

San Joaquin County

# Regional Congestion Management Program 2022 Monitoring Report

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San Joaquin Council of Governments

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## EXECUTIVE SUMMARY

The San Joaquin Council of Governments (SJCOG) is responsible for updating the San Joaquin County's Regional Congestion Management Program (RCMP) and monitoring its implementation. Monitoring congestion is required pursuant to the Federal Congestion Management Process (CMP) (CFR 23 450.320 (c)(3)). Measuring regional congestion and related RCMP multimodal performance measures requires an ongoing systematic monitoring program. The SJCOG RCMP Monitoring Program provides this mechanism by establishing the methodologies, requisite data, and multimodal performance monitoring on a continuous basis (i.e., biennial) basis. All traffic information collected as part of the SJCOG RCMP data monitoring program is made available to member and partner agencies (upon request). The list of RCMP Monitoring performance measures, descriptions and the associated resources are displayed in **Table 3.0-1**. The subset of performance measures that are addressed in this report and those that will be included in the next cycle are marked by 'Yes' and 'No' in the last column, respectively.

The RCMP Monitoring Program tracks multimodal performance on the RCMP network. Performance measures serves to gauge system performance and track progress achieving the congestion management objectives. These metrics create a framework for measuring the effectiveness of congestion reduction strategies and projects and the adequacy of alternatives to the Single Occupant Vehicle (SOV) and Transportation Demand Management (TDM) implementation pursuant to Federal requirements: *23 CFR 450.323 (b) and 450.323 (c)(2)*.

The purpose of the San Joaquin's 2021 CMP is to update the county's congestion management report by collecting data/monitoring system performance, with the goal of including roadway users (bicyclists, pedestrians, transit riders, motorists) into consideration within the county. This report provides a snapshot of the "state of congestion" on the county's designated RCMP roadway network. This includes roadway segments, multi-modal corridors, bicycle, and transit networks. To best ensure a representative performance assessment, operational and safety metrics were informed by post-COVID-19 2020-2021 data from varied sources where available.

## SUMMARY OF FINDINGS

RCMP multimodal performance measures address the following key areas:

- Operational Efficiency (Motorist Travel and Freight)
- Transit System Performance
- Bikeway Network Completion
- Multimodal Corridor Performance

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<sup>1</sup> The federal CMP requires an increased multimodal travel demand management

- Travel Demand Management (TDM)
- Safety

A summary of the RCMP multimodal performance measure monitoring results for San Joaquin County is provided below.

**OPERATIONAL EFFICIENCY (MOTORIST TRAVEL AND FREIGHT)**

Roadway operations for motorists and freight is based on speed data from the National Performance Monitoring Research Data Set (NPMRDS) from FHWA. The NPMRDS speed data for vehicles and trucks is used to measure congestion levels and the degree of travel time reliability in combination on the RCMP network.

Based on 12 months of passenger vehicle and truck speed data collected between November 2021 to November 2022<sup>1</sup>, more than 98% of all Interstate Highway System (IHS) and National Highway System (NHS) RCMP roadway segments operated without congestion during the weekday AM peak commute hour. During the weekday PM peak commute hour, the percentage of congested miles on the non-IHS NHS segments was greater (34%). Based on the 80th percentile travel time, more than 80% of NHS miles operated reliably during both AM and PM peak hours. For truck traffic only, the 95th percentile travel time showed that more than 78% of IHS miles were reliable for truck travel during both AM and PM peak hours.

Based on the combined speed-based congestion and reliability performance, potentially deficient corridors were identified and are listed below.

1. Kettleman Lane (SR 12): I-5 to SR 99
2. Eight Mile Road: I-5 to SR 99
3. West Lane and Airport Way: Eight Mile Road to Ralph Avenue
4. Hammer Lane: I-5 to SR 99
5. March Lane: I-5 to Fred Russo Drive
6. Pershing Avenue: Hammer Lane to I-5
7. Lathrop Road: I-5 to SR 99
8. Louise Avenue: I-5 to Union Road
9. Airport Way: Lathrop Road to SR 120
10. Union Road: Lathrop Road to SR 120
11. Yosemite Avenue: Airport Way to SR 99
12. Tracy Boulevard: I-205 to Valpico Road
13. Grant Line Road: Byron Road to I-205
14. I-205: East of Hansen Road to I-580

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<sup>1</sup> The 2021 RCMP monitoring report analysis 12 months pre-COVID data between March 2019 to March 2020. This 2022 RCMP monitoring report attempts to analyze 12 months of post-COVID data to the extent available to avoid using data between March 2020 and November 2021.

### **TRANSIT SYSTEM PERFORMANCE**

The San Joaquin County RCMP contains two transit system performance measures: 1) coverage and 2) frequency. Countywide transit service coverage is evaluated using a half-mile distance from transit stops based on network buffers (roadway distances). The goal of evaluating peak period transit frequency is to determine the likelihood that commuter travelers would use transit regularly.

Currently, about 66% of San Joaquin County's residential households and 56% of San Joaquin County jobs are located within a half-mile walking distance to a transit stop with quality-of-service E (less than one hour headway).

### **BIKEWAY SYSTEM**

As regional bikeways are constructed, SJCOG tracks the ratio of completed bikeways relative to the regional network. For each monitoring cycle a "percent complete" is computed that measures the total number of existing regional bikeway miles relative to the entire network's mileage by type of bike facility.

As of the last update to the SJCOG bikeway inventory, 378.5 miles of the envisioned 1,153 miles or 33% had been constructed. This includes 126 miles of Class I bicycle paths, 152 miles of Class II bicycle lanes, and 63 miles of Class III shared bicycle routes.

### **MULTIMODAL CORRIDORS**

There are 13 designated RCMP Multimodal Corridors in San Joaquin County. These designated RCMP Multimodal Corridors are generally located in areas that are characterized by a predominance of shared roadway users (pedestrians, bicyclists, transit passengers, and motorists), and where roadway widening is either infeasible or undesirable. To determine the quality of service for pedestrians, bicyclists, and transit the Complete Street Quality of Service (CSQOS) methodology (as described in the Highway Capacity Manual is applied.

Summing all LOS results over the 13 multimodal corridors indicates that overall level of service for pedestrian CSQOS is "C"; bicyclists CSQOS is "D" and transit CSQOS is "F".

### **TRAVEL DEMAND MANAGEMENT**

Travel demand management (TDM) strategies are those that provide alternatives to making trips in a single occupant vehicle, and therefore reduce the number of vehicle miles traveled on the roadway network. SJCOG manages the dibs program to facilitate travel choices and alternatives to driving alone. Estimates of vehicle miles traveled (VMT) reduction by participants of the program that either live or work in San Joaquin County is tracked.

Based on data from SJCOG's dibs program, 164 new vanpools were formed in 2018-19, 60 were added in 2021-22 and 164 were added in 2022. The total number of formalized vanpools has increased from 321 in 2020-21 to 417 in 2021-22. San Joaquin experienced about a 30% increase of vanpool from prior year and has contributed to 31 million vehicle miles reduced, and 286,576 vehicles off the road.

### **SAFETY**

Safety metrics relate to the national goal to significantly reduce traffic fatalities and serious injuries on all public roads. These are expressed in absolute terms (i.e., number of fatal and/or injury collisions) and as rates (i.e., collisions per 100 Million VMT). All safety metrics are based on 2020 and 2021 Transportation Injury and Mapping System (TIMS) data.

The number of fatalities on San Joaquin County roadways has been increasing since 2013. The rate of increase for serious injury has grown to a larger extent relative to fatalities. The five-year rolling average for

serious injuries has been trending upward since 2013. Fatal collision rates (per 100 million VMT) indicate an increase upward since 2013 with slight variation in 2018 and 2019. Similarly, serious injuries on county roadways is trending up both in absolute and rate terms. Non- motorized (pedestrian and bicycle) fatality and serious injuries peaked in 2019 at 104 (66 pedestrians and 38 bicyclists). High-fatality segments (roadways with fatality rates of 10 or more fatalities per 100 million VMT) exist in Stockton and county unincorporated areas while high-serious injury segments were most concentrated in the Manteca, Stockton, and county unincorporated areas. Based on the fatality and serious injury collision reduction targets adopted by Caltrans and accepted by SJCOG, San Joaquin County collisions are not on trajectory to meet targets. Of the five metrics established to track safety performance, only one is currently being met (rate of fatalities).

### **ASSET MANAGEMENT**

The Pavement Condition Index (PCI) system is used to report the quality of roadway surfaces in San Joaquin County. Roadway condition has been ranked as “Good” “Fair” or “Poor.”

Based on the 2019 pavement condition data for IHS and NHS designated roadways, 2020 data for bridge deck conditions, and 2020-21 data for local non-NHS roadways, the state of good repair pavement condition targets adopted by Caltrans and accepted by SJCOG are being met in San Joaquin County for the Interstate Highway System and the Non-IHS National Highway System. Conversely, the state of good repair targets for National Highway System bridges are currently not being met in San Joaquin County.

According to the RCMP schedule, PM2 metrics are monitored and reported bi-annually and will be included in the next monitoring cycle.

## 1.0 INTRODUCTION

### 1.1 PROGRAM BACKGROUND

This report documents the 2020 to 2022 (where available) monitoring results for 2022 SJCOG RCMP Update that implements the federal CMP<sup>2</sup>. A CMP is required in metropolitan areas such as San Joaquin County that have population exceeding 200,000, known as Transportation Management Areas (TMAs) (23 CFR Section 450.320 (a)). Federal requirements also state that in all TMAs, the CMP shall be developed and implemented as an integrated part of the metropolitan transportation planning process (23 CFR Section 450.320 (b)). Given that SJCOG is a designated TMA within a federal air quality non-attainment area; the federal requirements for implementing the federal CMP apply in San Joaquin County.

To reduce state and federal legislative redundancy and improve program efficiency, SJCOG and its member agencies formally opted out of the state CMP requirements in July 2021. The SJCOG 2021 RCMP specifically addresses the federal CMP requirements and is comprised of the eight steps listed below. These steps flow directly from the federal legislative requirements (23 CFR 450.323 (a) and 450.323 (b)). This 2021 RCMP Monitoring Report specifically addresses Step 4 of the CMP.

1. Develop Regional Objectives
2. Define CMP Network
3. Develop Multimodal Performance Measures
4. Collect Data/Monitor System Performance
5. Analyze Congestion Problems and Needs
6. Identify and Assess Strategies
7. Program and Implement Strategies
8. Evaluate Strategy Effectiveness

The SJCOG RCMP process is illustrated in **Figure 1.0-1**. This RCMP Monitoring Report serves to address the following requirements:

- Monitoring of SJCOG’s RCMP performance measures;
- Monitoring of the federal PM 1-3 performance measures;
- Compliance with the SJCOG’s Measure K renewal requirements; and,
- Compliance with the federal CMP<sup>3</sup>.

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<sup>2</sup> As of July 2021, San Joaquin County formally opted-out of the state CMP requirements. The SJCOG 2021 RCMP specifically addresses the federal CMP requirements.

<sup>3</sup> The federal CMP requires an increased multimodal TDM and system management emphasis at both the local and regional level to comply. Noncompliance with any of these directives can have local and regional funding implications.

The RCMP Monitoring Program tracks multimodal performance on the RCMP network. Performance measures serves to gauge system performance and track progress achieving the congestion management objectives. These metrics create a framework for measuring the effectiveness of congestion reduction strategies and projects and the adequacy of alternatives to the SOV and TDM implementation pursuant to Federal requirements: 23 CFR 450.323 (b) and 450.323 (c)(2)).

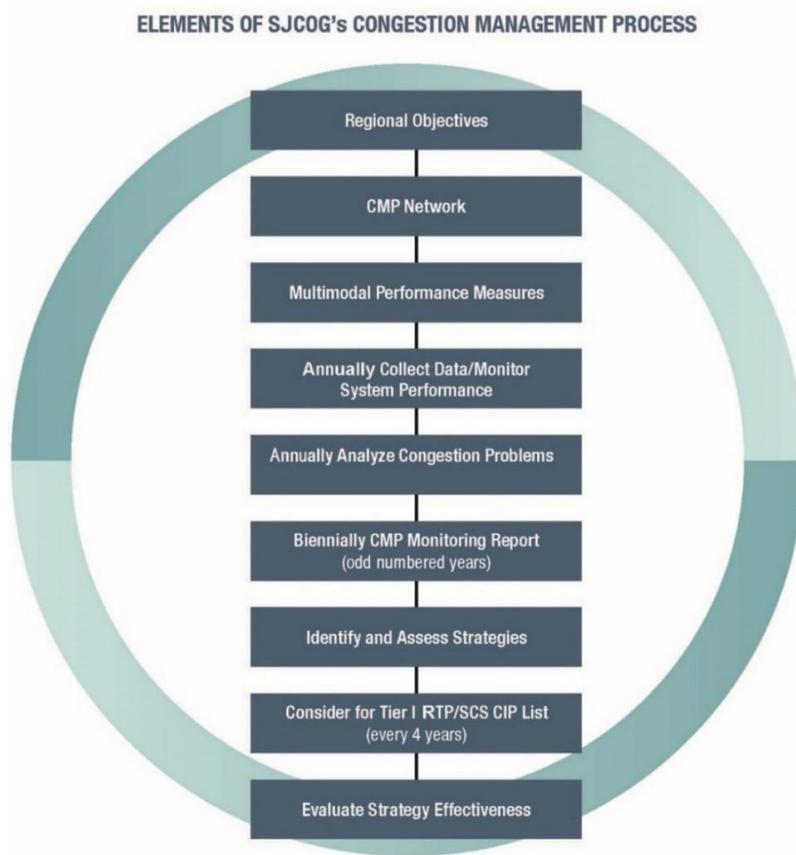
A key focus of the federal CMP aims to reduce single-occupant-vehicle (SOV) travel while minimizing the need to increase SOV roadway capacity. It also provides additional resources for the development and deployment of new congestion management technologies. For areas designated as non-attainment for federal air quality standards such as San Joaquin County, the federal CMP stipulates (*23 CFR 450.320 (d)*) that federal funds may not be programmed for any project that results in a significant increase in the carrying capacity of single occupancy vehicles (i.e., new general-purpose lanes with the exception of safety improvements or the elimination of bottlenecks) unless the project is addressed through a federally compliant CMP. For SOV capacity increasing projects proposed to be advanced with federal funds, an analysis is required to demonstrate that all reasonable travel demand reduction and operational management strategies have been implemented to the fullest extent possible on the subject roadway (*23 CFR 450.320 (e)*). If the analysis demonstrates that despite these strategies additional SOV capacity is still required, the federal CMP will identify all reasonable strategies to effectively manage the SOV facility in the future.

## 1.2 RCMP IMPLEMENTATION

SJCOG coordinates with all the local member agencies listed below.

**Table 1.0-1** lists the role each agency plays in the RCMP Monitoring Program. SJCOG works collaboratively with its member agencies to address its local, state, and federal transportation planning and programming needs. SJCOG’s RCMP process is legislatively integrated with its state and federal planning and programming processes.

