CITY OF FOLSOM

LOCAL ROADWAY SAFETY PLAN

APRIL 2021

FINAL DRAFT

CITY OF FOLSOM
DISTINCTIVE BY NATURE

ACKNOWLEDGEMENT

CITY OF FOLSOM

Department of Public Works

Transportation Safety Committee

The Folsom City Council

CONSULTANT TEAM

TJKM Transportation Consultants


STOP
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GLOSSARY

4E – The 4E of traffic safety: education, enforcement, engineering, emergency medical services.

ACS – American Community Survey.

ADT – Average Daily Traffic.

ATP – Active Transportation Plan.

B/C Ratio – Benefit-Cost Ratio. It summarizes overall value for money of a project.

BTP – Bicycle Transportation Plan.

CRF – Crash Reduction Factor. It is the percentage crash reduction that might be expected after implementing a given countermeasure at a specific site.

Collision Rate – It is the number of crashes that occur at a given location during a specified time period (usually three to five years) divided by a measure of exposure for the same period.

Collision Severity – Defined as seriousness of collision, which include fatal (F), severe injury (SI), other visible injury and complaint of pain (Other), and property damage only (PDO).

EMS – Emergency Medical Services.

FHWA – Federal Highway Administration.

HSIP – Highway Safety Improvement Program.

LRSM – Local Roadway Safety Manual.

MITP – Metropolitan Transportation Improvement Program.

OTS – California Office of Traffic Safety.

RSTP – Federal Regional Surface Transportation Program.

Primary Violation Factor – Defined as factors that are strong in contribution to the collision.

SB1 – Sustainable Community Grants

SACOG – Sacramento Area Council of Governments.

SR2S –Safe Routes to School.

STIP – State Transportation Improvement Program.

SWITRS – Statewide Integrated Traffic Records System. It is a database that contains all collisions reported to California Highway Patrol from local and governmental agencies.

TIMS – Transportation Injury Mapping System. It is a platform to access California's crash data.

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EXECUTIVE SUMMARY

The City of Folsom's Local Roadway Safety Plan (LRSP) is a comprehensive plan that creates a framework to systematically identify and analyze traffic safety-related issues and recommend safety projects and countermeasures. The LRSP aims to reduce fatal and severe injury collisions through a prioritized list of improvements that can enhance safety on local roadways.

The LRSP is a proactive approach to addressing safety needs. It is viewed as a guidance document that can be continuously reviewed and revised to reflect evolving collision trends and community needs and priorities. With the LRSP as a guide, the City would be able to apply for necessary safety funds, such as the Highway Safety Improvement Program (HSIP).

LRSP OVERVIEW

GOALS OF THE LRSP

- Goal 1: Systematically identify and analyze roadway safety problems and recommend improvements.
- Goal 2: Improve the safety of pedestrians and bicyclists by using proven effective countermeasures.
- Goal 3: Ensure coordination of key stakeholders to implement roadway safety improvements & response within Folsom.
- Goal 4: Continually seek funding for safety improvements.
- Goal 5: Ensure that safety improvements are made in a fair and equitable manner for all Folsom residents.

SAFETY PARTNERS

Potential safety partners (City and County agencies and officials, State and Federal agencies) identified in this document will be able to provide advice in acquiring and analyzing data, selecting emphasis areas, developing safety strategies, and implementing the final plan.

PROCESS

The systemic approach in preparing the LRSP involves the following steps:

1. Develop plan goals and objectives
2. Analyze collision data
3. Determine focus areas and identify crash reduction strategies
4. Prioritize countermeasures/projects
5. Prepare the LRSP

COLLISION DATA

Collision data was collected for a five-year period between 2015 and 2019 from the City of Folsom's Crossroads Software's Traffic Collision Database.

COLLISION TREND

Key findings on patterns and trends:

- A total of 2,911 collisions occurred between 2015 and 2019.
- 29 collisions resulted in fatalities, 54 collisions resulted in severe injuries, 297 collisions resulted in other visible injuries, 791 collisions resulted in complaints of pain, and 1,740 collisions resulted in property damage only (PDO).
- The year 2015 had the highest number of collisions with 615 collisions, and 2018 had the lowest number of collisions with 539 collisions.
- Unsafe speed accounted for 28% of all collisions, followed by automobile right-of-way violation (9%), driving under the influence of drugs or alcohol (9%), and improper turning (9%).
- 30% of the collisions resulted in rear-ending, followed by broadside (21%), hit object (19%), and sideswipe (16%).
- Almost 60% of motor-vehicle collisions were involved with other motor-vehicles, 2% collisions involved pedestrians, and 3% collisions involved bicyclists.
- Approximately 77% of overall collisions occurred at an intersection, while 23% collisions occurred at roadway segments.
- Most collisions occurred between 4:00 PM and 6:00 PM (18%), followed by between 2:00 PM and 4:00 PM (15%), 12:00 PM and 2:00 PM (13%), and 10:00 AM and 12:00 PM (10%).

HIGH-RISK LOCATIONS

The collision rate analysis was performed on all City streets. The corridors were ranked to show the top 10 roadway segments and top 30 intersections.

Key findings of identifying high-risk roadway segments are as follows:

- There were a total of 32 F+SI collisions that occurred on the roadway segments.
- A total of 12 collisions led to fatalities and 20 collisions led to severe injury.
- Bayline Circle between Whistle Stop Way and Kennar Way, and Perraud Drive between Alezane Drive and Briarcliff Drive, were observed to have the highest collision rates, 1.503 and 1.403, respectively.

Key findings of identifying high-risk intersections are as follows:

- There were a total of 51 F+SI collisions that occurred at intersections.
- A total of 17 collisions led to fatalities and 34 collisions led to severe injuries.
- The intersection of Arbuckle Avenue and Steeplechase Drive had the highest collision rate of 0.686, followed by the intersection of Bowden Drive and Smith Way, and the intersection of

Leidesdorff Street and Reading Street, 0.376 and 0.295, respectively.

EMPHASIS AREAS

Emphasis areas are focus of roadway safety plan that are identified through the various collision types and factors resulting in fatal and severe injury collisions within the City of Folsom. The 10 emphasis area identified for the City of Folsom are:

1. Intersection Safety Improvements
2. Reduce Night-Time Collisions
3. Reduce Roadway Departure Collisions
4. Pedestrian Safety Improvements
5. Bicycle Safety Improvements
6. Reduce Broadside Collisions due to Automobile Right-of-Way Violation
7. Reduce Hit Object Collisions due to Speeding and Impaired Driving
8. Reduce Collisions by Young-Adult Drivers and Aggressive Driving
9. Reduce Distracted Driving and Increase Driver Awareness
10. Reduce Collisions near School

IDENTIFICATION OF NEEDS

A total of 97 responses were collected through the project website, virtual workshop, and social media platforms. The most common responses were related to the following:

- Speeding
- Dangerous for Walking or Cycling
- Lack of Signage

VIABLE SAFETY PROJECTS

A set of 10 safety projects were created for high-risk intersections and roadway segments.

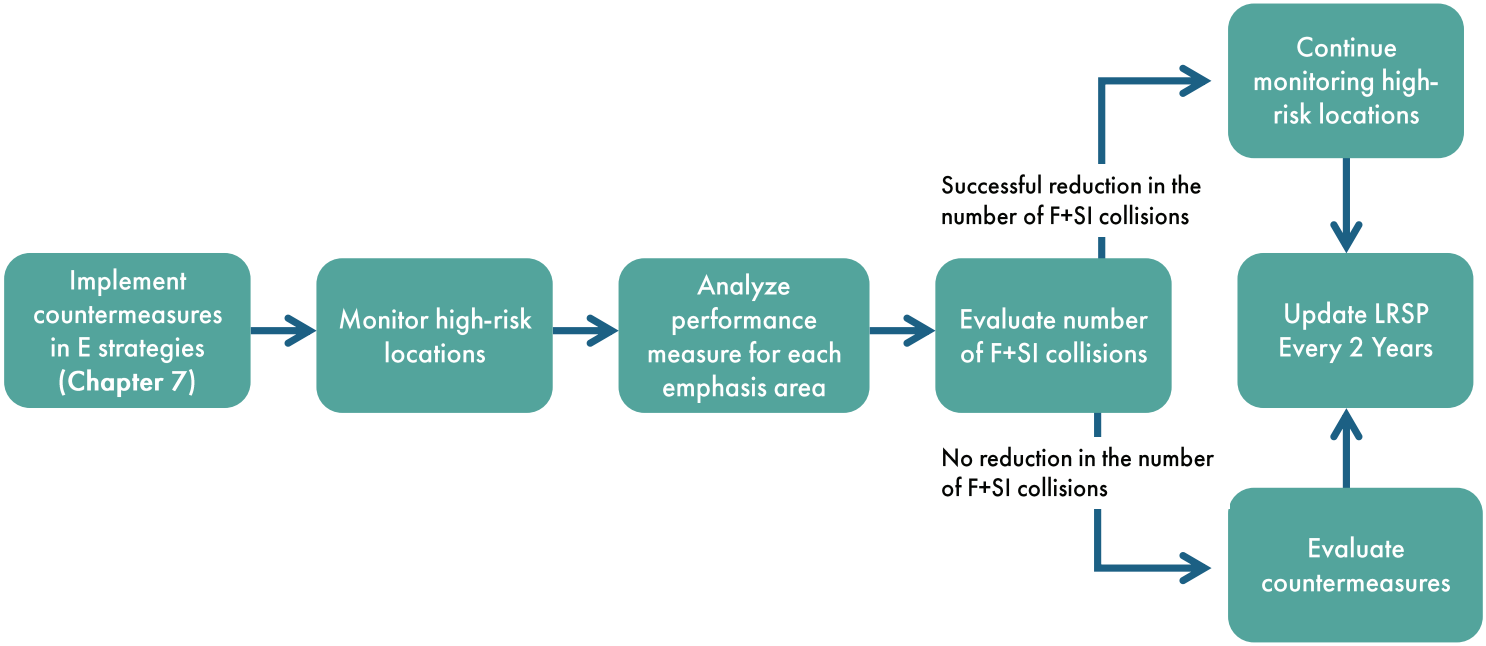
- Project 1. Upgrade Signal Hardware and Signal Timing
- Project 2. Non-Signalized Intersection - Install/Upgrade Raised Pavement Markers and Regulatory Signs
- Project 3. Signalized Intersection - Install/Upgrade Raised Pavement Markers
- Project 4. Improve Pedestrian and Bicyclist Safety at Intersections
- Project 5. Non-Signalized Intersection - Install Rumble Strips and Medians at Approaches
- Project 6. Signalized Intersection - Improve pavement friction (High Friction Surface Treatments)
- Project 8. Install Segment Lighting, and Delineators/Reflectors/Marked Objects
- Project 9. Install Rumble Strips, and Widen Shoulders along Segments

- Project 10. Install Segment Lighting, Median Barrier and Dynamic Speed Sign

IMPLEMENTATION AND EVALUATION

The LRSP is a guidance document that requires an update every two years. Each update will be led by the City of Folsom's Department of Public Works in coordination with the potential safety partners. The Traffic Safety Committee will oversee the LRSP process. It will be adopted after approval from the City Council. The LRSP document provides engineering, education, enforcement, and emergency medical service-related countermeasures that can be implemented throughout the City to reduce fatal and severe injury collisions. After implementing countermeasures, the performance measures for each emphasis area should be evaluated annually. The most important measure of success of the LRSP should be reducing fatal and severe injury collisions throughout the City. If the number of fatal and severe injury collisions does not decrease over time, then the countermeasures should be re-evaluated.

Figure ES-1. Implementation Process of the LRSP



1 INTRODUCTION

The California Department of Transportation's (Caltrans) Division of Local Assistance is responsible for administering the state's traffic safety funding to enhance local highway safety. One of the primary methods to acquire funding is through the Highway Safety Improvement Program (HSIP), a federally assisted and State-administered program centered on reducing fatalities and severe injuries on all local roads. For this purpose, a Local Roadway Safety Plan (LRSP) is required for an agency to be eligible to apply for the HSIP funds.

The LRSP is a localized data-driven traffic safety plan that provides opportunities to address unique highway safety needs and reduce fatal and severe injury collisions. The LRSP creates a framework to systematically identify and analyze traffic safety-related issues, identify causes and locations of collisions, establish emphasis areas and recommend safety projects and countermeasures. The LRSP facilitates the development of local agency partnerships and collaboration, resulting in developing a prioritized list of improvements that can enhance safety on local roadways.

The LRSP can be used throughout the City of Folsom. It can be refined and expanded as the City gains more experience and data on its effectiveness. This LRSP is a guidance document that the City will use to implement programs to reduce fatal and severe injury collisions in the City of Folsom. It will be reviewed every two years and updated to incorporate new data and address community needs and priorities. The City of Folsom may use this document as a blueprint to compete and apply for necessary safety funds (Federal and State) to enhance roadway safety.

1.1 BACKGROUND

The City of Folsom initiated LRSP in 2020, to enable the City to identify potential traffic safety projects educational programs, and enforcement measures to reduce fatal and severe injury collisions. The identified traffic safety projects are tailored to the City's needs and issues and consistent with Federal and State funding project requirements.

