ROADSIDE ASSETS

BIKEWAYS

CONGESTION

TRANSIT

SAFETY

ANNUAL FY 2018 TRANSPORTATION SYSTEMS MONITORING PROGRAM (TSMP) REPORT

October 2018

BRIDGES | CURB & GUTTER

LITTER | LANDSCAPE | GRAFFITI

Santa Clara Valley Transportation Authority

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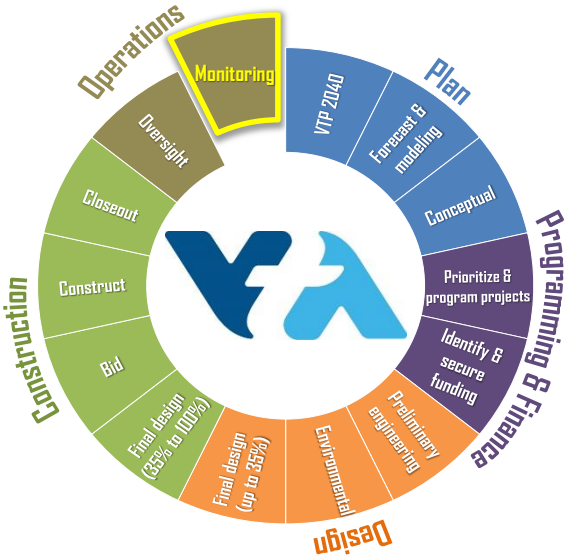


Why Monitor?

Santa Clara County residents and businesses have made significant investments in its transportation infrastructures. To maintain the functionality of these assets, local agencies raised concerns about the current conditions of the assets and their ability to maintain them. To address this issue, VTA's Technical Advisory Committee initiated an effort to develop a countywide Transportation System Monitoring Program (TSMP), which was adopted by the VTA Board of Directors in September 2008.

The primary purpose of this report is to serve as an asset management tool by providing an inventory and general assessment on the conditions and performance of selected key transportation systems on an annual basis in a single report.

Other benefits include:

- Enable the County and external stakeholders to better understand the performance of the County's transportation system and effectiveness of the investments;
- Communicate progress towards stated transportation system goals and objectives;
- Provide additional context for future funding and policy decisions.

In addition, the TSMP follows the goals of Moving Ahead for Progress in the 21st Century (MAP-21), the federal reauthorization transportation funding program that emphasizes performance-based management of transportation infrastructure assets at the state and local levels.

Introduction

The FY 2018 TSMP Report is the 8th edition of this report since the Program was first released in 2010. Each report highlighted additional areas of Santa Clara County's transportation network as new information became available:

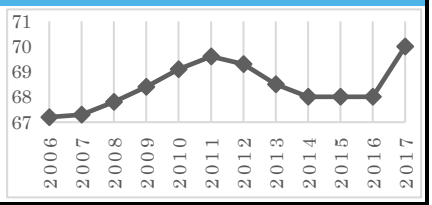
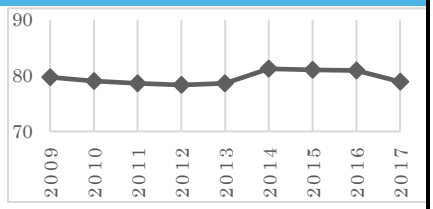
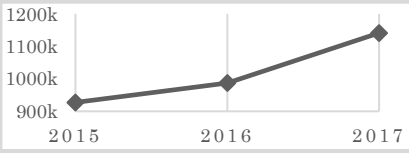
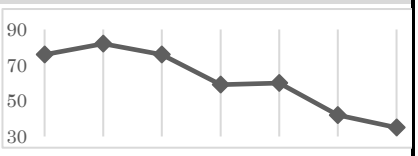
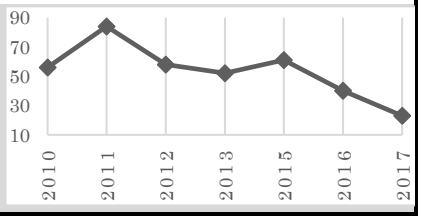
- 2011 (2nd ed.) introduced monitoring of litter and landscape conditions on the highways.
- 2013 (3rd ed.) featured an inventory of traffic signal systems and introduced monitoring of express lanes.
- 2014 (4th ed.) featured a new dashboard report format, key performance measures table, pavement, bridge, and litter and landscape monitoring sections, new safety section and revised air quality section.
- 2015 (5th ed.) featured expanded litter and landscape section.
- 2016 (6th ed.) added ramp metering inventory and featured green bike lanes materials and applications.
- 2017 (7th ed.) added a section to track the most frequently reported problems from local jurisdictions.
- FY 2018 (8th ed.) was renamed to better reflect the reporting period, introduces a *Commute and Time Spent in Congestion* section to track performance of major corridors in the County, and new performance metrics for monitoring litter and graffiti along the freeways.

ABOUT THE DATA

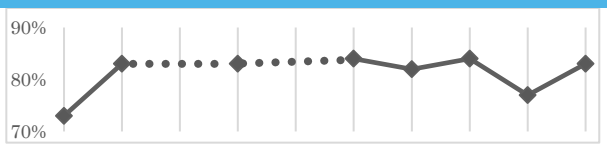
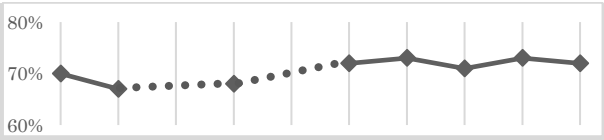
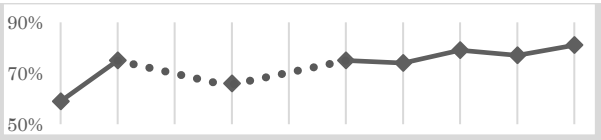
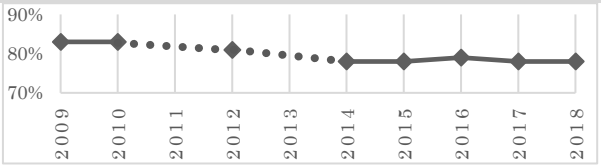
The data presented in the TSMP Reports are extracted from a variety of transportation resources such as local, state, regional, and federal agencies. The performance measures and sources used for this report are listed in the Notes Section.

2017 Highlights

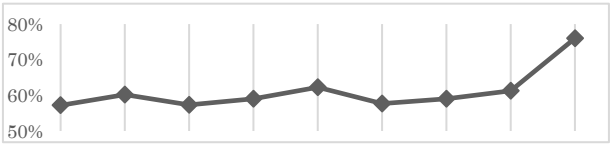
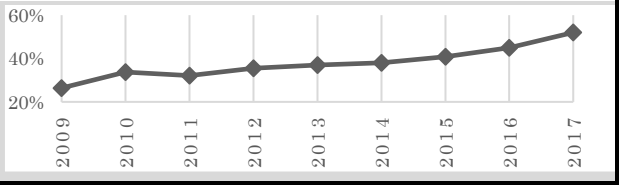
TABLE 1 - PERFORMANCE INDICATORS AND TRENDS

Indicators	Previous Period	Current Period	Goal	Goal Met ✓ Yes *X* No	Trend (Yearly)
Pavement					
Local Pavement Conditions (Avg. Pavement Condition Index (PCI) scale 0 – 100)	68 (2016)	**70 (2017)**	**75**	***X***	
Bridges/Overcrossings					
Local Bridge Conditions (Avg. Sufficiency Rating (SR) scale 0 – 100)	80.9 (2016)	**78.9 (2017)**	80	***X***	
Maintenance Areas					
Litter collected by Caltrans clean-ups (Cubic yards (yd^3))	11,867 (2016)	**16,036 (2017)**	-	-	
Graffiti removed by Caltrans clean-ups (Square feet (ft^2))	987,300 (2016)	**1,141,267 (2017)**	-	-	
Roadside LOS Landscape and Graffiti (Scale 0 – 100)	42 (2016)	**35 (2017)**	**87**	***X***	
Litter/Debris LOS	40 (2016)	**23 (2017)**	**80**	***X***	

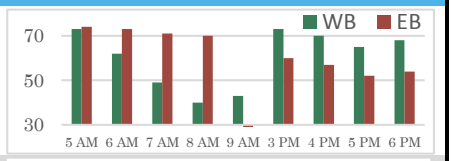
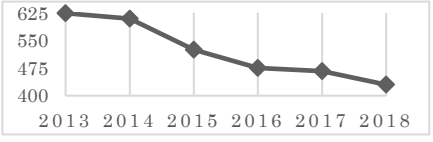
Roadside Assets

Traffic Signals	77% (2017)	**83% (2018)**	
Pavement Markings	73% (2017)	**72% (2018)**	
Traffic Signs	72% (2017)	**69% (2018)**	
Light Poles	77% (2017)	**81% (2018)**	
Curb & Gutter	78% (2017)	**78% (2018)**	

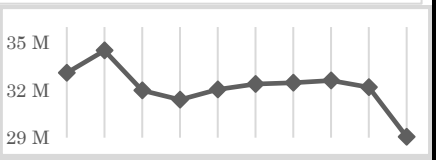
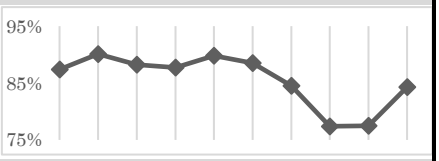
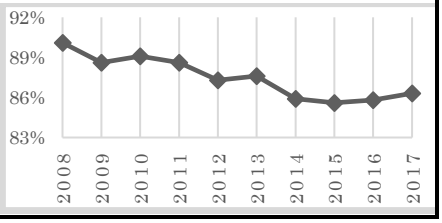
Congestion

CMP Freeway – General Purpose Segments **(% at LOS D or below)**	61% (2016)	**76% (2017)**	
CMP Freeway – Carpool Segments **(% at LOS D or below)**	45% (2016)	**52% (2017)**	

Express Lanes (SR 237/I-880 Connector)

Speed Monitoring (lowest speed in mph, averaged over 1 hr. period by direction)	43 WB 8AM (2017)	**40 WB 8AM (2018)**	**>45**	***X***	
HOV Only Mode Operation (in hours)	96 (2017)	**28 (2018)**	-	-	
Number of Tolled Vehicles (in thousands)	467 (2017)	**430 (2018)**	-	-	

Transit

Light Rail Annual Ridership (in Millions)	10.72 (2016)	**9.13 (2017)**	11.60	***X***	
Bus Annual Ridership (in Millions)	32.20 (2016)	**29.06 (2017)**	33.32	***X***	
Light Rail Annual On-time Performance	77.5% (2016)	**84.3% (2017)**	95%	***X***	
Bus Annual On-time Performance	85.8% (2016)	**86.3% (2017)**	92.5%	***X***	

County Census Information

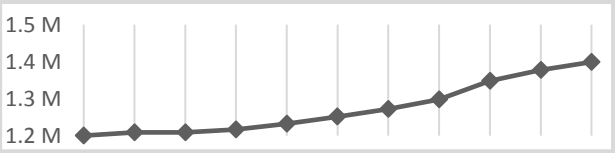
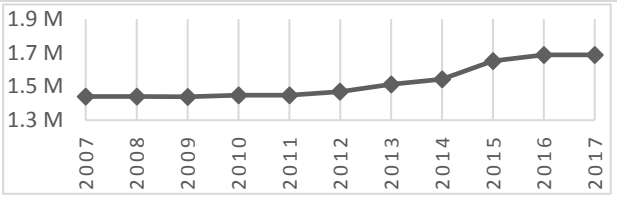
Population (millions)	1.92 (2016)	**1.94 (2017)**	
Registered Drivers (millions)	1.38 (2016)	**1.40 (2017)**	
Registered Vehicles (millions)	1.69 (2016)	**1.69 (2017)**	

TABLE 2 - INVENTORY OF ASSETS

Assets	Quantity	Year Collected
Bikeways		
Across Barrier Connections	50 Connections	2016
Cross County Bicycle Corridors	57 Corridors	2016
Miles of On-Street Facilities	340 mi	2016
Miles of Off-Street Facilities (Bike Paths)	110 mi	2016
Bridges (Local)	491 NBI Bridges	2017
Bus		
Fleet Age (avg.)	10.07 Years	2017
Fleet Size	470	2017
Route Mileage	1,265 mi	2017
Routes	74	2017
Stops	3,861	2017
Light Rail		
Fleet Size	99	2017
Miles of Track	81.6 mi	2017
Route Mileage	42.2 mi	2017
Stations	61	2017
Freeway – Ramp Meter Signals	250 Operational 28 Non-operational 60 Planned 13 Part construction	2017
Pavement (Local)	10,000 Lane Miles	2017
Traffic Signal Controllers	1,821 Local 160 State	2017

NOTES:

Table 1 - Not all Performance Indicators have established goals. In those instances, a dashed line is used to indicate that goals have not been set yet

Pavement

Overview

Inventory: **10,000 lane miles**

Condition: **70 PCI [Good]**

Needs: **$2.5B** (to eliminate back-log and attain PCI of 80 in 10 years for Local and State pavement)

Sources: MTC Vital Signs 2017 PCI Scores, 2017 California Statewide Local Streets and Roads Needs Assessment Report

INVENTORY

There are approximately **10,000 lane miles** of pavement in Santa Clara County maintained by local agencies. The term "lane miles" is a measure of road length which represents the number of miles of every driving lane. For example, 5 miles of a 2-lane road (2 lanes in each direction) is equal to 20 lane miles (5 miles x 2 directions x 2 lanes = 20 miles). This measure is used to better reflect the total amount of pavement that needs to be maintained.

Changes in inventory from year to year can be caused by construction of new or removal of old roads, such as widening of existing roadways, lane extensions, or removal of existing lanes (road diet projects). It can also be attributed to inconsistencies in reporting methods.

CONDITION

PCI Definition

PCI is based on the number and severity of pavement distresses observed during a visual inspection of a roadway and is expressed in numerical index between 0 and 100. Zero is the worst or failed condition and 100 represents a roadway that is in excellent or new condition.

Visual examples of the PCI index scale are shown below.

Pavement Surface	PCI
	100
	60
	5

Figure 1 *Examples of Pavement Surfaces & PCI*

To determine PCI of a road segment, inspector bases his/her evaluation on the PCI Conditions Description Guideline, shown below.

Table 1. *PCI Conditions Description Guideline*

Condition (PCI)	Description
	Newly constructed or resurfaced and almost no signs of distress.
	Newly constructed or resurfaced and have few if any signs of distress.
Ex (10 Ver (8	Show only low levels of distress, such as minor cracks or surface damage because of water permeation.
C (7 Fair (6	The low end of this range exhibit significant levels of distress and may require a combination of rehabilitation and other preventive maintenance to keep them from deteriorating rapidly.
At (59 – 50)	Pavements are deteriorated and require immediate attention and possibly rehabilitative work. Ride quality is significantly inferior to better pavement categories.
Poor (49 – 25)	Pavements have extensive amounts of distress and require major rehabilitation or reconstruction. Pavements in this category affect the speed and flow of traffic significantly.
Failed (24 – 0)	Pavements need reconstruction and are extremely rough and difficult to drive on.

Pavement Condition Index (PCI)

The average PCI score for Santa Clara County's roadways is **70 (Good)**, compared with the Bay Area's regional goal of 75 (Good).

The PCI score represents a weighted average based on a percentage of the roadway network by category (e.g. arterial, collector and residential). This measurement accounts for incremental wear of roadways over time.

Figure 2. *Current Overall PCI*

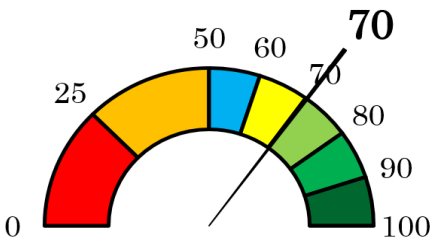
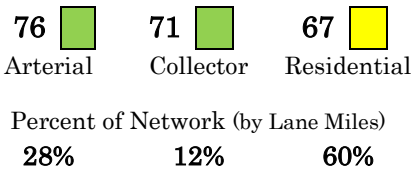


Figure 3. *PCI by Road Type & % of Network*

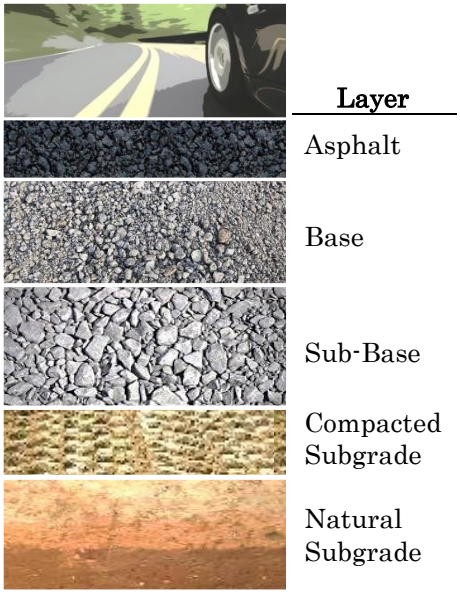


Condition and Pavement Evaluation

PCI is based on visual inspection of the top surface of pavement. Distresses originated below the surface are not typically noticed until they "makes their way up", causing cracks or depressions on the surface. These distressed conditions can originate from deteriorating underlying pavement, base, sub-base, and subgrade layers.

In addition to PCI, there are other methods of determining pavement conditions. However, many of these methods are too detailed and expensive for frequent reporting purposes.

