

Annual FY 2020 Transportation Systems Monitoring Program (TSMP) Report



March 2021

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Executive Summary

Santa Clara County residents and businesses have made significant investments in its transportation infrastructures. The Transportation Systems Monitoring Program (TSMP) was initiated by VTA's Technical Advisory Committee and approved by the Board of Directors in 2008 to monitor the conditions and performance of selected transportation system networks and assets. The TSMP and annual reports were developed in response to concerns raised by local jurisdictions on the ability and resources needed to maintain the County's transportation infrastructure to acceptable standards.

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



Other benefits include:

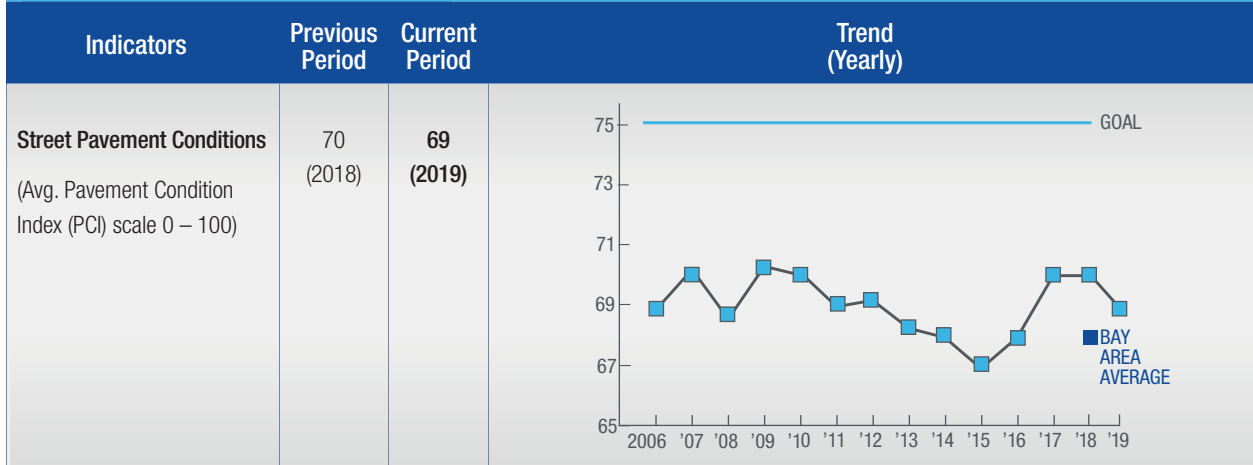
- Enable the County and external stakeholders to better understand the performance of the County's transportation system and effectiveness of the investments;
- Communicate progress towards stated transportation system goals and objectives;
- Provide additional context for future funding and policy decisions.

In addition, the TSMP follows the goals of Moving Ahead for Progress in the 21st Century and Fixing America's Surface Transportation Act, the federal reauthorization transportation funding programs that emphasizes performance-based management of transportation infrastructure assets at the state and local levels.

Each year, the TSMP focusses on selected areas of the transportation infrastructure, depending on available data and trending community interests. **This year's 2020 TSMP report focuses on the following three areas: 1) Street Pavement, 2) Highway Litter and Graffiti Maintenance, 3) Roadway Safety (Collisions), and 4) COVID-19 Impact Observations.**



Street Pavement



There are nearly **10,045 lane-miles of roadway pavement in Santa Clara County** maintained by local jurisdictions. This is the greatest number of pavement miles of the nine counties in the Bay Area. **The average Pavement Condition Index (PCI) decreased to 69** since the previous reporting period. The areas of the county showing the most needs were in the east, west, and south sections of San Jose, and central section of Gilroy.

A PCI of 69 indicates that the pavement is generally in Fair Condition, slightly below Good, with asphalt exhibiting significant levels of distress and requiring a combination of rehabilitation and other preventive maintenance to keep it from deteriorating. **The overall average PCI for the Bay Area was 67 compared with the region-wide goal of 75.** Roadways that are not maintained to a PCI score of 70 or higher cost more to repair in the future if rehabilitation maintenance is deferred over time.

The declining PCI could be attributed to delays for rehabilitation projects, and/or unexpected increase in costs for both materials and labor.

Local agency staff have commented that the proposals from vendors in general have been steadily increasing in the last couple years, and in some instances, the bids came in higher than the independent cost estimates where staff had to rebid the projects.

Solutions

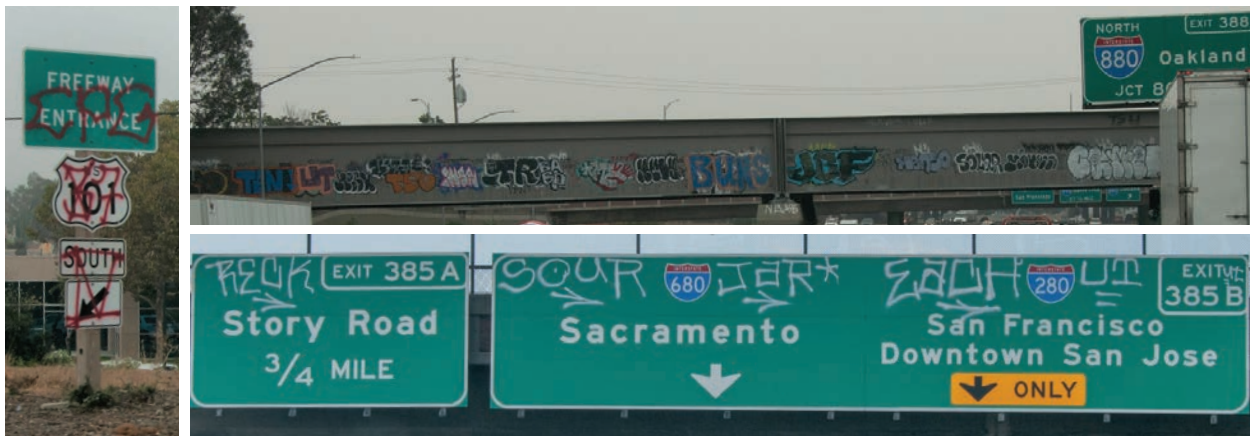
To supplement funding for maintaining the local roadways in Santa Clara County, voters approved a \$10 Vehicle Registration Fee in 2010. In FY 2018/19, nearly \$13.4 Million was distributed to VTA's Member Agency jurisdictions.

Executive Summary



Highway Litter, Illegal Encampments, and Graffiti Maintenance

Indicators	Previous Period	Current Period	Trend (Yearly)
Litter collected by Caltrans clean-ups (Cubic yards (yd ³))	15,398 (2019)	23,906 (2020)	
Litter collected at Illegal Encampments by Caltrans clean-ups (Cubic yards (yd ³))	3,556 (2019)	1,571 (2020)	
Graffiti removed by Caltrans clean-ups (Square feet (ft ²))	998,351 (2019)	427,068 (2020)	



The amount of trash collected along the 307 highway shoulder miles in Santa Clara County continues to increase. An additional 6,416 cubic yards of litter or nearly 44,912 30-gallon size trash bags were collected in FY 2020 compared to the previous year. The “hot spot” locations with the most trash were located along US 101 (around SR 85 and I-280 interchanges), I-680 (Hostetter/Berryessa and North Milpitas areas), I-280 (Hwy 17 to Lawrence Expy), and SR 85 (Hwy 17 to Hwy 87). On a positive note, the litter collection along SR 87, SR 237, and I-880 has been decreasing in the past two years, what could be attributed to reduction in littering on these routes.

The amount of litter collected at illegal encampment sites, typically near the interchanges and on/off ramp locations, significantly decreased by 2,281 cubic yards or 15,967 trash bags from the previous year. The improvements can be attributed to an aggressive, coordinated multi-jurisdictional clean-up effort between Caltrans, California Highway Patrol, City of San Jose Homeless Response Team, and San Jose Conservation Corps.

Graffiti removal and prevention along the freeways continues to be a challenge as the problem it is a moving target. The highway segments with the most graffiti were along US 101, State Routes 85 and 87, and I-280.

Solutions

VTA, in partnership with Caltrans, Keep America Beautiful, Santa Clara Valley Basin Watershed Management’s Zero Litter Initiative, and Valley Water are collaborating to develop a countywide highway litter prevention program called Keep Santa Clara Valley Beautiful. The program includes a community change behavior campaign, installation of illegal litter and encampment enforcement signs at problematic locations, and sponsoring of several clean-up events, including an anti-litter summit, over the next two years. In addition, VTA is also working with Caltrans and local jurisdictions to encourage sponsorship through Caltrans’ Adopt-A-Highway program to supplement current litter clean-up and graffiti removal efforts. Current efforts include procuring and installing No Dumping enforcement signs at frequently littered interchanges to deter illegal encampments and littering.





Roadway Safety (Collisions)

Indicators	Previous Period	Current Period	Trend (Yearly)
Total Collisions	15,227 (2017)	17,349 (2018)	
Fatal Collisions	65 (2017)	103 (2018)	
Injury Collisions	6,684 (2017)	7,579 (2018)	

The total number of reported collisions in Santa Clara County, including fatalities and serious injuries, significantly increased since the previous reporting period covering 2017 to 2018. In 2018, there were **17,349** total collisions. Of these collisions, there were 103 fatalities, 7,579 injuries, and 9,667 property damages. The total number of collisions increased by 2,122 collisions, 38 fatalities, and 895 injuries.

**It is important to mention here that the number of collisions for 2017 may have been under-reported due to the updating of the Crossroads Collision Database at the time when this report was produced. Any changes will be updated in the 2021 TSMP Report.*

The Primary Collision Factor (PCF) by type for all collisions were Rear-End (41%) and Sideswipe

(19%) collisions. The PCF for the causes of these collisions were Unsafe Speed (41%), Improper Turning (17%), and Unsafe Lane Changes (8%).

There were 1,218 collisions involving bicyclists and pedestrians. Of these collisions, 44% were vehicle-pedestrian, 40% involved bicyclists, and 16% were other types of collisions. The main PCF causes were Pedestrian Right of Way violations (vehicle driver at fault) 17%, Improper Turning 14%, and Vehicle Right of Way violations (bicyclist or pedestrian at fault) 12%.

Although the overall number of collisions involving pedestrian and bicyclist represents only 7% of the total number of collisions in the County, these collisions account for 39% of all fatalities.

The following is a list of locations with the highest number of collisions by modes involved:

Table 1

Top Vehicle, Bicycle, and Pedestrian Collisions Interchanges and Intersections

Vehicle/Vehicle	US 101/I 880 Interchange	41 collisions
Vehicle/Bicycle	Embarcadero Rd at El Camino Real	3 collisions
Vehicle/Pedestrian	11th St at Santa Clara St	3 collisions
Vehicle/Pedestrian	2nd St at San Fernando St	3 collisions
Vehicle/Pedestrian	Main St at 2nd St	3 collisions
Vehicle/Pedestrian	Santa Clara St at Market St	3 collisions
Vehicle/Pedestrian	Taylor St at 6th St	3 collisions

All jurisdictions in Santa Clara County have been taking incremental steps, like adopting Vision Zero Initiative policies, incorporating Complete Streets designs, and investing in Crossroads Countywide Traffic Collision Database, to make the roadway network safer for all modes. In addition, VTA was recently awarded a grant from Caltrans to develop a countywide Local Roadway Safety Plan for Santa Clara County.

Solutions

VTA was recently awarded a grant from Caltrans to develop a Countywide Local Roads Safety Plan. This plan will be developed in collaboration with local agencies through the Systems Operations and Management Working Group over the next 9-12 months.

Introduction



The Fiscal Year 2020 Transportation Systems Monitoring Program (TSMP) Report is the 10th edition since the Program was first initiated in 2010. Each published report included additional areas of review of Santa Clara County's transportation network as new information became available:

- 2011 (2nd ed.) introduced monitoring of litter and landscape conditions on the highways.
- 2013 (3rd ed.) featured an inventory of traffic signal systems and introduced monitoring of express lanes.
- 2014 (4th ed.) featured a new dashboard report format, key performance measures table, pavement, bridge, and litter and landscape monitoring sections, new safety section and revised air quality section.
- 2015 (5th ed.) featured an expanded litter and landscape section.
- 2016 (6th ed.) added ramp metering inventory and featured green bike lanes materials and applications.
- 2017 (7th ed.) added a section to track the most frequently reported problems that were highlighted by the local jurisdictions.
- FY 2018 (8th ed.) was renamed to better reflect the reporting period, introduced a Commute and Time Spent in Congestion section to track performance of major corridors in the County, and new performance metrics for monitoring litter and graffiti along the highways.
- FY 2019 (9th ed.) was updated using more quantitative metrics and reformatted to a more visual oriented report to highlight changes conditions.

About the Data

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



- *FY 2020 (10th ed.) includes a special section highlighting some of the impacts from COVID-19 and incorporates social equity awareness by identifying Communities of Concern using layered maps within the context of the TSMP Report and monitored areas where possible. This year's report focuses on the following areas: 1) Pavement, 2) Highway Litter, Illegal Encampments, and Graffiti, 3) Roadway Safety (Collisions), 4) COVID-19 Impact, and 5) Bicycle Network.*

Reports from past years are now available on VTA's website at www.vta.org, under the Congestion Management Agency web page.

About the Data

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

Street Pavement

OVERVIEW

Inventory

10,045 Lane Miles

Conditions

69 PCI (Fair)

Sources:
MTC Vital Signs 2019 PCI Scores,
2019 California Statewide Local Streets and Roads Needs Assessment Report



Inventory

There are approximately **10,000 lane miles** of pavement in Santa Clara County maintained by local agencies. The term “lane miles” is a measure of road length which represents the number of miles of every driving lane. This measure is used to better reflect the total amount of pavement that needs to be maintained.