The objective of the LRSP is to develop a successful safety plan for the local roadways by utilizing some of the existing elements that the City already has, such as a collision database and traffic safety committee. It is also to create a decision-making process that relies on a partnership with stakeholders, including the public, and develop countermeasures using 4 Es of traffic safety: Engineering, Enforcement, Education, and Emergency Medical Services.

1.2 THE FOUR "Es" OF SAFETY

The LRSP establishes goals, objectives, and emphasis areas that integrate the 4 Es of traffic safety – education, enforcement, engineering, and emergency medical services. It is essential to identify emphasis areas as they are areas of opportunity to improve safety through the 4 Es. The 4 Es help address safety issues by incorporating non-engineering elements, along with engineering measures.

- **Education –** It is an essential tool in modifying the behavioral aspect of traffic safety and distributing knowledge about traffic safety. Educational campaigns for drinking and driving, texting and driving, distracted driving, wearing a helmet, etc., can be used to spread awareness that may inform the people about the rules of the road.
- **Enforcement –** Increased enforcement with penalties and patrolling often lead to awareness and instill safe driving behavior among motorists.
- **Engineering –** These are high-level solutions that require analysis and construction for roadway infrastructure development to reduce collisions. Engineering solutions differ by locations and collision attributes and may alter the roadway geometry.
- **Emergency Medical Services (EMS) –** Collaboration with the City's EMS leaders to rapidly respond to collision sites, and improve quality of care for roadway collision victims. The solutions involve strategies to decrease response time.

1.3 REPORT **ORGANIZATION**

This document is organized into 10 chapters. They are as follows:

- **Chapter 1 –** Introduction: This chapter introduces the purpose of the LRSP, describes how this report is organized and the study area for the LRSP.
- **Chapter 2 –** Visions and Goals: This chapter defines the visions and goals for the LRSP.
- **Chapter 3 –** Safety Partners: This chapter identifies partners who would provide advice on acquiring and analyzing data, selecting emphasis areas, developing safety strategies, and implementing the final plan.
- **Chapter 4 –** Process: This chapter describes the outreach and analytical process used to develop the LRSP.
- **Chapter 5 –** Existing Efforts: This chapter summarizes the efforts and activities in development or proposed, which would be beneficial in coordination with this plan.
- **Chapter 6 –** Data Summary: This chapter summarizes the collision data analysis approach and presents key findings in the study area.
- **Chapter 7 –** Emphasis Area and Safety Strategies: This chapter identifies the top 10 emphasis areas for the City and the consequent safety strategies.
- **Chapter 8 –** Identification of Needs: This chapter summarizes the needs of the community.
- **Chapter 9 –** Viable Safety Projects: This chapter summarizes the list of viable safety projects applicable to the high-risk roadway segments and intersections, cost, and benefit-cost ratio.
- **Chapter 10 –** Implementation and Evaluation: This chapter summarizes the process of implementation, monitoring, evaluation, and future updates.

1.4 STUDY **CONTEXT**

The City of Folsom is located in Sacramento County, California, covering a total area of just under 28 square miles, situated along Lake Natoma and Folsom Lake. The City's estimated population is 81,328 (ACS 2019 5-year estimate).

The City is bordered by Placer County in the north and El Dorado County in the east.

State Route (SR) 50 is the major highway that connects the City of Folsom to other nearby cities.

2 VISIONS AND GOALS

The Folsom LRSP aims to systemically identify roadway safety issues within Folsom and address them through a holistic approach using the 4 Es: Engineering, Enforcement, Education, and Emergency Medical Services. Roadway deaths and serious injuries are preventable incidents and can be addressed through the 4 Es. The safety of human life is the highest priority.

Goal 1: Systematically identify and analyze roadway safety problems and recommend improvements.

Objective 1: Use the LRSP's data-driven process to identify fatal and severe injury collisions in Folsom; where, when, and how they are occurring, and implement appropriate and proven countermeasures.

Objective 2: Improve roadway planning, design, operations, maintenance and connectivity to enhance safety and mobility for users of all ages and abilities.

Objective 3: Implement traffic calming strategies to discourage speeding and other unsafe driving behaviors on residential streets.

Objective 4: Ensure that all recommended improvements are consistent with the City of Folsom goals, as well as State and Federal plans and goals (such as, but not limited to, California Strategic Highway Safety Plan, and the FHWA Local and Rural Road Safety Program).

Goal 2: Improve the safety of pedestrians and bicyclists by using proven effective countermeasures.

Objective 1: Identify safety issues and locations/hot spots where bicycle and pedestrian collisions occur in Folsom, and treat with appropriate and effective engineering countermeasures.

Objective 2: Provide educational programs for bicyclists, pedestrians, and motorists to inform on how to be safe in the public right-of-way, either through after-school programs, Folsom Police Department programs, the Highway 50 Transportation Management Authority (50TMA), or other public/private sponsored programs.

Objective 3: Improve sidewalks, walkways, and crossings to be free of hazards and minimize conflicts with vehicular traffic.

Objective 4: Prioritize improvements that promote Safe Routes to School efforts or are located near schools.

Goal 3: Ensure coordination of key stakeholders to implement roadway safety improvements & response within Folsom.

Objective 1: Coordinate between Public Works, Police Department, Fire Department, and EMS agencies to ensure a coordinated response to traffic safety, including:

- Implementation of safety improvements
- Public education on safely traveling in the public right-of-way, regardless of mode
- Enforcement of traffic safety laws in the public right-of-way
- Minimizing impacts to emergency response times.

Objective 2: Coordinate with local, regional, and state partners (such as Sacramento Regional Transit or Caltrans), to identify and address traffic safety issues and ensure a coordinated response.

Goal 4: Continually seek funding for safety improvements.

Objective 1: Ensure the LRSP meets Highway Safety Improvement Program (HSIP) guidelines to apply for funding for identified countermeasures.

Objective 2: Provide a list of prioritized improvements that guide City investments and grant funding applications.

Objective 3: Continually seek funding sources to implement engineering, education, enforcement, and emergency response solutions to roadway safety issues in Folsom.

Goal 5: Ensure that safety improvements are made in a fair and equitable manner for all Folsom residents.

Objective 1: Where feasible, implement community outreach to inform the public about upcoming safety improvements and seek their input.

Objective 2: Provide a forum for residents to submit traffic safety-related complaints; and for City staff and officials to respond to such complaints.

Objective 3: Ensure that social justice and equity is a primary factor in selecting where to make traffic safety improvements.

3 SAFETY PARTNERS

Potential safety partners identified in this document will be able to provide advice in acquiring and analyzing data, selecting emphasis areas, developing safety strategies, and implementing the final plan. The following list of potential safety partners will be involved in the implementation of this plan:

- City of Folsom Council Members
- City of Folsom Traffic Safety Committee (TSC)
- City of Folsom Public Works Department
- City of Folsom Police Department
- City of Folsom Fire Department
- Folsom Cordova Unified School District
- County of Sacramento Board of Supervisors
- County of Sacramento Department of Transportation (SACDOT)
- Sacramento Regional Transit District (SacRT)
- County of Sacramento Sheriff's Office
- Sacramento Area Council of Governments (SACOG)
- Sacramento-Placerville Rail Corridor JPA
- County of Placer Sheriff's Office
- County of El Dorado Sheriff's Office
- California Department of Parks and Recreation
- California Department of Transportation (Caltrans)
- California Highway Patrol (CHP)
- Federal Highway Administration (FHWA)

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4 PROCESS

This chapter describes the steps involved in preparing this LRSP document, including a systemic approach that involves the analysis of collision data to identify and prioritize countermeasures, and community outreach.

4.1 SYSTEMIC APPROACH

The systemic approach in preparing the LRSP involves the following steps:

1. **Develop plan goals and objectives –** Review the City's existing planning documents to ensure the LRSP visions and goals align with prior planning effort and that the potential 4E-strategies are consistent with local and regional policies.
2. **Analyze collision data –** Review the latest 5-year collision data and analyze the collision trend. Determine high-risk roadway segments and intersections, and identify significant risk factors.
3. **Determine focus areas and identify crash reduction strategies –** Identify 10 emphasis areas and recommend feasible countermeasures at high-risk locations. Evaluate Crash Reduction Factor (CRF) and the effectiveness of each countermeasure.
4. **Prioritize countermeasures/projects –** Conduct Benefit-Cost Ratio (BCR) analysis on all countermeasures/projects. Prioritize projects that are most beneficial to the City's roadway and intersection safety using BCR.
5. **Prepare the LRSP –** Prepare the LRSP that includes performance measures and implementation plan. Identify priority projects for state or federal programming, grant funding opportunities, and implementation.

4.2 PUBLIC **OUTREACH**

The purpose of public outreach is to solicit and summarize traffic and safety-related concerns, such as speeding, cut-through traffic on residential neighborhoods, pedestrian and bicycle safety on collector roads, and arterial streets. Public outreach is an essential tool to identify high-risk locations based on neighborhood concerns, along with collision analysis.

TARGET AUDIENCE AND STAKEHOLDERS

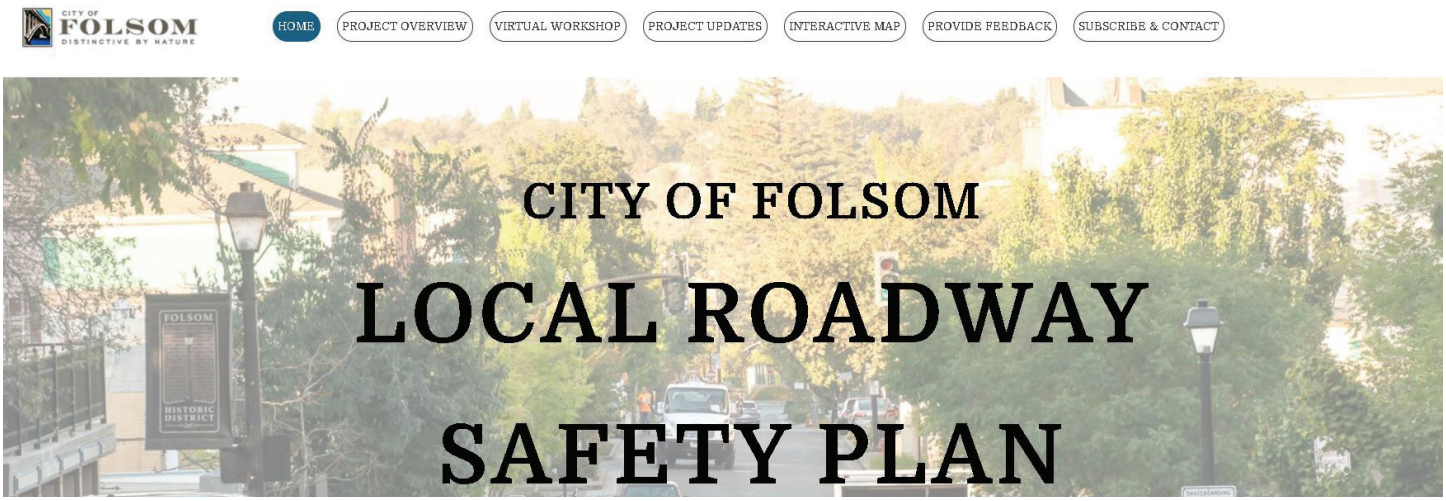
The target audience for the public outreach of the LRSP is the residents of the City of Folsom. The stakeholder group includes:

- City Council
- City Departments' staff: Police, Fire, Planning, and Public Works
- City's Traffic Safety Committee (TSC)
- City's public outreach representative
- School district representative
- Disadvantaged/minority groups
- SACOG Bicycle and Pedestrian Advisory Committee
- SACOG Transportation Committee

PROJECT WEBSITE

A project website (www.folsomcitysafestreets.com) was generated for this project. It provided a

Figure 1. Homepage of Project Website



platform for project information dissemination and other project-related announcements. The website contained six sections: project overview, virtual workshop, project updates, interactive map, feedback, and subscribe and contact. The website was publicized with the help of the City staff. The website was shared on the City's official website and social media accounts for public attention.

The outreach tools introduced in the project website for achieving the goals of the LRSP include:

- Virtual Workshop – it was the primary method of gathering feedback from the general public. Participants could mark intersections or roadway segments on the City's map to indicate their concerned locations. They could also type a narrative of their traffic and safety-related concern.
- Interactive Map – this section displayed an interactive map where website users could see and interact with the attributes of collisions all over the City.

The results of the virtual workshop have been detailed in **Chapter 8**.

Figure 2. Virtual Workshop and Interactive Map Platforms

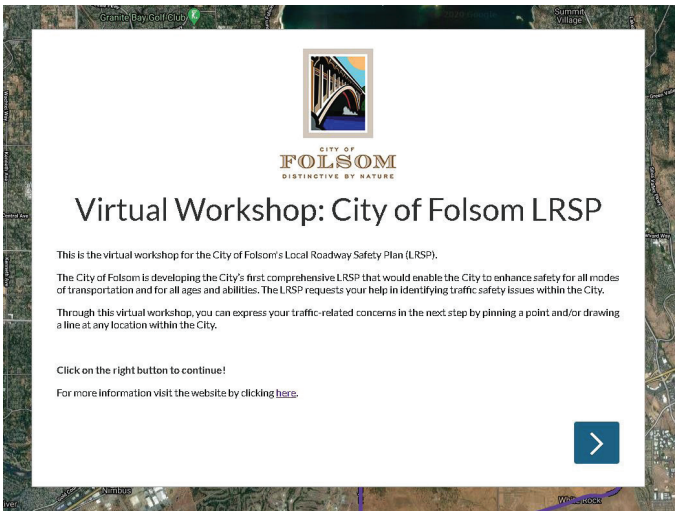


Figure 3. Process of the LRSP

5 EXISTING EFFORTS

This chapter summarizes the findings from various planning documents, and relevant projects underway for the City of Folsom. The purpose of reviewing existing planning efforts is to ensure the LRSP goals and objectives along with recommended improvements are aligned with prior planning efforts, planned transportation projects and non-infrastructure programs.