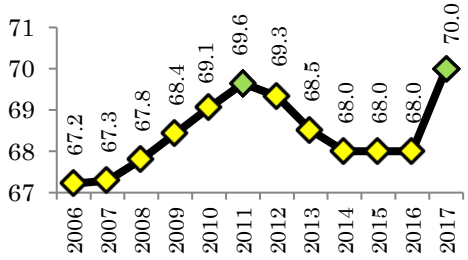
Figure 4. *Typical Pavement Section*



PCI Trend

An annual overall PCI trend is shown below.

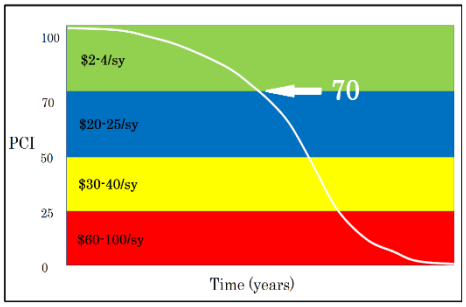
Figure 5. *PCI Trend*



Life Cycle

Pavement tends to deteriorate at an increasing rate over time. The current PCI is at the borderline of "Good" to "Fair" conditions with a relatively low need for rehabilitation. However, it is also close to the area on the curve where the need for rehabilitation and repair costs significantly increases. Preventative measures should be implemented to minimize the decline in PCI below 70.

Figure 6. *Pavement Life Cycle and Estimated Repair Costs*



PCI Distribution

The pavement condition is not uniform throughout the County. The percentages of PCI distribution are shown below:

Figure 7. *PCI Distribution*

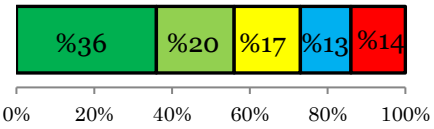


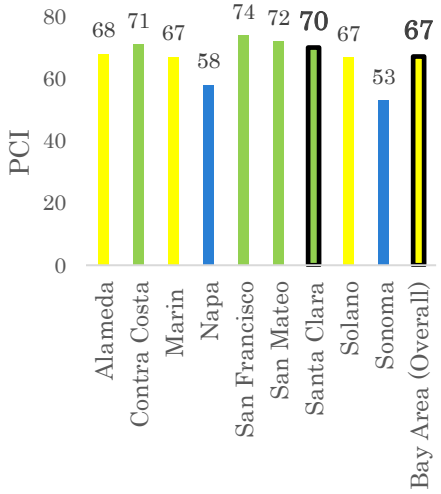
Table 2. *Current & Historical PCI Distribution*

	2015	2016	2017
Excellent/ Very Good	23.42%	26.69%	36.00%
Good	27.96%	26.55%	20.00%
Fair	18.90%	17.95%	17.00%
At risk	12.67%	12.28%	13.00%
Poor/Failed	16.97%	16.46%	14.00%
No Data	0.10%	0.07%	0.00%

Peer County Comparison

The PCI goal established for the Bay Area's local roadways is 75. Santa Clara County has a PCI score of 70, which is slightly better than the Bay Area's PCI average of 67 (Fair).

Figure 8. *Bay Area 2017 AVG PCI*



NEEDS

Based on the 2016 California Statewide Local Streets and Roads Needs Assessment, a bi-annual report, **Santa Clara County's needs is $2.5B** to eliminate accumulated pavement maintenance back-log and achieve a PCI in the low 80's (Very Good) within about 10 years. This cost is estimated based on number of lane miles within a PCI range and cost of rehabilitation.

California Crude Oil Price Index

Asphalt is a petroleum-based product that is mixed with cement, aggregate or crushed rock, and sand that is used for constructing the top layer of roadways. The cost of paving asphalt can vary from year to year. One key indicator is the price of crude oil; if crude oil prices increase, so does price of paving asphalt. As of March 2015, Caltrans has stopped creating their own asphalt price index in favor of using the California crude oil price index. This information helps estimate construction costs for projects.

The graph below shows the California crude oil price index along with the previous Caltrans paving asphalt price index. The graph helps illustrate the fluctuations in cost of over the last 15 years.

Figure 9. *Caltrans Asphalt Price Index and California State Wide Crude Oil Price Index*

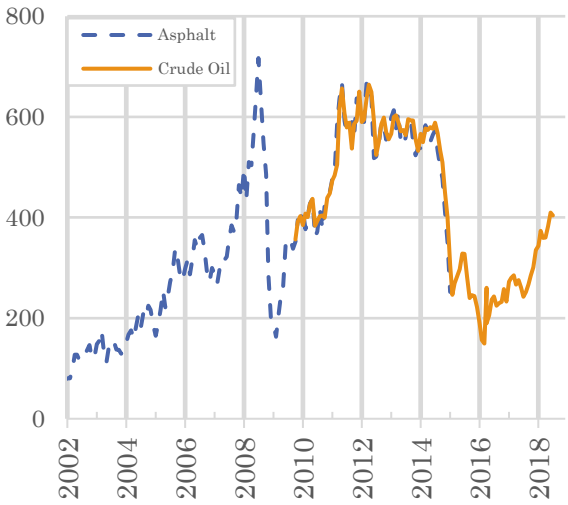
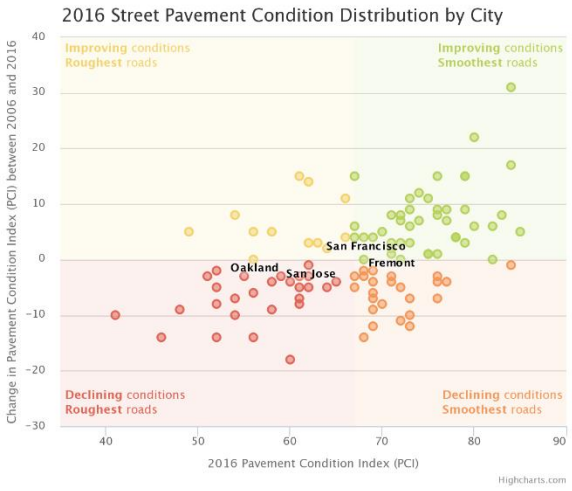


Figure 10. *Vital Signs PCI Change Over Time*



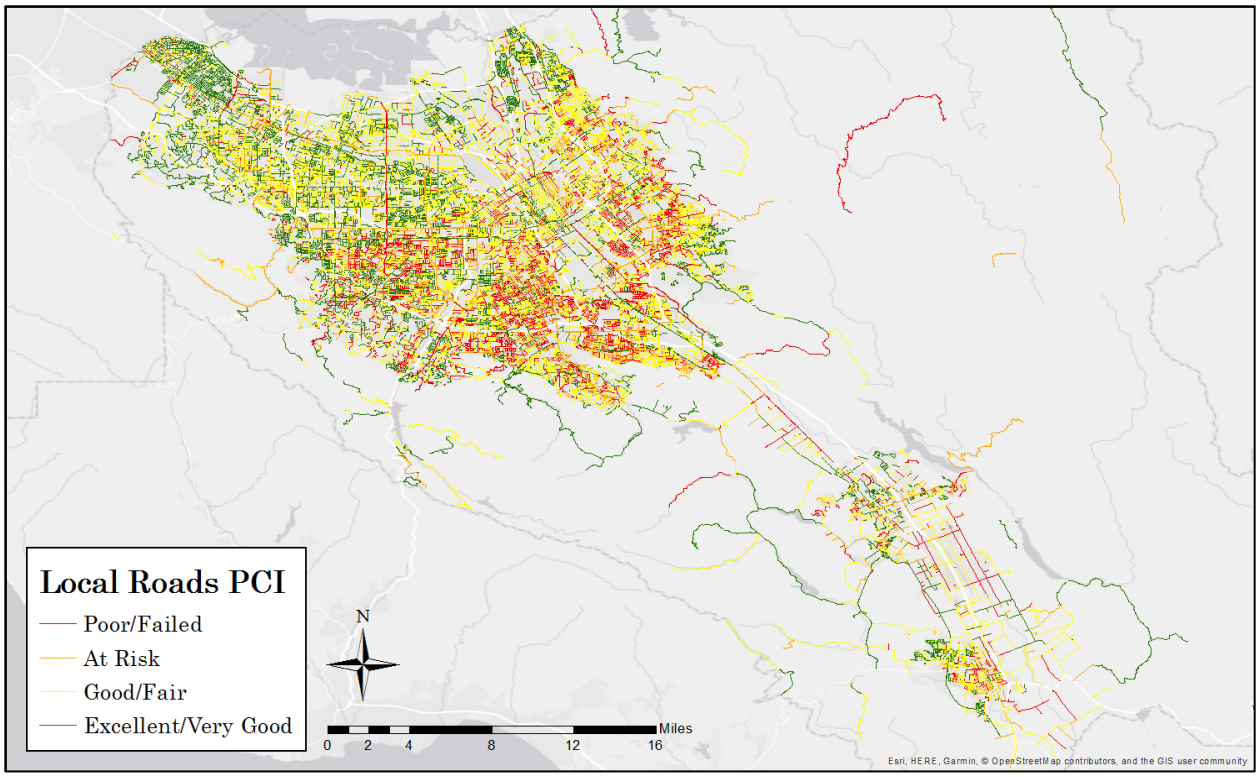
INDUSTRY NEWS

VITAL SIGNS

"Vital Signs", website by MTC, provides interactive and extensive access to historical local pavement data. As an example of available information, below is the graph of street PCI for each of the Bay Area plotted over time.

In addition to pre-generated graphs, MTC's "Vital Signs" allows access to raw data for personal analysis and visualization. Based on such data, a **Santa Clara County 2017 Street Pavement Condition Index (PCI) map** (NEW) was generated. The map displays assigned level of PCI for each local road link within the County.

Figure 11. *Santa Clara County 2017 Street PCI map*



Bridges/Overcrossings

Overview

Inventory: **491 local NBI bridges**

Condition: **79 SR [Fair]**

Needs: **$120M** (to maintain SR for 10 years)

Source: 2018 Caltrans Local Bridge List, 2016 California Statewide Local Streets and Roads Needs Assessment

INVENTORY

There are **491 local bridges** (bridges, overcrossings, and culverts) reported for Santa Clara County based on the **National Bridge Inventory (NBI)**, a database compiled by the Federal Highway Administration (FHWA). "Local" bridges are the bridges maintained by local agencies (not Caltrans). FHWA defines NBI bridges as "*structures that carry or directly support automobile traffic which span 20 feet or longer in length*". By this definition, creek culvert structures can also be considered NBI Bridges.

To be eligible for federal funding for bridge improvements, the structure is required to meet the NBI definition of a bridge. Caltrans manages NBIs for all Santa Clara County agencies and publishes an inventory list of local bridges every year. Changes to the local NBI bridge inventory are shown in Table 1 and 4.

Table 1. *Added Bridges - Local Agency NBI Bridge List by Caltrans for Santa Clara County, 2018.*

Status	Comment	Agency	Bridge No.	Facility Carried	Feature Intersected	SR	Year Built
Added	Existing	Los Altos	37C0440	PURISSIMA CREEK	DEER CREEK	91.1	2002
Added	Changed to NBI	Los Altos	37C0441	PURISSIMA CREEK	SAMUEL LANE	85.0	1996

Table 4. *Reassigned Bridges - Local Agency NBI Bridge List by Caltrans for Santa Clara County, 2018.*

2016 Agency	2017 Agency	Bridge No.
San Jose	County of Santa Clara	37C0019, 37C0028, 37C0041, 37C0042, 37C0069, 37C0074, 37C0075L, 37C0075R, 37C0099, 37C0101, 37C0102, 37C0185, 37C0190, 37C0288, 37C0509
Palo Alto	County of Santa Clara	37C0151, 37C0179
County of Santa Clara	Gilroy	37C0580
County of Santa Clara	Morgan Hill	37C0549
San Jose	City of Santa Clara	37C0808

CONDITION

Current Sufficiency Rating

Santa Clara County has a current average **Sufficiency Rating (SR) of 79.0 (Fair)**.

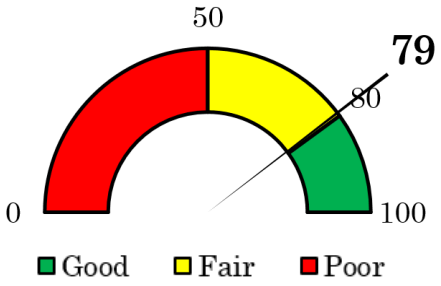
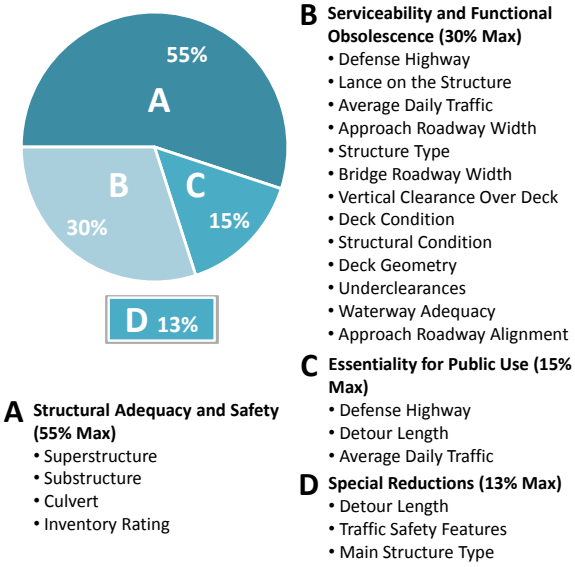


Figure 12. *Average Overall Bridge SR*

Sufficiency Rating (SR) Description

Similar to the Pavement Condition Index (PCI), SR ranges from 0 to 100 (worst to best condition). Figure 13 below depicts four weighted categories of SR, one of which is "structural adequacy and safety", which represents only 55% of the overall SR score. Therefore SR, should not be solely relied upon as a measure of structural condition.

Figure 13. *Details of Sufficiency Rating*



SR is a federal standard of bridge condition assessment, set by the National Bridge Inspection Standards (NBIS), and developed mainly as a tool for evaluating eligibility for federal funding.

Inspections are typically performed every two years. The SR for each bridge is updated in the NBI, which contains the national bridge database.

% in Good Condition

Since there are two federal funding categories for bridges (rehabilitation for 80≥SR>50 and replacement for SR≤50), a "good," "fair" and "poor" metric can be developed by using SR. Using this measure **57% of bridges are in Santa Clara County are in "Good" condition**.

Figure 14. *Current SR Distribution*

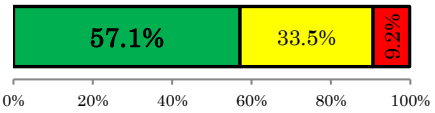


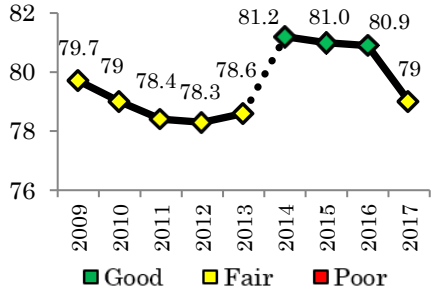
Table 5. *Historical SR Distribution*

	2015	2016	2017
Good	62.17%	62.45%	57.06%
Fair	31.08%	30.20%	33.54%
Poor	6.75%	7.35%	9.20%

Historical SR

The overall average SR has been declining since 2014 with a noticeable change in the past year. The last significant increase in average SR (78.6 to 81.2) was recorded in 2014 and can be attributed to the update of Caltrans reporting methods, bridge condition improvement programs and addition of new local bridges.

Figure 15. *SR Trend*



The 2014 Caltrans update of the reporting method consisted of distinguishing NBI versus non-NBI bridges, eliminating duplicate bridges, and adding bridges that were previously recorded as a single bridge are now recorded as two separate bridge structures. These changes more accurately reflect the

number of crossings and can affect the average sufficiency ratings.

Other Condition Ratings

"Structurally Deficient" (SD) is a term that is related to the SR rating and implies that one of the categories in "Structural Adequacy and Safety" is rated below average and indicates that the bridge structure needs maintenance or repairs.

"Functionally Obsolete" (FO) is another term related to SR that indicates how the bridge functionality compares to current design standards for attributes such as traffic load, vertical clearances, alignment, and lane widths. In many cases, the only way to fix a FO rated bridge is to replace the entire bridge.

Bridge Health Index (BHI) is a number from 0 to 100 used to reflect the structural condition of an individual bridge. BHI is based on a detailed structural inspection and analysis of all bridge structural elements and combines level of severity and extent of any defects found. Caltrans developed BHI to better determine the structural condition of a single bridge or a network of bridges.

Caltrans has recently begun publishing BHI for local bridges and it is anticipated that this method will attract more attention as more data becomes available.