California Department of Transportation County of San Joaquin	Ripon Blossom Express Lodi Grapevine
City of Stockton City of Lodi	Tracy Tracer Manteca Transit Escalon E-Trans
City of Manteca City of Tracy City of Ripon City of Escalon City of Lathrop	Altamont Commuter Express San Joaquin Regional Transit District San Joaquin Valley Air Pollution Control District



**Figure 1.0-1 SJCOG CMP** (Source: SJCOG CMP Report 2021)

**Table 1.0-1: Agency Responsibilities** (Source: SJCOG CMP Report 2021)

RCMP Task	SJCOG	Jurisdictions	Caltrans D-10	Public
Prepare Plan/Updates	Lead Agency	Technical Support/Concurrence	Concurrence	Input
Define RCMP Network	Lead Agency	Input	Input	Input
Performance Measure Development	Lead Agency	Input	Input	Input
Monitoring / Data Collection	Lead Agency	Input	Input	Input
Analyze Congestion Problems	Lead Agency	Concurrence	Input	Input
Identify and Assess Improvement Strategies	Lead Agency	Technical Support/Concurrence	Concurrence	Input
Program and Implement Strategies	Lead Agency	Technical Support/Concurrence	Technical Support/Concurrence	Input
Evaluate Strategy Effectiveness	Lead Agency	Technical Support	Concurrence	Input

## 2.0 REGIONAL TRANSPORTATION SYSTEM

The purpose of the RCMP is to monitor congestion, identify congestion problems, and facilitate programming aimed at reducing congestion. Designation of a regional transportation system supports RCMP monitoring activities and focuses the implementation of the RCMP on a core network of key transportation facilities that facilitate regional travel within and through San Joaquin County.

### 2.1 RCMP ROADWAY NETWORK

The RCMP network at a minimum reflects all roadways designated as part of the National Highway System (NHS). If the Federal Highway Administration (FHWA) updates the NHS network SJCOG will amend the RCMP network to reflect such changes. In addition to the NHS designated roadways, SJCOG in coordination with the RCMP Steering Committee chose several non-NHS roadways for inclusion in the RCMP network. The RCMP roadway network is built based on SJCOG RCMP Report (2021) and NPMRDS (2022) and shown in **Figure 2.0-1**.

As shown in **Table 2.0-1**, the RCMP network consists of total 504 centerline miles of which 396 are on NHS designated roadways and 108 are on non-NHS roadways. At this time, continuous monitoring of vehicular speeds by the Federal Highway Administration’s National Performance Monitoring Research Data Set (NPMRDS) is only available on the NHS designated roadways. SJCOG plans to augment the speed monitoring to include the 108 centerline miles of non-NHS roadways for future performance reporting.

**Table 2.0-1: RCMP Network by Centerline Miles**

Jurisdiction	RCMP NHS Centerline Miles	RCMP Non-NHS Centerline Miles	Total RCMP Network Centerline Miles
Escalon	0	0	0
Lathrop	11	1	12
Lodi	7	0	7
Manteca	24	8	32
Ripon	0	0	0
Stockton	75	3	78
Tracy	31	5	36
County	28	55	83
State Highway	220	36	256
<b>TOTAL</b>	<b>396</b>	<b>108</b>	<b>504</b>

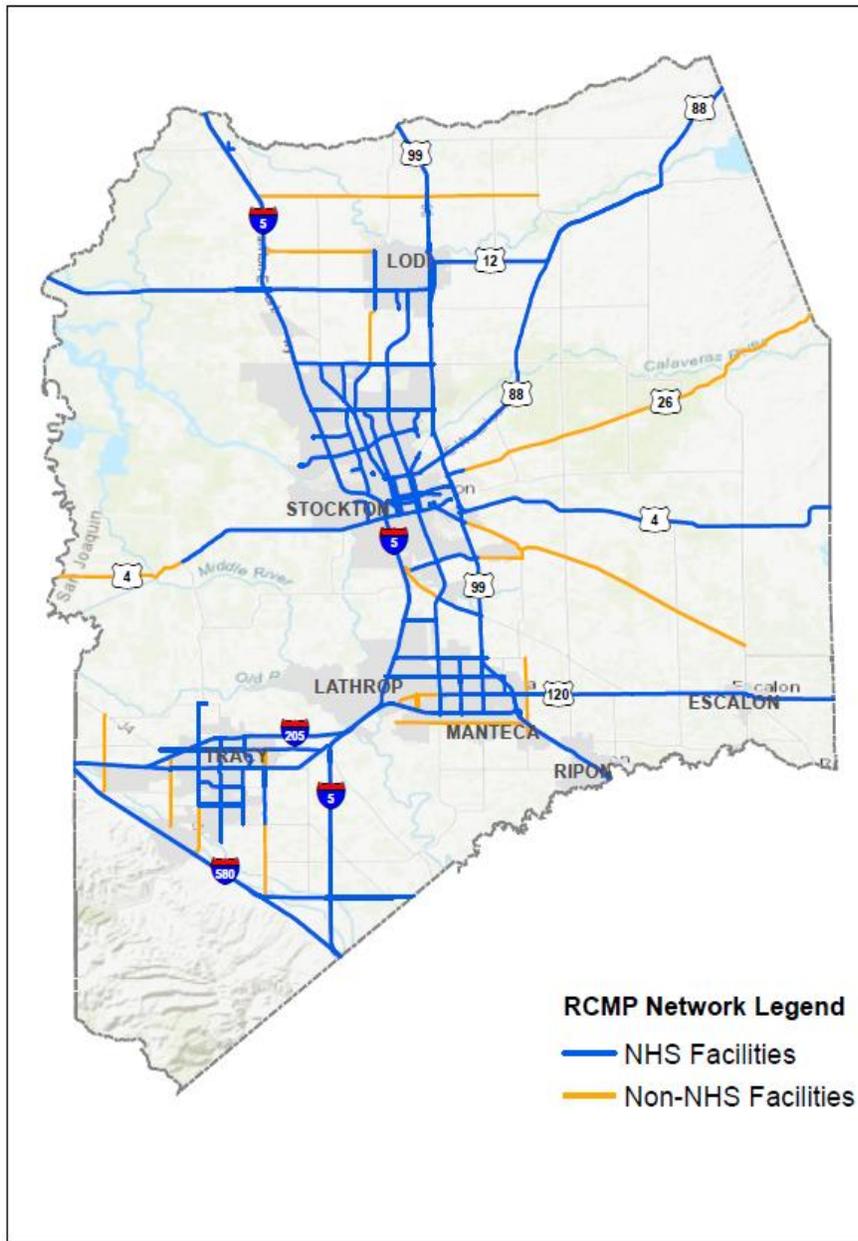


Figure 2.0-1: San Joaquin County CMP Roadway Segments

## 2.2 RCMP MULTIMODAL CORRIDORS

The Federal CMP requires consideration of all major modes of travel as part of a RCMP. Additionally, the California Complete Streets Act (AB 1358) requires counties and cities to include policies that take all roadway users (bicyclists, pedestrians, transit riders, motorists) into consideration as part of their general plan updates. In recognition of these legislative mandates, SJCOG, in coordination with its member agencies, has identified a sub-set of the RCMP network to be designated as RCMP multimodal corridors. RCMP multimodal corridors are defined as sections of the RCMP roadway network where pedestrian, bicyclist, transit passenger, and motorist levels of service are analyzed. This designation also allows for the use of an expanded toolbox of options to address congestion-related deficiencies that do not rely on increasing vehicular capacity. In addition to the baseline segments that are currently designated, the RCMP also identifies future segments that have a high likelihood of meeting multimodal corridor criteria as they develop. Selection of the multimodal corridors was guided using the following criteria:

- Roadway is a part of the regional network and serves as a city’s or community’s main street;
- Roadway possess “Complete Streets” characteristics, meaning they have limited additional right of-way and the existing right-of-way is shared by many types of users (motorists, pedestrians, bicyclists, and transit passengers); and,
- Roadway traverses areas with existing or future urbanized development patterns.

Based on the above guidance, the list of RCMP multimodal corridors is shown and listed by jurisdiction in **Table 2.0-2**. Both the table and figure indicate corridors that will be analyzed by SJCOG to establish baseline conditions and future corridors that will be evaluated when development patterns warrant a multimodal analysis. The potential for new multimodal corridors is evaluated during each four-year RCMP update cycle.

**Table 2.0-2: RCMP Multimodal Corridors** (Source: SJCOG RCMP Report, 2021)

ID	Roadway	Multimodal Segment	Status	Jurisdiction
1	SR-88	Locke Rd to North Sierra Dr	Baseline	County
		Brandt Rd to eastern town limit of Lockeford	Future	County
2	SR-120	McHenry Ave-Escalon Bellota Rd to David Dr	Baseline	Escalon
3	Lathrop Rd	Crestwood Ave to S Airport Wy	Baseline	Manteca
		S Harlan Rd to 7th St	Baseline	Lathrop
		S Harlan Rd to Crestwood Ave	Future	Lathrop/ County/ Manteca
4	SR-12/Kettleman Ln	Lower Sacramento Rd to Cherokee Ln	Baseline	Lodi
5	Yosemite Ave	Airport Wy to Northwoods Ave-Commerce Ave	Baseline	Manteca
6	Main St	Jack Tone Rd to Stockton Ave	Baseline	Ripon
7	March Ln	Da Vinci Dr-Quail Lakes Dr to West Ln	Baseline	Stockton
8	Eight Mile Rd	Thornton Rd to Davis Rd	Baseline	Stockton
		Trinity Pkwy to Davis Rd	Future	Stockton
9	Hammer Ln	Kelley Dr to Maranatha Dr	Baseline	Stockton
10	Lower Sacramento Rd	Royal Oaks Dr to Hammer Ln	Baseline	Stockton
		Eight Mile Rd to Hammer Ln	Future	Stockton
11	West Ln-Airport Wy	El Pinal Dr to Roosevelt St	Baseline	Stockton
		E Alpine Ave to E Roosevelt St	Future	Stockton
12	11th St	Lammers Rd to N MacArthur Dr (west)	Baseline	Tracy
13	SR-26	N Granada Ln to N Market St	Future	County

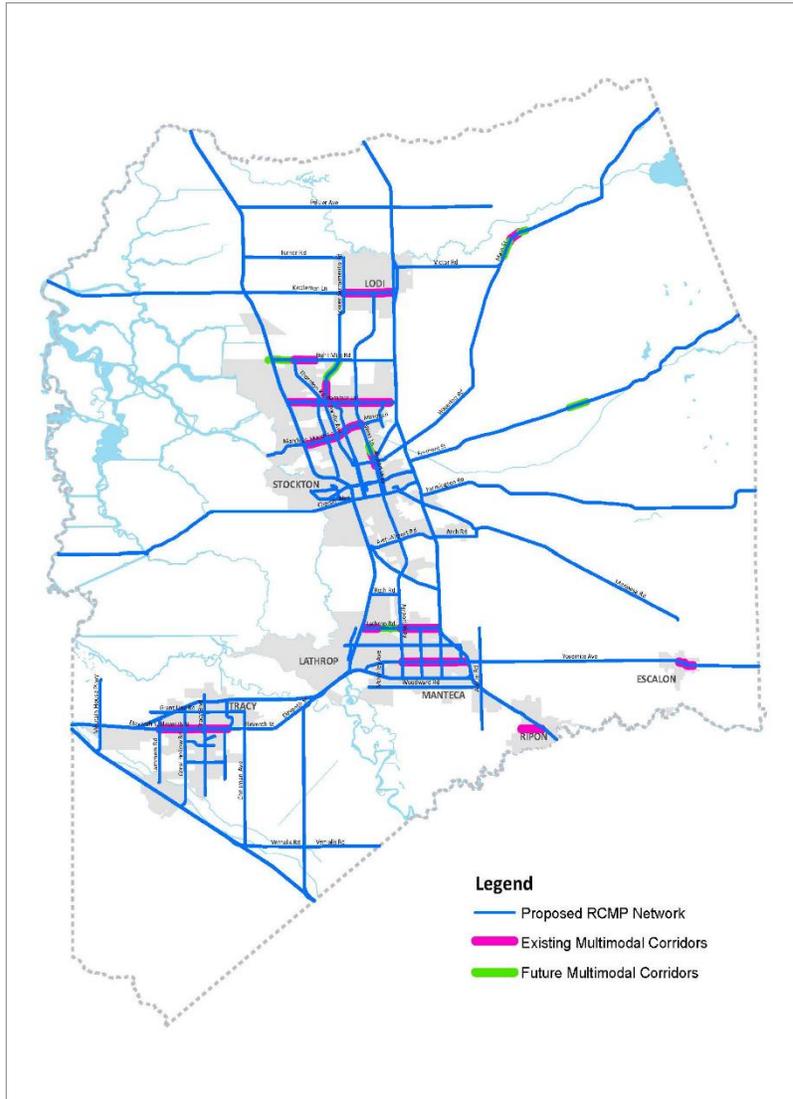


Figure 2.0-2: San Joaquin County RCMP Baseline Multimodal Corridors (Source: SJCOG RCMP Report, 2021)

## 2.3 RCMP BICYCLE NETWORK

SJCOG has developed a regional bikeway network as part of the Bicycle, Pedestrian, and Safe Routes to School Plan. The network establishes routes of regional significance for bicyclists. There are many other elements that create a supportive environment for bicycling, including bikeway facilities, parking, shower and locker facilities, and wayfinding signage that are best addressed in the Regional Transportation Plan. The RCMP performance measure will focus on the bikeway network's completion.

The San Joaquin County RCMP Bikeways Network is shown in **Figure 2.0-3**. This includes both the existing and planned future networks.

## 2.4 RCMP TRANSIT NETWORK

San Joaquin County is diverse with respect to types of transit service offered and land use types. While Stockton is the most urbanized area in the county, many areas of Stockton and other cities in the county are predominantly suburban, and much of the unincorporated areas of the county are rural. As such, transit providers must tailor their services to balance the diverse needs of residents while managing funding constraints. San Joaquin County is served by several local and regional bus transit providers including:

- San Joaquin Regional Transit District provides fast and frequent service with Bus Rapid Transit (BRT) Express within the Stockton Area, Metro Hopper which is a deviated fixed-route service serving popular destinations in Stockton city, Commuter line which connects San Joaquin to Sacramento and Dublin BART, local fixed-route service within the Stockton Metropolitan Area (SMA) connecting RTD's Express, Hopper, and Commuter services. On demand rideshare services, Van Go! and Dial-A-Ride, are also available to provide safe, convenient, and flexible travel experience for regular passengers and those who qualify under the Americans with Disabilities Act (ADA).
- Lodi Grapeline provides local bus service for Lodi;
- TRACER provides local bus services for Tracy;
- Manteca Transit provides local bus service for Manteca;
- eTrans provides service between Escalon and Modesto's Vintage Faire Mall;
- Ripon Blossom Express Transit Services provides local bus service for Ripon and service to Modesto;
- Modesto Area Express provides commuter connections between Modesto and the Lathrop-Manteca ACE train station; and,
- South County Transit provides a connection between Lodi, Galt, and Sacramento.

