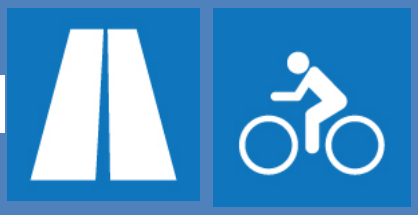
ROADSIDE ASSETS

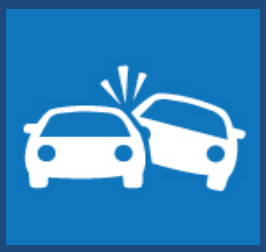
PAVEMENT | BIKEWAYS



CONGESTION

TRANSIT

SAFETY



2016 TRANSPORTATION SYSTEMS MONITORING REPORT (DRAFT)

September 2016

BRIDGES | CURB & GUTTER

LITTER | LANDSCAPE | GRAFFITI

VTA Santa Clara Valley Transportation Authority

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Why Monitor?

The residents of Santa Clara County have made significant investments in its transportation infrastructures. A concern raised by local agencies is their ability to maintain Santa Clara County's transportation systems to acceptable levels. To address this concern, 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.

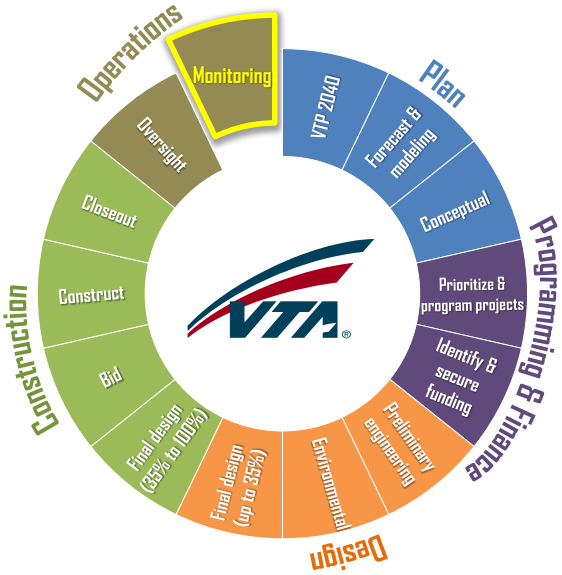
The primary purpose of this report is to serve as an asset management tool by providing an inventory and general assessment on the conditions and performance of selected key transportation systems in a single report on an annual basis.

Other benefits include:

- Enable the county and external stakeholders to better understand the performance of the county's transportation system and the effectiveness of transportation 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.

Figure 1. *Typical Transportation Project Life Cycle.*



Introduction

The 2016 TSMP Report is the sixth edition of this report since the Transportation Systems Monitoring Program (TSMP) was first released in 2010. Each new report released highlights different areas of Santa Clara County's transportation network as new information is added:

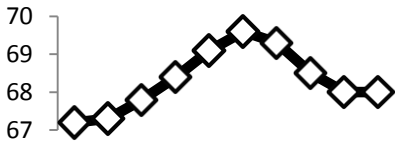
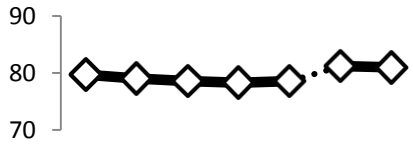
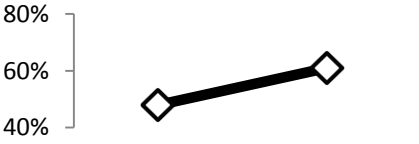
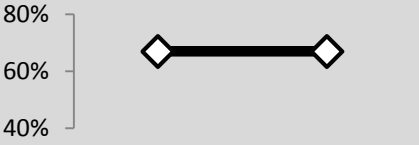
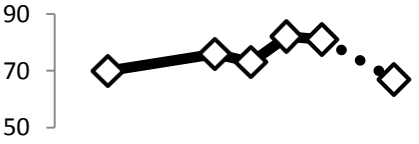
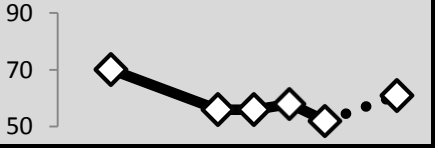
- 2010 (1st ed.) introduced 13 areas to monitor and 18 performance measures
- 2011 (2nd ed.) introduced monitoring of litter and landscape conditions on the highways
- 2013 (3rd ed.) featured inventory of traffic signal systems, introduced monitoring of express lanes and included comparisons of transportation systems with peer counties in the Bay Area
- 2014 (4th ed.) featured a new report format, key performance measures table, expanded: pavement, bridge, and litter and landscape monitoring sections, new safety section and revised air quality section.
- 2015 (5th ed.) featured expanded litter and landscape
- 2016 (6th ed.) ramp metering inventory and green bike lanes materials and applications

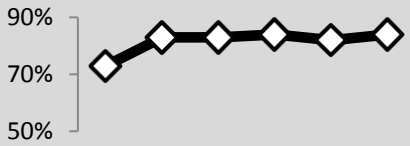
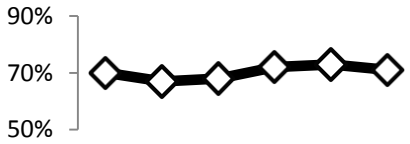
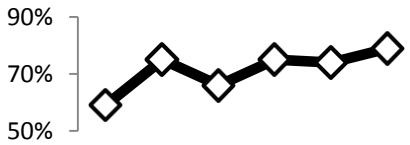
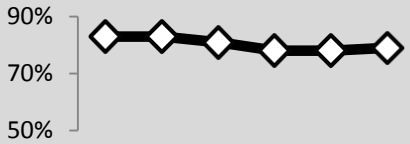
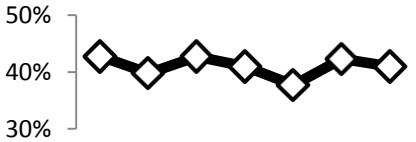
ABOUT THE DATA

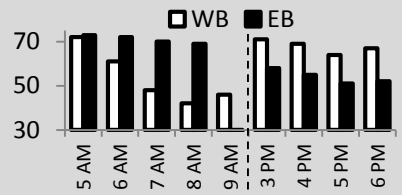
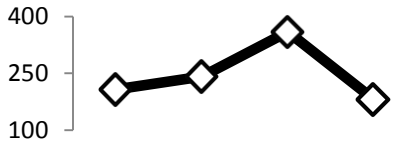
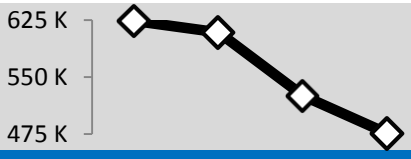
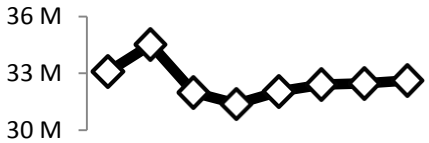
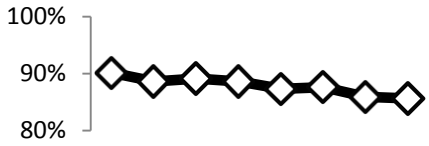
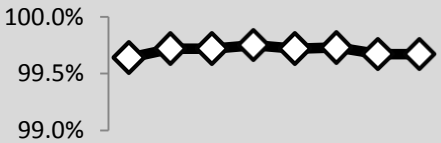
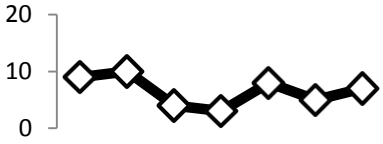
One of the goals established when developing the TSMP concept was to take advantage of available data from existing resources that could be consistently be tracked over time to identify trends into a single, comprehensive report. Where data was unavailable, a survey was used to fill in gaps of the information being sought such as the conditions of the county's roadside assets (e.g. traffic signal controllers, roadway signage and streetlight poles). The performance measures and sources used for this report are summarized in the Notes Section.

2016 Highlights

TABLE 1 - SELECT KEY PERFORMANCE INDICATORS

Indicators	Previous Period	Current Period	Goal	Goal Met ✓ Yes ✖ No	Trend (Yearly)
Pavement					
Local Pavement Conditions (Avg. PCI scale of 0-100 points)	68 (2014)	**68** (2015)	75	✖	
Bridges					
Local Bridge Conditions (Avg. SR scale of 0-100 points)	81.2 (2014)	**81.0** (2015)	80	✓	
Litter Maintenance					
Littered Freeway Shoulder Miles (% moderately littered or worse)	48% (2015)	**61%** (2016)	-	-	
Littered Freeway Monitored Interchanges (% moderately littered or worse)	67% (2015)	**67%** (2016)	-	-	
Roadway Maintenance LOS (0-100 points)	81 (2013)	**67** (2015)	87	✖	
Litter/Debris Maintenance LOS (0-100 points)	52 (2013)	**61** (2015)	80	✖	

Roadside Assets	Previous Period	Current Period	Goal	Goal Met	Trend (Yearly)
Traffic Signals (% in good condition)	82 (2015)	**84 (2016)**	-	-	
Pavement Markings (% in good condition)	73 (2015)	**71 (2016)**	-	-	
Traffic Signs (% in good condition)	67 (2015)	**68 (2016)**	-	-	
Light Poles (% in good condition)	74 (2015)	**79 (2016)**	-	-	
Curb & Gutter (% in good condition)	78 (2015)	**79 (2016)**	-	-	
Congestion					
CMP Intersections (% at LOS C or above)	46% (2012)	**47%** (2014)	-	-	
CMP Freeway – General Purpose Segments (% at LOS C or above)	42% (2014)	**41%** (2015)	-	-	
CMP Freeway – Carpool Segments (% at LOS C or above)	62% (2014)	**59%** (2015)	-	-	

Express Lanes (SR 237/I-880 Connector)					
Speed Monitoring (minimum mph)	44 (2015)	**42 (2016)**	>45	✗	
HOV Only Mode Operation (in hours)	360 (2015)	**181 (2016)**	-	-	
Number of Tolled Vehicles (in thousands)	525.2 (2015)	**475.5 (2016)**	-	-	
Transit	**Previous Period**	**Current Period**	**Goal**	**Goal Met**	**Trend** (Yearly)
Light Rail Annual Ridership (in Millions)	10.95 (2014)	**11.32** (2015)	11.60	✗	
Bus Annual Ridership (in Millions)	32.48 (2014)	**32.62** (2015)	34.00	✗	
Light Rail Annual On-time Performance	84.5% (2014)	**77.4%** (2015)	95%	✗	
Bus Annual On-time Performance	85.9% (2014)	**85.6%** (2015)	92.5%	✗	
System Annual % Scheduled Service Operated	99.67% (2014)	**99.67%** (2015)	99.55%	✓	
Air Quality					
Air Quality Index Annual Median (0-500; see Notes on Report section)	39 (2014)	**40** (2015)	-	-	
Air Quality Index Annual Unhealthy Days (Days per year where AQI>100)	5 (2014)	**7** (2015)	-	-	

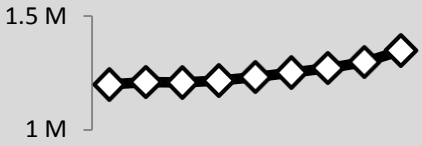
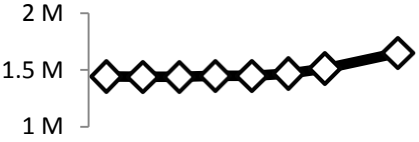
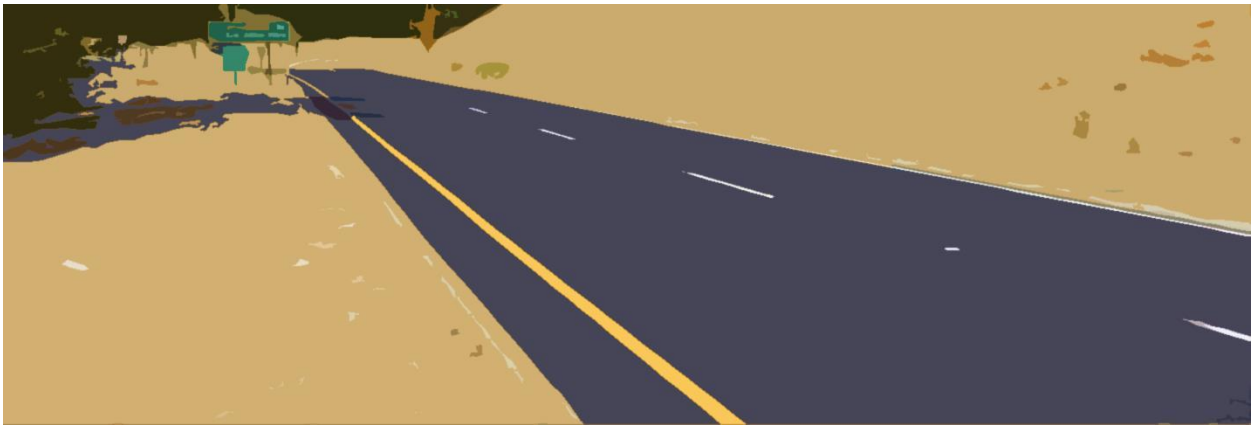
County Census Information	Previous Period	Current Period	Goal	Goal Met	Trend (Yearly)
Population (millions)	1.89 (2014)	**1.92** (2015)	-	-	
Registered Drivers (millions)	1.30 (2014)	**1.35** (2015)	-	-	
Registered Vehicles (millions)	1.51 (2013)	**1.65** (2015)	-	-	

TABLE 2 - INVENTORY OF ASSETS

Assets	Quantity	Year Data Collected
Bikeways – Across Boundary Connections	**25** connections	**2016** *Updated
Bikeways – Miles of On-Street Facilities	**234** mi	**2016** *Updated
Bikeways – Miles of Off-Street Facilities	**110** mi	**2016** *Updated
Bridges (Local)	**489** NBI Bridges	**2016** *Updated
Transit – Bus and Light Rail		
Bus – Fleet Age (avg.)	**10.6** Yrs.	**2016** *Updated
Bus – Fleet Size	**493**	**2016** *Updated
Bus – Route Mileage	**1,236** mi	**2016** *Updated
Bus – Routes	**75**	**2016** *Updated
Bus – Stops	**3,844**	**2016** *Updated
Light Rail – Fleet Size	**99**	**2016** *Updated
Light Rail – Miles of Track	**79.6** mi	**2016** *Updated
Light Rail – Route Mileage	**42.2** mi	**2016** *Updated
Light Rail – Stations	**61**	**2016** *Updated
Freeway – Ramp Meters	**265** Operational **14** Non-operational	**2016** *Updated
Pavement (Local)	**9,953** Lane Miles	**2016** *Updated
Traffic Signal Controllers	**1,181** Local Controllers **160** State Controllers	2013

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

INVENTORY

There are approximately **9,953 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 addition or reductions of new or old roads, such as widening of existing roadways, extension of lanes or removal of existing lanes (road diet projects) or by inconsistencies of yearly reporting and inspecting.

CONDITION

Pavement Condition Index (PCI)

The 3-year rolling average PCI score for Santa Clara County's roadways is **68 (Fair)**, compared with the Bay Area's regional goal of 75 (Good).

PCI is a numerical index between 0 and 100 which is used to indicate the general condition of pavement. Zero is considered to be the worst or failed condition and 100 represents a roadway that is in excellent or best condition (new).

The PCI score presented here represents a weighted average based on a percentage of the roadway network by roadway category (e.g. arterial, collector and residential) over a 3-year time period. This measurement accounts for incremental changes or wearing down of the roadways over time.

