacity/Operational Improvement Element. Specifically, the Tier 1A Almaden/SR 85 Project Study Report (PSR), Tier 1B Montague/US 101 par-clo interchange, and Tier 1A San Tomas/SR 17 operational/safety improvement study present opportunities to look at new ramp design concepts. VTA may also be able to resolve the Capitol/US 101 ramp conflict location as part of the US 101 Central Corridor Study.

The Capacity/Operational Improvement Element also includes a number of new expressway interchanges. Following the BAG principles and guidelines, the interchange ramps will be signalized or otherwise designed to avoid forcing bicyclists to cross more than one conflicting vehicle lane at a time. In addition, as the interchange projects are designed, the County will seek to make the interchange areas as bicycle and pedestrian friendly as possible consulting with bicycling experts and the County BPAC on the design.

The HOV System Element includes recommendations to construct direct connector ramps for HOV lanes. At several locations, existing HOV ramp meter bypass lanes are the source of the conflict with through bike use. Installing direct connectors would eliminate the conflict.

Shoulder Widening

Projects in this category involve widening the shoulders to provide sufficient bicycle travel width. Ten specific projects have been identified. The locations for these projects are shown on Figure 6-1 and listed on Table 6-1. Costs and implementation of these projects are divided as follows:

- ❖ The project on Almaden is already listed as a VTP 2020 Tier 1 bicycle project. The cost for this project is \$2 million with \$1.6 million in grant funds already allocated.
- ❖ Lawrence (at Pruneridge and from El Camino Real to Kifer Road) will be implemented as part of the County's 2003 pavement resurfacing project at no additional cost.
- ❖ Two projects (Foothill at Loyola Corners and Oregon at Alma Avenue) can only be accomplished as part of the overall bridge reconstruction projects that are included in the Capacity/Operational Improvements Element. Therefore, there is no cost estimate for just making the bicycle-related improvements.
- ❖ Three projects (Foothill/San Antonio Road, San Tomas/Hamilton Avenue, and Capitol/Silver Creek Road) can be done as part of roadway projects already included in the Capacity and Operational Improvements Element under Tiers 1A and 1B at no additional cost. However, these roadway projects may take 10-20 years to implement. Given the relatively low cost of these pavement-widening improvements (\$0.65 million total), it is recommended that these projects be pursued independent of the roadway projects where site conditions indicate minimal impacts or facility relocation.
- ❖ Two pavement widening areas (Foothill/Magdalena and San Tomas/Cabrillo) do not have any associated roadway improvement projects. They will cost \$0.5 million to implement.

Specific shoulder widening needs for Montague Expressway have not been identified. Montague is being widened to 8 lanes along its full length. Some sections are already widened and some sections are funded, while the remaining unfunded sections are included in the Tier 1A Capacity/Operational Improvement project list. The 8-lane widening project scope includes bringing Montague into full compliance with the BAG, including providing adequate shoulder width for bicycle travel.

Table 6-1: Bicycle Improvement Projects

Improvement Category	Location	Project Description	Cost (millions)	Potential Implementation
Pavement Delineation	All Expressways	Re-striping per Bicycle Accommodation Guide (BAG)	\$0.60 (\$0.50 funded)	Most re-striping can be done as part of near-term pavement overlay projects at no additional cost. This cost estimate reflects spot treatments needed independent of pavement overlays.
Shoulder Widening	Almaden between Ironwood and Koch	SB widening to provide adequate shoulder per BAG	\$2.00 (\$1.60 funded)	VTP 2020 Tier 1 bicycle project
	Capitol/Silver Creek	Widen WB approach for approximately 270 feet to provide a bicycle slot	\$0.20	Tier 1B Roadway Project ⁽¹⁾
	Foothill/San Antonio	Widen WB approach for approximately 300 feet to provide a bicycle slot	\$0.20	Tier 1A Roadway Project ⁽¹⁾
	Foothill/Magdalena	Widen EB approach for approximately 600 feet to provide a bicycle slot	\$0.30	
	Foothill/Loyola	Provide more shoulder width in both directions under the Loyola Bridge	N.A.	Must be completed as part of overall bridge reconstruction project (Tier 1A in Capacity/Operational Element)
	Lawrence/Pruneridge	Widen NB approach for approximately 150 feet to provide angle break before Pruneridge	N.A.	Part of County's 2003 Pavement Maintenance Project
	Lawrence/El Camino Real to Kifer	Provide more shoulder width	N.A.	Part of County's 2003 Pavement Maintenance Project
	Oregon/Alma Bridge	Provide more shoulder width in both directions under the Alma Bridge	N.A.	Must be completed as part of overall bridge reconstruction project (Tier 3 in Capacity/Operational Element)

Table 6-1: Bicycle Improvement Projects (continued)

Improvement Category	Location	Project Description	Cost (millions)	Potential Implementation
Shoulder Widening (continued)	San Tomas/Hamilton	Widen SB approach for approximately 275 feet to provide adequate shoulder per BAG	\$0.25	Tier 1A Roadway Project ⁽¹⁾
	San Tomas/Cabrillo	Widen NB approach for approximately 375 feet to provide adequate shoulder per BAG	\$0.20	
Total Funded:			\$2.10	
Total Tier 1A:			\$0.45	
Total Tier 1B:			\$0.20	
Total Bicycle Improvement Only:			\$1.00	
Total Needs			\$3.75	

Notes:

1) Roadway project costs in the Capacity/Operational Element include these bicycle improvements.

Trail Connections

One of the objectives of the BAG is to provide for connections to all creek trails that cross or run parallel to an expressway. Trail connection points are identified on Figure 6-1. County staff will work with all related public agencies involved in building the trails to facilitate connections to the expressways. All off-expressway trail improvements are funded by the trails projects. It is not anticipated that the activities involved in facilitating the trail connections will involve much cost (e.g., openings in fences); therefore, no costs for the trail connections are included in the bicycle improvement plan.

The Pedestrian Element does include on-expressway projects to support trail connections. These projects are crossing enhancements and a pedestrian overcrossing (POC). Although these projects will benefit bicyclists, they are generally considered to be pedestrian improvements and the costs are included in the Pedestrian Element.

Cost Summary

A total of \$3.75 million in bicycle improvement projects has been identified with only \$1.65 million unfunded. This is a low cost compared to other *Implementation Plan* elements for three reasons: 1) most expressway mileage is already in compliance with the BAG due to County Roads improving bicycle accommodations on the expressways for the last ten years; 2) the remaining major problem areas (Foothill/Loyola, Oregon/Alma Bridge, and Page Mill/I-280) require operational roadway improvements that include more than just bicycle-related improvements; and, 3) the freeway/expressway ramp conflict locations require Caltrans agreement on design changes before cost estimates can be developed.

Bicycle Travel Area Maintenance

One of the BAG guidelines is to maintain clear and clean shoulder areas on the expressways. In support of this guideline, the Maintenance and Operations Element of the *Implementation Plan* includes a recommendation to increase sweeping of each expressway from one time per month to twice per month plus on-call response. The estimated cost to implement this recommendation is \$0.6 million annually.



The Maintenance and Operations Element also includes increased levels of effort for pavement maintenance, landscaping maintenance, and traffic control/safety devices infrastructure replacement which will also benefit bicycle travel. As discussed in the Funding Strategy section, these increased levels of effort, including more sweeping, can only be implemented when additional operating revenue is secured.

Bike Lane Designation Process

In general, the recommended expressway approach is to delineate bike travel width, but not to designate bike facilities as formal bike lanes. Delineation refers to striping; designation refers to bike lane signs and pavement markings. This approach is based on the concept that children and inexperienced bicyclists should not be encouraged to use the expressways. Another element of designation is the incorporation of routes into various bicycle route maps. Casual recreational or family outing users could misunderstand inclusion on a bike route map to mean an easy route for novices.

However, expressways vary as to existing conditions and community preferences. To allow designation of bike lanes, the following process will be used:

1. Specific criteria for evaluating bike lane designation proposals will be developed. The criteria will consider elements such as: posted speed limit, geometric conditions, type of merge and diverge crossings, consistency along the expressway, consistency with city bike plans, and continuity with other bike facilities, including creek trails. County staff

will establish the bike lane designation criteria using a collaborative process involving city staff, the County Roads Commission, and the County BPAC.

2. Where new bike lanes are proposed, cities shall supply a council-approved request.
3. County staff shall then apply the criteria to evaluate the suitability and develop a recommendation about the proposed bike lane. The recommendation will be brought to the County Roads Commission and County BPAC, prior to submittal to the Board of Supervisors for final action.

The existing bike lanes along portions of Oregon-Page Mill and Foothill Expressways will remain in place. Extending these lanes, however, will require Board of Supervisors' approval using the bike lane designation process.



SECTION SEVEN

PEDESTRIAN ELEMENT

The Pedestrian Element focuses on two different pedestrian needs: traveling along expressways and crossing the expressways. To identify projects for travel along the expressways, a pedestrian facilities plan was developed covering the entire length of each expressway. For crossing needs, high-demand crossing locations were identified for crossing enhancement treatments.

Pedestrian Facilities Along the Expressways

In 1991, the Santa Clara County Board of Supervisors adopted a “Policy for Bicycle and Pedestrian Usage of the Expressways.” The policy stated that the Board is committed to accommodating pedestrians wherever possible, subject to safety considerations and fiscal constraints. Since 1991, other agencies such as the Federal Highway Administration (FHWA), Caltrans, and Santa Clara Valley Transportation Authority (VTA), have developed policies and design guidelines to facilitate pedestrian use of roadway corridors. The types and designs of pedestrian facilities on expressways will continue to evolve as new policies, legislation, and design guidelines are developed. The County’s 1991 policy is still in effect today and is supported in the Pedestrian Element’s recommendations.

Pedestrian Use of Expressways

Pedestrians walk along the expressways for a variety of reasons including: to access a bus stop or building that fronts on the expressway; because there is no parallel facility available or no other way to cross a barrier such as a creek or freeway; because they are unaware of alternate routes; or for emergency needs (e.g., their car breaks down). Sometimes, the expressway is simply the most direct route to their destination.

There are also a variety of conditions along the expressways that affect the level of pedestrian demand and how pedestrian-friendly the expressway is. These conditions include:

- ❖ All but one of the expressways are posted with speed limits of 45 or 50 miles per hour. Some of the expressways have high-occupancy vehicle (HOV) lanes in the right-hand lane.
- ❖ Most of the shoulder widths are six feet wide but there are some areas where, due to limited right-of-way, shoulders are narrower. Shoulders are used for bicycle travel, vehicular emergencies, traffic enforcement, and other emergency vehicle use.
- ❖ Most of the expressways have little or no additional right-of-way available. Pavement and landscaping may be using all right-of-way available leaving no room behind the curb line.
- ❖ Generally, there are few destinations fronting on the expressways. Buildings tend to have their backs to the expressway with access points off a parallel local street, but some expressway sections do have retail/commercial development fronting on the expressway.
- ❖ Frontage roads and nearby parallel roads, trails, or easements are available along portions of the expressways.

The expressway vision statements all classify the expressways as arterials; however, the type of arterial ranges from high-end express arterials with some freeway-like sections to local, multimodal arterials. These vision statements imply a different approach to pedestrian facilities for each expressway. In general, for the freeway-like sections, a parallel pedestrian facility is preferred while for the local arterials, sidewalks along the expressways are encouraged.

Recommended Pedestrian Facilities

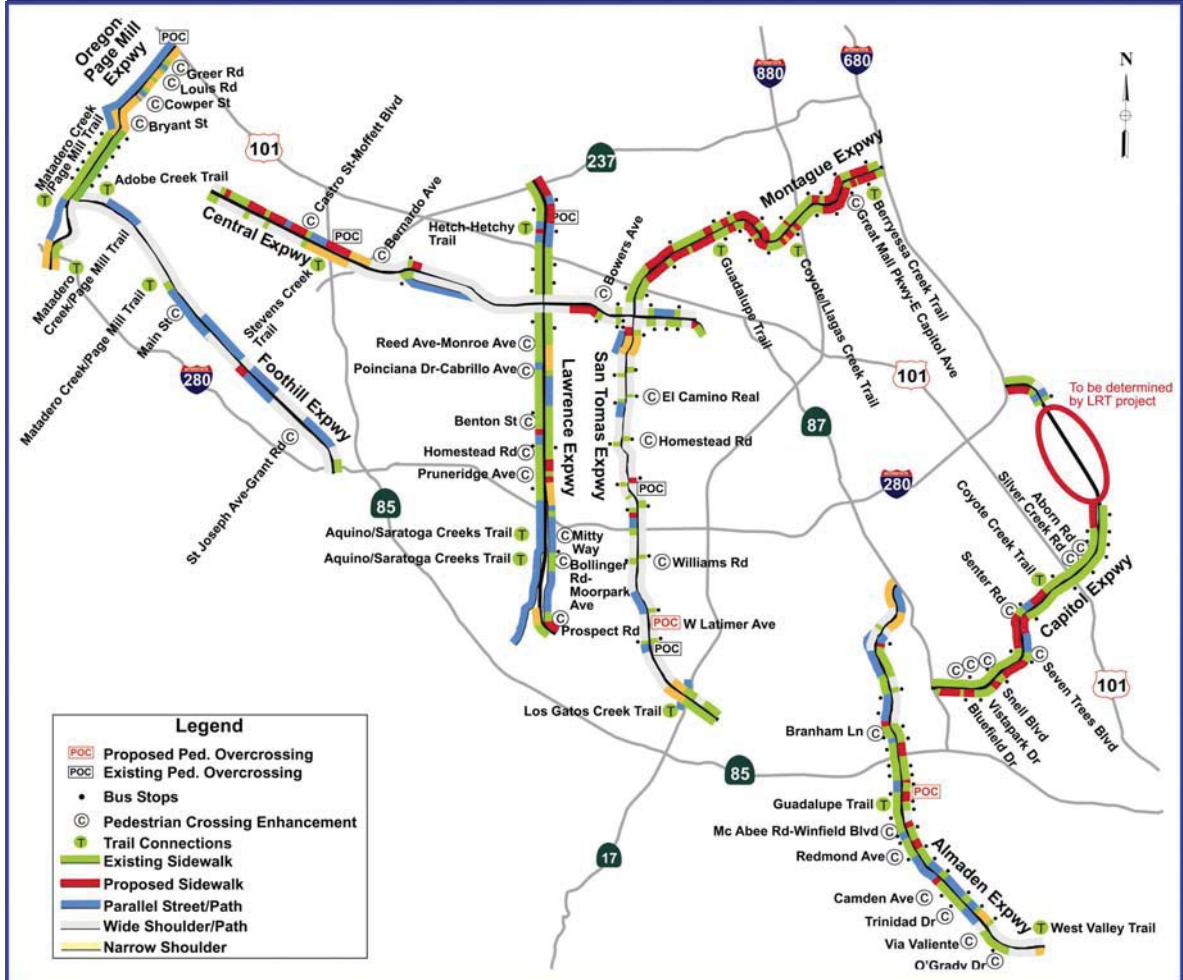
To help identify pedestrian needs and projects, an inventory of existing pedestrian facilities and conditions along each expressway was developed. The inventory included existing sidewalks, shoulder widths, informal paths, frontage roads, parallel creek trails, surrounding land uses, and locations of bus stops, schools, and other destination points. With the help of the inventory, a pedestrian facilities plan was developed covering the length of each expressway. Pedestrian treatments varied along sections of the expressways based on physical conditions, pedestrian needs, fronting land uses, and community development plans. Figure 7-1 illustrates the pedestrian plan for each expressway with the following pedestrian provisions and recommended improvements for pedestrian travel along the expressways.

Sidewalks – Existing sidewalk locations and proposed new sidewalks are shown. New sidewalks are recommended to close gaps, access transit stops, and provide access to land uses fronting on the expressway.

Table 7-1 provides a list of new sidewalk projects totaling \$6.6 million. Approximately \$1.4 million of this need can be met as part of roadway capacity/operational improvements. The remaining \$5.2 million in sidewalk improvements will have to be pursued as independent projects. The new sidewalk locations for Montague Expressway are not listed on Table 7-1 because they are already included in the 8-lane widening project, which is currently partially funded.

Some of these sidewalks may not be deliverable. A final determination will need to be made in context of the overall finishing treatments for the expressway. As discussed in the Finishing Program Element, when right-of-way is limited, some tradeoff decisions may be needed about sidewalks, sound walls, and landscaping for each project location as funds become available.

Figure 7-1: Pedestrian Improvements



Parallel Street or Path – Where convenient parallel streets or paths (e.g., frontage roads and creek trails) are available, they are shown as the preferred pedestrian route along the expressway. In some cases, a sidewalk is provided to access a bus stop on the expressway, but the parallel facility is shown for through travel.

Improvements to parallel streets and trails are not listed as part of the expressway program since they are outside the expressways’ right-of-way and under other agencies’ jurisdiction. The list of expressway sidewalk improvements does include improving connections to parallel facilities. In addition, approximately \$0.2 million for expressway signage directing pedestrians to the parallel paths is included in the expressway pedestrian program.

Table 7-1: New Sidewalks

Expressway	Location	Project Need	Cost (millions)	Potential Implementation ⁽¹⁾
Almaden	NW quadrant at Camden	Gap closure	\$0.08	Tier 1C roadway project
	NE of Redmond	Gap closure	\$0.15	
	NE of McAbee	Gap closure	\$0.08	
	NE of Coleman	Gap closure	\$0.23	Tier 1A roadway project
	NE of Via Monte	Gap closure	\$0.15	Tier 1A roadway project
	SE of Cherry	Gap closure	\$0.16	
	NW of Branham	Connect to parallel path	\$0.06	
	NE of Koch	Connect to parallel path	\$0.04	
Capitol	Vista Park to SR 87, south side	Gap closure	\$0.41	
	SW of Snell to SE of Monterey	Gap closure	\$0.41	
	Seven Trees to Senter, west side & SE of Senter	Gap closure & connect to parallel path	\$0.63	
	NE of Senter to NW of McLaughlin along Coyote Creek Park, north side	Connect to parallel path	\$0.21	
	SW of Quimby	Gap closure	\$0.41	
	Capitol Ave to I-680, west side	Connect to parallel path	\$0.36	Tier 1C roadway project
Central	NW of Mayfield	Gap closure	\$0.05	
	Moffett to Rengstorff, north side	Gap closure	\$0.90	
	Whisman to NW of SR 85, north side	Neighborhood circulation	\$0.41	
	NE of Mary	Connection to bus stop and businesses	\$0.05	
	Bowers to Oakmead, south side	Business access	\$0.41	Tier 1A roadway project
	SW quadrant at De La Cruz	Gap closure	\$0.05	
Foothill	SW of Magdalena with connection to Boulder frontage road	Connect to parallel path	\$0.05	

Table 7-1: New Sidewalks (continued)

Expressway	Location	Project Need	Cost (millions)	Potential Implementation ⁽¹⁾
Lawrence	Saratoga to Prospect, east side	Gap closure	\$0.18	Tier 1A roadway project
	SE of Pruneridge	Connection to parallel path	\$0.03	
	North of Pruneridge, east side	Gap closure	\$0.18	
	SW of Benton	Gap closure	\$0.03	Tier 1C roadway project
	NW of Lakehaven	Connection between parallel paths	\$0.14	
	North of Palamos to Tasman, east side	Connection between parallel paths, bus stop connection	\$0.25	
	North of Elko to Caribbean, east side	Neighborhood circulation	NA ⁽²⁾	
San Tomas	SW of Stevens Creek	Gap closure	\$0.38	
	NE quadrant at Pruneridge	Bus stop connection	\$0.03	
	NW quadrant at Walsh	Bus stop connection	\$0.08	
Total Tier 1A			\$0.97	
Total Tier 1C			\$0.47	
Total Sidewalk Only			\$5.16	
Grand Total			\$6.60	

Notes:

New sidewalks for Montague Expressway are included in the 8-lane widening Baseline project.

- 1) Identifies which sidewalk installations are included in roadway project costs in the Capacity/Operational Improvement Element.
- 2) This sidewalk will require widening of the overpass at SR 237. An estimated cost is not available but could be \$5 to \$10 million. It should be noted that sidewalks are provided north of Elko along the west side over the overpass through to Caribbean Drive.

Additional funding will be needed for maintenance of the signs and is accounted for in the Maintenance and Operations Element.

During the community outreach process, there was one request to provide a new parallel facility: residents near San Tomas Expressway in San Jose have requested that the open creek culvert along the west side of San Tomas (from north of Hamilton Avenue to Moorpark Avenue) be covered, landscaped, and made into a parkstrip walkway. Implementation of this request does not conflict with any of the expressway plans and the County would support efforts by the city, water district, and trails program to create the parkstrip walkway.

Wide Shoulder or Path within Expressway Right-of-Way -- In locations where there are no sidewalks or parallel facilities and there is no major demand for pedestrian travel, these shoulder/path facilities can serve as emergency walkways and for occasional pedestrian use. No projects are recommended for these locations; however, landscaping needs to be kept trimmed back at intersection areas and along the travel way so pedestrians do not have to enter the travel lane. Landscaping maintenance costs are included in the Maintenance and Operations Element.

Narrow Shoulder -- These areas represent gaps in the pedestrian plan for each expressway. There is no sidewalk or parallel facility and the shoulder area is narrow. In many cases, there is a pedestrian facility on the other side of the expressway and, in some cases, a more distant parallel facility is indicated. Typically, these areas represent no or low demand for pedestrian travel. No specific improvements are recommended for these “gap” locations since there is generally no immediately apparent cost-effective solution. However, the locations are noted on the map so that shoulder widening and/or adding a pedestrian facility can be pursued if an opportunity arises (e.g., future roadway improvement or new development).