The City of Folsom has identified several goals, policies, and projects from the following documents:

- **General Plan 2035 (2018)** - The goals and policies identified in the Mobility chapter of the General Plan guide the overall provision of multi-modal transportation system and services in Folsom. These goals and policies are aligned with the goals of the LRSP informed the countermeasure selection and proposed safety projects.
- **Bicycle Master Plan (2007)** - The plan proposes prioritization of 41 miles of new bikeways (Class I, II and III). The plan establishes goals and policies to improve bicycling in the City of Folsm that helped inform safety projects for the City of Folsom.
- **Pedestrian Master Plan (2014)** - The plan established six key goals and recommends projects to enhance walking environment and enhance crossing safety in the City of Folsom. These findings helped inform safety projects for the City of Folsom.
- **East Bidwell Street Corridor Plan (2005)** - The plan identifies needs and deficiencies across East Bidwell Street and recommends complete street improvements. The improvement recommendations listed in the plan helped to confirm countermeasures considered for the LRSP.
- **Metropolitan Transportation Plan/Sustainable Communities Strategy (2016)** - Prepared by SACOG, this plan recommends improving the conditions of existing roads and adding more sidewalks, bike lanes, and restoring, maintaining and expanding transit. The policies identified in the plan helped inform countermeasure selection.
- **Capital Improvement Projects (FY 2020-2021)** - The document consists of detailed project information, funded and unfunded, for the fiscal year 2020-2021. The projects listed under the sections of Streets and Transportation will help to confirm traffic safety solutions for the LRSP.

The City has already completed and implemented several projects identified in the aforementioned documents that include:

- Addition and modification of traffic signals at various locations;
- Widening of streets;
- Replacement of distressed curb, gutter, and sidewalks at various locations through the Neighborhood Sidewalk Rehabilitation Project;
- Modification of existing sidewalks to meet ADA requirements;
- Installation of new crosswalks;
- Installation of video detection systems;
- Improvements at railway crossings.

Upcoming projects for the City include the following:

- Retrofitting streetlights, parking lot lights, and traffic signals with energy-efficient alternatives;
- Retrofitting and installation of new pedestrian facilities at various locations;
- Addition of lanes at various roadway segments;
- Installation of Intelligent Transportation System (ITS) that include vehicle detection, video monitoring, communications infrastructure, dynamic message boards, and pathfinder signs;
- Striping and lane configuration for pavement delineation, signage, and signal modification;
- Upgrade traffic signal systems;
- Right-of-way acquisition and construction along various roadway segments.

Detailed information on goals, policies, and projects derived from various planning documents can be found in **Appendix A**.

6 DATA SUMMARY

This chapter summarizes the results of a citywide collision analysis for the time period between January 2015 and December 2019 and includes the following information:

- Data collection source;
- Collision data analysis results and key highlights;
- Identification and ranking of high-risk locations on local roadways.

The City of Folsom may use this chapter to refer to collision trends during the analysis period and compare them to trends for future analyses.

6.1 CRASH DATA

COLLISION DATA

Collision data was collected for a five-year period between 2015 and 2019 from the City of Folsom's Crossroads Software's Traffic Collision Database.

Collision data was also collected from the Transportation Injury Mapping System (TIMS) and Statewide Integrated Traffic Records System (SWITRS) between 2014 and 2018. The collision data available for 2019 in TIMS is provisional. Note that TIMS' data does not include property damage only collisions that provide additional insight into collisions' characteristics that occur in the City of Folsom. Data from Crossroads, TIMS, and SWITRS were crosschecked to make sure that Crossroads included a comprehensive collision dataset. Thus, Crossroads collision data was used to conduct this study. The collision data collected for the citywide collision analysis can be found in **Appendix B**.

VOLUME DATA

Average Daily Traffic (ADT) counts were used for calculating collision rates as a part of high-risk location screening and ranking. The ADTs were retrieved from the Engineering & Traffic Survey conducted in 2019 (2018 counts). In addition, the City's transportation model (with base year 2015) was used. An average annual growth factor of 0.4% was applied to the volume data collected from the model to extrapolate the 2018 data. The ADT data for the citywide collision analysis can be found in **Appendix C**.

6.2 CRASH **TRENDS**

There were a total of 2,911 reported collisions on City roadways between January 2015 and December 2019. Detailed collision tables can be found in **Appendix D.** Collision data was evaluated to identify patterns and trends for the following collision attributes:

- Collisions by Severity
- Year Trend
- Primary Violation Factors
- Collision Types
- Modes Involved
- Roadway Segment vs Intersection Collisions
- Collisions by Time of Day

COLLISIONS BY SEVERITY

Severity is classified as fatal, severe injury collision, other visible injury, complaint of pain, and property damage only. Out of 2,911 total collisions, 29 collisions resulted in fatalities, 54 collisions resulted in severe injuries, 297 collisions resulted in other visible injuries, 791 collisions resulted in complaints of pain, and 1,740 collisions resulted in property damage only (PDO). **Figure 4** shows the percent distribution of collisions by severity and **Figure 5** shows their locations.

Figure 4. Distribution of Collisions by Severity

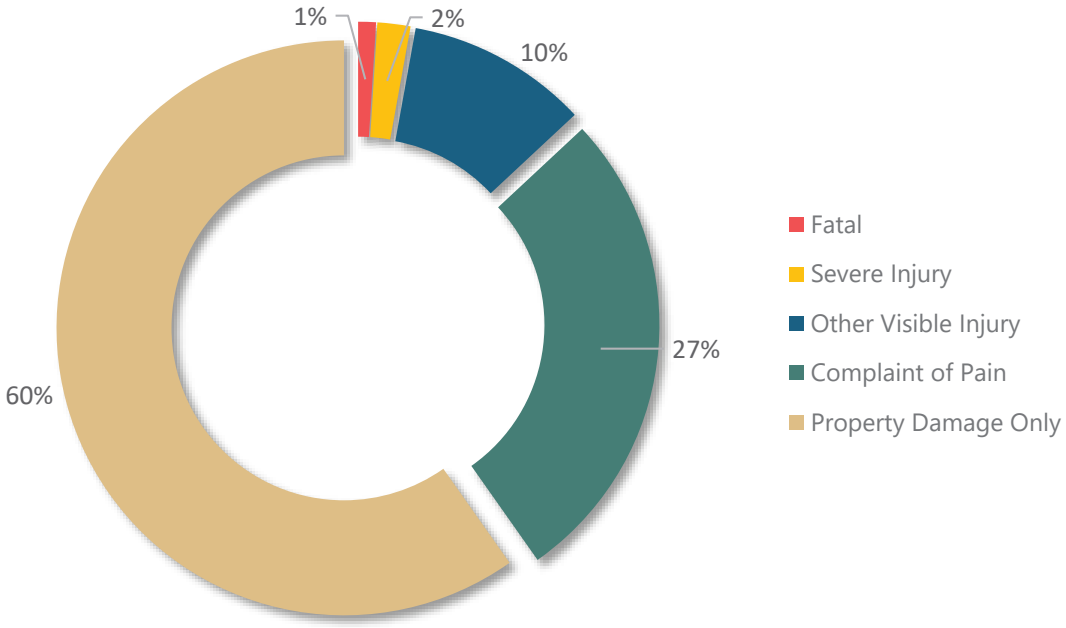
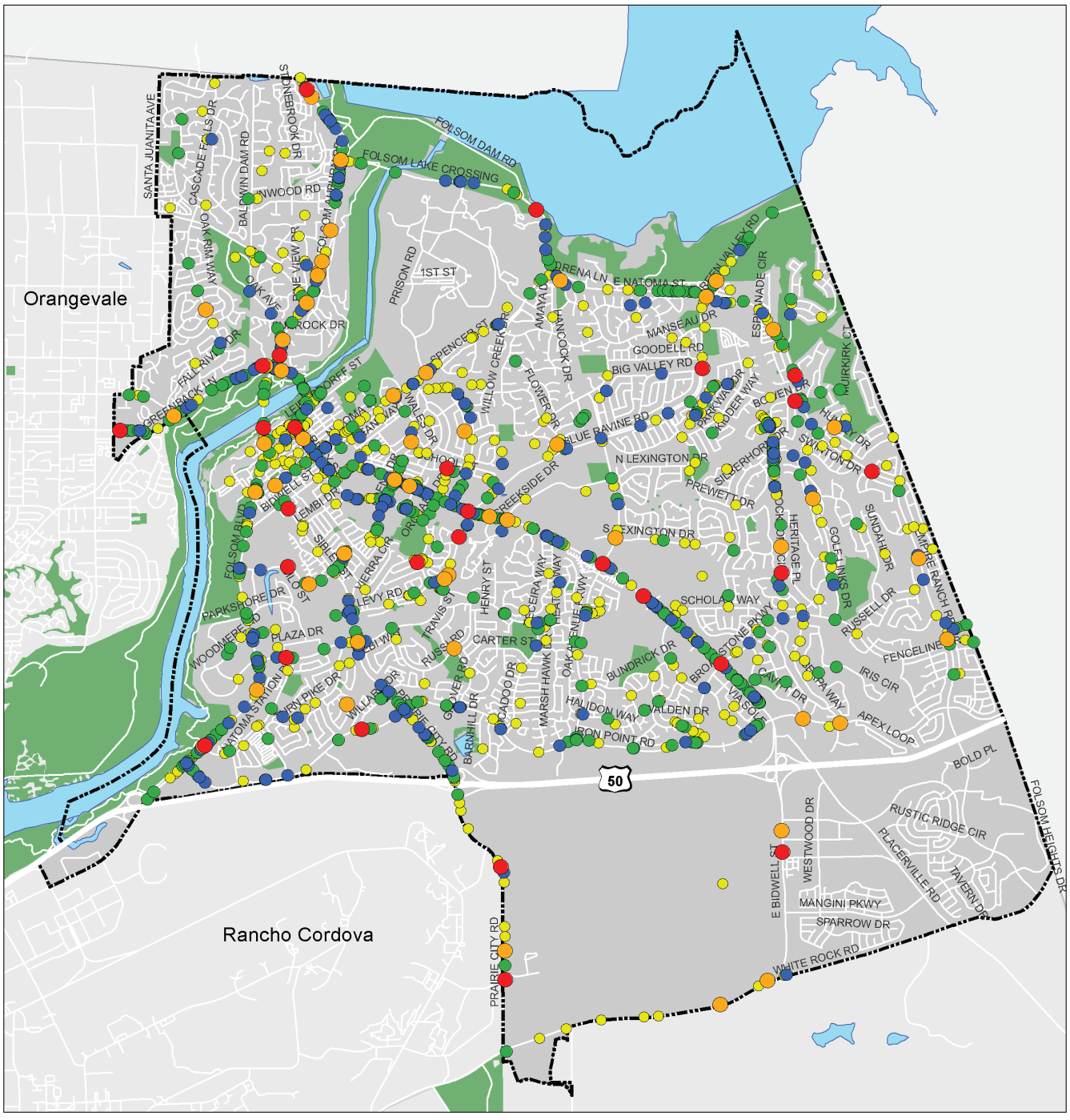


Figure 5. Collisions by Severity (2015 – 2019)



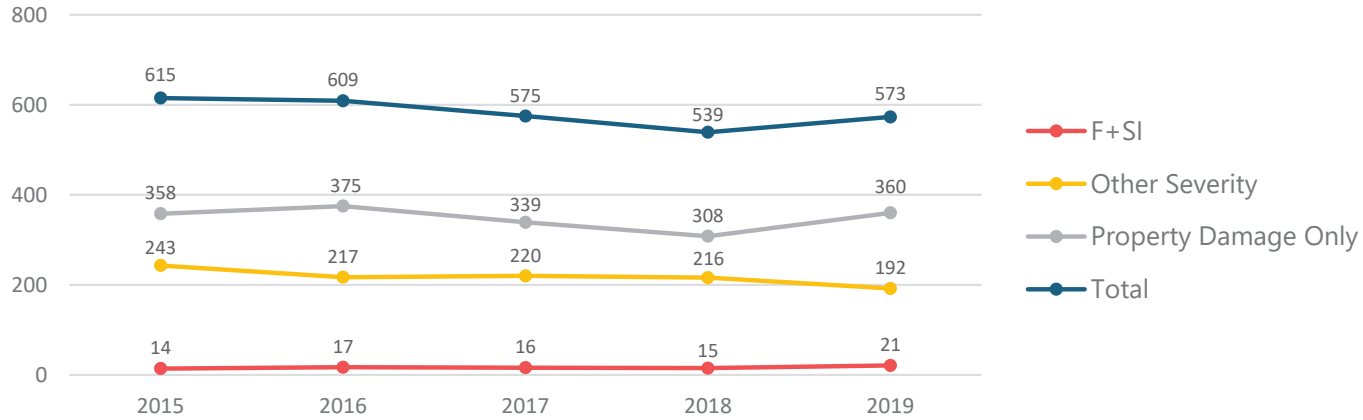
Collisions by Severity (2015 - 2019)

- Fatal
- Severe Injury
- Other Visible Injury
- Complaint of Pain
- Property Damage Only
- Parks and Open Space
- City of Folsom

YEAR TREND

Highest number of collisions occurred in 2015 with 615 collisions, followed closely by 2016 with 609 collisions. The lowest number of collisions took place in 2018, with 539 collisions reported. Highest number of F+SI collisions occurred in 2019 with 21 collisions, and lowest in 2015 with 14 collisions. The result of the five-year collision trend is shown in **Figure 6**.