Overview

Inventory: **9,953 lane miles**

Condition: **68 PCI [Fair]** (3-yr average)

Needs: **$2,314M** (to eliminate back-log and attain PCI of 75 in 10 years),

Sources: MTC Vital Signs 2015 PCI Scores, 2014 California Statewide Local Streets and Roads Needs Assessment Report

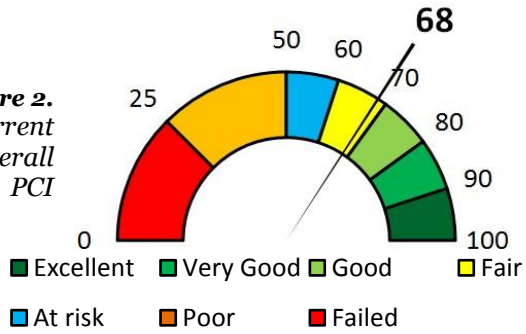


Figure 2. *Current Overall PCI*

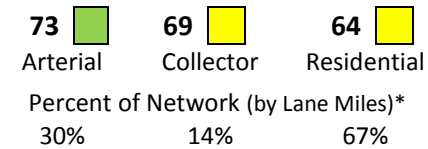


Figure 3. *Overall PCI by Road Type & % of Network*

*From 2015 Data

PCI Description

PCI is based on the number and severity of pavement distresses observed during a visual inspection of a roadway. Visual examples of the PCI index scale are shown below.

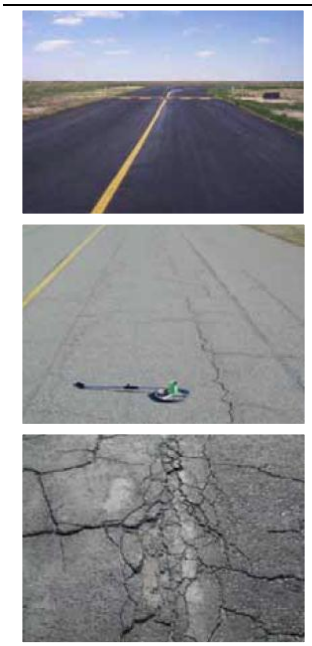


Figure 4 *Example Pavement Surface & PCI*

Table 3. *PCI & Condition Description*

Condition (PCI)	Description
Excellent (100 – 90)	Newly constructed or resurfaced and have few if any signs of distress.
Very Good (89 – 80)	Newly constructed or resurfaced and have few if any signs of distress.
Good (79 – 70)	Show only low levels of distress, such as minor cracks or surface damage as a result of water permeation.
Fair (69 – 60)	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 risk (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.

Condition and Pavement Evaluation

PCI is based on visual inspection of the top surface of pavement. Distresses originating below the pavement are not typically noticed until it "makes its 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 also numerous methods of determining pavement condition. However, many of these methods are too detailed and cost prohibitive for frequent reporting purposes.

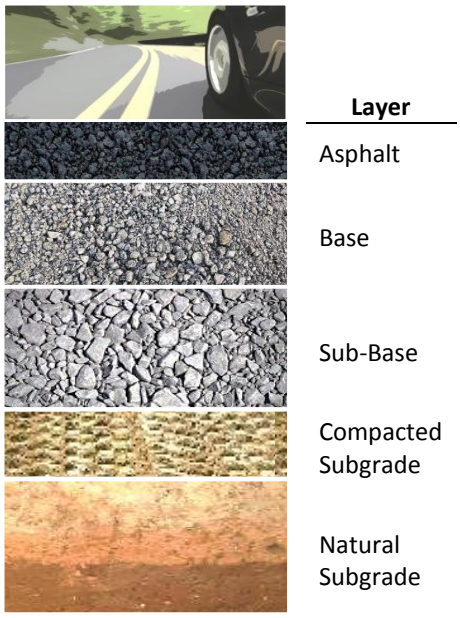


Figure 5. *Typical Pavement Section*

PCI Trend

Based on historical PCI scores, this year's score of 68 shows that there is a leveling trend in average PCI for the county. PCI scores for the Bay Area are based on a 3-year moving average which means that the current PCI of the county may be worse or slightly better than the PCI of 68.

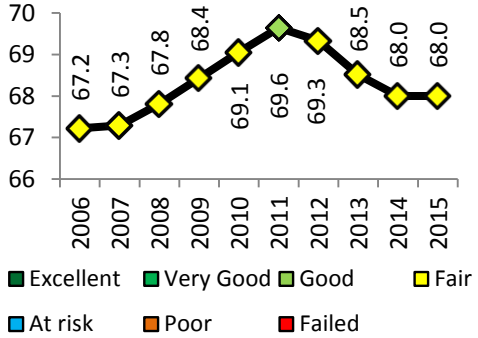
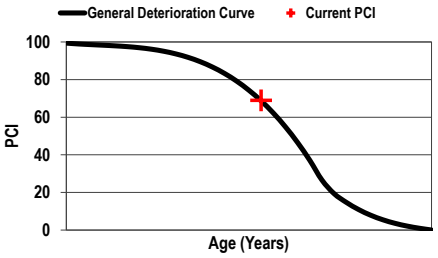


Figure 6. *PCI Trend (3-yr AVG)*

Life Cycle

Pavement tends to deteriorate at an increasing rate over time. The current PCI is at the high end of the "Fair" range and is approaching the "At-Risk" category where a PCI of 60 warns of potential rapid deterioration.

Figure 7. *Current Life Cycle*



Condition Type Distribution

Because different conditions of pavement require different levels of maintenance, it can be useful for decision making purposes to look at the full spectrum of pavement condition categories.

Figure 8. *Current Condition Distribution*

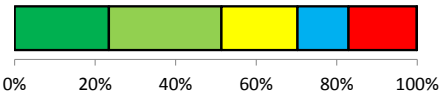


Figure 9. *Current & Historical Distribution Data*

	2013	2014	2015
Excellent/ Very Good	28.59%	25.50%	23.42%
Good	25.68%	27.46%	27.96%
Fair	17.84%	18.61%	18.90%
At risk	11.86%	11.99%	12.67%
Poor/Failed	15.90%	16.22%	16.97%
No Data	0.13%	0.22%	0.10%

% in Good Condition

If the condition categories are combined into "Good," "Fair/At-Risk," and "Poor," a generalized "% in Good condition" can be developed. The result is **51% of pavement is in "Good" condition**.

Figure 10.

Current Combined Distribution

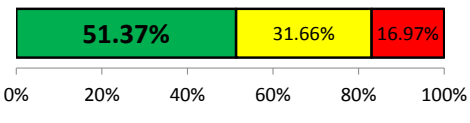


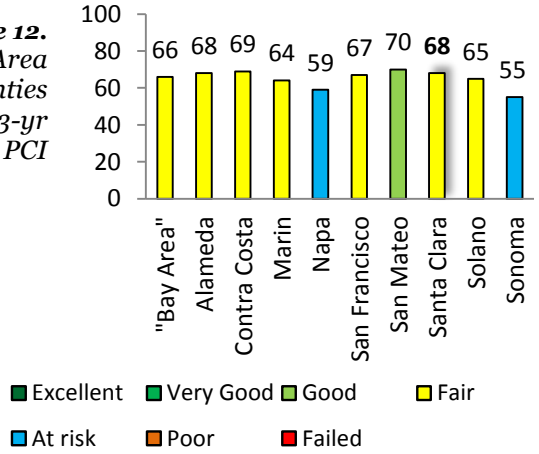
Figure 11. *Current & Historical Combined Distribution Data*

	2013	2014	2015
Good	54.27%	52.96%	51.37%
Fair/At-Risk	29.71%	30.60%	31.66%
Poor	16.03%	16.44%	16.97%

Peer County Comparison

The PCI goal established for the Bay Area's local roadways is 75. Santa Clara County has a PCI score of 68, which is slightly better than the Bay Area's PCI average of 66 (Fair Condition).

Figure 12. *Bay Area Counties 2015 3-yr AVG PCI*



NEEDS

Based on the 2014 California Statewide Local Streets and Roads Needs Assessment, a bi-annual report, **Santa Clara County's needs is $2.3B** in order to eliminate accumulated pavement maintenance back-log and achieve a PCI in the low 80's (Good) within about 10 years. This cost is estimated based on number of lane miles within a PCI range and cost of rehabilitation.

Treatments and Cost

PCI helps to indicate the severity of roadway deterioration and maintenance and rehabilitation treatments needed to improve pavement conditions. Estimated treatment costs are also provided in the California Local Streets & Roads Needs Assessment 2014 Update report.

Table 4. PCI and Treatment.

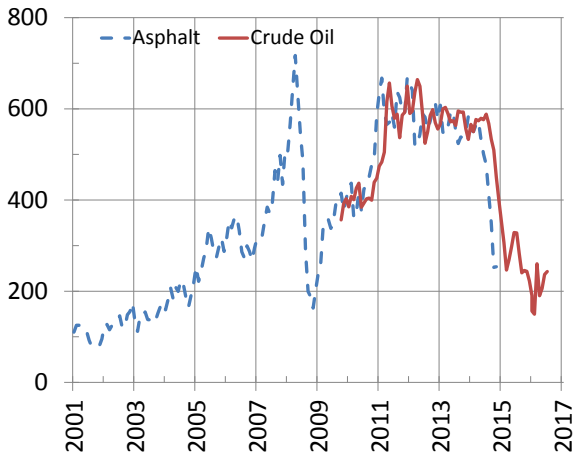
Condition (PCI)	Common Treatment	Costs ($/sq. yard)
Excellent/ Very Good (100 – 80)	Preventative Maintenance	< $4.75
Good (79 – 70)	Preventative Maintenance	$4.75 (Base)
Fair (69 – 60)	Mix of Preventative Maintenance & Thin Overlay	$18.50 (3.9 x Base)
At risk (59 – 50)	Thick Overlay	$29.00 (6.1 x Base)
Poor (49 – 25)	Mix of Thick Overlay & Reconstruction	$46.75 (9.8 x Base)
Failed (24 – 0)	Reconstruction	$64.50 (13.6 x Base)

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



Industry News

- New "Vital Signs" website by MTC provides interactive and extensive historical local pavement data. An interactive map is provided and individual jurisdictions and street conditions can be viewed.

Figure 14. Vital Signs PCI Area Map

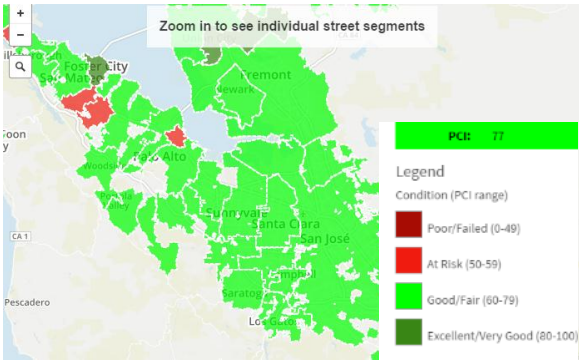


Figure 15. Vital Signs PCI Street Map

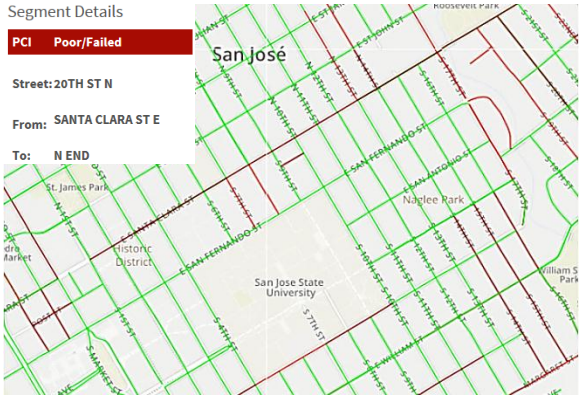
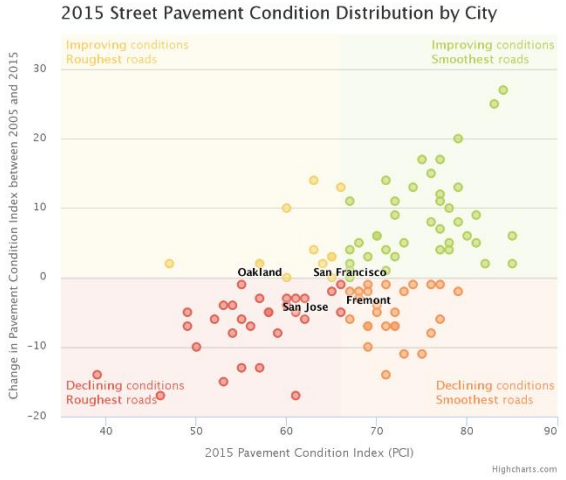
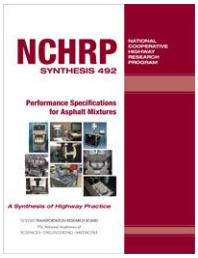


Figure 16. Vital Signs PCI Change Over Time



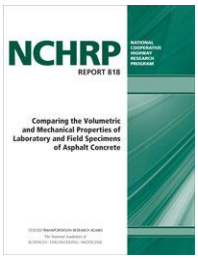
- Recent pavement publications include:



NCHRP Synthesis 492: Performance Specifications for Asphalt Mixtures

6/20/2016

Provides examples of engineering tools used in the development and implementation of performance specifications for asphalt mixtures



NCHRP) Report 818: Comparing the Volumetric and Mechanical Properties of Laboratory and Field Specimens of Asphalt Concrete

4/15/2016

Provides proposed practices for evaluating the causes and magnitude of variability of specimen types tested in quality control and assurance programs for asphalt paving projects.

NCHRP Report 815: Short-Term Laboratory Conditioning of Asphalt Mixtures

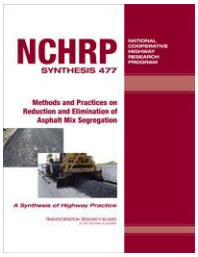
11/10/2015

Develops procedures and associated criteria for laboratory conditioning of asphalt mixtures to simulate short-term aging

NCHRP Report 810: Consideration of Preservation in Pavement Design and Analysis Procedures

7/20/2015

Explores the effects of preservation on pavement performance and service life on pavement design and analysis procedures.



NCHRP Synthesis 477: Methods and Practices on Reduction and Elimination of Asphalt Mix Segregation

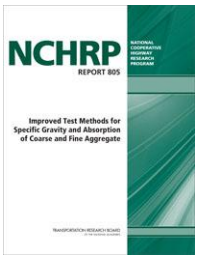
6/8/2015

Provides guidance on how to reduce or eliminate segregation during aggregate production, mix design, asphalt mix production, mix transport and transfer, and placement

NCHRP Report 807: Properties of Foamed Asphalt for Warm Mix Asphalt

5/9/2015

Presents methods for measuring the performance-related properties of foamed asphalts and designing foamed asphalt mixes with satisfactory aggregate coating and workability.



NCHRP Report 805: Improved Test Methods for Specific Gravity and Absorption of Coarse and Fine Aggregate

5/9/2015

Develops test methods for determining the specific gravity and absorption of coarse and fine aggregates.

Bridges/Overcrossings

INVENTORY

There are **489 local bridges** (bridges, overcrossings, or 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 bridges that are maintained by local agencies (not Caltrans). FHWA defines NBI bridges as structures that carry or directly support automobile traffic which span 20ft or longer in length; this can also include creek culvert structures. Caltrans manages NBI for all Santa Clara County agencies and also publishes a list of local bridges every year.

In order to be eligible for federal funding for bridge improvements, the bridge must meet the NBI definition of a bridge. There are many local bridges that do not qualify under the NBI definition but require regular maintenance and monitoring by local agencies without federal aid.

Overview

Inventory: **489 local NBI bridges**

Condition: **81.0 SR [Good]**

Needs: **$204M** (to maintain SR for 10 years)

Source: 2014 Caltrans Local Bridge List, 2014 California Statewide Local Streets and Roads Needs

Some new and existing culverts were added to the local bridge list. It is possible that past inaccurate "Length" code of less than 20 feet caused these structures not to be classified as NBI bridges. There was also creek widening project for Silver Creek at Jackson Ave in San Jose, which necessitated a new bridge. One duplicate record was also removed. Changes to the local NBI bridge inventory are shown in Table 5.