NEEDS

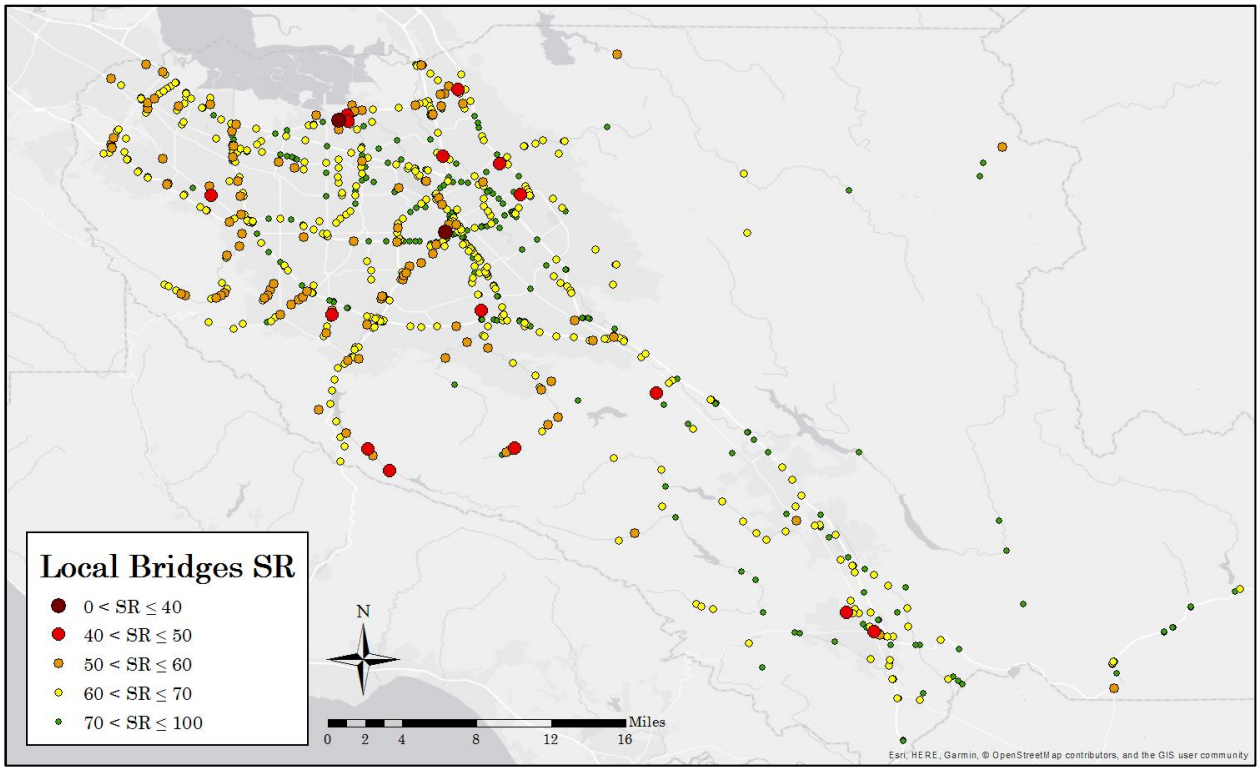
Based upon the 2016 California Statewide Local Streets and Roads Needs Assessment, a bi-annual report, **Santa Clara County needs $120M** to maintain current bridge conditions for the next 10 years. This cost is based upon estimated maintenance and construction costs, and generalized condition reports which describe the condition of different substructures of each bridge.

INDUSTRY NEWS

VITAL SIGNS

MTC Vital Signs data portal provides conditions records for each bridge structure in the nine Bay Area counties. Below is **Santa Clara County 2017 Bridges SR map** (New) that shows the ratings assigned in 2017 by color.

Figure 16. *Santa Clara County 2017 Bridges SR map.*



Freeway/Expressway Litter, Landscape and Graffiti Maintenance

Overview

Inventory: **307 Freeway Roadside Miles**

128 Interchanges

1,193 acres of landscape area

Needs: **$11.2M** (to maintain "slightly littered" condition per year)

Source: 2008 Litter Control Pilot Program, VTA.

BACKGROUND

VTA Technical Advisory Committee has identified freeway litter, landscape, and graffiti maintenance as a major roadway maintenance issue. The accumulation of litter and poorly maintained landscaping on freeways and expressways is viewed as driver distraction and potential hazardous, as well as aesthetic and environmental problem. The cleanliness of freeways and groomed landscaping also shows community civic pride to local and regional travelers.

INVENTORY

There are approximately **307 roadside miles (shoulder length miles), 128 interchanges, and 1,193 acres of landscaped area** on the state highway system in Santa Clara County requiring regular maintenance.

MAINTENANCE

Depending on available resources allocated from the State's annual budget, which varies from year to year, Caltrans may have up to 13 maintenance crews at any given time that cover several counties. The crews consist of the following teams: 1 bridge crew, 1 vegetation spray crew, 1 special programs crew, 5 road maintenance crews, and 5 landscape maintenance crews. In addition to Caltrans crews, the non-profit Adopt-a-Highway (AAH) is utilized in many locations for litter removal.

The crews rotate between Santa Clara, San Mateo, and San Francisco Counties, and each running on variable schedules. The AAH crew typically picks-up litter from freeways 1 or 2 pick-ups per month. There are also special programs that supplement freeway litter maintenance; these crews typically consist of 3 teams and work 4 days per week. Road sweeping is performed on daily basis, in theory covering the same location every 6 weeks. Road sweeping has recently been made a higher priority.

Caltrans, in partnership with volunteer organizations like Beautiful Day and San Jose Downtown

Street Team sponsors multiple clean-up day events each year. The California Highway Patrol (CHP) also participates in freeway clean-up by sponsoring 4 litter clean-up days per year.

Another group that Caltrans has recently partnered with is Santa Clara Valley Zero Litter Initiative (ZLI). ZLI is a voluntary group comprised of cities, water agencies, and conservation organizations, including VTA in Santa Clara County, that are currently working on development and implementation of a comprehensive, multi-year anti-litter program.

CONDITION

Caltrans Maintenance LOS

Caltrans monitors the overall maintenance quality of their facilities by visually inspecting random samples of roads (generally 20%) to correspond the general conditions to maintenance activities needed to improve these conditions. They assign the overall condition a "Maintenance LOS" value which ranges from 0-100. The LOS made up of 4 weighted categories:

- Travelway (40%)
- Drainage (15%)
- Roadside (15%)
- Traffic Guidance (30%)

For the purposed of this report, the following scale is used to assign an overall condition to all Maintenance LOS scores:

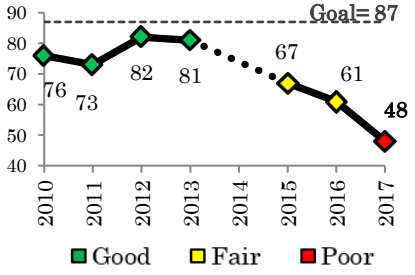
Figure 17. *LOS Rating System*

Condition	Good	Fair	Poor
LOS	100-71	70-51	50-0

Overall Maintenance LOS Trend

Although no LOS scores were received last year, according this year's Caltrans Maintenance LOS, the overall LOS has continued to decrease.

Figure 18. *Overall Maintenance LOS Trend*

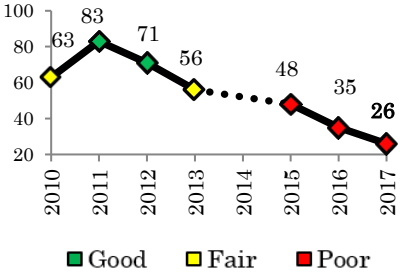


Roadside Maintenance LOS Trend

Roadside Maintenance – subset of the overall LOS – had a steady downward trend with this year being a new low of 26 out of 100. Items evaluated as part of this group are:

- Roadside Vegetation
- Fences
- Tree/Brush Encroachment
- Litter/Debris
- Graffiti
- Ramps

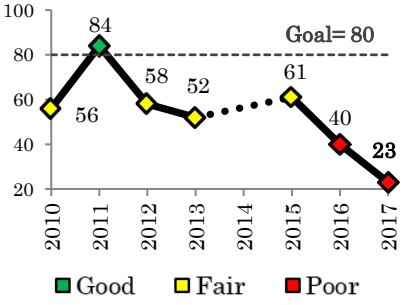
Figure 19. *Historical Roadside Maintenance LOS Trend*



Litter/Debris Maintenance LOS Trend

Looking in further detail, "Litter/Debris" LOS – a subset of "Roadside" LOS – has been experiencing a significant decline since 2015. The current Litter/Debris LOS is 23 out of 100, which is much less than the statewide goal of 80.

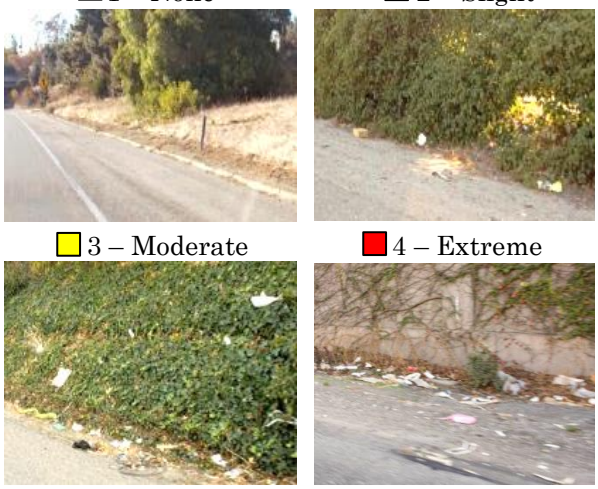
Figure 20. *Historical Litter/Debris Maintenance LOS Trend*



Drive-by Visual Assessment Survey

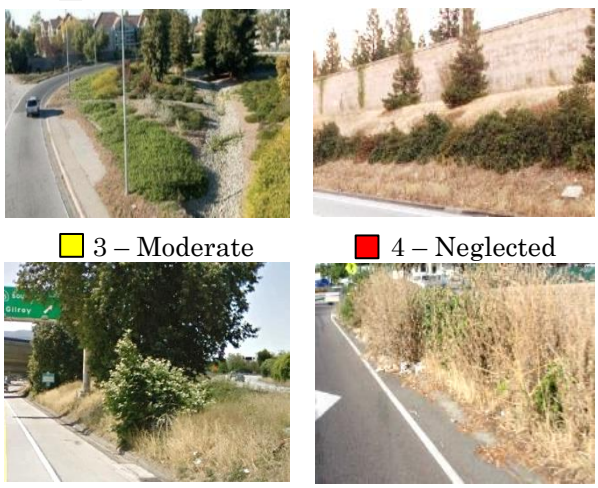
To provide additional perspective, drive-by video surveys were used to assess the levels of litter and grooming of vegetation on the county's freeways and expressways. This methodology provides a visual "snapshot" of current roadside maintenance conditions. The videos were then analyzed for assessing the following three areas: litter, landscape, and graffiti. The following grading scales were used for each category:

Figure 21. *Litter Grading Scale.*



Condition	Description
Low (1)	Virtually no litter can be observed along the freeway. The observer has to look hard to see any litter, with perhaps a few occasional litter items in a 1/4-mile. Any litter seen could be quickly collected by one individual. The freeway has a generally neat and tidy appearance; nothing grabs the eye as being littered or messy.
Slight (2)	A small amount of litter is obvious to the observer. The litter along the freeway could be collected by one or two individuals in a short period of time. While the freeway has a small amount of litter, the eye is not continually grabbed by litter items.
Moderate (3)	Visible litter can readily be seen along the freeway or ramp, likely requiring an organized effort for removal. This area is "littered" and clearly needs to be addressed.
Extreme (4)	Continuous litter is one of the first things noticed about the freeway. Major illegal dumpsites might be seen, requiring equipment and/or extra manpower for removal. There is a strong impression of a lack of concern about litter on the freeway.

Figure 22. *Landscape Grading Scale.*



Condition	Description
Attractive (1)	No noticeable weeds. Landscaped areas are well maintained with healthy, thriving, and or attractive landscaping. Areas likely to have attractive ground cover, such as ivy, tan bark, or gravel. No vegetation encroaches or impairs road users.
Decent (2)	Some noticeable weeds less than 2 ft high. Landscaped areas are well maintained with generally healthy landscaping. Non-landscaped areas are mowed or cleared in such that no overgrown brush is present. Areas may or may not have ground cover. No vegetation encroaches or impairs road users. May include roads with only roadside barriers with only minor weeds.
Moderate (3)	Weeds are apparent which may be close to 2ft high and will need to be abated soon. Landscape may be encroaching the edge of pavement, bicycle lane, or sidewalk and may begin to impair road users or partially obscure road signs. Tree saplings or hardy brush is beginning to grow in or in front of traffic safety devices.
Neglected (4)	Weeds are pervasive and may be 2ft high or greater. Landscape is overgrown and may be encroaching the edge of traveled way of streets, bicycle lanes, or sidewalks and impairing road users or obscuring road signs. Dead or dying plants or trees may be observed.

Figure 23. *Graffiti Grading Scale.*

1 – None

2 – Slight

3 – Moderate

4 – Extreme

Condition	Description
Low (1)	Very low amount of graffiti currently present.
Slight (2)	Some graffiti is present and likely small in size and may not be clearly visible. Not likely to be distracting to most drivers. Entire location has less than 36 square feet (6'x6') of graffiti.
Moderate (3)	Graffiti is present and likely medium in size and clearly visible. Distracting to most drivers and may hold driver's attention for a second. May constitute many clusters of small instances of graffiti or one to two medium sized instances. Entire location has less than 240 square feet (6'x40') of graffiti.
Extreme (4)	Either large solitary instance or large areas of smaller instances of graffiti and are visible and obtrusive. Solitary instances are very distracting to drivers and may hold driver's attention for more than a second. May illicit concerns of neighborhood safety. Entire location has more than 240 square feet (6'x40') of graffiti.

For the purpose of this report, freeway and expressway segments are defined by VTA's Congestion Management Program. Field surveys were conducted from July to August in 2018.

Results

The assessments are categorized in the following areas:

- "Overall Conditions", page 17
- "Freeway Conditions", page 17
- "Expressway Conditions", page 17
- "Litter, Landscape, and Graffiti Assessment maps", pages 18-20
- "Selected Interchange Conditions", page 21

During the survey observations, some segments had recently been cleaned of litter by AAH or another group, and some of the regular graffiti hot spots were painted over. It was also observed that many usual graffiti hot spots that had been recently abated were vandalized, including two rail road bridges over Hwy 101 near Oakland Road in San Jose. In addition, it was observed that various locations with sound walls had weeds growing out of construction joints between the pavement and the wall or in accumulated sediment. These observations serve as reminders that maintenance conditions are constantly in flux.

NEEDS

According to a follow-up report to the initial Litter and Landscape study, "Litter Control Pilot Program, US 101 between I-880 and Blossom Hill Road, 2008," **$11.2 million a year** was the estimated cost needed (using probationers through the Special Persons Program) to attain acceptable levels highway litter (slightly littered) for all of Santa Clara County. In 2017 Caltrans has spent approximately **$3.1 million on litter abatement**, **$0.5 million on street sweeping**, and **$0.8 million on cleanup of illegal encampments** along the freeways is Santa Clara County.

Overall Conditions

Below are the overall results of the drive-by survey assessment for Santa Clara County freeway.

Figure 24. *Overall Freeway Conditions.*

LITTER	LANDSCAPE	GRAFFITI
2.00 [Slight]	2.24 [Decent]	1.26 [Low Graffiti]

Figure 25. *Overall Interchange Conditions.*

LITTER	LANDSCAPE	GRAFFITI
2.5 [Moderate]	2.75 [Moderate]	1.1 [Low Graffiti]

Figure 26. *Overall Expressway Conditions.*

LITTER	LANDSCAPE	GRAFFITI
1.79 [Slight]	1.89 [Decent]	1.01 [Low Graffiti]

Freeway Conditions

The following is a list of Santa Clara County freeway segments with Extreme Litter, Landscape, and Graffiti conditions. The results were obtained through the drive-by survey assessments.

Litter

- US 101 NB – McKee Rd. to Oakland Rd.
- US 101 NB – Oakland Rd. to I-880
- SR 85 SB – US 101 to Central Expwy.
- US 101 SB – SR 85 to Moffett Blvd.

Landscape

- I-880 NB – Alameda to N. Bascom Ave.
- SR 237 EB – North First St. to Zanker Rd.
- US 101 SB – SR 237 to North Mathilda Ave.
- US 101 SB – Moffett Blvd. to SR 237
- SR 237 EB – Zanker Rd. to McCarthy Blvd.
- SR 237 EB – McCarthy Blvd. to I-880
- SR 237 WB – I-880 to McCarthy Blvd.
- SR 237 WB – Zanker Rd. to North First St.
- SR 237 WB – Great America Pkwy. to Lawrence Expwy.
- SR 237 WB – US 101 to Maude Ave.
- SR 237 WB – SR 85 to El Camino Real

Graffiti

- US 101 NB – McKee Rd. to Oakland Rd.
- US 101 SB – I-880 to Oakland Rd.
- US 101 NB – Oakland Rd. to I-880
- SR 87 SB – Capitol Expwy. to SR 85
- I-280 EB – Bird Ave. to SR 87
- US 101 SB – Santa Clara St. to I-280
- I-280 WB – De Anza Blvd. to SR 85

WORST OVERALL FREEWAY SEGMENTS

- **US 101 NB – McKee Rd. to Oakland Rd.**
  US 101 NB – Oakland Rd. to I-880

Expressway Conditions

The following is a list of Santa Clara County freeway segments with Extreme Litter, Landscape, and Graffiti conditions. The results were obtained through the drive-by survey assessments.