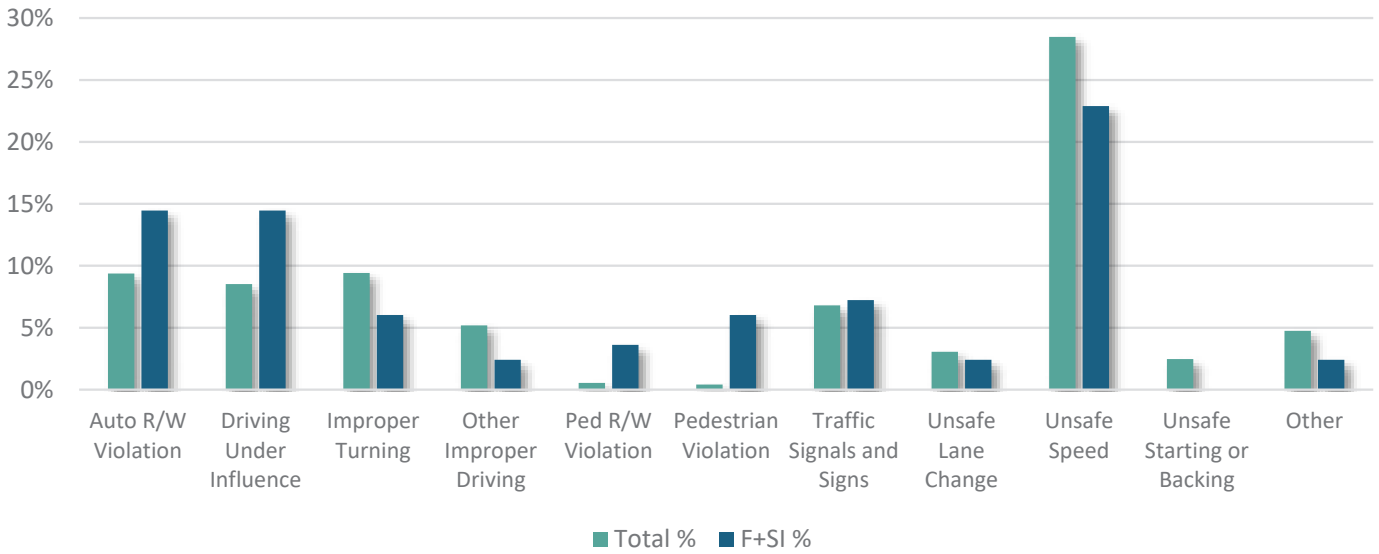
Figure 6. Five-Year Collision Trend (2015 - 2019)



PRIMARY VIOLATION FACTORS

Unsafe speed accounted for 28% of all collisions, followed by automobile right-of-way violation (9%), driving under the influence of drugs or alcohol (9%), and improper turning (9%). For F+SI collisions, unsafe speed also resulted in the most number of collisions (23%), followed by automobile right-of-way violations (14%), and driving under the influence of drugs and alcohol (14%). The Office of Traffic Safety ranked Folsom 59th out of 102 similar California cities with high levels of speed-related collisions and 67th for alcohol-related collisions (one being the highest, or worst). **Figure 7** shows the distribution of primary violation factors.

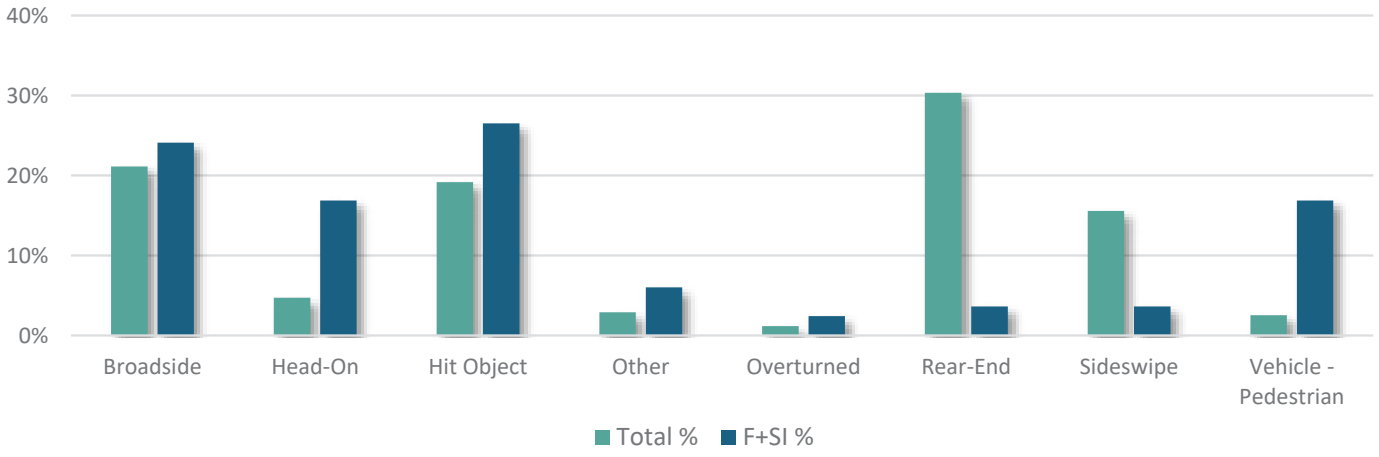
Figure 7. Primary Violation Factors for Total vs. F+SI Collisions (2015 - 2019)



COLLISION TYPES

Overall, almost 30% of the collisions resulted in rear-ending, followed by broadside (21%), hit object (19%), and sideswipe (16%). For F+SI collisions, hit object (27%) is the most commonly occurring type of collision, followed closely by broadside (24%). Other types of collisions under F+SI collisions include head-on (17%), and vehicle and pedestrian (17%). The distribution of collision types is shown in **Figure 8**.

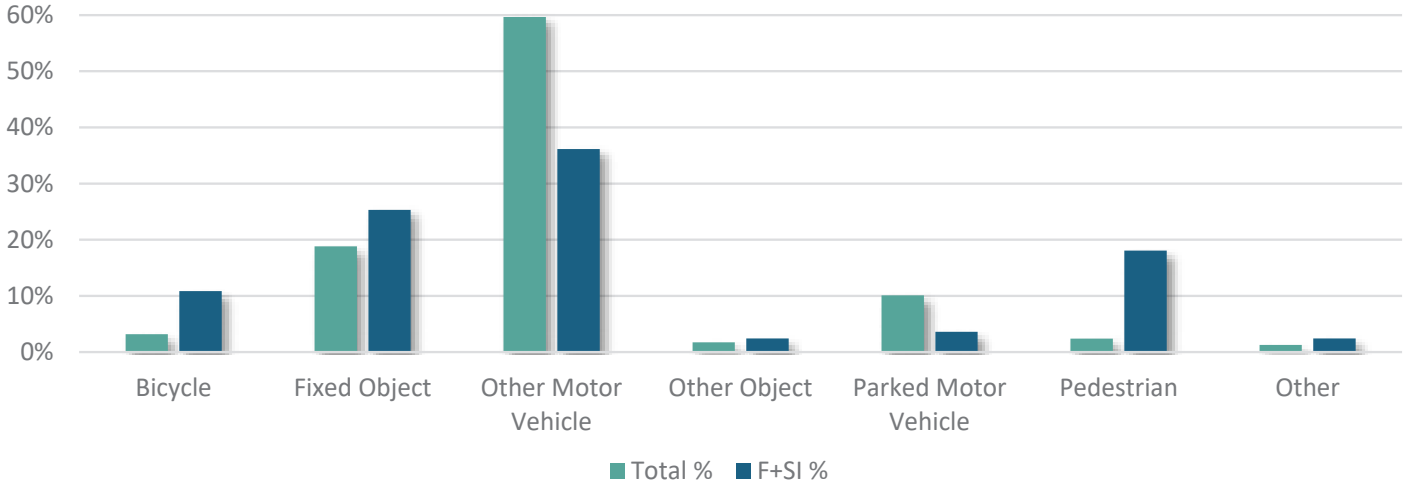
Figure 8. Collision Type for Total vs. F+SI Collisions (2015 - 2019)



MODES INVOLVED

Overall, 60% of motor-vehicle collisions were involved with other motor-vehicles. Other significant involvement occurred with a fixed object (19%), and parked motor-vehicles (10%). For F+SI collisions, it follows a similar trend with most collisions involving other motor vehicles (36%). Other involvements include fixed objects (25%), pedestrians (18%), and bicycles (11%). The Office of Traffic Safety ranked Folsom 51st out of 102 similar California cities with high levels of motorcycle-related collisions and 77th for bicycle-related collisions (one being the highest, or worst). The distribution of modes involved in shown in **Figure 9.**

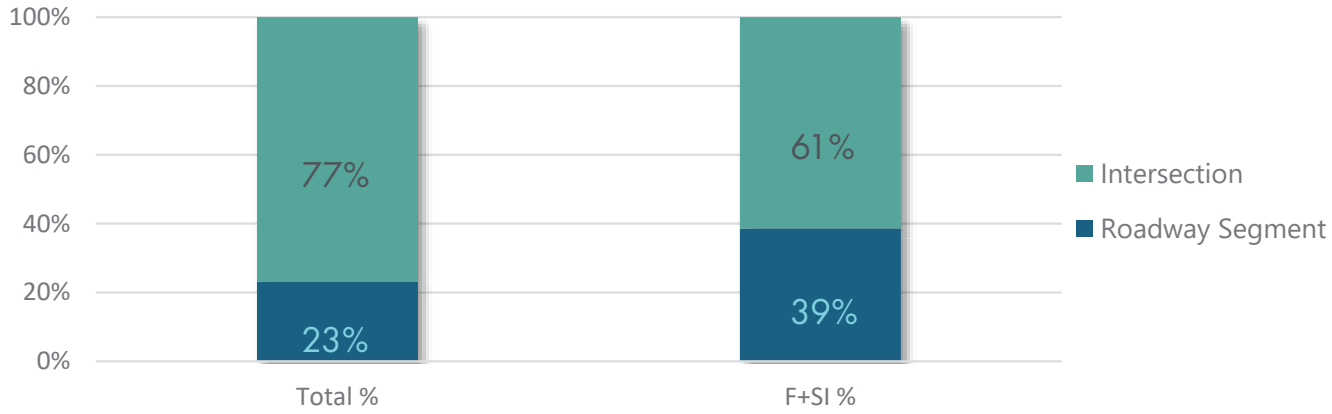
Figure 9. Modes Involved for Total vs. F+SI Collisions (2015 - 2019)



ROADWAY SEGMENT VS. INTERSECTION COLLISIONS

Approximately 77% of overall collisions occurred at an intersection, while 23% collisions occurred at roadway segments. For F+SI collisions, 61% occurred at intersections, and 39% occurred at roadway segments. **Figure 10** shows the comparison between intersection and roadway segment collisions.