Table 5. *Changes to Local Agency NBI Bridge List by Caltrans for Santa Clara County.*

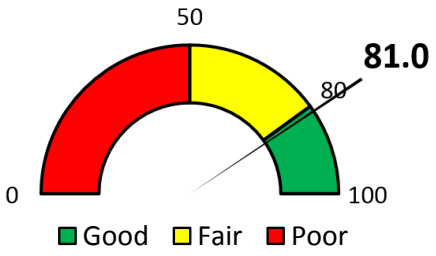
Status	Comment	Agency	Bridge No.	Facility Carried	Feature Intersected	SR	Year Built
Added	Exist Culvert	Milpitas	37C0433	NORTH ABBOTT	JWO HERMINA	67.9	1978
Added	Exist Culvert	Milpitas	37C0434	GREAT MALL	SE OF ELMWOOD	75.7	1994
Added	Exist Culvert	Milpitas	37C0435	ESCUELA	AT RUSSELL LANE	95.7	1984
Added	Exist Culvert	Milpitas	37C0436	ALVAREZ COURT	JWO S ABEL STREET	92.4	2006
Added	Exist Culvert	Milpitas	37C0437	MACHADO	JWO S ABEL STREET	75.9	2006
Added	New Culvert	Morgan Hill	37C0438	MONTEREY ROAD	W. LITTLE LLAGAS	72.4	2013
Added	New Culvert	Morgan Hill	37C0439	WATSONVILLE	W. LITTLE LLAGAS	97.4	2013
Removed	Replaced	San Jose	37C0239	JACKSON AVE	SILVER CREEK	86.4	1970
Added	Replacement	San Jose	37C0797	JACKSON AVE	SILVER CREEK	86.4	2014
Removed	49er Stadium	Santa Clara	37C0323	KIFER RD	CALABAZAS CREEK	95.7	2003

CONDITION

Current Sufficiency Rating

Santa Clara County has a current average Sufficiency Rating **(SR) of 81.0 (Good)**.

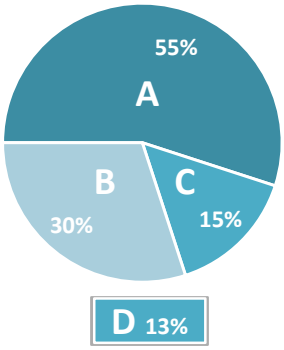
Figure 17. Average Overall SR



Sufficiency Rating (SR) Description

Similar to the pavement condition index, SR ranges from 0 to 100 (poor to best condition). Figure 18 below depicts how SR reflects four weighted categories, 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 18. Details of Sufficiency Rating



A Structural Adequacy and Safety (55% Max)
- Superstructure
- Substructure
- Culvert
- Inventory Rating

B Serviceability and Functional Obsolescence (30% Max)
- Defense Highway
- Lance on the Structure
- Average Daily Traffic
- Approach Roadway Width
- Structure Type
- Bridge Roadway Width
- Vertical Clearance Over Deck
- Deck Condition
- Structural Condition
- Deck Geometry
- Underclearances
- Waterway Adequacy
- Approach Roadway Alignment

C Essentiality for Public Use (15% Max)
- Defense Highway
- Detour Length
- Average Daily Traffic

D Special Reductions (13% Max)
- Detour Length
- Traffic Safety Features
- Main Structure Type

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

Inspections are typically performed every 2 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 **62% of bridges are in Santa Clara County are in "Good" condition**.

Figure 19. Current SR Distribution

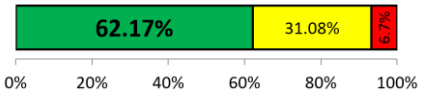


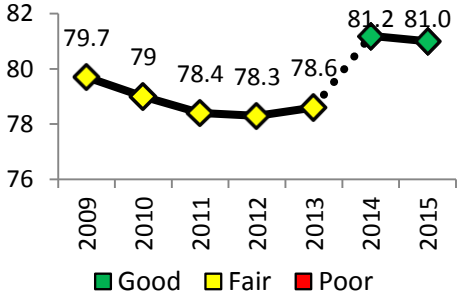
Figure 20. Current SR Distribution Data

	2013	2014	2015
Good (SR 100-81)	59.62%	63.84%	62.17%
Fair (SR 80-51)	27.62%	27.48%	31.08%
Poor (SR 50-0)	12.76%	8.68%	6.75%

Historical SR

The overall average SR has been improving with the most notable improvement in 2014 (SR81.2). This slight jump is likely due to improved bridge conditions and the adding of new local bridges that are in good condition.

Figure 21. SR Trend



It is also worth noting that in 2014, Caltrans updated its reporting method to: distinguish NBI versus non-NBI bridges, eliminate duplicate bridges, and by adding bridges that were previously recorded as a single bridge are now recorded as two separate bridge structures. These changes had an overall improvement to the average SR.

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.

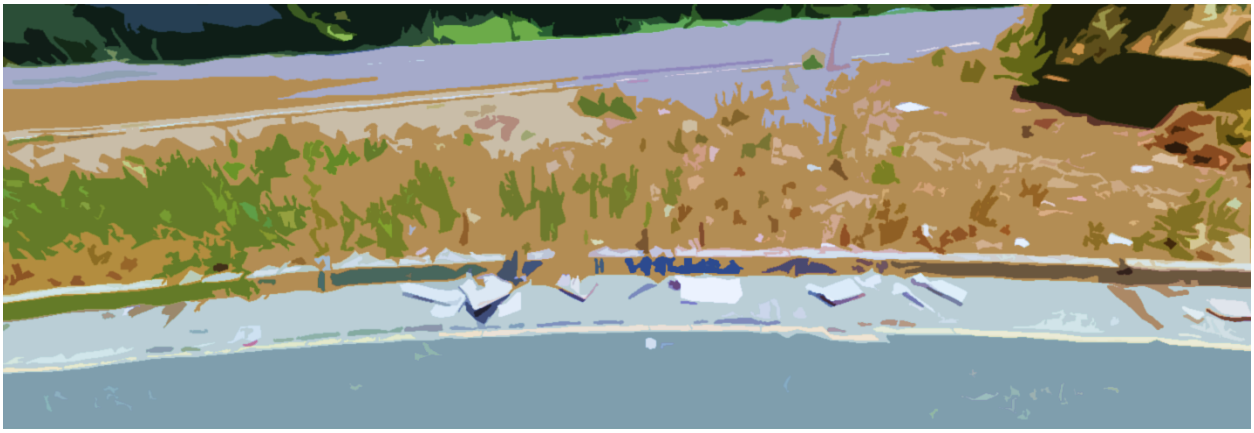
"Functionally Obsolete" (FO) is another term related to SR that indicates how the bridge functionality compares to current design standards for attributes such as traffic load, vertical clearances, alignment, and lane widths. In many cases, the only way to fix a FO rated bridge is to replace the entire 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 in order 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 2014 California Statewide Local Streets and Roads Needs Assessment, a bi-annual report, **Santa Clara County needs $204M** in order to maintain current bridge conditions for the next 10 years. This cost is based upon estimated maintenance and construction costs and somewhat generalized condition reports which describe the condition of different substructures of each bridge.



Freeway Litter, Landscape and Graffiti Maintenance

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 the freeways throughout Santa Clara County are aesthetic and environmental problems. The cleanliness of the freeways and groomed landscaping also represents civic community pride to both local and regional travelers.

INVENTORY

Based on the Litter Control and Landscape Maintenance Study for Santa Clara County conducted in 2005 and TSMP assessment results, 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 that require 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 three teams and work four days per week. Road sweeping is performed on a daily basis, theoretically 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, sponsor single clean-up days each year. Each year there are many single clean-up days. The California Highway Patrol (CHP) also participates in freeway clean-up events by sponsoring four litter clean-up days per year.

Overview

Inventory: **307 Freeway Roadside Miles**

Condition: **61% Littered or Worse Condition** on freeways

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

CONDITION

Caltrans Maintenance LOS

Caltrans monitors the overall maintenance quality of their facilities by visually inspecting random samples of roads (generally 20%) in order to relate a general condition and relate maintenance activities needed to improve the condition. 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 (15%)

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

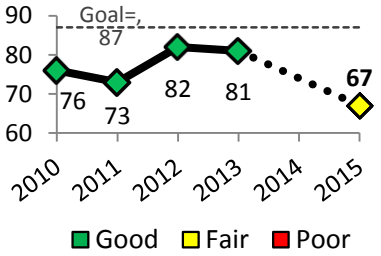
Figure 22. *LOS Rating System*

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 decreased to Fair.

Figure 23. *Overall Maintenance LOS Trend*



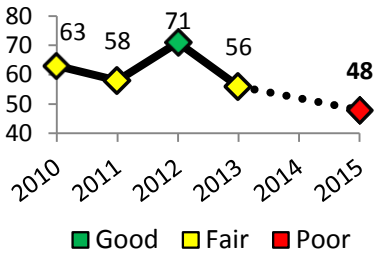
This year, Caltrans increased guardrail inspections requirements which resulted in a decrease in LOS statewide; for Santa Clara County, this may account for about 7 to 10 point decrease in overall LOS.

Roadside Maintenance LOS Trend

Roadside Maintenance is a subset of the overall LOS, and seems to have had a steady downward trend with this year being a new low of 48 out of 100. Items evaluated as part of this group are:

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

Figure 24. *Historical Roadside Maintenance LOS Trend*

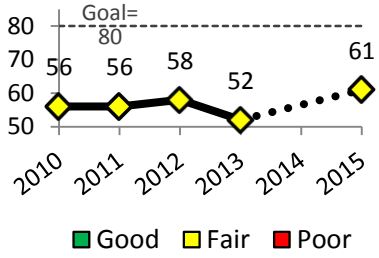


At this time, Caltrans Maintenance LOS report does not include the maintenance condition of established landscape areas.

Litter/Debris Maintenance LOS Trend

Looking in further detail, "Litter/Debris" LOS, which is a subset of "Roadside" LOS, has a somewhat flat trend line. The current Litter/Debris LOS is 61 out of 100, which is much less than the statewide goal of 80.

Figure 25. *Historical Litter/Debris Maintenance LOS Trend*



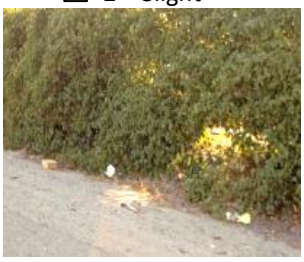
Drive-by Visual Assessment Survey

In order to provide additional perspective, TSMP performed drive-by video surveys of most of Santa Clara County's freeways and expressways. This was done to obtain a general "snapshot" impression of current roadside maintenance conditions. The survey was then analyzed for 3 categories: litter, landscape, and graffiti. The following grading scales were used for each category:

Figure 26. *Litter Grading Scale.*

1 – None

2 – Slight



3 – Moderate

4 – Extreme

Figure 27. *Landscape Grading Scale.*

1 – Attractive

2 – Decent

3 – Moderate

4 – Neglected

Condition (Number)	Description
None (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.

Condition (Number)	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 that are less than 2ft 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, or better.
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 28. *Graffiti Grading Scale.*

1 – None

2 – Slight

3 – Moderate

4 – Extreme

Condition (Number)	Description
None (1)	No 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 drivers 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 drivers 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 CMP (Congestion Management Program). Surveys were conducted from July to August in 2015. Surveys were supplemented by Google Street View where needed.

Results

See the following sections:

"Overall Conditions", page 18
"Freeway Conditions", page 22
"Selected Interchange Conditions", page 30 and
"Expressway Conditions", page 32

During the survey it was observed that some segments had recently been cleaned of litter by AAH (or other group) and that some of the regular graffiti hot spots were painted over. It was also noted that that many usual graffiti hot spots had been recently abated but two rail road bridges over HWY 101 were still graffitied. 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. Additionally, in fiscal year 2014/2015, Caltrans has spent about $1.3 million on litter abatement, $0.7 million on street sweeping, and $0.4 million on cleanup of illegal encampments.

Overall Conditions

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

Figure 29. *Overall Freeway Conditions.*

LITTER	LANDSCAPE	GRAFFITI
3 [Moderate]	3 [Moderate]	1 [No Graffiti]

Figure 30. *Overall Interchange Conditions.*

LITTER	LANDSCAPE	GRAFFITI
3 [Moderate]	3 [Decent]	1 [No Graffiti]

Figure 31. *Overall Expressway Conditions.*

LITTER	LANDSCAPE	GRAFFITI
2 [Slightly Littered]	2 [Decent]	1 [No Graffiti]

Figure 32. *Overall Freeway Conditions by Rating.*

RATING	LITTER	LANDSCAPE	GRAFFITI	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	4.0	2.1	271.8	1.3%	0.7%	86.5%
2	117.6	151.4	30.4	37.5%	48.3%	9.7%
3	166.2	146.4	7.0	53.1%	46.7%	2.5%
4	25.0	13.0	3.7	8.0%	4.1%	1.2%
UC	0.4	0.4	0.4	0.1%	0.1%	0.1%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**313.2**	**313.2**	**313.2**	**100.0%**	**100.0%**	**100.0%**

Figure 33. *Overall Interchange Conditions by Rating.*

RATING	LITTER	LANDSCAPE	GRAFFITI	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	0	0	11	0.0%	0.0%	91.7%
2	4	1	0	33.3%	8.3%	0.0%
3	5	7	1	41.7%	58.3%	8.3%
4	3	4	0	25.0%	33.3%	0.0%
UC	0	0	0	0.0%	0.0%	0.0%
NR	0	0	0	0.0%	0.0%	0.0%
Total	**12**	**12**	**12**	**100.0%**	**100.0%**	**100.0%**

Figure 34. *Overall Expressways Condition by Rating.*

RATING	LITTER	LANDSCAPE	GRAFFITI	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	63.6	8.0	111.3	52.6%	6.6%	92.1%
2	40.5	81.5	3.1	33.5%	67.5%	2.6%
3	10.8	23.6	0.5	8.9%	19.5%	0.4%
4	0.0	1.8	0.0	0.0%	1.5%	0.0%
UC	4.6	4.6	4.6	3.8%	3.8%	3.8%
NR	1.3	1.3	1.3	1.1%	1.1%	1.1%
Total	**120.8**	**120.8**	**120.8**	**100.0%**	**100.0%**	**100.0%**