Pedestrian Prohibition

Pedestrians are currently prohibited along some sections of the expressways. Pedestrian prohibitions along expressways are a function of and enforceable through city police powers and, therefore, are established by city ordinances. When the County Board of Supervisors adopted the 1991 Bicycle and Pedestrian Policy, one of the policy statements was to encourage cities to repeal pedestrian prohibition ordinances, except where safe access is

impeded by obstacles that create an unsafe environment. Upon approval of the Expressway Study *Implementation Plan*, County staff will assist the cities with reviewing existing ordinances and revising them as appropriate to be legally enforceable, to reflect existing conditions, and to meet city objectives.

Expressway Pedestrian Crossings

A key pedestrian issue for all expressways is facilitating safe pedestrian crossings, especially at high demand locations near schools, community centers, transit facilities, and trail connections. A total of 45 high demand pedestrian crossing locations have been identified through city and community comments as well as field observations (see Figure 7-1 and Table 7-2). These crossings are recommended to receive “crossing enhancement” improvements.

Types of Improvements

There is a wide variety of crossing enhancement improvements that could be applied to an intersection to make it more pedestrian friendly. Much is dependent upon existing conditions at the site. Crossing enhancement concepts include:

- ❖ Eliminate free right turns at non-signalized entrances/exits by adding “Stop” or “Yield to Pedestrian” signs.
- ❖ Eliminate free right turns at signalized intersections by modifying the signals and/or curb line so the right turns must stop at the signal, including removing pork chops where appropriate.
- ❖ Use signals or yield signs at interchange areas to support pedestrian crossings at ramp locations.
- ❖ Add pedestrian bulb-outs to shorten crossing distances.
- ❖ Use electronic signs with flashers to highlight the presence of pedestrians for motorists.
- ❖ Set pedestrian signal timing to allow enough time for crossing the full width of the expressways, especially near senior housing, senior services, or elementary schools.

Table 7-2: Pedestrian Crossing Enhancement Locations

Expressway	Intersection	Access Needed	Potential Implementation ⁽¹⁾
Almaden	O'Grady/Almaden	Trail; Bus stops; Commercial	Tier 1C roadway project
	Via Valiente	School; Commercial	Tier 2 roadway project
	Trinidad	Bus stops	Tier 2 roadway project
	Camden	School	
	Redmond	Bus stops; Commercial	
	McAbee/Winfield	Bus stops; Commercial	
	Branham	Bus stops; Commercial	Tier 2 roadway project
Capitol	Bluefield	Bus stops	
	Vista Park	Bus stops; Commercial	
	Snell	Bus stops; Commercial	
	Seven Trees	Bus stops; Commercial	
	Senter	School	Tier 1C roadway project
	Silver Creek	Bus stops; Commercial	Tier 1B roadway project
	Aborn	Bus stops; Commercial	Tier 1C roadway project
Central	Castro	Downtown; Transit Center	
	Bernardo	Commercial	
	Mary	Neighborhood circulation; Commercial	Tier 2 roadway project
	Bowers	Commercial	Tier 1A roadway project
Foothill	Main/Burke	Downtown; Park	
	El Monte	School	Funded by Measure B Sales Tax Program
	Magdalena/Springer	School; Commercial	Funded by Safe Routes to Schools Program
	St Joseph/Grant	School	
	Vineyard/Homestead	School; Commercial	Funded by Measure B Sales Tax Program

Table 7-2: Pedestrian Crossing Enhancement Locations (continued)

Expressway	Intersection	Access Needed	Potential Implementation ⁽¹⁾
Lawrence	Prospect	School; Trail	Tier 1C roadway project
	Moorpark	School; Trail	Tier 1A roadway project
	Mitty	School; Trail	Tier 1A roadway project
	Pruneridge	Bus stops; Commercial	
	Homestead	Commercial	Tier 1C roadway project
	Benton	Commercial	Tier 1C roadway project
	Cabrillo	Schools (3); Commercial	
	Reed/Monroe	School; Commercial	Tier 1B roadway project
	Sandia/Lakehaven	Neighborhood circulation	
	Tasman	Light Rail Station	Tier 2 roadway project
Montague	North First	Light Rail Station	Tier 1A roadway project
	Great Mall	Transit Center	Tier 1A roadway project
Oregon-Page Mill	El Camino	Commercial	Tier 2 roadway project
	Bryant	Neighborhood circulation	Tier 1A roadway project
	Cowper	Neighborhood circulation	Tier 1A roadway project
	Middlefield	Neighborhood circulation	Tier 1A roadway project
	Louis	Neighborhood circulation	Tier 1A roadway project
	Greer	Neighborhood circulation	Tier 1A roadway project
San Tomas	Williams	School; Bus stops	Tier 1A roadway project
	Homestead	School; Bus stops	Tier 1A roadway project
	El Camino Real	Commercial	Tier 1A roadway project
	Cabrillo	School; Bus stops	

Notes:

Average cost per intersection is \$0.2 million

1) Several pedestrian crossing enhancement locations are part of roadway improvement projects.

- ❖ Install pedestrian countdown timers to inform pedestrians of the time remaining to cross the street.
- ❖ Install median signal push buttons where the median is wide enough to provide safe refuge for the pedestrian.
- ❖ Use high-visibility crosswalk striping.
- ❖ Install signs to advise pedestrians to keep a clear distance from the curb while waiting to cross.
- ❖ Install pedestrian ramps on the corners of the intersection.



The effectiveness of various types of crossing enhancements in improving pedestrian safety is continuously being studied and evaluated throughout the United States and other countries. Some of the concepts listed above are experimental in nature (e.g., electronic signs with flashers to notify motorists of pedestrian presence) and the effectiveness of others are being evaluated (e.g., high-visibility crosswalks and pedestrian countdown timers). The list of pedestrian crossing enhancement concepts will be updated as needed to reflect the latest studies and the most effective improvements.

The exact improvements for each intersection must be determined on a case-by-case basis. As funds become available, the intersections will be studied to determine which types of improvements and strategies are needed. City involvement and community outreach will be included in the decisions of types of improvements to make.

Improvement Costs

The costs for these improvements can range from less than \$0.05 million to \$0.3 million per intersection. The average cost is assumed to be \$0.2 million since many of the identified locations need the more expensive intersection reconfiguration treatments. With 42 intersections listed as unfunded for crossing enhancements, the total cost estimate would be \$8.4 million if all projects were pursued independent of roadway improvements. Twenty-seven of these intersections, however, are within the project limits of recommended capacity/operational roadway improvements, leaving 15 intersections (totaling \$3.0 million) to implement as stand-alone projects.

Generally, those intersections needing curb line reconstruction or relocation of signals should be done as part of roadway improvement projects, when possible. If the crossing improvement is funded in advance of the roadway project, the improvements made must be consistent with the final plans for the roadway.

There are also additional maintenance costs associated for the improvement concepts involving electronic signage and new signal equipment. Implementation of these projects can only occur if there is adequate funding for the ongoing maintenance and operations.

Pedestrian Overcrossing (POC) Structures

Pedestrian overcrossings (POCs) are typically recommended to facilitate mid-block crossings of the expressways where high demand exists and the nearest signalized intersection is too far away for convenient pedestrian use. New POCs cost approximately \$4 million each. Figure 7-1 indicates the locations of existing POCs and the following two recommended POCs:

- ❖ Almaden Expressway – near Coleman Road to connect trails and provide access to the Almaden light rail station.
- ❖ San Tomas Expressway – near Latimer Avenue in Campbell to connect various community facilities separated by the expressway.



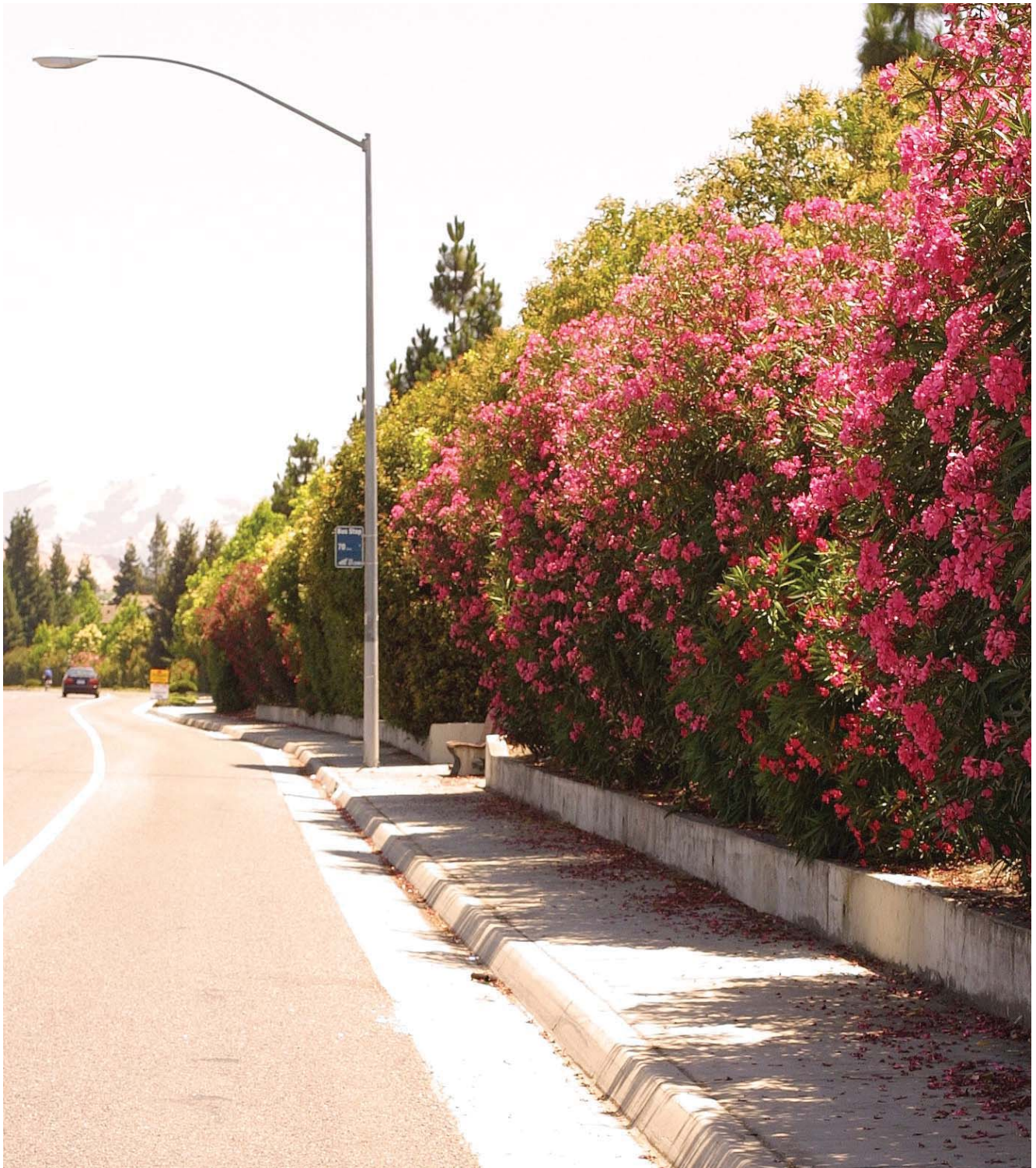
Cost Summary

The total cost for the recommended pedestrian improvements is \$23.2 million. Table 7-3 provides a summary of these costs by type of project. Table 7-4 indicates that approximately \$6.8 million is already included in roadway improvement project costs, leaving \$16.4 million in stand-alone pedestrian projects.

Improvement Category	Cost (millions)
New Sidewalks	\$6.60
Crossing Enhancements	\$8.40
Parallel Street/Path Signage	\$0.20
Pedestrian Overcrossings	\$8.00
Total	\$23.20

Roadway Project Tier	Cost (millions)
Tier 1A	\$3.57
Tier 1B	\$0.40
Tier 1C	\$2.27
Tier 2	\$0.60
Pedestrian Improvements Only	\$16.36
Total	\$23.20

At this time, the *Implementation Plan* does not prioritize the pedestrian improvements. As discussed in more detail in the Funding Strategy section, the most likely fund sources for pedestrian improvements are as part of roadway projects, developer conditions, and the Valley Transportation Plan (VTP) 2020 Livable Community and Pedestrian funding program. The roadway projects are already prioritized and will be implemented as funds become available. Developer conditions will happen by opportunity regardless of priority. As the Livable Community and Pedestrian grant program is developed, those projects that can compete successfully for funding will be pursued. Therefore, the Pedestrian Element identifies needs rather than priorities to take advantage of all funding opportunities.



SECTION EIGHT

FINISHING PROGRAM ELEMENT

The Finishing Program Element involves improvements to expressway medians and edges (i.e., back of curb to right-of-way line). These improvements include landscaping, sound walls, and sidewalks. Due to varying community preferences and restrictive right-of-way, and to avoid future conflicts or throw-away installations, it is important to plan for these improvements in the coordinated context of a finishing program. Included in this element are sound wall and landscaping needs. Sidewalk needs are listed in the Pedestrian Element. The element concludes with a list of finishing program implementation strategies.

Sound Walls

In compliance with environmental regulations, sound walls are provided to mitigate noise impacts along residential and other sensitive land uses when expressway capacity improvement projects are constructed. However, there are several areas along the expressways with no or inadequate sound walls. These expressways were built or expanded before current practices for noise mitigation were developed. Most of the first generation walls are 30 years old, are relatively low in height, and have become inadequate over time with increasing traffic volumes. In addition, many of the existing sound walls that are adequate for noise attenuation are reaching the end of their design life and will soon need replacement.

To assess sound wall needs along the expressways, an inventory and noise attainment survey was conducted to identify the following three conditions:

- ❖ Locations where a sound wall does not exist but is needed.
- ❖ Locations where existing sound walls are too low in height to provide an adequate level of noise abatement.
- ❖ Locations where existing sound walls are sufficient for noise mitigation purposes.

Sound walls are recommended for residential neighborhoods, schools, churches, and other noise-sensitive land uses. Sound walls are not provided in commercial and office areas.

Evaluation Criteria and Methodology

The assessment of sound wall needs was conducted according to the guidelines of Caltrans and the Federal Highway Administration (FHWA). These are guidelines that are in effect for any state or federally funded roadway improvement project that would increase roadway capacity or move the traveled ways closer to wayside residents. The assessment was based on predicted noise levels resulting from projected 2025 expressway traffic conditions.

The criteria used to determine new and higher sound wall needs were as follows:

- ❖ The criterion that would trigger the need for either a higher wall or a new wall where none presently exists is 65.5 decibels. This trigger helps determine the areas of highest priority and establish funding needs that may qualify for grant funds.
- ❖ The minimum height of a new sound wall is ten feet in keeping with the requirement that sound walls must block the lines of sight between heavy truck exhaust stacks and receptors on the ground.
- ❖ The maximum height used is approximately 16 feet. This is based on the Highway Design Manual, which limits sound wall heights to 5 meters (16.4 feet).
- ❖ Consistent with relatively new Caltrans practices, higher sound walls were indicated to abate noise levels for second and third floors of buildings if they would provide at least five decibels of attenuation for these receptors.

The methodology used to determine the sound wall need locations and requisite heights was consistent with the FHWA highway noise abatement regulations (as cited in 23 CRF 772). Distances of the wall alignments and receptors from the roadways were determined using aerial photographs. The sides of all eight expressways were videotaped to gather data about the relative elevations of the roadway, existing wall tops, and the receptors. This data, combined with the projected 2025 traffic conditions, allowed the noise consultant to compute the noise level of receptors along the expressways.

Recommended Sound Wall Improvements

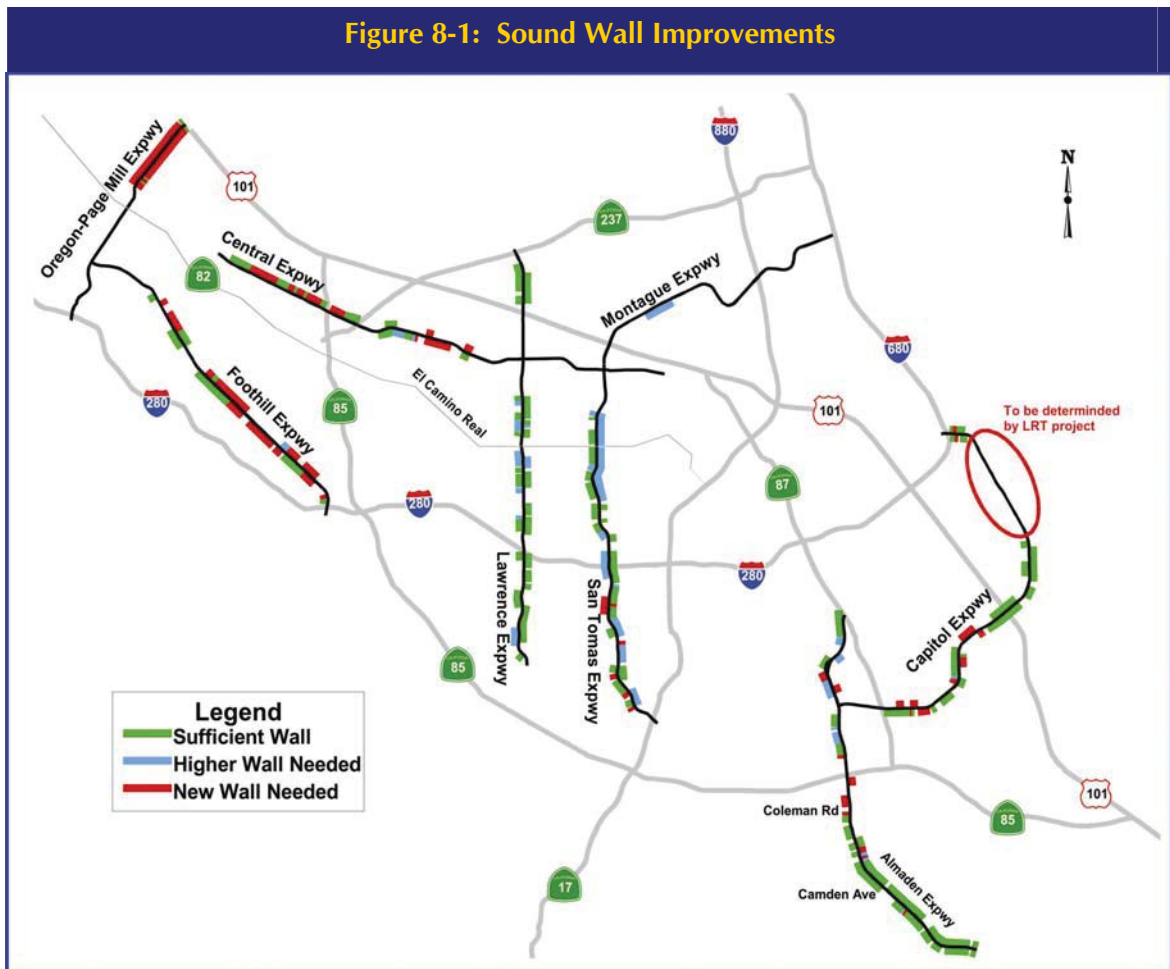
The initial results of the sound wall needs assessment were shared with city staff, policymakers, and the community. Some of the locations identified as potentially needing new sound walls were not supported due to conflicts with community preferences and plans. These locations were deleted from the new sound wall list.

The recommended sound wall improvements are illustrated in Figure 8-1 and summarized below:

- ❖ 63,500 linear feet of new walls are needed at various heights.
- ❖ 36,000 linear feet of existing walls need to be replaced with higher walls ranging from 10 to 16 feet.
- ❖ The remaining 150,000 linear feet of existing sound walls are sufficient to meet the noise level standard, but will require replacement as they reach the end of their design life.

The overall result of the sound wall recommendations is that all residential areas would have sound walls except in areas where they are in conflict with local preferences. There are some relatively newer sound walls along Lawrence Expressway that are shown as being too low. This is due to the application of the new second floor guidelines.

Figure 8-1: Sound Wall Improvements



Sound Wall Costs

The overall cost estimates for the sound wall recommendations add up to close to \$100 million. Approximately \$27 million is needed for new sound walls and \$21 million for higher replacement walls. Another \$50 million is needed to replace the noise-sufficient walls that become structurally and aesthetically insufficient as they reach the end of their design life.

Table 8-1 provides a breakdown of new and higher wall costs by expressway. The costs are provided by expressway segment for ease of comparison to roadway widening projects.