Rail services in San Joaquin County are provided by the Altamont Corridor Express (ACE) commuter rail service and the Amtrak San Joaquin passenger rail service. ACE service has stations in Stockton, Tracy, and Lathrop, and extends to Santa Clara County via Alameda County. The Amtrak San Joaquin provides intercity rail services from Oakland and Sacramento to Bakersfield via San Joaquin County, with two stations in Stockton and one in Lodi, and bus connections to the Lathrop-Manteca ACE Station and Tracy.



### 3.0 PERFORMANCE MEASUREMENT

A performance measure is “an analytical planning tool that is used to quantitatively evaluate transportation improvements and to assist in determining effective implementation actions, considering all modes and strategies.” Performance measures provide the basis for evaluating the operating conditions of the regional transportation system, identifying the location and severity of congestion, identifying gaps in transit service, indicating insufficient pedestrian or bicycle access, or indicating unsafe facilities or areas.

Establishment of multimodal performance measures is a federal CMP requirement. Federal directives outlined in 23 CRR 450.320 (b) require the CMP to result in multimodal system performance measures and strategies that can be reflected in the regional planning documents, such as the Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP). As such, SJCOG’s RCMP must include a performance element that includes performance measures to evaluate current and future multimodal system performance for the movement of people and goods. The performance measures should incorporate highway and roadway system performance, measures established for the frequency and routing of public transit, and the coordination of transit service provided by separate operators. These performance measures shall support mobility, air quality, land use, and economic objectives, and shall be used in the development of the capital improvement program.

The Infrastructure Investment and Jobs Act (IIJA) continues the performance- and outcome-based program, known as “Performance Based Planning,” that was initiated with the Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21) Act with the objective to invest in projects that will make progress toward national goals for the transportation. Passage of the federal performance management rule required state departments of transportation (DOTs) and metropolitan planning organizations (MPOs) to implement the federal performance measures by 2018. State DOTs (e.g., Caltrans) are directly responsible for submitting performance targets and annual progress reports on those targets to federal agencies. MPOs, such as SJCOG, are required to establish targets specific to their planning area, or support the statewide targets, and report annually on progress. SJCOG accepted the statewide targets and per agreement with Caltrans, SJCOG began this reporting in 2019.

To complete the required reporting tasks more efficiently for the federal CMP and the federal performance management rule, SJCOG has integrated many of the federal performance measures as RCMP performance measures. The identified RCMP performance measures, shown in **Table 3.0-1**, will be monitored using analysis tools and software developed to streamline quantification and tracking. As RCMP program implementation continues, refinement of these measures and/or additional performance measures can be established as part of future updates.

**Table 3.0-1: RCMP Performance Measure** (Source: SJCOG RCMP Report, 2021)

Category of Objectives	Source	Measure of Effectiveness	Performance Measure	Data Sources	Addressed in this cycle
Operational Efficiency	RCMP	Congestion (congested speeds)	Percent of miles (on IHS and non-IHS NHS and RCMP network) that are congested (when congested speed is less than 60% of free flow speed).	FHWA: NPMRDS	Yes
Operational Efficiency	PM3	Travel Time Reliability (TTR) Index (80% and 95% travel time) (All vehicles)	Percent of Person-miles of travel (on IHS and non-IHS NHS) that are reliable (TTR)	FHWA: NPMRDS Caltrans: AADT Vehicle Occupancy (Surveys, CHTS)	Yes
Operational Efficiency	RCMP	Travel Time Reliability (TTR) Index (80% and 95% travel time) (All vehicles)	Percent of miles (on IHS and non-IHS NHS) that are reliable (TTR)	FHWA: NPMRDS	Yes
Operational Efficiency	RCMP	Congestion & TTR (95% travel time)	“Facility Specific” that are congested and/or unreliable. Provides basis for identifying RCMP deficient corridors.	FHWA: NPMRDS	Yes
Goods Movement & Operational Efficiency	RCMP	STAA Intersections	Track STAA-compliant intersections listed as part of Interregional Truck Operations on I-5 and SR-99 and STAA Routes Study	SJCOG RCMP	Yes
Goods Movement & Operational Efficiency	PM3	Truck Travel Time Reliability Index (80% and 95% travel time)	Percentage of IHS mileage that are reliable (TTTR)	FHWA: NPMRDS	Yes
Goods Movement & Operational Efficiency	RCMP	Truck Congestion & TTR (95% travel time)	“Facility Specific” that are congested (congested speed less than 60% of free flow truck speed) and/or unreliable. Provides basis for identifying RCMP deficient corridors.	FHWA: NPMRDS	Yes
Transit System	RCMP	Transit Coverage	Population & employment within ½-mile walking distance of a transit stop	Transit Agencies: transit data U.S. Census: population data VMIP2 Land Use Data: household and employment data	Yes
Transit System	RCMP	Transit Frequency	Level of service for service frequency of transit vehicles per hour (Transit Capacity and Quality of Service Manual)	Transit Agencies: transit line information	Yes
Regional Bikeway Network	RCMP	Percent Completed of Regional Bikeway Network	Ratio of completed to total Regional Bikeway Network miles, listed by jurisdiction.	SJCOG: bike network completion	Yes

Category of Objectives	Source	Measure of Effectiveness	Performance Measure	Data Sources	Addressed in this cycle
Complete Streets	RCMP	RCMP Multimodal Corridor Quality of Service (transit, bike, pedestrian)	Multimodal quality of service for existing conditions on designated corridors (transit, bike, pedestrian).	HCM 6 <sup>th</sup> Edition – Quality of Service SJCOG: Infrastructure Improvements, transit service schedules, traffic counts	Yes
Travel Demand Management	RCMP	Commuter VMT Reduction	Track San Joaquin County employer and employee participation rates for commute to work mode.	SJCOG - Dibs	Yes
Travel Demand Management	RCMP	VMT Per Capita	Land Use Efficiency	VMT: HPMS Population: Department of Finance	Yes
Safety	PM1	Fatal Collisions & Rates	Number of fatalities Fatalities per 100 million VMT	Collision/incident data: FARS/SWITRS VMT data: HPMS, SJCOG, local counts	Yes
Safety	PM1	Serious Injury Collisions & Rates	Number of serious injuries Serious injuries per 100 million VMT	Collision/incident data: TIMS/SWITRS VMT data: HPMS, SJCOG, local counts	Yes
Safety	PM1	Number of Collisions	Number of non-motorized fatalities and non-motorized serious injuries	Collision/incident data: SWITRS	Yes
System Management	PM2	PCI / PSI / IRI / Qualitative	PM2 Percentage of pavements of the Interstate System in Good Condition & Poor Condition	Local Agency Pavement Management Systems or Caltrans (for State Highways)	No
System Management	PM2	PCI / PSI / IRI / Qualitative	Percentage of pavements of the non-Interstate NHS in Good Condition & Poor Condition	Local Agency Pavement Management Systems or Caltrans (for State Highways)	No
System Management	PM2	PCI / PSI / IRI / Qualitative	Percentage of NHS bridges classified as in Good Condition & Poor Condition	Local Agency Pavement Management Systems or Caltrans (for State Highways)	No

### 3.1 OPERATIONAL EFFICIENCY (TRAVEL AND FREIGHT)

Operational efficiency refers to the level of efficiency by which individual passenger cars and trucks are transported in the system. Operational efficiency plays a critical role in maintaining a safe, robust, and effective transportation system. This further affects the quality of life, sustainability, accessibility, and livability of society.

From a traffic operations perspective, operational efficiency management is concerned with congestion mitigation, traffic flow improvement, and capacity of the transportation system. According to the Federal Highway Administration, congestion and reliability are two interrelated performance measures to monitor the level of efficiency on the roads. System Performance Management regulations requires DOTs and MPOs to monitor and report these two performance measures to the FHWA at the level of National Highway System (NHS) network to evaluate the progress toward achieving established targets determined at each state's Metropolitan Transportation Plan.

Traffic congestion is one of the largest threats to America's economy and quality of life which costs about \$200 billion a year. Congestion is a major problem in metropolitan areas in general, and for commuters, whilst it is extending beyond the urban boundaries in location and the rush hours in time. Congestion harms efficiency in freight delivery by an increase in the driver payment, decrease in fuel efficiency, and increase the vehicle maintenance cost as consequences of stop-and-go driving in congestion. This along with environmental pollution and diminished accessibility lead to social costs in the community (FHWA).

Travel time reliability refers to the extent of unexpected delay caused by daily congestion and measures the robustness or dependability of travel times. Travel time reliability is critical to all mode users as it significantly affects their travel plan, particularly during rush hours (FHWA).

In this section, we extracted travel time and speed data to measure the operational efficiency of passenger vehicles and heavy-duty trucks on the NHS RCMP network. The rest of this section presents the details for data collection, describes the congestion and reliability measurement methods, and illustrates the results.

#### **Data collection**

National Performance Management Research Data Set (NPMRDS) is an online database containing field - observed travel time and speed data collected from a fleet of passenger cars and trucks equipped with mobile devices. The data is aggregated in 5-minute, 10-minute and 15-minute intervals per traffic message channel (TMC) location on National Highway System (NHS). Each TMC is a directional roadway segment featuring a length range from 0.5 mile to 10 mile depending on the context (e.g., rural, suburban, urban, etc.).

The analysis used peak hour<sup>2</sup> travel time, and speed data for passenger cars and heavy-duty trucks from NPMRDS for the RCMP network for a typical weekday. The heavy-duty truck data was only available on the interstate system. The data period covered November 2021 to November 2022 (i.e., post-pandemic conditions). Each data record includes items per segment such as speed<sup>3</sup>, reference speed<sup>4</sup>, and travel time<sup>5</sup>. In addition, each TMC segment is identified by associated metadata describing its geographic location, traffic

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<sup>2</sup> AM Peak is from 6:00 to 10:00 and PM Peak is from 16:00 to 20:00

<sup>3</sup> Harmonic average speed for all reporting vehicles on the segment

<sup>4</sup> An approximation of free-flow speed for the segment

<sup>5</sup> Ratio between the segment length and the harmonic average speed for all reporting vehicles on the segment

volume, centerline miles, and facility type.

**Methodology**

*Congestion*

Following federal highway recommendations, congested TMC segments are identified as those with a peak-hour average speed of less than 60 percent of free-flow speed on the same segment. The results are displayed as percent of congested centerline miles on IHS and non-IHS National Highway System (NHS) RCMP network.

*Reliability*

For a given TMC, the passenger car travel time reliability is calculated using a cumulative distribution of travel time observations for one year on weekdays and weekends. On weekdays and weekends, the following periods (6:00 to 10:00; 10:00 to 16:00; 16:00 to 20:00) are used to generate travel time observation. Then the level of travel time reliability (LOTTR) is calculated for each period (Equation 1):

$$\text{TMC LOTTR (passenger car)} = \frac{80^{\text{th}} \text{ percentile travel time}_i}{50^{\text{th}} \text{ percentile travel time}_i} \quad (1)$$

where *i* is the TMC segment. Then the maximum LOTTR of all periods is used to determine if the TMC is reliable or unreliable. According to NPMRDS, if the LOTTR exceeds the threshold of 1.5, it is deemed unreliable; TMC is moderately reliable if LOTTR is between 1.25 and 1.5; and it is reliable if LOTTR is less than 1.25.

For the heavy-duty trucks, a similar approach to what is described above is followed except that 80th percentile travel time is replaced by 95th nominator (see Equation 2)

$$\text{TMC LOTTR (heavy – duty truck)} = \frac{95^{\text{th}} \text{ percentile travel time}_i}{50^{\text{th}} \text{ percentile travel time}_i} \quad (2)$$

**Results**

In this section, the congestion and reliability results are presented as percent of congested centerline miles on IHS and non-IHS National Highway System (NHS) RCMP network in 2022.

Table 3.0-2 lists the percentages of congested miles on IHS and non-IHS NHS segments in the county. More than 98% of IHS and NHS segments were not congested during the AM peak hour. Conversely, more than 32% of non-IHS and NHS segments were congested during the same period. This percentage was about 2% higher during the PM peak hours.

**Table 3.0-2 Percent of congested miles on RCMP network – All vehicles**

Facility	Percent of Congested Centerline Miles	
	AM	PM
IHS	1.53%	0.13%
Non-IHS National Highway System (NHS)	32.94%	34.32%

**Table 3.0-3** and Table 3.0-4 provide percentages of miles on NHS segments that were reliable. Based on the 80<sup>th</sup> percentile travel time for passenger cars, more than 91% of HIS and NHS miles were reliable during both AM peak hours. The percentages of reliable segments for non-HIS were lower, standing at about 80% for both AM and PM. In the same year, more than 89% and 78% of truck mileage were reliable on the IHS

network during AM and PM. NPMRDS only provides the 95th percentile travel time truck reliability data inputs on interstates, so it was not possible to conduct the same analysis on the non-interstate network.

**Table 3.0-3 Percent of reliable miles on RCMP network – All vehicles**

Facility	Percent of Congested Centerline Miles (80th percentile travel time)	
	<i>AM</i>	<i>PM</i>
IHS	96.21%	91.89%
Non-IHS National Highway System (NHS)	80.91%	81.09%

**Table 3.0-4 Percent of reliable miles on RCMP network – Trucks**

Facility	Percent of Congested Centerline Miles (95th percentile travel time)	
	<i>AM</i>	<i>PM</i>
IHS	89.18%	78.92%

**Figure 3.0-1** through **3.0-4** provide the detailed segment-based congestion and reliability results combined for the RCMP network during AM or PM peak hour.

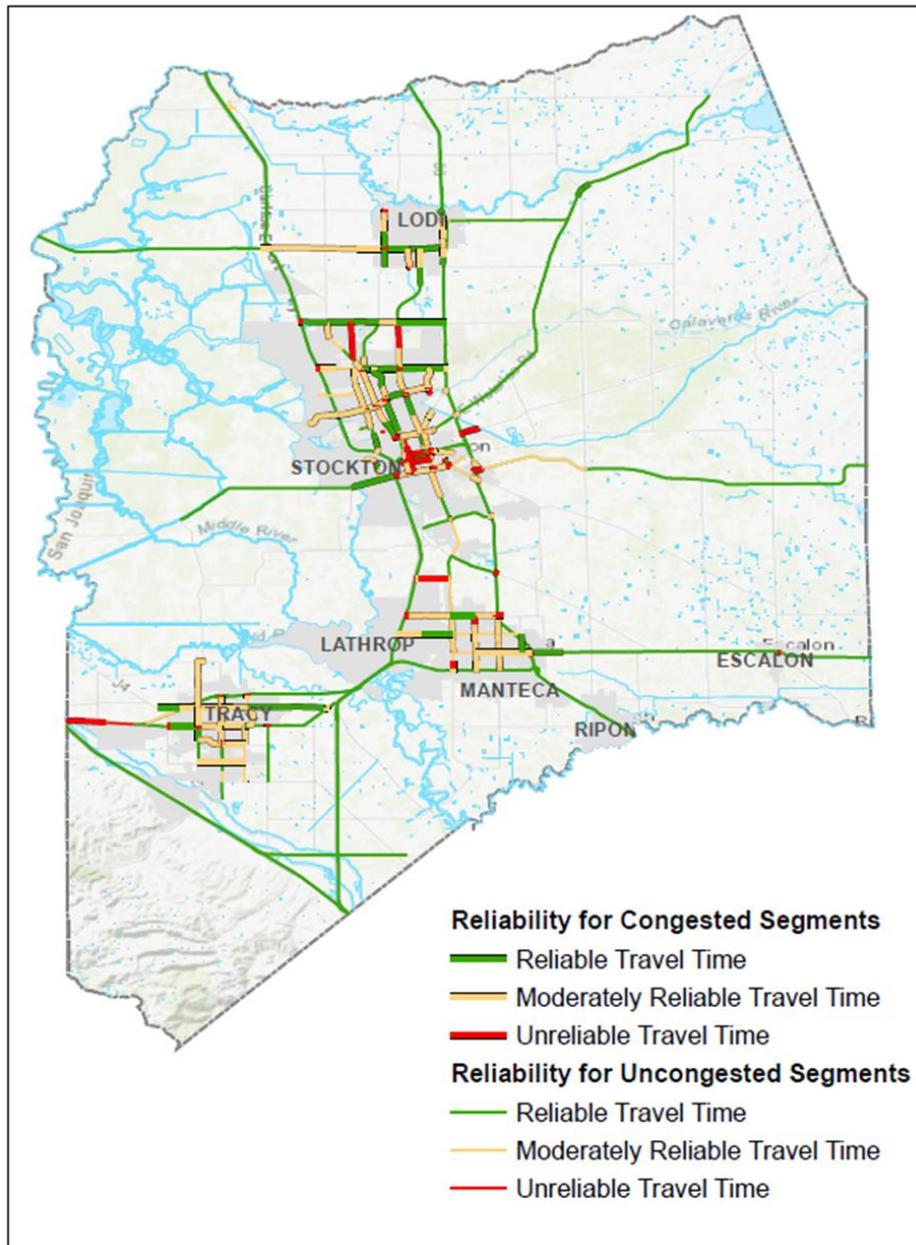


Figure 3.0-1 : Congestion/Reliability Map – All Vehicles, AM Peak Hour

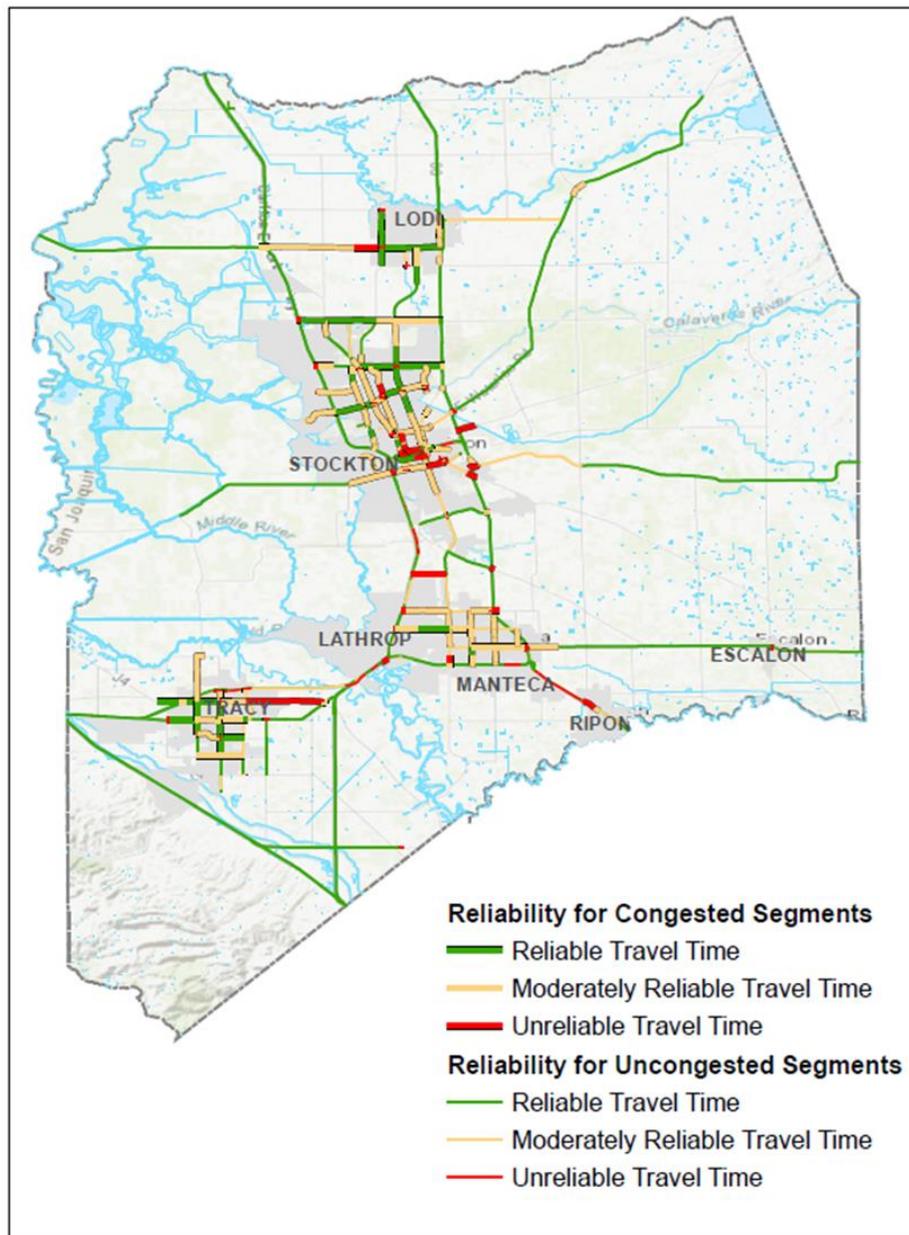


Figure 3.0-2 Congestion/Reliability Map – All Vehicles, PM Peak Hour

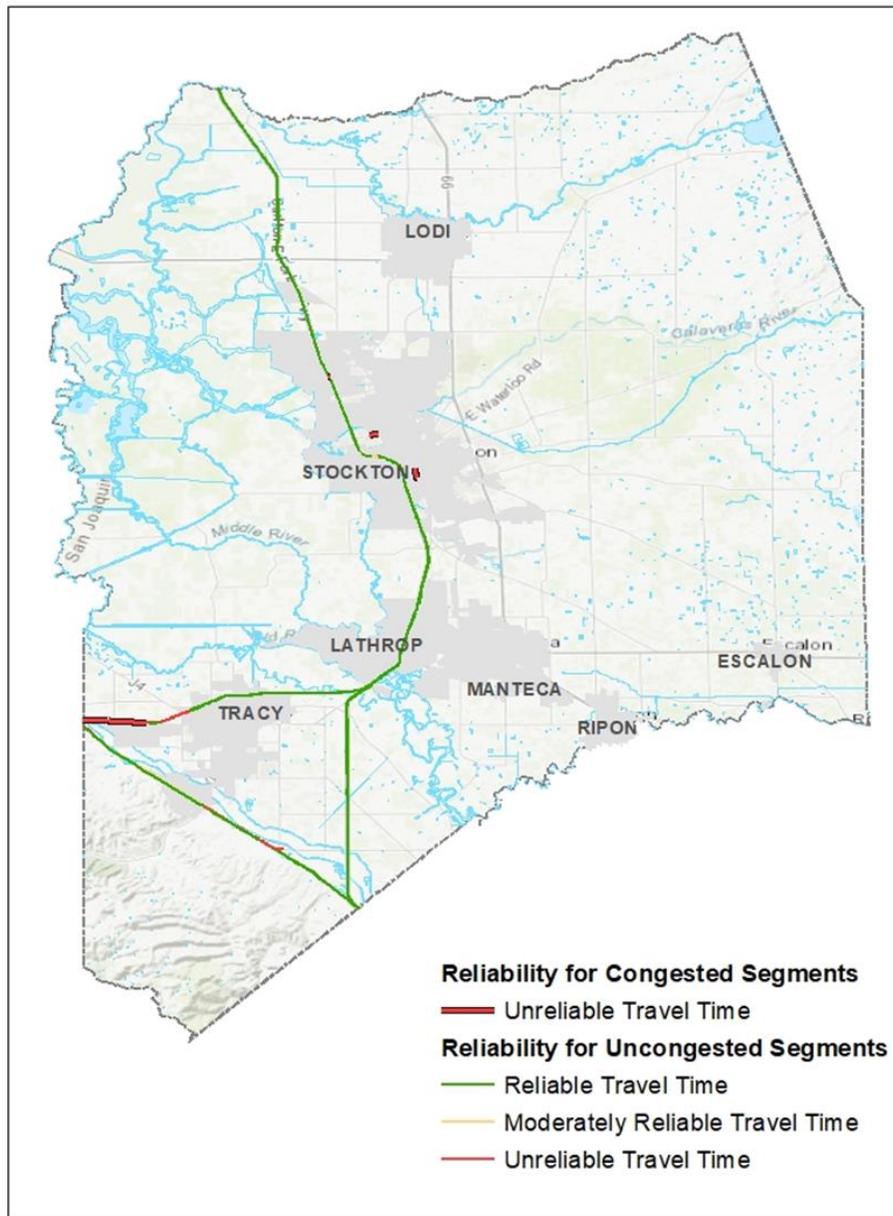


Figure 3.0-3 Congestion/Reliability Map – Trucks, AM Peak Hour

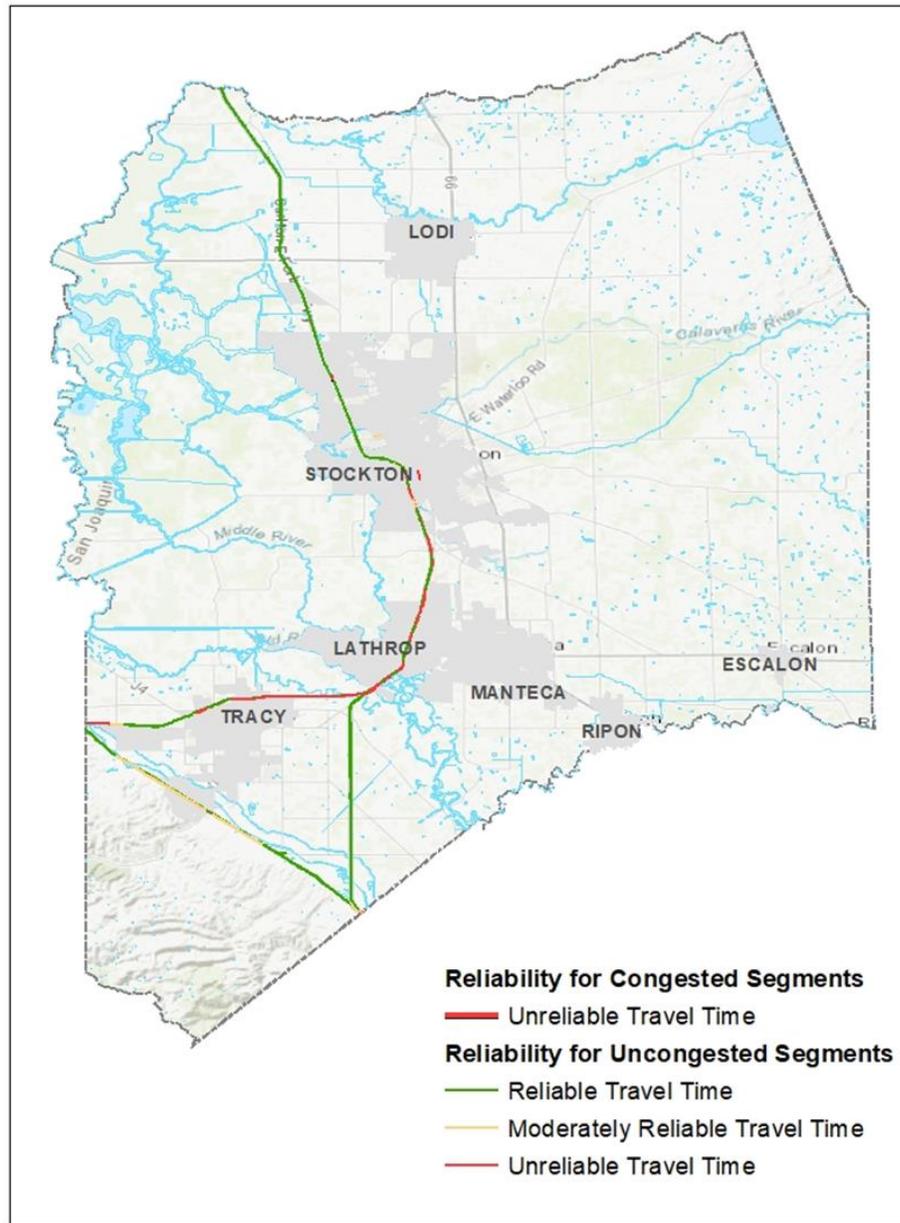


Figure 3.0-4 Congestion/Reliability Map – Trucks, PM Peak Hour

The congestion and reliability results were further used to identify deficient corridors on the RCMP network. For this purpose, two criteria are considered to identify the deficient road segments:

1. Segments with congestion during the AM or PM peak period for either passenger car traffic or heavy-duty trucks
2. Segments with congestion and unreliable travel time during the AM or PM peak period for either passenger car traffic or heavy-duty trucks

**Figure 3.0-5** shows the deficient road segments according to criteria 1 and criteria 2.

Furthermore, deficient road segments more than 3 miles in length were identified as deficient corridors (see **Figure 3.0-6**). Based on these, 14 potentially deficient corridors are identified and listed below:

1. Kettleman Lane (SR 12): I-5 to SR 99
2. Eight Mile Road: I-5 to SR 99
3. West Lane and Airport Way: Eight Mile Road to Ralph Avenue
4. Hammer Lane: I-5 to SR 99
5. March Lane: I-5 to Fred Russo Drive
6. Pershing Avenue: Hammer Lane to I-5
7. Lathrop Road: I-5 to SR 99
8. Louise Avenue: I-5 to Union Road
9. Airport Way: Lathrop Road to SR 120
10. Union Road: Lathrop Road to SR 120
11. Yosemite Avenue: Airport Way to SR 99
12. Tracy Boulevard: I-205 to Valpico Road
13. Grant Line Road: Byron Road to I-205
14. I-205: East of Hansen Road to I-580

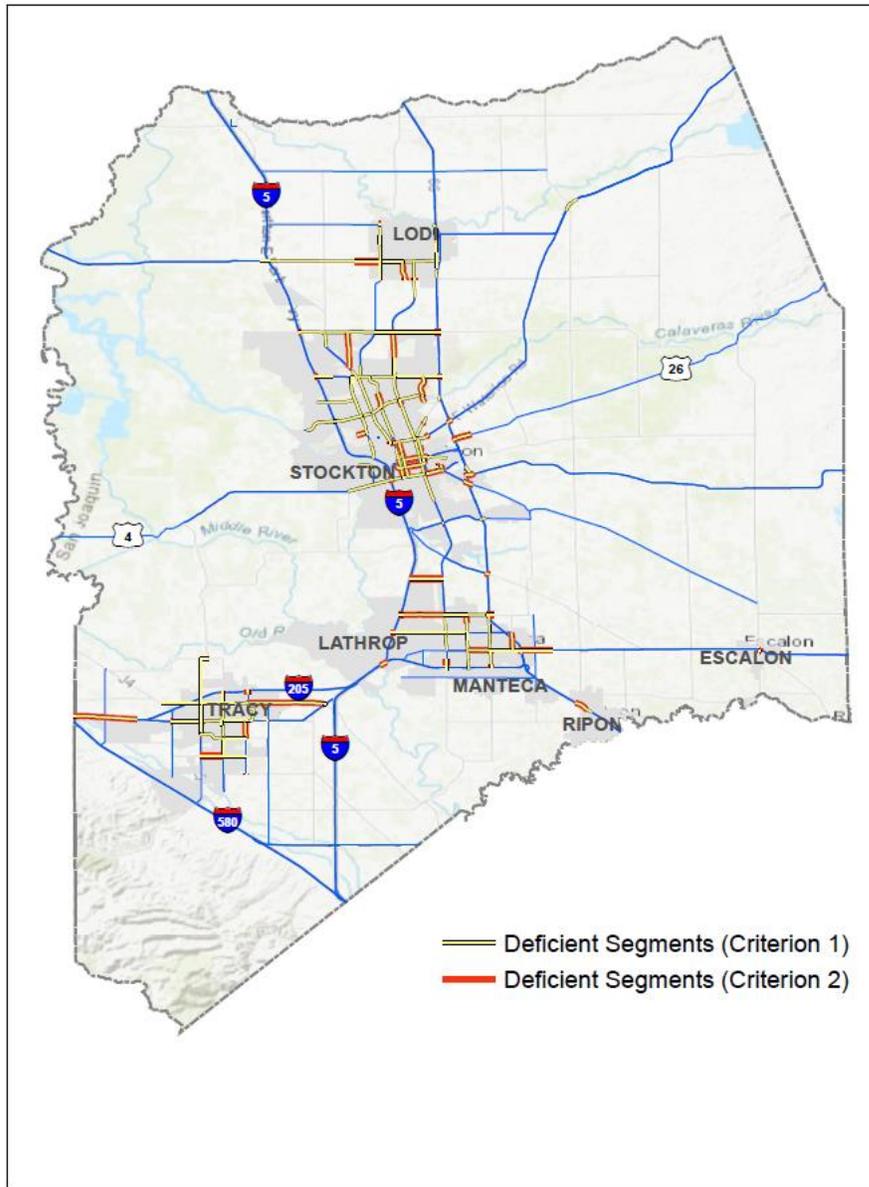


Figure 3.0-5 Deficient Road Segments

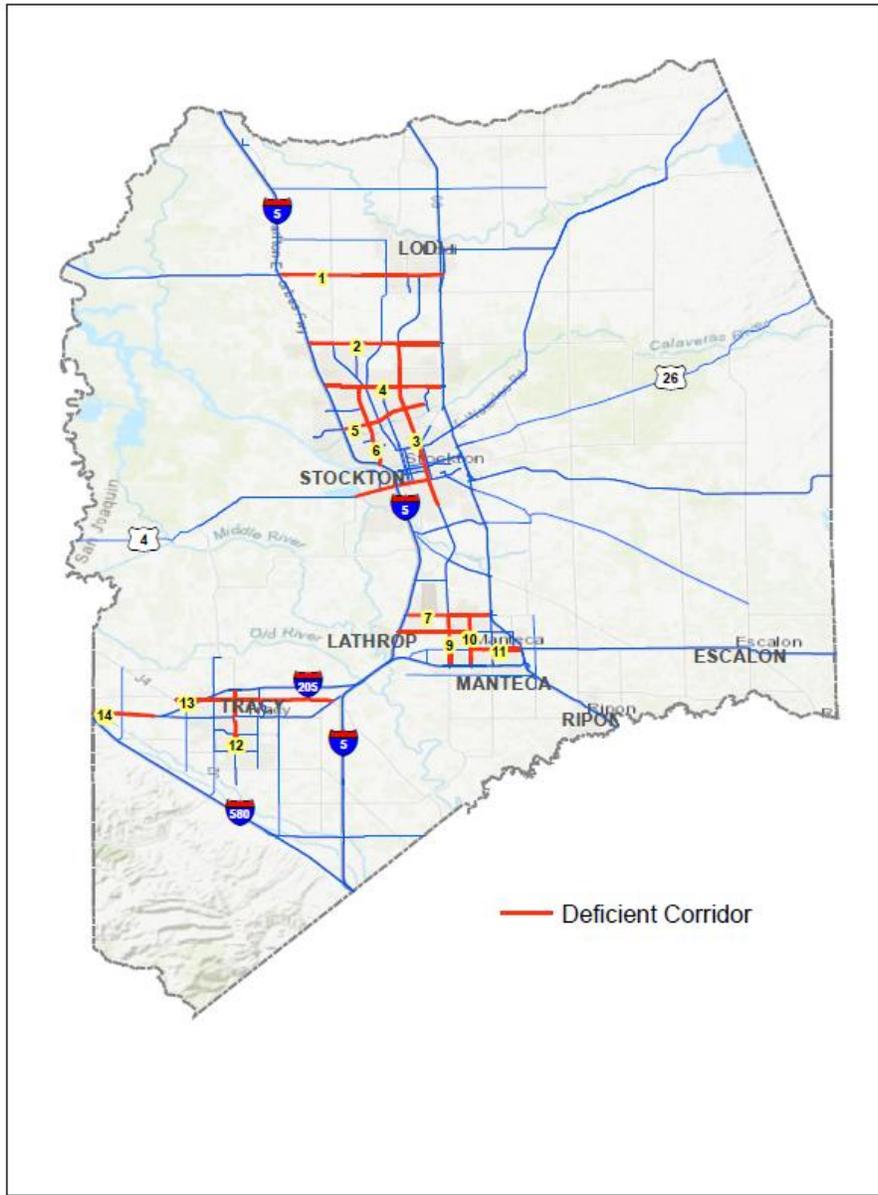


Figure 3.0-6 Deficient Corridors

### 3.2 TRANSIT SYSTEM

The RCMP considers two performance measures to evaluate transit: 1) service coverage and 2) service frequency. The former uses half mile distance from the bus stops to define coverage for the transit service countywide. While this coverage was identified drawing linear buffers around bus stops in previous monitoring reports, this report uses network distance service areas to better account for actual bus service accessibility. The level of service is based on the number of transit service trips (considering all existing transit lines) per hour at each stop during peak hours in a day. The goal of evaluating peak period transit frequency is to determine the likelihood that commuter travelers would use transit regularly. The peak period transit quality of service assessment may be best described using the thresholds for urban scheduled transit service, as shown in **Table 3.0-5**.

**Table 3.0-5: Transit Frequency Quality of Service Thresholds** (Source: FDOT Quality/Level of Service Handbook, 2013)

Level of Service	Adjusted service frequency (vehicles/hour)	Headway (minutes)
A	> 6	< 10
B	> 4	< 15
C	≥ 3	≤ 20
D	≥ 2	≤ 30
E	≥ 1	≤ 60
F	< 1	> 60

#### Data Collection

The most recent 2022 transit data and service schedules from SJCOG, San Joaquin Regional Transit District, Altamont Corridor Express, and City operators were used. The 2021 population and 2019 job data were collected from census.

#### Results

The numbers of population in each jurisdiction at transit frequency level are shown in **Table 3.0-6** and **Table 3.0-7**, respectively. Currently, 61% of San Joaquin County jobs are located within a half-mile walking distance to a transit stop with QoS F or better. Only 6% of population are located close to transit stops with peak period service frequency quality of service C or better (20 minute or less headways), but 66% more of the residential population are close to transit stops with peak period service frequency quality of service E (60 minute or less headways).

**Table 3.0-6 Population Proximity to Transit**

	Rating	QoS F or better		QoS E or better		QoS D or better		QoS C or better		QoS B or better		QoS A or better	
	Total	Served	%	Served	%	Served	%	Served	%	Served	%	Served	%
<b>SJ County</b>	771,406	759,989	99%	511,659	66%	117,755	15%	48,337	6%	32,602	4%	12,803	2%
Escalon	4,196	2,921	70%	-	0%	-	0%	-	0%	-	0%	-	0%
Lathrop	24,763	5,298	21%	5,298	21%	-	0%	-	0%	-	0%	-	0%
Lodi	62,236	57,863	93%	57,841	93%	28,725	46%	-	0%	-	0%	-	0%
Manteca	74,507	55,464	74%	55,416	74%	-	0%	-	0%	-	0%	-	0%
Ripon	11,917	7,307	61%	6,497	55%	-	0%	-	0%	-	0%	-	0%
Stockton	310,353	276,204	89%	230,579	74%	48,368	16%	40,586	13%	27,984	9%	8,185	3%
Tracy	87,815	78,712	90%	68,753	78%	28,558	33%	-	0%	-	0%	-	0%
Unincorporated	195,620	7,795	4%	10,580	5%	5,166	3%	4,618	2%	4,618	2%	4,618	2%

The Regional Transit District (RTD) primarily serves Stockton and San Joaquin County, with additional stops in most of the other cities in San Joaquin County and at transit and job centers outside of San Joaquin County. Due to changing ridership patterns, RTD added one service route in Stockton and removed five commuter routes that travel outside of San Joaquin County. In addition, one route reduced its frequency from 10 to approximately 15 minutes during the AM peak commute period. Most importantly, RTD partnered with ride sharing services to connect bus riders to transit centers within San Joaquin County at half the ride sharing fare.

**Table 3.0-7 Employment Proximity to Transit**

	Rating	QoS F or better		QoS E or better		QoS D or better		QoS C or better		QoS B or better		QoS A or better	
	Total	Served	%	Served	%	Served	%	Served	%	Served	%	Served	%
<b>SJ County</b>	249,722	151,419	61%	139,304	56%	53,506	21%	13,707	5%	8,540	3%	1,239	0%
Escalon	2,107	1,918	91%	-	0%	-	0%	-	0%	-	0%	-	0%
Lathrop	10,358	2,203	21%	2,203	21%	-	0%	-	0%	-	0%	-	0%
Lodi	24,239	20,608	85%	20,608	85%	9,559	39%	-	0%	-	0%	-	0%
Manteca	18,604	11,065	59%	11,065	59%	-	0%	-	0%	-	0%	-	0%
Ripon	4,399	3,158	72%	2,853	65%	-	0%	-	0%	-	0%	-	0%
Stockton	105,869	80,533	76%	73,213	69%	27,452	26%	11,364	11%	6,808	6%	523	0%
Tracy	35,644	21,515	60%	20,522	58%	13,536	38%	-	0%	-	0%	-	0%
Unincorporated	48,502	10,419	21%	8,840	18%	2,959	6%	2,343	5%	1,732	4%	716	1%

### 3.3 BIKEWAY SYSTEM

San Joaquin county has provided the most up to date existing bikeway maps for cities of Tracy, Lathrop, Ripon, Stockton, Manteca, Lodi, and Escalon in the county. The bikeways are categorized into four types: class I, class II, class III and class IV. The total existing mileage for each class of bicycle lanes and the city is provided per existing and planned scenarios in **Table 3.0-8**. The San Joaquin County existing and planned bikeways network are shown in **Figure 2.0-3**.

As of the last update to the SJCOG bikeway inventory, 378.5 miles of the envisioned 1,153 miles or 33% had been constructed. This includes 126 miles of Class I bicycle paths, 152 miles of Class II bicycle lanes, and 63 miles envisioned miles of Class III shared bicycle routes.

**Table 3.0-8 Bicycle Network Mileage Summary (Existing and Planned)**

City	Lane Type	Mileage (Existing)	Total	Mileage (Planned)	
Tracy	Class 1	22.37	72.52	14.97	25.40
	Class 2	31.06		7.68	
	Class 3	16.62		2.74	
	Other	2.47			
Lathrop	Class 1	20.75	32.08	28.41	71.51
	Class 2	10.11		40.97	
	Class 3	0		2.13	
	Other	1.22			
Manteca	Class 1	12.12	61.2	13.68	50.16
	Class 2	30.04		31.57	
	Class 3	18.53		4.91	
	Other	0.51			
Lodi	Class 1	0.1	30.31	9.39	51.19
	Class 2	24.89		25.08	
	Class 3	3.69		16.71	
	Other	1.63			
Ripon	Class 1	9.15	44.72	28.98	48.38
	Class 2	5.88		17.25	
	Class 3	6.87		2.15	
	Other	22.82			
Escalon	Class 1	0.38	5.74	3.09	14.62
	Class 2	3.98		5.38	
	Class 3	1.04		6.16	
	Other	0.34			
Stockton	Class 1	36.56	90.21	74.93	252.26
	Class 2	45.39		66.20	
	Class 3	0		111.14	
	Other	8.26			
Unincorporated	Class 1	24.3	41.73	2.62	260.64
	Class 2	1		6.65	
	Class 3	16.43		251.38	
	Other	0			
Total	Class 1	125.73	378.51	176.07	774.17
	Class 2	152.35		200.79	
	Class 3	63.18		397.31	
	Other	37.25			

### 3.4 MULTIMODAL CORRIDORS

There are 13 designated RCMP Multimodal Corridors in San Joaquin County. Future updates should be performed if traffic volumes significantly change, major transit scheduling changes occur, or major roadway treatments and improvements are implemented. Although none of these conditions have occurred by 2022 relative to the 2016 monitoring cycle, a new analysis CSQOS is conducted for this monitoring report, given the eight years gap. **Table 3.0-10** summarizes the peak hour analysis results respectively. Summing all CSQOS results over the 13 multimodal corridors indicates that in general pedestrian CSQOS is “C”; bicyclists CSQOS is “D” and transit CSQOS is “F”. It is noted that only transit stops, and routes located on the corridor were considered to measure the transit LOS in this version.

### 3.5 TRAVEL DEMAND MANAGEMENT

Travel demand management (TDM) strategies are those that provide alternatives to making trips in a single occupant vehicle, and therefore reduce the number of vehicle miles traveled on the roadway network. These can include strategies to group trips such as carpool/vanpooling, removing trips by encouraging telecommuting or reducing trip lengths by developing land uses that allow trips to be made by walking, bicycling, or shorter drives.

All of the counties in the San Joaquin Valley are designated as “severe” to “extreme” non-attainment for the federal health-based pollutants by the EPA and are therefore required to take extra steps to improve air quality, with employer-based travel demand management as a key strategy. San Joaquin Valley Air Pollution Control District (SJVAPD) Rule 9410 (eTrip) requires major employers (with 100 or more employees) in the region to develop and implement TDM strategies. These strategies can include employee shuttles, staggered work hours, telecommute options, transit subsidies, carpool/vanpool programs, and many other strategies.

SJCOG’s dibs Program offers information and several programs to support TDM in the county, as well as supporting Stanislaus and Merced counties. This inter-county collaboration is highly supportive of regional travel demand management. Programs include employer assistance in developing trip reduction plans, trip planning, emergency ride home, rideshare matching, vanpool formation/subsidies, and community events. It also provides information on benefits and tax credits, connections to other helpful resources, and educational links to traveler information services.

The ‘dibs’ program collect data on the usage of smart travel modes for work commuting through its website (dibsmway.com), which currently has 6,166 members originating in San Joaquin County as of 2021. The number of vanpools formed during the fiscal year 2021-22, with 164 new vanpools, and a total of 417 vanpools. San Joaquin experienced about a 30% increase of vanpool from prior year and has contributed to 31 million vehicle miles reduced, and 286,576 vehicles off the road. Many of the vanpools commuting destination are composed of employer locations which include Tesla and Defense Distribution Center.

The estimated annual reduction of vehicle miles traveled (VMT) from ‘dibs’ vanpools between 2018 and 2022 is provided in **Table 3.0-9**. The reduction of VMT from vanpools has remained strong over the last four years (for example, in 2021 carpool and vanpool usage increased by 22%).

Also shown is the estimated VMT reductions from trip logging from all smart travel modes during special events each year. The ‘dibs’ program coordinates annual events such as Rideshare Week and Bike Month to encourage commuters to utilize smart travel options such as carpool, vanpool, transit and biking or walking to work as well as telecommuting. During these events, trips are logged by participants in the dibs trip planning system that allows estimate of vehicle miles reduced to be calculated. This differs from the vanpool

data since vanpool information is based on actual activity from vanpools.

**Table 3.0-9: Estimated Annual Reduction of Vehicle Miles Traveled**

Year	# of Vans	VMT Reduction Vanpool	VMT Reduction Special Event
2018-19	123	6,654,250	450,980
2019-20	164	9,313,153	362,853
2020-21	321	17,270,150	292,576
2021-22	417	31,000,000	-

Annual VMT reduction based on actual annual vanpools data reported the National Transit Database (NTD)

Special Event VMT reduction based on trip logging for all smart travel modes (carpool, vanpool, transit, bike, walk, telecommute) from dibs trip planning system

Given the shift to vehicle miles of travel (VMT) under CEQA pursuant to Senate Bill 743, there has been greater interest to incorporate VMT into other local and regional transportation planning processes. VMT provides an indication of overall system utilization and is a direct indicator of land use efficiency and on-road mobile source emissions.

**Table 3.0-11** shows the 2020 VMT per capita for each jurisdiction in San Joaquin County. The VMT source is the Highway Performance Monitoring System (HPMS) program while estimates of population is from the California Department of Finance. Data used to retrieve VMT did not have a breakdown for VMT State Highway for each jurisdiction. VMT was estimated by first calculating the proportion of 2019 State Highway VMT for each jurisdiction to the total San Joaquin County State Highway VMT. This proportion was then applied to the total State Highway VMT for San Joaquin County in 2020, which resulted in an estimate for each jurisdiction’s State Highway VMT for 2020. This metric does not account for the portion of a trip’s VMT that occurs outside the county (metrics do not account for the full length of intercounty trips). As shown, all incorporated cities have VMT per capita ranging between 8-30 miles per person per day. This is due to many incorporated area vehicle trips being local in nature (due to greater land use efficiency). Unincorporated areas and the City of Lathrop have VMT per capita values of approximately 50 vehicle miles per person per day. Take as a whole, the county average VMT per capita is just about 22 miles per person per day. Comparing jurisdiction VMT among 2021 to 2019 there has been a slight decrease among the total VMT of a 1.63 difference. While comparing the total VMT of San Joaquin from 2021 to 2019 there was also a decrease of VMT of approximately 2,621. Overall, there has been a reduction in VMT from 2019 to 2020.

**Table 3.0-10: Complete Street Quality of Service Employment Peak Hour**

ID	Roadway	From	To	Jurisdiction	Pedestrian		Bike		Transit	
					Score	LOS	Score	LOS	Score	LOS
1	SR 88	Locke Road	N Sierra Drive	County	3.44	C	5.38	F	0	F
2	SR 120	McHenry Avenue- Escalon Bellota Road	David Drive	Escalon	3.06	C	3.77	D	0	F
3-1	Lathrop Road	Airport Way	Crestwood Avenue	Lathrop	4.79	E	4.9	E	0	F
3-2	Lathrop Road	Harlan Road	7th Street	Lathrop	2.81	C	3.9	D	0	F
4	SR 12	Lower Sac. Road.	Cherokee Lane	Lodi	2.14	B	1.61	A	0.78	F
5	Yosemite Avenue	Airport Way	Northwoods Avenue- Commerce Avenue	Manteca	3.49	C	3.53	D	0.79	F
6	W Ripon Road (Main Street)	Jack Tone Road	N Stockton Avenue	County/Ripon	2.07	B	2.45	D	0	F
7	March Lane	Da Vinci Drive-Quail Lakes Drive	West Lane	Stockton	4.02	D	4.59	E	2.1	D
8	Eight Mile Road	Thornton Road	Davis Road	County	5.91	F	5.55	F	0	F
9	Hammer Lane	Kelley Drive	Maranatha Drive	Stockton	2.42	B	3.59	D	2.2	D
10	Lower Sac. Road	Royal Oaks Drive	Hammer Lane	Stockton	4.02	D	4.59	E	2.1	D
11	West Lane - Airport Way	El Pinal Drive	Roosevelt Street	Stockton	3.02	C	3.82	D	1.77	E
12	Eleventh Street	Lammers Road	MacArthur Drive	Tracy	3.4	C	4.63	E	0.17	F

Note: Facilities with transit MMLOS results of "F" typically had no transit service or were served by one transit route with hourly headways.

**Table 3.0-11: 2020 Vehicle Miles Traveled (VMT) per Capita by Jurisdiction**

Jurisdiction 2020	Local Road VMT (1,000)	State Highway VMT	Total VMT	Population (1/1/2021)	Daily VMT Per Capita
Escalon	20.66	39.57	60.23	7,472	8.05
Lathrop	186.65	1,174.12	1,360.77	28,701	47.41
Lodi	383.55	468.80	852.35	67,020	12.71
Manteca	421.71	835.76	1257.47	85,799	14.65
Ripon	78.50	426.79	505.29	16,440	30.73
Stockton	1,827.73	2,262.08	4,089.81	322,107	12.69
Tracy	658.02	706.49	1,364.51	95,384	14.30
County (Unincorporated Area)	2,344.45	5,763.56	8,108.01	166,487	48.70
San Joaquin Total	5921.27	11,677.18	17,598.45	789,410	22.29

### 3.6 SAFETY

Transportation safety is a key step in transportation planning, seeking to reduce the fatalities and injuries on the roads. Vision Zero aims to ensure that safety is prioritized over other aspects of the transportation system, such as mobility, and to reduce roadway fatalities and serious injuries to zero. A data-driven safety processing approach helps identify safety issues and address them.

Safety Performance Management is a part of the Federal Highway Administration (FHWA) developed Transportation Performance Management (TPM) program to make informed investment and policy decisions. Toward this, Highway Safety Improvement Program (HSIP) needs to regularly assess the state of safety on the roads concerning federal performance measures:

- Number of fatalities (all roadways)
- Rate of fatalities (per 100m VMT) (all roadways)
- Number of serious Injuries (all roadways)
- Rate of serious Injuries (per 100m VMT) (all roadways)
- Number of non-motorized fatalities and serious injuries (all roadways)

Items 1 and 2 refer to crash frequency data analysis to measure the number of crashes per severity type for all users. Item 5 is similar to items 1 and 2 except that it is for the subset of crashes being involved with non-motorized modes (bicyclists and pedestrians). The rate of fatalities and serious injuries for crash type  $i$  is displayed by  $R_i$  per 100 million vehicle miles and is calculated using the equation below (Equation 3):

$$R_i = \frac{C_i \times 100,000,000}{VMT \times 365} \quad (3)$$

where  $C_i$  is the total number of fatalities or serious injuries for crashes of type  $i$ ; VMT refers to vehicle miles traveled.

#### Data collection

The Statewide Integrated Traffic Records System (SWITRS) contains all crash data collected and reported to California Highway Patrol (CHP) by local and governmental agencies. SWITRS data consists of detailed crash summaries by year, geography, and crash type. We collected 2020 and 2021 SWITRS crash data for the case study and reported the results by crash severity type and user groups in Tables below.

#### Results

In 2020, there were 120 fatalities and 566 serious injuries involving all users in traffic collisions that occurred on San Joaquin County roads of which 50 (68%) fatalities and 277 (61%) serious injuries occurred on the RCMP network. In 2021, the numbers increased in all cases except for the number of serious injuries that occurred on the RCMP network, which was 264, which decreased by 5% compared to 2020.

**Table 3.0-12 2020 Fatal and Serious Injury Collisions – All Users**

Facility	All Users (2020)			
	Fatal Crashes	Number of fatalities	Serious Injury Crashes	Number of serious injuries
SJ county	111	120	346	566
RCMP Network				
NHS	44	47	140	267
Non-NHS	3	3	6	10
Non-RCMP Network	64	70	200	289

**Table 3.0-13 2021 Fatal and Serious Injury Collisions – All Users**

Facility	All Users (2021)			
	Fatal Crashes	Number of fatalities	Serious Injury Crashes	Number of serious injuries
SJ county	121	136	375	607
RCMP Network				
NHS	49	57	138	251
Non-NHS	3	3	7	13
Non-RCMP Network	69	76	230	343

In 2020, non-motorized (e.g., pedestrians, bicyclists) fatalities and serious injuries accounted for 26% and 10% of total fatalities and serious injuries, respectively. In 2021, the share of non-motorized fatalities shrank to 19%, while the share of serious injuries status the same as in 2020.

**Table 3.0-14 2020 Fatal and Serious Injury Collisions – Non-motorized**

Facility	Non-motorized (2020)							
	Bicycle				Pedestrian			
	Fatal Crashes	Number of fatalities	Serious Injury Crashes	Number of serious injuries	Fatal Crashes	Number of fatalities	Serious Injury Crashes	Number of serious injuries
SJ county	8	8	16	16	22	23	36	42
RCMP Network								
NHS	2	2	7	7	12	13	14	18
Non-NHS	0	0	1	1	0	0	0	0
Non-RCMP Network	6	6	8	8	10	10	22	24

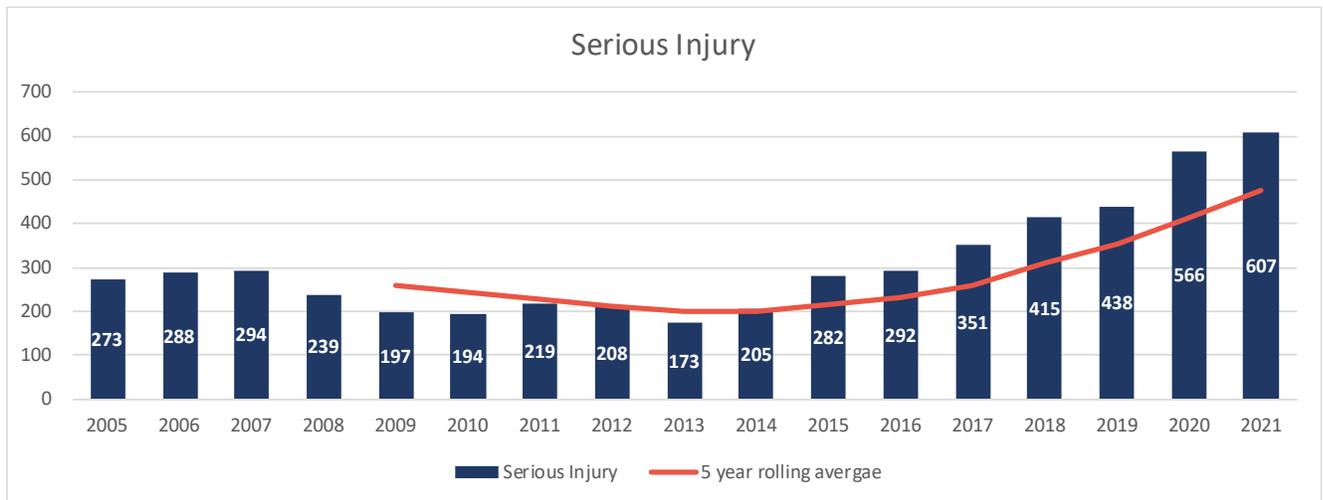
**Table 3.0-15 2021 Fatal and Serious Injury Collisions – Non-motorized**

Facility	Non-motorized (2021)							
	Bicycle				Pedestrian			
	Fatal Crashes	Number of fatalities	Serious Injury Crashes	Number of serious injuries	Fatal Crashes	Number of fatalities	Serious Injury Crashes	Number of serious injuries
SJ county	3	3	18	19	23	23	37	43
RCMP Network								
NHS	2	2	4	4	12	12	11	13
Non-NHS	0	0	0	0	0	0	1	1
Non-RCMP Network	1	1	14	15	11	11	25	29

As shown in Figure 3.0-7, the number of fatalities steadily decreased from 2005 to 2009 but has been trending upward since 2012. The five-year rolling average peaked at 120 fatalities in 2016 and has held relatively stable till 2021 when fatalities grow by 13%. Figure 3.0-8 shows the serious injury trend from 2005 to 2019, which is similar to the fatality trend except that the number of serious injuries increased to a larger extent relative to fatalities. The five-year rolling average peaked at 607 serious injuries in 2021 and has been trending upward since 2013.

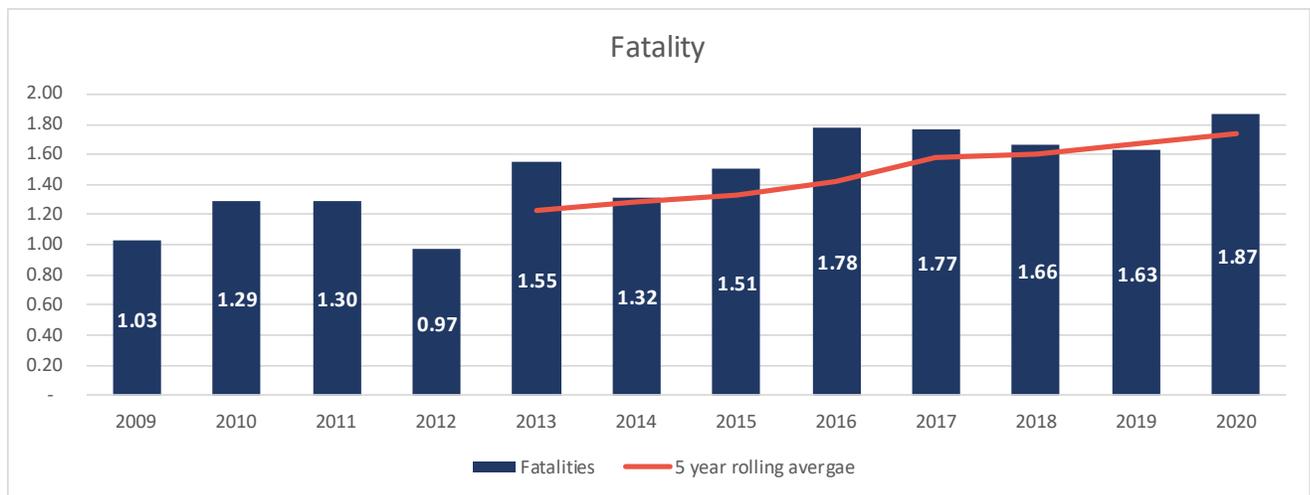


**Figure 3.0-7 Fatality Trend on San Joaquin County Roads (2005-2021)**



**Figure 3.0-8 Serious Injury Trend on San Joaquin County Roads (2005-2021)**

**Figure 3.0-9** and **Figure 3.0-10** show the fatal and injury collision rates (per 100 million VMT) based on the same five-year rolling average. These metrics indicate that similar to the absolute numbers, the rates of fatalities and serious injuries per year have increased. This is significant since the annual average daily vehicle miles of travel is decreased by 13% from 2019 to 2020. We were unable to generate similar rates for 2021 since the daily vehicle miles of travel is not yet available for this year from Caltrans Highway Performance Monitoring System (HPMS).

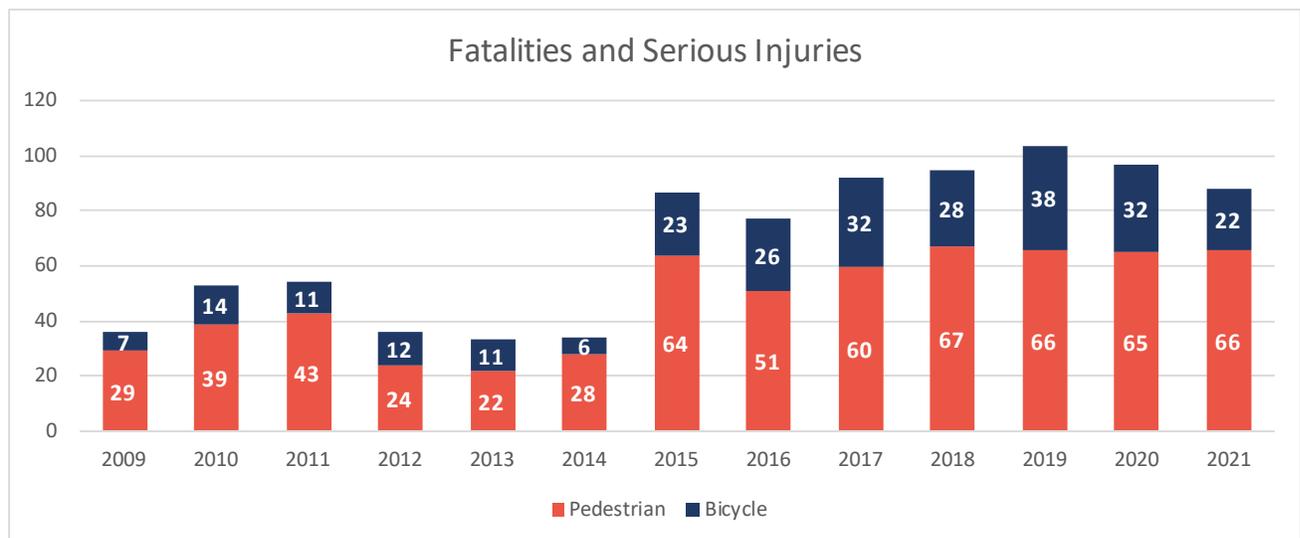


**Figure 3.0-9 Fatal Collision Rate (Fatalities per 100M VMT) on San Joaquin County Roads (2009-2020)**



**Figure 3.0-10 Serious Injury Rate (Injuries per 100M VMT) on San Joaquin County Roads (2009-2020)**

**Figure 3.0-11** shows the absolute number of fatalities and serious injury involving pedestrians and bicyclists between 2009 and 2021. Bicycle fatality and serious injuries peaked in 2019 at 38, while the number of fatalities and serious injury involving pedestrians stay stable till 2021.



**Figure 3.0-11 Pedestrian and Bicycle Fatalities and Serious Injuries on San Joaquin County Roads (2009-2021)**

The segment-based fatality rates were mapped in **Figure 3.0-12** and **Figure 3.0-13** serious injury rates in **Figure 3.0-14** and **Figure 3.0-15** for 2020 and 2021. The high-fatality segments (roadways with fatality rates of 10 or more fatalities per 100 million VMT) were observed in the Stockton and Manteca.

Specific high-fatality segments in 2020 and 2021 include:

- Stockton: March Lane (Pacific Avenue and West Lane)
- Stockton: Waterloo Road (Comstock Road to Eight Mile Road)
- Stockton: Waterloo Road (I-99 to Wilcox Road)
- Unincorporated area: Marengo Road (Inland Drive to Tracy Boulevard)

Severe injury segments (roadways with a severe injury rate of 10 or more per 100 million VMT) were mostly observed in the Stockton, Manteca, Tracy and County unincorporated areas. The top high-risk segments, present in both 2020 and 2021, were observed at the following locations:

- Unincorporated: CA-88 (Jack Tone Bypass to Elliot Road)
- Stockton: West Lane (Armstrong Road to Harney Lane)
- Stockton: CA 12 (Thornton Road to I-5)
- Stockton: Eight Mile Road (Lower Sacramento Road to West Lane)
- Stockton: March Lane (Hillsboro Way to West Lane)
- Stockton: Waterloo Road (I-99 to Wilcox Road)
- Stockton: Fremont Street (CA-99 to Cardinal Avenue)
- Stockton: Airport Way (Charter way to Harding Way)
- Stockton: Charter Way (Stockton Street to I-5)
- Unincorporated: Airport Way (Roth Road to French Camp Road)
- Manteca: Airport Way (I-120 to Lathrop Road)
- Manteca: West Manteca Avenue (Airport Way to Fremont Avenue)
- Manteca: Yosemite Avenue (I-99 to Austin Road)

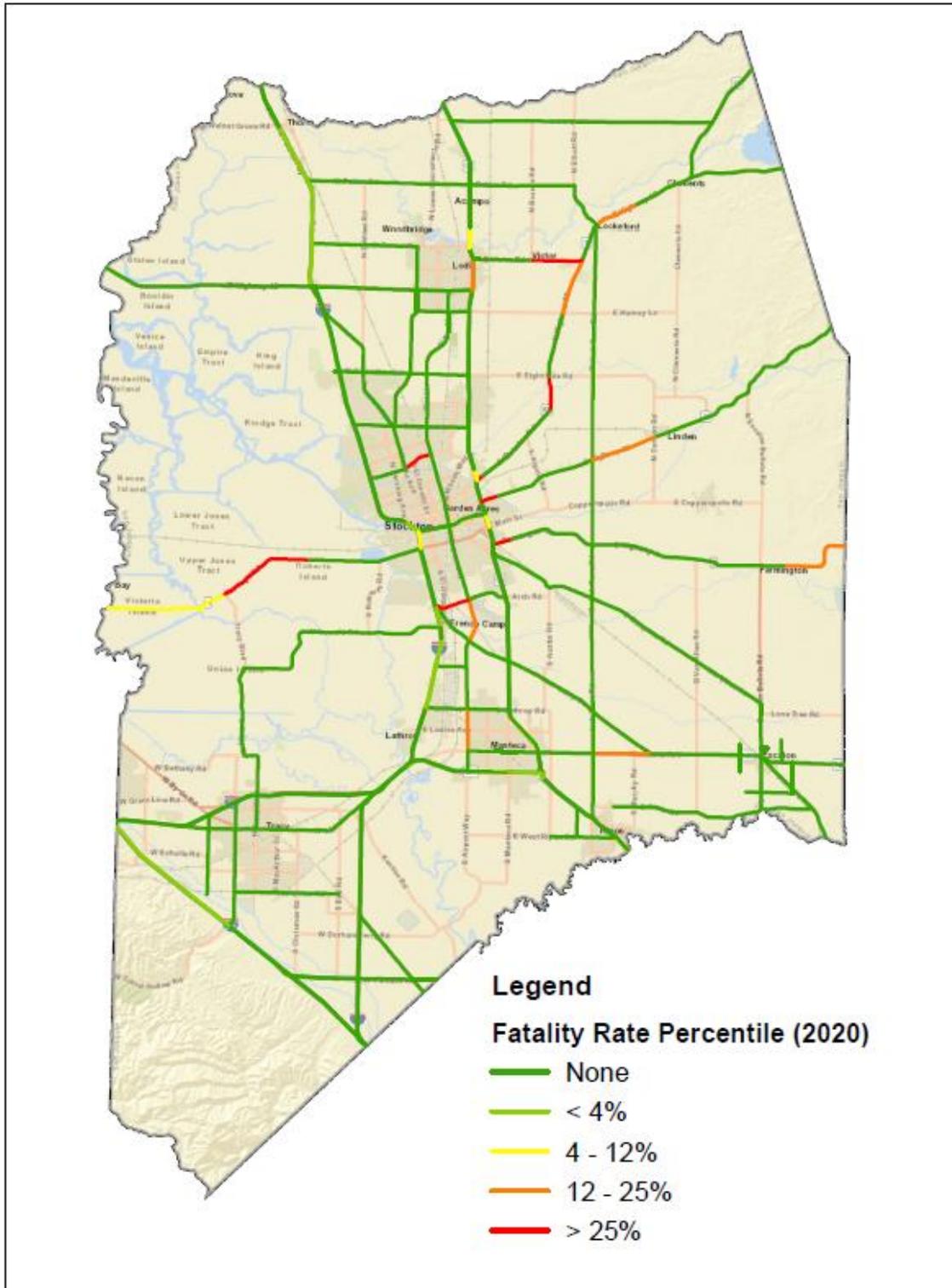


Figure 3.0-12 2020 Fatality Rate Map

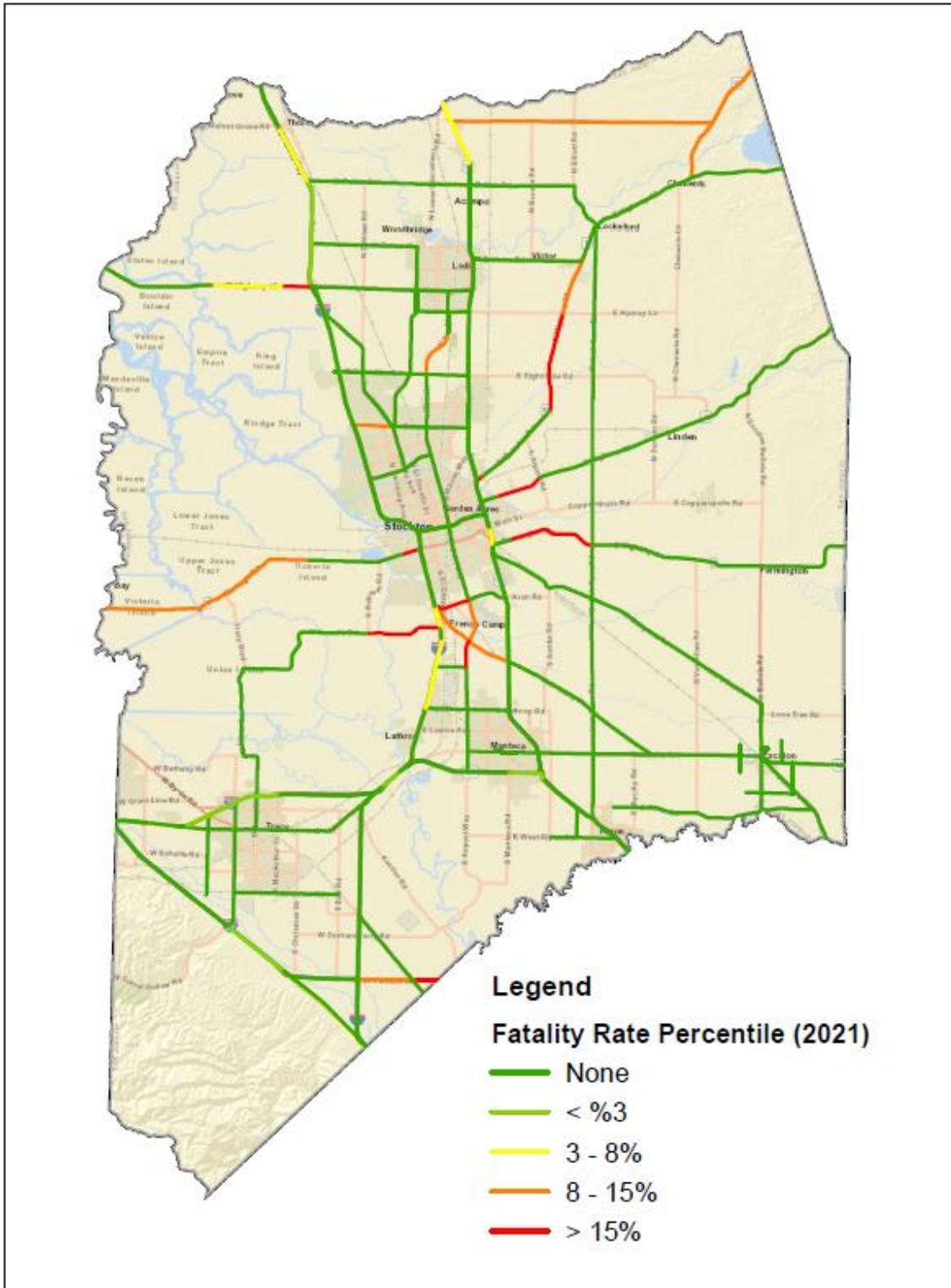


Figure 3.0-13 2021 Fatality Rate Map

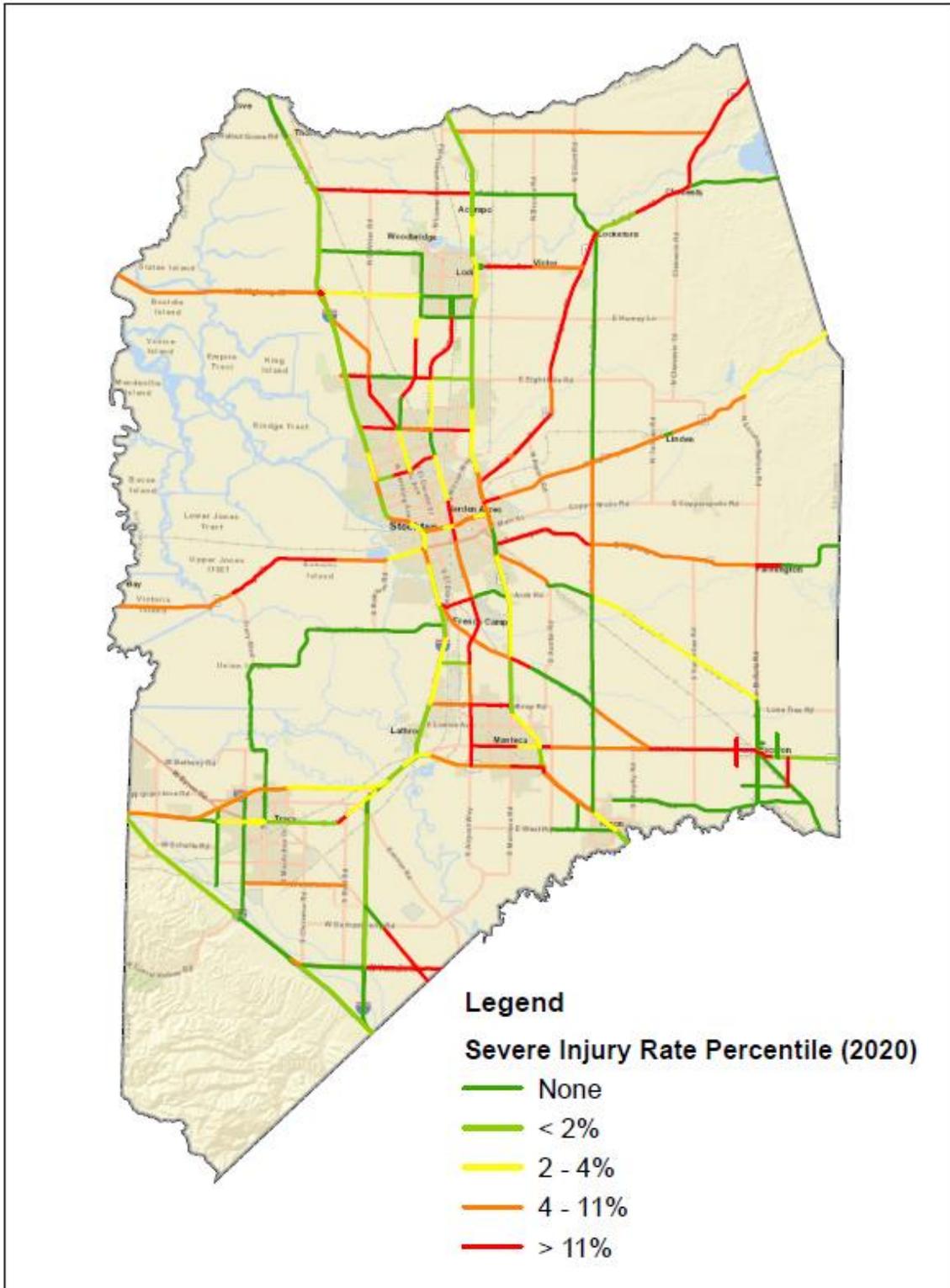


Figure 3.0-14 2020 Severe Injury Rate Map

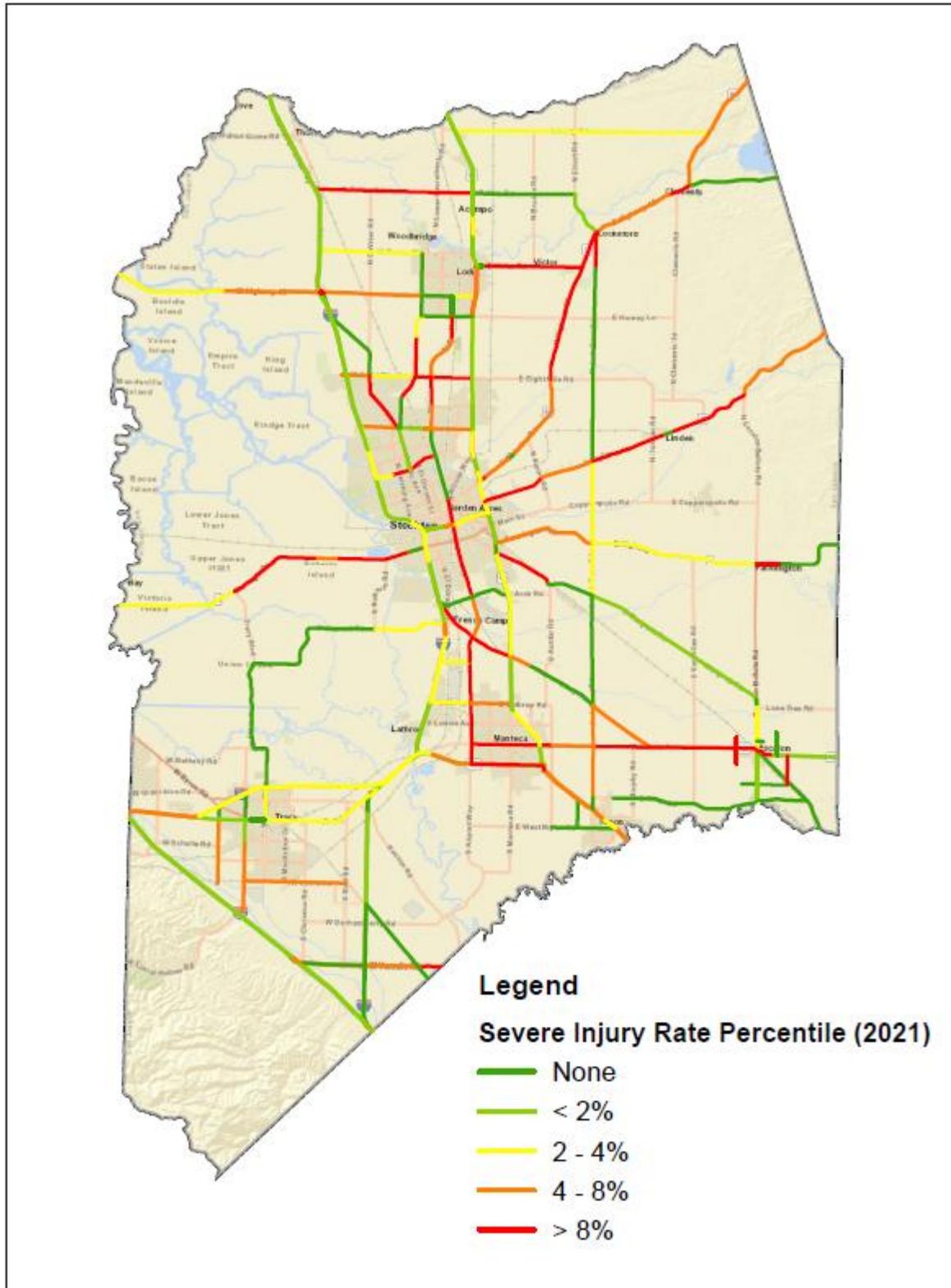


Figure 3.0-15 2021 Severe Injury Rate Map

### 3.7 TRANSPORTATION ASSET MANAGEMENT

To maintain the RCMP infrastructure asset system in a state of good repair, it is critical to identify pavement maintenance and rehabilitation need. The following Federal performance measures were evaluated relative to 2019 pavement condition data for IHS and NHS designated roadways, 2020 data for NHS bridge decks, and 2020-21 data for local non-NHS roadways to assess the pavement conditions of the RCMP network:

- Percent of Interstate Highway System (IHS) pavement in good condition (IHS only);
- Percent of IHS pavement in poor condition (IHS only);
- Percent of non-IHS National Highway System (NHS) pavement in good condition (non-IHS NHS);
- Percent of non-IHS NHS pavement in poor condition (non-IHS NHS);
- Percent of NHS bridges by deck area in good condition (NHS only); and,
- Percent of NHS bridges by deck area in poor condition (NHS only).

Pavement Condition Index (PCI), an American Society for Testing and Materials (ASTM) D6433 standard, is the accepted performance measurement used by the majority (70%) of California local agencies to measure the structural condition of pavement and to make planning and funding decisions. PCI is a readily available metric that measures system preservation on local roads. The data are readily collected and comparable across local, regional, and statewide jurisdictions.

Some jurisdictions may use Overall Condition Index (OCI) to measure roadway pavement conditions. OCI is a rating system developed by the U.S. Army Corps of Engineers (USACE), taking into consideration both PCI and Riding Comfort Index (RCI). RCI ranges from 0 to 100 indicating the roughness of a roadway segment measured by a laser profiler.

Per the federal performance measurement rule, FHWA advocates the use of the International Roughness Index (IRI) as the preferred measure over PCI for local roadways. Although an appropriate performance measure for high-speed highway facilities as a measurement of ride quality or functionality, IRI is not applicable for the 5,500 miles of lower speed NHS roadways in California. As such, SJCOG advocates local flexibility in the choice of pavement condition measurement types. **Table 3.0-16** provides the thresholds for pavement conditions as applied for San Joaquin County.

**Table 3.0-16 PCI and OCI Ranges and Pavement Condition** (Source: SJCOG RCMP Report, 2021)

PCI Range	Pavement Condition	OCI Range	Pavement Condition
71 - 100	Good	71 - 100	Good
61 - 70	At Lower Risk	50 - 70	Fair
50 - 60	At Higher Risk		
0 - 49	Poor	0 - 49	Failed or Poor

Caltrans maintains performance data sets to help local agencies in assessing the location and condition of their NHS pavement and bridges. San Joaquin County data sets for 2019 and 2020 were obtained from Caltrans and analyzed to evaluate the NHS roadway pavement conditions and NHS bridge deck pavement conditions respectively. There are 108 centerline miles of the RCMP network that are neither state

highways or designated as part of the NHS. For non-NHS segments, 2020-21 PCI data was obtained from local agencies and used to estimate the performance measures.

The performance measure results are provided in **Table 3.0-17**. The results indicate that:

**Table 3.0-17 Pavement Conditions on RCMP Network** (Source: SJCOG RCMP Report, 2021)

Facility	Pavement Condition		
	Good	Fair	Poor
2019 Interstate Highway System (lane miles)	66%	34%	0%
2019 Non-IHS National Highway System (lane miles)	33%	62%	5%
2020-21 Non-NHS Segments* (centerline miles)	38%	45%	17%
2020 NHS Bridges (deck area)	59%	27%	14%

According to the RCMP schedule, PM2 metrics are monitored and reported bi-annually and will be included in the next monitoring cycle.

## 4.0 FEDERAL PERFORMANCE MANAGEMENT RULE

### 4.1 INTEGRATION WITH FEDERAL PERFORMANCE MEASURES

The federal performance management rule required state departments of transportation (DOTs) and metropolitan transportation organizations (MPOs) to implement the federal performance measures by 2018. The federal performance measures were thematically split into the three groupings under the rubric of “performance management” (PM). Depending on the performance measure, different geographic and network representations apply (e.g., all roadways, Interstate Highway System (IHS) only, non-IHS National Highway System, National Highway System). These are noted after each measure. Given that the RCMP is specific to the RCMP network that reflects a mix of IHS, NHS and non-NHS roadways, not all metrics are directly applicable to RCMP reporting. Additionally, some metrics such as those that pertain to vehicular emissions, are outside the scope of the RCMP and are more appropriately addressed as part of other planning efforts (e.g., during RTP/SCS updates) or will be addressed by Caltrans or Caltrans data analysis tools.

The federal performance measures are as follows:

- PM1: Safety
  - Number of fatalities (all roadways)
  - Rate of fatalities (per 100 million VMT) (all roadways)
  - Number of serious injuries (all roadways)
  - Rate of serious injuries (per 100 million VMT) (all roadways)
  - Number of non-motorized fatalities and serious injuries (all roadways)
- PM2: Transportation Asset Management
  - Percent of Interstate Highway System (IHS) pavement in good condition (IHS only)
  - Percent of IHS pavement in poor condition (IHS only)
  - Percent of non-IHS National Highway System (NHS) pavement in good condition (non-IHS NHS)
  - Percent of non-IHS NHS pavement in poor condition (Non-IHS NHS)
  - Percent of NHS bridges by deck area in good condition (NHS only)
  - Percent of NHS bridges by deck area in poor condition (NHS only)
- PM3: System Reliability, Freight, Congestion, and Air Quality
  - Percent of person-miles traveled on the IHS that are reliable (IHS only)
  - Percent of person-miles traveled on the non-IHS NHS that are reliable (Non-IHS NHS)
  - Percent change in tailpipe CO2 emissions on NHS compared to 2017 level (NHS)
  - Truck travel time reliability (TTTR) index (IHS only)
  - Annual hours of peak hour excessive delay (PHED) per capita (NHS only in urbanized TMAs in federal non-attainment areas)
  - Total emissions reduction (all projects)

More details about these performance measures, including the information indicating if they are monitored in this report or included in the next cycle (biennial track) can be found in **Table 3.0-1**.

State DOTs (e.g., Caltrans) are directly responsible for submitting performance targets and annual progress reports on those targets to federal agencies. To complete the required reporting tasks more efficiently for both federal CMP and the federal performance management rule, SJCOG has integrated many of the PM1-3 federal performance measures as RCMP performance measures.

The RCMP does not report the federal PM3 emissions performance measures. These include:

- Percent change in tailpipe CO<sub>2</sub> emissions on NHS;
- Annual hours of peak hour excessive delay (PHED) per capita; and,
- Percent of non-single occupancy vehicle (SOV) travel and total emissions reduction.

In 2022, SJCOG was informed the qualifying threshold for the latter two PM 3 was reduced from 1,000,000 to 200,000 population and required to apply these PM 3 measures, based on Stockton’s urbanized area (UZA). These measures will be under consideration when SJCOG starts updating our RCMP in 2024.

The RCMP monitors and reports on the federal PM1 safety performance measures as well as the federal PM2 asset management metrics (reporting of the IHS and non-IHS NHS system is deferred to Caltrans). SJCOG works with its local agencies to report the PM3 non-NHS system roadways identified in the RCMP. MPOs, such as SJCOG, are required to establish targets specific to their planning area, or support the statewide targets, and annually submit progress reports. SJCOG accepted the statewide targets and per agreement with Caltrans, SJCOG began this reporting requirement in 2019. In this report, the PM1, and parts of PM3 metrics related to congestion and reliability were monitored and reported. The PM2 metrics and remaining metrics from PM3 will be included in the next update cycle.

The Caltrans/SJCOG targets established for safety are shown in **Table 4.0-1**. As shown, of the five metrics established to track safety performance, none currently being met.

**Table 4.0-1: Caltrans Adopted Safety Performance Targets and SJCOG 2022 Results**

Performance Target	Percent Reduction Target From 2018	2020 Percent Change of 2018
Number of Fatalities	2.9%	+6.19%
Rate of Fatalities (per 100M VMT)	2.9%	+12.65%
Number of Serious Injuries	1.3%	+36.38%
Rate of Serious Injuries (per 100M VMT)	1.3%	+44.20%
Number of Non-Motorized Fatalities	2.9%	+10.71%
Number of Non- Motorized Serious Injuries	1.3%	+87.1%

## 5.0 STUDY REFERENCES

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