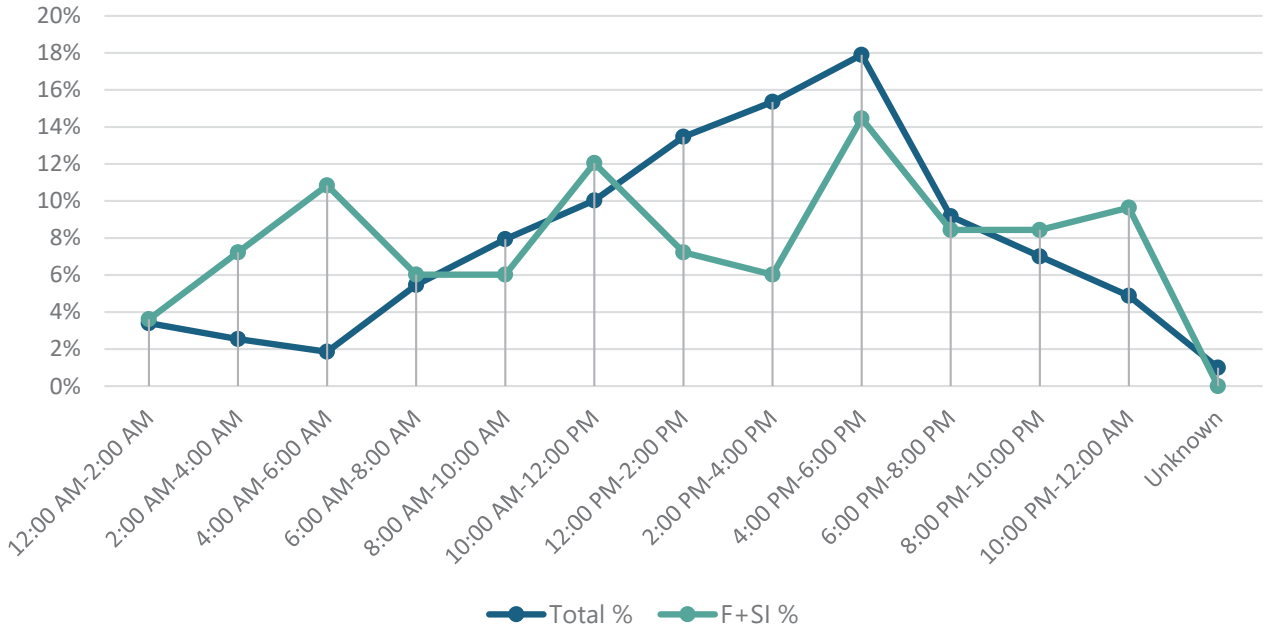
Figure 10. Intersection vs. Roadway Segment Collisions (2015 - 2019)



COLLISIONS BY TIME OF DAY

Almost 18% of total collisions occurred between 4:00 PM and 6:00 PM, 15% occurred between 2:00 PM and 13% between 4:00 PM, 12:00 PM and 2:00 PM, and 10% between 10:00 AM and 12:00 PM. For F+SI collisions, most collisions occurred between 4:00 PM and 6:00 PM (14%), between 10:00 AM and 12:00 PM (12%), between 4:00 AM and 6:00 AM (11%), and between 10:00 PM and 12:00 AM (10%). The Office of Traffic Safety ranked Folsom 77th out of 102 similar California cities with high levels of nighttime collisions (one being the highest, or worst). **Figure 11** shows the trend of collision as per time of day.

Figure 11. Collisions by Time for Total vs. F+SI Collisions (2015 - 2019)



6.3 ROADWAY SEGMENT COLLISION ANALYSIS

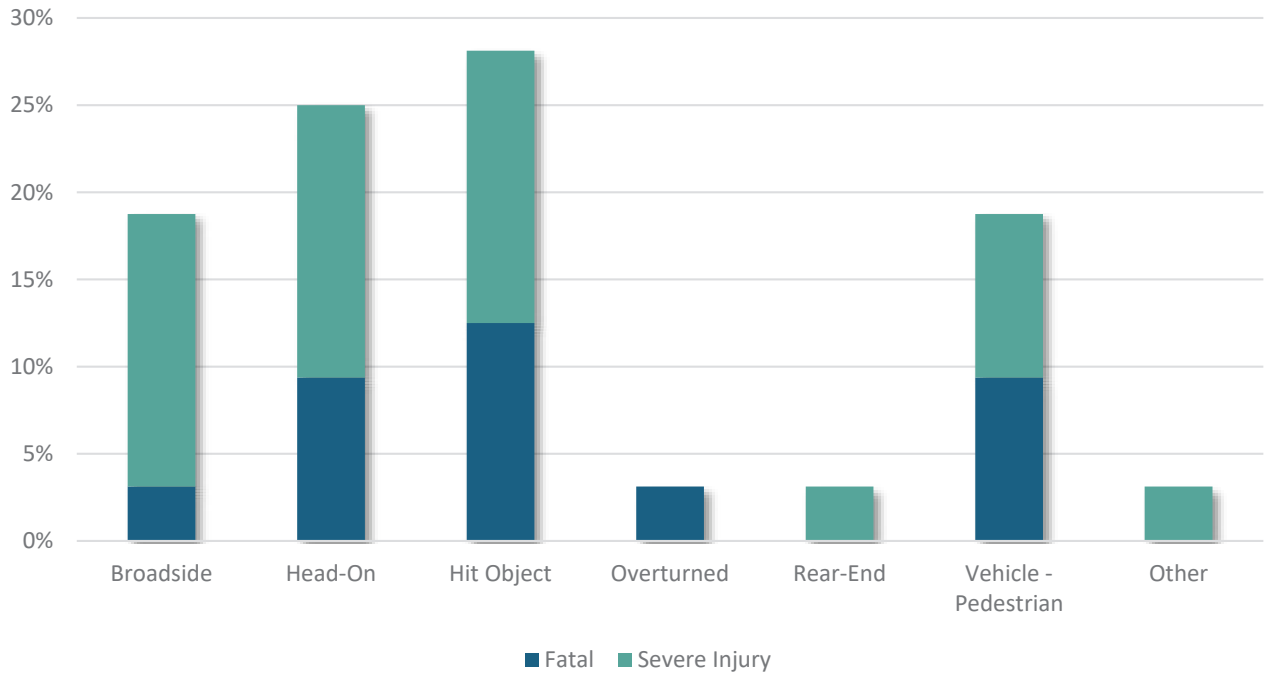
There were a total of 32 F+SI collisions that occurred on roadway segments (out of total of 83 F+SI collisions), between January 1, 2015 and December 31, 2019. The following interrelations to collision types have been analyzed for roadway segments:

- Collision Type and Severity
- Collision Type and Primary Violation Factor
- Collision Type and Lighting Condition
- Collision Type and Weather Condition
- Collision Type and Time of Day

COLLISION TYPE AND SEVERITY

Hit object (29%) and head-on (25%) are the most prominent collision type observed for F+SI collisions, as shown in **Figure 12**. Other significant collision types were broadside (19%), and vehicle-pedestrian (18%).

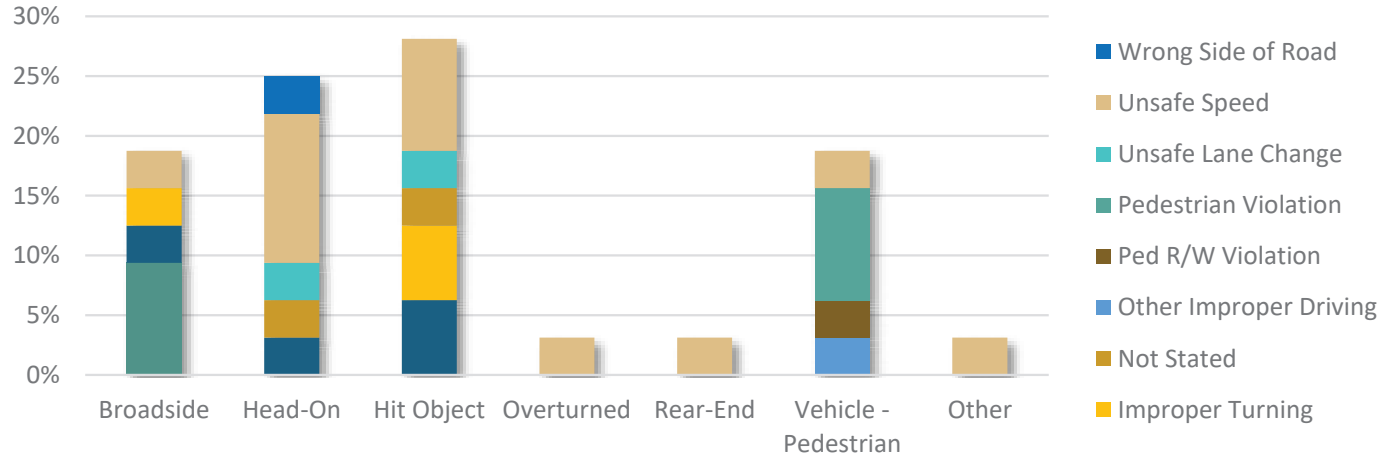
Figure 12. Collision Type for F+SI collisions on Roadway Segments (2015 - 2019)



COLLISION TYPE AND PRIMARY VIOLATION FACTORS

Unsafe speed (38%) was observed to be the most commonly occurring primary violation factor, followed by driving or bicycling under the influence of drugs or alcohol (13%), automobile right-of-way (9%), improper turning (9%), and pedestrian violation (9%). Unsafe speed led mostly to hit object and head-on collisions, while automobile right-of-way led mostly to broadside collisions, and pedestrian violation primarily led to vehicle-pedestrian collisions. The results of the violation category, compared with collision type, are shown in **Figure 13**.

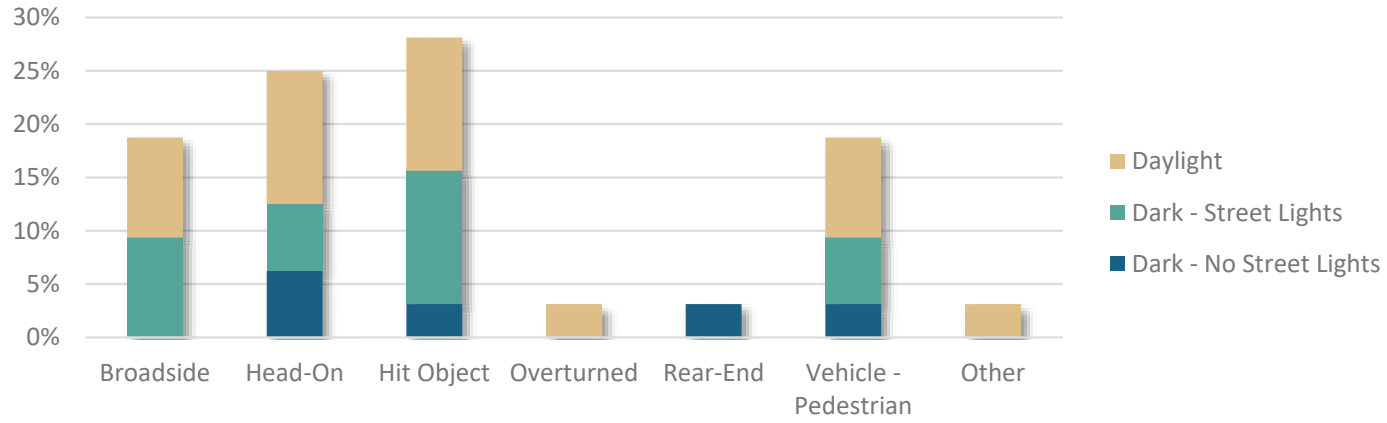
Figure 13. Violation Categories for F+SI Collisions on Roadway Segments (2015 - 2019)



COLLISION TYPE AND LIGHTING CONDITION

It was observed that 50% of F+SI collisions occurred during daylight on roadway segments. The remaining 50% of collisions occurred during darker hours, out of which 34% collisions occurred on roadway segments with street lights, and 16% occurred on roadway segments without street lights. Hit object, broadside, vehicle-pedestrian, and head-on collisions were common both in daylight conditions and in darker hours with street light. The results of lighting conditions, compared with collision type, are shown in **Figure 14**.

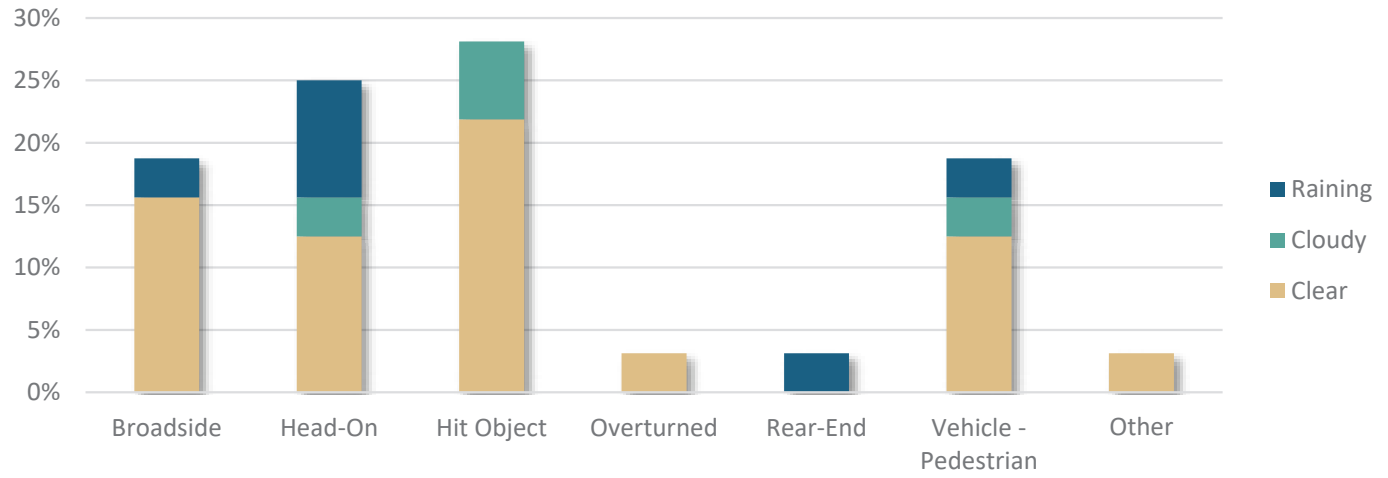
Figure 14. Lighting Conditions for F+SI Collisions on Roadway Segments (2015 - 2019)



COLLISION TYPE AND WEATHER CONDITION

A total of 69% of F+SI collisions occurred during clear weather on roadway. Approximately 19% occurred during rainy weather, and 13% occurred during cloudy weather. Hit object, broadside, head-on and vehicle-pedestrian collisions occurred during clear weather conditions. The results of weather conditions, compared with collision type, are shown in **Figure 15**.