Table 8-1: Sound Wall Improvement Projects

Expressway	Project Description ⁽¹⁾	Cost (millions)		Potential Implementation ⁽²⁾
		New Wall	Higher Replacement Wall	
Almaden	From Almaden/O'Grady to south of Camden <ul style="list-style-type: none"> Higher replacement walls along east side between Winfield and Redmond, and new walls between the existing and replacement walls Higher replacement and new walls SE of Trinidad 	\$0.27	\$0.42	Tier 2 roadway project
	Between Coleman and SR 85 <ul style="list-style-type: none"> New walls NE of Foxchase and west side between Mesa and Coleman 	\$0.37	--	Tier 1A roadway project
	Between SR 85 and SR 87 <ul style="list-style-type: none"> New walls NE and SE of Koch and SW of Cherry Higher replacement walls SW of Koch and NW of Cherry 	\$1.91	\$2.63	
Capitol	Between SR 87 and US 101 <ul style="list-style-type: none"> New walls along NE and SE of Senter, SW of Seven Trees, NW and SE of Vista Park, gap closure on south side between Vista Park and Bluefield, and NW of Bluefield Higher replacement wall SE of Seven Trees 	\$3.26	\$0.20	
	New walls for gap closure between I-680 and Capitol Avenue.	\$0.28	--	

Table 8-1: Sound Wall Improvement Projects (continued)

Expressway	Project Description ⁽¹⁾	Cost (millions)		Potential Implementation ⁽²⁾
		New Wall	Higher Replacement Wall	
Central	From west of Rengstorff to SR 85 <ul style="list-style-type: none"> New walls along north side from Rengstorff to Shoreline, NW and NE of Moffett 	\$2.33	--	Tier 1A roadway project
	North side between SR 85 and Whisman	\$0.63	--	
	From Mary to Lawrence <ul style="list-style-type: none"> New walls SE of Pastoria, NE of Mathilda, and south side between Mathilda and Fair Oaks Higher replacement wall along south side between Mary and Potrero, and SW of Pastoria 	\$1.38	\$0.76	
Foothill	Spot improvements along the expressway <ul style="list-style-type: none"> New walls on north side near Arroyo and adjacent to residences along Blue Oak, NW of El Monte, north side between El Monte and Springer, south side west of Springer and between Springer and east of Loyola, north side west and east of Grant, and south side between St. Joseph and Vineyard Higher replacement wall NE of Loyola/Fremont 	\$8.39	\$0.45	
Lawrence	Between I-280 and Central <ul style="list-style-type: none"> Higher replacement walls on west side near Dahlia, SW of Poinciana, east side near St. Lawrence, NW of Granada, both sides between Granada and Benton, NW of Homestead and SW of Pruneridge 	--	\$2.63	
	Higher replacement wall NW of Prospect	--	\$0.96	
Montague	Higher replacement wall on south side from west to east of De La Cruz adjacent to the mobile home park	--	\$2.06	Tier 1A roadway project

Table 8-1: Sound Wall Improvement Projects (continued)

Expressway	Project Description ⁽¹⁾	Cost (millions)		Potential Implementation ⁽²⁾
		New Wall	Higher Replacement Wall	
Oregon-Page Mill	New walls on both sides between US 101 and Alma ⁽³⁾	\$5.70	--	
San Tomas	Between SR 17 and Williams <ul style="list-style-type: none"> New walls along west side and gap closure on east side between Williams and Payne, SE of Hamilton, west side near Bucknall, SW of Budd, and NW of Winchester ramp Higher replacement walls along east side from south of Hamilton to north of Campbell and from Budd to Winchester 	\$2.25	\$3.31	
	Between Williams and El Camino Real <ul style="list-style-type: none"> Higher replacement walls east side from El Camino Real to Forbes, SW of Benton, SW of Saratoga, west side adjacent to Greenlee residences north of I-280 and Larkmead residences south of I-280, and east side gap closure north of Williams 	--	\$5.39	Tier 1A roadway project
	Between El Camino Real and Central <ul style="list-style-type: none"> Higher replacement walls along NW and NE of Cabrillo, and east side from Cabrillo to El Camino Real 	--	\$2.14	
Total Tier 1A:		\$1.75	\$8.21	
Total Tier 2:		\$0.27	\$0.42	
Total Sound Wall Only:		\$24.75	\$12.31	
Grand Total		\$26.77	\$20.94	

Notes:

- 1) Sound wall needs are divided into expressway segments for ease of comparison to roadway widening projects. Each segment can be divided into several separate sound wall projects since the sound wall needs are not continuous along the length of each segment.
- 2) Roadway project costs in the Capacity/Operational Element included these new or higher sound wall installations. Only roadway widening projects are used because they include significant segments of new and higher sound walls. The intersection roadway projects (i.e., interchanges and at-grade improvements) also include appropriate sound walls, but they are spot improvements that will not meet a significant portion of systemwide sound wall needs.
- 3) The new walls on Oregon-Page Mill are listed to document the need for sound mitigation measures. The local community and city have indicated that other sound mitigation measures may be preferred in place of sound walls.



Within each expressway segment, the sound wall needs can be divided into several separate sound wall projects since the needs are not continuous.

The \$50 million needed to replace existing sound walls as they reach the end of their design life is included in the Maintenance and Operations Element as Sound Wall Infrastructure Replacement. Over the 30-year period covered by this plan, the average annual need is \$1.7 million. The Maintenance and Operations Element also includes \$0.2 million per year for sound wall maintenance, mostly for removing graffiti.

Sound Wall Implementation

The sound wall assessment process was useful for dividing the sound wall needs into separate categories. These categories illustrate the areas of highest need in terms of noise abatement. They also provide a list of sound wall projects that may be eligible for grant funding versus projects that will have to depend on maintenance and operating funds.

This assessment of sound wall needs, including potential heights, is strictly for planning purposes. The determination of the actual height of each sound wall will be a balance between the amount of noise abatement, impacts created by the sound wall, and general community acceptance. These decisions will have to be made on a case-by-case basis when the sound walls are designed.

Specific implementation strategies for sound walls include the following:

- ❖ When funding is available to build new sound walls or replace existing sound walls, the preferred level of noise abatement and sound wall height for each location will be based on noise analysis, community outreach, and city coordination. Where appropriate, other implementation criteria typically used by Caltrans and FHWA will also be taken into account, such as cost-effectiveness analysis and the design standard to provide at least five decibels of improvement. Should the final design and costs exceed the state standard or funding amount available, cost-sharing agreements may be needed for full implementation. Should the results of community outreach and city coordination indicate a lack of support for sound walls, the sound wall project will not be pursued.

- ❖ Noise-sufficient sound walls due for infrastructure replacement that are located within roadway widening project limits should be replaced as part of the roadway project if funding is available. Completing all construction at once may lead to cost efficiencies and prevents residents from having to endure two separate construction projects.
- ❖ Other noise abatement strategies can be considered when determining the need and height of sound walls; however, their application will likely be quite limited. These strategies and their constraints are described below:
 - Pavement treatments – The special pavement surfaces primarily consist of “open graded” or rubberized asphalt concrete (RAC). The treatments provide limited benefits (e.g., 3 or 4 decibels when the pavement is new and less when older), and should only be used when material durability has been proven dependable.
 - Trees or other landscaping – A 100-foot deep row of trees and shrubs with dense foliage is required to provide noise reduction approaching that of sound walls. Application of this treatment is limited by available right-of-way. Expressway frontages are typically not wide enough to accommodate landscaping of sufficient depth.
 - Earth mounding – Use of earth mounds is limited by available right-of-way. Typical expressway frontages are not wide enough to accommodate mounding of sufficient height.
 - Operational control – This strategy includes reduction of speed limits, heavy-truck use restrictions, and land use restrictions. Use of these strategies could diminish the effectiveness of the expressways in meeting transportation needs.
 - Sound insulation of structures – This would involve installing acoustically qualified windows and doors for houses adjacent to the expressways. This strategy is fraught with implementation challenges and is generally pursued on a more limited rather than area-wide basis.

Sound wall projects are not prioritized beyond categorizing them as new and higher replacement walls. As discussed in more detail in the Funding Strategy section, the most likely fund sources for sound wall improvements are as part of roadway projects, developer conditions, and the Valley Transportation Plan (VTP) 2020 Sound Wall funding program.

The roadway projects are already prioritized and will be implemented as funds become available. Developer conditions will happen by opportunity regardless of priority. As the VTP 2020 Sound Wall grant program is developed, those projects that can compete successfully for funding will be pursued. Therefore, the Finishing Program Element identifies sound wall needs rather than priorities to take advantage of all funding opportunities.

Landscaping

Landscaping is a critical finishing aesthetic element for the expressways, affecting both the medians and roadway edges. The appearance of the expressways should contribute positively to the community and attractive landscaping is an integral part of the expressway appearance. Unfortunately, due to a lack of revenue to properly maintain landscaping, most expressways have little or no landscaping.

The expressways with more extensive landscaping are under maintenance agreements, where the cities or private developers are paying for landscape maintenance. These expressways include:

- ❖ Capitol Expressway between Silver Creek and Aborn (city maintenance agreement)
- ❖ Central Expressway in Mountain View (city maintenance agreement)
- ❖ Foothill Expressway – some sections in Los Altos and Palo Alto (city maintenance agreements)
- ❖ Montague Expressway – various sections (private developer agreements)
- ❖ Oregon Expressway in Palo Alto (city maintenance agreement)

Recent land development approvals along San Tomas and Capitol Expressways have made developers responsible for median landscaping. Montague Expressway through San Jose has benefited from assessment district contributions for both landscaping improvements and maintenance.

Expressway Master Landscape Plan

In June 2000, the Board of Supervisors adopted the *County of Santa Clara Expressway Master Landscape Plan*. The Master Landscape Plan included the following items:

- ❖ Evaluation and inventory of current landscaping and irrigation conditions
- ❖ Identification of four “levels” of landscaping, along with capital and maintenance costs associated with each level of landscaping
- ❖ Requirements and design guidelines for new plantings
- ❖ Discussion of funding sources and strategies
- ❖ An Action Plan to address landscaping needs, implemented by an Interim Policy and Long Term Plan



The Action Plan’s Interim Policy was based on the principle that new landscaping should only be installed if it can be properly maintained. The Interim Policy, which remains in effect today, includes the following statements:

- ❖ New landscape improvements shall not be installed unless full recovery of capital and maintenance costs can occur. New landscaping is dependent upon support systems that provide supplemental water, periodic fertilization, and the elimination of competing materials; therefore, assurance that maintenance costs will be covered is fundamental to the initial success of any landscape installation.
- ❖ The County shall cooperate fully with public agencies and private entities seeking to make landscaping improvements to the expressway system.

The Long Term Plan called for the County to seek regional funds for an Expressway Finishing Program and to work with Santa Clara Valley Transportation Authority (VTA) to develop a funding program to provide for final build-out and operational support of the expressway system. This action item eventually led to the development of the Expressway Study *Implementation Plan*.

Needs Assessment and Estimated Cost

The *Master Landscape Plan* stated that landscape improvements should establish at least a Type C level of landscaping throughout the expressway system. The Type C level includes trees and limited shrubs, with some ground cover and limited irrigation. The needs assessment and cost estimates provided in the *Master Landscape Plan* were based on this level of landscaping.

During the Expressway Study's review of landscaping needs, feedback from the cities was that the Type C level was not adequate. It needed to be enhanced with a few features from the Type B level to create an acceptable standard of landscaping. Therefore, the recommended level of landscaping is as follows:

- ❖ Trees and limited shrubs
- ❖ Median finishes, such as decomposed granite
- ❖ Sound walls covered with vines
- ❖ Automated irrigation system

A revised needs assessment based on this enhanced level of landscaping concludes that all expressways, except those sections under maintenance agreements, need new or upgraded landscaping. The installation cost systemwide is estimated to be \$19-23 million. The range takes into account that some landscaping installation costs can be met as part of roadway improvement projects. Although the installation costs are significant, there are a variety of sources, including grants, developer exactions, and neighborhood "plant-ins," to provide these one-time funds.

The more challenging obstacle has proven to be funding the annual maintenance. The estimated cost to fully maintain the landscaping for the whole system, including maintenance agreement areas, is \$3.5 million annually. This estimate includes weed control, litter pick-up, and fence repair. There are no grant sources currently available to provide for these costs.

Another critical maintenance need is replacing plants that reach the end of their natural life span. This need is already acute along existing finished landscape areas. For example, trees

are periodically removed due to damage or death by frost, drought or disease, as well as structural and safety issues. Currently, trees removed by County staff are not replaced due to lack of resources. Replacement plantings require more maintenance attention than mature, established plantings. The estimated annual cost for replacement plantings, including maintenance, is \$0.5 million.

The Maintenance and Operations Element includes a total of \$4.0 million per year to cover all landscape maintenance needs.

Street Lighting

Street lighting is not provided along the expressways. Since the expressways do not experience a high demand for pedestrian travel, there has not been a need for lighting. In addition, the utility and maintenance costs of street lighting are high and beyond the means of the expressway system's operating budget. During the Expressway Study, there were no requests from local communities for lighting and one community specifically requested that the expressway not be lit because it would disturb the surrounding homes.

Street lighting along Capitol Expressway may be added as part of VTA's light rail project in anticipation that pedestrian traffic will increase substantially along the expressway. It is expected that VTA or the City of San Jose will be responsible for the utility and maintenance costs of the lighting.

Finishing Program Implementation Strategies

As mentioned in the introduction to the Finishing Program Element, finishing plans must integrate sound wall, landscaping, and sidewalk needs. Where right-of-way is limited, some tradeoff decisions have to be made. This comprehensive approach is used during the design and construction of roadway projects. But timing and tradeoffs also need to be considered when projects are pursued independent of roadway improvements.

Some specific implementation issues and strategies include:

- ❖ Installation of sidewalks and sound walls usually disturbs and/or displaces existing landscaping. One opportunity to add new sidewalks and sound walls is when mature plantings need replacement. This way all the elements can be integrated into the new design.
- ❖ Adding landscape improvements without consideration of pedestrians potentially forces pedestrians to walk on the pavement closer to traffic. Where landscaping uses all the area behind the curb, plans need to ensure good parallel pedestrian routes are available with improved connections.
- ❖ Growing vines on sound walls can reduce graffiti abatement costs and softens the aesthetic appearance of the sound walls. The tradeoff, however, is increased landscape maintenance costs.
- ❖ While much of the expressway frontage properties are developed, finishing improvements and maintenance continue to be implemented through development conditions on a limited scale. If expanded to apply consistently to all developments, including those not fronting but perhaps within some defined mitigation or assessment area, the practice could achieve more than the currently limited effort. The cities and County should collaborate to complete the finishing plans for each expressway and condition projects for improvements during the city's development approval process.
- ❖ One of the key limitations to providing wide, offset sidewalks and extensive landscaping is the lack of right-of-way. There are generally more opportunities for implementing expressway finishing plans in industrial/commercial areas than in residential areas. Industrial/commercial areas tend to redevelop regularly allowing the cities to condition the developments for additional right-of-way or easements for

the pedestrian facility and landscaping improvements. In residential areas, the right-of-way is more limited, individual parcels are smaller, and reconstruction of large enough areas for continuous sidewalks and landscaping is less frequent.

- ❖ It is expected that expressways will qualify for the VTP 2020 sound wall program, although the assigned fund source does not allow projects off the state system. The assumption is expressway projects will be accommodated through fund exchanges. A potential topic for consideration in VTP 2030 is whether the sound wall category can be increased to respond to identified expressway needs. Also to be determined is if, consistent with the above discussion, qualifying project costs can include other finishing elements.





SECTION NINE

MAINTENANCE & OPERATIONS ELEMENT

The Maintenance and Operations Element includes all activities and materials necessary to keep the expressways functioning safely and efficiently while looking presentable. There are a wide variety of activities involved including signal operations, sweeping, pavement maintenance, landscaping maintenance, enforcement, and aging infrastructure replacement. The key feature these activities have in common is that their costs are recurring rather than a one-time capital outlay.

Based on comments received from the public, cities, and policy makers, the overall goal for maintenance and operations of the expressway system can be summed up as follows:

*“The expressways should be cleaner and greener
with smooth pavement and synchronized signals.”*



Current Practices

Table 9-1 provides a list of categories for maintenance and operations activities along with a description of the County's current practices. The County's current practices are determined by available funding and cannot be enhanced until additional revenue is secured. In the meantime, the County must first apply its limited revenue to safety and key operating areas, such as operating signals, repairing traffic control/safety devices, repairing potholes, and maintaining drainage systems. Aesthetic treatments, such as landscaping maintenance, receive a lower priority and are more dependent on revenue availability.

Recommended Levels of Effort

To develop a recommended level of effort for the expressway system, a survey of the cities' current practices for roadway maintenance and operations was conducted. This survey was useful in placing practical limits on what is desirable. The recommended levels of effort described in Table 9-1 reflect a medium to high-end level compared to the cities' current practices.

The total annual cost to provide the proposed maintenance and operations levels of effort is \$18.0 million. A breakdown of the costs is provided in Table 9-2. For some categories, such as signal operations, sweeping, and landscaping maintenance, the costs are incurred annually. For infrastructure replacement and pavement maintenance, the costs are incurred at various intervals. For these categories, the total cost over the *Implementation Plan's* 30-year planning period was calculated and then divided by 30 for an average annual cost.

The opportunities for increasing operating revenue to meet the \$18.0 million in needs are discussed in the Funding Strategy section.

Table 9-1: Maintenance and Operations Levels of Effort

Category	County's Current Practice	Proposed Level of Effort
Signal Operations	Optimize signal timing per request/complaint as funds allow	As described in the Signals /TOS Element: Develop and optimize variable timing plans for different times of the day and days of the week for all expressways annually Maintain newly installed Traffic Operations System (TOS)
Sweeping	Once per month	Twice per month plus on-call response
Landscaping Maintenance	Maintain landscaping and control weeds along expressways with none to minimum landscaping Expressways with more extensive landscaping have maintenance agreements with cities or private developers No replacement or new plantings Fence repair and trash pick-up as funds allow	Maintain landscaping and irrigation systems Replacement plantings as needed Control weeds Clean up litter Repair fences as needed
Pavement Maintenance	Patch potholes as encountered	Continue to patch potholes as encountered Resurface on 15-20 year cycle (60 Pavement Condition Index (PCI)) Preventive maintenance/rehabilitation to extend life of pavement (70-80 PCI) Use more expensive products like Rubberized Asphalt Concrete (RAC) with longer life cycle where cost-effective
Pavement Reconstruction (part of infrastructure replacement)	Implement pavement reconstruction as funds allow	Reconstruct/replace 10% of expressway pavement sections within the 30-year timeframe

Table 9-1: Maintenance and Operations Levels of Effort (continued)

Category	County's Current Practice	Proposed Level of Effort
Sound Wall Maintenance	Paint over graffiti in compliance with city requirements (1 – 2 weeks)	Respond to graffiti within 1 to 3 days of notification depending on type of graffiti
Sound Walls (as part of Infrastructure Replacement)	Repair sound walls where damaged by errant vehicles	Replace all existing noise sufficient sound walls (150,000 feet systemwide) based on a 30-40 year life cycle
Traffic Control/ Safety Devices Infrastructure Replacement (such as signal & lighting systems, guard rails, signs, delineators)	Fix immediately when safety-related items are broken or damaged; non-safety items deferred until resources are available	Implement preventive maintenance by replacing on scheduled routine before worn out Replace and upgrade materials to reflect latest technologies/ materials where cost-effective
Other Infrastructure Replacement (such as sidewalks, drainage, and other utility systems)	Repair as funds allow	Implement preventive maintenance by replacing on scheduled basis to prevent service interruption Replace with more expensive but longer service life materials where cost-effective
Facility, Equipment, and Fleet	Maintain, repair, and replace as funds allow	Implement routine maintenance Repair as needed Replace based on variable standard life cycles Upgrade to accommodate the proposed level of maintenance efforts listed above
Enforcement	Contract with the California Highway Patrol (CHP) for enforcement on San Tomas, Montague, and Lawrence Expressways ⁽¹⁾ Cities provide enforcement on all other expressways	Continue to contract with CHP to patrol San Tomas, Montague, and Lawrence Expressways; if feasible, add Central when HOV lanes are added Cities continue to provide enforcement on all other expressways

Note:

- 1) These expressways are patrolled by the CHP to enforce the high-occupancy vehicle (HOV) lanes. The CHP uses the fines collected from HOV lane violations to pay for most of the costs of enforcement.

Table 9-2: Maintenance and Operations Annual Costs	
Category	Annual Cost (millions)
Signal Operations	\$1.5
Sweeping	\$0.6
Landscaping Maintenance ⁽¹⁾	\$4.0
Pavement Maintenance	\$3.8
Pavement Reconstruction	\$1.4
Sound Wall Maintenance	\$0.2
Sound Wall Infrastructure Replacement	\$1.7
Traffic Control/Safety Devices Infrastructure Replacement	\$2.5
Other Infrastructure Replacement	\$1.0
Facility, Equipment, and Fleet	\$1.2
Enforcement ⁽²⁾	\$0.1
Total	\$18.0

Notes:

- 1) The annual cost for the landscaping category reflects the maintenance cost if all 8 expressways are brought up to the landscaping standard described in the Finishing Program Element. The capital costs for landscaping installation is not included here.
- 2) The \$0.1 million in annual enforcement costs is in addition to the \$0.3 million provided to the CHP from fines for HOV lane violations. If the CHP were to provide traffic enforcement for all 8 expressways, the annual cost would be \$3 million with the County and cities having to reimburse the state for the costs.



Source: *Joint Venture, 1999 Index of Silicon Valley*



SECTION TEN

FUNDING STRATEGY

The Expressway Study *Implementation Plan* has laid out a comprehensive program for the improvement and maintenance of the expressways over the next 30 years. The plan identifies a total capital program approaching \$2 billion as well as needs of \$18 million annually for maintenance and operations.

Funding such a program requires both aggressively pursuing existing revenue sources and finding new revenue sources. It is also advisable to be realistic about how much of the plan may actually be achievable during the 30-year timeframe given the competing interests for transportation dollars. To address this, the various needs are broken out by capital and maintenance/operations and into categories by type of project. In addition, the biggest category of capital projects (roadway capacity/operational improvements) has been broken into tiers to help the prioritization process.

This section summarizes the funding needs as identified in the plan; explains the existing level of funding available to the expressways along with other competing needs for roadway funds; and explores potential new revenue sources. The section concludes with a specific list of funding strategies to pursue.

Expressway Capital and Maintenance/Operations Needs

Total capital needs for the expressway system range from \$1.7 to 2.0 billion. Table 10-1 summarizes the capital program needs by element.

Table 10-2 provides local match requirements for each tier list and the entire capital program. The local match requirement is based on the 20% match policy included as part of Santa Clara Valley Transportation Authority’s (VTA) Valley Transportation Plan (VTP) 2020 Plan. The match requirement currently applies to all grant funds from federal, state, and regional sources that are allocated by VTA.

Total maintenance/operations needs are \$18 million annually, based mostly on existing facility requirements (pavement maintenance and signal operations) and to a lesser extent on build-out of the related portions of the capital program (i.e., Traffic Operations System (TOS) enhancements, landscaping). Table 10-3 summarizes the annual maintenance operations needs by category to provide the level of effort that matches the adjoining cities’ current policies.