Litter (Moderate)

- G8 Almaden – Capitol to Branham
- G21 Capitol – Silver Creek to US 101
- G21 Capitol – Senter to Monterey
- G2 Lawrence – Central to Monroe
- G2 Lawrence – Monroe to El Camino
- G2 Lawrence – Pruneridge to Stevens Creek
- G2 Lawrence – Stevens Creek to Moorpark

Landscape

- G3 Page Mill – Foothill to I-280

Graffiti

No significant graffiti observed

WORST OVERALL FREEWAY SEGMENTS

- **G3 Page Mill – Foothill to I-280**
- **G8 Almaden – Capitol to Branham**
- **G2 Lawrence – Central to Monroe**
- **G2 Lawrence – Pruneridge to Stevens Creek**

Figure 27. *Litter Conditions Assessment Map.*

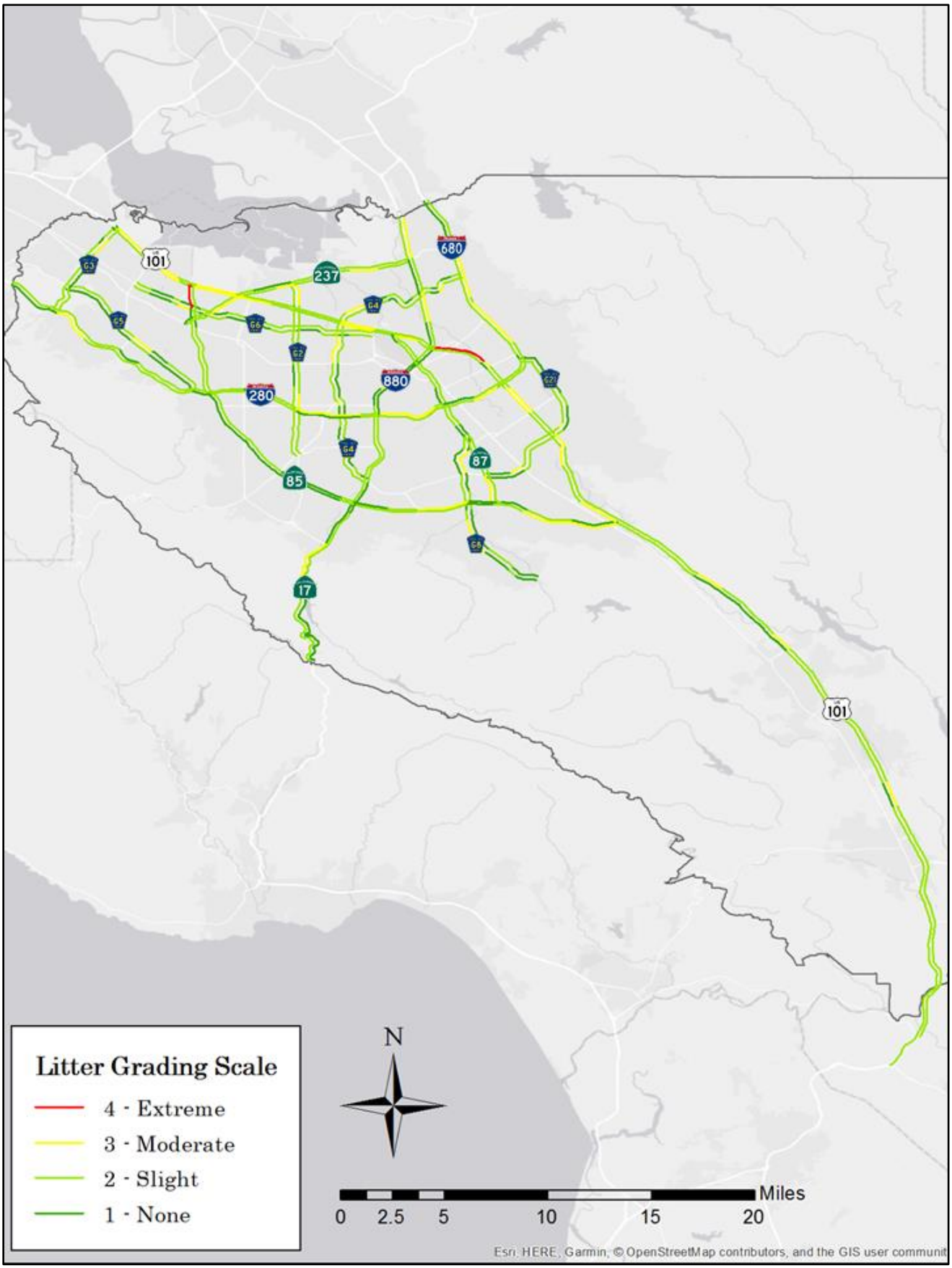


Figure 28. *Landscape Conditions Assessment Map.*

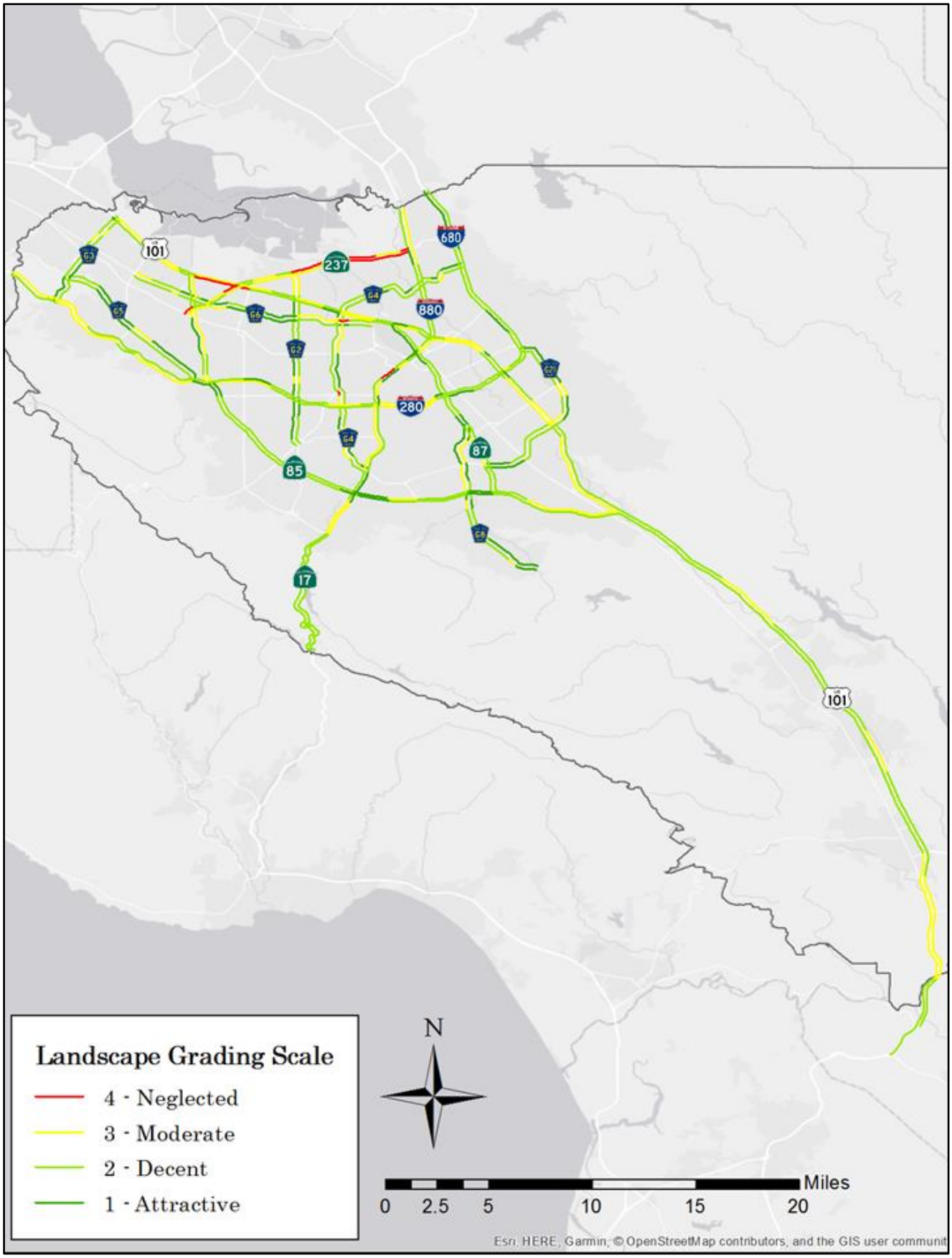
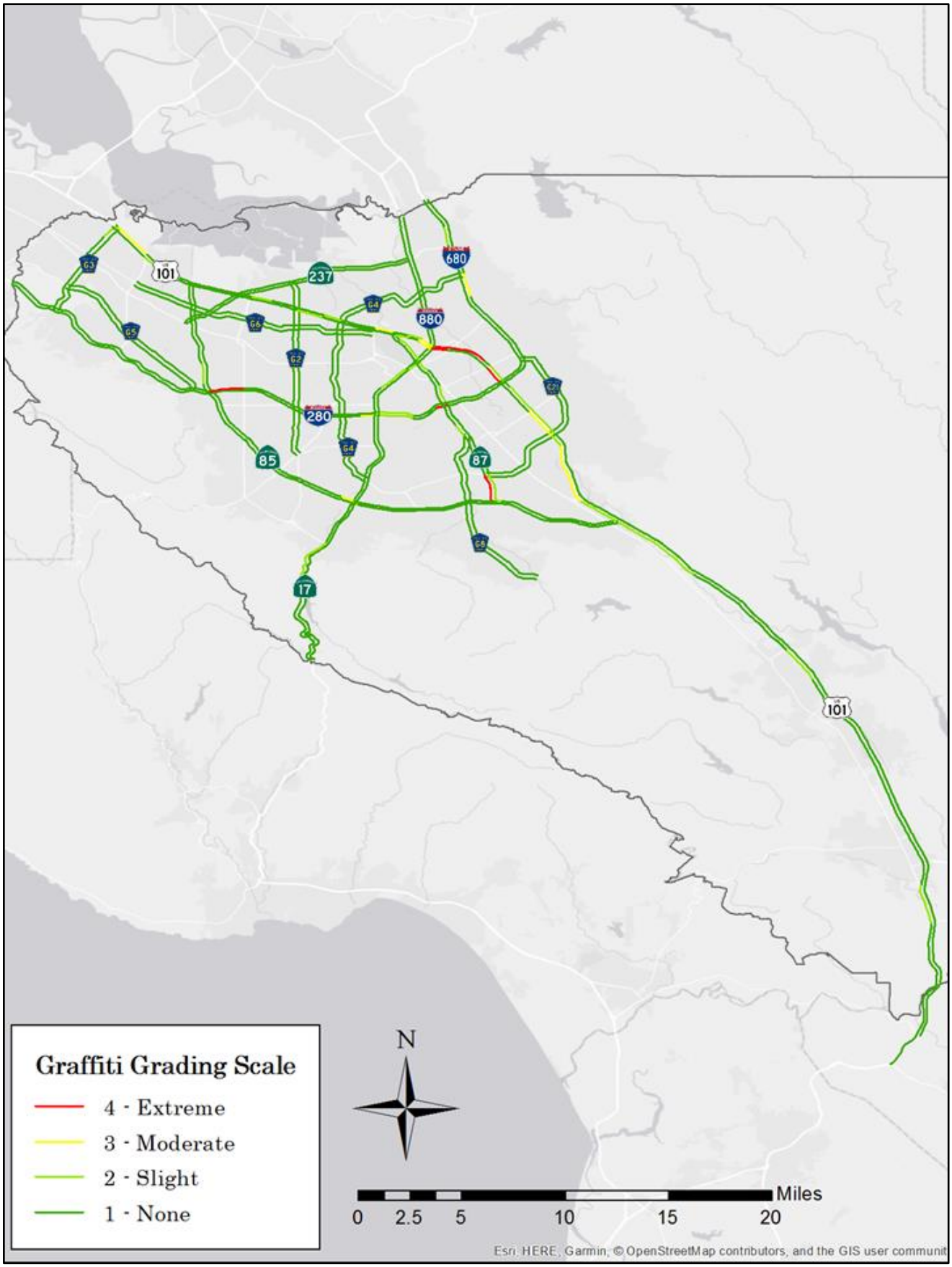


Figure 29. *Graffiti Conditions Assessment Map.*



Selected Interchange Conditions

Table 6. *Interchange Conditions.*

NO	RTE	CROSSING	LITTER	LANDSCAPE	GRAFFITI
1	101	SR 152 East	3	3	1
2	101	Story Rd	3	3	1
3	101	Trimble Rd	3	3	1
4	101	SR 237	3	4	1
5	101	Oregon Expwy	2	2	1
6	680	Montague Expwy	3	3	1
7	880	Montague Expwy	3	3	1
8	880	US 101	3	2	2
9	280	Page Mill Rd	2	3	1
10	237	N Mathilda Ave	3	3	1
11	87	Capitol Expwy	1	2	1
12	85	Saratoga Ave	1	2	1

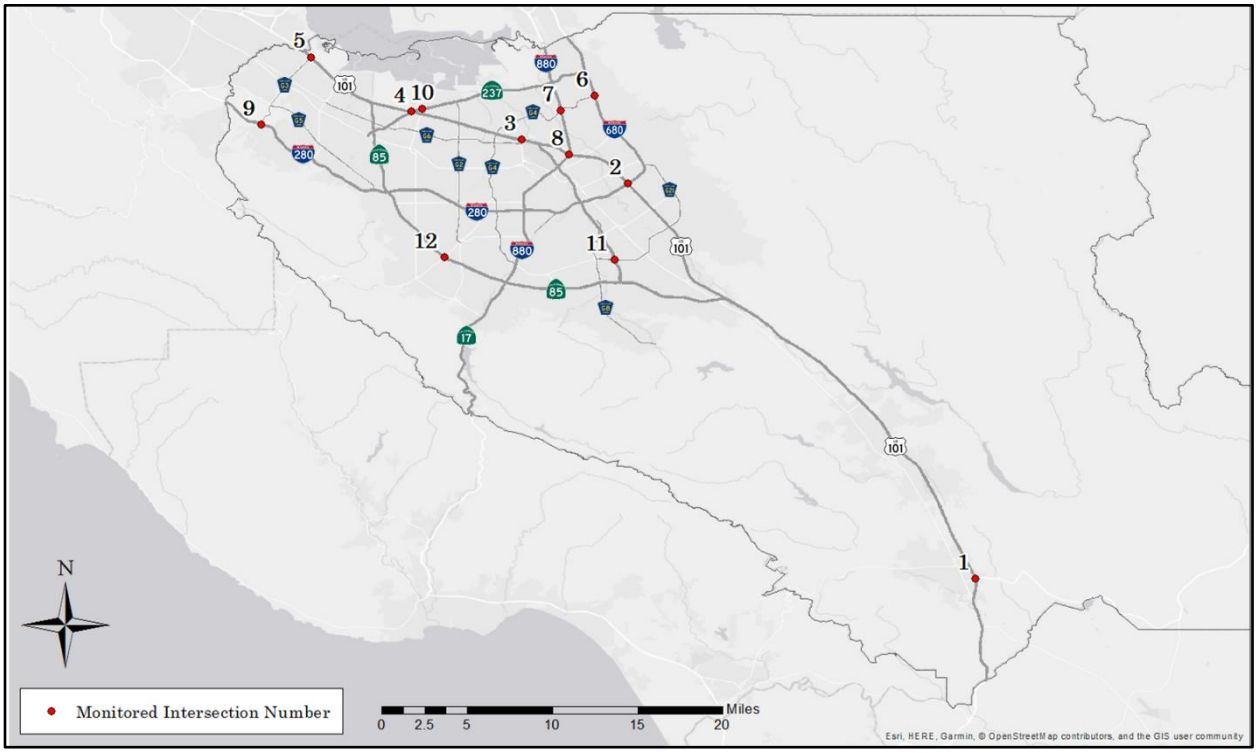
***Worst** Litter/Landscape/Graffiti conditions intersections:*

- Litter – I-680/Montague Expwy.
- Landscape – US 101/SR 237
- Graffiti – I-880/US 101

***Best** Litter/Landscape/Graffiti conditions intersections:*

- Litter – SR 87/Capitol Expwy. and SR 85/Saratoga Ave.
- Landscape – SR 87/Capitol Expwy.
- Graffiti – no graffiti except I-880/US 101, I-880/Montague Expwy. and US 101/Trimble

Figure 30. *Map of Interchange Monitoring Locations.*



Amount of Litter Picked-Up and Graffiti Removed (New Performance Metric)

New data collected by Caltrans shows that in FY 2017, an estimated 16,050 cubic yards of litter was picked-up and 1,141,300 square feet of graffiti was removed along the nearly 310 freeway shoulder miles in Santa Clara County. To provide some visual perspective, this equates to approximately 112,350 trash bags (1 cubic yard = 7 of 30-gallon sized trash bags, measure used in Caltrans District 4) and approximately 20 football fields (300 ft. length x 160 ft. width).

Compared to FY 2016, the amount of litter picked-up increased by approximately 35% or 4,180 cubic yards (29,260 trash bags) and nearly 16% or 154,000 square feet of graffiti; and compared to FY 2015 litter increased by approximately 160% and graffiti increased by approximately 23%.

The data in the tables below show the changes over a 3-year period by highway and freeway routes.