Figure 35. *Litter Conditions Assessment Map.*

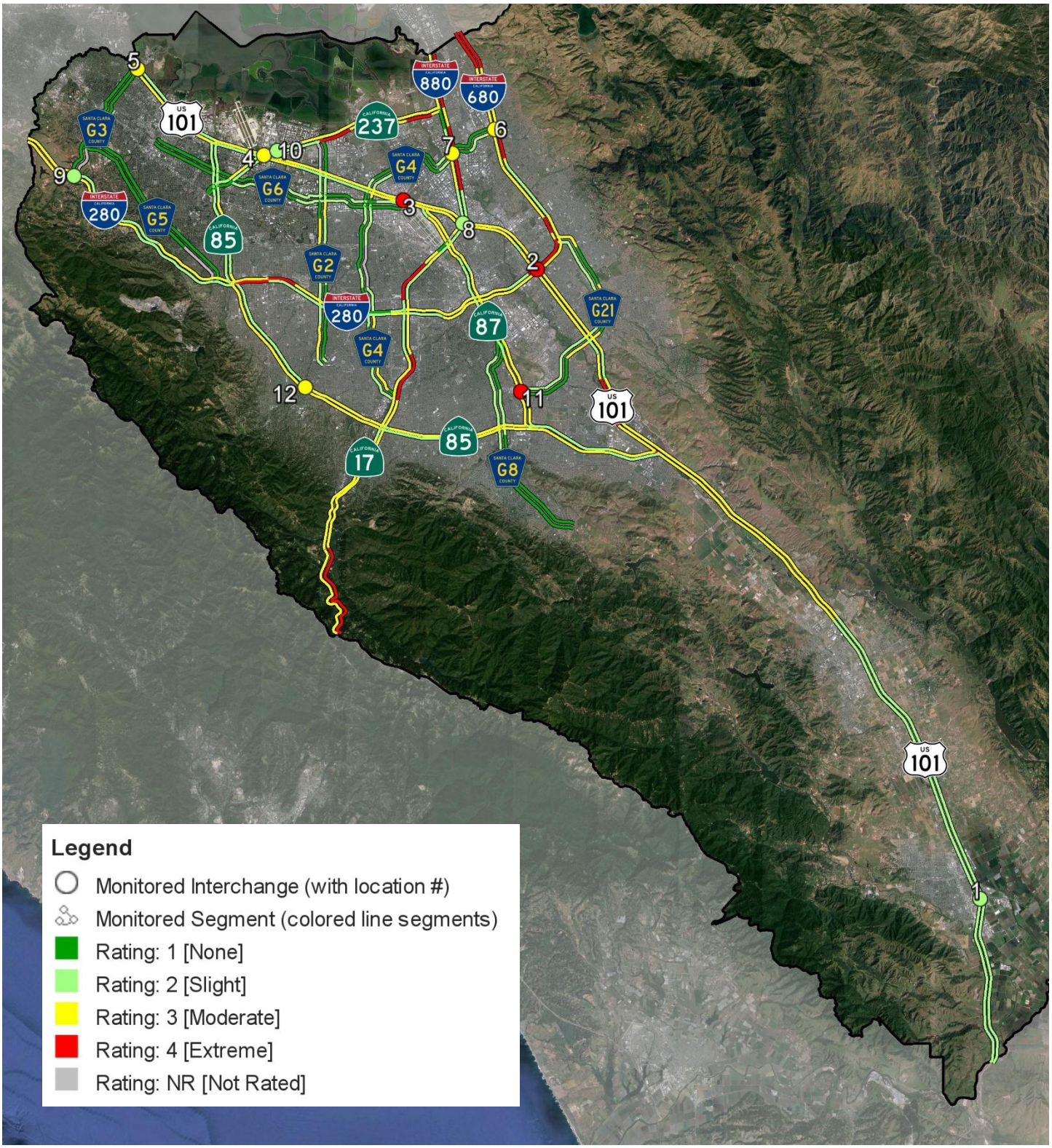


Figure 36. *Landscape Conditions Assessment Map.*

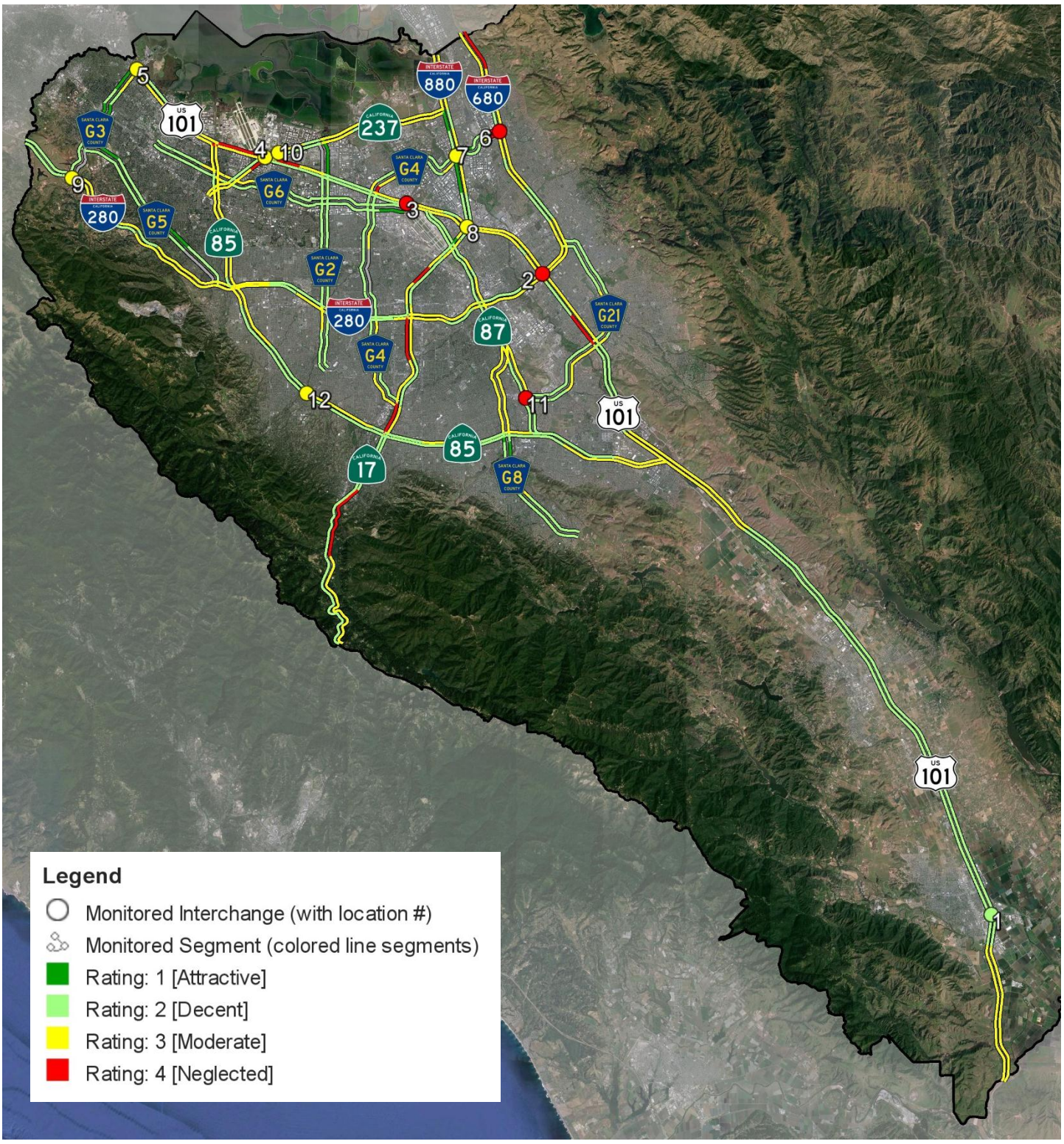
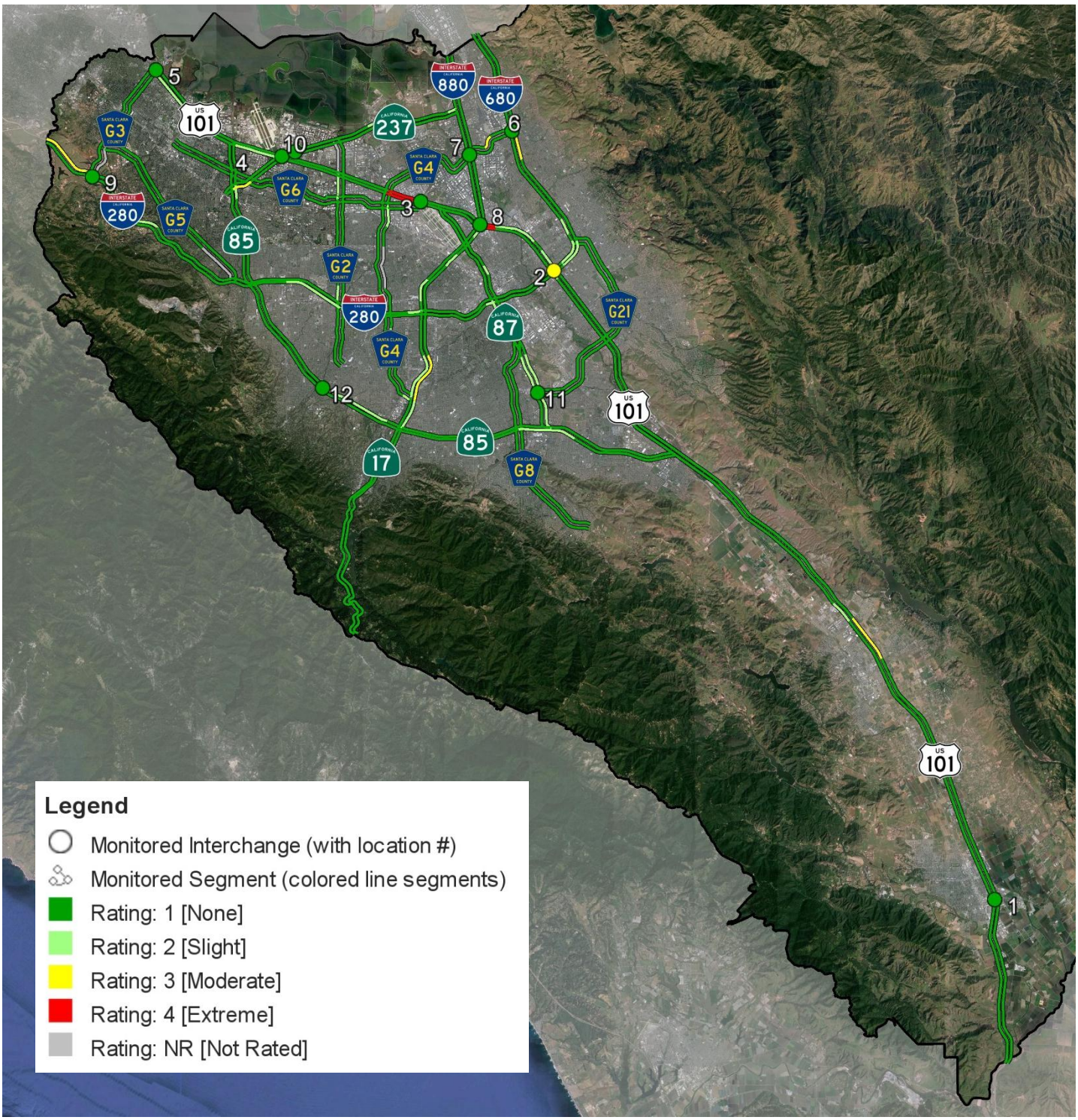


Figure 37. *Graffiti Conditions Assessment Map.*



Freeway Conditions

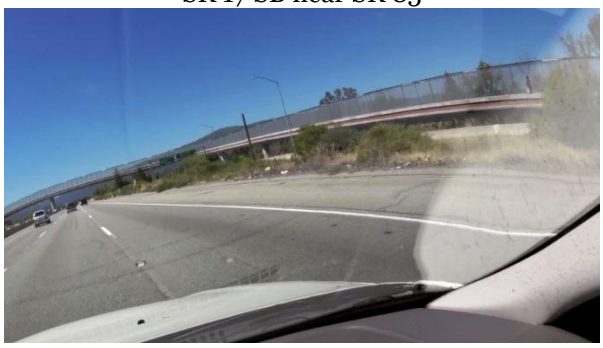
Below are the results of the drive-by survey assessment, grouped by rating, for Santa Clara County freeways.

Figure 38. *SR 17 Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	0.0	0.0	18.8	0.0%	0.0%	67.9%
2	2.1	12.9	3.0	7.5%	46.5%	10.8%
3	19.7	9.1	5.9	71.3%	33.0%	21.3%
4	5.9	5.7	0.0	21.3%	20.5%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**27.7**	**27.7**	**27.7**	**100.0%**	**100.0%**	**100.0%**

SR 17 NB near Campbell Ave

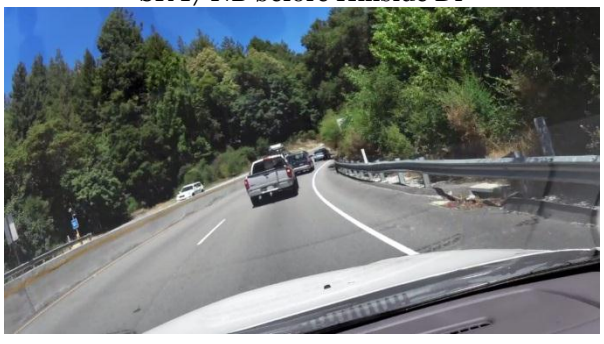
SR 17 SB near SR 85



SR 17 NB before Hamilton Ave

SR 17 SB near Lark Ave

SR 17 NB before Hillside Dr



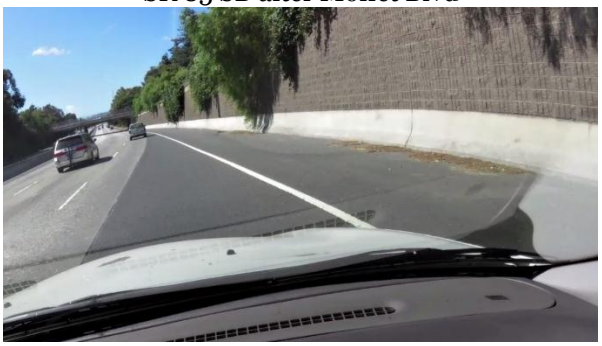
SR 17 SB near Summit Rd

Figure 39. *SR 85 Conditions.*

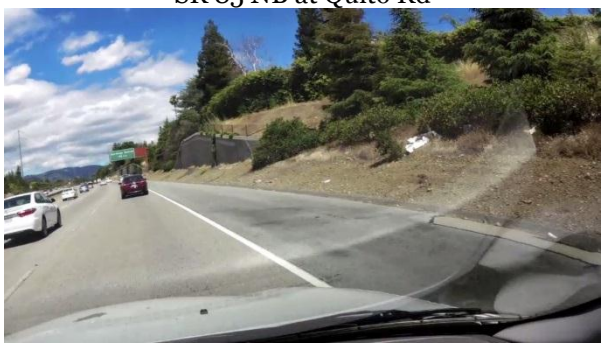
RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	0.0	0.0	44.5	0.0%	0.0%	93.4%
2	21.2	24.1	1.9	44.4%	50.6%	6.6%
3	26.5	23.6	0.0	55.6%	49.4%	0.0%
4	0.0	0.0	0.0	0.0%	0.0%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**47.7**	**47.7**	**47.7**	**100.0%**	**100.0%**	**100.0%**

SR 85 NB at De Anza Blvd

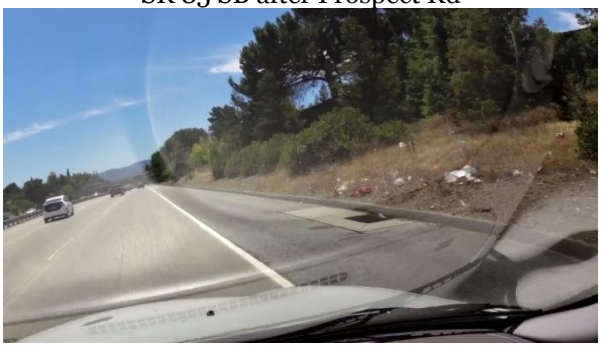
SR 85 SB after Moffet Blvd



SR 85 NB at Quito Rd



SR 85 SB after Prospect Rd



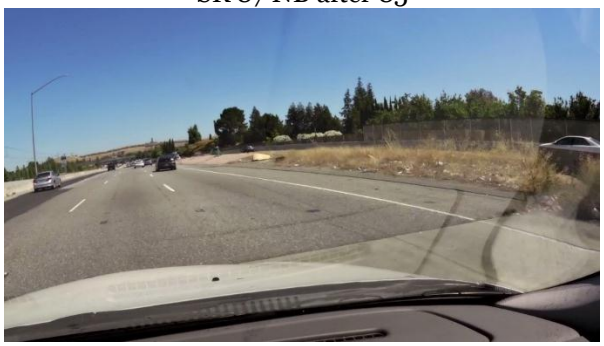
SR 85 NB after Blossom Hill Rd

SR 85 SB before Almaden

Figure 40. *SR 87 Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	0.0	0.0	12.3	0.0%	0.0%	67.1%
2	4.4	13.2	6.0	24.1%	71.6%	32.9%
3	14.0	5.2	0.0	75.9%	28.4%	0.0%
4	0.0	0.0	0.0	0.0%	0.0%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**18.4**	**18.4**	**18.4**	**100.0%**	**100.0%**	**100.0%**