Table 10-1: Capital Program Needs		
Element	Subtotal Cost (millions)	Total/Net Cost (millions)
<i>Capacity/Operational Improvement Element (including HOV & signal/TOS projects) ⁽¹⁾</i>		
Tier 1A Roadway Projects	\$149-151	
Tier 1B Roadway Projects	\$261-271	
Tier 1C Roadway Projects	\$49-53	
Tier 2 Roadway Projects	\$585-671	
Tier 3 Roadway Projects	\$593-795	
Total		\$1,637 – 1,941

Table 10-1: Capital Program Needs (continued)

Element	Subtotal Cost (millions)	Total/Net Cost (millions)
<i>Bicycle Element</i>		
Total	\$3.75	
Funded	(\$2.10)	
Tier 1A Roadway Projects ⁽¹⁾	(\$0.45)	
Tier 1B Roadway Projects ⁽¹⁾	(\$0.20)	
Net Needs		\$1.00
<i>Pedestrian Element</i>		
Total	\$23.20	
Tier 1A Roadway Projects ⁽¹⁾	(\$3.57)	
Tier 1B Roadway Projects ⁽¹⁾	(\$0.40)	
Tier 1C Roadway Projects ⁽¹⁾	(\$2.27)	
Tier 2 Roadway Projects ⁽¹⁾	(\$0.60)	
Net Needs		\$16.36
<i>Finishing Program Element: New and Higher Sound Walls ⁽²⁾</i>		
Total	\$47.71	
Tier 1A Roadway Projects ⁽¹⁾	(\$9.96)	
Tier 2 Roadway Projects ⁽¹⁾	(\$0.69)	
Net Needs		\$37.06
<i>Finishing Program Element: Landscaping Installation ⁽³⁾</i>		
Net Needs		\$19-23
Grand Total		\$1,710-2,018

Notes:

- 1) The capacity/operational roadway project cost estimates include appropriate bicycle, pedestrian, and sound wall improvements within each project's limits. In order to avoid double counting these needs in the "Grand Total," the amount included in roadway projects is deducted from each element's total needs.
- 2) Infrastructure replacement of aging, noise-sufficient sound walls is included in the Maintenance/Operations cost summary.
- 3) The level of landscaping recommended in the plan is not included in the capacity/operational roadway projects' scope of work due to lack of ongoing maintenance funding. If landscape maintenance funds can be secured, then some portion of the \$19-23 million in landscape installation costs may be funded within roadway project budgets. Environmental mitigation requirements also may require project replacement plantings, but lacking increased maintenance funding, agreements with local cities or private partnerships will be needed to ensure planting survival.

Table 10-2: Capital Program Local Match Requirements ⁽¹⁾		
Description	Total Match (millions)	Annualized Cost (millions)
Tier 1A Roadway Projects	\$29.8-30.1	\$1.0
Tier 1B Roadway Projects	\$52.2-54.2	\$1.7-1.8
Tier 1C Roadway Projects	\$9.8-10.6	\$0.3-0.4
Tier 2 Roadway Projects	\$117.0-134.2	\$3.9-4.5
Tier 3 Roadway Projects	\$118.6-159.0	\$4.0-5.3
Bicycle, Pedestrian, Sound Wall, and Landscaping	\$14.7-15.5	\$0.5
Total Capital Program	\$342.1-403.6	\$11.4-13.5

Note:

- 1) Calculated based on the VTA VTP 2020's 20% local match requirement for receiving federal and state capital program funds. Annualized cost assumes a 30-year capital program implementation period.

Table 10-3: Maintenance and Operations Needs	
Category	Annual Cost (millions)
Signal Operations/TOS	\$1.5
Sweeping	\$0.6
Landscaping Maintenance	\$4.0
Pavement Maintenance	\$3.8
Infrastructure Replacement (all types)	\$6.6
All Other	\$1.5
Total	\$18.0

Existing and Potential Funding Sources

Existing funding sources for the expressway system are monies already allocated to the expressways. This includes designated capital improvement dollars and maintenance/operations revenue.

There are also established funding sources for which the expressways may be eligible, but would have to compete with other roadways for the funds. These are called “potential” funding sources because it is unknown how much of this money will be available for the expressways. Described below are the existing and potential funding sources for the capital program, local match, and maintenance/operations needs.

Capital Program – Existing Funding Sources

Measure B – The most significant source of current funding for capital improvements on the expressways is the Measure B Sales Tax Program. Measure B, the general fund 1/2-cent sales tax passed by County voters in 1996, will raise approximately \$1.3 billion in revenue over the nine-year life of the tax. The Board of Supervisors has authorized the sales tax monies for many categories of transportation improvements including major highway and transit projects. All Measure B revenue has been allocated.

Measure B expressway capital projects have included \$11.2 million for level of service (LOS) intersection improvements (e.g., at San Tomas Expressway/Campbell Avenue) and \$24.5 million to upgrade to the Traffic Operations Center and to install fiber optic cable and closed-circuit TV cameras to improve the efficiency of the signals system. The Measure B expressway capital projects have been listed as funded in the Expressway Study *Implementation Plan*.

VTP 2020 – VTA’s VTP 2020 Plan was adopted in 2000. VTP 2020 estimates that approximately \$2 billion in flexible revenue from the State Transportation Improvement Program (STIP) and federal Surface Transportation Program/Congestion Mitigation Air Quality (STP/CMAQ) programs will be available for Santa Clara County through the year 2036. VTP 2020 also allocates this money to various transportation projects and programs. Listed below are VTP 2020 funds specifically allocated to expressway projects:

- ❖ *Expressway Program* – \$80 million in 2006-2036 STIP funds for specific capital projects on Montague and Central (\$40 million each). When VTP 2020 was developed, there was no comprehensive list of expressway projects and needs; therefore, only projects that had been identified in other plans and studies were incorporated. The Expressway Study *Implementation Plan* has now developed a list of projects with priorities. In addition, the Central Expressway project identified in VTP 2020 has been re-scoped (e.g., replacing the proposed Central HOV lane through Sunnyvale with a safety improvement project in the same right-of-way) changing cost estimates. The *Implementation Plan* assumes the \$80 million will be available to the Tier 1A list of roadway projects.
- ❖ *Freeway Program* – \$35 million in 2006-2036 STIP funds for two freeway/expressway interchange areas: Montague Expressway/San Tomas Expressway/US 101/Mission College Boulevard (\$10 million) and Lawrence Expressway/I-280 (\$25 million). The Montague/San Tomas/101 project is a Tier 1B roadway project. The Caltrans Project Study Report (PSR) for the Lawrence/280 project is a Tier 1A project and construction of the project is in Tier 1C. VTP 2020 also cites a Trimble Road/De la Cruz/Central Expressway/US 101 (\$25 million) project; however, this project is not included in the *Implementation Plan* since it only indirectly relates to Central Expressway.

VTP 2020's funding allocations were based on long-range estimates of state and federal fund programs. Therefore, they must be revisited regularly to reflect changing conditions. VTP 2020 will be updated every three years with the next update called VTP 2030, starting by the end of 2003. The first step in the update will be to revise the 30-year projections. Due to reduced revenues at all government levels, it is anticipated that the dollars originally earmarked in VTP 2020 may not be available in the same timeframe as originally anticipated. Once VTA has revised the fund estimates, it will proceed to reallocate the funds among the nine roadway transportation programs (e.g., freeways, expressways, local streets & county roads).

County Bicycle/Pedestrian Funds – The County receives a bicycle/pedestrian project allocation of \$60,000 per year from Transportation Development Act (TDA) Article 3 funds administered by the Metropolitan Transportation Commission (MTC). These TDA funds are divided between unincorporated roads and expressways. The projects funded are based on

priorities recommended by the County Bicycle and Pedestrian Advisory Committee (BPAC) and the County Roads Commission.

Capital Program – Potential Funding Sources

VTP 2020 and VTP 2030 – VTP 2020 allocates STIP and STP/CMAQ revenue among nine transportation programs. Seven of the programs can potentially help fund expressway capital improvements. These seven programs are summarized below and described in Table 10-4:

- ❖ The Expressway Program earmarks money for expressway capacity/operational roadway improvements.
- ❖ Expressways are technically ineligible for the Freeway Program; however, there is potential benefit when freeway funds are allocated to freeway/expressway interchanges.
- ❖ Expressways are eligible to compete for the Transportation Systems Operations/Management (TSOM), Pedestrian/Livable Community, and Bicycle Programs.
- ❖ For expressways to be eligible for the Sound Walls and Landscape Restoration/ Graffiti Removal Programs, VTA would have to use a fund source not restricted to freeways.

The remaining two VTP 2020 programs include Local Streets & County Roads (\$410 million), where expressways are ineligible, and Pavement Management (\$450 million), which is discussed as part of maintenance/operations funding sources.

As part of VTP 2030, funding may be reallocated among the various programs. With the completion of the Expressway Study *Implementation Plan*, a list of expressway project priorities is now available for funding consideration in the VTP update. Therefore, a key potential funding source is to increase the Expressway Program allocation from the current \$80 million to \$150 million to fully fund the Tier 1A roadway projects. With the constrained revenue projections, increasing the expressways' allocation will require moving funds from other VTP programs, such as Freeways, Local Streets & County Roads, or other programs listed in Table 10-4.

Table 10-4: VTP 2020 Capital Funding Programs

These are programs with expressway allocations or for which expressways may be able to compete.

VTP 2020 Capital Improvement Programs	Category Eligibility	STIP 2006-2036 (millions)	Federal STP/CMAQ (millions)
Expressway	Montague and Central have been specifically earmarked	\$80	
Freeway	The freeway program is allocated a total of \$820 million. Two freeway/expressway interchange projects are included for \$35 million.	\$820	
Transportation Systems Operations and Management (TSOM)	VTA has a short-term list of projects that will use \$50 million and the remaining \$20 million will likely go to projects in the mid-term list. The lists include some expressway projects, but new projects would need to be added to the list to receive funding.		\$70
Livable Community and Pedestrian Projects	Currently unallocated - any eligible city or county sponsored project could compete for these funds once VTA establishes the criteria.		\$25
Bicycle	VTA has developed a tiered list of bicycle projects to receive these funds. It includes some expressway bicycle projects, but new projects would need to compete to be added.		\$40 + additional funds from TFCA & TDA ⁽¹⁾
Sound Walls	Currently unallocated – current funding source makes only freeway projects eligible although the funds are intended for both freeways and expressways.	\$30	
Landscape Restoration and Graffiti Removal	Currently VTP 2020 allocates the full amount to augment Caltrans' efforts on the freeways while simultaneously acknowledging needs on the expressway system.	\$30	

Notes:

- 1) TFCA = Transportation Fund for Clean Air
- TDA = Transportation Development Act

Developer Contributions – Generally, developer contributions have been and can continue to be a good source of improvements to the expressway system. Cities collect traffic impact fees or require direct improvements as a condition of the development permits. To the extent County Roads is brought into the process, the department coordinates with the individual city jurisdiction to suggest and support appropriate traffic impact mitigations. Major projects previously funded by developer fees/conditions include the HOV lanes on Capitol Expressway and widening of portions of Montague Expressway through Milpitas, San Jose, and Santa Clara. The larger scale projects are rare, however. Usually the county expressways receive small-scale improvements such as sidewalks, landscaping, sound walls, or an intersection improvement. A developer project to add median landscaping and sound walls on Capitol Expressway is a recent example of this type of project.

The developer conditions have limitations as a dependable funding source. First, they are unpredictable. They are generally a matter of opportunity and working closely with the cities who have the legal authority to make developer exactions. Second, they usually require nexus where the funds must be used on a project that has a relationship to the impacts of the development. In other words, they cannot be automatically applied to the highest expressway priorities. Finally, some developer fees have sunset or expiration dates that make them problematic for matching federal grant projects that involve long development timelines.

Local Match Funding Sources

The County remains financially challenged to provide a significant local match for expressway projects. The County's existing roadway revenue sources must be used to provide maintenance and operations and are not adequate for providing matching funds for capital projects.

The most significant existing and potential source of local match funds are developer traffic impact fees. The County cannot directly collect developer traffic impact fees in the incorporated city areas through which the expressways run. As discussed above, the developer contributions are determined and collected by the cities, and the contributions must have nexus to the actual project funded. It is unlikely that even an aggressive impact fee program pursued by all cities would raise enough funds for the full 20% local match for every project given the magnitude of the needs and the nexus requirement.

It has been suggested that VTA treat expressway projects differently on the match requirement. This issue has yet to be resolved and is expected to be addressed as part of the VTP 2030 process.

Maintenance/Operations – Existing Funding Sources

Table 10-5 lists the various sources of maintenance/operations revenue, both existing and potential. The existing sources of expressway maintenance/operations revenue include:

Gas Tax – A portion of the state sales tax on gasoline and diesel fuel goes directly back to the cities and counties for streets and roads maintenance. These funds are allocated based on formulas set by the state legislature. There are no special funds received by the County for operating the expressway system. Santa Clara County is the only county in the state with a high-capacity expressway network operating through incorporated cities. The state gas tax formula does not recognize the funding needs of such a unique system.

The fiscal year 2002 Roads Department allocation from the gas tax was \$26 million. The County must split these revenues between unincorporated roads and expressways. There are 635 centerline miles of non-expressway County roads including 248 miles of mountain roads and 36 miles of County roads east of Mt. Hamilton. In addition, there are 168 bridges to maintain on these roads. The mountain and rural roads place a special burden on the County as they are particularly susceptible to extensive storm damage. The County has a legal responsibility to maintain all unincorporated roads at a minimum standard regardless of traffic volumes.

The expressways account for approximately 9% of the total County road centerline miles and 20% of the total lane miles. The County's gas tax revenue split is 80% (\$20.8 million) to unincorporated roads and 20% (\$5.2 million) to expressways, equivalent to the percentage of lane miles between the expressways and unincorporated roads.

Proposition 42 – The recent passage of State Proposition 42 (March 2002) will benefit transportation once it takes effect in 2009. This proposition clarifies that the sales tax on the gas tax needs to be utilized for transportation purposes only. The proposition also clarified a formula for the distribution of those funds. The annual positive impact to the County Roads

Department budget is estimated to be \$12 million. With the 80/20 unincorporated roadway/expressway split, expressways will receive \$2.4 million more per year.

Pavement Maintenance Program – The Measure B sales tax program allocated \$27 million in one-time revenues to help with expressway pavement maintenance. These funds will be fully expended by the end of 2003. While the 62-mile expressway system received \$27 million for pavement maintenance, the 635-mile unincorporated road system received \$13.7 million in one-time federal funds for storm damage repair and long-deferred maintenance. Despite applying two-thirds of the available pavement maintenance funds to the expressways, not all of the immediate needs will be met due to the seriously deteriorated condition of the pavement resulting from inadequate maintenance funds and years of increasing traffic.



Landscape Maintenance Agreements – These agreements can be with individual cities or private developers. Through these agreements, the parties generally perform the maintenance themselves. There are agreements in place with Los Altos for landscape maintenance on Foothill Expressway, Palo Alto for Oregon/Page Mill, Mountain View for Central Expressway, and San Jose for a small portion of Capitol Expressway. A developer agreement funds landscape maintenance on a portion of Montague in San Jose. In addition, the expressways realize a landscaping benefit where commercial landowners maintain their frontages by providing a landscaped buffer between their property and the expressway outside the expressway right-of-way.



Table 10-5: Expressway Maintenance and Operating Revenue

Source	Expressway Annual Revenue (millions in 2002 \$)	Comments
State Gas Tax	\$5.2	20% of County Roads' gas tax allocations; remaining 80% goes to the 635-mile unincorporated road system.
SB 541 (<i>if enacted</i>)	\$1.1	Based on the 4-cent immediate gas tax increase and the 80/20 County roads/expressway split.
Proposition 42 funds	\$2.4	Will be available starting in 2009 and assumes 80/20 County roads/expressway split.
Measure B pavement maintenance funds	\$0	A total of \$27 million was allocated to expressways, which will be fully expended by the end of 2003.
VTP 2020 Pavement Maintenance Program (PMP)	Unknown	\$15 million is planned to be allocated annually among the County and cities starting in 2006. No formula has been set yet. The County's allocation will be split between unincorporated roads and expressways.
Federal Gas Tax Indexing (<i>if enacted</i>)	Unknown	Could increase VTP 2020 allocations of STP/CMAQ funds to cities and County by approximately \$1million annually.
Transportation Fund for Clean Air (TFCA)	\$0	This is a one-time grant source rather than an annual revenue stream. \$2.4 million will be allocated among city and County grant applicants in 2003. Types of projects funded are specialized and limited.
Landscape Maintenance Agreements	Unknown	As opposed to being a revenue source, these agreements relieve the County of financial responsibility to maintain the landscaping.

Maintenance/Operations - Potential Funding Sources

SB 541 – SB 541 (Torlakson) is a bill that would tie the state gas tax rate to the consumer price index so as inflation goes up, the gas tax would automatically adjust upward to compensate. If this bill were enacted, the initial result would be a 4-cent increase in the state gas tax rate from 18 cents to 22 cents. This could potentially provide another \$1.1 million annually for expressway maintenance. Also of significance would be the automatic increases in the state gas tax indexed to inflation helping this primary maintenance/operating revenue source maintain its purchasing power over time.

VTP 2020 Pavement Maintenance Program – VTP 2020 allocates \$450 million in federal STP/CMAQ money to pavement maintenance countywide. This equates to \$15 million annually that must be divided between the County expressways, County unincorporated roads, and the cities. No formula has been set for dividing the funds; therefore, it is unknown how much the expressways will receive.

Federal Gas Tax Indexing – Similar to SB 541 for the state gas tax, there are discussions occurring to index the federal gas tax to inflation. The current proposal is for an immediate 5-cent increase to restore the purchasing power of the federal gas tax back to 1992 levels. This would potentially result an immediate increase of \$7.8 million per year to Santa Clara County and an annual increase of \$1.0 million thereafter. It is unknown how much of this money could flow to the expressways since the federal gas tax is used to fund the STP/CMAQ and other federal grants programs. VTP 2020 currently allocates 55% of the current STP/CMAQ funds to the VTP 2020 Pavement Management Program. Assuming this allocation split continues, the Pavement Management Program could see an increase in funding levels for city and County use.

Transportation Fund for Clean Air (TFCA) – These funds are generated by the \$4 surcharge on vehicle registration. The funds are used to implement projects and programs to reduce air pollution from motor vehicles. Approximately \$2.7 million from the recent cycle is available to distribute within Santa Clara County using an application process administered by VTA. Program criteria generally excludes most road improvements other than signal system improvements under very limited conditions. Some cities have been successful in qualifying trail improvements and maintenance vehicles for the grant funds.

Maintenance/Operations Shortfall

The Expressway Study *Implementation Plan* estimates that \$18.0 million in today's dollars would be required to provide the level of effort for maintenance/operations desired by the cities and community. As the revenue projections indicate, the *predictable sustainable* revenue available ranges from \$5.2 million in 2003 to \$7.9 million in 2009 when Proposition 42 funds begin plus some VTP 2020 PMP funds beginning in 2006.

A critical problem is that the predictable revenue sources are based on the gas tax, and the gas tax is not indexed to inflation. Gas tax is based solely on revenue off of gasoline sold,

and it has experienced relatively flat revenue growth due to more fuel-efficient cars and, recently, the poor economy. In addition, gas tax revenue growth usually does not keep pace with additional wear and tear on the expressways as traffic demand increases. Therefore, the increase in maintenance/operations costs often outpaces the growth in gas tax revenue. SB 541, if enacted, could help substantially with this problem. Without SB 541 or another type of gas tax increase, most of the Proposition 42 funds will need to be used to simply continue the current level of maintenance/operations rather than expand efforts.

The lack of adequate sustainable revenue for maintenance/operations affects both the quality of the expressways and the ability to make improvements. For example, the County will not install nor allow others to install new landscaping unless funds are available for maintaining it. Other capital improvements that create increased maintenance/operating costs (e.g., new signal technologies, more roadway pavement) could increase the maintenance/operations shortfall. For example, the \$24.5 million in Measure B funds for TOS improvements just paid for equipment and installation and does not cover the additional \$0.5 million needed annually to maintain and operate the system.

Summary of Capital and Maintenance/Operations Revenue Sources

Table 10-6 summarizes all revenue sources described above, matching the specific funding pots to each expressway element. As can be seen, the opportunities for funding different types of projects vary depending on the funding source. This is one of the reasons the plan does not try to prioritize between the elements. For example, although some cities have stated improved landscaping is a higher priority than either sound walls or pedestrian improvements, there are currently more funding opportunities for sound walls and pedestrian improvements than for landscaping. It is also difficult to prioritize sound wall or pedestrian improvements, since the most likely funding sources are developer improvements and implementation will be based more on opportunity than on priorities.

Table 10-6: Summary of Expressway Program Funding Sources

CAPITAL PROGRAM					
Expressway Element	Cost (millions)	Existing Funds		Potential Funds	
		Source	\$ (millions)	Source	\$ (millions)
Capacity/ Operational Improvements (including HOV, Signals/TOS)	\$150 (Tier 1A)	VTP 2020 Expressway	\$80	VTP 2030 Expressway	Additional \$70 for a total of \$150
	\$1,636-1,940 (Total)	VTP 2020 Freeway (expressway interchanges)	\$35	VTP 2020 TSOM Developer fees from cities	Portion of \$70? Unknown
Bicycle	\$1.65	TDA County Bike/Ped Allocation	Portion of annual \$0.06	Tier 1A Roadway Project ⁽¹⁾	\$0.45
				VTP 2020 Bicycle Developer conditions	Portion of \$40? Unknown
Pedestrian	\$23.14	TDA County Bike/Ped Allocation	Portion of annual \$0.06	Tier 1A Roadway Project ⁽¹⁾	\$3.57
				VTP 2020 Pedestrian Developer conditions	Portion of \$25? Unknown
Sound Walls	\$47.71			Tier 1A Roadway Project ⁽¹⁾	\$9.96
				VTP 2020 Sound Wall Developer conditions	Portion of \$30? Unknown
Landscaping	\$19-23			VTP 2020 Landscape Developer conditions	Portion of \$30? Unknown
LOCAL MATCH FOR CAPITAL PROGRAM					
Total	\$342-404			Developer fees from cities	Unknown
Tier 1A	\$30				
Non-Roadway	\$15				
MAINTENANCE & OPERATIONS					
Annually	\$18.0	Gas Tax	\$5.2 annually	SB 541 (if enacted)	\$1.1 annually
		Prop 42 (start in 2009)	\$2.4 annually	VTP 2020 Pavement Maintenance	Portion of \$15 annually
		Landscape maintenance agreements	Unknown	More landscape maintenance agreements	Unknown
				TFCA	Small one-time grants

Note:

(1) Only improvements included in Tier 1A Capacity/Operational roadway projects are listed as potentially fundable since no source of capital funds has been identified for the lower tier roadway projects.