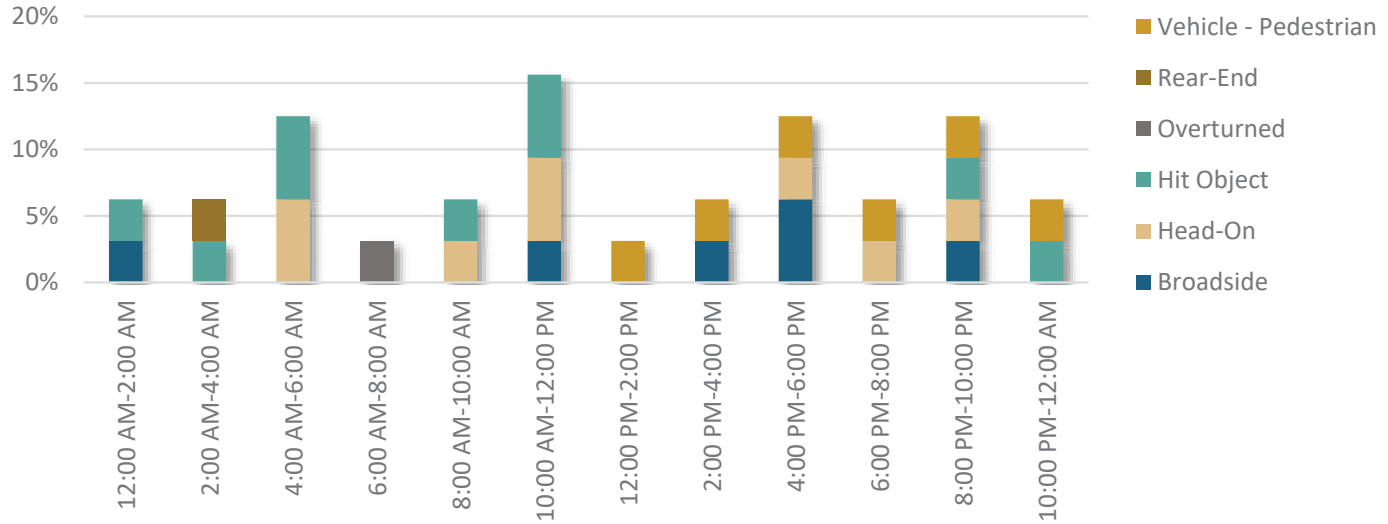
Figure 15. Weather Conditions for F+SI Collisions on Roadway Segments (2015 - 2019)



COLLISION TYPE AND TIME OF DAY

The most prominent time periods for F+SI collisions on roadway segments were observed to be between 10:00 AM and 12:00 PM (16%), and 4:00 PM and 6:00 PM (16%). Other significant time periods include between 4:00 AM and 6:00 AM (13%), and 8:00 PM and 10:00 PM (13%). Hit object is the most occurring collision type in a two-hour window (between 4:00 AM and 6:00 AM, and 10:00 AM and 12:00 PM), closely followed by head-on. The results for the time of collisions, compared with collision type, are shown in **Figure 16**.

Figure 16. F+SI Collisions on Roadway Segments as per Time of Day (2015 - 2019)



6.4 INTERSECTION COLLISION ANALYSIS

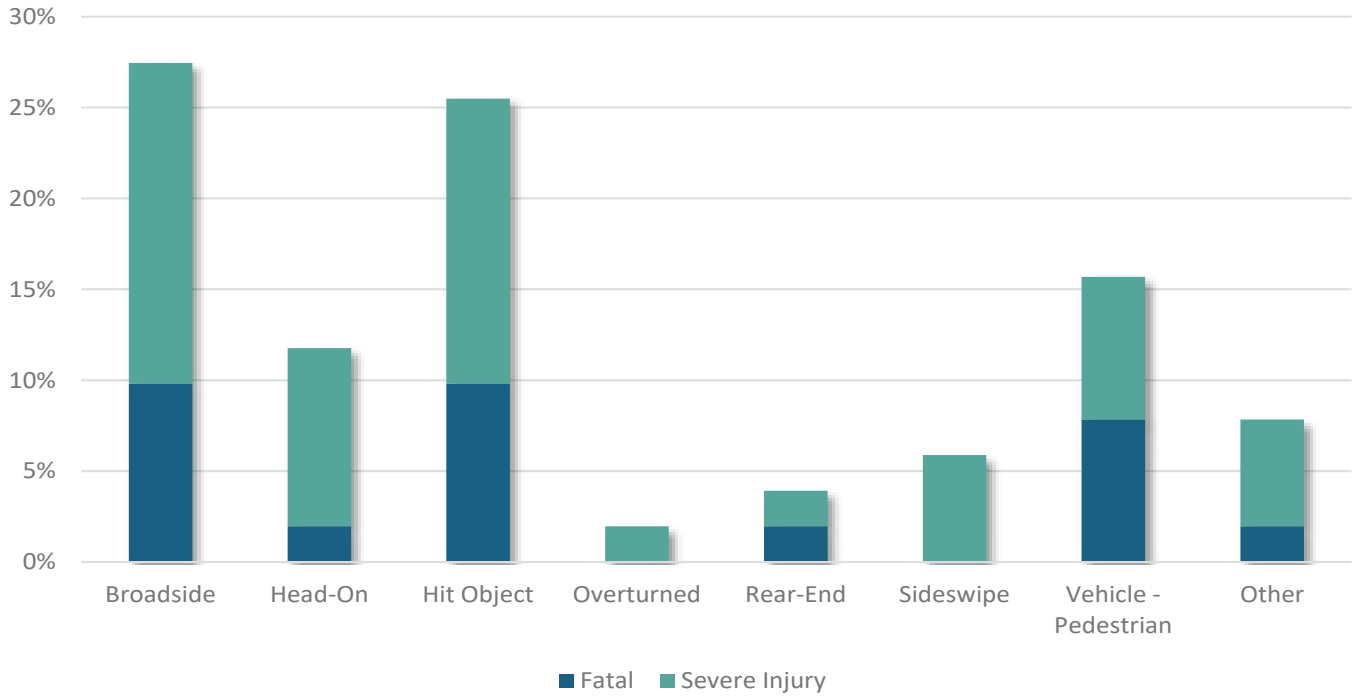
There were a total of 51 F+SI collisions that occurred at intersections, between January 1, 2015 and December 31, 2019. The following interrelations to collision types have been analyzed for intersections:

- Collision Type and Severity
- Collision Type and Primary Violation Factor
- Collision Type and Lighting Condition
- Collision Type and Weather Condition
- Collision Type and Time of Day

COLLISION TYPE AND SEVERITY

Broadside (27%), and hit object (25%) were the most prominent collision type responsible for F+SI collisions at intersections. Broadside, head-on, hit object, rear end, and vehicle-pedestrian collisions have led to fatalities, and are also common causes for severe injury collisions. The results of collision types by severity are shown in **Figure 17**.

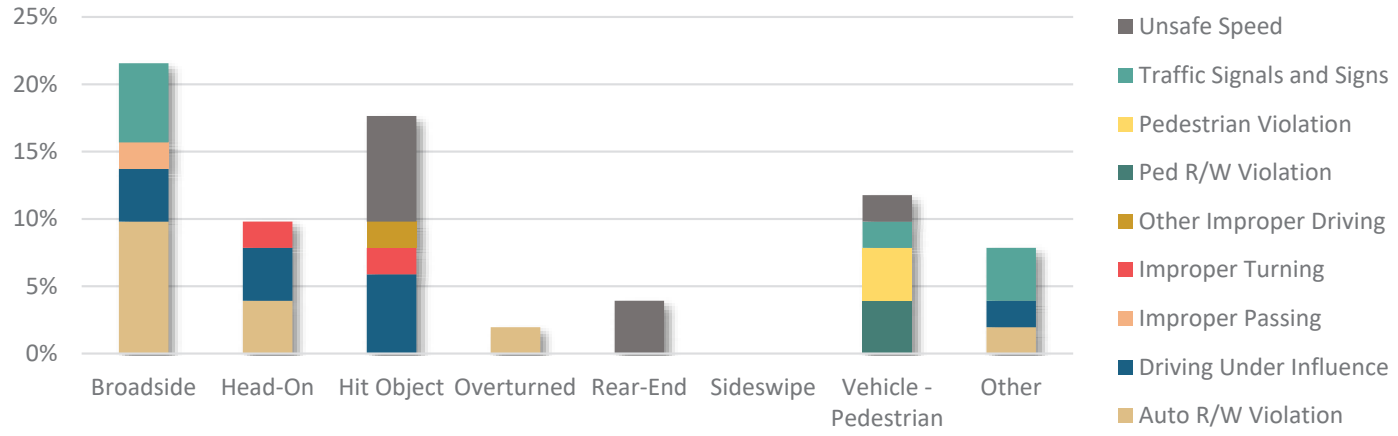
Figure 17. Collision Type by Severity for F+SI Collisions at Intersections (2015 - 2019)



COLLISION TYPE AND PRIMARY VIOLATION FACTOR

It was observed that automobile right-of-way violation (16%) resulted in the most F+SI collisions at intersections. Driving or bicycling under the influence of drugs or alcohol, and unsafe speed were the second most common violations (14% each). Hit object collisions were primarily due to unsafe speed, driving under the influence, improper turning, and other improper driving. Broadside collisions occurred due to automobile right-of-way violation, driving under the influence of drugs or alcohol, and traffic signs and signals violation. The results of violation categories, compared with collision type, are shown in **Figure 18**.

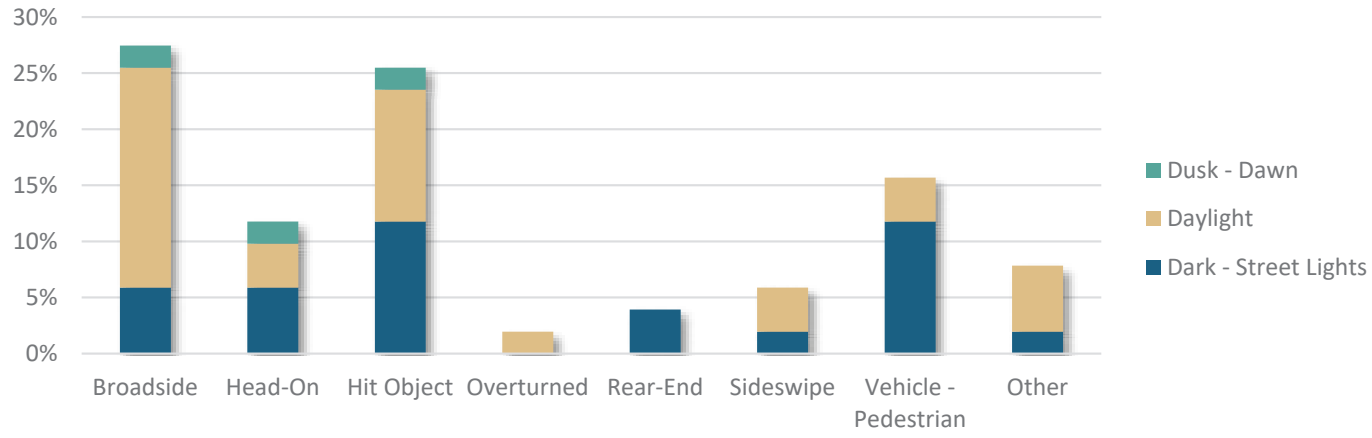
Figure 18. Violation Categories for F+SI Collisions at Intersections (2015 - 2019)



COLLISION TYPE AND LIGHTING CONDITION

Out of all the F+SI collisions, 51% occurred during daylight. Approximately 43% occurred in the darker hours with the presence of streetlights, and 6% occurred during dusk or dawn. Broadside and hit object collisions mostly occurred during daylight conditions. Broadside, head-on, hit object and vehicle-pedestrian collisions occurred during darker hours with the presence of street lights. The results of lighting conditions, compared with collision type, are shown in **Figure 19**.