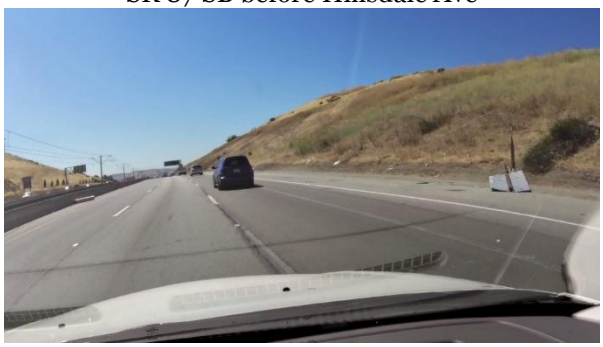
SR 87 NB after 85



SR 87 SB after 101

SR 87 NB after Willow St

SR 87 SB before Hillsdale Ave



SR 87 NB before Skyport Dr

SR 87 SB after Branham Ln

Figure 41. *US 101 Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	0.0	0.0	107.1	0.0%	0.0%	93.0%
2	56.5	66.1	4.4	49.0%	57.3%	3.8%
3	56.7	45.0	0.0	49.2%	39.0%	0.0%
4	2.0	4.2	3.7	1.8%	3.6%	3.2%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**115.3**	**115.3**	**115.3**	**100.0%**	**100.0%**	**100.0%**

US 101 NB at I-680

US 101 SB at Lafayette St

US 101 NB before Taylor St

US 101 SB before Rengstorff Ave

US 101 NB after Metcalf Rd

US 101 SB at CA-25

Figure 42. *SR 237 Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	1.4	0.0	17.1	7.2%	0.0%	86.5%
2	6.5	4.7	2.7	32.7%	23.9%	13.5%
3	9.7	14.3	0.0	48.9%	72.5%	0.0%
4	2.2	0.7	0.0	11.2%	3.6%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**19.8**	**19.8**	**19.8**	**100.0%**	**100.0%**	**100.0%**

SR 237 WB at 880

SR 237 EB after Zanker Rd

SR 237 WB at Maude Ave

SR 237 EB before Great America

SR 237 WB after 85

SR 237 EB before 101

Figure 43. *I-280 Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	1.4	0.0	38.9	3.2%	0.0%	90.2%
2	17.5	18.1	3.2	40.6%	42.0%	7.3%
3	21.8	25.0	1.1	50.7%	58.0%	2.5%
4	2.4	0.0	0.0	5.5%	0.0%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**43.1**	**43.1**	**43.1**	**100.0%**	**100.0%**	**100.0%**

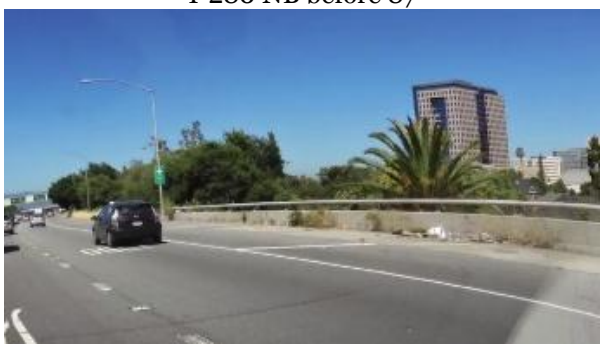
I-280 NB at Magdalena Ave

I-280 SB after Alpine Rd

I-280 NB before 17

I-280 SB at N Stelling Rd

I-280 NB before 87



I-280 SB after 11th St

Figure 44. *I-680 Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	0.0	0.0	18.0	0.0%	0.0%	82.4%
2	2.4	4.0	2.6	11.7%	19.5%	12.8%
3	11.7	15.1	1.0	56.6%	72.9%	4.8%
4	6.6	1.6	0.0	31.7%	7.6%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**20.6**	**20.6**	**20.6**	**100.0%**	**100.0%**	**100.0%**

I-680 NB Before McKee Rd

I-680 SB before Jacklin Rd

I-680 NB at Montague Expwy

I-680 SB before Alum Rock Ave

I-680 NB before Scott Creek Rd

I-680 SB before King Rd

Figure 45. *I-880 Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	1.2	2.1	15.1	5.9%	10.0%	72.5%
2	7.0	7.9	3.3	33.8%	38.2%	16.0%
3	6.1	9.6	2.0	29.5%	46.0%	9.6%
4	6.0	0.8	0.0	28.8%	3.9%	0.0%
UC	0.4	0.4	0.4	1.9%	1.9%	1.9%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**20.8**	**20.8**	**20.8**	**100.0%**	**100.0%**	**100.0%**

I-880 NB after Brokaw Rd

I-880 SB before W Hedding St

I-880 NB after 280

I-880 SB before 87

I-880 NB before Trimble Rd

I-880 SB after Park Ave

Selected Interchange Conditions

Table 6. *Interchange Conditions.*

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

Figure 46. *Map of Interchange Monitoring Locations.*

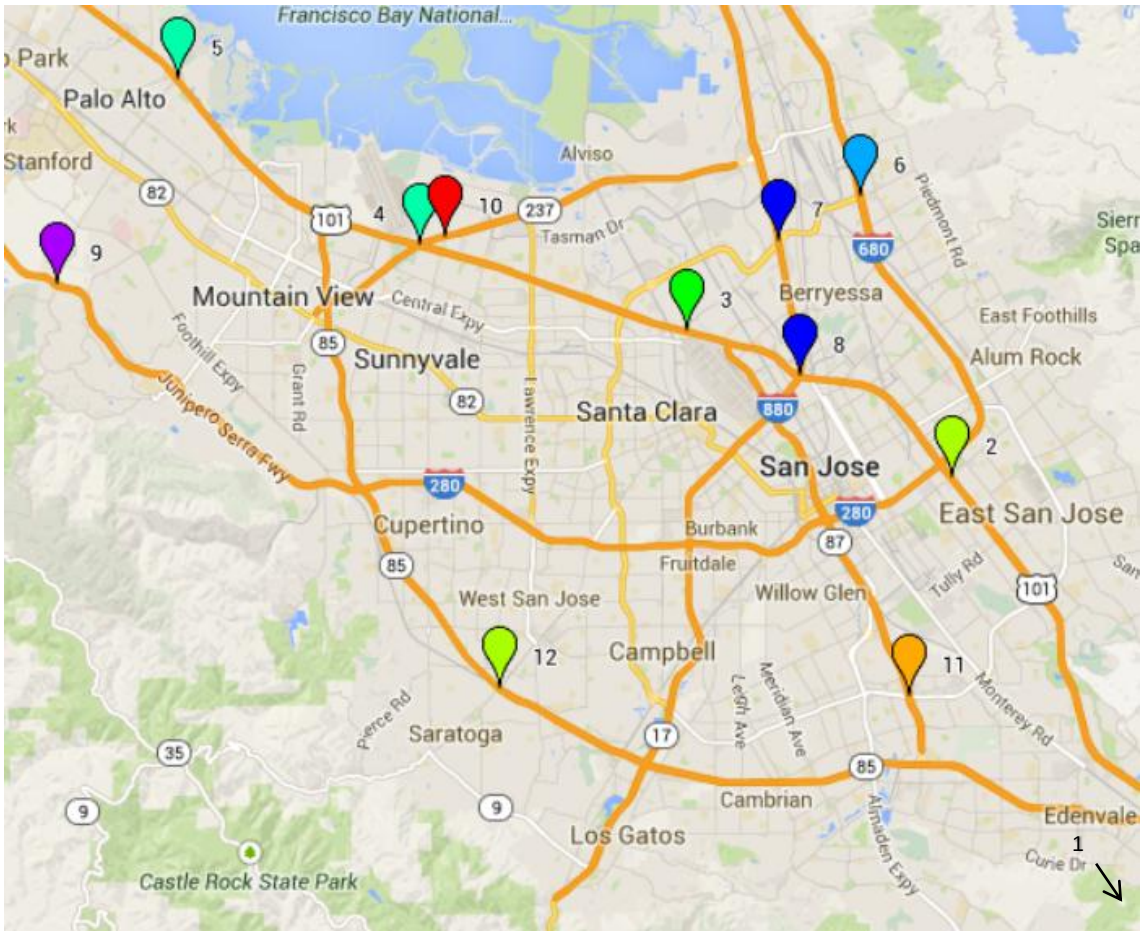


Figure 47. Selected Interchange Photos.

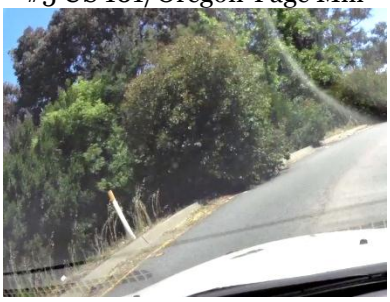
#1 US 101/SR 152 East

#2 US 101/Story

#3 US 101/Trimble

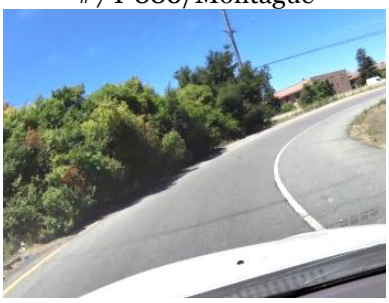
#4 US 101/SR 237

#5 US 101/Oregon-Page Mill



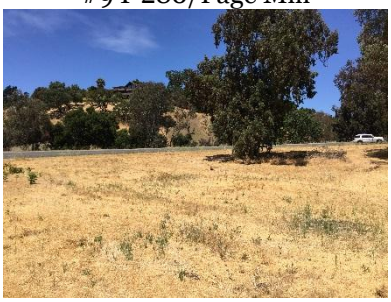
#6 I-680/Montague

#7 I-880/Montague



#8 I-880/US 101

#9 I-280/Page Mill



#10 SR 237/Mathilda

#11 SR 87/Capitol

#12 SR 85/Saratoga

Expressway Conditions

Below are the results of the drive-by survey assessment, grouped by rating, for Santa Clara County Expressways.

Table 7. *Almaden Expressway Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	11.5	0.7	16.6	69.3%	4.2%	100.0%
2	5.1	7.2	0.0	30.7%	43.4%	0.0%
3	0.0	8.7	0.0	0.0%	52.4%	0.0%
4	0.0	0.0	0.0	0.0%	0.0%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**16.6**	**16.6**	**16.6**	**100.0%**	**100.0%**	**100.0%**

Table 8. *Capitol Expressway Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	5.3	0.0	16.4	32.3%	0.0%	100.0%
2	8.2	12.1	0.0	50.0%	73.8%	0.0%
3	2.9	4.3	0.0	17.7%	26.2%	0.0%
4	0.0	0.0	0.0	0.0%	0.0%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**16.4**	**16.4**	**16.4**	**100.0%**	**100.0%**	**100.0%**

Table 9. *Central Expressway Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	10.8	0.9	19.6	55.1%	4.6%	100.0%
2	8.8	16.2	0.0	44.9%	82.7%	0.0%
3	0.0	2.5	0.0	0.0%	12.8%	0.0%
4	0.0	0.0	0.0	0.0%	0.0%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**19.6**	**19.6**	**19.6**	**100.0%**	**100.0%**	**100.0%**

Table 10. *Foothill Expressway Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	12.3	3.0	12.3	87.9%	21.4%	87.9%
2	0.0	9.3	0.0	0.0%	66.4%	0.0%
3	0.0	0.0	0.0	0.0%	0.0%	0.0%
4	0.0	0.0	0.0	0.0%	0.0%	0.0%
UC	1.7	1.7	1.7	12.1%	12.1%	12.1%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**14.0**	**14.0**	**14.0**	**100.0%**	**100.0%**	**100.0%**

Table 11. *Lawrence Expressway Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	4.7	1.3	13.8	28.3%	7.8%	83.1%
2	6.7	12.1	1.5	40.4%	72.9%	9.0%
3	3.9	1.9	0.0	23.5%	11.4%	0.0%
4	0.0	0.0	0.0	0.0%	0.0%	0.0%
UC	1.3	1.3	1.3	7.8%	7.8%	7.8%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**16.6**	**16.6**	**16.6**	**100.0%**	**100.0%**	**100.0%**

Table 12. *Montague Expressway Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	7.4	0.3	11.5	61.7%	2.5%	95.8%
2	3.9	7.3	0.0	32.5%	60.8%	0.0%
3	0.7	2.6	0.5	5.8%	21.7%	4.2%
4	0.0	1.8	0.0	0.0%	15.0%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**12.0**	**12.0**	**12.0**	**100.0%**	**100.0%**	**100.0%**

Table 13. *Oregon Expressway Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	4.0	1.8	4.0	100.0%	45.0%	100.0%
2	0.0	1.2	0.0	0.0%	30.0%	0.0%
3	0.0	1.0	0.0	0.0%	25.0%	0.0%
4	0.0	0.0	0.0	0.0%	0.0%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**4.0**	**4.0**	**4.0**	**100.0%**	**100.0%**	**100.0%**

Table 14. *Page Mill Road Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	4.1	0.0	4.1	75.9%	0.0%	75.9%
2	0.0	4.1	0.0	0.0%	75.9%	0.0%
3	0.0	0.0	0.0	0.0%	0.0%	0.0%
4	0.0	0.0	0.0	0.0%	0.0%	0.0%
UC	0.0	0.0	0.0	0.0%	0.0%	0.0%
NR	1.3	1.3	1.3	24.1%	24.1%	24.1%
Total	**5.4**	**5.4**	**5.4**	**100.0%**	**100.0%**	**100.0%**

Table 15. *San Tomas Expressway Conditions.*

RATING	LITTER (mi)	LANDSCAPE (mi)	GRAFFITI (mi)	LITTER (%)	LANDSCAPE (%)	GRAFFITI (%)
1	3.5	0.0	13.0	21.6%	0.0%	80.2%
2	7.8	12.0	1.6	48.1%	74.1%	9.9%
3	3.3	2.6	0.0	20.4%	16.0%	0.0%
4	0.0	0.0	0.0	0.0%	0.0%	0.0%
UC	1.6	1.6	1.6	9.9%	9.9%	9.9%
NR	0.0	0.0	0.0	0.0%	0.0%	0.0%
Total	**16.2**	**16.2**	**16.2**	**100.0%**	**100.0%**	**100.0%**

Roadside Assets

BACKGROUND

In order to form a perspective on local transportation infrastructure that is not yet systematically inventoried and/or regularly inspected for condition, a self-assessment survey was conducted with local agencies. This survey asked general questions about the inventory, condition, and ability to maintain assets in a "good" condition. The results are shown below.

The information received from this self-assessment survey is mainly substantiated on estimates and not through documentation. The results should also be treated as "snap-shot" in time.

In addition, the survey this year introduced a new section which allowed respondents to share frequency of maintenance strategies for each asset type.

INVENTORY

The survey asked respondents to provide total inventory of the items listed below, to the best of their ability.

- Traffic Signs: 198,369
- Street lamps: 110,237
- Sidewalks: 7,859 miles

CONDITION

Because asset condition can be easier to approximate than inventory, conditions for a greater number of assets were requested.

Overview

Reponses: **16 responses out of 17**

Inventory: **198,369 traffic signs**

Condition: **84% traffic signs in good condition**

Table 16. *Average Local Asset Conditions.*

Local Assets	% in Good Condition (avg.)	Ability to Maintain (avg.)
Traffic Signals	84%	High
Traffic Signals Timing	-	High
Pavement Markings	71%	Medium
Traffic Signs	68%	Medium
Light Poles	79%	High
Curb & Gutter	79%	Medium
Litter Control	83%	Medium
Sidewalks	78%	Medium

Condition Distribution

Below are frequency charts for the condition portion of the self-assessment survey.

Table 17. *Traffic Signals*

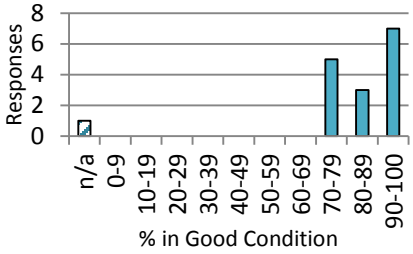


Table 18. *Pavement Markings*

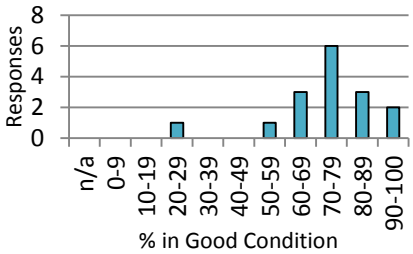


Table 19. *Traffic Signs*

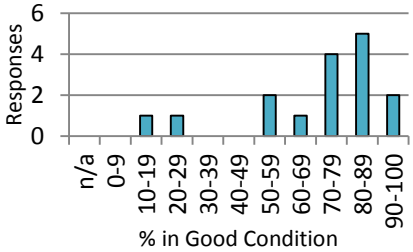


Table 20. *Light Poles*

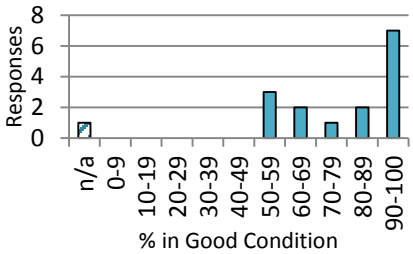


Table 21. *Curb & Gutter*

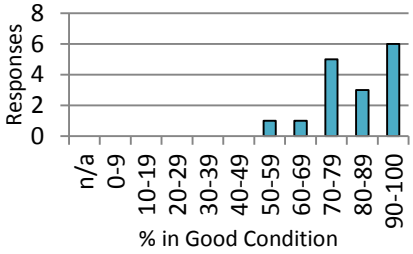


Table 22. *Litter Control*

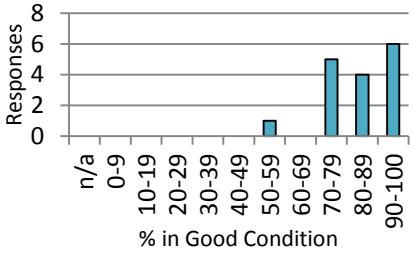
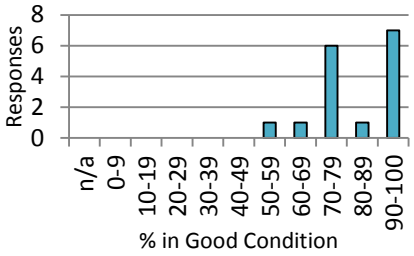


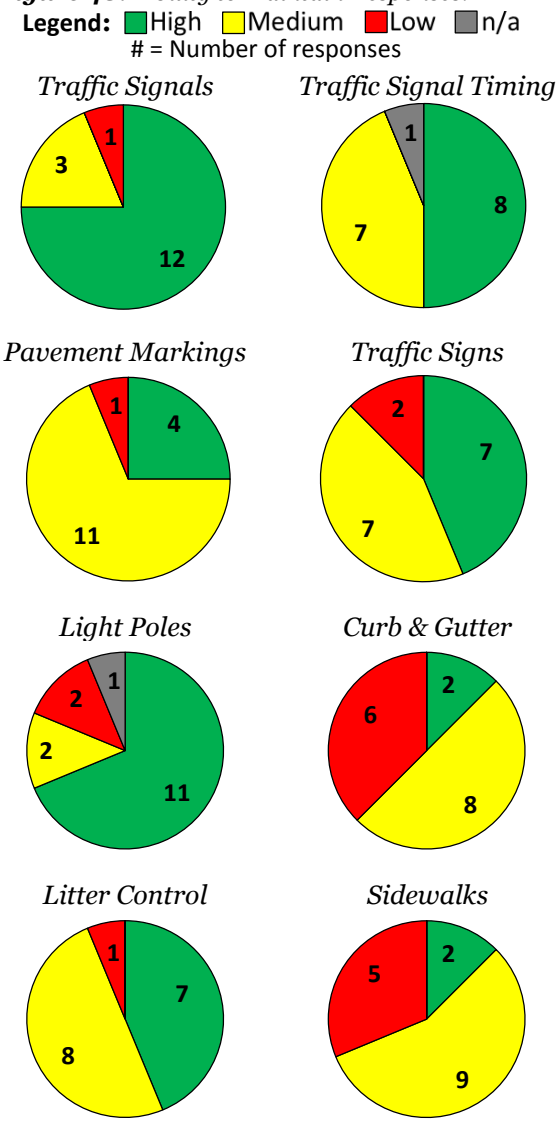
Table 23. *Sidewalks*



ABILITY TO MAINTAIN

This metric helps communicate the amount of need in maintaining a transportation asset. A low ability to maintain generally indicates that current funding is not enough to maintain a network of assets to a desired condition. The following pie charts represent the number of responses received for each category of "ability to maintain."

Figure 48. *Ability to Maintain Responses.*



FREQUENCY OF MAINTENANCE

This metric helps communicate the maintenance strategy selected for each of the following transportation assets.

Table 24. *Traffic Signals*

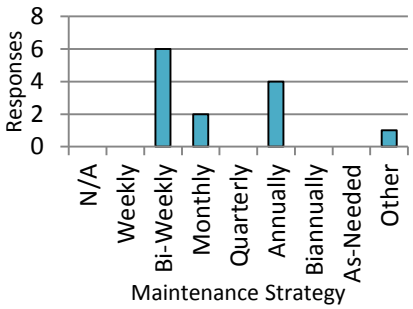


Table 25. *Pavement Markings*

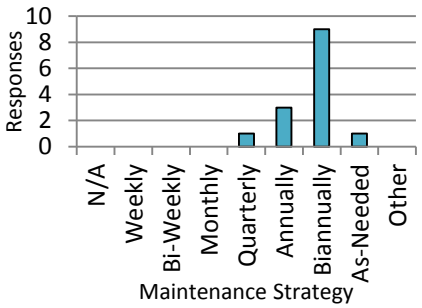


Table 26. *Traffic Signs*

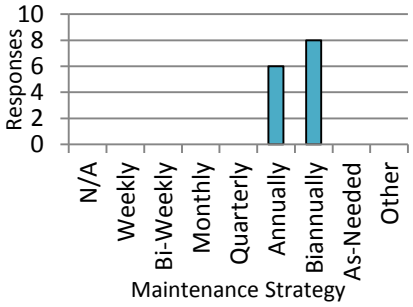


Table 27. *Light Poles*

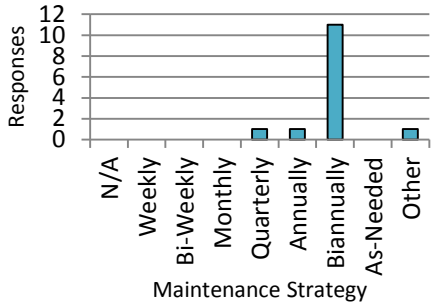


Table 28. *Curb & Gutter*

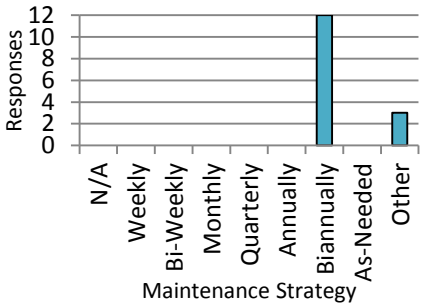
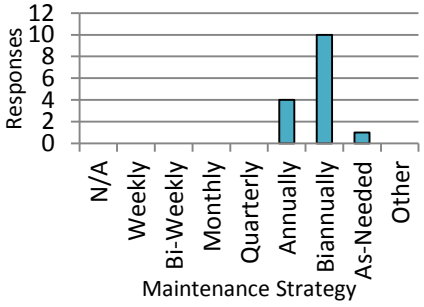


Table 29. *Litter Control*



LOCAL NEWS

Recent Efforts

Gilroy: Sign reflectivity study starting in late 2016.

Monte Sereno: OBAG funded street rehab and updating pavement management report.

Palo Alto: Upgraded all traffic signals systems and testing connected vehicle technology, recognized by ITS America. Developing infrastructure management software for pavement.

San Jose: Improved response time to 7 days (from 21) for litter removal.

Santa Clara County: Box culvert replacement in San Tomas Expressway; won 2016 APWA project of the year in Utilities category.

Current Challenges

Theft or Damage

Gilroy: Copper theft down due to preventative measures.

Santa Clara County: increase in copper wire theft.

Inadequate Resources

- Limited budget for ADA compliant curb ramps, implementing complete streets policies, and maintaining GIS software.

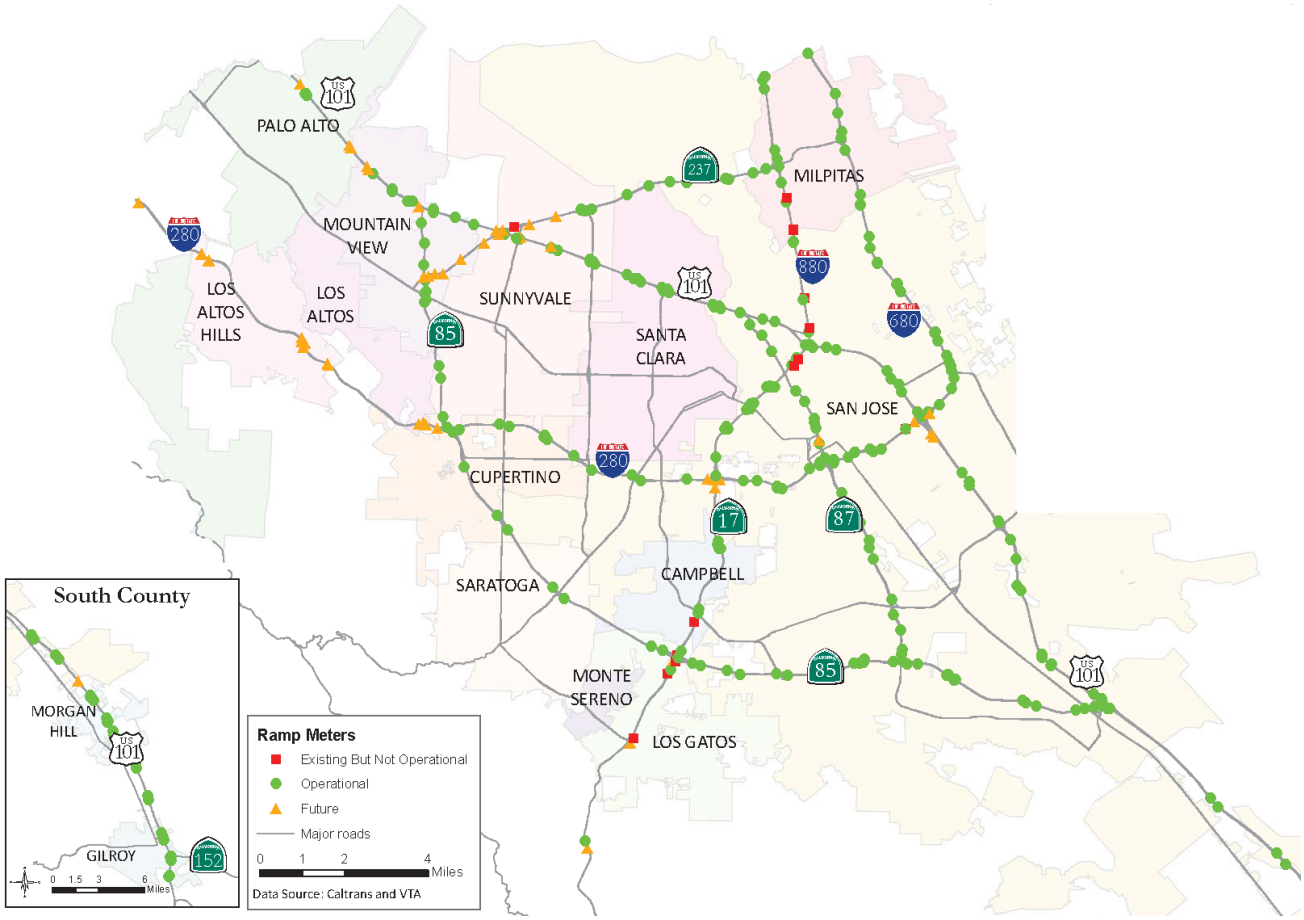
FREEWAY RAMP METERS

As an effort to reduce freeway congestion, beginning in 2008, freeway ramp meters have been constructed throughout Santa Clara County. **There are currently 265 operational ramp meters (nearly half of all active ramp meters in the Bay Area)**, 14 non-operational, and 50 future ramp meters. This means that about 80% of the originally planned meter system is installed and operational. Travel time savings have been observed between 2% and 26%.

In 2015, activity includes activation of:

- 30 meters along US 101 between SR 85 south and Monterey Rd in Gilroy,
- 38 meters along I-680 between King Road and Scott Creek Road, and
- 19 meters along SR 85 between US 101 north and De Anza Blvd.

Figure 49. Freeway ramp meter location and status.



Roadway Safety

Transportation has a significant effect on public health and safety and includes concerns road user collisions, air quality, and active transportation (bicycling and walking).

ACCIDENT COLLISIONS

Road safety is a primary concern of community leaders, transportation professionals and all users of the roadway (auto drivers, truck drivers, motorcyclists, bicyclists, or pedestrians.) There are many causes of collisions and they are generally related to: driver characteristics, weather conditions, and physical road layout.

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, 2014 data was recently released and made available to the public in late 2016.

Provisional 2014 SWITRS data was obtained for this report. There were **14,222 total collisions**, which included **6,721 injury collisions**, **104 fatal collisions**, and **7,397 property damage only collisions**. The total percentage of collisions decreased in 2014 by 0.7%. Fatal pedestrian and bicycle involved collisions also decreased 16% and 40% respectively.

Figure 50. *Historical Total Collisions*

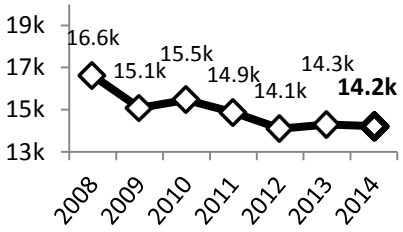


Figure 51. *Historical Injury Collisions*

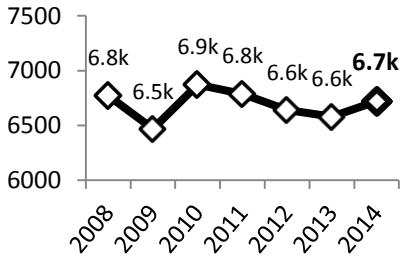


Figure 52. *Historical Fatal Collisions*

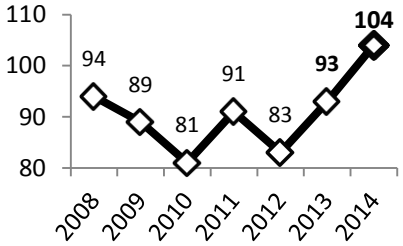
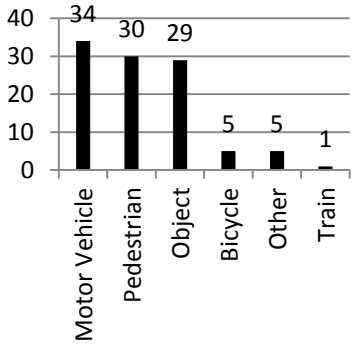


Figure 53. *2014 Fatal Collisions Involved With*

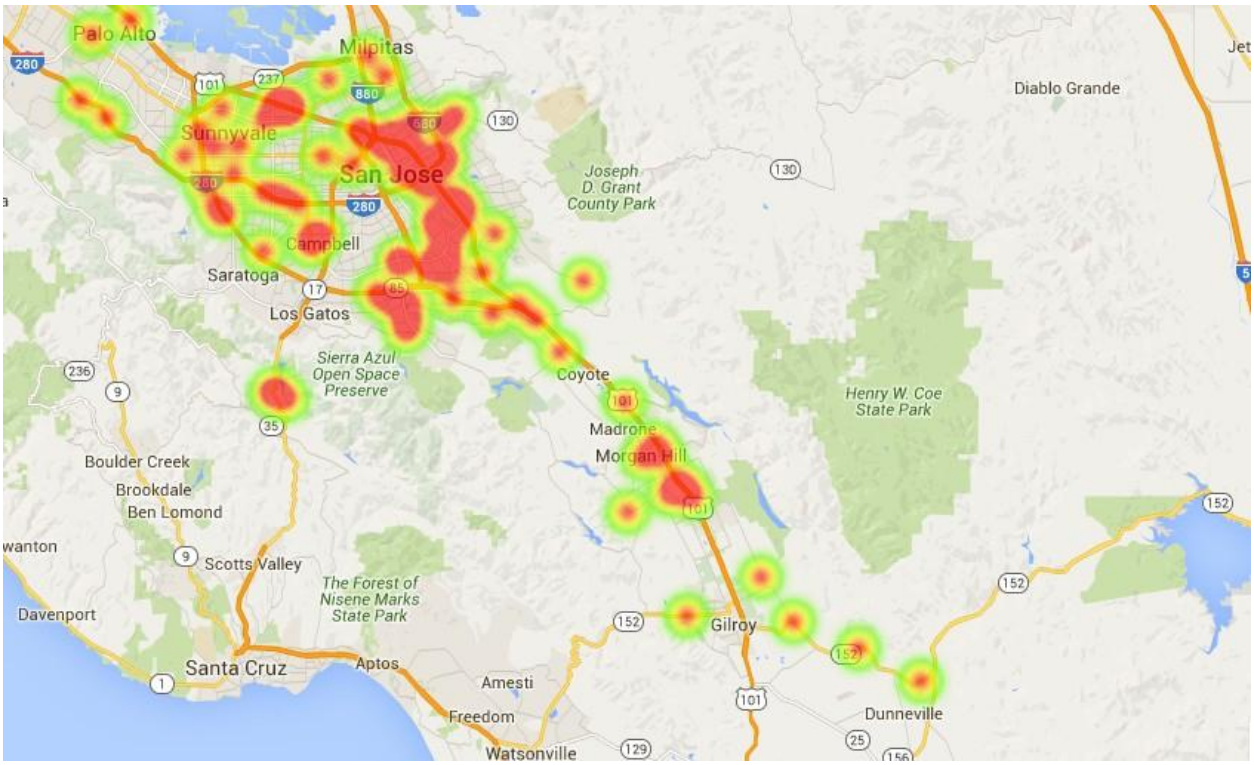


Data Source: CHP, Provisional 2014 SWITRS, Section 8 or Online Report 1 – Collisions and Victims by Motor Vehicle Involved.