Conditions

PCI Definition

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

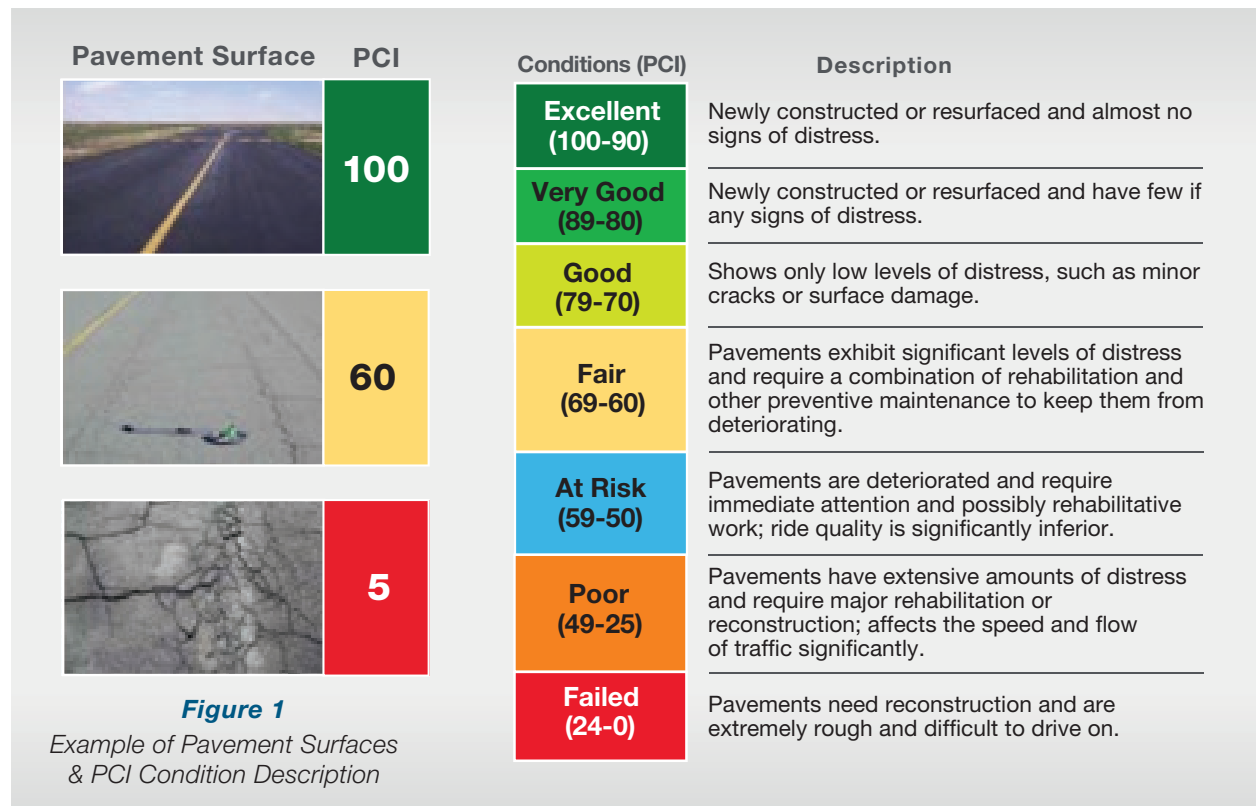


Figure 1

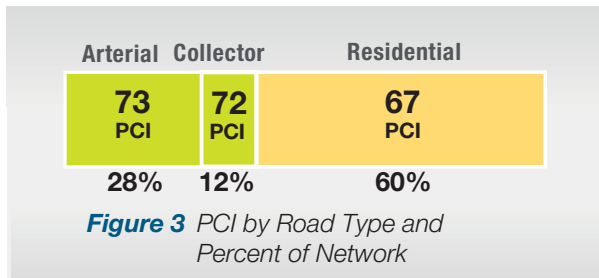
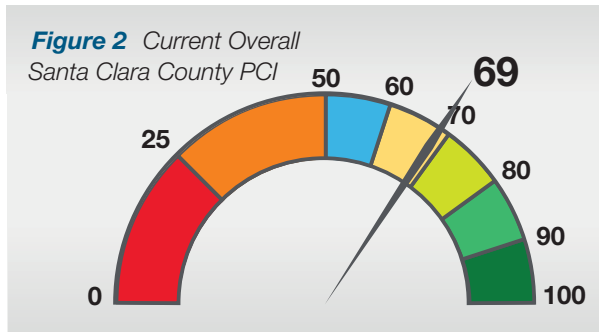
Example of Pavement Surfaces & PCI Condition Description

Street Pavement

Pavement Condition Index (PCI)

The average PCI score for Santa Clara County's roadways is **69 (Fair)**, compared with the Bay Area's regional PCI of 67 (Fair) and the regional goal of 75 (Good).

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



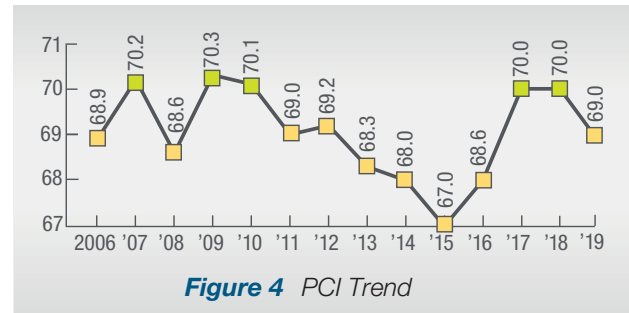
Condition and Pavement Evaluation

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

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

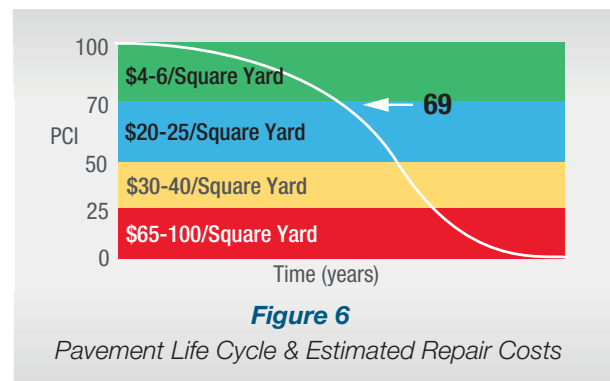
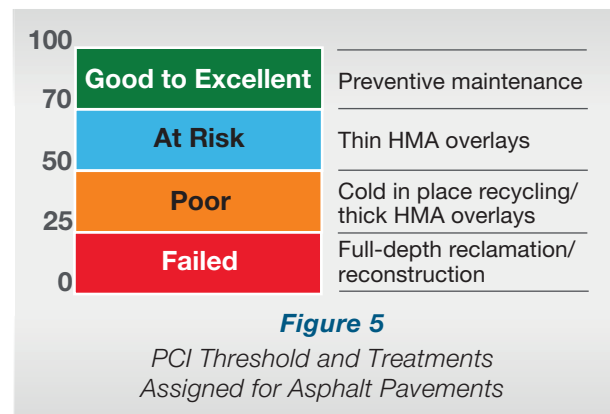
PCI Trend

An annual overall PCI trend for Santa Clara County is shown in the next column.



Life Cycle

Pavement tends to deteriorate at an increasing rate over time. In 2019, the PCI for Santa Clara County dropped from the borderline of "Good" (2018) to "Fair" condition. The current condition is now within the area on the curve where the need for rehabilitation and repair cost starts to significantly increase. Preventative and restorative measures would minimize the further decline in PCI below 70 and reverse this trend.



PCI Scores by Jurisdiction in Santa Clara County

The Pavement Condition is not homogeneous across Santa Clara County. Each jurisdiction’s PCI is evaluated separately, and weighted average is used to determine the overall PCI.

Below is shown the PCI scores for each jurisdiction in Santa Clara County, ranked from the best to worst in 2019, and the change in PCI from 2018 to 2019. Nine of sixteen jurisdictions experienced decrease in PCI from 2018 to 2019, four had no change in PCI, and three improved their Pavement Condition.

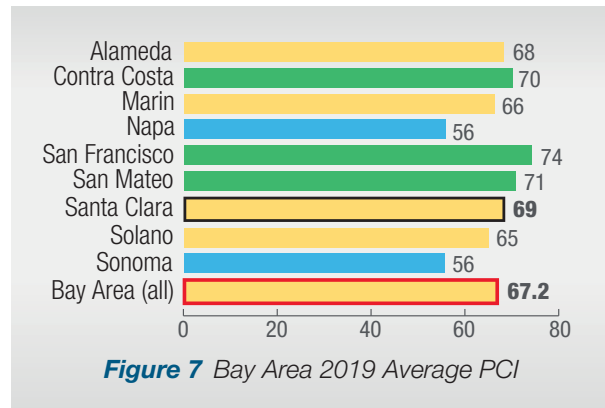
Table 2

2019 Pavement Condition Index Scores by Jurisdiction in Santa Clara County

Jurisdiction per Category	Annual Network PCI Scores 2019	Annual Network PCI Scores 2018	Change 2018 to 2019
VERY GOOD (PCI = 80-89)			
Cupertino	85	85	0
Palo Alto	82	85	-3
Los Altos Hills	80	80	0
GOOD (PCI = 70-79)			
Sunnyvale	77	76	1
Santa Clara	74	75	-1
Morgan Hill	74	71	3
Milpitas	73	75	-2
Campbell	70	72	-2
FAIR (PCI = 60-69)			
Los Gatos	69	69	0
Monte Sereno	69	65	4
Los Altos	68	69	-1
San Jose	66	66	0
Santa Clara County	66	67	-1
Saratoga	66	68	-2
Gilroy	62	65	-3
Mountain View	62	64	-2

Peer County Comparison

The PCI goal established for the Bay Area’s local roadways is 75. **Santa Clara County’s roadways with a PCI score of 69, is slightly better than the Bay Area’s PCI average of 67.2 (Fair).**



2019 Local Streets PCI Map

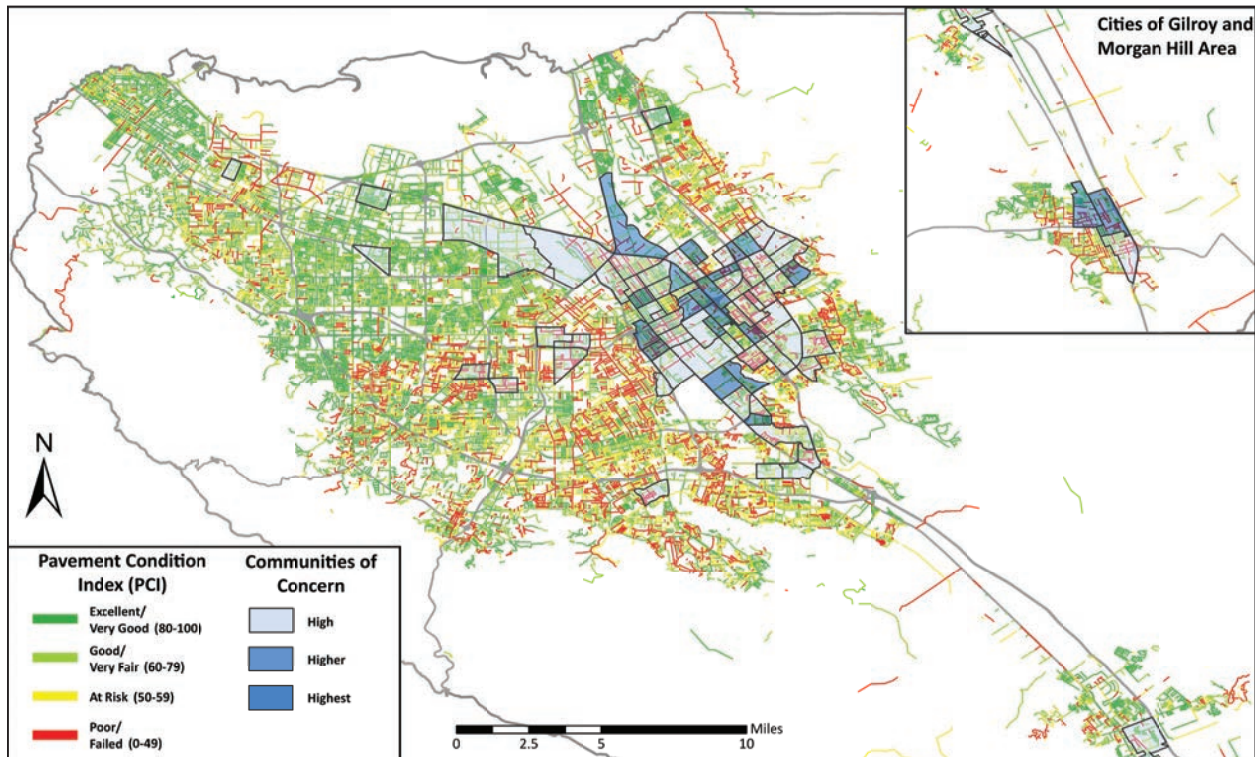
“Vital Signs,” a website managed by MTC and



Association of Bay Area Governments that tracks transportation, economic and housing trends in the Bay Area region, provides interactive and extensive access to historical local pavement data. In addition to pre-generated graphs, MTC’s “Vital Signs” allows access to raw data for personal analysis and visualization. Based on such data, a **Santa Clara County 2019 Local Street Pavement Condition Index (PCI) map was generated.** The map on the following page displays assigned level of PCI for each local road link within the County.

Figure 8

Santa Clara County 2019 Local Streets PCI Map with Communities of Concern



After being stable for the past two years, the 2019 Santa Clara County PCI decreased by one point from 70 to 69, entering the “Fair” average condition. At this condition, pavement rehabilitation projects become more expensive and time consuming. (Due to this year data limitations, we cannot attribute the overall PCI decrease to any specific jurisdiction in Santa Clara County. However, the negative change can be related to the constant increase of Vehicle Miles Traveled (VMT) in Santa Clara County, which means, roadway pavement deterioration rate increases the more vehicles travel on it per unit of time.)

Based on the 2018 California Statewide Local Streets and Roads Needs Assessment, a bi-annual report sponsored by the cities and counties of California including the Bay Area’s Metropolitan Transportation Commission, **Santa Clara County’s needs is estimate to be \$1.9 Billion** to eliminate accumulated pavement maintenance back-log and achieve a best management practice PCI goal in the low 80’s (Very Good) by year 2028 (in 10 years). This cost is estimated based on number of lane miles within a PCI range and cost of rehabilitation.

Solutions

To help address the funding needs to maintain Santa Clara County’s roadways to a state of good repair, Santa Clara County voters approved a \$10 Vehicle Registration Fee (VRF) in November 2010. The funds are used to pay for local transportation improvements, including pothole repair, paving, traffic control signals, and safety improvements. The VRF Program generates approximately \$14 million annually and is distributed to cities to help fund their highest priority roadway improvements.

In FY 2018/19, nearly \$13.4 million was distributed to VTA’s Member Agency jurisdictions through the VRF’s Local Road and Repair Program. Some agencies are combining funds over multiple years and/or combining them with other funding sources to finance, large multi-year project. More detailed information on the distribution of funds to the individual jurisdictions and their projects can be found on VTA’s 2010 \$10 Vehicle Registration Fee webpage.