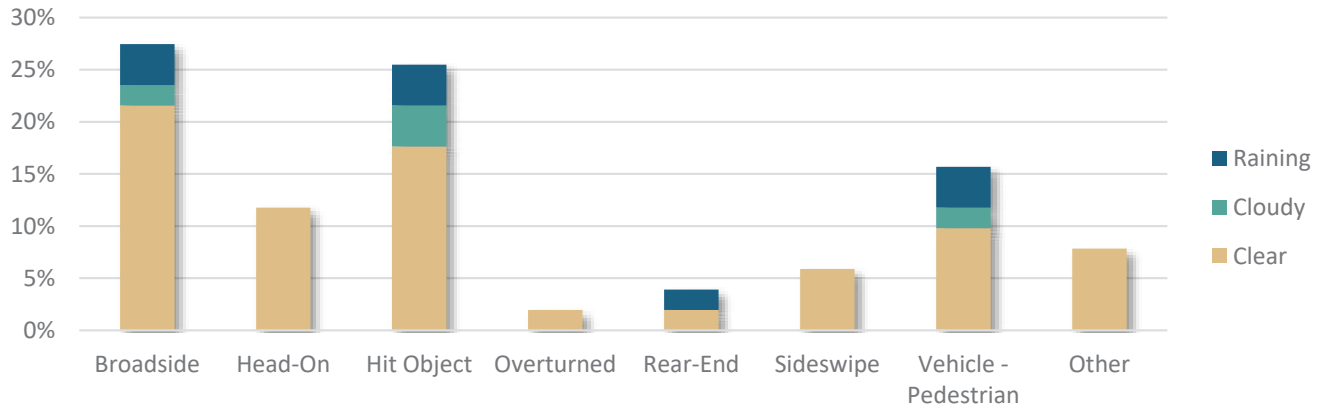
Figure 19. Lighting Conditions for F+SI Collisions at Intersections (2015 - 2019)



COLLISION TYPE AND WEATHER CONDITION

A total of 78% F+SI collisions at intersections occurred during clear weather, while 14% occurred in rainy weather, and 8% occurred in cloudy weather. Almost all type of collisions occurred during clear weather. Broadside, hit object, and vehicle-pedestrian collisions occurred during cloudy weather. Broadside, hit object, vehicle-pedestrian, and rear end collisions occurred during rainy weather. The results of weather conditions, compared with collision type, are shown in **Figure 20**.

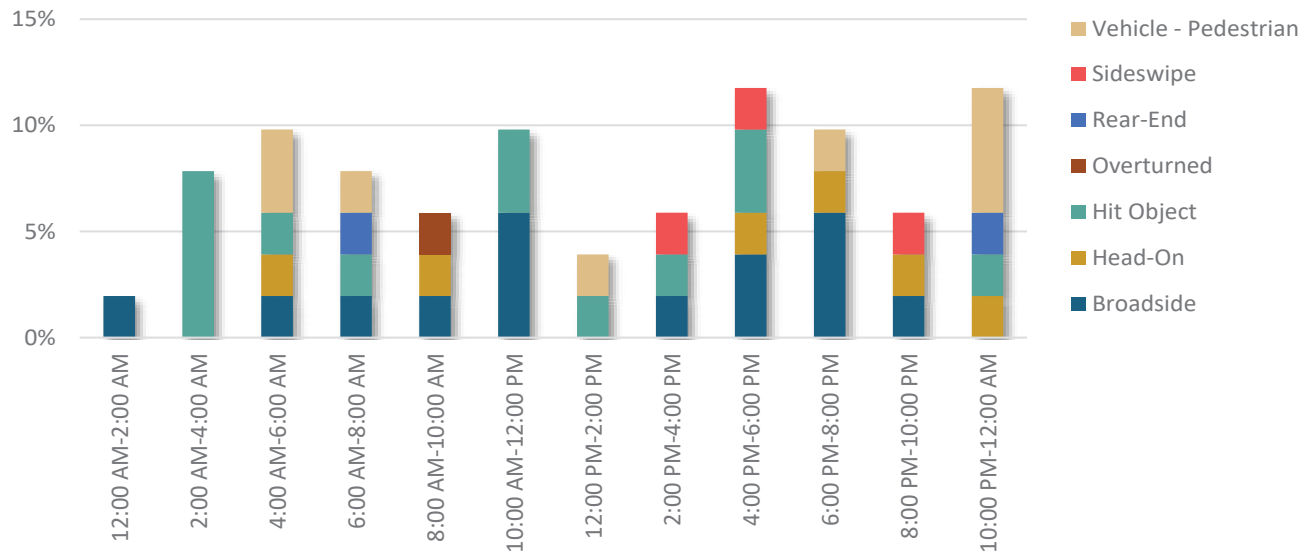
Figure 20. Weather Conditions for F+SI Collisions at Intersections (2015 - 2019)



COLLISION TYPE AND TIME OF DAY

The most prominent time for F+SI collisions at intersections were observed to be between 4:00 PM and 6:00 PM (14%), and 10:00 PM and 12:00 AM (12%). Other significant periods include between 4:00 AM and 6:00 AM, 10:00 AM and 12:00 PM, 12:00 PM and 2:00 PM (at 10% each). The results for collision times, compared with collision type, are shown in **Figure 21**.

Figure 21. F+SI Collisions at Intersections as per Time of Day (2015 - 2019)

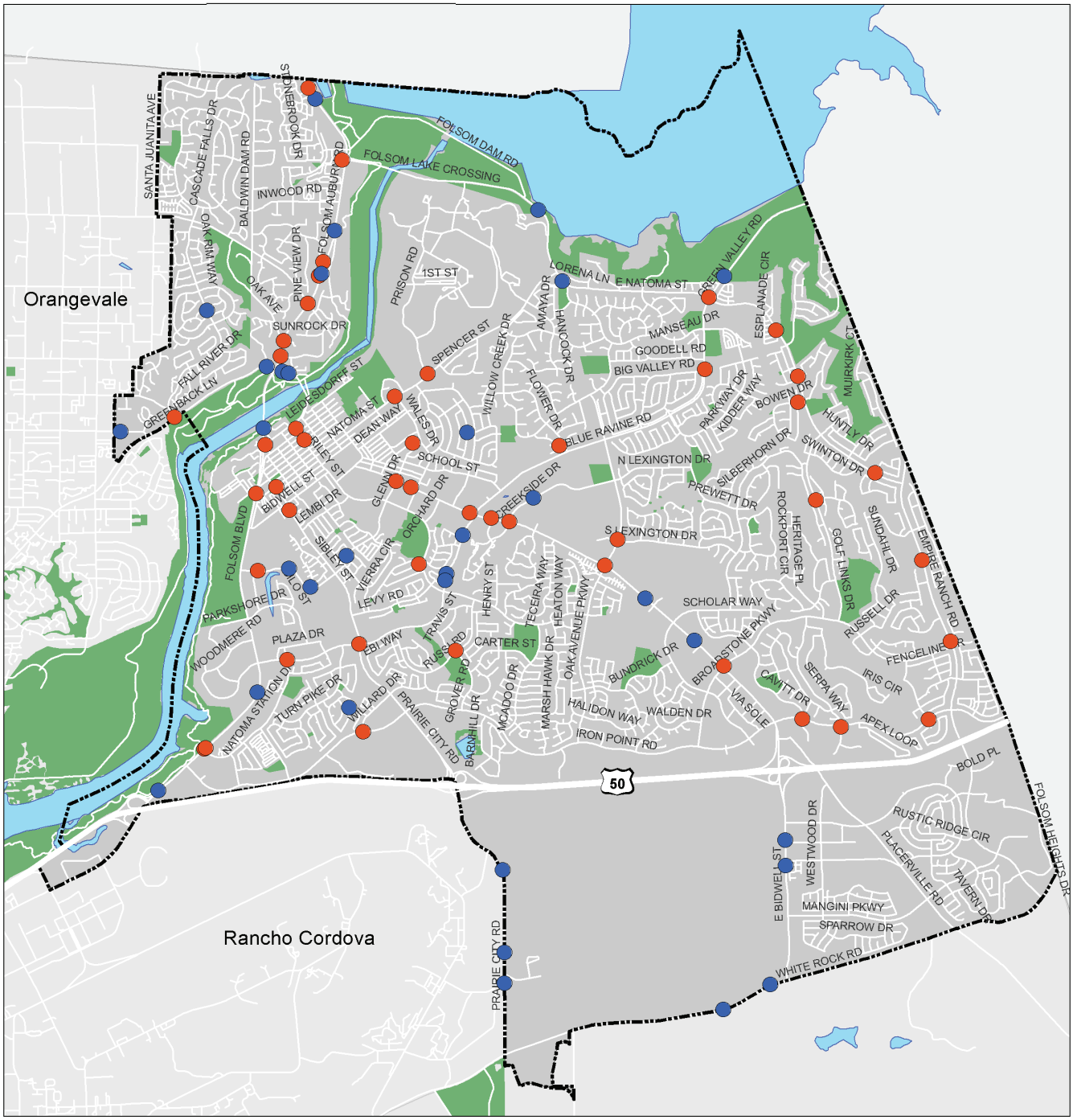


6.5 IDENTIFICATION OF HIGH-RISK LOCATIONS

Following the detailed collision analysis in **Sections 6.3** and **6.4**, the next step was to identify the City's high-risk roadway segments and intersections. A collision rate analysis was conducted for the whole City. This section lists the top 10 high-risk roadway segments and top 30 high-risk intersections. Detailed methodology and process for identification of high-risk roadway segments and intersections can be found in **Appendix E**.

This section ranks the top 10 high-risk roadway segments, and top 30 high-risk intersections on the City of Folsom's local roadways. It also includes information on collision type, and primary violation factors. Note that only fatal and severe injury collisions were considered for this analysis. **Figure 22** illustrates the roadway segment and intersection related F+SI collisions in the City of Folsom.

Figure 22. Intersection and Roadway Segment F+SI Collisions (2015 - 2019)



Fatal and Severe Injury Collisions by Facility Type (2015 - 2019)

Facility Type

- Roadway Segment Collision
- Intersection Collision
- Parks and Open Space
- City of Folsom

ROADWAY SEGMENTS

There were a total of 32 F+SI collisions that occurred on the roadway segments. Out of the 32 F+SI collisions, 12 led to fatalities, and 20 led to severe injury collisions. Perraud Drive between Alezane Drive and Briarcliff Drive and Bayline Circle between Whistle Stop Way and Kennar Way were observed to have the highest collision rates. The reason is attributed to having low ADT in the segments. Note that not all roadway segments with high collision rate have been prioritized for safety projects (**Chapter 9**). These locations help identify risk factors from the systemic point of view, roadway segments with similar characteristics, and emphasis areas (**Chapter 7**).

Table 1 lists the top ten identified high-risk roadway segments and their collision rates, collision type, and primary violation factor. Note that the high-rated collisions have occurred due to improper turning resulting in broadside collision, and unsafe speed resulting in vehicle and pedestrian collision. Vehicle and pedestrian collision was observed to be the predominant collision type. Unsafe speed was the most common violation factor.

Figure 23 illustrates all the collision locations, along with the calculated collision rate.

Table 1. City-Wide Collision Analysis Rate for Roadway Segments

Code	Roadway Segment	Collision Rate	# Collision	Severity	Collision Type	Primary Violation Factor
RS1	Bayline Circle, between Whistle Stop Way and Kennar Way	1.503	1	Severe Injury	Vehicle-Pedestrian	Unsafe Speed
RS2	Perraud Drive, between Alezane Drive and Briarcliff Drive	1.403	1	Severe Injury	Broadside	Improper Turning
RS3	Creekside Drive, between E Bidwell Street and 2,640 feet west from Oak Avenue Parkway	0.341	1	Fatal	Vehicle-Pedestrian	Pedestrian Right-of-Way Violation
RS4	American River Canyon Drive, between Oak Canyon Way and Canyon Rim Drive	0.339	1	Severe Injury	Hit Object	Unsafe Speed (2)
RS5	Glenn Drive, between 360 feet west from Sibley Street and 1,050 feet east from Folsom Boulevard	0.241	2	Severe Injury (2)	Head-On / Hit Object	Wrong Side of Road
RS6	White Rock Road, between 2,500 feet west from E Bidwell Street and 4,900 feet west from E Bidwell Street	0.179	1	Severe Injury	Head-On	Pedestrian Violation

Table 1. City-Wide Collision Analysis Rate for Roadway Segments (Continued)

Code	Roadway Segment	Collision Rate	# Collision	Severity	Collision Type	Primary Violation Factor
RS7	White Rock Road, between 100 feet west from E Bidwell Street and 2,500 feet west from E Bidwell Street	0.179	1	Severe Injury	Vehicle-Pedestrian	Pedestrian Violation
RS8	Glenn Drive, between Whiting Way and 360 feet west from Sibley Street	0.178	1	Fatal	Hit Object	Unsafe Speed
RS9	Green Valley Road, between East Natoma Street and 1,000 feet north from East Natoma Street	0.099	1	Severe Injury	Head-On	Not Stated
RS10	Greenback Lane, between Madison Avenue and Folsom City Boundary	0.089	1	Fatal	Vehicle-Pedestrian	Pedestrian Violation

Figure 23. City-Wide Collision Rate Analysis for Roadway Segments

Collision Rate Analysis - Roadway Segment Collisions

Collision Rate

- 0.046799 - 0.098509
- 0.098510 - 0.340508
- 0.340509 - 1.503279

- F+SI Collisions on Roadway Segments
- Parks and Open Space
- City of Folsom

INTERSECTIONS

There were a total of 51 F+SI collisions that occurred at intersections. Out of the 51 collisions, 17 led to fatalities and 34 led to severe injury collisions. The intersection of Arbuckle Avenue and Steeplechase Drive had the highest collision rate. This is attributed to low ADT on a residential street. Note that not all intersections with high collision rate have been prioritized for safety projects (**Chapter 9**). These locations help identify risk factors from the systemic point of view, intersections with similar characteristics, and emphasis areas (**Chapter 7**). Intersections with the same number of collisions and same ADT values resulted in identical collision rates.