Fatal Collisions

Below is a heat map of only fatal collisions where red areas represent concentrated collision locations. Locations are approximate and this year 94 of 104 collisions (90%) are mapped. Non-mapped collisions result from incomplete information on CHP report. Also included is 2014 provisional collision data queried from UC Berkeley's Transportation Injury Mapping System (TIMS) and verified with provisional 2014 SWITRS primary collision factor (PCF) data.

Figure 54. *Fatal Collisions 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 of Alcohol or Drug	12	**11.5%**
02 - Impeding Traffic	0	0%
03 - Unsafe Speed	15	**14.4%**
04 - Following Too Closely	0	0%
05 - Wrong Side of Road	3	2.9%
06 - Improper Passing	0	0%
07 - Unsafe Lane Change	4	3.8%
08 - Improper Turning	15	**14.4%**
09 - Automobile Right of Way	3	2.9%
10 - Pedestrian Right of Way	2	1.9%
11 - Pedestrian Violation	15	**14.4%**
12 - Traffic Signals and Signs	5	4.8%
13 - Hazardous Parking	0	0%
14 - Lights	0	0%
15 - Brakes	0	0%
16 - Other Equipment	1	1%
17 - Other Hazardous Violation	1	1%
18 - Other Than Driver (or Pedestrian)	3	2.9%
19 - (Not Used)	0	0%
20 - (Not Used)	0	0%
21 - Unsafe Starting or Backing	0	0%
22 - Other Improper Driving	0	0%
23 - Pedestrian or Other Under the Influence of Alcohol or Drug	0	0%
24 - Fell Asleep	0	0%
00 - Unknown	10	9.6%
- - Not Stated	**15**	**14.4%**

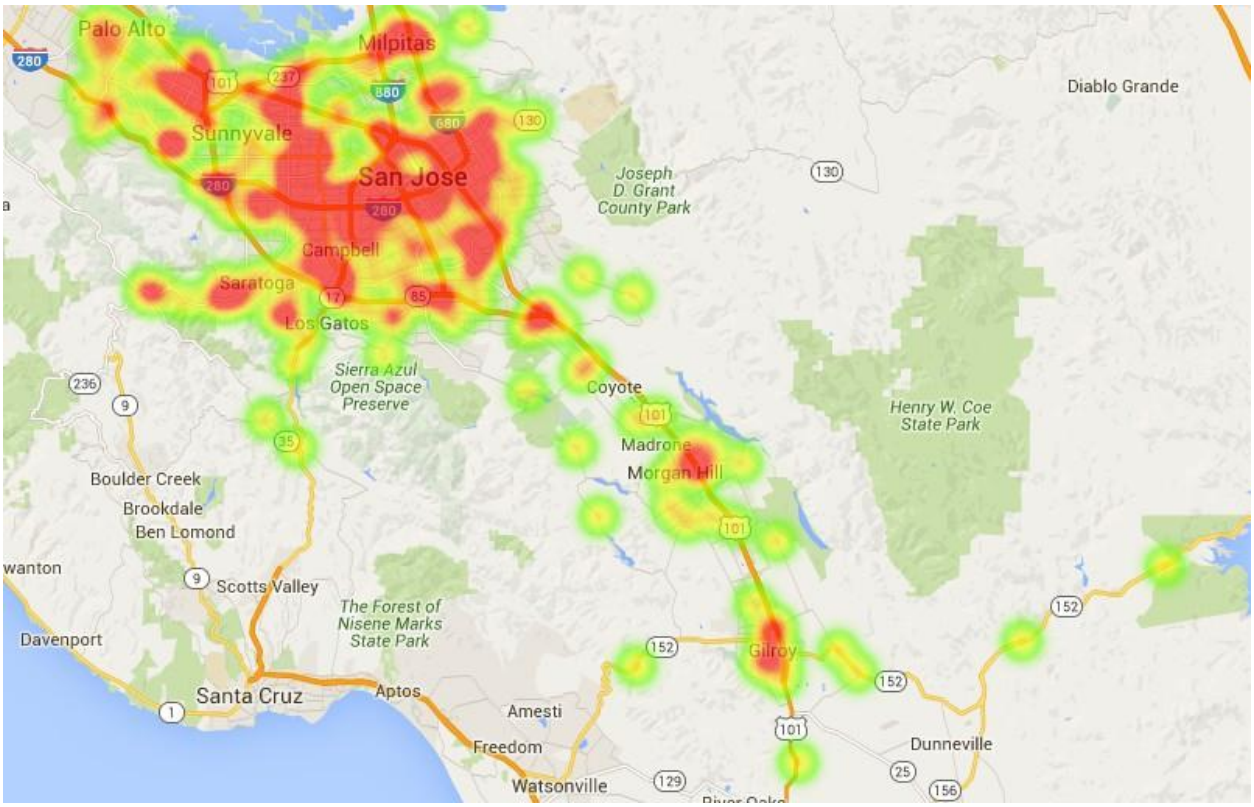
Type of Collision	#	%
A - Head-On	7	6.7%
B - Sideswipe	9	8.7%
C - Rear End	14	**13.5%**
D - Broadside	8	7.7%
E - Hit Object	23	**22.1%**
F - Overturned	4	3.8%
G - Vehicle/Pedestrian	27	26%
H - Other	7	6.7%
- - Not Stated	5	4.8%

Vehicle Involvement	#	%
Pedestrian Collision	32	**30.8%**
Motorcycle Collision	17	**16.3%**
Bicycle Collision	5	4.8%
Truck Collision	9	8.7%

Severe Injury Collisions

Below is a heat map of only severe injury collisions where red areas represent concentrated collision locations. Locations are approximate and this year 275 of 346 collisions (80%) are mapped. Non-mapped collisions result from to incomplete information on CHP report. Also included is 2014 provisional collision data queried from UC Berkeley's Transportation Injury Mapping System (TIMS) and verified with provisional 2014 SWITRS primary collision factor (PCF) data.

Figure 55. *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 of Alcohol or Drug	48	13.9%
02 - Impeding Traffic	1	0.3%
03 - Unsafe Speed	**71**	**20.5%**
04 - Following Too Closely	3	0.9%
05 - Wrong Side of Road	15	4.3%
06 - Improper Passing	0	0%
07 - Unsafe Lane Change	13	3.8%
08 - Improper Turning	**57**	**16.5%**
09 - Automobile Right of Way	29	8.4%
10 - Pedestrian Right of Way	17	4.9%
11 - Pedestrian Violation	19	5.5%
12 - Traffic Signals and Signs	24	6.9%
13 - Hazardous Parking	0	0%
14 - Lights	1	0.3%
15 - Brakes	0	0%
16 - Other Equipment	0	0%
17 - Other Hazardous Violation	7	2%
18 - Other Than Driver (or Pedestrian)	4	1.2%
19 - (Not Used)	0	0%
20 - (Not Used)	0	0%
21 - Unsafe Starting or Backing	1	0.3%
22 - Other Improper Driving	2	0.6%
23 - Pedestrian or Other Under the Influence of Alcohol or Drug	0	0%
24 - Fell Asleep	0	0%
00 - Unknown	10	2.9%
- - Not Stated	24	6.9%

Type of Collision	#	%
A - Head-On	37	10.7%
B - Sideswipe	25	7.2%
C - Rear End	40	11.6%
D - Broadside	**73**	**21.1%**
E - Hit Object	63	18.2%
F - Overturned	32	9.2%
G - Vehicle/Pedestrian	55	15.9%
H - Other	14	4%
- - Not Stated	7	2%

Vehicle Involvement	#	%
Bicycle Collision	54	**15.6%**
Pedestrian Collision	66	**19.1%**
Motorcycle Collision	54	**15.6%**
Truck Collision	6	1.7%

Air Quality

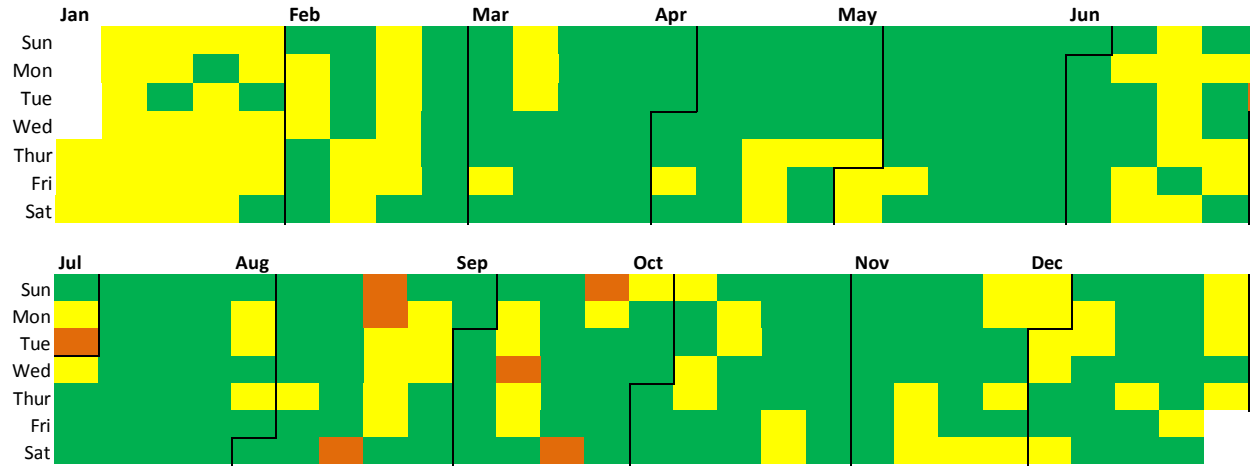
Air pollution caused by motor vehicles and land use activities is of great concern to the public and is monitored by the Federal Environmental Protection Agency (EPA).

The EPA receives air quality data from state and local agencies and provides this data to the public. The EPA monitors levels of chemicals and toxins such as: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. Each compound has been linked to various human health risks and is monitored separately. In order to incorporate monitoring of separate compounds into a single scoring system the "Air Quality Index" (AQI) was created.

The AQI is an index for general reporting on how clean or polluted the air is and what health effects may be experienced in a few hours or days after breathing the current air in your area. AQI ranges from 0 [Good] to 500 [Hazardous]. See below table for more information.

According to the EPA, in 2015, Santa Clara County experienced **7 days of AQI>100 [pollution>moderate]** (where pollution was unhealthy, or unhealthy for Sensitive Groups). See below for AQI for each day for 2015. Additionally, the county also had a **median AQI of 40 [good].** This is a slight improvement over 2015, which had 5 days of AQI>100 but a median AQI of 39 [good].

Figure 56. *Air Quality Tile Plot.*



Data Source: Environmental Protection Agency, 2015 Tile Plot by AirData.

AQI		Condition	Description
0-50		Good	Air quality is considered satisfactory, and air pollution poses little or no risk.
51-100		Moderate	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive to ozone may experience respiratory symptoms.
101-150		Unhealthy for Sensitive Groups	Although general public is not likely to be affected at this AQI range, people with lung disease, older adults and children are at a greater risk from exposure to ozone, whereas persons with heart and lung disease, older adults and children are at greater risk from the presence of particles in the air.
151-200		Unhealthy	Everyone may begin to experience some adverse health effects, and members of the sensitive groups may experience more serious effects.
201-300		Very Unhealthy	This would trigger a health alert signifying that everyone may experience more serious health effects.
301-500		Hazardous	This would trigger health warnings of emergency conditions. The entire population is more likely to be affected.

Mode Share

Balancing mode share and encouraging use of alternate modes of transportation to single occupant auto driving is one strategy of managing traffic congestion. Promoting active transportation—bicycling and walking—is also good for personal health and good for the environment. It is also encouraged to use transportation that has less impact on the environment, such as carpooling and using public transportation.

Every year, the US Census Bureau surveys United States Citizens and asks about their "Means of Transportation to Work." In 2014, Santa Clara County respondents polled that about **3.5% used active transportation** (bicycling and walking) to get to work. This is a **decrease from the 2013** survey where respondents polled at about 4.0% using active transportation.

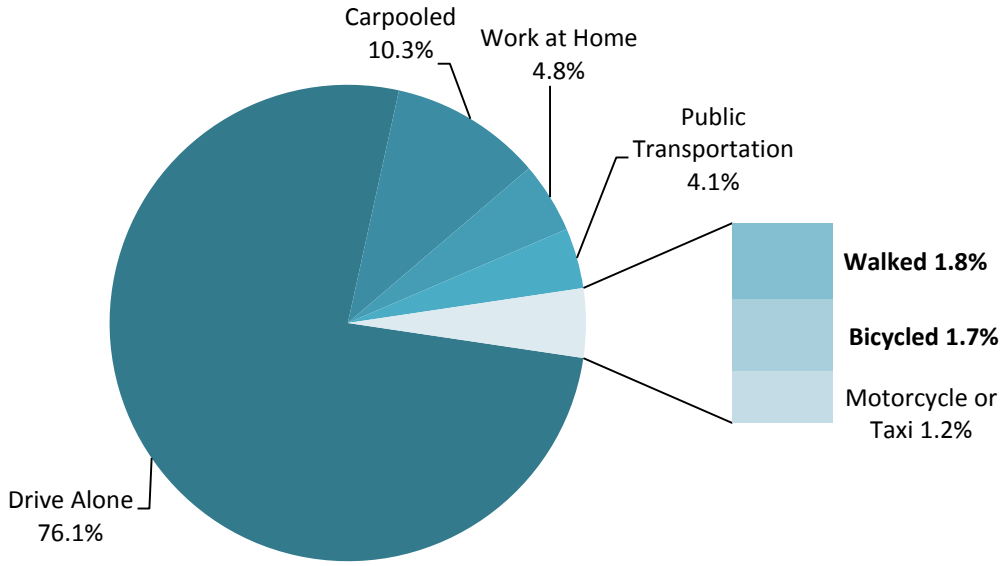


Figure 57 ***2014*** *Means of Transportation to Work in Santa Clara County*

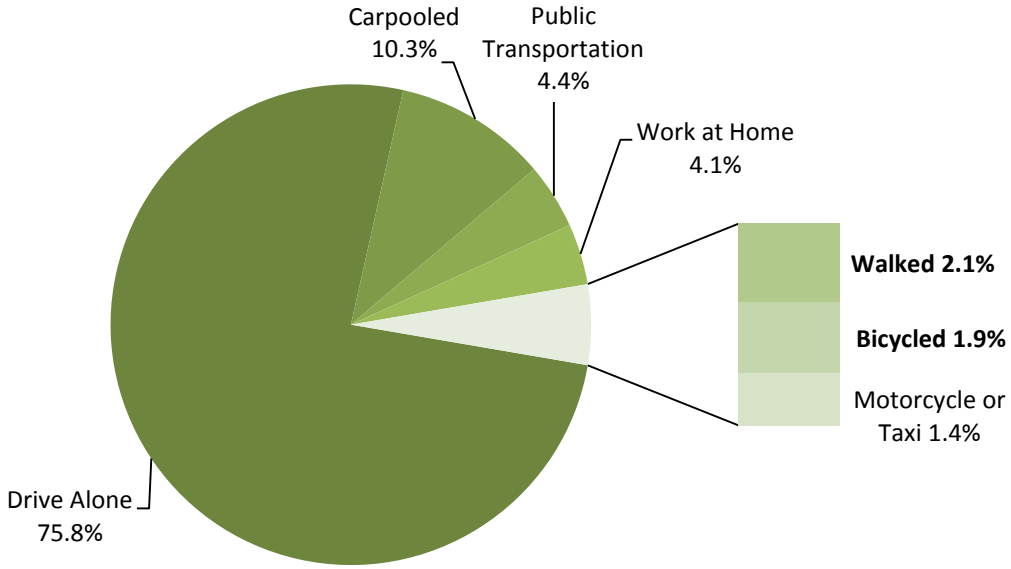


Figure 58 ***2013*** *Means of Transportation to Work in Santa Clara County*

Data Source: Census Bureau, 2014 and 2013 American Community Survey 1-Year Estimates.