Highway Litter, Illegal Encampments, and Graffiti Maintenance

OVERVIEW

Inventory

128 Interchanges

307 Highway Roadside Miles

1,193 Acres of Landscape Area

Source: 2008 Litter Control Pilot Program, VTA.

Background

VTA Technical Advisory Committee identified highway litter, landscape, and graffiti maintenance as major roadway maintenance issues. The accumulation of litter and graffiti are viewed as driver distractions and potential hazards, as well as having negative impacts on the environment. The cleanliness of the highways can also be perceived as a quality of life indicator representing the level of community civic pride to residents, regional travelers, and tourists.

Inventory

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

Conditions

Monitoring of litter and graffiti on roadways is a challenging task, as conditions are constantly changing throughout the year and any single day "snapshot" would not be an adequate data source. Up to last year's 2019 TSMP report, a subjective drive-by approach using a visual assessment scale was used as a performance metric to assess litter and graffiti conditions. In 2019 the methodology

was changed to use cubic yards of litter collected and square feet of graffiti removed by Caltrans clean-up crews throughout the FY 2019. Caltrans maintenance crews keep a log of the work completed that includes data on type of clean-up, location, and amounts removed. This data was used to generate the heat maps and observe the clean-up trends from year to year.

Litter

Data collected by Caltrans clean-up crews shows that in FY 2020, an estimated 23,906 cubic yards of litter were picked-up along the 307 highway shoulder miles in Santa Clara County. To provide some visual perspective, this equates to approximately 167,342 trash bags (1 cubic yard = 7 of 30-gallon sized trash bags) or approximately 13 football fields (300 ft. length x 160 ft. width).



Figure 9 6-Year Total Litter Collection Trend

Compared to FY 2019, the amount of litter picked up increased by approximately 26.8% or 6,416 cubic yards (44,912 trash bags).

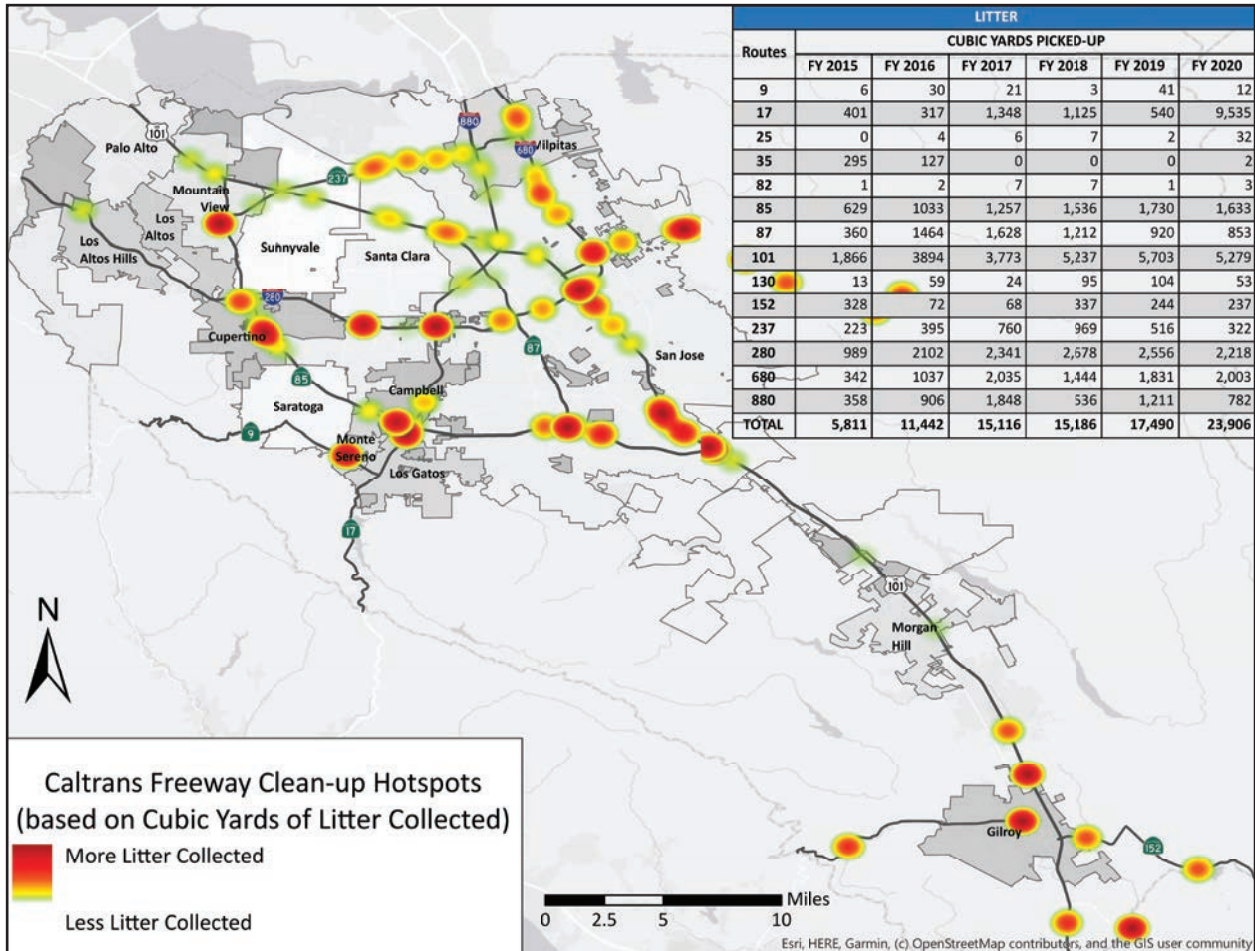
Highway Litter, Illegal Encampments, and Graffiti Maintenance

The hotspot map below depicts the location and amount of litter collected in FY 2020. Caltrans maintenance crews typically clean each highway corridor two times a month throughout the year. The dark orange-reddish spots represent the areas with the most amounts of litter collected. The table shows the changes in amount of litter collected over a 6-year period by corridor routes.

Identifying and tracking high-density littered locations are important for identifying anti-litter strategies. These locations require additional monitoring and possibly a more in-depth investigation study to determine the primary sources of litter and appropriate mitigation measures.

Figure 10

Hotspot Map of Litter in Cubic Yards Picked-up along Highways in Santa Clara County, FY 2020



Highway Litter, Illegal Encampments, and Graffiti Maintenance

Illegal Encampments

In addition to scheduled cleaning of the highway shoulders, Caltrans also recently started to record identify the location of illegal encampments and amount of litter collected at these sites. The encampments clean-up event requires a 72-hour notice for the residents and are often repetitive. The data record shows that in FY 2020 an estimated 1,571 cubic yards of litter were removed from illegal encampments along the highways in Santa Clara County.

Compared to FY 2019, the amount of litter picked-up at illegal encampments during FY 2020 decreased by approximately 59.2% or 2,281 cubic yards (70,230 trash bags). According to Litter and Illegal Encampments yearly trends, it is apparent that the Caltrans clean-up crews are shifting their focus and man-hours from picking illegal encampments litter to the highway curbside pickup.

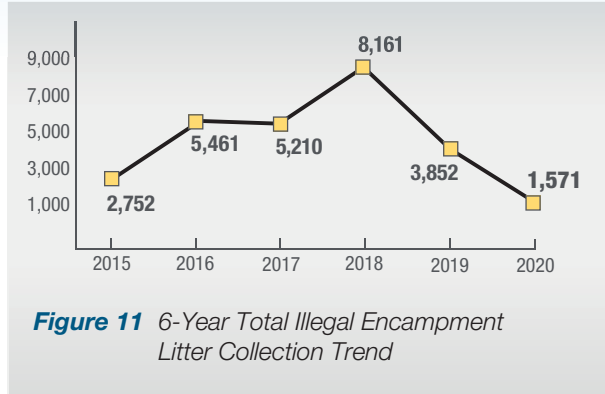
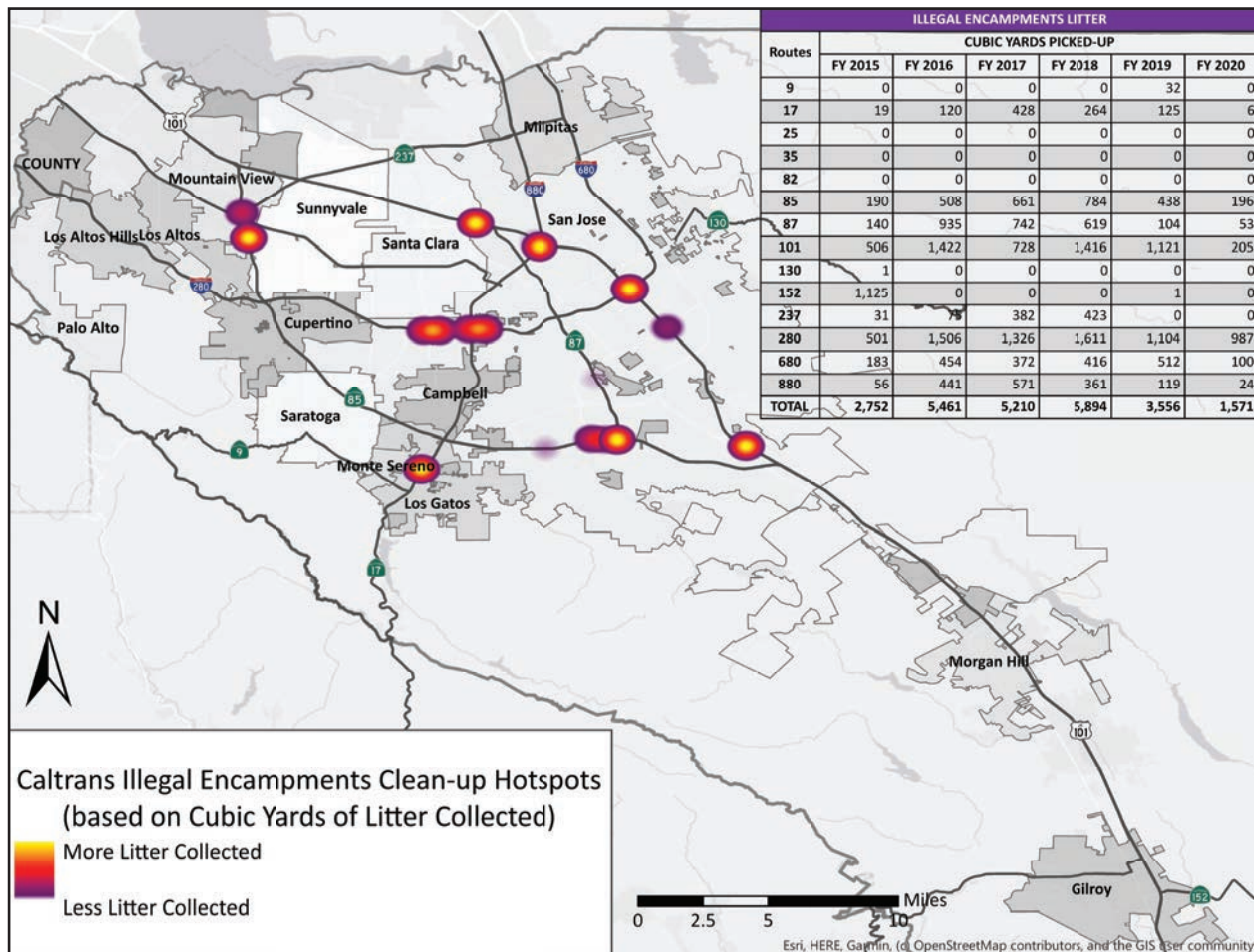


Figure 11 6-Year Total Illegal Encampment Litter Collection Trend

The hotspot map below depicts the areas along highways with the largest amount of litter collected at the identified illegal encampments. The data in the table also shows the illegal encampments litter collection changes over a 6-year period by highway and highway routes.

Figure 12

Hotspot Map of Illegal Encampments Litter in Cubic Yards Picked-up along Highways in Santa Clara County, FY 2020

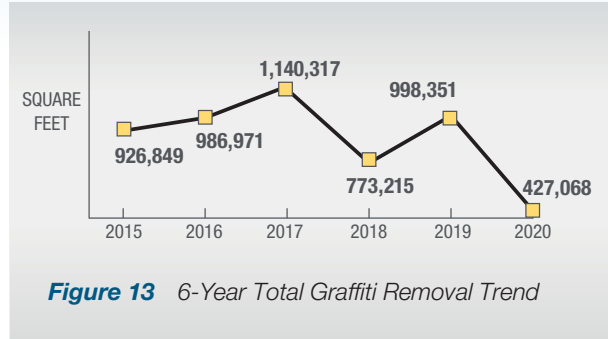


Highway Litter, Illegal Encampments, and Graffiti Maintenance

The locations with the most amount of litter collected can also indicate the size of the illegal encampments. For locations that are routinely occupied, preventive measures such as restrictive signs, fencing, installation of trash containers, and social service outreach can be through community outreach can be implemented.