New Revenue Sources

Regardless of the outcome of the VTP 2030 process, the amount of funds available will fall significantly short of needs in capital, local match, and annual maintenance/operations. Therefore, implementation of a significant portion of the plan will require new revenue sources. The Expressway Study considered a variety of new funding sources in terms of revenue potential, implementation process, and community acceptability.

During the study, a telephone survey conducted in late January 2003 concentrated on a modest 3 or 5-cent gas tax for the expressway system. Although those surveyed use the expressway system frequently (61% use it weekly and an additional 18% use it monthly) and 92% feel the expressway system is “an important part of the transportation system in Santa Clara County,” there was not strong support for paying for the improvements at the pump. Of course, some of the pessimism can be traced to the downturn in the economy and the spike in gas prices, but there is also a feeling that the gas tax is a sensitive subject for many motorists.

Based on these findings, the overall list of new revenue sources was pared down and can be found in Table 10-7. As the table shows, the fund sources have the potential to raise significant transportation dollars. Many of these funding sources are also being looked at by VTA to solve their current transit operations fiscal crisis. The sources that may have the capacity to support a transportation package for both transit and expressway needs are marked. Most of the new sources will require a vote of the public and will need an organized campaign to explain the benefits of the various projects to the voting public.

Federal earmarks are another possible new source for expressway revenue; however, opportunities are likely to be limited to a few million dollars. The current reauthorization program is known as the Safe and Flexible Transportation Efficiency Act of 2003, or SAFETEA. It calls for authorizing a relatively flat federal surface transportation program for the next six years. The County will pursue as much funding from federal sources as possible.

Table 10-7: New Funding Sources To Consider

Potential Source	Potential \$ from Source	Decision Process/ Controlling Body	Approval Process and Comments
Local Sales Tax 1/4 cent ⁽¹⁾	\$65 million per year	County or VTA	2/3 vote if special district; simple majority if A plus B approach
Local Sales Tax 1/2 cent ⁽¹⁾	\$130 million per year	County or VTA	2/3 vote if special district; simple majority if A plus B approach
STIP Portion of Prop 42	\$22-29 million per year after '09	VTA	Passed by statewide vote in March 2002. Allocation not yet voted as a policy at VTA Board; however, in current VTA funding plan, 100% is earmarked for transit
Regional Fuel Tax/ "car user fee"	3 – 5 cents/gallon would raise \$25 - 45 million per year for distribution within Santa Clara County	MTC to allocate calculation based on population split, likely to also include money set aside for region-wide priorities	MTC is authorized up to 10 cents; approval requires majority vote of the residents in 9 Bay Area Counties
Countywide Fuel Tax	1 cent equals \$7 million per year	County Board of Supervisors and the Cities	Majority vote of the Board of Supervisors and the majority of the cities representing the majority of the population in the county and 2/3 vote of Santa Clara County voters
Payroll Tax ⁽¹⁾	1/4% equals \$150 million per year	County Board of Supervisors	Would need to develop service area and determine fee and nexus to % of wages within service area
Parcel Tax/Benefit Assessment District ⁽¹⁾	Unknown. Depends on tax amount and scope.	County Board of Supervisors and Property Owners	Property within certain distance of the expressways could be subject to an assessment; 2/3 majority of property owners would need to vote approval

Note:

(1) Fund source being considered by VTA also. Could be a VTA/Expressway package.

Implementation Plan Funding Strategy

Taking into consideration all the existing, potential, and possible new funding sources, a funding strategy has been developed addressing each major area of need.

Capacity/Operational Improvements – Tier 1A

Tier 1A projects have highest priority for VTP Expressway Program funding allocations. The Tier 1A funding strategy involves the following steps:

- ❖ As part of the VTP 2030 process, VTA will be requested to increase the VTP 2020 Expressway Program allocation from \$80 million to at least \$150 million to allow full implementation of the Tier 1A projects.
- ❖ If inadequate funds are allocated in VTP 2030, the Study’s Technical Working Group (TWG) and Policy Advisory Board (PAB) will reconvene to set criteria to prioritize the Tier 1A projects to meet the available revenues.
- ❖ City participation in Tier 1A project match requirements is not mandatory, but in the absence of other sources available to the County to provide expressway program revenue, participation by the cities may be necessary to allow projects to proceed.

Capacity/Operational Improvements – Tier 1B

The Tier 1B projects, totaling \$261-271 million, also address existing LOS F intersections. There may be opportunities for the cities to provide all or a portion of the funding for a Tier 1B project through developer fees. The points listed below outline the process for advancing Tier 1B projects early and for prioritizing the Tier 1B projects:

- ❖ If Tier 1A is fully funded through VTP 2030 and any city wants to advance a lower tier project for VTP 2030 funding prior to completion of all viable Tier 1A projects, the city will need to identify Tier 1A project(s) in that city, or through agreement with other cities, which can be deferred to provide sufficient funding and allow the lower tier project to proceed.
- ❖ Tier 1B project priority shall be based on evaluation of cost effectiveness defined as the relationship of project vehicle hours traveled (VHT) savings to estimated project cost as developed by the Expressway Study.

- ❖ To allow Tier 1B flexibility and recognize the significant contributions of local cities and/or land developments within that city, city and/or developer contributions will be deducted from the project estimate so the cost-effectiveness evaluation reflects only the project requirements for grant or expressway program revenue.
- ❖ Cities may choose to fully fund Tier 1B projects and distribute credit for that work as local contribution to other Tier 1B projects in that city.

All Capital Improvements

The following actions will help produce funding for all types of capital improvements:

- ❖ Work with the cities to collect expressway traffic mitigation fees and expressway pedestrian, sound wall, landscaping, and intersection improvements through the land development approval process.
- ❖ Pursue funding from the various VTP competitive programs for expressway improvements.
- ❖ Pursue grants and partnerships for non-roadway capacity projects, such as pedestrian, bicycle, sound wall, and Intelligent Transportation Systems (ITS) projects.
- ❖ Pursue funding from other programs/agencies that benefit from a proposed project. For example, off-expressway improvements needed to connect pedestrians and bicyclists to the trails should be funded by the trails program and/or local jurisdiction. Projects involving grade separating rail tracks from the expressway should have funding participation from the rail operator.

Maintenance/Operations and Local Match

The following actions address the maintenance/operations annual shortfall and the lack of local matching funds:

- ❖ Jointly with VTA, pursue additional revenue for meeting both the transit operating needs and the expressway maintenance/operations needs, including capital program local match requirements.
- ❖ Resolve the expressway local match issue during VTA's VTP 2030 process, especially if a new funding source cannot be secured. There should be an understanding that the expressways are an essential part of the regional

transportation network, with many of them serving residents and employees from multiple cities. Improvements should not be limited to those areas with major new development potential where cities can raise significant money. Strategies include continuing to work with the cities to secure developer impact fees where appropriate, exchanging federal/state funds for local funds with no match requirements, and using other non-county sources as match.

- ❖ Support all state efforts to index gas tax to inflation and to increase the gas tax to help fund the maintenance and operations of the expressway system.
- ❖ Continue with the County’s current landscaping policy that states: “New landscape improvements shall not be installed unless full recovery of capital and maintenance costs can occur.”
- ❖ Include maintenance and lifecycle costs when approving capital projects. The intent of this recommendation is to ensure that any “significant new burden” to the maintenance and/or operations of the expressway system should be fully considered in the context of the decision to allocate the capital dollars to the project.





SECTION ELEVEN

NEXT STEPS & UPDATES

The Expressway Study's *Implementation Plan* will be submitted to the Santa Clara Valley Transportation Authority (VTA) for inclusion in the Valley Transportation Plan (VTP) 2030 process. It is anticipated that VTP 2030 will incorporate all projects and priorities as identified in the plan. VTP 2030 will also determine the amount of federal and state funding that will be allocated to the expressway program over the next 30 years.

Next Steps

Based on key recommendations in the *Implementation Plan*, the County of Santa Clara will pursue the following activities:

- ❖ Participate in the development of the South County Circulation Study to be managed by VTA.
 - ❖ Implement signal timing plans for Foothill, Oregon-Page Mill, and San Tomas Expressways using results of signal timing studies conducted by the Expressway Study.
 - ❖ Monitor the performance of expressway high-occupancy vehicle (HOV) lanes using the established performance measures and take corrective action for under-performing lanes.
-

- ❖ Conduct the environmental review and the Regional Transportation Plan (RTP) amendment process for converting the Lawrence HOV lane north of US 101 and Montague HOV lane east of I-880 to mixed-flow lanes.
- ❖ Work with Caltrans to determine what is needed to continue expressway HOV lanes across freeway interchanges.
- ❖ Update County policies regarding bicycle and pedestrian access on the expressways as needed to be consistent with the *Implementation Plan*, including adopting the policy for designating new bike lanes, establishing the bike lane designation criteria, and continuing to work with cities in reviewing city ordinances prohibiting pedestrians and seeking their repeal where determined unnecessary.
- ❖ Work with Caltrans to study design options to eliminate freeway interchange ramp conflicts for bicyclists traveling on expressways.
- ❖ Work closely with VTA and the cities to pursue the *Implementation Plan* Funding Strategy.
- ❖ Continue to pursue grants and partnerships to the extent operating funds can support match requirements or added maintenance responsibilities.
- ❖ Update the *Implementation Plan* every three years in conjunction with the triennial updates of VTA's VTP to reflect changing traffic and financial conditions.
- ❖ Prepare an interim update if VTA does not fully fund the Tier 1A list of roadway projects in VTP 2030.

Interim Plan Update

The 28 Tier 1A roadway capacity and operational projects address the top priorities for each expressway and city and improves most of the current level of service (LOS) and operational/safety problem areas. The *Implementation Plan* recommends all of Tier 1A be funded as part of the VTP 2030 Expressway Program at a total cost of \$150 million. With only \$80 million currently shown in the VTP 2020 Expressway Program, an additional \$70 million must be identified during the VTP 2030 process.

Should VTA decide not to allocate \$150 million to the expressways, decisions will be needed on which of the 28 projects will be funded within the available allocation. If it is

necessary to prioritize the Tier 1A projects, the Expressway Study's collaborative process will be used to set the criteria and develop the priority list. The timeline will require that the interim update take place in 2004 prior to completion of VTP 2030.

Triennial Plan Updates

The *Implementation Plan's* project lists, cost estimates, and other recommendations are based on conditions known today. The plan will be revisited prior to each VTP update so the VTP Expressway Program stays current.

The process used during each update will vary depending on the types of revisions that may be necessary. In those years where new conditions do not affect the expressway project list or priorities, the update is likely to be more administrative in nature with participation by the County Roads Commission and approval by the Board of Supervisors. Should there be a critical issue for one expressway or city, the County will set up a collaborative planning process involving affected staff and policymakers to deal with that issue. If major revisions to the plan are needed, the Policy Advisory Board (PAB) and Technical Working Group (TWG) will be re-established. It is anticipated that every third or fourth update (9 to 12 years) will require the full collaborative planning and technical analysis process.

Specific issues to be addressed in future *Implementation Plan* updates include the following:

- ❖ Develop a delivery schedule for the Tier 1A list of projects during the update immediately preceding the first availability of funds. Whether or not Tier 1A is fully funded in VTP 2030, the funds will be allocated over a 30-year period. In addition, the first set of funds will likely become available after 2006. Therefore, it is necessary to develop a delivery schedule for the project list to determine when each project will receive funding once more is known about the timing of funding availability.
- ❖ Prioritize the Tier 1B interchange projects when enough expressway program funding becomes available to pursue Tier 1B projects. The Funding Strategy includes a recommended process for prioritizing the projects.
- ❖ Incorporate any expressway-related recommendations from the South County Circulation Study.

- ❖ Revise the HOV System Element's recommendations to reflect the results of the 3 to 5-year trial periods for the Central and Montague HOV lane segments.
- ❖ Prioritize bicycle, pedestrian, and/or sound wall projects after VTA sets criteria for existing funding sources and/or new funding sources become available. This will help assure that the highest priority projects are the ones that will compete successfully for funding.
- ❖ Update the Bicycle Accommodation Guidelines (BAG) as may be determined beneficial.
- ❖ Update the Expressway Landscape Master Plan's block-by-block recommendations to meet the upgraded landscaping recommended in the *Implementation Plan* when funding sources are secured for systemwide installation and maintenance.
- ❖ As conditions change, review feasibility of improving existing and projected LOS F intersections and other problem areas that are currently considered impracticable or undesirable to improve.

Appendix A

Glossary of Terms

APPENDIX A

GLOSSARY OF TERMS

A

Access Control

The condition where the right of owners or occupants of abutting land to access a roadway is fully or partially controlled by public authority. Driveways or other access connections are limited or completely prohibited between intersections.

Alignment

The course of a road.

Arterial

A general term denoting a roadway primarily for through traffic usually on a continuous route.

At-grade

At the same level as the surrounding topography – often used to describe crossing streets which meet at signalized intersections as opposed to roadways separated by use of structures and ramps.

Auxiliary Lanes

A lane from one on-ramp or intersection to the next off-ramp or intersection to allow vehicles coming on the expressway or getting off the expressway to have more time to merge with the through lanes. These lanes are often installed for safety purposes (i.e., reduce merging accidents).

B

BAG (Bicycle Accommodation Guidelines)

A document providing detail diagrams and guidelines for bicycle treatments on expressways.

Board of Supervisors

The Board of Supervisors is the governing policy body for the County of Santa Clara. There are five (5) Supervisorial Districts in the County. The Supervisor for each district is duly elected by voters that reside within the boundaries of that specific district. Each elective term of service for County Supervisors is four years.

BPAC (Bicycle and Pedestrian Advisory Committee)

An advisory committee to the County that is responsible for providing input to County staff for work associated with bicycle and pedestrians plans, guidelines, projects, and programs.

Braided Ramp

A design feature where two nearly parallel ramps cross each other by use of a grade separation to avoid weaving or crossing at grade. Most often this occurs when an on-ramp from one nearby interchange is braided to avoid interfering with an off-ramp for the next one.

Bulb-out

Curb extensions at the corners of intersections that are often associated with elimination of right turn lanes and that may shorten pedestrian crossing distances.

C**Caltrain**

Commuter rail service running between Gilroy and San Francisco through San Jose. It is governed by the Peninsula Corridor Joint Powers Board (JPB).

Caltrans (California Department of Transportation)

The responsible owner/operator of the state highway system providing for its safe operation and maintenance.

Capacity

The maximum rate of flow that can be accommodated on a roadway segment under prevailing conditions. Rate of flow is the number of vehicles passing a point on a facility during some period of time, expressed in vehicles per hour or persons per hour.

Carpooling

An arrangement where two or more people share the use and cost of privately owned automobiles in traveling to and from pre-arranged destinations together.

CCTV (Closed-Circuit Television)

The common abbreviation for closed-circuit television.

Centerline Miles

Miles of roadway measured down the yellow stripe or centerline, in one direction. Centerline miles do not measure actual miles of traffic lanes. For example, one centerline mile of a two-lane road would equal two miles of traffic lanes.

Channelization

The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movement of both vehicles and pedestrians.

CHP (California Highway Patrol)

State agency responsible for law enforcement on the state highways and unincorporated roadways. The CHP also enforces the HOV lanes and general traffic rules on Lawrence, Montague, and San Tomas Expressways.

CIP (Capital Improvement Program)

A multi-year program of projects to maintain or improve a transportation system, such as the expressway system. Projects in the CIP are generally one-time capital investments rather than ongoing maintenance and operating expenses.

CMA (Congestion Management Agency)

The CMA is a countywide organization responsible for preparing and implementing the County's CMP (see definition below). CMAs came into existence as a result of state legislation and voter approval of Proposition 111 in 1990 (later legislation removed the statutory requirements of Proposition 111, making CMAs optional). In Santa Clara County, VTA is the designated CMA.

CMAQ (Congestion Mitigation and Air Quality Improvement Program)

A federal source of funding for projects and activities that reduce congestion and improve air quality, both in regions not yet attaining federal air quality standards and those engaged in efforts to preserve their attainment status. The San Francisco Bay Area region meets this qualification and receives CMAQ funds.

CMP (Congestion Management Program)

A comprehensive program designed to reduce traffic congestion, to enhance the effectiveness of land-use decision-making, and to improve air quality. The program must comply with CMP state statutes, and with state and federal Clean Air Acts. In Santa Clara County, VTA, acting as the CMA, develops the CMP.

CMS (Changeable Message Sign)

Electrically operated sign capable of displaying multiple messages.

Collaborative Planning

A planning process that involves working with all interested parties to develop consensus and broad-based support for decisions, recommendations, and/or some type of plan.

Commute

A home-to-work or work-to-home trip.

Commute Period

Morning and afternoon time periods when commute trips are the heaviest. Also referred to as peak periods.

Congestion

The condition of any transportation facility in which the use of the facility is so great that there are delays for the users of that facility. Usually this happens when traffic approaches or exceeds facility capacity.

Corridor

A predominant travel alignment and the area contributing to the major facility serving that travel movement.

County of Santa Clara

The County of Santa Clara is located at the southern end of the San Francisco Bay and encompasses 1,312 square miles. There are 15 cities ranging from Palo Alto in the north to Gilroy in the south. It is governed by a 5-member Board of Supervisors. Santa Clara County provides services such as law enforcement, correctional institutions, road construction and maintenance, parks and recreation, libraries, and environmental resources as well as operating as an agent of the state in providing other services.

County of Santa Clara Roads and Airports Department

A department within the County of Santa Clara government structure that is responsible for operating, maintaining, and improving County expressways, unincorporated roads, and County airports.

County Roads Commission

The Roads Commission was established on April 18, 1995. The Commission is composed of seven members, appointed by the Board of Supervisors, each representing the public at large and serving four-year terms. The purpose of the Commission is to give advice and make recommendations to the Board of Supervisors on matters generally relating to the planning, design, construction, and operation of the County's expressways, highways and roads and such other matters as directed by the Board.

D**Decibel**

A unit for expressing the relative intensity of sounds on a scale from zero for the average least perceptible sound to about 130 for the average pain level.

Delay

A measure of the amount of additional time travelers spend during a trip due to congestion. It is measured as the difference in travel time between congested and free-flow conditions.

Demand

The number of users desiring to use a transportation facility or system.

Developer Exaction

A contribution or payment required as an authorized precondition for receiving a development permit; can include dedication of roadway rights-of-way and improvement of roadway facilities.

Development Impact Fees

A fee, also called a development fee, levied on the developer of a project by a city, county, or other public agency as compensation for otherwise unmitigated impacts the project will produce.

Discretionary Funding

Unlike funding that flows only to highways or only to transit by a rigid formula, this is money that can be invested in a range of transportation projects and the project selection can be made regionally or locally.

Downtown East Valley Policy Advisory Board

One of VTA's transportation corridor policy advisory boards. This board, consisting of appointed elected officials from the County of Santa Clara and City of San Jose, provides oversight for the development and implementation of the Downtown East Valley Transit Improvement Plan.

E

EIS/EIR (Environmental Impact Study/Environmental Impact Report)

A study which analyzes various alternatives for environmental impacts, identifies possible mitigations to reduce impacts, and obtains legally mandated state and/or federal environmental clearance for a chosen preferred alternative. Federal funding requires an EIS while California state law requires an EIR.

Expressway

Expressway shall mean an arterial highway for through traffic with partial access control, which may or may not be divided or have grade separations at intersections. There are eight expressways in the Santa Clara County expressway system.

F

FHWA (Federal Highway Administration)

An agency of the U.S. Department of Transportation that funds highway planning and programs.

Finishing Program

Improvements to expressway medians and edges (i.e., back of curb to right-of-way line). These improvements include landscaping, sound walls, and sidewalks.

Fixed Guideway Funds

Federal funds available to transit agencies for operating transit services on fixed guideways, including HOV lanes.

Flyover Ramp

A ramp serving a high traffic volume movement, connecting two roadway facilities and providing a direct connection to avoid congestion, merging, and/or an intersection.

Freeway

A divided arterial highway designed for through traffic with full control of access and with grade separations at intersections. Freeways are operated and maintained by Caltrans.

Frontage Road

A local street or road located on the side of an expressway which provides access to abutting property and adjacent areas.

FTA (Federal Transit Administration)

A component of the U.S. Department of Transportation, delegated by the Secretary of Transportation to administer the Federal transit program under the Urban Mass Transportation Act of 1964, as amended, and various other statutes.

Future Width Line Study

A County planning study completed in 1971 that detailed the desired length and width of each roadway in the County system.

G**Gas Tax**

An excise tax assessed on gasoline and diesel fuel at the point of sale. The current rate assessed by the state is \$0.18 per gallon of gasoline and the federal rate is \$0.183 per gallon. A portion of these funds are returned to the cities and counties for streets and roads maintenance. These funds are allocated based on formulas set by legislation and are the sole sustainable source of operating and maintenance funds for County expressways and unincorporated roads.