Table 2 lists the top 30 identified high-risk intersections' collision rate along with their collision rate, collision type and primary violation factor. The analysis shows that the high-rated collisions have occurred due to unsafe speed, resulting in rear-end and vehicle-pedestrian collisions. Broadside and head-on collisions were observed to be the predominant collision types. Unsafe speed and automobile right-of-way were the most common violation factors.

Figure 24 illustrates the collision locations along with the calculated collision rate.

Table 2. City-Wide Collision Analysis Rate for Intersections

Code	Intersection	Collision Rate	# Collision	Severity	Collision Type	Primary Violation Factor
I1	Arbuckle Avenue / Steeplechase Drive	0.686	1	Fatal	Rear-End	Unsafe Speed
I2	Bowden Drive / Smith Way	0.376	1	Fatal	Vehicle-Pedestrian	Unsafe Speed
I3	Leidesdorff Street / Reading Street	0.295	1	Severe Injury	Vehicle-Pedestrian	Pedestrian Right-of-Way Violation
I4	Cavitt Drive / 1800 Cavitt Drive	0.277	1	Severe Injury	Sideswipe	Not Stated
I5	Russi Road / Grover Road	0.229	1	Severe Injury	Hit Object	Driving Under Influence
I6	E Natoma Street / Cameron Drive	0.106	1	Fatal	Broadside	Automobile Right-of-Way Violation

Table 2. City-Wide Collision Analysis Rate for Intersections (Continued)

Code	Intersection	Collision Rate	# Collision	Severity	Collision Type	Primary Violation Factor
I7	Sibley Street / Kelly Way	0.091	1	Fatal	Vehicle-Pedestrian	Not Stated
I8	Empire Ranch Road / Woodhead Street	0.090	1	Severe Injury	Head-On	Improper Turning
I9	E Bidwell Street / Oak Avenue Parkway	0.077	4	Fatal (2) / Severe Injury (2)	Rear-End / Sideswipe / Hit Object / Other	Unsafe Speed / Driving Under Influence (2) / Unknown
I10	Glenn Drive / Coolidge Drive	0.072	1	Severe Injury	Hit Object	Unsafe Speed
I11	Empire Ranch Road / Broadstone Parkway	0.064	1	Severe Injury	Hit Object	Unsafe Speed
I12	Iron Point Road / Carpenter Hill Road	0.063	1	Severe Injury	Broadside	Driving Under Influence
I13	Glenn Drive / Market Street	0.056	1	Severe Injury	Hit Object	Driving Under Influence
I14	Golf Links Drive / Sturbridge Drive	0.054	1	Severe Injury	Broadside	Automobile Right-of-Way Violation
I15*	E Natoma Street / Prison Road	0.46	1	Severe Injury	Head-On	Not Stated

Table 2. City-Wide Collision Analysis Rate for Intersections (Continued)

Code	Intersection	Collision Rate	# Collision	Severity	Collision Type	Primary Violation Factor
115*	Iron Point Road / Willard Drive	0.46	1	Fatal	Broadside	Automobile Right-of-Way Violation
116*	E Natoma Street / Green Valley Road	0.44	1	Severe Injury	Head-On	Driving Under Influence
	Natoma Street / Wales Drive	0.44	1	Severe Injury	Head-On	Automobile Right-of-Way Violation
	Natoma Street / Sibley Street	0.44	1	Severe Injury	Head-On	Automobile Right-of-Way Violation
117	Iron Point Road / Serpa Way	0.039	1	Severe Injury	Other	Traffic Signals and Signs
118*	E Natoma Street / Picasso Way	0.036	1	Severe Injury	Hit Object	Unknown
	E Natoma Street / Harvest Loop	0.036	1	Fatal	Hit Object	Unsafe Speed
119	Folsom Boulevard / Natoma Station Drive	0.034	2	Fatal / Severe Injury	Hit Object / Other	Unknown / Traffic Signals and Signs
120	Oak Avenue Parkway / S Lexington Drive	0.031	1	Severe Injury	Broadside	Not Stated

Table 2. City-Wide Collision Analysis Rate for Intersections (Continued)

Code	Intersection	Collision Rate	# Collision	Severity	Collision Type	Primary Violation Factor
I21	E Bidwell Street / Wales Drive	0.030	1	Severe Injury	Vehicle-Pedestrian	Pedestrian Violation
I22	E Bidwell Street / Broadstone Parkway	0.029	2	Fatal (2)	Broadside / Head-On	Traffic Signals and Signs / Driving Under Influence
I23*	Riley Street / Leidesdorff Street	0.028	1	Fatal	Hit Object	Unsafe Speed
	Riley Street / Figueroa Street	0.028	1	Severe Injury	Broadside	Traffic Signals and Signs
I24	Blue Ravine Road / Flower Drive	0.025	1	Severe Injury	Hit Object	Not Stated
I25	Blue Ravine Road / Natoma Station Drive	0.024	1	Fatal	Vehicle-Pedestrian	Traffic Signals and Signs
I26	Blue Ravine Road / Big Valley Road	0.022	1	Fatal	Vehicle-Pedestrian	Unknown
I27*	Folsom Auburn Road / Berry Creek Drive	0.021	1	Severe Injury	Sideswipe	Unknown
	Folsom Auburn Road / Marietta Court;	0.021	1	Severe Injury	Broadside	Automobile Right-of-Way Violation

Table 2. City-Wide Collision Analysis Rate for Intersections (Continued)

Code	Intersection	Collision Rate	# Collision	Severity	Collision Type	Primary Violation Factor
I27*	Folsom Auburn Road / Oak Avenue	0.021	1	Severe Injury	Other	Automobile Right-of-Way Violation
	E Bidwell Street / Harrington Way	0.021	1	Severe Injury	Broadside	Improper Passing
	E Bidwell Street / Glenn Drive	0.021	1	Severe Injury	Broadside	Unknown
	E Bidwell Street / Blue Ravine Road	0.021	1	Fatal	Vehicle-Pedestrian	Pedestrian Right-of-Way Violation
	E Bidwell Street / Creekside Drive	0.021	1	Severe Injury	Hit Object	Other Improper Driving
I28	Blue Ravine Road / Sibley Street	0.020	1	Severe Injury	Broadside	Traffic Signals and Signs
I29*	Folsom Auburn Road / Oak Avenue Parkway	0.018	1	Severe Injury	Overturned	Automobile Right-of-Way Violation
	Folsom Auburn Road / Hillswood Drive	0.018	1	Fatal	Broadside	Automobile Right-of-Way Violation
I30	Folsom Boulevard / Natoma Street	0.017	1	Severe Injury	Vehicle-Pedestrian	Pedestrian Violation

* Locations have same collision rate

Figure 24. City-Wide Collision Rate Analysis for Intersections

Collision Rate Analysis - Intersection Collisions

Collision Rate

- 0.013943 - 0.055782
- 0.055783 - 0.229170
- 0.229171 - 0.685789

City of Folsom

Parks and Open Space

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7 EMPHASIS AREAS AND SAFETY STRATEGIES

Emphasis areas are focus of roadway safety plan that are identified through the various collision types and factors resulting in fatal and severe injury collisions within the City of Folsom. Emphasis areas help in identifying appropriate safety strategies and countermeasures with the greatest potential to reduce collisions occurring at roadway segments and intersections. Emphasis areas help meet the plan's overall goal by establishing strategies, actions and performance measures. These strategies are identified through a comprehensive approach, following the four Es of traffic safety: Education, Enforcement, Engineering, and Emergency Medical Services. Combining multiple strategies under the various Es increases the likelihood of success in improving traffic safety.

This chapter summarizes the 10 emphasis area identified for the City of Folsom, they are:

1. Intersection Safety Improvements
2. Reduce Night-Time Collisions
3. Reduce Roadway Departure Collisions
4. Pedestrian Safety Improvements
5. Bicycle Safety Improvements
6. Reduce Broadside Collisions due to Automobile-Right-of-Way Violation
7. Reduce Hit Object Collisions due to Speeding and Impaired Driving
8. Reduce Collisions by Young-Adult Drivers and Aggressive Driving
9. Reduce Distracted Driving and Increase Driver Awareness
10. Reduce Collisions near School

Tables 3 to 12 summarizes the 10 emphasis areas, and the E-strategies (Education, Enforcement, Engineering, and Emergency Medical Services). Detailed information on the collision summary for the emphasis area; and possible countermeasures can be found in **Appendix F.**

Table 3. Emphasis Area 1 - Intersection Safety Improvements

Intersection Safety Improvements					
Objectives			Success Indicator		
Reduce the number of fatal and severe injury collisions at intersections.			A reduction in the number of fatal and severe injury collisions at high-risk intersections.		
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Education	Conduct public information and education campaign for intersection safety laws regarding traffic lights, stop signs, and turning left or right.	Awareness of traffic safety laws to be followed at intersections.	Number of education campaigns.	Online or print survey of public response.	ATP BTP OTS
Enforcement*	Targeted enforcement at high-risk intersections to monitor traffic law violations, right-of-way violations, and DUIs.	Reduction in intersection collisions due to traffic law violations, right-of-way violations, and DUI.	Number of tickets issued.	Number of intersection collisions related to traffic law, violations, compared to the previous year.	ATP OTS
Engineering**	• S02, Improve signal hardware: lenses, back-plates with retro-reflective borders, mounting, size, and number • S09, Install raised pavement markers and striping (Through Intersection) • NS06, Install/upgrade larger or additional stop signs or other intersection warning/ regulatory signs • NS07, Upgrade intersection pavement markings (NS.I.) • NS14, Install raised median on approaches (NS.I.) • R01, Add Segment Lighting • R22, Install/Upgrade signs with new fluorescent sheeting (regulatory or warning) • R27, Install delineators, reflectors and/or object markers	Reduction of traffic movement conflicts at intersections.	Number of intersections improved.	Number of intersection crashes related to traffic movement compared to the previous year.	HSIP ATP BTP SB1 RSTP MTIP STIP
EMS	Maintenance and upgradation of existing preemptive system	Decrease in response time.	EMS response time	EMS response time compared to the previous year.	OTS

*The purpose of increased enforcement is not to increase the number of citations but to encourage drivers to adhere to traffic laws.

**Countermeasures labeled S (Signalized), NS (Non-Signalized) and R (Roadway Segment) and their corresponding countermeasure number should be referred from the Local Roadway Safety Manual (LRSM, 2020)

Table 4. Emphasis Area 2 - Reduce Night-Time Collisions

Reduce Night-Time Collisions					
Objectives			Success Indicator		
Reduce the number of fatal and severe injury collisions occurring at night (no natural light).			Reduction in the number of night-time fatal and severe injury collisions at high-risk locations.		
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Education	Develop awareness program to inform residents of high-risk collision locations, the most common violations and collision types occurring at night.	Awareness regarding night-time collision types and traffic law violations.	Number of awareness program related events.	Online or print survey of public response.	ATP BTP OTS
Enforcement*	Increase patrolling at locations where night time collisions are higher.	Reduction in night-time collisions caused due to traffic violations.	Number of tickets for violators at night.	Number of night-time collisions compared to the previous year.	ATP OTS
Engineering**	• S02, Improve signal hardware: lenses, back-plates with retro-reflective borders, mounting, size, and number • S09, Install raised pavement markers and striping (Through Intersection) • NS06, Install/upgrade larger or additional stop signs or other intersection warning/ regulatory signs • NS07, Upgrade intersection pavement markings (NS.I.) • R01, Add Segment Lighting • R22, Install/Upgrade signs with new fluorescent sheeting (regulatory or warning) • R27, Install delineators, reflectors and/or object markers • Reflective paint on roadside objects, guard walls and poles	Reduction in fatal and severe injury collisions at night.	Number of locations improved to mitigate night-time collisions.	Number of fatal and severe injury collisions at night compared to the previous year.	HSIP ATP BTP SB1 RSTP MTIP STIP
EMS	Improve resource deployment at night for emergency responses at collision sites.	Decrease response time at night.	EMS vehicle response time at night.	Response time at night compared to the previous year.	OTS

*The purpose of increased enforcement is not to increase the number of citations but to encourage drivers to adhere to traffic laws.

**Countermeasures labeled S (Signalized), NS (Non-Signalized) and R (Roadway Segment) and their corresponding countermeasure number should be referred from the Local Roadway Safety Manual (LRSM, 2020)

Table 5. Emphasis Area 3 - Reduce Roadway Departure Collisions

Reduce Roadway Departure Collisions					
Objectives			Success Indicator		
Minimize the frequency and severity of roadway departure collisions.			Reduction in the number of fatal and severe injury collisions due to roadway departures.		
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Education	Education and outreach efforts to encourage safe-driving behaviors at roadway segments.	Awareness of safe-driving behavior on roadway segments.	Number of outreach events for safe-driving behaviors.	Number of attendees and responses at such outreach events.	ATP BTP OTS
Enforcement	• Implement stricter law enforcement and increase fines for violations that result in roadway departure crashes. • Deploy visible targeted enforcement at high-risk roadway departure locations.	Change in driving behavior leading to roadway departure.	Number of warnings issued for driving behavior leading to roadway departures.	Number of warnings issued compared to the previous year.	ATP OTS
Engineering*	• S09, Install raised pavement markers and striping (Through Intersection) • S11, Improve pavement friction (High Friction Surface Treatments) • NS07, Upgrade intersection pavement markings (NS.I.) • NS12, