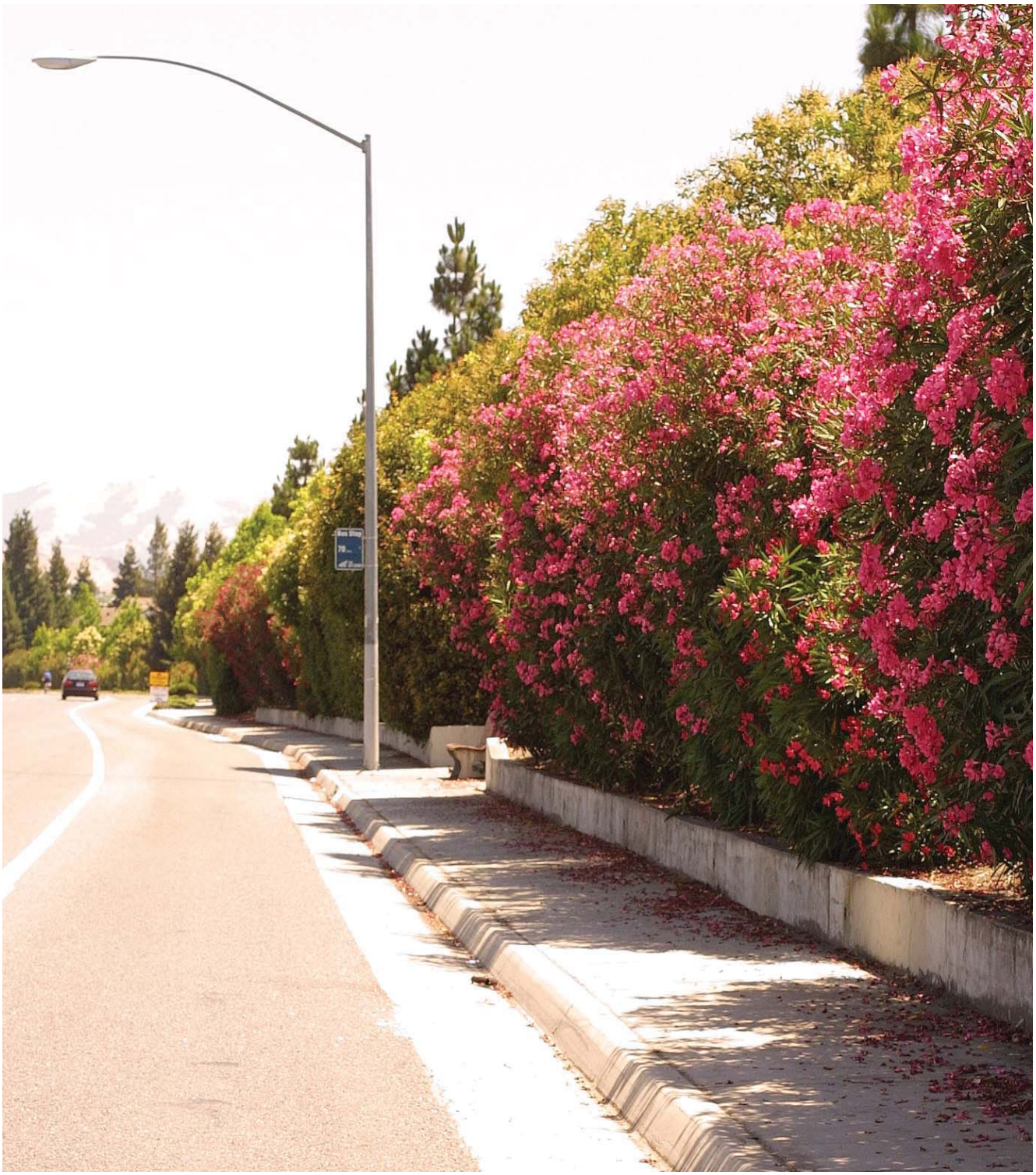


SECTION EIGHT

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

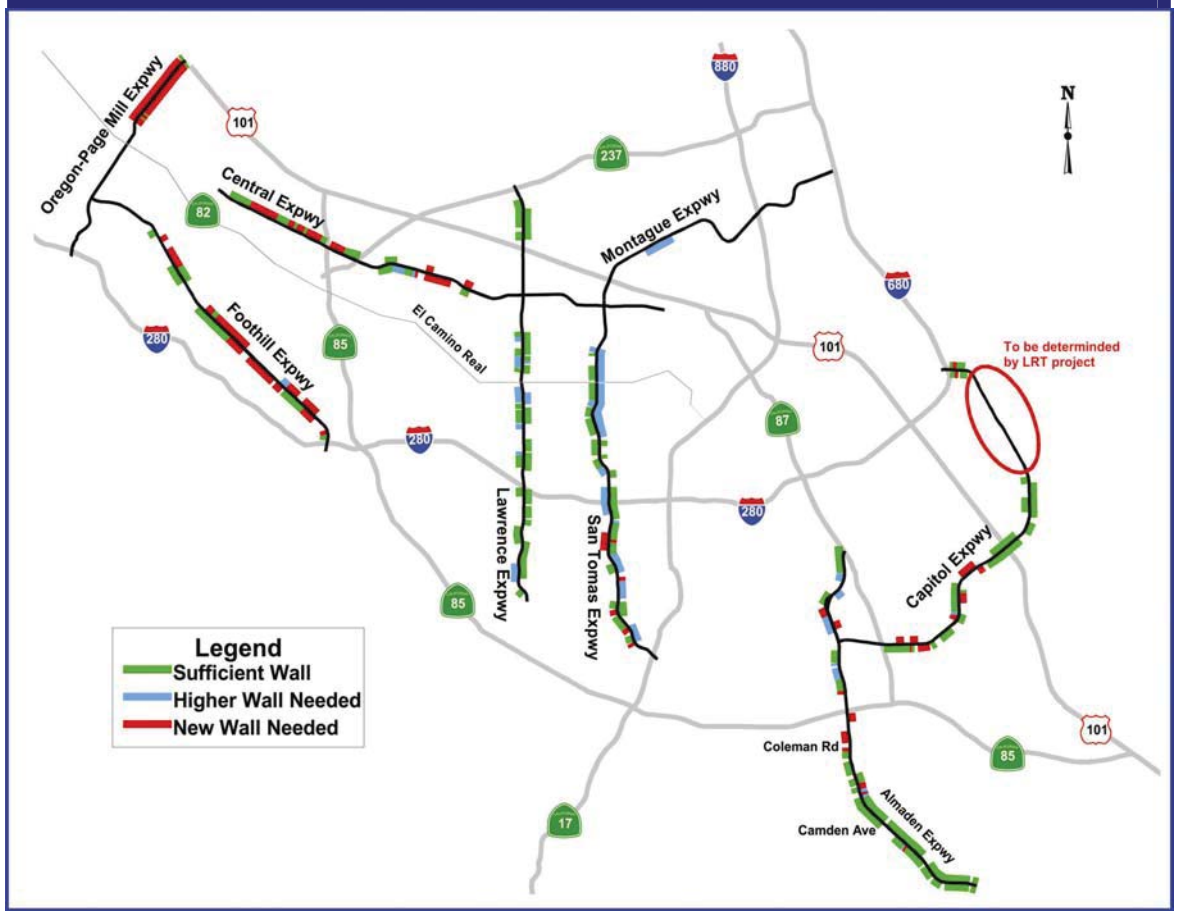
The initial results of the sound wall needs assessment were shared with city staff, policymakers, and the community. Some of the locations identified as potentially needing new sound walls were not supported due to conflicts with community preferences and plans. These locations were deleted from the 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 • 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 • New walls NE of Foxchase and west side between Mesa and Coleman	$0.37	--	Tier 1A roadway project
	Between SR 85 and SR 87 • 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 • 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 • 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 • 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	Tier 1A roadway project
Foothill	Spot improvements along the expressway • 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 • 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 • 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 • 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 • 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.