Grade Separation

A crossing of two highways or a highway and a railroad at different levels.

H**HDM (Highway Design Manual)**

The HDM, prepared by Caltrans, establishes uniform policies and procedures to carry out the highway design functions of Caltrans. It is also used by the County of Santa Clara to assist with the design of County roadways.

HOV (High Occupancy Vehicle)

Any vehicle carrying two or more occupants.

HOV Lanes

Lanes on heavily congested roadways that are used exclusively at peak hours by carpools, vanpools, buses or any vehicle that transports multiple passengers.

HOV Queue Jump Lanes

Short HOV lane segments provided just before congested signalized intersections that allow HOVs (e.g., carpools, buses) to move to the front of queues waiting at red lights.

HOV Direct Connector Ramps

A structure providing direct, uninterrupted HOV movements from the HOV lane of one freeway to the HOV lane of the second freeway, eliminating the need to leave the HOV lane to exit one freeway only to merge back across the next freeway into its HOV lane. The *Expressway Implementation Plan* includes recommendations for similar direct connections from expressway HOV lanes to freeway HOV lanes.

I

I-680/I-880 Cross Connector Study

One of VTA's gateway studies. The study's purpose is to identify and evaluate alternatives for corridor connections between I-680 to I-880. The study's boundaries extend from Auto Mall Parkway in Fremont to Montague Expressway in Milpitas and involves officials from both Alameda and Santa Clara Counties.

Incidents

Events that cause increased congestion on our roads.

Infrastructure

Expressway infrastructure refers to all physical structures that are part of the expressways.

Interchange

The connection of two or more roadways using a grade-separated structure with ramps for moving from one road to the other. Ramp connections may or may not have traffic signals.

ITS (Intelligent Transportation Systems)

The application of technology to improve the efficiency and safety of transportation systems. When integrated into the transportation system infrastructure or in vehicles, these technologies help monitor and manage traffic flow, reduce congestion, and provide improved mobility, safety, air quality, and productivity.

L

Land Use

Activities and structures on the land, such as housing, shopping centers, farms, and office buildings.

Landscape Maintenance Agreement

Formal agreement between the County and a city or private landowner where the city/landowner provide for landscape maintenance along a section of expressway.

Livable Community and Pedestrian Program

One of VTA's funding programs in VTP 2020. The program aims to provide funding for safe walking access to jobs, schools, housing, transit, and other destinations.

Local Match

A requirement for local funding (e.g., from cities or the County) to supplement grant funds for transportation projects. Most federal and state grants require some amount of local match. VTA's current policy for calls for a minimum of 20% of a transportation project's cost being locally funded to receive federal, state, or regional sources that are allocated by VTA.

Long-Range Plan

A transportation plan covering a time span of 20 or more years.

LOS (Level of Service)

LOS measures the interrelationship between travel demand (volume) and supply (capacity) of the transportation system. LOS is a quantitative measure categorized into six levels, A through F, with A representing ideal conditions or no congestion and LOS F representing poor conditions or congested flow. Roadways at LOS F are considered deficient and not meeting CMP standards.

LRT (Light Rail Transit)

LRT operates on an electrical system powered from an overhead wire on dedicated tracks. The system is capable of operating at high speeds in dedicated rights-of-way and at lower speeds on arterial streets and downtown environments.

M

Measure B Sales Tax (1996)

A 1996 ballot measure in Santa Clara County that raised the local sales tax by one-half cent for a nine-year period, with the proceeds being deposited into the County's General Fund. Its companion measure (Measure A) identified a specific program of priority transportation improvement projects in Santa Clara County to be undertaken as funding became available. Measure B funds have been used to implement the Measure A program.

Median

The portion of a divided highway separating traffic traveling in opposite directions.

Mixed-flow Lane

A lane of traffic that is not restricted to HOV use and, therefore, can carry both single-occupant and HOV vehicles.

Mitigation

An action to reduce or eliminate the impacts of another action. In the case of transportation, the term can refer to an action or project to improve LOS conditions (a traffic mitigation), or to any number of roadway project mitigations such as installation of sound walls (an environmental mitigation).

Montague Study

A multi-agency study completed in 1999 identifying LOS improvements and priorities for Montague Expressway.

MTC (Metropolitan Transportation Commission)

The transportation planning body for the nine-county San Francisco Bay Area, including Santa Clara County. MTC is responsible for preparing the RTP for the Bay Area.

Multimodal

Of or relating to more than one mode of transportation.

N

Nexus

Refers to the need for a rational and defensible link or connection between the imposition of traffic impact fees, the responsibility for such impacts, and the infrastructure that will be provided.

Noise Attenuation

The reduction of sound intensity by any means (e.g., air, humidity, materials, etc.).

PAB (Policy Advisory Board)

An appointed board of local officials that monitored and guided progress of the Expressway Study and development of the *Implementation Plan*. The Expressway Study PAB consisted of two county supervisors, one council member each from twelve cities, two VTA board members, and two members of the County Roads Commission.

Par-clo (Partial Cloverleaf) Interchange

A type of interchange providing two exit ramps (with signalized turns at the end) and four entrance ramps (all right turns).

Pavement Delineation

Striping and marking on roadways defining travel and non-travel lanes.

PCI (Pavement Condition Index)

Based on measurements of roughness, surface distress, skid resistance and deflection, pavements can be assigned a score that reflects their overall condition. This score quantifies a pavement's overall performance and can be used to help manage pavement maintenance. The pavement condition index is the scale, or series of numbers, used to describe a pavement condition.

PR (Project Report)

For Caltrans facilities, the PR is prepared at the same time as the Draft Environmental Document and after completion of environmental studies. It summarizes studies of need, alternatives, costs, and overall impacts of a proposed project. For simpler, well-defined projects, the PR is combined with the PSR process.

Peak Hour

The highest hour of traffic volumes in an area.

Peak Period

Morning and afternoon hours when commute trips are the heaviest. On the expressways, these hours are usually 6 a.m. to 9 a.m. and 3p.m. to 7 p.m. Also referred to as commute periods.

Peninsula Corridor Joint Powers Board

This Joint Powers Board (JPB) is made up of representatives from the Counties of San Francisco, San Mateo, and Santa Clara and oversees the Caltrain commuter rail service.

PMP (Pavement Management Program)

Pavement management refers to regular programs to monitor asphalt pavement conditions, evaluate serviceability, and schedule repairs. The cities and County must use a Pavement Management System certified by MTC to identify and prioritize pavement needs. In the past, PMP fund programs have distributed revenue using a population-based and lane-mile formula.

POC (Pedestrian Overcrossing)

A structure or bridge for pedestrians to cross a roadway while avoiding conflicts with vehicles. Expressway POCs are recommended to facilitate mid-block crossings where high demand exists and the nearest signalized intersection is too far away for convenient pedestrian use.

Pork Chop

The triangular island used to provide a divided right-turn-only lane at an intersection.

Proposition 42

A state constitutional amendment passed by California voters in March 2002 that permanently dedicates 100% of the state sales tax on gasoline for transportation investments, although the Legislature is able to suspend these provisions in times of fiscal crisis.

PSR (Project Study Report)

Chapter 878 of the (California) Statutes of 1987 requires that any capacity increasing project on the state highway system, prior to programming in the STIP, have a completed PSR. The PSR must include a detailed description of the project scope and estimated costs. The intent of this legislation was to improve the accuracy of the schedule and costs shown in the STIP, and thus improve the overall accuracy of the estimates of STIP delivery and costs.

PUC (Public Utilities Commission)

The California PUC regulates privately owned electric, telecommunications, natural gas, water and transportation companies, in addition to household goods movers and rail safety. Its rail safety responsibilities include LRT and Caltrain crossings and structures.

R**RAC (Rubberized Asphalt Concrete)**

A road pavement surface that uses rubber from scrap tires blended with asphalt.

Right-of-Way

A strip of land occupied or intended to be occupied by certain transportation and public use facilities, such as roadways, railroads, and utility lines.

Roadway Project Tiers

Grouping of expressway capacity/operational improvement projects into tiers to reflect priority. For the Expressway *Implementation Plan*, Tier 1A reflects the highest priority of projects and Tier 3 is the lowest priority.

RTP (Regional Transportation Plan)

A master plan prepared by MTC to guide the Bay Area's transportation investments for a 25-year period. Updated every three years, it is based on projections of growth in population and jobs and the ensuing travel demand. Required by state and federal law, it includes programs to better maintain, operate and expand transportation. The 2005 RTP, now under way, is known as Transportation 2030.

Rural Commute Routes

County unincorporated roads in rural areas identified by the County Roads Commission as being used for commuting. These roads typically have high traffic counts and demand is expected to increase due to local land development plans.

S

SAFETEA (Safe and Flexible Transportation Efficiency Act of 2003)

The current federal reauthorization program for transportation funding. It calls for authorizing a relatively flat federal surface transportation program for the next six years.

SB 541 (Senate Bill 541)

A bill introduced by Senator Torlakson that would tie the state gas tax rate to the consumer price index so as inflation goes up, the gas tax would automatically adjust upward to compensate.

Signal Coordination

Traffic signal coordination is a method of establishing timed relationships between adjacent traffic control signals to move large volumes or "platoons" of traffic in one movement along a corridor. In order to accomplish this, communication between and common equipment at each intersection that works together is required.

Signal Pre-emption

Interruption to the regular signal cycle to provide a green light for an emergency vehicle or to turn lights red to stop cross traffic at train at-grade crossings. Once the pre-emption event has passed, the lights return to normal functions.

Signal Synchronization

Once signal coordination is established, traffic signals can be synchronized to provide improved mobility. This does not mean that the signals will provide a green light at the same time for the entire length of a corridor; rather, that each signal will be timed in relationship with the entire system, allowing for more efficient mobility.

Smart Corridor

A Smart Corridor is one where various public agencies' traffic management activities are coordinated to more effectively manage traffic in that corridor. These are typically achieved using advanced technologies or ITS, while partnerships between jurisdictions are necessary to develop procedures and measures for coordination.

South County

The portion of Santa Clara County consisting of the area from the SR 85/US 101 interchange in San Jose to the San Benito County line. It includes a portion of the City of San Jose, all of the Cities of Morgan Hill and Gilroy, and County unincorporated land between and surrounding these cities.

South County Circulation Study

A study recommended in the *Expressway Implementation Plan* to identify travel needs and potential transportation improvements for the South County area of Santa Clara County.

SOV (Single-Occupant Vehicle)

A vehicle with one occupant.

STIP (State Transportation Improvement Program)

The STIP is a multi-year planning and expenditure plan adopted by the California Transportation Commission for the State Transportation System. VTA recommends the allocation of STIP funds for Santa Clara County in its Valley Transportation Plan (VTP) plans.

STP (Surface Transportation Program)

A flexible federal funding program. Funds may be used for a wide variety of purposes, including: roadway construction, reconstruction, resurfacing, restoration and rehabilitation; roadway operational improvements; capital costs for transit projects; highway and transit safety improvements; bicycle and pedestrian facilities; scenic and historical transportation facilities; and, preservation of abandoned transportation corridors.

SV-ITS (Silicon Valley ITS Program)

Expanded partnership originally formed to implement the Silicon Valley Smart Corridor (I-880/SR 17) project. Its purpose is to work towards implementing three additional ITS projects in Santa Clara and southern Alameda County.

T

T2000 Plan

A long-range countywide transportation plan adopted by the County of Santa Clara Board of Supervisors in 1986. The T2000 Plan included a comprehensive study of and improvement recommendations for the County Expressway System.

TDA (Transportation Development Act)

The state TDA created the Transportation Development Account in 1972. This account receives 1/2-cent of the 6-cent statewide sales tax. The 1/2-cent is apportioned to the county of origin according to the amount of sales tax generated by that county, and it is allocated by MTC to the county's eligible applicants. TDA funds are divided different pots, each with specific designated uses. TDA Article 3 funds (4% of the total TDA fund) are allocated annually for bicycle/pedestrian projects, which are nominated by the VTA.

TFCA (Transportation Fund for Clean Air)

TFCA funds are generated by a \$4.00 surcharge on motor vehicle registrations. The funds generated by the fee are used to implement projects and programs to reduce air pollution from motor vehicles. The Bay Area Air Quality Management District (BAAQMD) manages 60% of the funds via a regional discretionary program. The remaining 40% are returned to each county based on annual vehicle registrations. VTA allocates the 40% funds for Santa Clara County.

TMC (Traffic Management Center)

TMCs help in the real-time management of traffic, including monitoring and controlling roadway access, responding to and managing incidents, rerouting traffic, and communicating and coordinating with the public and the media. It performs these functions with advanced ITS technology.

TOC (Traffic Operations Center)

Centralized location where traffic operations are monitored and controlled. The County Roads and Airports Department TOC is located at the East Yard facility on Schallenger Road in San Jose.

TOS (Traffic Operations System)

A system made up of various ITS components which monitor and respond to traffic operations for an area. Components typically include surveillance (loop detectors, CCTV, etc.), monitoring equipment, highway advisory radio, changeable message signs (CMS), and ramp metering.

TOS Master Plan

A plan developed by the County of Santa Clara that identifies \$42 million in TOS improvements for the expressway system.

Traffic Adaptive System

Traffic-adaptive signal control systems are designed to develop coordination patterns in real-time based on traffic flow data gathered, processed, and communicated to a central computer. The traffic flow data is gathered using a detector located in each lane at the signalized intersection.

Transit

Passenger service provided to the public along established routes via bus or rail. VTA operates most of the transit services in Santa Clara County.

Transit Center

A location where a concentration of transit services is provided, such as multiple bus routes and/or rail stations. It is a major transfer facility for transit patrons.

TSOM (Transportation Systems Operations/Management)

One of VTA's VTP 2020 funding programs intended for ITS type improvements.

TWG (Technical Working Group)

An Expressway Study advisory committee consisting of staff from twelve cities, Caltrans, MTC, and VTA. The TWG provided review and input to both project staff and the PAB.

U

Unincorporated Roads

Roads outside city limits. Counties are responsible for the operation and maintenance of unincorporated roads. In Santa Clara County, there are 635 centerline miles of unincorporated roads, including 248 miles of mountain roads.

US 101 Central Corridor Study

One of VTA's corridor studies identifying transportation needs and improvements for US 101 between Alum Rock Avenue to north of Hellyer Avenue. The study's boundaries extend to the first intersection on each side of US 101.

V

VTA (Santa Clara Valley Transportation Authority)

The Santa Clara Valley Transportation Authority (VTA) is an independent special district responsible for bus and light rail operations, congestion management, specific highway improvement projects, and countywide transportation planning. As such, VTA is both a transit provider, and a multimodal transportation planning organization involved with transit, highways and roadways, bikeways, pedestrian facilities, and land use. The VTA Board of Directors is comprised of 12 elected officials appointed by the member cities and County of Santa Clara.

VTP (Santa Clara Valley Transportation Plan)

A long-range plan developed by the VTA which provides policies and programs for transportation in the Santa Clara Valley including roadways, transit, ITS, bicycle, pedestrian facilities, and land use. The VTP is updated every three years. VTP 2020 was the first plan and was adopted in 2000. VTP 2030 is currently under development.

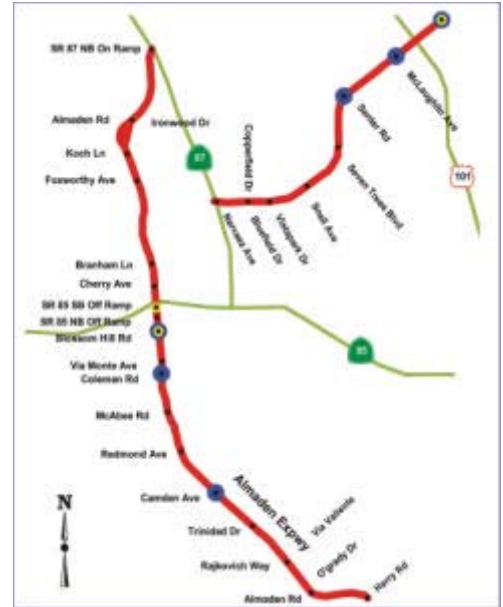
Appendix B

Summary of Recommendations by Expressway

Almaden Expressway

Vision High-end express arterial with freeway-like segments.

- Expressway Characteristics**
- 8.5 miles long
 - 4-8 lanes wide
 - 19 signalized intersections
 - 2 freeway connections (SR 85, SR 87)
 - 1 city served (San Jose)
 - 150,000 vehicles use Almaden daily
 - 2 LOS F intersections in 2001/2002
 - 3 LOS F intersections projected in 2025



Roadway Capacity and Operational Improvements The roadway improvement projects recommended for Almaden Expressway are listed below:

Tier Priority	Project Description ⁽¹⁾	Cost (millions)
Measure B/ Property Developer	Provide additional NB through lane on Almaden at Blossom Hill and SR 85 NB off-ramp intersections plus additional SB through lane on Almaden at Branham and Cherry intersections with additional left-turn lane at all four approaches at Cherry intersection	N.A.
1A	Widen to 8 lanes between Coleman and Blossom Hill including an additional left-turn lane from SB Almaden to Coleman and from EB and WB Coleman to Almaden, and a right-turn lane from WB Coleman to NB Almaden; a 4th SB and NB through lane on Almaden at Via Monte; and an additional left-turn (a total of three) from SB Almaden to EB Blossom Hill and an additional SB through lane at Blossom Hill intersection	\$6-8
1A	Initiate a Caltrans Project Study Report (PSR)/Project Development Study (PDS) to reconfigure SR 85/Almaden interchange	\$.25
1A	Provide interim operational improvements at SR 85/Almaden: widen SB Almaden to provide a 5th lane between the Best Buy driveway and SB loop on-ramp serving as auxiliary lane for weaving vehicles; widen SB SR 85 off-ramp to add a third left-turn; provide an additional EB approach lane resulting in two left-turn, one through/right shared, and two right-turn lanes	\$2
1C	Widen to 6 lanes starting south of Camden to conform with the current 6-lane segment south of Redmond with additional left-turn lane from EB and WB Camden to Almaden	\$5-6
2	Widen to 6 lanes from Almaden Road to south of Camden	\$10
3	Modify the SR 85/Almaden interchange to a par-clo type with loops in the NE and SE quadrants	\$20

(1) When funding is obtained, each project will undergo design, environmental review, and community outreach as appropriate. Project descriptions will be changed as needed based on the results of these activities.

NOTE:

Implementation of an extension of Almaden Expressway to Bailey Avenue and additional improvements for the existing Almaden Expressway will be determined by City of San Jose land use decisions.

Total Tier 1A	\$8.25-10.25
Total Tier 1C	\$5-6
Total Tier 2	\$10
Total Tier 3	\$20
Total	\$43.25-46.25

- Effectiveness of Roadway Improvements
- ◆ Expressway south of SR 85 would improve from LOS E to LOS D and north of SR 85 would continue to operate at LOS C or better.
 - ◆ All existing and projected LOS F intersections would be improved to LOS E or better.

- Bicycle Improvements
- ◆ All necessary re-striping to bring Almaden Expressway into compliance with the Bicycle Accommodation Guidelines (BAG) will be completed as part of a systemwide re-striping project.
 - ◆ Shoulder widening is needed between Ironwood and Koch for a total cost of \$2.0 million. \$1.6 million is funded by a grant creating a net need of \$0.4 million.

- Pedestrian Improvements
- Almaden has a generally continuous pedestrian system using sidewalks and parallel facilities.
- ◆ Seven pedestrian crossing enhancement locations were identified for trail, school, bus stop, and commercial access: O’Grady/Almaden, Via Valiente, Trinidad, Camden, Redmond, McAbee/Winfield, and Branham. Total potential cost is \$1.4 million.
 - ◆ A new pedestrian overcrossing (POC) is recommended near Coleman to connect trails and provide access to the Almaden light rail station. Estimated cost is \$4.0 million.
 - ◆ New sidewalks are recommended at the following locations:

New Sidewalk Locations	Project Need	Cost (millions)
NW quadrant at Camden	Gap closure	\$0.08
NE of Redmond	Gap closure	\$0.15
NE of McAbee	Gap closure	\$0.08
NE of Coleman	Gap closure	\$0.23
NE of Via Monte	Gap closure	\$0.15
SE of Cherry	Gap closure	\$0.16
NW of Branham	Connect to parallel path	\$0.06
NE of Koch	Connect to parallel path	\$0.04
Total		\$0.95

Sound Wall Improvements The Plan recommends both new sound walls and higher replacement walls at certain locations to meet noise standards. Recommendations are as follows:

Sound Wall Project Description	Cost (millions)
From Almaden/O'Grady to south of Camden <ul style="list-style-type: none"> Higher replacement walls along east side between Winfield and Redmond, and new walls between the existing and replacement walls Higher replacement and new walls SE of Trinidad 	\$0.69
Between Coleman and SR 85 <ul style="list-style-type: none"> New walls NE of Foxchase and west side between Mesa and Coleman 	\$0.34
Between SR 85 and SR 87 <ul style="list-style-type: none"> New walls NE and SE of Koch and SW of Cherry Higher replacement walls SW of Koch and NW of Cherry 	\$4.54
Total	\$5.6

Total Other Capital Costs The bicycle, pedestrian, and sound wall improvements recommended for Almaden total \$12.35 million. \$2.32 million of these costs are included in roadway project costs for a net need of \$10.03 million.

Other Improvements The Implementation Plan also includes recommendations for systemwide improvements in signal operations, landscaping, and maintenance (such as sweeping, pavement maintenance, graffiti removal, replacing aging sidewalks and sound walls). These recommendations apply to all expressways. For more information about these systemwide improvements, please see the following sections:

- ◆ Section 4 "Signals/Traffic Operations System (TOS)"
- ◆ Section 8 "Finishing Program" (includes landscaping discussion)
- ◆ Section 9 "Maintenance and Operations"

Capitol Expressway

Vision Corridor in transition to high-capacity arterial with light rail transit in median.