Graffiti

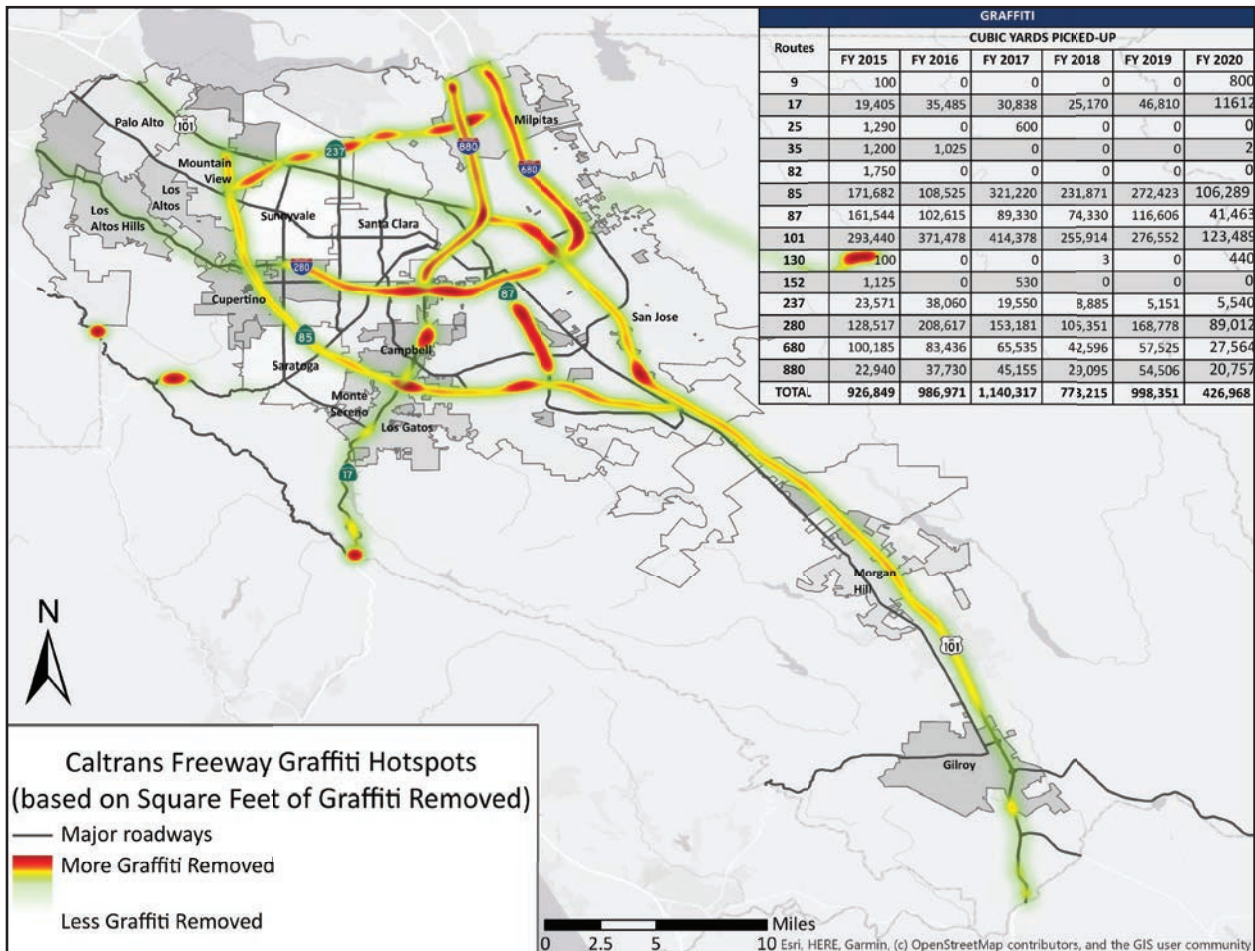
Highway overcrossings, sound walls and signages are frequently the target of graffiti. Caltrans clean-up crews routinely patrol the highway corridors and either remove or paint-over the graffiti. The data inventory shows that in FY 2020, an estimated 427,068 square feet of graffiti were removed along the highways in Santa Clara County.



Compared to FY 2019, the amount of graffiti removed in FY 2020 decreased by approximately 57.22% or 571,283 square feet of graffiti.

Figure 14

Surface Area of Graffiti per Mile Removed along Highways in Santa Clara County, FY 2020



Highway Litter, Illegal Encampments, and Graffiti Maintenance

Caltrans graffiti removal efforts are conducted in partial segments of the highway, depending on the size and scale of the graffiti tags. The hotspot map below depicts the areas along highways with the largest number of square feet of graffiti removed. The data in the table also shows the changes in square footage of graffiti removed over a 6-year period by highway and freeway routes.

The litter, illegal encampments, and graffiti removal data collection could be improved by more precisely reporting on the amounts cleaned-up per post mile. It is also important to leverage the data from the clean-up crews besides Caltrans to obtain the complete picture of the state of highway shoulders and surrounding areas year-round.

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.

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 highways 1 or 2 pick-ups per month. There are also special programs that supplement highway litter maintenance; these crews typically consist of 3 teams and work 4 days per week. Road sweeping is performed on daily basis, in theory covering the same location every 6 weeks. Road sweeping has recently been made a higher priority.

Solutions



VTA, in partnership with Caltrans, Valley Water, and Keep America Beautiful, are developing a comprehensive countywide highway litter abatement program that includes procurement of illegal encampment and litter signs to be installed at high litter interchanges, a reporting app, and sponsoring of litter clean-up events over the next three years.



KEEP AMERICA BEAUTIFUL AFFILIATE

With the recent passing of Senate Bill 1: Road Repair and Accountability Act (SB 1), Caltrans District 4 has received an additional funding of \$6 Million to address litter and graffiti on the highways. However, one the main issues facing Caltrans in Bay Area, is employee retention due to the high cost-of-living index.



In addition to regular maintenance crews, Caltrans has an Adopt-a-Highway (AAH) program that allows communities and organizations to help maintain sections of the roadside. Groups have the option to participate a volunteer or to hire a maintenance service provide to perform the work on their behalf. A current effort is underway by VTA to work with its member agencies to get all the adoptable highway segments adopted by their respective communities. Adoptions usually span a two-mile stretch of roadside, and permits are issued for five-year periods.

Highway Litter, Illegal Encampments, and Graffiti Maintenance

Participation can include one or more of the following activities:

- Removing litter (work frequency varies with location)
- Planting and establishing trees or wildflowers
- Removing Graffiti
- Controlling vegetation

Caltrans, in partnership with volunteer organizations like Beautiful Day, San Jose Downtown Street Team, and San Jose Conservation Corps sponsors multiple clean-up day events each year. The California Highway Patrol (CHP) also participates in highway clean-up by sponsoring four litter clean-up days per year.

Another group that Caltrans has partnered with is Santa Clara Valley Zero Litter Initiative (ZLI). ZLI is a voluntary group comprised of cities, water agencies, and conservation organizations, including VTA, that are currently working on development and implementation of a comprehensive, multi-year anti-litter program that focusses on preventing pollution from entering waterways that lead to the San Francisco Bay.

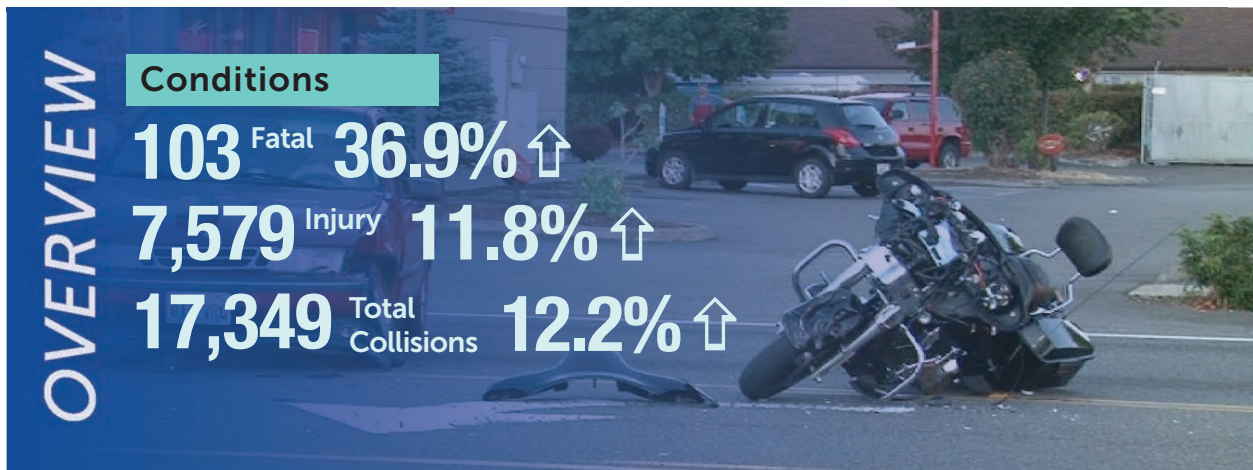


ZERO LITTER INITIATIVE

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Roadway Safety



Background

Transportation has a significant effect on public health and safety, creating a high-risk collision environment for all roadway users. Santa Clara County has joined a nationwide effort to eliminate fatal and serious injuries on the local roadways, while increasing safe, healthy and equitable mobility for all. To better understand this problem, the first step is collecting and analyzing collision data.



VTA and its Member Agencies have invested in the County's



Crossroads Collision software data base as a primary source for tracking and analyzing collisions. Crossroads includes data from the Statewide Integrated Traffic Records System (SWITRS) in addition to the non-serious collisions collected by the local police departments that might not be reported to the State. This provides for a more comprehensive database tool for use by local transportation engineers, planners, and public health department staff.

Conditions

Collision Maps

Provisional 2018 data provided by Crossroads Countywide Collision Database is used as a source for the following statistics. There were **17,349 total collisions**, which included **103 fatal collisions**, **7,579 injury collisions**, and **9,667 property damage only collisions**. The total number of collisions **increased** in 2018 by **12.2%** and the number of fatal collisions **increased** by **36.9%**.

It is important to note that the number of collisions for 2017 may have been under-reported due to the updating of the Crossroads Collision Database at the time when this report was produced. Any changes will be updated in the 2021 TSMP Report.

The maps on the following pages display “hot spots” of frequent collision locations by type.