Table 7. *Amount of Litter Picked-up and Graffiti Removed (FY 2015 to FY 2017)*

LITTER			
ROUTES	CUBIC YARDS PICKED-UP		
	FY 2015	FY 2016	FY 2107
9	6	30	21
17	401	317	1,348
25	0	4	6
35	295	127	0
82	1	2	7
85	629	1033	1,257
87	360	1464	1,628
101	1,866	3894	3,773
130	13	59	24
152	328	72	68
237	223	395	760
280	989	2102	2,341
680	342	1037	2,035
880	358	906	1,848
TOTAL	5,811	11,442	15,116

GRAFFITI			
ROUTES	SQUARE FEET REMOVED		
	FY 2015	FY 2016	FY 2107
9	100	0	0
17	19,405	35,485	30,838
25	1,290	0	600
35	1,200	1,025	0
82	1,750	0	0
85	171,682	108,525	321,220
87	161,544	102,615	89,330
101	293,440	371,478	414,378
130	100	0	0
152	1,125	0	530
237	23,571	38,060	19,550
280	128,517	208,617	153,181
680	100,185	83,436	65,535
880	22,940	37,730	45,155
TOTAL	926,849	986,971	1,140,317

For monitoring purposes, the use of cubic yards and square footage are more reliable and objective metrics for measuring the amount of litter picked-up and graffiti removed than the annual subjective visual assessments. These metrics will be used as primary performance measures for assessing the freeway litter and graffiti conditions in future reports, and visual assessments will be used for identifying "hot spots" or problematic locations and providing "snap-shot" conditions.

Roadside Assets

Overview

Reponses: **16 out of 17 agencies**

Conditions: **78% of all roadside assets in good condition**

Maintenance: **2.3** (scale of 1 (low) to 3 (high)) **average ability to maintain the roadside assets in current condition**

BACKGROUND

To gain a perspective on local transportation infrastructure and roadside assets, an annual self-assessment survey is conducted with local agencies. The survey asks for data related to inventories of selected assets within their respective jurisdictions, estimates on the conditions of their assets, and the ability to maintain them in "good" condition.

The information received from this self-assessment survey is mainly substantiated on general assessments and not detailed inspections. The results should also be treated as "snap-shots" in time.

INVENTORY

The survey asked agencies to provide total inventory of the selected assets to the best of their ability. The total number of items is as following:

- Traffic Signs: **208,928**
- Street Lights: **117,328**
- Sidewalks: **8010.5 miles**

CONDITION

Because asset condition could be easier to approximate than obtain the exact number of assets, the survey is focused mostly on conditions rather than inventory of assets.

The combined average for asset conditions of the responded local agencies per asset type are listed below. It is apparent that the agencies estimate their **signal equipment and litter management** as the strongest assets with **83% average in good condition**, when **signage** was given a significantly lower average ranking of **69% in good condition**.

Table 8. *Average Local Asset Conditions.*

Local Assets	% in Good Condition
Signal Equipment	83%
Pavement Marking	72%
Signage	69%
Light Poles	81%
Curb & Gutter	78%
Litter Management	83%
Sidewalks	78%

Condition Distribution

For a detailed breakdown of the number of responses falling into different percentage tiers, below are frequency charts for the condition portion of the self-assessment survey.

Figure 31. Signal Equipment

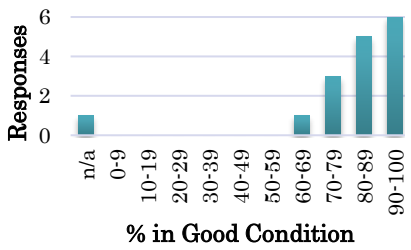


Figure 32. Pavement Markings

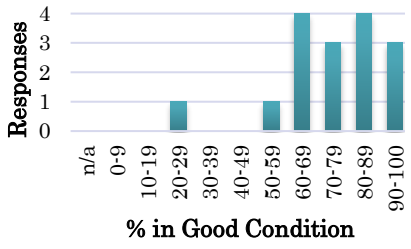


Figure 33. Signage

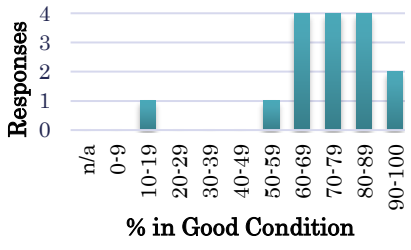


Figure 34. Light Poles

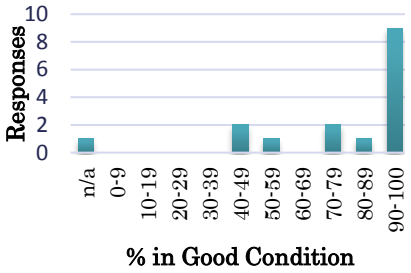


Figure 35. Curb & Gutter

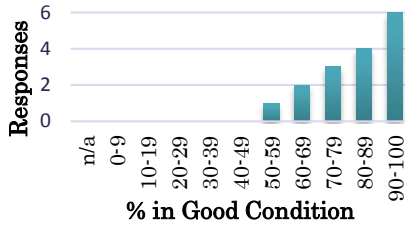


Figure 36. Litter Control

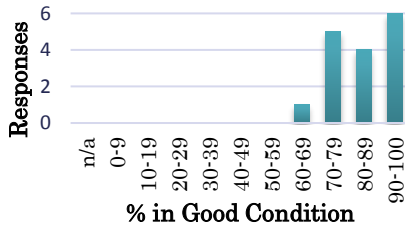
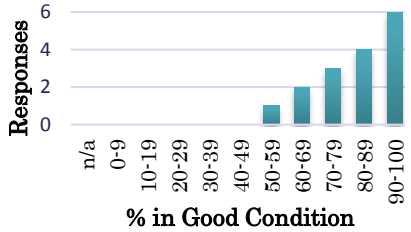


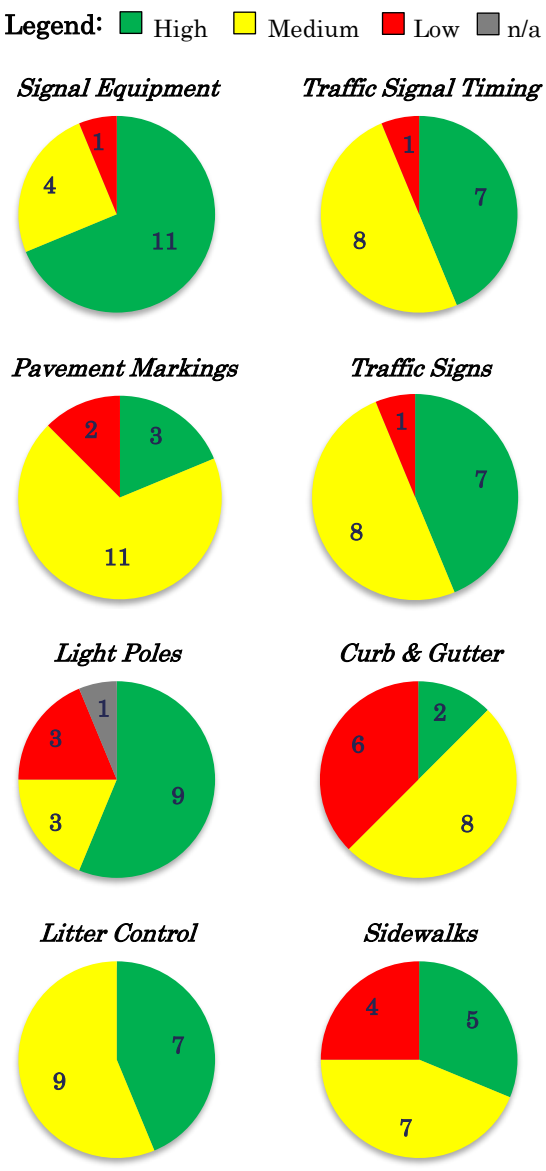
Figure 37. Sidewalks



ABILITY TO MAINTAIN

"Ability to maintain" metric helps communicate the effort needed to maintain a transportation asset. A "Low" ability generally indicates that current funding is insufficient to maintain a network of assets at a desired condition. The following pie charts represent the number of responses received for each category of assets.

Figure 38. Ability to Maintain Responses.



FREQUENCY OF MAINTENANCE

It is vital to consistently monitor roadside assets to keep them in good condition. In addition to the 'ability to maintain" metric, the agencies were asked to the frequency at which they conduct the maintenance. The number of responses per frequency are shown below:

Figure 39. Traffic Signals

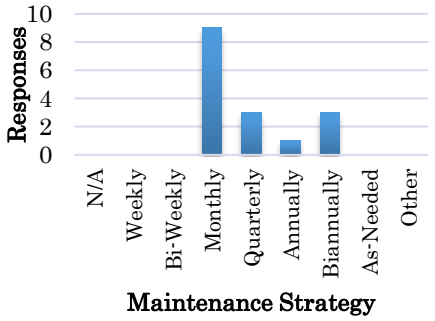


Figure 40. Traffic Signals

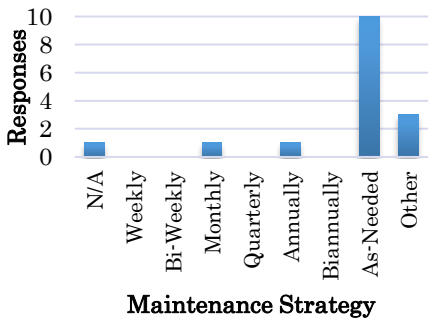


Figure 41. Pavement Markings

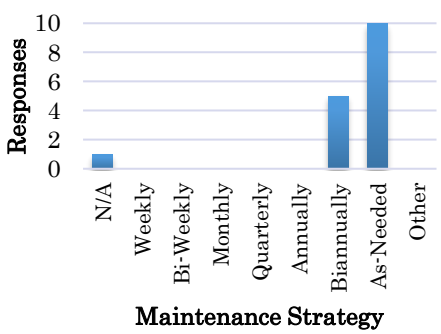


Figure 42. Traffic Signs

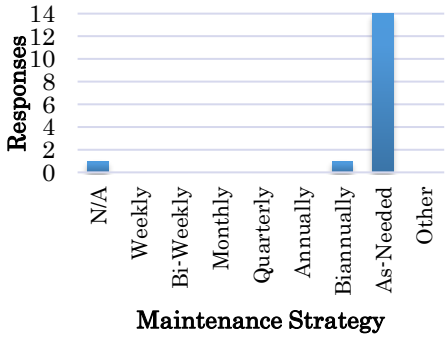


Figure 43. Light Poles

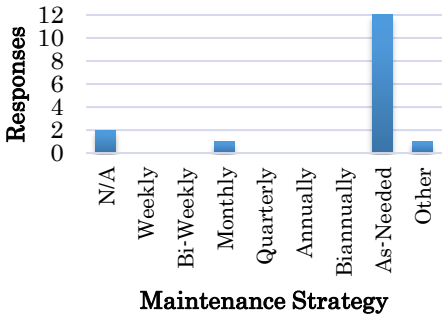


Figure 44. Curb & Gutter

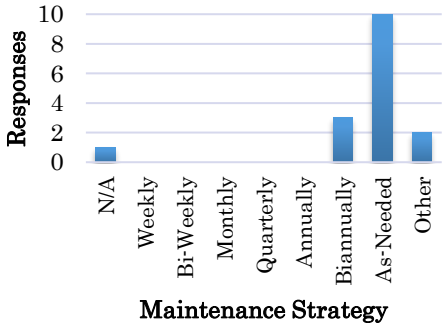


Figure 45. Litter Control

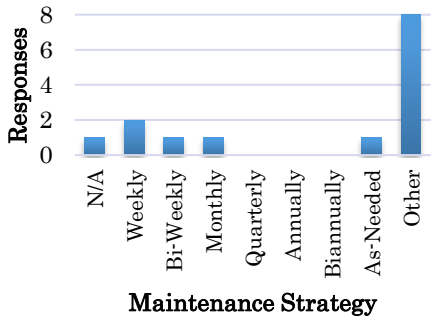
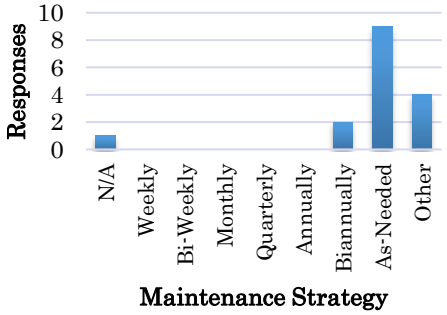


Figure 46. Litter Control



LOCAL NEWS

Recent Asset Management Projects

Campbell: Trafficware dropped its distributor WPS. This change is influencing whether cities will be looking at alternate central system software solutions. In turn, new controller purchases may be affected.

Palo Alto: 1) - Upgrade Downtown – gas line and intersection update, including APS and pedestrian facilities. 2) - Charleston-Arastradero Streetscape project (Complete Streets and Adaptive timing project). 3) - Ross Road Neighborhood Traffic Safety and Bicycle Boulevard project. 4) - Middlefield Road – North Neighborhood Traffic Safety Project.

Santa Clara County: County was able to replace signal controllers on County expressway intersections with grants from the VRF program.

Sunnyvale: 1) - Completion of project to retrofit 5,749 cobra heads and 835 post tops HPS to LEDs and implementation of an Adaptive Streetlighting Control System that will allow us to dim all LED cobra heads. 2) - Completion of project to install 50 CCTV cameras at various locations throughout the City.

Recognition from Professional Organizations

Gilroy: Wren and Welburn signalize Intersection.

Sunnyvale: Presentation of paper "Addressing Practical Challenges in the Day-to-Day Transportation Operations with Advanced Adaptive Traffic Management System (AATMS)" at ITS America 2018 Annual Meeting.

Current Challenges

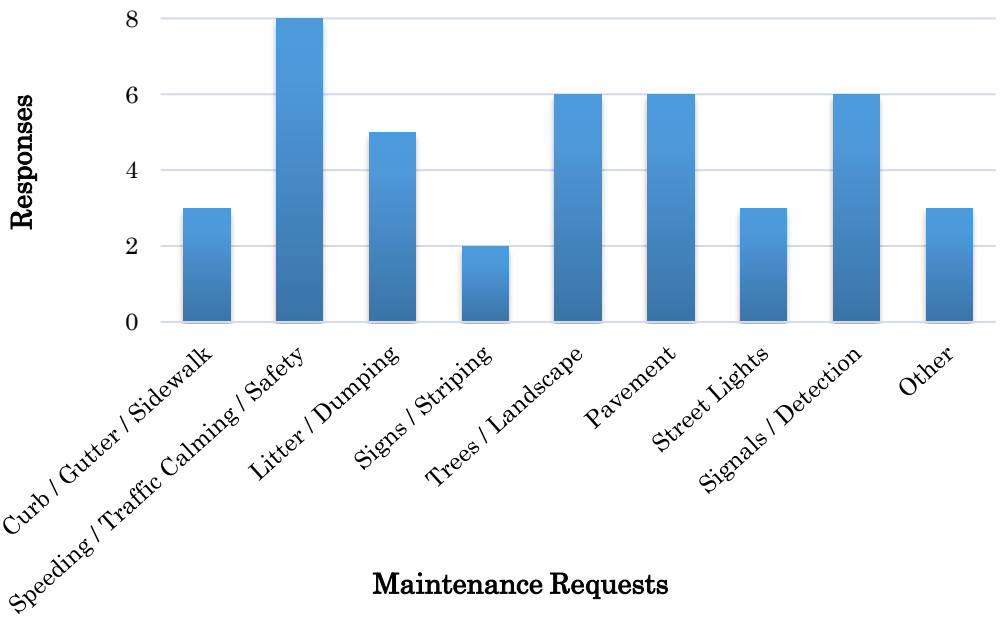
On-going Projects

Santa Clara County: 1) - City started implementation of 6-inch striping at various locations through paving and CIP projects. 2) - Installation of green bike lanes at 13 locations citywide with 4 more to be completed by the end of 2018.

Inadequate Resources

Campbell: City purchased its first Emtrac emergency vehicle preemption systems to accommodate County Fire. City will migrate to a hybrid Emtrac optical/GPS system as funds allow.

Figure 47. *Top 3 Public Maintenance Requests*



Freeway Ramp Meters

Overview

Ramp meters: **250 Operational**

28 Non-operational

60 Planned

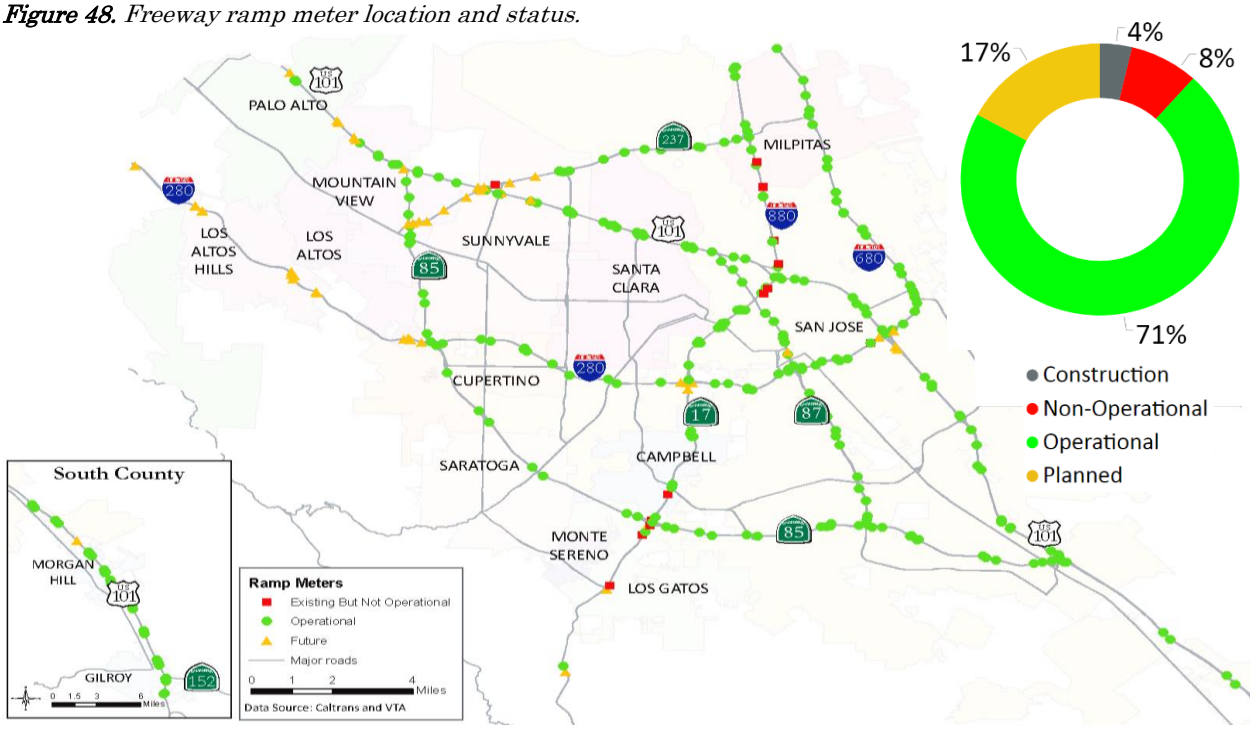
13 Under construction

Use of Intelligent Transportation Systems technology, like adaptive traffic signals, sensors and ramp meters, are used to manage the flow of traffic. Since 2008, Santa Clara County in partnership with Caltrans and Metropolitan Transportation Commission have been implementing freeway ramp meters throughout Santa Clara County. About 71% of the originally planned meter system is installed and operational. Travel time savings have been observed between 2% and 26%.