- Expressway Characteristics**
- 8.7 miles long
 - 6-8 lanes wide, including HOV lanes
 - 18 signalized intersections
 - 3 freeway connections (SR 87, US 101, I-680)
 - 1 city served (San Jose)
 - 300,000 vehicles use Capitol daily
 - 2 LOS F intersections in 2001/2002
 - 9 LOS F intersections projected in 2025



Roadway Capacity and Operational Improvements The roadway improvement projects recommended for Capitol Expressway are listed below:

Tier Priority	Project Description ⁽¹⁾	Cost (millions)
N.A.	Story to Nieman ⁽²⁾	TBD
1B	Interchange at Silver Creek ⁽³⁾	\$50-60
1C	Provide a third left-turn lane from SB Senter to EB Capitol	\$4.5
1C	Provide a third left-turn form SB McLaughlin to EB Capitol ⁽³⁾	\$3.5
1C	Provide a third left-turn lane from NB Aborn to WB Capitol and a second right-turn lane from EB Capitol to SB Aborn ⁽³⁾	\$5-6
1C	Provide a third left-turn shared with through lane from SB Capitol Avenue to the SB expressway	\$2
3	Freeway/expressway direct connector HOV ramps at US 101	\$20-30

Total Tier 1B	\$50-60
Total Tier 1C	\$15-16
Total Tier 3	\$20-30
Total	\$85-96

(1) When funding is obtained, each project will undergo design, environmental review, and community outreach as appropriate. Project descriptions will be changed as needed based on the results of these activities.

(2) Any potential roadway improvements for the Story to Nieman segment of Capitol Expressway will be determined through coordination with VTA's light rail project and San Jose's policies. The light rail project Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) to the Federal Transit Administration (FTA) will be released in late-2003.

(3) Actual improvements and cost estimates for the McLaughlin to Aborn segment of Capitol Expressway will be identified through VTA's US 101 Central Corridor Study to be completed by the end of 2003 or early 2004. Projects for McLaughlin, Silver Creek, and Aborn are listed here as placeholders.

- Effectiveness of Roadway Improvements
- ◆ Projected LOS information for the expressway north of Nieman to I-680 is not available since the future conditions with the planned LRT in place have not yet been fully defined.
 - ◆ The expressway from Nieman to McLaughlin would improve from LOS F to LOS E and from McLaughlin to SR 87 would continue to operate at LOS D.
 - ◆ All existing and projected LOS F intersections from Nieman to SR 87 would be improved to LOS E or better.

- Bicycle Improvements
- ◆ All necessary re-striping to bring the expressway into compliance with the Bicycle Accommodation Guidelines (BAG) will be completed as part of a systemwide re-striping project.
 - ◆ Specific bicycle improvements for the Story to Nieman area are being determined by the light rail project.
 - ◆ Shoulder widening is needed on the westbound approach at Silver Creek to provide a bicycle slot for a cost of \$0.2 million.

- Pedestrian Improvements
- The pedestrian plan for Capitol calls for sidewalks along almost the entire length of the expressway except in the Story to Nieman area where the light rail project is planning to provide a wide multi-use path along one side of the roadway.
- ◆ Seven pedestrian crossing enhancement locations were identified for school, bus stop, and commercial access: Bluefield, Vista Park, Snell, Seven Trees, Senter, Silver Creek, and Aborn. Total potential cost is \$1.4 million.
 - ◆ New sidewalk recommendations include:

New Sidewalk Location	Project Need	Cost (millions)
Vista Park to SR 87, south side	Gap closure	\$0.41
SW of Snell to SE of Monterey	Gap closure	\$0.41
Seven Trees to Senter, west side & SE of Senter	Gap closure & connect to parallel path	\$0.63
NE of Senter to NW of McLaughlin along Coyote Creek Park, north side	Connect to parallel path	\$0.21
SW of Quimby	Gap closure	\$0.41
Capitol Ave to I-680, west side	Connect to parallel path	\$0.36
Total		\$2.43

Sound Wall Improvements Sound wall needs for the area between Story and Nieman will be determined by the light rail project. The Plan recommends both new sound walls and higher replacement walls at certain locations to meet noise standards. Recommendations are as follows:

Sound Wall Project Description	Cost (millions)
Between SR 87 and US 101 <ul style="list-style-type: none"> • New walls along NE and SE of Senter, SW of Seven Trees, NW and SE of Vista Park, gap closure on south side between Vista Park and Bluefield, and NW of Bluefield • Higher replacement wall SE of Seven Trees 	\$3.46
New walls for gap closure between I-680 and Capitol Avenue.	\$0.28
Total	\$3.74

Total Other Capital Costs The bicycle, pedestrian, and sound wall improvements recommended for Capitol total \$7.77 million. \$1.16 million of these costs are included in roadway project costs for a net need of \$6.61 million.

Other Improvements The Implementation Plan also includes recommendations for systemwide improvements in signal operations, landscaping, and maintenance (such as sweeping, pavement maintenance, graffiti removal, replacing aging sidewalks and sound walls). These recommendations apply to all expressways. For more information about these systemwide improvements, please see the following sections:

- ◆ Section 4 “Signals/Traffic Operations System (TOS)”
- ◆ Section 8 “Finishing Program” (includes landscaping discussion)
- ◆ Section 9 “Maintenance and Operations”

Central Expressway



Vision High-end express arterial with freeway-like segments.

- Expressway Characteristics**
- 9.6 miles long
 - 4-6 lanes wide
 - 17 signalized intersections
 - Access to 3 freeways (US 101, SR 237, SR 85) and 2 expressways (San Tomas, Lawrence)
 - 5 cities served (Palo Alto, Mountain View, Sunnyvale, Santa Clara, San Jose)
 - 110,000 vehicles use Central daily
 - 3 LOS F intersections in 2001/2002
 - 3 LOS F intersections projected in 2025

Roadway Capacity and Operational Improvements The roadway improvement projects recommended for Central Expressway are listed below:

Tier Priority	Project Description ⁽¹⁾	Cost (millions)
1A	Widen between Mary and Lawrence to provide auxiliary and/or acceleration/deceleration lanes to improve ramp operations and safety ⁽²⁾	\$13
1A	Widen to 6 lanes between Lawrence and San Tomas Expressways without HOV lane operations ⁽³⁾	\$10
1A	Convert the Measure B HOV lane widening between San Tomas and De La Cruz to mixed flow and remove the HOV queue jump lanes at Scott, if unsuccessful after a 3 to 5 year trial period ⁽³⁾	\$0.1
2	Interchange at Rengstorff ⁽⁴⁾	\$60
2	Depress Central at light rail crossing near Whisman	\$35
2	At-grade improvements or interchange at Mary ⁽⁵⁾	\$4-50
2	Interchange at Bowers	\$45

(1) When funding is obtained, each project will undergo design, environmental review, and community outreach as appropriate. Project descriptions will be changed as needed based on the results of these activities.

(2) May also include a turning lane improvement at Central/Mary; this needs to be determined during project design.

(3) The existing LOS F intersections between Lawrence Expressway and De La Cruz will be mitigated if the widening is operated as mixed-flow. If the new lanes between San Tomas and De La Cruz remain designated as HOV after the trial period and the widening between Lawrence and San Tomas is operated as HOV lanes, then interchanges will be required at 2 of the LOS F intersections (Bowers and Lafayette) and will need to be placed in Tier 1B.

(4) Mountain View is pursuing options for grade separating the Caltrain railroad tracks from Rengstorff Avenue. If this project is built, the signalized intersection at Central and Rengstorff may degrade to LOS F, in which case the Central/Rengstorff interchange project will move into Tier 1B.

(5) Local and regional LOS standards are not projected to be violated at the Central/Mary intersection within the timeframe of the plan.

Total Tier 1A	\$23.1
Total Tier 2	\$144-190
Total	\$167.1-213.1

- Effectiveness of Roadway Improvements
- ◆ Expressway east of Lawrence would improve from LOS F to LOS D and west of Lawrence would remain LOS C or better.
 - ◆ All existing and projected LOS F intersections would be improved to LOS E or better.

Bicycle Improvements All necessary re-striping to bring the expressway into compliance with the Bicycle Accommodation Guidelines (BAG) will be completed as part of a systemwide re-striping project.

Pedestrian Improvements Central through Santa Clara and Sunnyvale has wide shoulders for emergency and occasional pedestrian use. In Mountain View, an incomplete system of sidewalks, informal paths, and parallel facilities are available for travel along the expressway.

- ◆ Four pedestrian crossing enhancement locations were identified for commercial and transit center access: Castro, Bernardo, Mary and Bowers. Total potential cost is \$0.8 million.
- ◆ New sidewalk recommendations include:

New Sidewalk Location	Project Need	Cost (millions)
NW of Mayfield	Gap closure	\$0.05
Moffett to Rengstorff, north side	Gap closure	\$0.90
Whisman to NW of SR 85, north side	Neighborhood circulation	\$0.41
NE of Mary	Connection to bus stop and businesses	\$0.05
Bowers to Oakmead, south side	Business access	\$0.41
SW quadrant at De La Cruz	Gap closure	\$0.05
Total		\$1.87

Sound Wall Improvements The Plan recommends both new soundwalls and higher replacement walls at certain locations to meet noise standards. Recommendations are as follows:

Sound Wall Project Description	Cost (millions)
From west of Rengstorff to SR 85 <ul style="list-style-type: none"> • New walls along north side from Rengstorff to Shoreline, NW and NE of Moffett 	\$2.33
North side between SR 85 and Whisman	\$0.63
From Mary to Lawrence <ul style="list-style-type: none"> • New walls SE of Pastoria, NE of Mathilda, and south side between Mathilda and Fair Oaks • Higher replacement wall along south side between Mary and Potrero, and SW of Pastoria 	\$2.14
Total	\$5.1

Total Other Capital Costs The pedestrian and sound wall improvements recommended for Central total \$7.77 million. \$2.95 million of these costs are included in roadway project costs for a net need of \$4.82 million.

Other Improvements The Implementation Plan also includes recommendations for systemwide improvements in signal operations, landscaping, and maintenance (such as sweeping, pavement maintenance, graffiti removal, replacing aging sidewalks and sound walls). These recommendations apply to all expressways. For more information about these systemwide improvements, please see the following sections:

- ◆ Section 4 "Signals/Traffic Operations System (TOS)"
- ◆ Section 8 "Finishing Program" (includes landscaping discussion)
- ◆ Section 9 "Maintenance and Operations"

Foothill Expressway

Vision Attractive express arterial, not freeway-like, that also plays an important role as a regional bicycle facility.

Expressway Characteristics

- 7.3 miles long
- 4 lanes wide
- 11 signalized intersections
- 1 freeway connection (I-280)
- 4 cities served (Cupertino, Los Altos, Los Altos Hills, Palo Alto)
- 110,000 vehicles use Foothill daily
- 1 LOS F intersections in 2001/2002
- 2 LOS F intersections projected in 2025



Roadway Capacity and Operational Improvements

The roadway improvement projects recommended for Foothill Expressway are listed below:

Tier Priority	Project Description ⁽¹⁾ ⁽²⁾	Cost (millions)
Expressway Study	Updated signal timing plan from Magdalena to Edith	N.A.
1A	Signal operational improvements between Edith and El Monte including adjacent side street intersections at Grant/St. Joseph	\$1.5
1A	Extend existing WB deceleration lane at San Antonio by 250 feet	\$0.5
1A	Replace Loyola Bridge (This improvement project should also provide necessary bicycle and pedestrian facilities, and channelization and operational improvements at adjacent intersections.)	\$10
Total Tier 1A		\$12
Total		\$12

(1) When funding is obtained, each project will undergo design, environmental review, and community outreach as appropriate. Project descriptions will be changed as needed based on the results of these activities.

(2) The Foothill/Page Mill intersection (an existing and 2025 LOS F intersection) is listed as part of Oregon-Page Mill Expressway.

Effectiveness of Roadway Improvements Foothill Expressway would continue to operate at LOS D and all existing and project LOS F intersections would be improved to LOS E or better.

- Bicycle Improvements
- ◆ All necessary re-striping to bring Foothill Expressway into compliance with the Bicycle Accommodation Guidelines (BAG) will be completed as part of a systemwide re-striping project.
 - ◆ Shoulder widening is needed at the following locations:

Bicycle Improvement Location	Project Description	Cost (millions)
San Antonio	Widen WB approach for approximately 300 feet to provide a bicycle slot	\$0.20
Magdalena	Widen EB approach for approximately 600 feet to provide a bicycle slot	\$0.30
Loyola	Provide more shoulder width in both directions under the Loyola Bridge	N.A. ⁽¹⁾
Total		\$0.50

(1) Must be completed as part of overall bridge reconstruction project (Tier 1A in Capacity/Operational Improvement Element)

Pedestrian Improvements Foothill has wide shoulders for emergency and occasional pedestrian use. It also has long stretches of frontage roads for pedestrian travel. Improvement recommendations include:

- ◆ Two pedestrian crossing enhancement locations were identified for school, park, and commercial access: St. Joseph/Grant and Main/Burke. Total potential cost is \$0.4 million. Crossing improvements for the El Monte, Magdalena, and Homestead intersections are already being made as part of the Safe Routes to Schools Program or Measure B Sales Tax Program.
- ◆ A new sidewalk southwest of Magdalena with connection to Boulder frontage road for a cost of \$0.05 million.

Sound Wall Improvements The Plan recommends both new sound walls and higher replacement walls at certain locations to meet noise standards. Recommendations are as follows:

Sound Wall Project Description	Cost (millions)
Spot improvements along the expressway <ul style="list-style-type: none"> • New walls on north side near Arroyo and adjacent to residences along Blue Oak, NW of El Monte, north side between El Monte and Springer, south side west of Springer and between Springer and east of Loyola, north side west and east of Grant, and south side between St. Joseph and Vineyard • Higher replacement wall NE of Loyola/Fremont 	\$8.84

Total Other Capital Costs The bicycle, pedestrian, and sound wall improvements recommended for Foothill total \$9.79 million. \$0.2 million is included in roadway project costs for a net need of \$9.59 million.

Other Improvements The Implementation Plan also includes recommendations for systemwide improvements in signal operations, landscaping, and maintenance (such as sweeping, pavement maintenance, graffiti removal, replacing aging sidewalks and sound walls). These recommendations apply to all expressways. For more information about these systemwide improvements, please see the following sections:

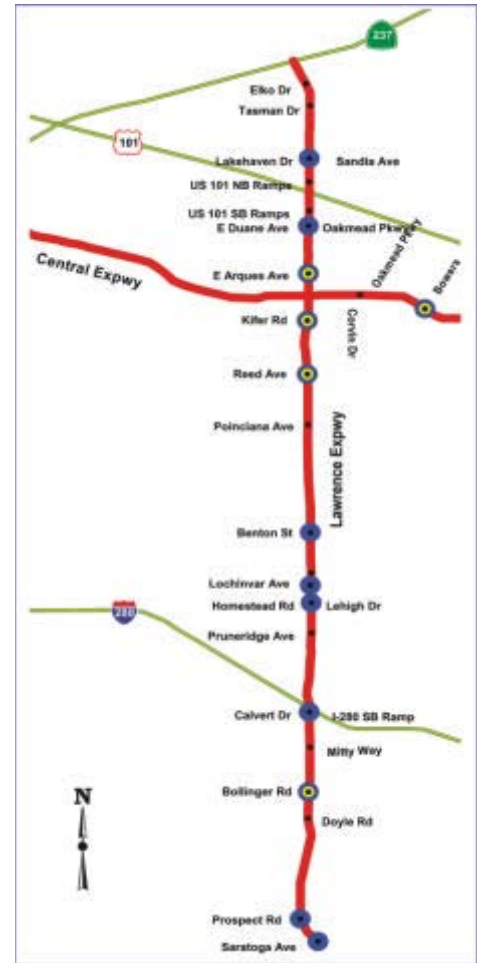
- ◆ Section 4 "Signals/Traffic Operations System (TOS)"
- ◆ Section 8 "Finishing Program" (includes landscaping discussion)
- ◆ Section 9 "Maintenance and Operations"

Lawrence Expressway

Vision Southern end more arterial-like; mid-section more high-end expressway with freeway-like segments; and northern end more high-end express arterial.

Expressway Characteristics

- 8.7 miles long
- 6-8 lanes wide, including HOV lanes
- 23 signalized intersections
- 3 freeway connections (I-280, US 101, SR 87)
- 5 cities served (Saratoga, San Jose, Cupertino, Santa Clara, Sunnyvale)
- 280,000 vehicles use Lawrence daily
- 4 LOS F intersections in 2001/2002
- 12 LOS F intersections projected in 2025



Roadway Capacity and Operational Improvements

The roadway improvement projects recommended for Lawrence Expressway are listed below:

Tier Priority	Project Description ⁽¹⁾	Cost (millions)
1A	Optimize signal coordination along Lawrence-Saratoga Avenue corridor including Lawrence/Prospect, Lawrence/Saratoga, Saratoga/Prospect, and Saratoga/Cox intersections	\$0.1
1A	Widen to 8 lanes between Moorpark/Bollinger and south of Calvert with additional WB through lane at Moorpark	\$4
1A	Coordinate and optimize signal phasing and timing plans at I-280/Lawrence interchange area including City of Santa Clara signals along Stevens Creek and County's signal at Lawrence/Calvert/I-280 SB ramp	\$0.1
1A	Prepare Caltrans PSR for Tier 1C project at the Lawrence/Calvert/I-280 interchange area	\$0.5
1A	Close median at Lochinvar and right-in-and-out access at DeSoto, Golden State, Granada, Buckley, and St. Lawrence/Lawrence Station on-ramp	\$0.5
1A	Convert high-occupancy vehicle (HOV) to mixed-flow lanes between US 101 and Elko due to high violation rates & operational problems	\$0.1
1B	Interchange at Monroe	\$45
1B	Interchange at Kifer	\$45
1B	Interchange at Arques with square loops along Kern and Titan	\$35

Roadway Capacity and Operational Improvements (continued)

Tier Priority	Project Description ⁽¹⁾	Cost (millions)	
1C	Provide additional left-turn lane from EB Saratoga to NB Lawrence	\$2	
1C	Provide additional left-turn lane from EB Prospect to NB Lawrence	\$2	
1C	Interim improvements at Lawrence/Calvert/I-280: provide additional SB through lane at Calvert; widen I-280 SB on-ramp to provide additional mixed-flow lane; and construct I-280 SB slip on-ramp from Calvert west of Lawrence and prohibit EB through movement at Calvert/Lawrence intersection	\$8	
1C	Provide additional EB through lane on Homestead ⁽²⁾	\$2	
1C	Provide additional left-turn lane from WB Benton to SB Lawrence	\$2	
1C	Provide a 3rd left-turn lane from EB Oakmead/Duane to NB Lawrence	\$2	
2	Signalize the Wildwood Ave. intersection including opening the median, realigning Wildwood Ave., and re-timing signals between Elko and US 101	\$4	
2	Interchange at Tasman ⁽³⁾	\$45	
3	Initiate a feasibility study to provide direct access between Lawrence, I-280, and Stevens Creek, and HOV direct connectors at this interchange area	\$1	
3	Reconstruct the interchange to provide direct access ramps between Lawrence, I-280, and Stevens Creek, and HOV direct connectors	\$250-300	
3	Freeway/expressway direct connector HOV ramps at US 101	\$20-30	
<p>(1) When funding is obtained, each project will undergo design, environmental review, and community outreach as appropriate. Project descriptions will be changed as needed based on the results of these activities.</p> <p>(2) Additional EB through at the Homestead intersection would not improve the projected 2025 LOS from F to E or better. However, it would reduce average intersection delay significantly.</p> <p>(3) Local and regional LOS standards are not projected to be violated at the Lawrence/Tasman intersection within the timeframe of the plan.</p>		Total Tier 1A	\$5.3
		Total Tier 1B	\$125
		Total Tier 1C	\$18
		Total Tier 2	\$49
		Total Tier 3	\$271-331
		Total	\$468.3-528.3

Effectiveness of Roadway Improvements

- ◆ Expressway south of I-280 would improve from LOS E to LOS D and north of I-280 from LOS E and D to LOS C or better.
- ◆ All but one of the existing and projected LOS F intersections would be improved to LOS E or better. The remaining intersection at Homestead would remain a projected LOS F location but the recommended Tier 1C roadway improvement would reduce average intersection delay significantly.

Bicycle Improvements

- ◆ All necessary re-striping to bring the expressway into compliance with the Bicycle Accommodation Guidelines (BAG) will be completed as part of a system-wide re-striping project.
- ◆ Shoulder widening is needed near Pruneridge and from El Camino Real to Kifer and will be implemented as part of the County's 2003 Pavement Maintenance Project.

Pedestrian Improvements

Lawrence has a generally continuous pedestrian system using sidewalks and parallel facilities.

- ◆ Ten pedestrian crossing enhancement locations were identified for school, trail, bus stop, and commercial access: Prospect, Moorpark, Mitty, Pruneridge, Homestead, Benton, Cabrillo, Reed/Monroe, Sandia/Lakehaven, and Tasman. Total potential cost is \$2.0 million.
- ◆ New sidewalks are recommended at the following locations:

New Sidewalk Locations	Project Need	Cost (millions)
Saratoga to Prospect, east side	Gap closure	\$0.18
SE of Pruneridge	Connection to parallel path	\$0.03
North of Pruneridge, east side	Gap closure	\$0.18
SW of Benton	Gap closure	\$0.03
NW of Lakehaven	Connection between parallel paths	\$0.14
North of Palamos to Tasman, east side	Connection between parallel paths, bus stop connection	\$0.25
North of Elko to Caribbean, east side	Neighborhood circulation	NA ⁽¹⁾
Total		\$0.81

(1) This sidewalk will require widening of the overpass at SR 237. An estimated cost is not available but could be \$5 to \$10 million. It should be noted that sidewalks are provided north of Elko along the west side over the overpass through to Caribbean Drive.