Figure 15
2018 All Collisions "Hot Spots" Map, Santa Clara County

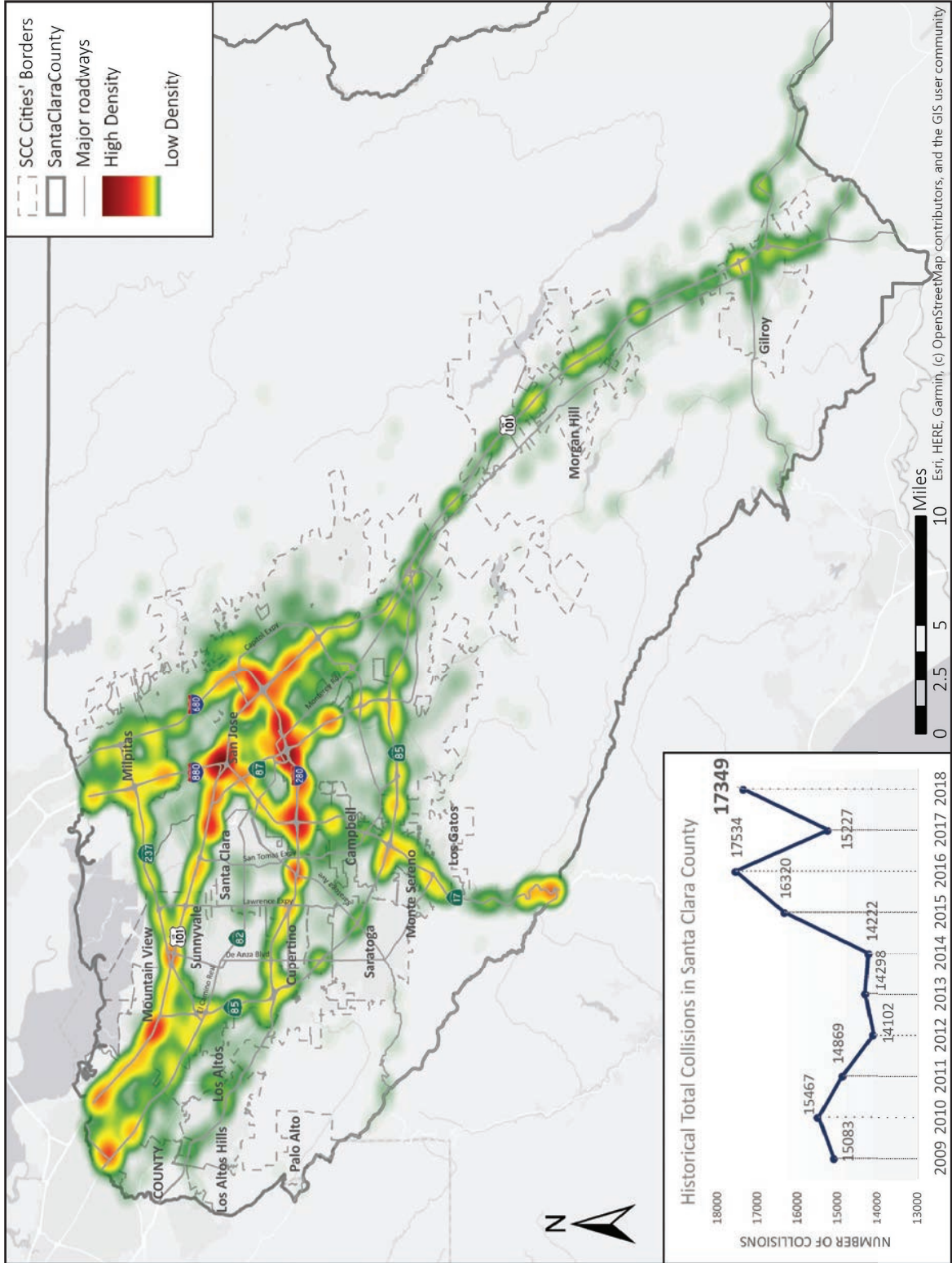


Figure 16
2018 Fatal Collisions “Hot Spots” Map, Santa Clara County

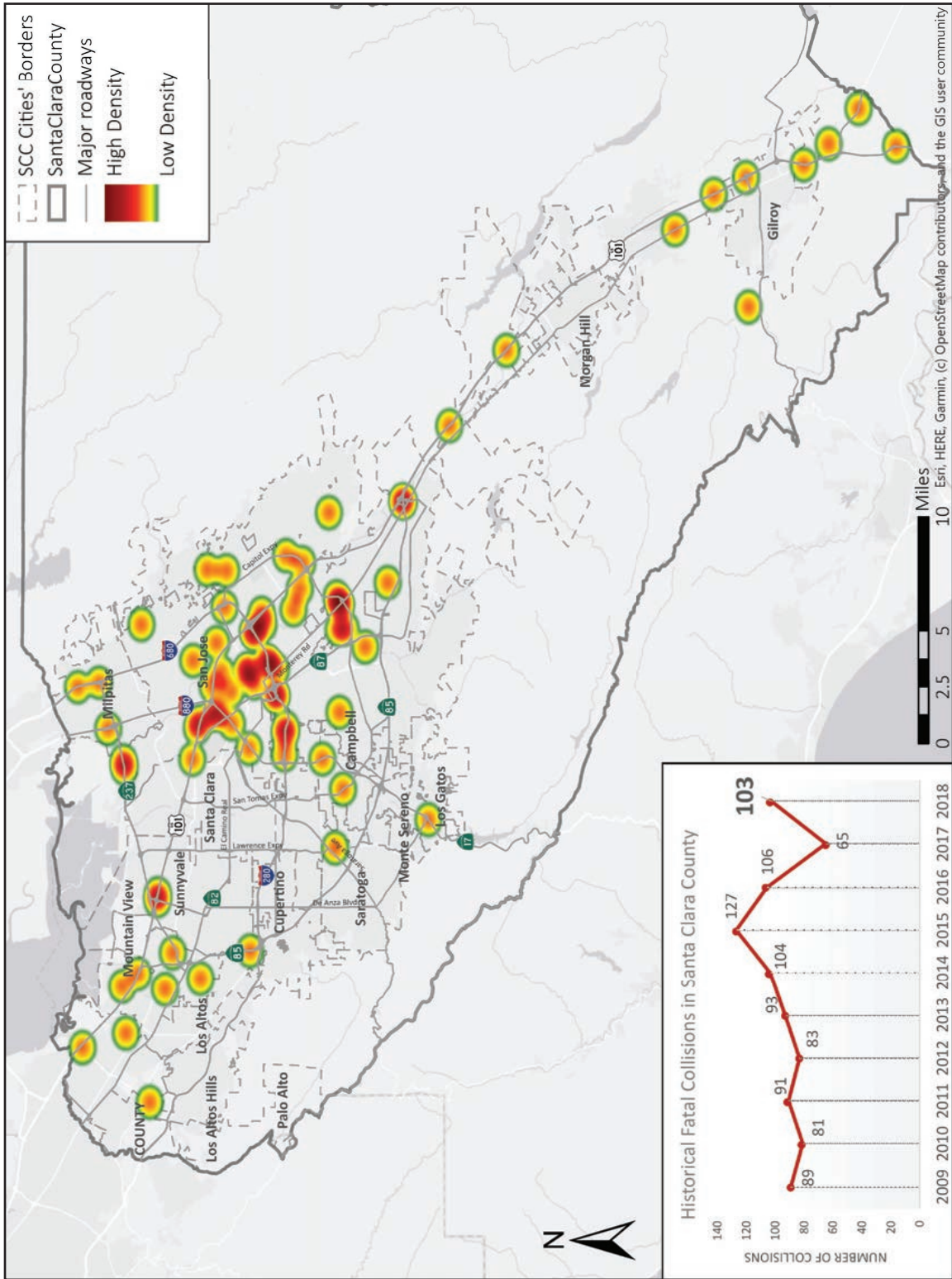
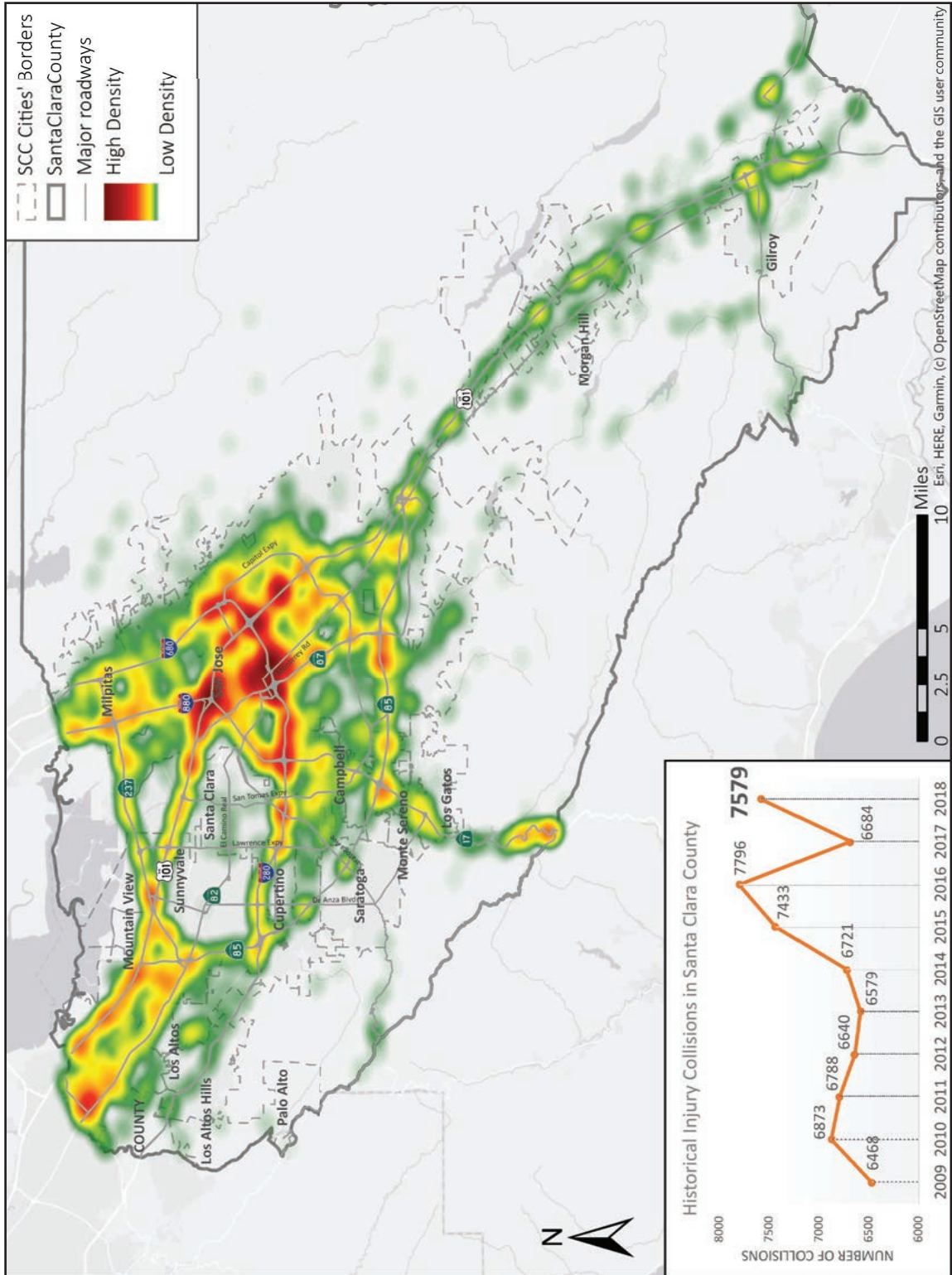


Figure 17
2018 Injury Collisions “Hot Spots” Map, Santa Clara County



The overall number of 2018 major collision types, factors and involved parties per agency could be found in the table below:

Table 3
2018 Major Collision Types, Factors, and Involved Parties per Agency

Agency	Total Collisions	Fatal Collisions	Injury Collisions	Hit & Run	DUI*	Speed	Auto RW**	Ped	Bike	Hit Object
Campbell	74	0	60	14	11	11	12	10	8	5
Cupertino	532	1	117	116	13	113	67	16	40	58
Gilroy	91	0	21	31	3	17	19	5	2	10
Los Altos	92	0	51	18	1	18	13	10	10	11
Los Altos Hills	41	0	20	4	3	12	2	0	7	11
Los Gatos	220	0	77	43	18	64	39	7	19	24
Milpitas	366	0	171	87	34	86	41	14	9	49
Monte Sereno	0	0	0	0	0	0	0	0	0	0
Morgan Hill	23	0	10	2	3	6	5	2	0	8
Mountain View	309	4	171	72	35	47	37	20	43	46
Palo Alto	580	2	279	88	24	138	122	36	69	40
San Jose	1967	27	1891	253	41	535	299	267	175	70
Santa Clara	1058	8	321	310	43	245	175	31	41	116
Santa Clara County	1694	16	992	274	129	492	201	64	78	341
Saratoga	199	1	54	20	12	44	37	4	11	43
State	8781	35	2888	1414	497	4928	76	64	35	1397
Sunnyvale	1253	6	432	327	66	300	218	50	69	148

*DUI - Driving Under the Influence

** Auto R/W - vehicle's Right-Of-Way violation

Roadway Safety

Collision Types and Primary Collision Factors (PCF)

Each collision record includes a type and primary collision factor. The following figures, representing the ratios of the collision types and factors, allow to determine the most common dangerous behavior of road users and develop strategies for mitigating it.

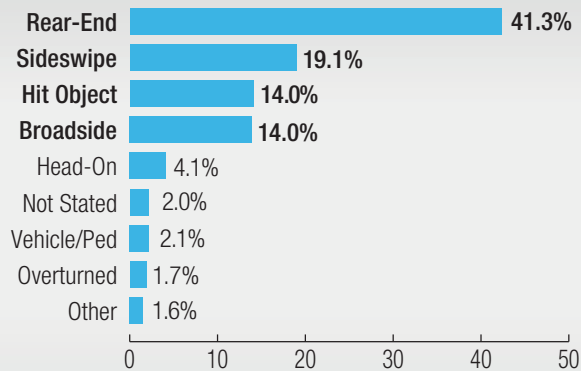


Figure 18 2018 All Collision – Collision Types

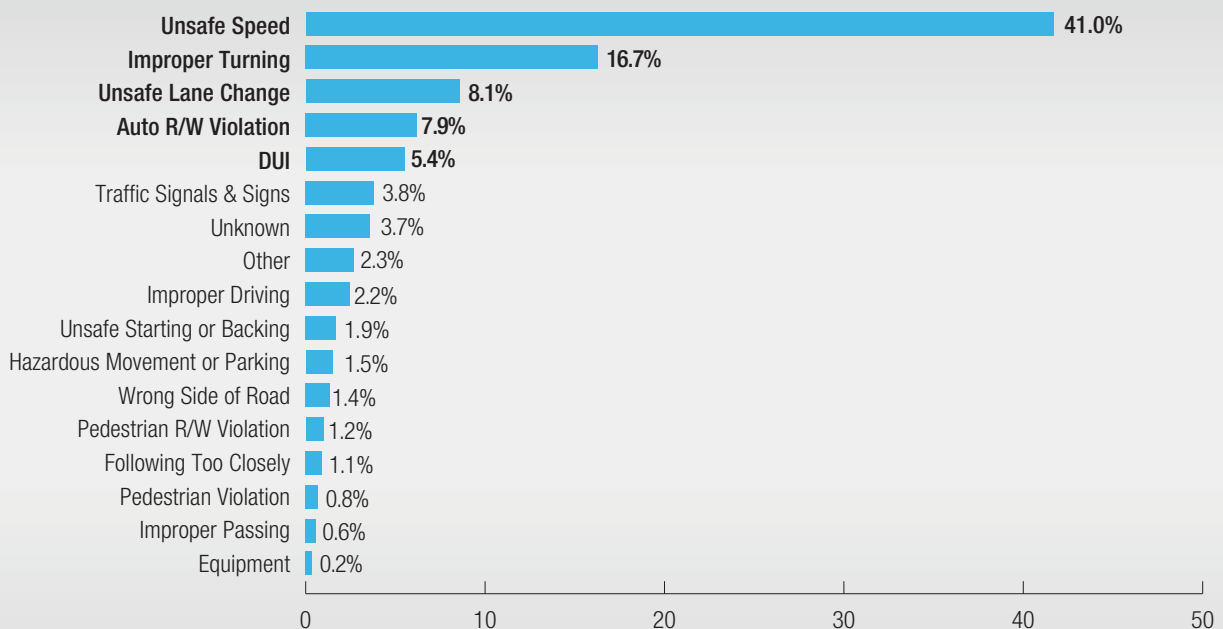


Figure 19 2018 All Collision – Primary Collision Factors (PCF)

Pedestrian and Bicycle Involved Collisions

In 2018 pedestrian and/or bicycle roadway users were involved in **1218 collisions** out of total **17,349**. The following section takes a closer look on the collision types, primary collision factors, and degree of injury.

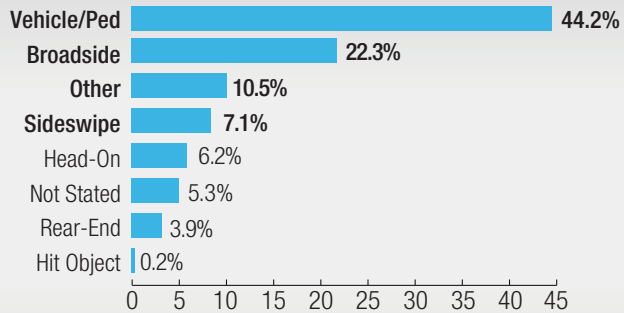


Figure 20 2018 All Collision – Collision Types

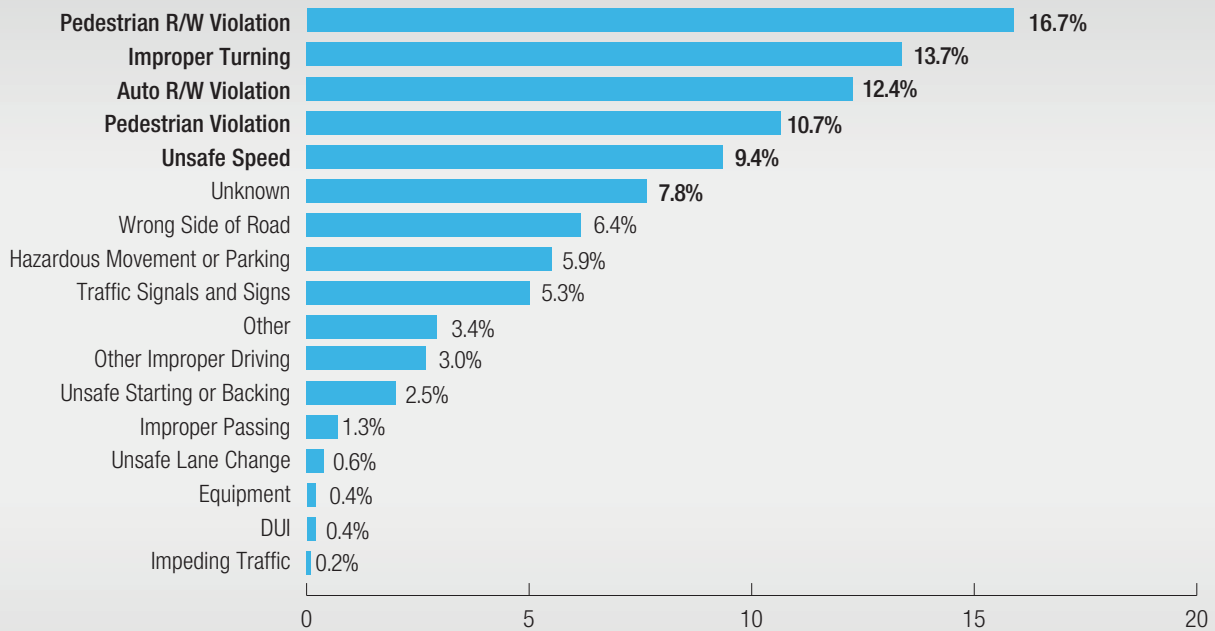


Figure 21 2018 All Collision – Primary Collision Factors (PCF)

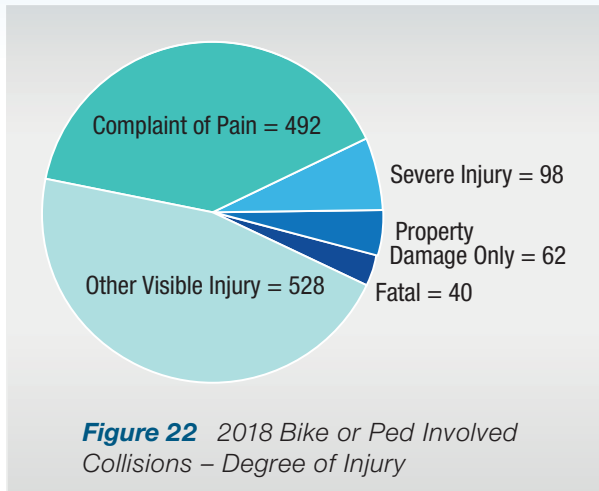


Figure 22 2018 Bike or Ped Involved Collisions – Degree of Injury

The overall number of pedestrian or bicyclist involved collisions amounts to only 7% from the total number of collisions in Santa Clara County. However due to pedestrians’ and cyclists’ vulnerability, these collisions translate to 39% of all fatalities. Due to the high human health

and life cost of ped/bike involved collisions, it is essential to develop the infrastructure that allows non-driving residents to travel safely.

The Most Dangerous Locations for Pedestrians, Bicyclists and Vehicles in Santa Clara County

Certain intersections in Santa Clara County are shown to be more prone to collisions than other locations. Below are the maps of the intersections with the highest number for pedestrians, bicyclists, and vehicle involved collisions. The most dangerous ped/bike intersections are located within City of San Jose downtown and East/South areas, and along high-density pedestrian and bike activity routes within other cities. The intersections that are not falling into either of these categories should be closely studied and given a priority for Complete Streets projects to reduce the number of the future collisions.

Figure 23
2018 Top Bicycle and Pedestrian Collision Intersections

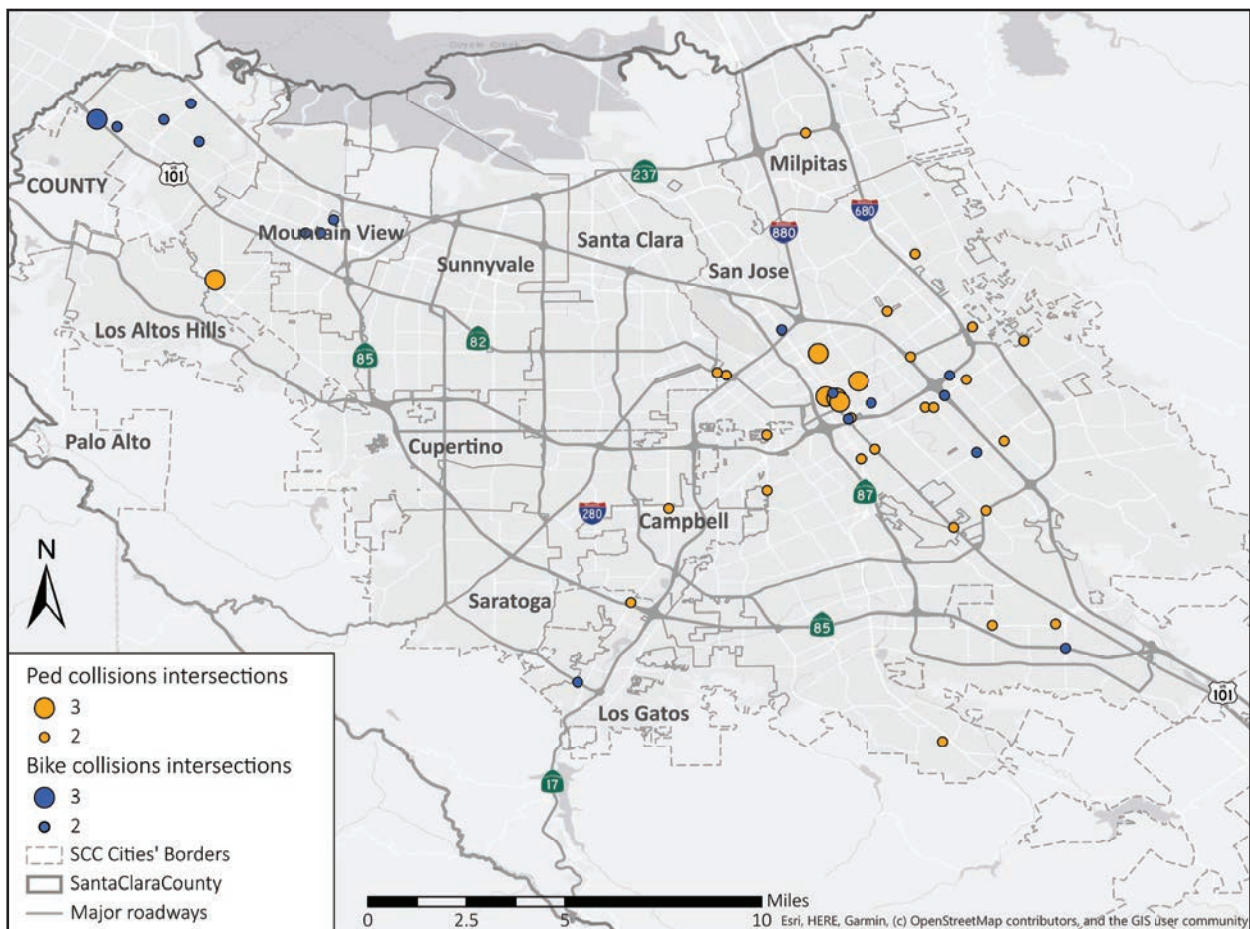
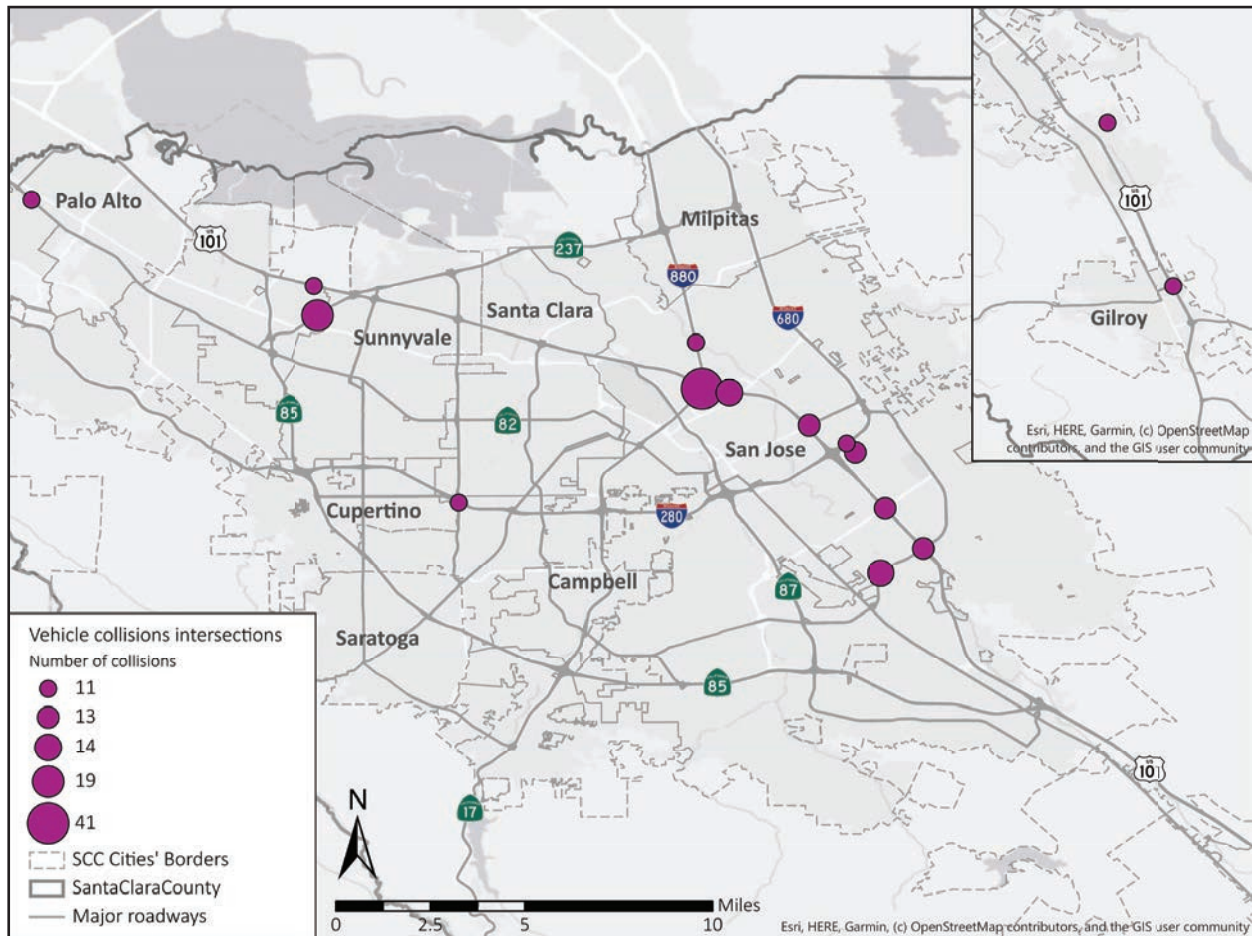
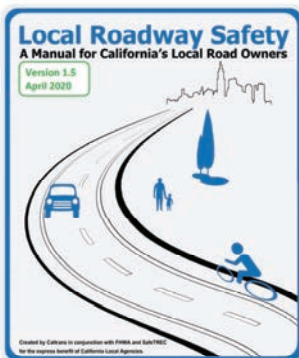


Figure 24
2018 Highest Number of Vehicle Collisions Intersections



Solutions

To reduce the number of collisions in Santa Clara County, VTA and the local agencies have been working together to identify frequent and high risk



collision locations, develop projects to improve safety, and allocate funding to implement these projects. Examples of these efforts are the 2016 Measure B programs and projects, and a recent grant award from Caltrans to develop

a Countywide Local Roads Safety Plan that will provide a strategy for reducing and eventually eliminating fatal and serious injury collisions in Santa Clara County.



COVID-19 Impacts



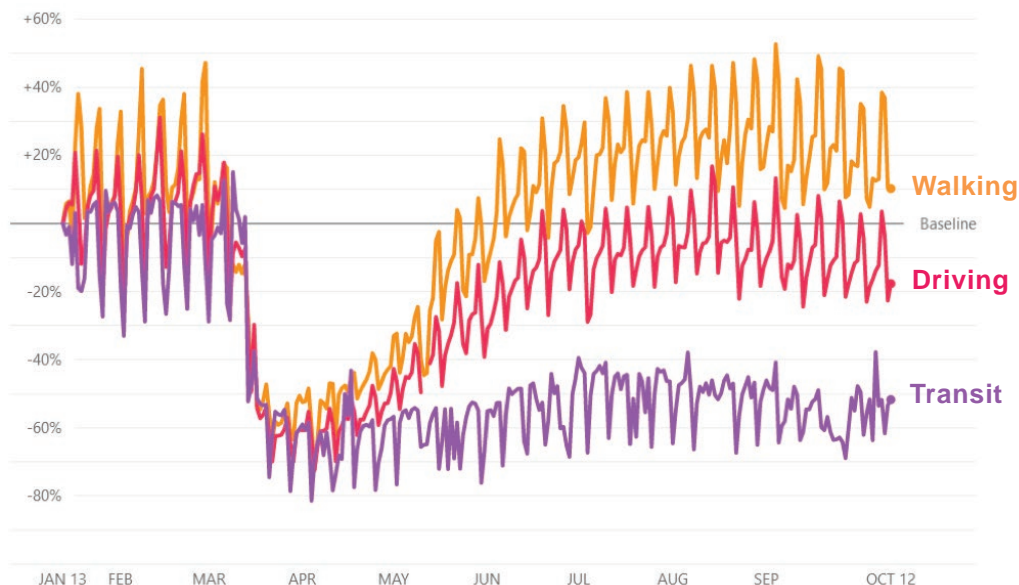
This section describes some general observations on the Covid-19 pandemic situation as it relates to transportation, and responses from local agencies since the shelter-in-place order and social distancing guidelines were issued by the State and County Public Health Department in March 2020.

Following these orders and guidelines, many employers, schools, and other organizations transitioned their operations from onsite work to telecommuting, while adjusting their workflow processes. This resulted in changes personal transportation mode choices and commute patterns.

The graph below displays the change in patterns for vehicle, transit, and walking travel modes in Santa Clara County from January 2020 to October 2020. The data was generated based on Apple Maps© users' requests for directions by mode choice.

The overall vehicular traffic in Santa Clara County has returned to approximately 80% of the pre-COVID-19 volumes; walking increased by 20% after dropping to under 50% after the shelter-in-place order, transit usage fell to under 60% of average ridership and remained at 40-50% ridership levels.

Figure 25 Apple Maps© Mobility Trends Reports 01/13/2020 – 10/12/2020 for Santa Clara County



Source: <https://covid19.apple.com/mobility>

Notes: It is important to note that the Apple Maps© data does not allow to determine if the peak hour

Traffic Impacts

With fewer trips taken by Santa Clara County residents during the shelter-in-place order, the number of Vehicle Miles Traveled (VMT) and congestion levels also decreased. However, there were changes in travel patterns and increases in travel speeds on the major corridors and arterial roadways.

To show these changes, data collected from Year 2019 were compared with data from Year 2020 for the same time period using colors shown on the maps below. The roadway segments shown in red indicate a negative change in travel speeds or congested locations, yellow indicating slow speeds, and green showing positive changes or free flow traffic conditions. The Speed Change maps were generated using data from Tuesdays, Wednesdays, and Thursdays (typical weekdays with the heaviest traffic volumes) for the months of February, March, and October 2020. The travel speeds were actually slower in 2020 than the same time in 2019. However, as soon as the shelter-in-place order was issued in March 2020, the speeds increased on almost all of the major roadways in the County.

Since March 2020, traffic in Santa Clara County has been gradually increasing; however, it is still far below the pre-COVID-19 volumes. Below is a map generated for October 2020. The colors show that travel speeds in some areas are still generally higher than in October 2019, while other locations have shown slower speeds indicating a return of traffic congestion.

Figure 26

Speed Change on Major Roadways from 2019 (February 2020)

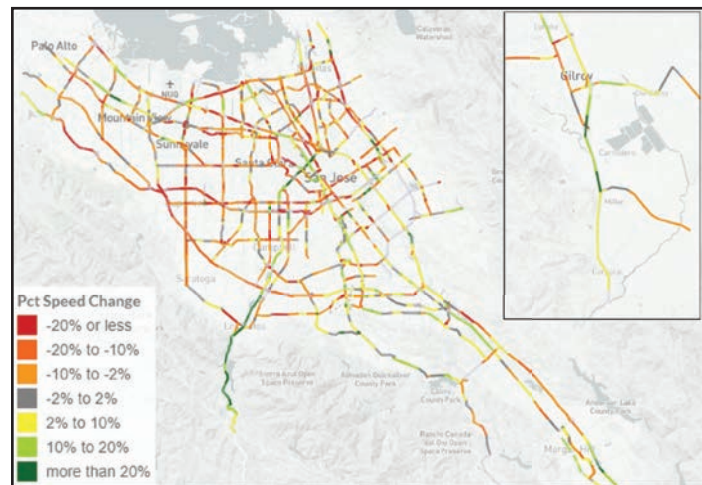


Figure 27

Speed Change on Major Roadways from 2019 (March 2020)

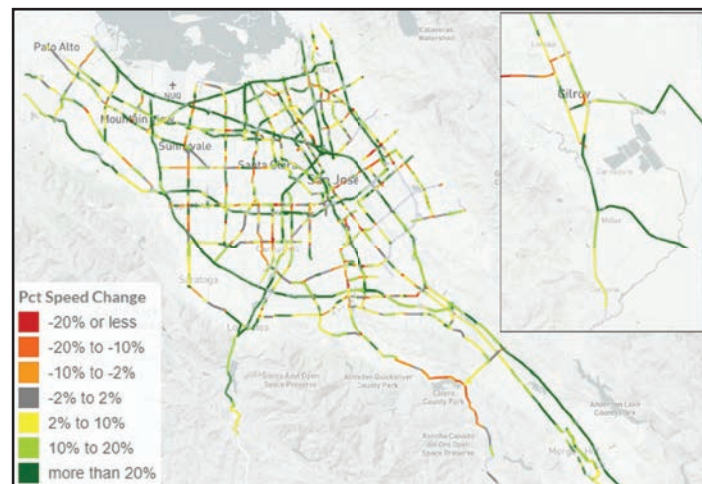
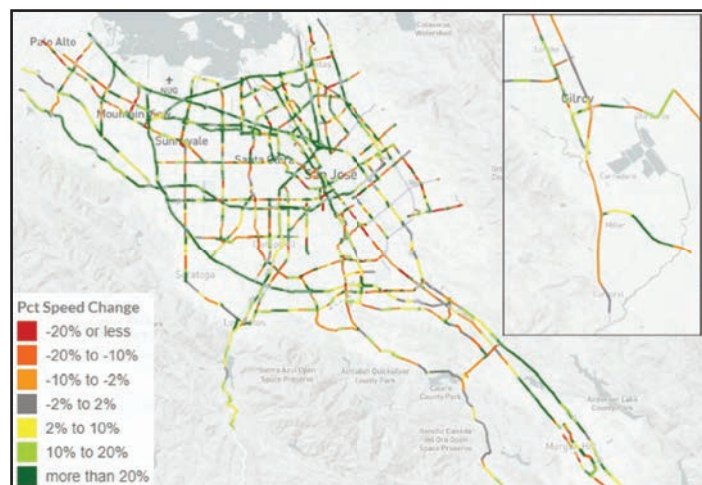


Figure 28

Speed Change on Major Roadways from 2019 (October 2020)



Transit Impacts

VTA's transit services were the most affected travel mode due to COVID-19 pandemic measures. Since the shelter-in-place order in March 2020, the ridership has struggled to recover, as the residents prefer to use more social distanced modes over the common space transit vehicles. To restore rider confidence, VTA has implemented a set of actions, designed to increase passenger safety and reduce virus transmission risk.

Immediately after the shelter-in-place on March 16, 2020, transit service was adjusted to reflect lower ridership demand:

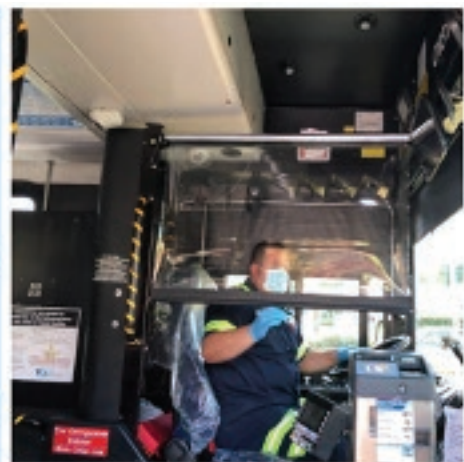
- Light Rail service operated 6:00 am-6:00 pm, Monday through Friday.
- Bus service was reduced to operating until 9 pm, with some routes being suspended.
- All fares were waived.
- All school service was suspended.

For the next several months, VTA adapted to the changing pandemic situation with the following actions:

- Mar 26: suspended all light rail service for two weeks
- Mar 30: implemented major service reductions across network (approximately 40% less service than normal)
- Apr 6: suspended Route 22 overnight service
- Apr 9: reintroduced limited light rail service
- Jun 8: implemented service improvements to bus and light rail operations
- Aug 10: implemented major service improvements across the network (approximately 30% less service than normal)

In addition, VTA implemented an action plan with operating procedures for Buses, Light Rail and Paratransit Vehicles:

- Daily cleaning using Center for Disease Control approved cleaning products
- Crews in the field throughout the day wiping down frequently touched areas of vehicles
- Road call mechanics have bleach cleaning solution and rags to wipe down surfaces
- Sanitizing stations at bus yards and headquarters
- All operators supplied with hand sanitizer, gloves, and face masks



Bicycle and Pedestrian Impacts

Since the Stay-in-Shelter order with restrictions on gatherings and business operations, there has been an increase in bicycling and walking. Some assumptions can be attributed to residents switching to alternative travel modes from driving and taking transit, and a desire to exercise and maintain an active lifestyle. According to a survey poll by the Silicon Valley Bicycle Coalition in May 2020, the majority of the residents were walking and cycling more mainly for exercise and fresh air. The responders noted the following travel behaviors:

- 88% drive less
- 61% walk more
- 42% bike more

In response to the increase demand in public space for active transportation, some local agencies implemented Slow Streets or Shared Streets programs, designed to fully or partially close the streets for traffic to accommodate pedestrians and bicyclists.

On May 8, 2020, the City of Palo Alto initiated a Shared Streets Program. The City limited vehicle access to local traffic only on certain streets. This created more space for residents to walk, bike, and run while complying with physical distancing requirements. The program was piloted on three street segments, shown on the map below.



On June 22, 2020 City of Mountain View closed a vehicular through movement on Castro street within downtown, converting it into the bicycle and pedestrian-friendly outdoor dining area. The project received a largely positive response from the local businesses that were able keep open while adhering to the social distancing protocols and residents that appreciated an additional outdoor space for safe dining and walking.



Solutions

Other COVID-19 Agencies' Response Strategies

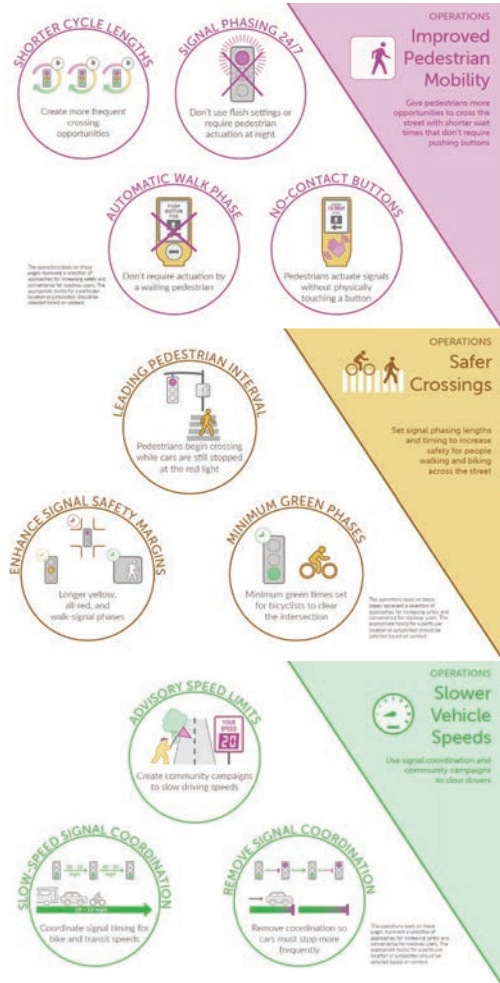
To response to the challenges, inflicted by COVID-19, several local agencies had to rapidly implement strategies to maximize public safety and maintain the efficient transportation operation.

Below are listed the actions taken:

San José

- Pedestrian buttons were disabled at over 100 intersections within the downtown area; the pedestrian crossing signals were set up to activate automatically with vehicle through green phases.
- The signal coordination was disabled city-wide.
- Posted messages to encourage safe travel speed and awareness of an increased number of pedestrians and bicyclists.

These responses fall in line with Arterial Operations Strategies, recommended by MTC:



Santa Clara County (unincorporated)

- Posted messages to encourage safe travel speed.
- Adjusted signal timing immediately after the Health Order was issued on March 16 to all corridors with coordinated signal timing.
- Successfully streamlined the touchless pedestrian signal crossing button pilot project and installed touchless buttons at S. Bascom Avenue and Renova Drive intersection, in front of Valley Medical Hospital in San Jose.

Mountain View

- Pedestrian buttons were disabled at 23 intersections with high pedestrian activity; the pedestrian crossing signals were set up to activate automatically with vehicle through green phases.

Future Mobility Challenges due to COVID-19 Impacts

As the world is still struggling to function amid pandemic, the society comes to realization that the current COVID-19 measures can be extended for a longer time than anticipated. The pandemic has also impacted almost all spheres of life, especially transportation. This raises the questions that will have to be addressed sooner or later:

- Where does new mobility and emerging technology fit in?
- What is the impact of increased delivery services?
- How to account for new travel behavior?

Source: <https://bikesiliconvalley.org/2020/05/the-streets-they-are-a-changin/>

Source: https://www.cityofpaloalto.org/gov/depts/trn/shared_streets_program.asp

Highlights of Other Transportation Systems



Below summarized the latest bikeway data available for Santa Clara County's jurisdictions. Each bikeway is categorized as one of the four classes:

Class I – Bicycle Path

Off-street paved bikeways. They are separated from vehicle traffic but are almost always shared with pedestrians.



Class II – Bicycle Lane

A portion of road reserved for the preferential or exclusive use of people biking, indicated by road markings. shared with pedestrians.



Class III – Shared Lane

Wide travel lanes shared by bicyclists and vehicles.



Class IV – Separated Bikeways

(Also commonly referred to as cycle tracks or protected bikeways) Bicycle facilities that are separated from traffic by parked cars, safe-hit posts, transit islands or other physical barriers.

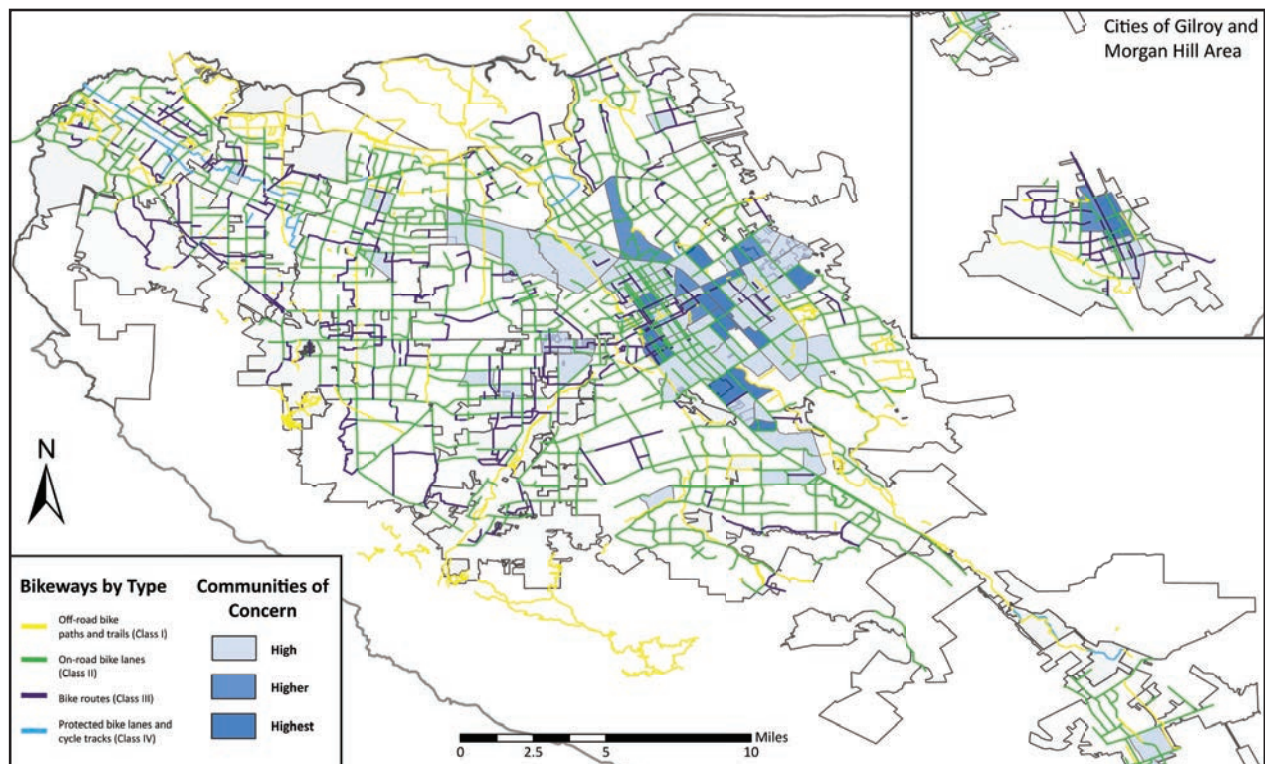


Highlights of Other Transportation Systems

Table 4
2020 Bikeway Mileage by Jurisdiction

JURISDICTION	Class I	Class II	Class III	Class IV
Campbell	10.35	15.12	10.24	-
Cupertino	9.01	23.32	11.57	-
Gilroy	6.67	21.36	19.36	-
Los Altos	2.05	11.57	11.61	-
Los Altos Hills	0.41	1.26	6.18	-
Los Gatos	13.77	7.05	3.52	-
Milpitas	7.41	26.94	10.46	-
Monte Sereno	-	-	1.59	-
Mountain View	16.95	25.96	10.44	5.67
Palo Alto	16.78	35.43	10.40	7.51
San Jose	101.95	317.02	54.96	3.90
Santa Clara	9.63	34.07	10.22	-
Saratoga	2.27	12.96	9.59	-
Sunnyvale	14.49	55.24	12.05	0.24
Unincorporated SCC	61.78	23.61	7.00	3.45
Total	278.83	633.28	189.21	20.75