Bikeways

In 2008, VTA updated its Countywide Bicycle Plan to both define a regional bicycle system and identify ways to improve both safety and convince. As a result, numerous improvements were identified and categorized in to various projects lists; some of these categories include: On-street Projects, Off-street Projects, and Across Barrier Connections (ABCs). This plan is currently (as of 6/2016) going through an extensive updating process which has resulted in new baseline inventory data and reorganization of data categories for Cross-county Bicycle Corridors (CCBCs).

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 the purpose of the TSMP, the monitoring of planned Cross County Bicycle Corridor (CCBC) projects compared with the number of miles and projects completed is used to measure the county's progress towards achieving its vision for cross-county bike mobility in Santa Clara County. The below tables present the areas measured and the progress made through 2016 on the planned bike improvements identified in the 2008 Countywide Bicycle Plan.

The first table presents the number of planned CCBCs miles, total completed on-street facility miles and completed off-street facility miles on CCBCs. Bike on-street projects are bike projects along roadways shared with autos; and bike off-street projects are bike projects along trails or paths shared with pedestrians.

As of March 2016, approximately **234 miles of on-street projects, 110 miles of off-street projects,** and **25 across barrier connections were completed. This accounts for 45% of CCBCs and 7% of potential ABC's identified in the 2008 Countywide Bicycle Plan.** A map showing the total completed cross-county on-street bicycle projects is included on the next page.

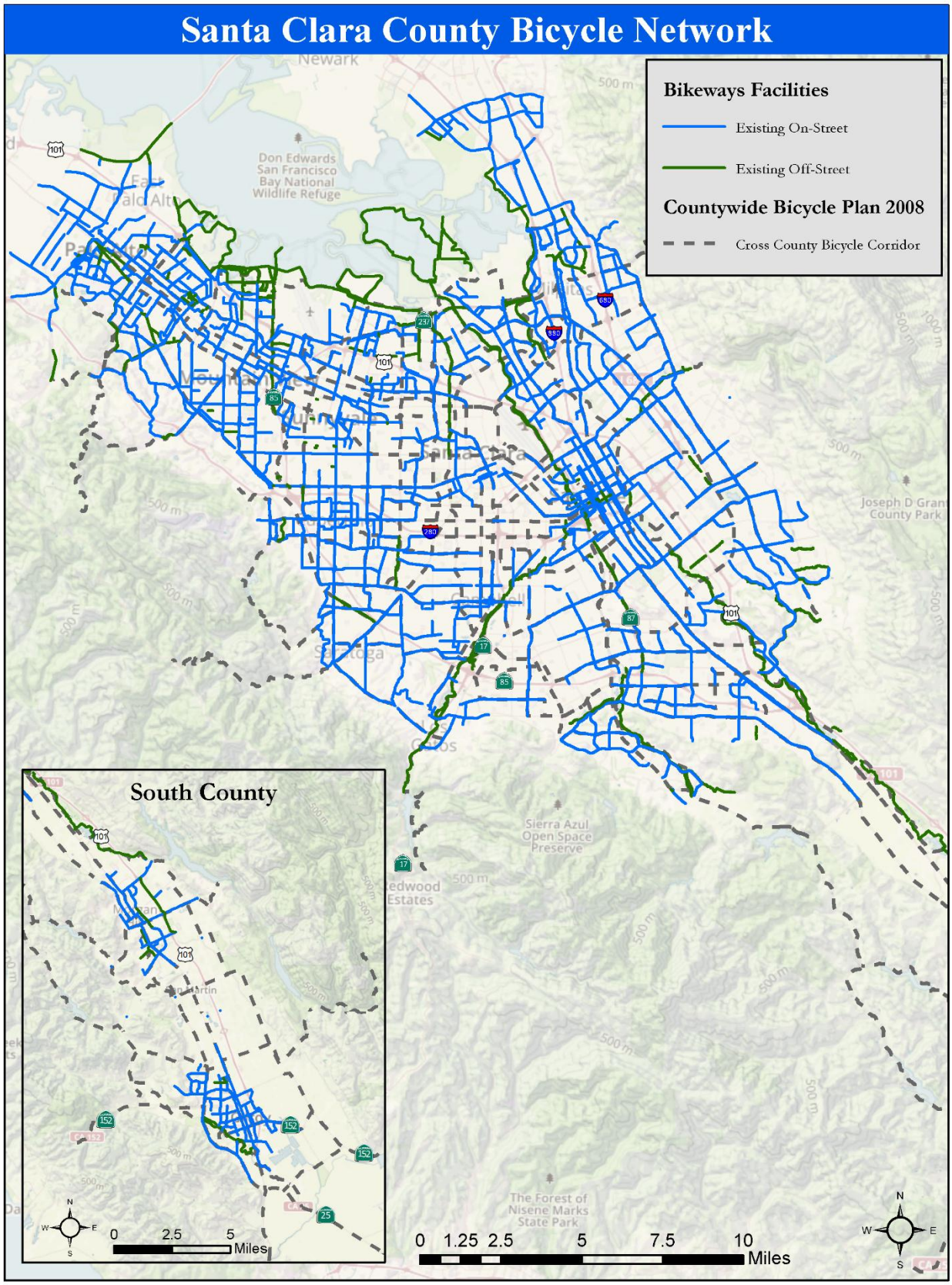
Table 30. *Cross-County Bicycle Corridors.*

Cross-County Bicycle Corridors	2016
Total length planned to construct (CBP 2008)	758
Completed miles (on-street)	234
Completed miles (off-street)	110
Overall percent complete	**45%**

Table 31. *Across Barrier Connections.*

Across Barrier Connections	2016
Total potential ABC's (CBP 2008)	353
Under construction	0
Completed ABCs	25
Unbuilt	328
Overall percent complete	**7%**

Figure 59. *Map of Completed On-Street Bicycle Projects.*



Green Bike Lanes

As the Santa Clara County continues to improve and expand its bicycle networks, one improvement that is being implemented are "green bike lanes." Green bike lanes refers to the application of a green pigment, such as green paint, to help distinguish bicycle facilities from general purpose vehicle facilities.

Table 32 shows the results of a survey of local agencies and their current use of green bike lanes, the materials used, and the type of application.

Green bike lanes are typically installed at intersections where there are heavy vehicle and bicycle traffic volumes to increase visibility and provide a buffer between vehicle lanes and a bicycle lane.

Table 32. *Survey of local uses of green bike lanes.*

City	Uses Green Bike Lanes?	Materials							Type of Application				
		Water-based Paint	Extruded Thermo-plastic	Pre-formed Thermo-plastic	Cyclegrip MMAX Resin (Ennis-Flint)	Green Slurry	Epoxy with Green Aggregate	High Friction Surface Treatment	First and Last Points	Conflict Points	Intersection Approaches and Departures	Continuous	Through inter-sections and Lateral Shifts
Cupertino	Y			X	X					X		X	
Gilroy	Y	X							X				X
Los Altos	Y	X								X			
Los Gatos	Y		X	X	X		X			X			
Morgan Hill	N												
Mountain View	Y							X		X	X		
Palo Alto	Y					X	X			X			
San Jose	Y			X							X		
Santa Clara	Y			X						X	X		

Notes on Report

2016 SUMMARY

Key Performance Indicators

Pavement
See Pavement section.

Bridges
See Bridges section.

Maintenance
See Roadside Maintenance section.

Air Quality
See health & safety section

Congestion
Current freeway LOS data retrieved from VTA 2015 Congestion Monitoring Program (CMP) Monitoring and Conformance Report and the current intersection LOS data was retrieved from the 2014 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 usually only analyzed every 2 years, therefore, for the purposed of this report, only every other year is reported every 2 years when both freeway and intersection data are available at the same time.

Express Lanes Program
Current information was taken from the SR 237 Express Lanes FY (fiscal year) 2015 Report which will be reported to the VTA board of directors on October 6th 2016, available on VTA website: http://www.vta.org/get-involved/board-of-directors. Previous data was taken from prior annual reports.

Transit
Statistics on transit ridership were obtained from Santa Clara Valley Transportation Authority's FY2013 Comprehensive Annual Financial Report, and found in Table 21 Operating Information – Operating Indicators. 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 http://quickfacts.census.gov/qfd/states/06/06085.html and by reviewing the Santa Clara County Quick Facts Database http://quickfacts.census.gov/qfd/download_data.html.

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; because it take about two years to finalize, this is a lagging data source. Registered vehicles for 2014 could not be found on the DMV's website and is not yet available through SWITRS.

Recent Inventory

Pavement
See pavement section.

Bridges
See bridges section.

Bus
Current bus data was retrieved from internal VTA report called "VTA Facts, Current Bus System Data, January 2015. Bus fleet includes all the following bus types: articulated (69), standard (257), hybrid 40-ft (80), community bus (54), and Express (40, also hybrid engines). 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, January 2015. 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 found in 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.

Signal Controllers

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

PAVEMENT

Current (2014) pavement conditions were downloaded from a new MTC website called "Vital Signs" which can be found here: http://www.vitalsigns.mtc.ca.gov/street-pavement-condition. MTC also published the PCI scores on their website here: http://www.mtc.ca.gov/news/street_fight/pci_2014.htm. Because of this new publishing platform, and the change from consultants to in-house work, there is some new data and there is some missing data. TSMP staff received some supplemental data from Local Streets and Roads working group (LSRWG), but this did not make up completely for the missing data. For instance, Figure 3 PCI for road types was provided by LSWG but MTC no longer provides information on percent of network by road type; however, this information should be relatively unchanged for at least a few years. A new development this year includes that MTC has, for the first time, published county wide PCI data going all the way back to 2001, for both yearly and 3-year averages. Prior to 2012 no raw network values were published and no county wide PCI values were regularly published by MTC; therefore, in previous TSMP Reports, 3-year rolling averages were used to develop a county-wide weighted average PCI prior to 2012.

*Arterial % of system also includes express ways.

MTC reports on pavement conditions yearly and TSMP staff had in the past collected and stored this data year to year in order to show trends in the data. This data relates the overall PCI and total number of lanes miles for each city and county. By MTC's lead, the overall PCI is reported as a 3-year rolling average. 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.

For 2013 pavement condition data, see MTC Website at http://www.mtc.ca.gov/news/press_releases/rel663.htm. For 2012 pavement condition data, see MTC website at http://www.mtc.ca.gov/news/pressreleases/ rel624.htm; for 2011 data: http://www.mtc.ca.gov/news/press_releases/rel586.htm; for 2010 data: http://mtc.ca.gov/library/potholereport/ index.htm.

Caltrans Paving Asphalt price index was access from Caltrans' website: http://www.dot.ca.gov/hq/esc/oe/ac_index.html. 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.

BRIDGES

The primary data source used for local bridges is a spreadsheet provided by Caltrans (called Local_Agency _Bridge_List _2014_10_31.xlsx) on their website here: http://www.dot.ca.gov/hq/LocalPrograms/hbrr99/hbrr99a.htm. 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, and TSMP staff must rely on previously downloaded records. Other data sources used to verify this list are: Caltrans Structure Maintenance & Investigations list http://www.dot.ca.gov/hq/structur/strmaint/local/localbrlist.pdf, FHWA NBI (National Bridge Inventory) 2014 ASCII Files http://www.fhwa.dot.gov/bridge/nbi/ascii.cfm?year=2014, and NationalBridges.com. FHWA NBI does provide a county-wide count of bridges along with a county of structurally deficient and functionally obsolete bridge; 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.

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. Because of the shift in reporting

format last year (2013), TSMP calculated an artificially high SR of 82.8 for the 2013 bridge conditions, but has now been corrected to SR of 78.3 in this year's report.

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 2011 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'. 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.

ROADSIDE ASSETS

A brief survey was designed by TSMP staff and sent to 17 local agencies of which 2 did not respond. Some questions did not apply to some agencies and there for the 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 some of the feedback provided by the respondents.

Ramp meter information was taken from VTA board agenda packet for March 2016. Additional information about activity in 2015 was provided by VTA staff.

ROADWAY SAFETY

Provisional 2014 collision data was taken from the iSWITRS system: http://iswitrs.chp.ca.gov/Reports/jsp/ CollisionReports.jsp. Total collisions, injury collisions, fatal collisions, and property damage only collisions show in the TSMP report are taken from iSWITRS system Report 1 – Collisions and Victims By Motor Vehicle Involved and limited to Santa Clara County. The majority of this information can be obtained the Annual Report from Table 8F – Injury Collisions by County and Table 8D – Injury Collisions by County. It has been noticed that the iSWITRS system is continually updated while the SWITRS Annual Reports are not retroactively corrected; for example, 2012 SWITRS Annual Report Table 8A shows 82 fatal collisions and 6,639 injury collisions in Santa Clara county, whereas the iSWITRS Report 1 shows 83 fatal collisions and 6,640 injury collision. To be more straight forward, some of the categories shown in Figure 53 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 Veh on Other RDWY, Other: Non-Collision + Animal + Not Stated. Figure 53 Data is taken from iSWITRS Report 1 not TIMS, which may be slightly different and do not provided all the same categories.

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 2014 data from the CHP on May 20th 2016. 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.

AIR QUALITY

Annual Air Quality Index (AQI) annual median data from http://www.epa.gov/airdata/, accessed June 20th 2016. The AirData-Air Quality Index Summary Report displays an annual summary of Air Quality Index (AQI) values for Santa Clara County. Air Quality Index is an indicator of overall air quality, because it takes into account many different pollutants measured within a geographic area. Although AQI includes all available pollutant measurements, users should be aware that many areas have monitoring stations for some, but not all, of the pollutants. Air quality data is received from state agencies. Interactive maps of monitoring stations are available here: http://www.epa.gov/airdata/ad_maps.html.

MODE SHARE

2012 1-year estimates journey to work mode data was taken from US Census Bureau's website: http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_12_1YR_S0801&prodType=table using their "FactFinder" search tool. 2011 can be found on US Census Bureau's website: http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_11_1YR_S0801&prodType=table.

BIKEWAYS

This 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.

Green bike lanes survey was provided by Matthew Jue from the City of Campbell. The informal survey was conducted in 2016 and was used to assist city staff in selecting green bike lanes construction materials and application types.

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