Sound Wall Improvements

The Plan recommends both new soundwalls and higher replacement walls at certain locations to meet noise standards. Recommendations are as follows:

Sound Wall Project Description	Cost (millions)	
Between I-280 and Central	\$2.63	
<ul style="list-style-type: none"> • Higher replacement walls on west side near Dahlia, SW of Poinciana, east side near St. Lawrence, NW of Granada, both sides between Granada and Benton, NW of Homestead and SW of Pruneridge 		
Higher replacement wall NW of Prospect	\$0.96	
Total		\$3.59

The sound walls north of I-280 are relatively new having been built when the HOV lane was added. This Study used the latest federal and state criteria, which included new second floor guidelines not available when the HOV lane was added.

Total Other Capital Costs The pedestrian and sound wall improvements recommended for Lawrence total \$6.4 million. \$1.6 million of these costs are included in roadway project costs for a net need of \$4.8 million.

Other Improvements The Implementation Plan also includes recommendations for systemwide improvements in signal operations, landscaping, and maintenance (such as sweeping, pavement maintenance, graffiti removal, replacing aging sidewalks and sound walls). These recommendations apply to all expressways. For more information about these systemwide improvements, please see the following sections:

- ◆ Section 4 "Signals/Traffic Operations System (TOS)"
- ◆ Section 8 "Finishing Program" (includes landscaping discussion)
- ◆ Section 9 "Maintenance and Operations"

Montague Expressway

Vision Multimodal, pedestrian friendly arterial roadway in Milpitas east of I-880; west of I-880, high-end express arterial with freeway-like segments.

Expressway Characteristics

- 6 miles long
- 6-8 lanes wide, including HOV lanes
- 13 signalized intersections
- 3 freeway connections (US 101, I-880, I-680)
- 3 cities served (Santa Clara, San Jose, Milpitas)
- 290,000 vehicles use Montague daily
- 8 LOS F intersections in 2001/2002
- 8 LOS F intersections projected in 2025



Roadway Capacity and Operational Improvements

The roadway improvement projects recommended for Montague Expressway are listed below:

Tier Priority	Project Description ⁽¹⁾	Cost (millions)
1A	Convert HOV lanes on 6-lane facility to mixed-flow use between I-880 and I-680 due to operational and safety problems	\$0.1
1A	Baseline project consisting of 8-lane widening and I-880 par-clo interchange with at-grade improvements at Lick Mill, Plumeria/River Oaks, Main/Old Oakland, and McCandless/Trade Zone; designate new lanes between I-880 and I-680 as HOV for a 3 to 5 year trial period	\$38.5
1B	At-grade improvements at Mission College and par-clo interchange at US 101	\$11
1B	Trimble Flyover	\$15
1B	McCarthy-O'Toole square loop interchange	\$60
2	Interchange at Mission College	\$55
2	Interchange at Great Mall/Capitol ⁽²⁾	\$42
3	Freeway/expressway direct connector HOV ramps at US 101	\$30-45
3	I-680 interchange modification	\$20

(1) When funding is obtained, each project will undergo design, environmental review, and community outreach as appropriate. Project Descriptions will be changed as needed based on the results of these activities.

(2) If the new HOV lanes between I-880 and I-680 remain designated as HOV after the trial period, the Great Mall/Capitol interchange may need to be moved into Tier 1B.

Total Tier 1A	\$38.6
Total Tier 1B	\$86
Total Tier 2	\$97
Total Tier 3	\$50-65
Total	\$271.6-286.6

Effectiveness of Roadway Improvements

- ◆ Corridor east of I-880 would improve from LOS F to LOS E.
- ◆ Corridor west of I-880 would remain LOS F; however, there would be a 25% reduction in delay and 13-minute reduction in travel time.
- ◆ 7 of the existing LOS F intersections and 6 of the projected LOS F intersections would be improved to LOS E or better.

Bicycle Improvements

All necessary re-striping and shoulder widening improvements needed to bring Montague Expressway into compliance with the Bicycle Accommodation Guidelines (BAG) are included as part of the Tier 1A 8-lane roadway widening project.

Pedestrian Improvements

Sidewalks are planned for the entire length of Montague Expressway and will be added as part of the 8-lane roadway widening project. Two crossing enhancement locations were identified – at North First Street and at Great Mall Parkway/Capital Avenue for a total cost of \$0.4 million.

Sound Wall Improvements

Higher sound walls are recommended on the south side of Montague Expressway between Lafayette Street and Guadalupe River. They will be constructed as part of the 8-lane roadway widening project.

Other Improvements

The Implementation Plan also includes recommendations for systemwide improvements in signal operations, landscaping, and maintenance (such as sweeping, pavement maintenance, graffiti removal, replacing aging sidewalks and sound walls). These recommendations apply to all expressways. For more information about these systemwide improvements, please see the following sections:

- ◆ Section 4 “Signals/Traffic Operations System (TOS)”
- ◆ Section 8 “Finishing Program” (includes landscaping discussion)
- ◆ Section 9 “Maintenance and Operations”

Oregon-Page Mill Expressway

Vision Multimodal, pedestrian friendly arterial roadway with slower, smooth-flowing traffic.

Expressway Characteristics

- 4.7 miles long
- 4 lanes wide
- 14 signalized intersections
- 2 freeway connections (US 101, I-280)
- 2 cities served (Palo Alto, Los Altos Hills)
- 50,000 vehicles use Oregon-Page Mill daily
- 1 LOS F intersections in 2001/2002
- 1 LOS F intersections projected in 2025



Roadway Capacity and Operational Improvements

The roadway improvement projects recommended for Oregon-Page Mill Expressway are listed below:

Tier Priority	Project Description ⁽¹⁾	Cost (millions)
Expressway Study	Updated signal timing plan from El Camino Real to Indian	N.A.
1A	I-280/Page Mill interchange modification: remove SB loop on-ramp and construct SB diagonal on-ramp with signal operations; signalize NB off-ramp intersection; and provide proper channelization for pedestrians and bicycles	\$5
1A	Alma Bridge Replacement Feasibility Study	\$0.25
1A	Oregon corridor improvements: <ul style="list-style-type: none"> • Replace signal poles and optimize timing plan avoiding impacts on safety at unsignalized intersections • Construct pedestrian ramps with relocation of traffic signal poles at signalized intersections • Study operational changes at the unsignalized intersections at Waverley, Ross, and Indian that avoid increasing traffic impacts on cross and parallel streets, enhance bicycle and pedestrian safety, and maintain vehicle safety • Conduct feasibility study of adding turn lane at Middlefield Road and converting to 8-phase signal operation to enhance efficiency and safety without taking right-of-way 	\$5
2	Provide a separate right-turn lane from WB Oregon to El Camino Real and lengthen left-turn lane from WB Oregon to El Camino Real ⁽²⁾	N.A.

Roadway Capacity and Operational Improvements (continued)	Tier Priority	Project Description ⁽¹⁾	Cost (millions)	
	3	Add a second SB right-turn lane from Junipero Serra to Page Mill; extend the SB right-turn lane half way to Stanford Avenue intersection. Maintain through bike lane, no free right-turn lane, avoid inadvertently inducing traffic shift onto Stanford ⁽³⁾	\$2-4	
	3	Alma Bridge Reconstruction	\$100	
			Total Tier 1A	\$10.25
			Total Tier 3	\$102-104
			Total	\$112.25-114.25

(1) When funding is obtained, each project will undergo design, environmental review, and community outreach as appropriate. Project descriptions will be changed as needed based on the results of these activities.

(2) Palo Alto may conduct further studies and minor operational improvements for the Oregon-Page Mill/El Camino Real intersection, as specified in the City's Comprehensive Plan.

(3) Although this is an existing LOS F intersection, Palo Alto would like to wait on improvements until the benefits of the Sand Hill Road improvements and programs to encourage alternate modes of transportation on the LOS at this location can be evaluated. Should a future evaluation indicate improvements are still needed, the project could be moved into Tier 1 with Palo Alto's concurrence.

Effectiveness of Roadway Improvements Oregon-Page Mill would continue to operate at LOS D and the LOS F intersection would be improved to LOS E or better.

Bicycle Improvements All necessary re-striping to bring the expressway into compliance with the Bicycle Accommodation Guidelines (BAG) will be completed as part of a systemwide re-striping project. Shoulder widening is needed through the Alma bridge area; however, this widening must be completed as part of the bridge reconstruction project.

Pedestrian Improvements Oregon has continuous frontage roads along the north side for pedestrian use and Page Mill has sidewalks from El Camino Real to Foothill Expressway. A parallel path is recommended for pedestrian travel west of Foothill. Pedestrian crossing enhancements are recommended at six locations along Oregon (El Camino Real, Bryant, Cowper, Middlefield, Louis, and Greer). The primary need is to add pedestrian ramps, which will require moving signal poles. These ramps are included in the Tier 1A Oregon Corridor Improvement project.

Sound Wall Improvements Preliminary noise level analysis indicates that sound mitigation measures along both sides of Oregon between US 101 and Alma may be warranted. Sound walls would be one potential measure and would cost \$5.7 million. It is recommended that sound mitigation measures be considered when the existing landscaping reaches the end of its life cycle and needs replacement allowing an integrated installation plan to be pursued.

Other Improvements The Implementation Plan also includes recommendations for systemwide improvements in signal operations, landscaping, and maintenance (such as sweeping, pavement maintenance, graffiti removal, replacing aging sidewalks and sound walls). These recommendations apply to all expressways. For more information about these systemwide improvements, please see the following sections:

- ◆ Section 4 "Signals/Traffic Operations System (TOS)"
- ◆ Section 8 "Finishing Program" (includes landscaping discussion)
- ◆ Section 9 "Maintenance and Operations"

San Tomas Expressway

Vision High-end express arterial with freeway-like segments.

Expressway Characteristics

- 8.5 miles long
- 6-8 lanes wide, including HOV lanes
- 19 signalized intersections
- 2 freeway connections (SR 17, US 101)
- 3 cities served (Campbell, San Jose, Santa Clara)
- 220,000 vehicles use San Tomas daily
- 9 LOS F intersections in 2001/2002
- 12 LOS F intersections projected in 2025



Roadway Capacity and Operational Improvements

The roadway improvement projects recommended for San Tomas Expressway are listed below:

Tier Priority	Project Description ⁽¹⁾	Cost (millions)
Expressway Study	Updated signal timing plans from Budd to Hamilton and Moorpark to Scott	N.A.
Measure B	Provide a 2nd left-turn lane from EB and WB Campbell to San Tomas and a separate right-turn lane from WB Campbell to NB San Tomas	N.A.
1A	At grade improvements at SR 17/San Tomas: <ul style="list-style-type: none"> • Restripe the EB through lane on White Oaks to provide an optional left as 3rd left-turn lane • Provide second right-turn lane on SB off-ramp • Study potential operational & safety improvements in the interchange area 	\$2
1A	Provide a 2nd left-turn lane from EB and WB Hamilton to San Tomas and a 2nd left-turn lane from NB San Tomas to WB Hamilton	\$2
1A	Widen to 8 lanes between Williams and El Camino Real with additional left-turn lane from EB and WB El Camino Real to San Tomas	\$28
1A	Provide additional right-turn lane from WB Monroe to NB San Tomas	\$1
1C	Provide additional right-turn lane from WB Scott to NB San Tomas	\$1
2	Interchange at Stevens Creek	\$50-70
2	Interchange at El Camino Real	\$60
2	Interchange at Monroe	\$55
2	Interchange at Scott	\$65

Roadway Capacity and Operational Improvements (continued)

Tier Priority	Project Description ⁽¹⁾	Cost (millions)	
3	Initiate a study to reconfigure SR 17/San Tomas Interchange	\$0.25	
3	Reconstruct SR 17/San Tomas Interchange	\$100-200	
3	Freeway/expressway direct connector HOV ramps at US 101 and I-280	\$30-45	
(1) When funding is obtained, each project will undergo design, environmental review, and community outreach as appropriate. Project descriptions will be changed as needed based on the results of these activities.		Total Tier 1A	\$33
		Total Tier 1C	\$1
		Total Tier 2	\$230-250
		Total Tier 3	\$130.25-245.25
		Total	\$394.25-529.25

Effectiveness of Roadway Improvements

- ◆ Expressway south of I-280 would improve from LOS E to LOS D and north of I-280 from LOS E to LOS C or better.
- ◆ All of the existing and projected LOS F intersections would be improved to LOS E or better.

Bicycle Improvements

- ◆ All necessary re-striping to bring San Tomas Expressway into compliance with the Bicycle Accommodation Guidelines (BAG) will be completed as part of a systemwide re-striping project.
- ◆ Shoulder widening recommendations include:

Location	Project Description	Cost (millions)
Hamilton	Widen SB approach for approximately 275 feet to provide adequate shoulder per BAG	\$0.25
Cabrillo	Widen NB approach for approximately 375 feet to provide adequate shoulder per BAG	\$0.20
Total		\$0.45

Pedestrian Improvements

Most of San Tomas has wide shoulders for emergency and occasional pedestrian use with sidewalks provided at bus stops and at the Los Gatos Creek Trail connection.

- ◆ Four pedestrian crossing enhancement locations were identified for school, bus stop, and commercial access: Williams, Homestead, El Camino Real, and Cabrillo. Total potential cost is \$0.8 million.
- ◆ A new pedestrian overcrossing (POC) is recommended near Latimer to connect various community facilities at a cost of \$4.0 million.

- Pedestrian Improvements (continued)
- ◆ The Plan supports efforts to cover the open creek culvert along the west side of the expressway from Hamilton to Moorpark to create a landscaped, parkstrip walkway.
 - ◆ New sidewalks are recommended at the following locations:

New Sidewalk Location	Project Need	Cost (millions)
SW of Stevens Creek	Gap closure	\$0.38
NE quadrant at Pruneridge	Bus stop connection	\$0.03
NW quadrant at Walsh	Bus stop connection	\$0.08
Total		\$0.49

Sound Wall Improvements The Plan recommends both new sound walls and higher replacement walls at certain locations to meet noise standards. Recommendations are as follows:

Sound Wall Project Description	Cost (millions)
Between SR 17 and Williams <ul style="list-style-type: none"> • New walls along west side and gap closure on east side between Williams and Payne, SE of Hamilton, west side near Bucknall, SW of Budd, and NW of Winchester ramp • Higher replacement walls along east side from south of Hamilton to north of Campbell and from Budd to Winchester 	\$5.56
Between Williams and El Camino Real <ul style="list-style-type: none"> • Higher replacement walls east side from El Camino Real to Forbes, SW of Benton, SW of Saratoga, west side adjacent to Greenlee residences north of I-280 and Larkmead residences south of I-280, and east side gap closure north of Williams 	\$5.39
Between El Camino Real and Central <ul style="list-style-type: none"> • Higher replacement walls along NW and NE of Cabrillo, and east side from Cabrillo to El Camino Real 	\$2.14
Total	\$13.09

Total Other Capital Costs The bicycle, pedestrian, and sound wall improvements recommended for San Tomas total \$18.83 million. \$6.24 million of these costs are included in roadway project costs for a net need of \$12.59 million.

Other Improvements The Implementation Plan also includes recommendations for systemwide improvements in signal operations, landscaping, and maintenance (such as sweeping, pavement maintenance, graffiti removal, replacing aging sidewalks and sound walls). These recommendations apply to all expressways. For more information about these systemwide improvements, please see the following sections:

- ◆ Section 4 "Signals/Traffic Operations System (TOS)"
- ◆ Section 8 "Finishing Program" (includes landscaping discussion)
- ◆ Section 9 "Maintenance and Operations"

Appendix C

Summary of Plan Endorsement Actions

APPENDIX C

Summary of Plan Endorsement Actions

On March 25, 2003, the Board of Supervisors released the draft *Implementation Plan* for review and comment. During the comment period, the city councils of the ten cities with existing expressway mileage reviewed the plan. Listed below is a summary of the cities' actions and comments. The final *Implementation Plan* was revised to reflect the comments received as appropriate.

City	Date	Action Taken
Milpitas	April 1, 2003	Endorsed the plan.
San Jose	May 5, 2003	<p>The Council's Building Better Transportation committee approved the plan with the following comments:</p> <ul style="list-style-type: none"> • Include in the document a statement about the community's request that the culvert adjacent to San Tomas Expressway be covered and used as a landscaped walkway. • A mechanism is needed to seize opportunities that come along in between the 3-year plan update cycles. <p>The full City Council received the committee's report on May 20 with no further comments.</p>
Campbell	May 6, 2003	<p>Approved the plan with the following comments:</p> <ul style="list-style-type: none"> • Recommend that the County with VTA pursue local matching funds for the San Tomas Expressway/Hamilton LOS improvement project. • Reiterated the City's position of not supporting a closure of the East Sunnyoaks Avenue on-ramp to San Tomas Expressway.
Saratoga	May 7, 2003	Endorsed the plan.
Sunnyvale	May 13, 2003	<p>Endorsed the plan with the following comments:</p> <ul style="list-style-type: none"> • Future improvements at the intersection of Central Expressway/Mary Avenue and Lawrence Expressway/Tasman Drive should be listed with the notation that local and regional LOS standards are not projected to be violated at these locations within the timeframe of the plan. • Encourage the County of Santa Clara to pursue shared cooperative local match funding with adjacent local jurisdictions for expressway capital project needs. • VTP 2020 Local Streets and County Roads program funds should be made available for expressways improvements.
Cupertino	May 19, 2003	Endorsed the plan.
Santa Clara	May 20, 2003	Endorsed the plan.
Los Altos	May 27, 2003	Endorsed the plan.
Mountain View	July 8, 2003	Endorsed the plan.
Palo Alto	August 14, 2003	Endorsed the plan, including changes made at the request of the City's Planning and Transportation Commission.

Additional Endorsement

The Silicon Valley Manufacturing Group endorsed the plan in July 2003 with a request that the County consider making some of the funds in the Signals & Traffic Operations System Element discretionary to enable the County to take advantage of new technologies that become available during the life of this planning document.

Acknowledgements

Acknowledgements

Special thanks to the Policy Advisory Board and Technical Working Group for their commitment, time and efforts.



Policy Advisory Board

Left to right: Dave Cortese (VTA Board Member), Matt Pear (Mountain View Vice Mayor), Don Burr (Campbell Vice Mayor), Dave Fadness (County Roads Commissioner), Ted Brown (County Roads Commissioner), Aldyth Parle (Santa Clara Councilmember), Linda LeZotte (San Jose Councilmember), Tim Risch (Sunnyvale Vice Mayor), Sandra James (Cupertino Vice Mayor), Ann Waltonsmith (Saratoga Vice Mayor), James T. Beall, Jr. (County Supervisor), Patricia Dixon (Milpitas Vice Mayor), Yoriko Kishimoto (Palo Alto Councilmember), Don Gage (County Supervisor).

Not Pictured: Tom Springer (Gilroy Mayor), Francis La Poll (Los Altos Councilmember), Dennis Kennedy (Morgan Hill Mayor), Michael Kasperzak (Mountain View Mayor), Pat Dando (San Jose Vice Mayor), Manual Valerio (VTA Board Member).

Technical Working Group

Zachary Chop

Caltrans

Matthew Jue

City of Campbell

Ralph Qualls

City of Cupertino

Kristi Abrams

City of Gilroy

Jim Porter

City of Los Altos

Tom Ho

City of Los Altos

Joseph (Joe) J. Oliva

City of Milpitas

Jim Rowe

City of Morgan Hill

Dennis Belluomini

City of Mountain View

Joseph Kott

City of Palo Alto

Chris Ching

City of San Jose

Ben Tripousis

City of San Jose

David Pitton

City of Santa Clara

Morgan Kessler

City of Saratoga

Jack Witthaus

City of Sunnyvale

Marc Roddin

MTC

Doug Johnson

MTC

Carolyn Gonot

VTA

Jim Lightbody

VTA

Julie Render

VTA

Casey Emoto

VTA

Acknowledgements

County of Santa Clara

Project Staff

Michael Murdter, Director
Roads & Airports Department

Dan Collen, Senior Civil Engineer
Study Project Manager

Dawn Cameron
Consulting Transportation Planner

Contributing Staff

Rollo Parsons, Branch Manager
Design & Construction

Jon Elson, Branch Manager
Traffic & Electrical Operations

Alan Jones, Branch Manager
Roads & Fleet Operations

Masoud Akbarzadeh, County Traffic Engineer
Traffic & Electrical Operations

Ananth Prasad, Associate Civil Engineer
Traffic & Electrical Operations

Bernardine Caceres, Civil Engineer
Design & Construction

Ruth Marston, Deputy Clerk
Clerk of the Board

Consultant Staff

Chwen Siripocanont
Team Project Manager
CCS Planning and Engineering, Inc.

Betty Caudle
Project Assistant
CCS Planning and Engineering, Inc.

Steve Fitzsimons
Pedestrian/ITS
CCS Planning and Engineering, Inc.

Kevin Picanco
Civil/Roadway Design
CCS Planning and Engineering, Inc.

David Kobayashi
Traffic/Bicycle
CCS Planning and Engineering, Inc.

Tim McKimson
Landscaping
AAM Design, Inc.

Eileen Goodwin
Public Outreach/Funding
Apex Strategies, Inc.

Robert Burkhalter
Photographer
Robert Burkhalter Photography

Ruth Bernstein
Public Outreach
Evans/McDonough Company, Inc.

Mike Aronson
Travel Forecast
Dowling Associates, Inc.

Keith Higgins
Traffic
Higgins Associates, Inc.

Mike O'Connor
Noise
MO'C Physics Applied

Chris Metzger
Civil/Roadway Design
Nolte and Associates, Inc.

Steven Grover
Pedestrian Overcrossing
SGA Architecture & Engineering

John Ciccarelli
Bicycle
TransSight/Bicycle Solutions LLC