Figure 29
Santa Clara County 2020 Bikeways Map with Communities of Concern

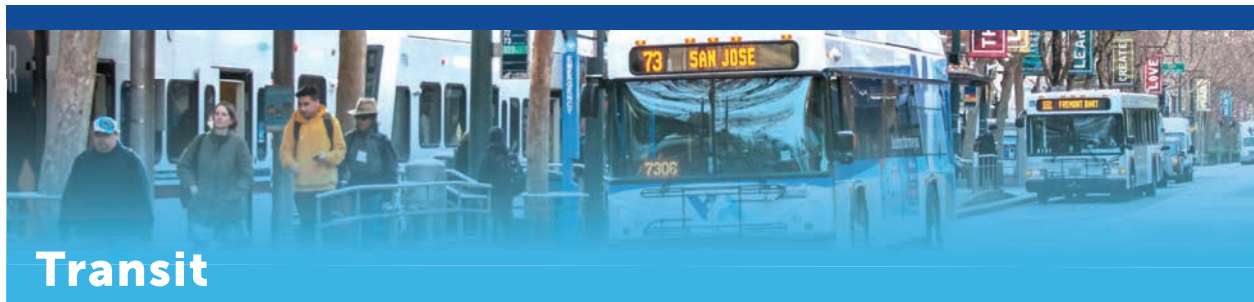


Highlights of Other Transportation Systems



Bridges/Overcrossings

Santa Clara County	Bridge Counts				% in Condition		
	All	Good	Fair	Poor	Good	Fair	Poor
2016	952	580	311	61	61%	33%	6%
2017	954	591	280	83	62%	29%	9%
2018	955	545	329	81	57%	34%	8%
2019	961	484	374	103	50%	39%	11%



Transit

Indicators	Previous Period	Current Period	Goal	Goal Met	Trend (Yearly)
Light Rail Annual Ridership (in Millions)	8.51 (2018)	8.44 (2019)	11.60	NO	
Bus Annual Ridership (in Millions)	28.05 (2018)	27.03 (2019)	33.32	NO	

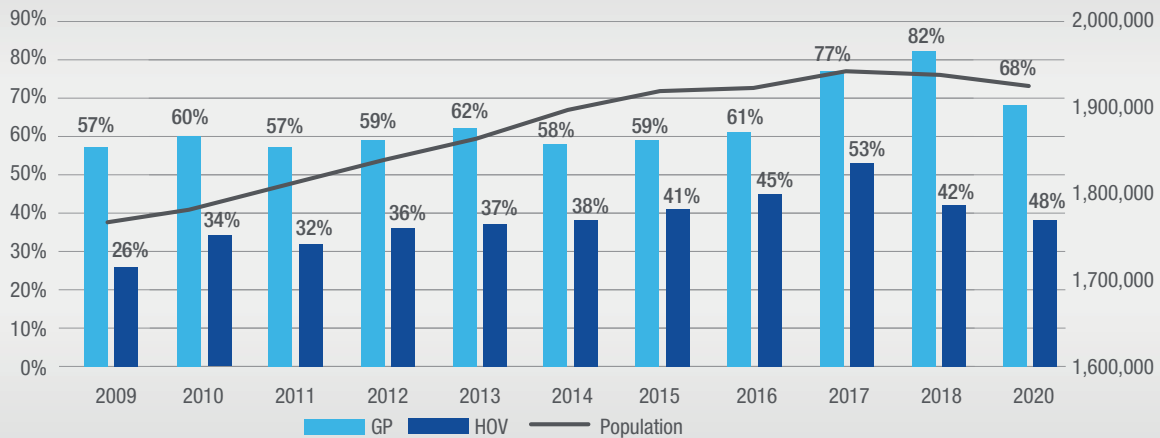
Highlights of Other Transportation Systems



Roadside Assets

Indicators	Previous Period	Current Period	Trend (Yearly)
Traffic Signals (percentage of Assets in useful condition)	83% (2019)	79% (2020)	
Pavement Markings (percentage of Assets in useful condition)	72% (2019)	71% (2020)	
Traffic Signs (percentage of Assets in useful condition)	76% (2019)	74% (2020)	
Litter Management (percentage of Assets in useful condition)	88% (2019)	86% (2020)	

% of Highway Segments operating at LOS D or lower (speed ≤ 62 mph) vs Population in Santa Clara County



Highlights of Other Transportation Systems

Table 5
Inventory of Assets

ASSETS	QUANTITY	YEAR COLLECTED
Roadway Lane Miles Repaired/Repaved (Total)	1,950 miles	2020
Miles Repaired/Repaved 2017	537 miles	2020
Miles Repaired/Repaved 2018	467 miles	2020
Miles Repaired/Repaved 2019	952 miles	2020
Bus		
Fleet Age (avg.)	9.39 Years	2019
Fleet Size	453	2019
Route Mileage	1,265 mi	2019
Routes	71	2019
Stops	3,800	2019
Light Rail		
Fleet Size	98	2019
Miles of Track	81.6 Miles	2019
Route Mileage	42.2 Miles	2019
Stations	61	2019
Highway – Ramp Meter Signals	265 Operational 12 Non-operational 62 Planned 26 Part construction	2020
Traffic Signal Controllers	1,925 Local 144 State	2020
Traffic Signs	216,672	2020

References

Street Pavement

Current (2019) Local Streets PCI shapefile, used to create the Figure 5 was downloaded from a MTC website called “Vital Signs”: <http://www.alsigns.mtc.ca.gov/street-pavement-condition>. The rest of the data was obtained through a data request to an MTC staff, as, at the time of the 2020 TSMP report creation, the latest data was not yet made available online.

2018 California Statewide Local Streets and Roads Needs Assessment Report found on League of California Cities website (accessed July 2020): <https://www.cacities.org/Member-Engagement/Professional-Departments/Public-Works-Officers-Department/California-Statewide-Local-Streets-and-Roads-Needs.aspx>.

VTA 2010 \$10 Vehicle Registration Fee webpage: <https://www.vta.org/projects/funding/2010-10-vehicle-registration-fee>. This webpage includes an expenditure plan which provides details on project eligibility and how the funds are to be distributed by individual Member Agencies.

To more accurately present the change in pavement conditions, the report has moved away from 3-year rolling PCI average and displays annual PCIs. It should be noted here that PCI is based on human observations and interpretations; therefore, the minor differences in PCI scores between years could reflect similar conditions. The intent of reporting PCI's on an annual basis is to monitor the trending conditions over time.

Highway Litter, Illegal Encampments, And Graffiti Maintenance

Following the successful changes made in 2019, the 2020 TSMP Litter, Illegal Encampments, and Graffiti Maintenance section focuses on quantitative data, representing the volume of litter and square footage of graffiti removed. The data was provided by the Caltrans highway maintenance crews, that work on collection and removal of litter, paint over graffiti, clean-up of homeless encampments, etc. The available data goes as far as 2015, which allows to generate a 6-year trend lines.

Each clean-up event, conducted by a Caltrans crew, is recorded with a type of work, amount removed, and post mile location or a highway segment. This information was used to generate a litter, illegal encampments, and graffiti heat maps, displayed above. Such methodology allows to show a full annual statistic on the removal, instead of an instant “snapshot” of litter, landscape, and graffiti conditions, making the analysis legitimate. The future use of this methodology will allow to monitor the highway “hotspots” and observe the amounts collected and removed in the most challenging areas each year.

In order to advance the TSMP report in the future, it would be beneficial to obtain litter collection data from all highway clean-up crews besides Caltrans, working in Santa Clara County. The data recording, however, needs to be done in a similar fashion, as the one from Caltrans, to be able to match and join the records into one database.

Roadway Safety

Provisional 2018 collision data was taken from the Crossroads database that combines the information from the iSWITRS system and the local CHP databases. The Crossroads data request consisted of raw collision data and selected statistics for vehicle, pedestrian and cyclist on the collisions by severity, primary collision factor, road users' involvement. The request also included collision breakdown by city and a list of intersections with the highest number of vehicle, pedestrian, and cyclist collisions. All maps were generated in ArcGIS Pro software using requested Crossroads data.

COVID-19 Impact

The section was compiled from a number of publicly available external sources and VTA data. Apple Maps© Mobility Trends Reports 01/13/2020 – 10/12/2020 for Santa Clara County was retrieved from <https://covid19.apple.com/mobility> website. Traffic Impacts are assessed through a difference in traffic speed along the major roadways pre and during covid. The speed data was retrieved from INRIX© website and compiled and visualized using Congestion Tracker tool, developed by VTA staff. Transit Impacts section was compiled from the internal VTA data. Bicycle and Pedestrian Impacts section utilized multiple sources such as Silicon Valley Bicycle Coalition portal, local Bay Area agencies' practices – Mountain View, Palo Alto, Santa Clara County, and MTC.

Highlights of Other Transportation Systems

2020 Bikeways

The data was retrieved from the VTA Planning group, who, in their turn collected the information from local jurisdictions.

Key Performance Indicators and Trends

Bridges

The most recent Local Agency Bridge List available was provided by Caltrans in July 2018, which is three months after the April 2018 Local Agency Bridge List used for FY 2018 TSMP. Therefore, with only three months passed from the previous inspection, a limited number of bridges had the Sufficiency Rating updated, providing a minimal change for the Average Sufficiency Rating. Instead this year the data reported was retrieved from the following website and constitutes of the count of local Santa Clara County bridges in good, fair, and poor condition over the past four years: <https://www.fhwa.dot.gov/bridge/britab.cfm>

Roadside Assets

The reported data was summarized from the 2020 Roadside Assets Condition Self-Assessment Surveys, distributed to each of the local jurisdictions.

Congestion vs Population in Santa Clara County

Current freeway LOS data retrieved from VTA 2019 Congestion Monitoring Program (CMP) Monitoring and Conformance Report is available at <http://www.vta.org/cmp/monitoring-report>. Population data from United States Census Bureau provided on their website at State & County Quick Facts page <https://www.census.gov/quickfacts/fact/table/US/PST045216> and by searching Santa Clara County, CA.

Transit

<http://www.vta.org/transparency/performance-indicators/light-rail-system-performance>. <http://www.vta.org/transparency/performance-indicators/bus-performance>. Statistics on transit ridership were obtained from Santa Clara Valley Transportation Authority's FY2019 Comprehensive Annual Financial Report and found in Table 21 Operating Information – Operating Indicators near the end of the report. This and previous reports can be accessed at: <http://www.vta.org/about-us/financial-and-investor-information-accepted>.

Inventory of Assets

Roadway Lane Miles Repaved

See Roadside Assets section.

References

Bus

Current bus data was retrieved from internal VTA report called “VTA Facts, Current Bus System Data, 2020”. Bus fleet includes all the following bus types: articulated (58), standard (195), hybrid 40-ft (119), hybrid 30-ft (38), and Hybrid Express (50). Bus route mileage is reported as the total round trip. Although this report is not published on the website, much of this information can be found in other reports such as the Annual Service Transit Plan (fleet size, number of routes & stops, and weekly ridership) which can be found on VTA’s website here: <http://www.vta.org/reports-and-studies>. Additionally, a Bus System Overview fact sheet is provided periodically on VTA’s website here: <http://www.vta.org/news-and-media/resources/vta-newsroom-fact-sheets-vta-information>.

Light Rail

Current light rail data was retrieved from internal VTA report called “VTA Facts, Current Light Rail System Data, 2020”. In addition to the fleet of 99 standard vehicles, there are also 4 historic trollies that operate during the Christmas holiday season. Route miles define the extent of the operational network and represent the total extent of routes available for trains to operate. Track miles takes into account multiple track routes (e.g. for each route mile where there is double track, there are two track miles; where there are four tracks, there are four track miles). Although this report is not published on the website, much of this information can be retrieved from other reports such as the Annual Service Transit Plan (fleet size, number of routes & stops, and total ridership), which can be found on VTA’s website here: <http://www.vta.org/reports-and-studies>.

Highway – Ramp Meter Signals

The data was provided by Caltrans Office of Traffic Systems staff.

Traffic Signal Controllers

See Roadside Assets section.

Traffic Signs

See Roadside Assets section.

Acknowledgements

Participating Agencies

California Department of Transportation
(Caltrans District 4)*

City of Campbell

City of Cupertino

City of Gilroy

City of Los Altos

City of Milpitas

City of Monte Sereno

City of Morgan Hill

City of Mountain View

City of Palo Alto

City of San Jose

City of Santa Clara

City of Saratoga

City of Sunnyvale

County of Santa Clara Roads & Airports

Metropolitan Transportation Commission
(StreetSaver Program) *

Town of Los Altos Hills

Town of Los Gatos

* A special acknowledgement to Caltrans staff Earl Sherman III, Maintenance Manager, and Nick Saleh, District Division Chief, for their cooperation and support for the litter, landscape, and graffiti maintenance and monitoring efforts in Santa Clara County, and Sui Tan, MTC StreetSaver Program Manager, for sharing data on the Bay Area region and local pavement conditions.

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Solutions that move you

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