Table 9. *Ramp Meters Inventory*

Highway	Oper.	Non-Oper.	Plan	Const.	Total
SR17	8	6	6	2	22
SR85	50	0	5	0	55
SR87	20	0	4	0	24
US101	84	11	12	3	110
SR 237	12	1	11	2	26
I-280	30	1	20	2	53
I-680	20	1	1	0	22
I-880	26	8	1	4	39

Figure 48. *Freeway ramp meter location and status.*



Roadway Safety

Transportation has a significant effect on public health and safety, creating accident-prompt environment for all roadway users. To achieve Vision Zero goal of eliminating all transportation-related fatalities and sever injuries, while increasing safe, healthy and equitable mobility for all, it is vital to monitor current accident rates.

ACCIDENT COLLISIONS

Roadway safety is a primary concern of community leaders, transportation professionals and all users of the roadway. There are many causes of collisions such as driver's characteristics, weather conditions, and physical layout of the roadway.

The California Highway Patrol (CHP) collects and maintains a collision database called the Statewide Integrated Traffic Records System (SWITRS). This database is used in monitoring collision types and their severities throughout the state. Because of the nature of collision reporting, full year datasets are typically released 2 years later. As a result, 2015 data was recently released and made available to the public in late 2017.

Provisional 2016 SWITRS report is used as a source for the following statistics. There were **17,534 total collisions**, which included **106 fatal collisions**, **7,796 injury collisions**, and **9,632 property damage only collisions**. The total number of collisions **increased** in 2016 by **7.4%,** while number of fatal collisions **decreased** by **16.5%,** a significant improvement.

Figure 49. *Historical* ***Total*** *Collisions*

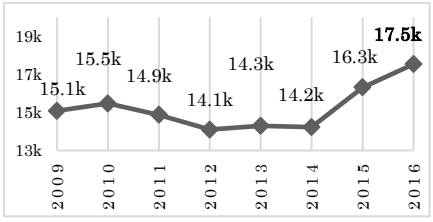


Figure 50. *Historical* ***Fatal*** *Collisions*

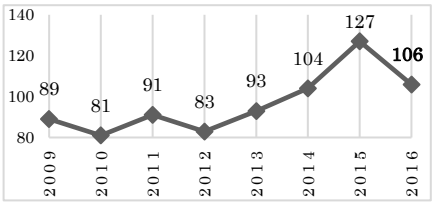


Figure 51. *Historical* ***Injury*** *Collisions*

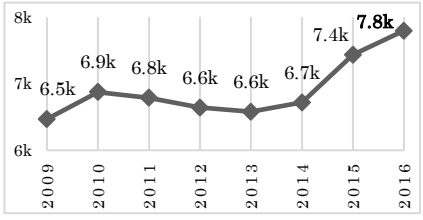
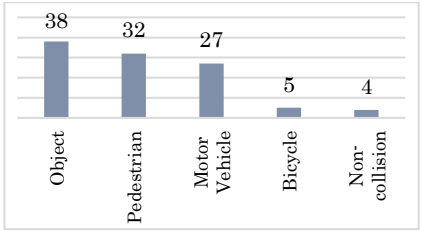


Figure 52. *2016* ***Fatal*** *Collisions Involvement Type*



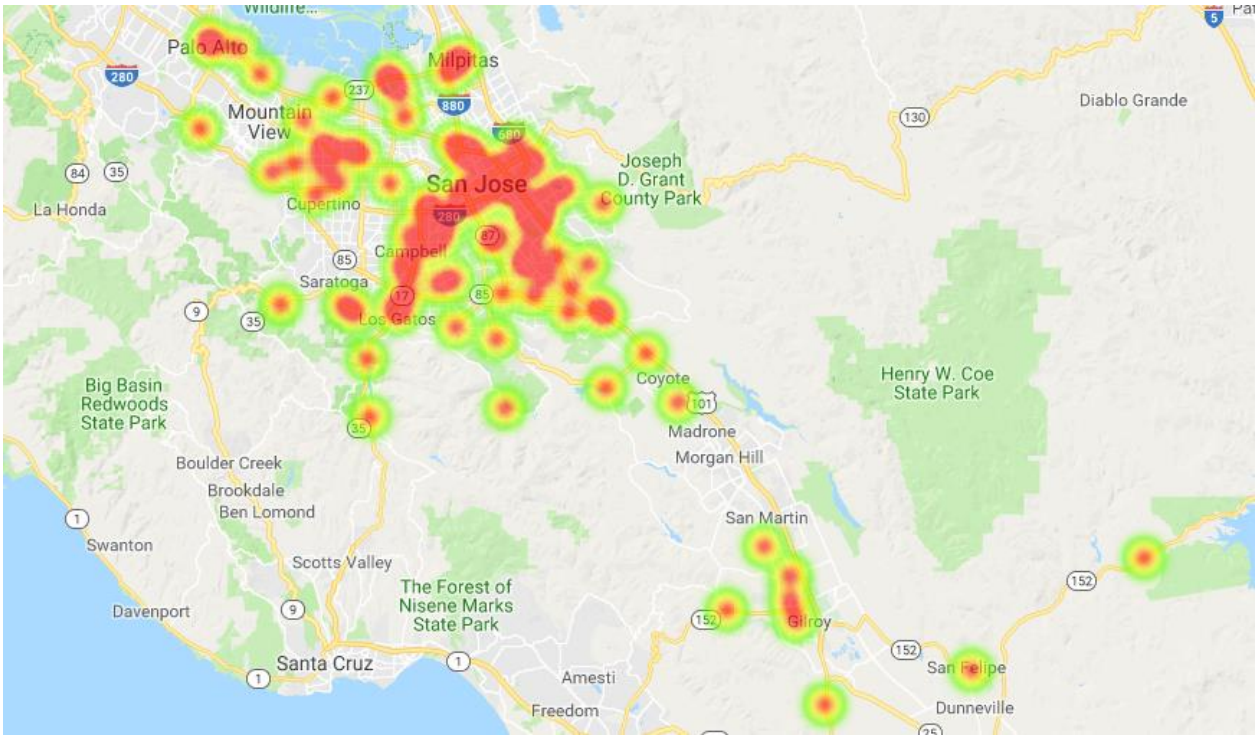
Source: CHP, Provisional 2016 SWITRS, Section 8 or Online Report 1 – Collisions and Victims by Motor Vehicle Involved.

Fatal and Severe Injury Collisions

Below are the heat maps of fatal and severe injury collision locations. The red areas represent areas with the highest density of the collisions. For the fatal collision maps all **106** accidents are displayed, while for the severe injury map only **293 of 336** collisions (87.2%) are shown.

In addition to locations of the collisions, below listed the numbers and percentages of Primary Collision Factor (PCF) – main causes, and number of collisions per type. The data was collected from UC Berkeley's Transportation Injury Mapping System (TIMS) and SWITRS CHP web resources.

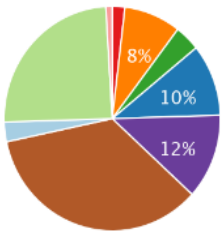
***Figure 53. 2016** Fatal Collisions Heat Map.*



Source: Safe Transportation Research and Education Center (SafeTREC), University of California Berkeley, TIMS.

Primary Collision Factor (PCF) Violation	#	%
Driving or Bicycling Under the Influence	25	23.58%
Unsafe Speed	**16**	**15.09%**
Wrong Side of Road	2	1.89%
Improper Passing	2	1.89%
Unsafe Lane Change	4	3.77%
Improper Turning	**20**	**18.87%**
Automobile Right of Way	5	4.72%
Pedestrian Right of Way	1	0.94%
Pedestrian Violation	**16**	**15.09%**
Traffic Signals and Signs	5	4.72%
Other Than Driver (or Pedestrian)	2	1.89%
Unsafe Starting or Backing	3	2.83%
Other Improper Driving	1	0.94%
Unknown	4	3.77%

Vehicle Involvement	#	%
Pedestrian Collision	31	29.2%
Motorcycle Collision	13	12.3%
Bicycle Collision	8	**7.5%**
Truck Collision	4	3.8%



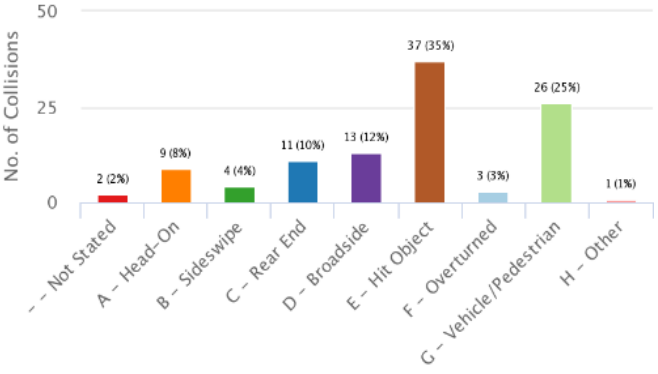
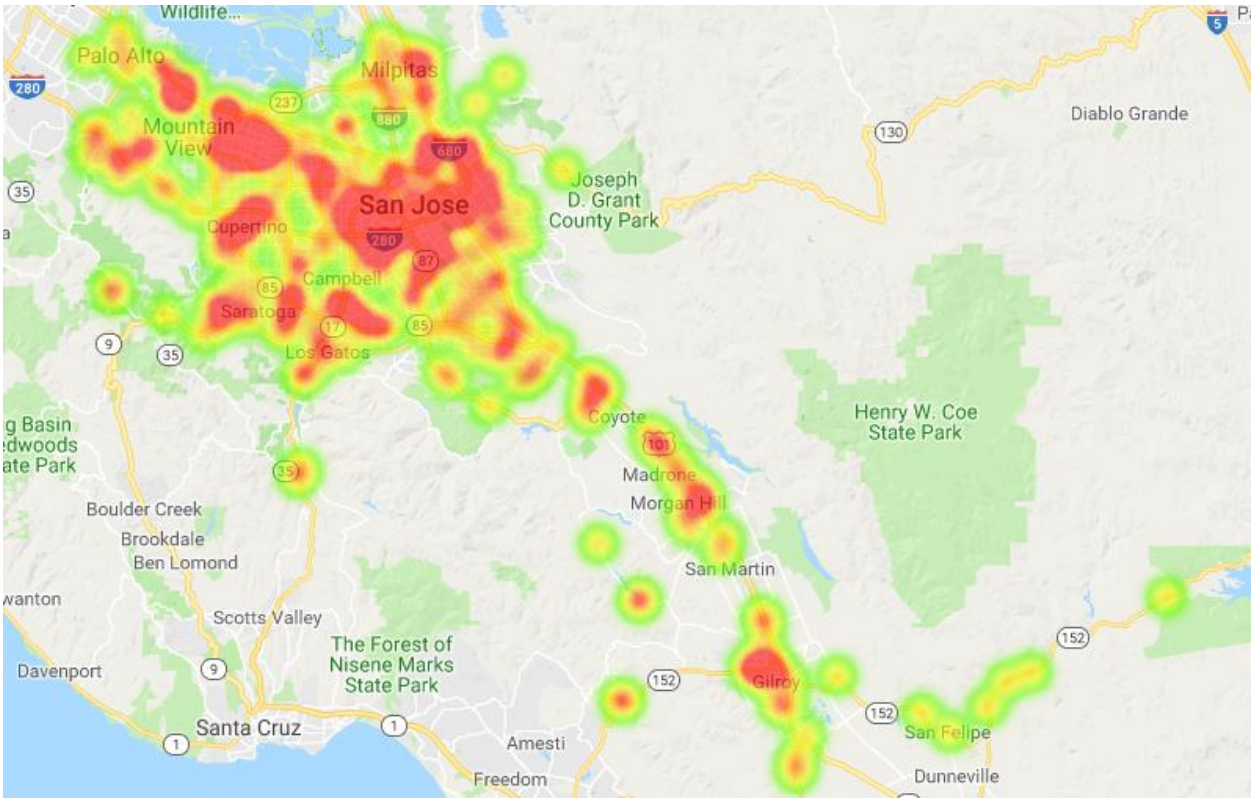


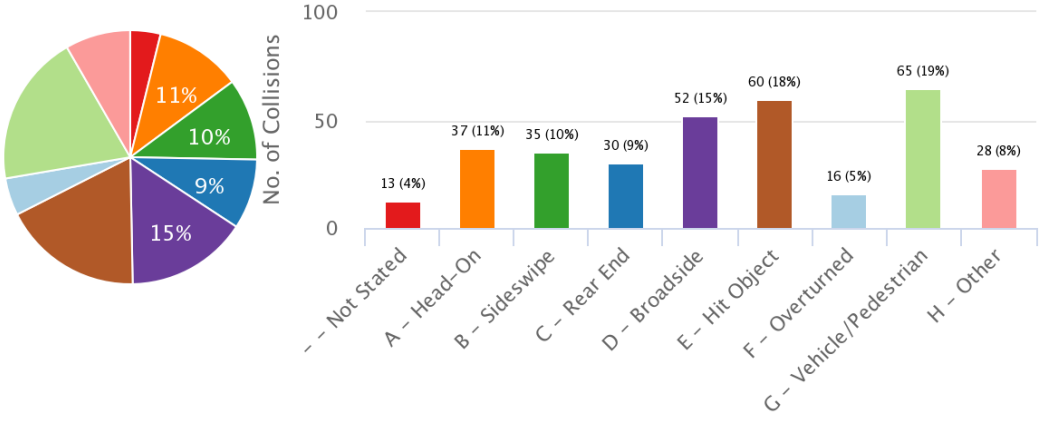
Figure 54. *2016 Severe Injury Collision Heat Map.*



Source: Safe Transportation Research and Education Center (SafeTrec), University of California Berkeley, TIMS.

Primary Collision Factor (PCF) Violation	#	%
01 - Driving or Bicycling Under the Influence	**49**	**14.58%**
03 - Unsafe Speed	**62**	**18.45%**
04 - Following Too Closely	1	0.30%
05 - Wrong Side of Road	12	3.57%
06 - Improper Passing	3	0.89%
07 - Unsafe Lane Change	15	4.46%
08 - Improper Turning	**55**	**16.37%**
09 - Automobile Right of Way	29	8.63%
10 - Pedestrian Right of Way	17	5.06%
11 - Pedestrian Violation	32	9.52%
12 - Traffic Signals and Signs	19	5.65%
17 - Other Hazardous Violation	3	0.89%
18 - Other Than Driver (or Pedestrian)	5	1.49%
21 - Unsafe Starting or Backing	2	0.60%
22 - Other Improper Driving	5	1.49%
00 - Unknown	18	5.36%
- - Not Stated	9	2.68%

Vehicle Involvement	#	%
Pedestrian Collision	73	**21.7%**
Motorcycle Collision	53	15.8%
Bicycle Collision	46	**13.7%**
Truck Collision	7	2.1%



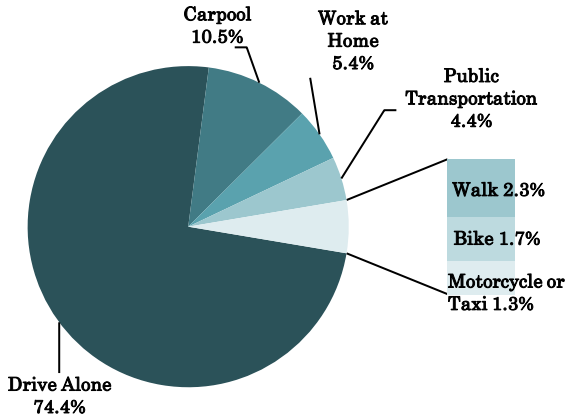
Mode Share

Providing a balanced network and encouraging the use of alternate modes to single occupant auto driving are strategies for managing congestion, promoting healthy communities, and achieving an efficient transportation system. Examples include making accommodations for bicyclists, designing safe, attractive facilities for pedestrians, improving transit service reliability and connections to transit facilities, and promoting transportation demand measures like carpooling, ridesharing, and telecommuting.

To measure the effectiveness of these efforts, the TSMP monitors the journey to work statistics collected by the US Census Bureau.

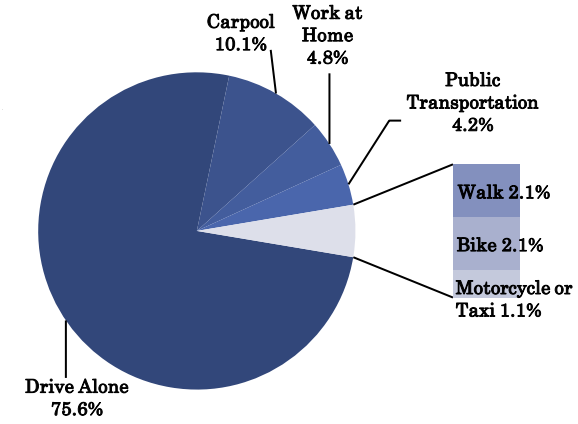
Each year, the US Census Bureau surveys residents who are working general questions about their commute to work, including "Means of Transportation to Work." The data for 2016 shows 25.6% of workers took alternate modes of transportation to driving alone (75.6%) commuting to their jobs. This is a 1.2% increase over workers surveyed in 2015, and a positive trend to increasing mode share and efficiency of the existing transportation networks.

Figure 55. 2016 *Means of Transportation to Work in Santa Clara County*



Data Source: Census Bureau, 2016 American Community Survey 1-Year Estimate

Figure 56. 2015 *Means of Transportation to Work in Santa Clara County*



Data Source: Census Bureau, 2015 American Community Survey 1-Year Estimate

Figure 57. *Auto Mode Share 2006-2016, Santa Clara County*

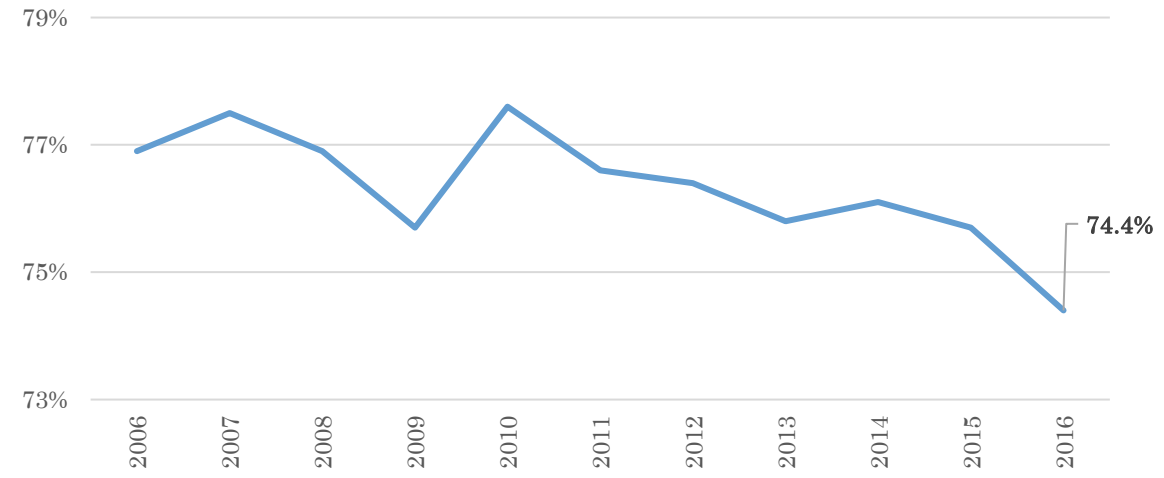


Figure 58. *Carpool Mode Share 2006-2016, Santa Clara County*

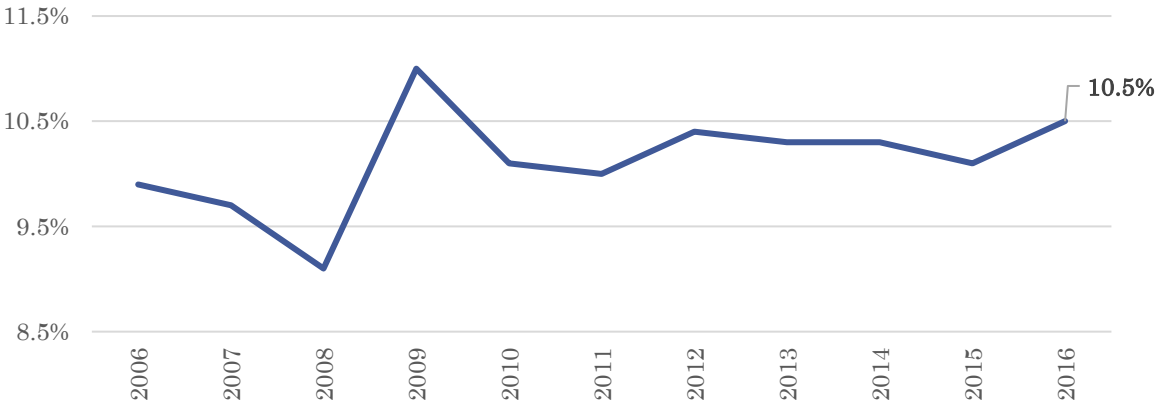
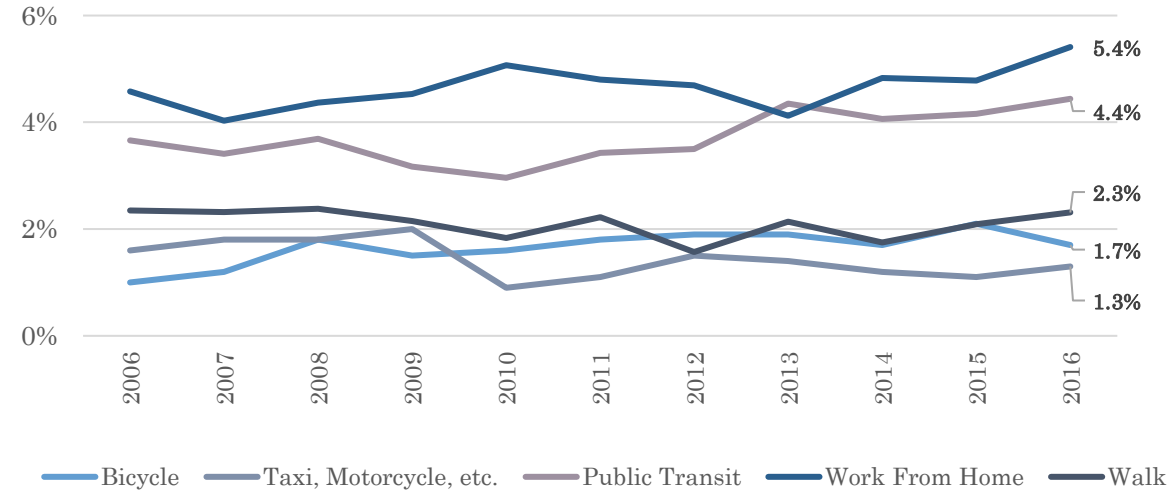


Figure 59. *Non-auto Mode Share 2006-2016, Santa Clara County*



Data Source: Census Bureau, 2016 and 2015 American Community Survey 1-Year Estimate

Time Spent in Congestion (New)

This section was added to provide a perspective on the mobility and effectiveness of Santa Clara County's transportation networks and planning efforts.

In 2014, the Bay Area ranked second-worst in total freeway traffic delay among major metro areas in the nation, surpassed only by Los Angeles and followed by Boston. Using big data, collected from Bluetooth readers and vehicle detectors, MTC Vital Signs calculated an **average total highway delay of 8.6 minutes per person** in the Bay Area (using data collected on Tuesdays, Wednesdays, and Thursdays, during the Peak AM and PM periods).

According to data shown on MTC Vital Signs, two of the most congested corridors in the Bay Area in 2016 were located in Santa Clara County. The two corridors, ranked third and sixth, were US 101 southbound from Mountain View to Downtown San Jose, and I-280 southbound from Foothill Expressway in Los Altos Hills to Downtown San Jose.

The visualizations of lost time on the sections highway corridors in Santa Clara County with recurring delay of 15+ minutes are shown in Figure 62 and Figure 63.

The unit of measure Vehicle Hours of Delay (VHD) represents a total daily time lost in traffic by all vehicles traveling with speed below 35 mph. A large VDH number reflects a low average speed and high vehicle throughput of a corridor. According to the visualizations, the two highways corridors with the highest number of hours lost in congestion are **US 101** and **I-280.**

The data collected to measure the delays are from multiple mobile sources such as GPS units and cellular phones. MTC uses data gathered by INRIX, a transportation data analytics company.

Figure 60. *Metro Comparison for 2014 Time Spent in Congestion*

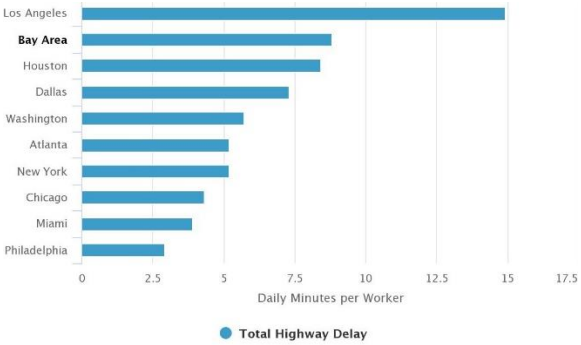


Figure 61. *Historical Trend for Time Spent in Congestion – Bay Area*

Figure 62. *Map of Santa Clara County congested corridors Vehicle Hours of Delay per segemnt – Northbound and Eastbound*

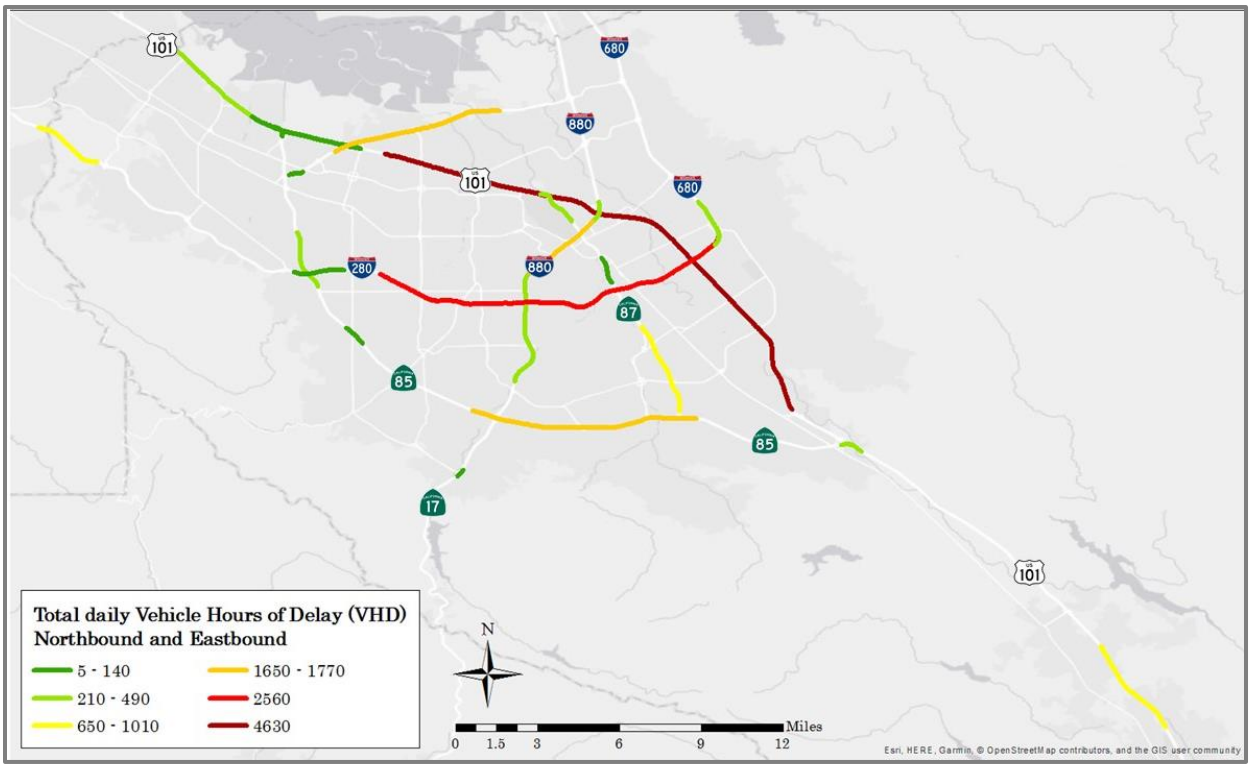
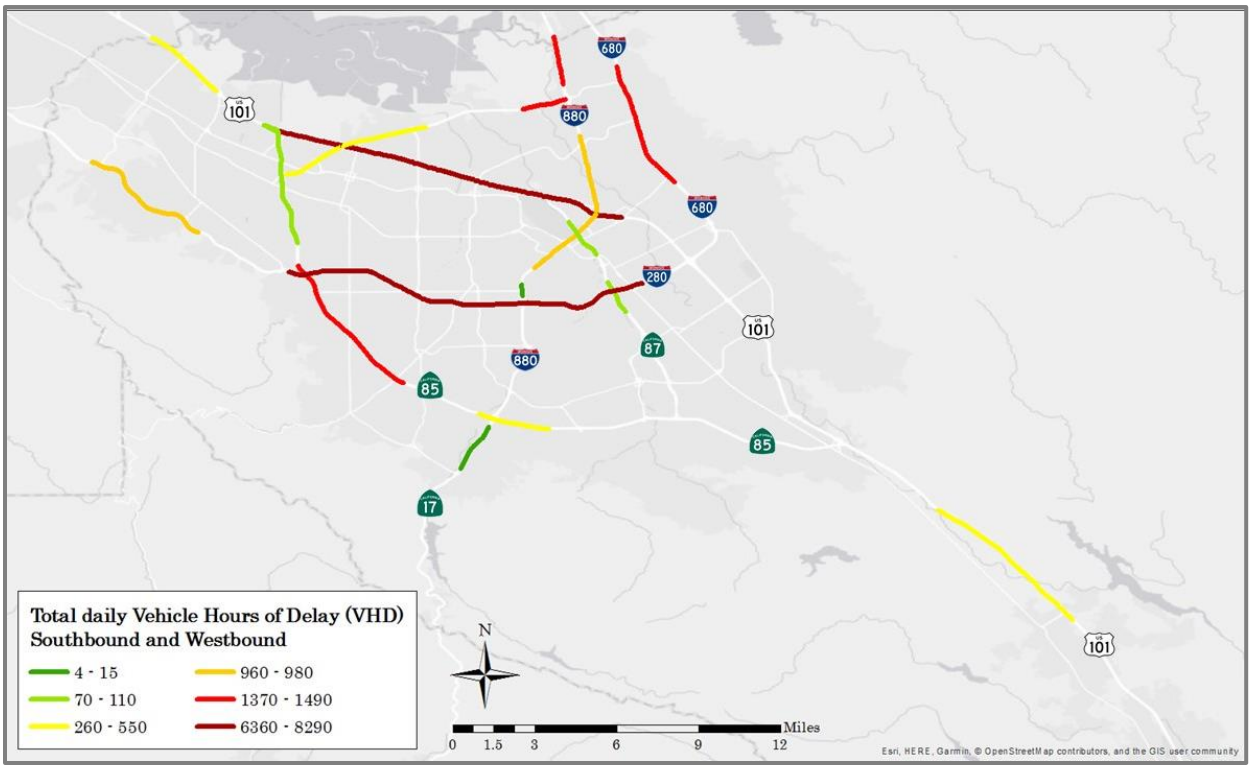


Figure 63. *Map of Santa Clara County congested corridors Vehicle Hours of Delay per segemnt – Southbound and Westbound*



Bikeways

The Countywide Bicycle Plan adopted in 2008 was recently updated in May 2018. This plan provides a vision, goals, and policies for the planning, designing, and building of a countywide bicycle network. The 2018 Santa Clara County Bicycle Plan identifies three major improvement areas: Cross County Bicycle Corridor (CCBC), Across Barrier Connections (ABCs), and Education and Encouragement Programs.

The first two elements of the Plan focus on making improvements to the existing bicycle network and identifying routes that cross multiple jurisdictions. The third element focuses on bicycle education and encouraging the use of the bicycle network.

The CCBCs serve as major arterials and freeways for bicyclists, allowing them to travel throughout and outside of Santa Clara County. ABCs enable bicyclists and pedestrians to conveniently and safely cross freeways, waterways and railroad tracks rather than make circuitous detours to existing roadway crossings.

For monitoring purposes, the TSMP tracks the progress on number of miles CCBCs and ABCs completed each year against the plan towards achieving the vision for cross-county bike mobility. The tables and maps below present the areas measured and the progress made through 2016 on the planned bike improvements identified in the 2008 Countywide Bicycle Plan.

Table 10. CCBCs current construction progress

Cross-County Bicycle Corridors	2016
Total CCBC length planned (2008)	950
Completed miles (on-street)	340
Completed miles (off-street)	110
Overall percent complete	**47%**
Overall percent to complete	**53%**

Table 11. ABCs current construction progress

Across Barrier Connections	2016
Total potential ABC's (2008)	330
Under construction	32
Completed ABCs	50
Unbuilt	248
Overall percent complete	**15%**
Overall percent to complete	**85%**

Figure 64. *Map of Across Barrier Connections Bicycle Projects in Santa Clara County.*

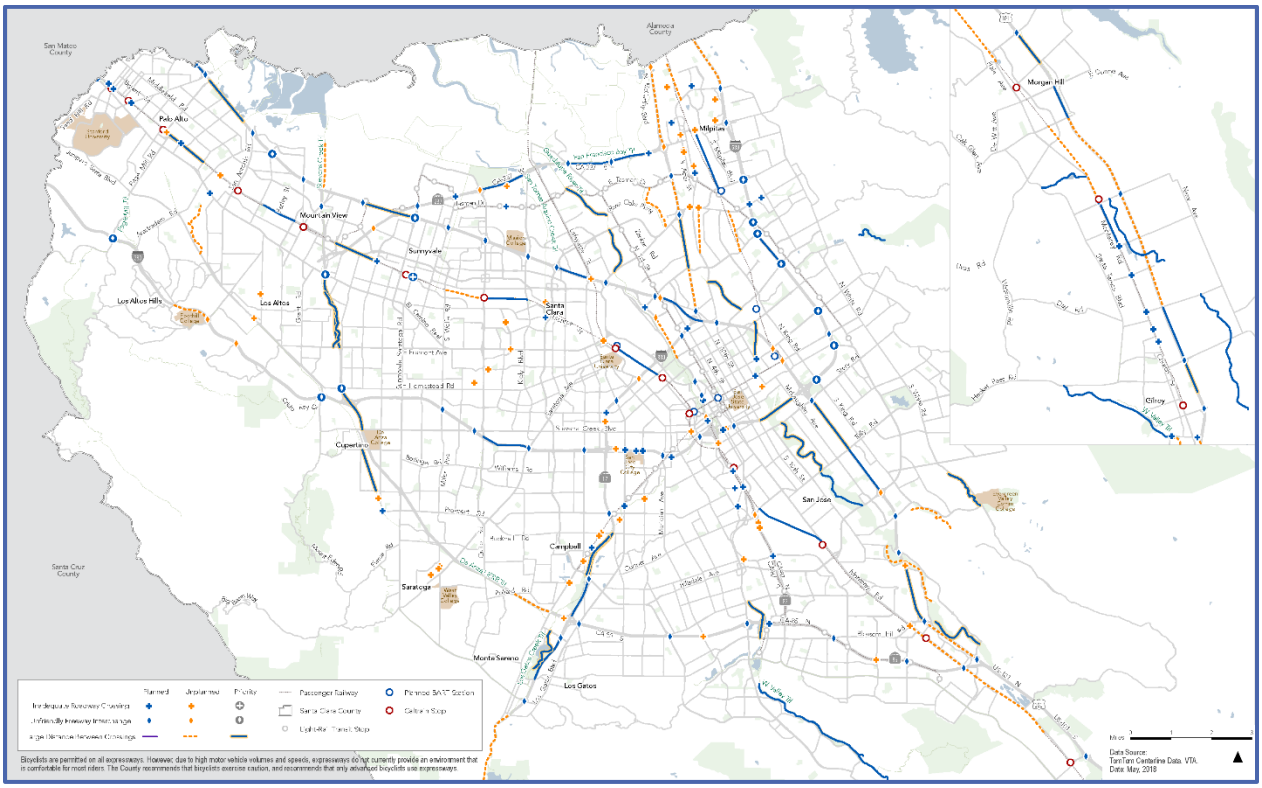
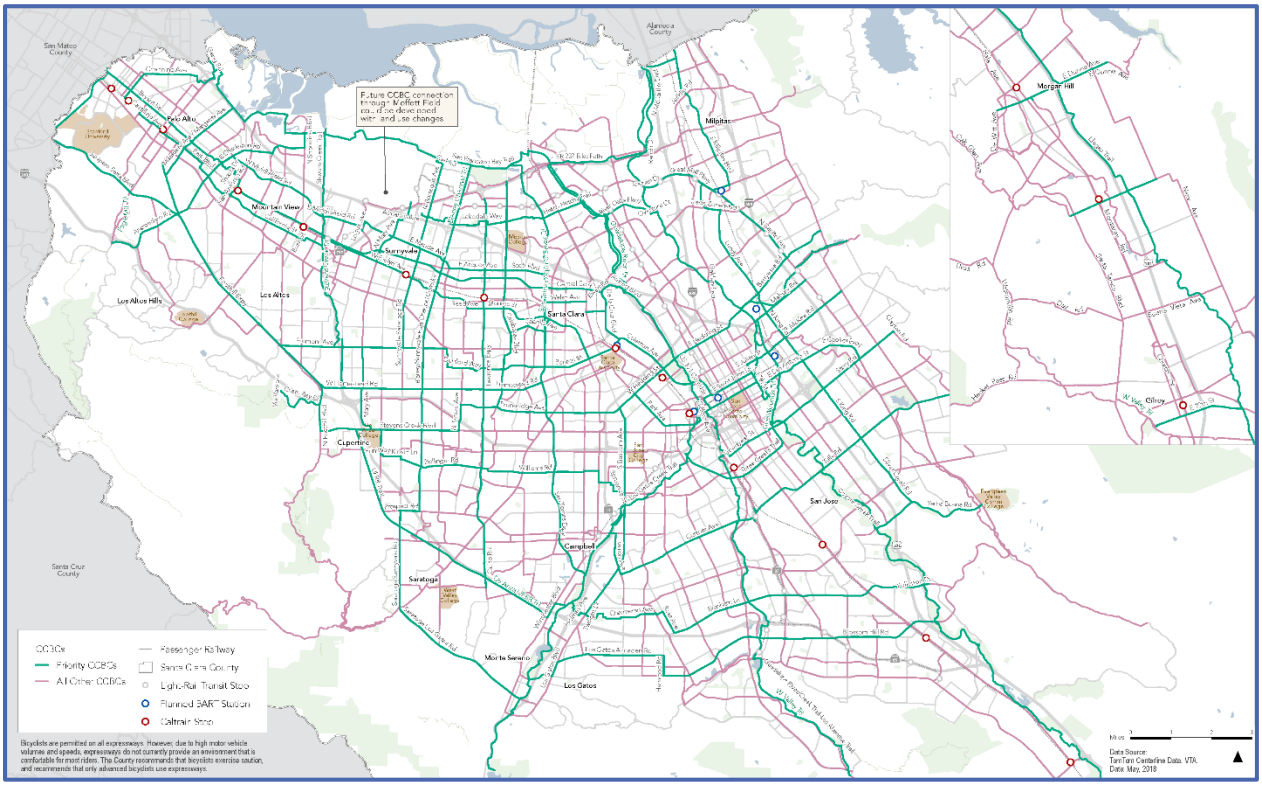


Figure 65. *Map of Across Barrier Connections Bicycle Projects in Santa Clara County.*



Report Notes

2018 SUMMARY

Key Performance Indicators

Pavement

See Pavement section.

Bridges

See Bridges/Overcrossings section.

Maintenance

See Roadside Maintenance section.

Congestion

Current freeway LOS data retrieved from VTA 2016 Congestion Monitoring Program (CMP) Monitoring and Conformance Report and the current intersection LOS data was also retrieved from the 2017 report both of which are available at http://www.vta.org/cmp/monitoring-report. For the sake of this report, AM and PM freeway lane miles of LOS were combined. Freeway LOS is normally analyzed every year, but intersection LOS is only analyzed every 2 years; therefore 2017 CMP Report does not include intersection analysis.

Express Lanes Program

Current information was taken from the SR 237 Express Lanes FY (fiscal year) 2018 Report which will be reported to the VTA board of directors in October 2018, and will be available on VTA website: http://www.vta.org/get-involved/board-of-directors. Previous data was taken from prior annual reports.

Transit

http://www.vta.org/transparency/performance-indicators/light-rail-system-performance. http://www.vta.org/transparency/performance-indicators/bus-performance. Statistics on transit ridership were obtained from Santa Clara Valley Transportation Authority's FY2017 Comprehensive Annual Financial Report and found in Table 21 Operating Information – Operating Indicators near the end of the report. This and previous reports can be accessed at: http://www.vta.org/about-us/financial-and-investor-information-accepted.

Population

Population data from United States Census Bureau provided on their website at State & County Quick Facts page https://www.census.gov/quickfacts/fact/table/US/PST045216 and by searching Santa Clara County, CA.

Vehicle and Driver

Registered drivers and vehicles statistics can be found on California DMV Statistics Page here https://www.dmv.ca.gov/portal/dmv/detail/pubs/media_center/statistics or by searching "Licenses Outstanding" and "Vehicles Registered by County" at https://www.dmv.ca.gov/. Historical registered drivers and registered vehicles by county can also be found on SWITRS report on Table 8B.

Recent Inventory

Bikeways

See bikeways section.

Bridges (Local)

See bridges/overcrossings section.

Bus

Current bus data was retrieved from internal VTA report called "VTA Facts, Current Bus System Data, April 2018". Bus fleet includes all the following bus types: articulated (58), standard (195), hybrid 40-ft (119), hybrid 30-ft (38), and Hybrid Express (50). Bus route mileage is reported as the total round trip. Although this report is not published on the website, much of this information can be found in other reports such as the Annual Service Transit Plan (fleet size, number of routes & stops, and weekly ridership) which can be found on VTA's website here: http://www.vta.org/reports-and-studies. Additionally, a Bus System Overview fact sheet is provided periodically on VTA's website here: http://www.vta.org/news-and-media/resources/vta-newsroom-fact-sheets-vta-information.

Light Rail

Current light rail data was retrieved from internal VTA report called "VTA Facts, Current Light Rail System Data, April 2018". In addition to the fleet of 99 standard vehicles, there are also 4 historic trollies that operate during the Christmas holiday season. Route miles define the extent of the operational network and represent the total extent of routes available for trains to operate. Track miles takes into account multiple track routes (e.g. for each route mile where there is double track, there are two track miles; where there are four tracks, there are four track miles). Although this report is not published on the website, much of this information can be retrieved from other reports such as the Annual Service Transit Plan (fleet size, number of routes & stops, and total ridership), which can be found on VTA's website here: http://www.vta.org/reports-and-studies.

Freeway – Ramp Meter Signals

See freeway ramp meters section.

Signal Controllers

See 2013 Transportation Systems Monitoring Report http://www.vta.org/tsmp.

PAVEMENT

Current (2017) pavement conditions were downloaded from a MTC website called "Vital Signs", which can be found here: http://www.vitalsigns.mtc.ca.gov/street-pavement-condition. MTC no longer provides summarized information on percent of network by road type; therefore, TSMP staff makes special request to MTC and they provide the raw data form TSMP staff to make the calculations.

To more precisely present the change in pavement conditions, this year report moves away from 3-year rolling average and display annual PCIs. It is worth repeating that PCI starts with human observation and interpretation; therefore, it is possible to receive different results year to year for the same condition.

Caltrans has replaced its historical Paving Asphalt price index with the Crude Oil Index and can be accessed from Caltrans' website: http://www.dot.ca.gov/hq/construc/crudeoilindex/. Caltrans uses this index to adjust compensation according to the projects special provisions section called "Adjustments for Price Index Fluctuations." The index is used to illustrate how paving costs have changed over time; however, TSMP staff is not yet able to equate a change in this price index with a dollar cost for street asphalt pavement projects.

BRIDGES

The primary data source used for local bridges and overcrossings is a PDF spreadsheet provided by Caltrans called Local Agency Bridge Inventory on the website here: http://www.dot.ca.gov/hq/structur/strmaint/local/localbrlist.pdf. FHWA NBI does provide a county-wide count of local bridges (without State bridges) along with a count of structurally deficient and

functionally obsolete bridges; however, this county-wide SR includes both local and state-owned bridges, and because of the nature of this report, a count of local assets and SR is preferred at this time. These sources are mainly used to obtain the SR of a particular bridge, which as stated in the report, is a combined structural/functional metric and is therefore not solely a measure of bridge structural integrity. This information is usually updated at least once a year. Unfortunately, as this list is updated, records from previous years are removed from website, which makes it difficult to observe long-term trends. TSMP staff must rely on previously downloaded records.

Other data sources used to verify this list are ASCII Files that can be found at https://www.fhwa.dot.gov/bridge/nbi/ascii.cfm and NationalBridges.com.

The main challenge to TSMP staff is that no county-wide SR for local bridges is provided by Caltrans; therefore, TSMP staff must calculate an average SR for the entire county.

As Caltrans continues to publish BHI (bridge health index) data for local bridges, SR may eventually be replaced with BHI as TSMP's measure of bridge condition.

FREEWAY LITTER, LANDSCAPING AND GRAFFITI MAINTENANCE

Caltrans did not provide TSMP staff with FY2014 LOS score reports for Santa Clara County; therefore, there is a gap in our data trend in this report. Caltrans Maintenance LOS is not distributed to the public but is provided on a request only basis. Through yearly requests, TSMP has received enough data to begin showing trend graphs. Litter LOS goal is found in Caltrans' FY 2017 Statewide LOS Report. Overall Roadway Maintenance LOS goal is 87 per the June 2-15 issue of "the Mile Marker" performance report by Caltrans Headquarters' (http://www.dot.ca.gov/milemarker/). Information on current highway maintenance crews and their schedules is based on prior TSMP communication with Caltrans District 4 regional manager in 2012. To find more information or volunteer with Beautiful Day visit BeautifulDay.org.

Initial identification of haul routes, gateways, and landfills/disposal sites, and definition of litter and landscape scales are referenced from: Litter Control and Landscape Maintenance Study for Freeways in Santa Clara County, T. Y. Lin International, Final Report, December 20, 2005. Monitoring locations were then selected by proximity to gateways, landfill/disposal site, and having a history of litter problems.

Litter and landscape scales are also based upon concepts from Keep America Beautiful community appearance index rating scales.

Graffiti scale was created by TSMP staff based initially from Western Australia's graffiti management toolkit, Appendix D Graffiti Grading System, provided on their website here: http://www.goodbyegraffiti.wa.gov.au/local-councils/graffiti-management-toolkit

Estimate of $11.2 million (using probationers) for annual freeway roadside maintenance for Santa Clara County is referenced from: Litter Control Pilot Program, US 101 between I-880 and Blossom Hill Road, Santa Clara Valley Transportation Authority, California Department of Transportation, August 2008. This estimate was created by applying the actual annual costs incurred during the pilot study. Estimate of Caltrans FY2014 maintenance costs were provided by Deputy Chief to TSMP staff; these estimates may or may not include outstanding invoices.

In addition to data and drive-by video analysis used in previous years, 2018 TSMP includes information on volume of trash and area of graffiti removed annually for the past three years, provided by Caltrans cleaning crews. The future report will also include more detailed information on amount of trash and graffiti removed per freeway.

ROADSIDE ASSETS

A brief survey was designed by TSMP staff and sent to 17 local agencies of which 1 did not respond. Some questions did not apply to some agencies and there for some agencies answered with "n/a". For instance, some agencies do not own their own streetlights, instead local utility companies, such as PG&E, own and operate them. Some amount of local news was provided so this section includes of the feedback provided by the respondents.

FREEWAY RAMP METERS

Ramp meter information was taken from Caltrans 2017 Ramp Meters Development Plan http://www.dot.ca.gov/trafficops/tech/docs/RampMeteringDevelopmentPlan.pdf, published in February 2018.

ROADWAY SAFETY

Provisional 2016 collision data was taken from the iSWITRS system: http://iswitrs.chp.ca.gov/Reports/jsp/ CollisionReports.jsp. The collision data shown in the TSMP report are taken from iSWITRS system Report 1 – Collisions and Victims By Motor Vehicle Involved and is limited to Santa Clara County. Most of this information can be obtained from the Annual Report from Table 8F – Injury Collisions by County and Table 8D – Injury Collisions by County. The iSWITRS system is continuously updated, while the SWITRS Annual Reports are not retroactively corrected. To be more precise, some of the categories shown in Figure are combined crash types as defined by CHP. The following combined TSMP categories are correlated to CHP categories by (TSMP: CHP), Object: Fixed Object + Parked Motor Vehicle + Other Object, Motor Vehicle: Other Motor Vehicle + Motor Vehicle on Other RDWY, Other: Non-Collision + Animal + Not Stated.

Heat mapping and preliminary table data are provided by Safe Transportation Research and Education Center, University of California Berkeley, Transportation Injury Mapping System (TIMS) http://tims.berkeley.edu/. TIMS updated the provisional 2016 data from the CHP on March 16th, 2018. For the TSMP report, TIMS data is used along with the heat maps but is not used to report the overall number of collusions by severity. Because of the limited reports available (from the CHP SWITRS system) that are limited on a county basis, there are currently no SWITR reports for "Type of Collision" on a county basis. According to CHP's SWITR Glossary (http://www.chp.ca.gov/switrs/pdf /2012-glossary.pdf) a collision resulting in a "severe wound" is defined as an injury which prevents the injured party from walking, driving, or performing activities he/she was normally capable of before the collision.

MODE SHARE

2016 1-year estimates journey to work mode data was taken from US Census Bureau's website: https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml using their "FactFinder" search tool.

TIME SPENT IN CONGESTION

Data used for this section was obtained from MTC Vital Signs http://www.vitalsigns.mtc.ca.gov/time-spent-congestion webpage. To create Vehicle Hours of Delay GIS map, source shapefile was downloaded from http://www.vitalsigns.mtc.ca.gov/data/97 webpage.

BIKEWAYS

Historical information was researched by VTA planning staff by contacting local agencies and reviewing existing information. The information provided helps illustrate the progress being made to complete the goals set forth in the 2008 county bicycle plan. Over time, the goals and projects planned in the 2008 plan have changed and therefore a shifting target is experienced which could result in a decrease in percent complete calculations.

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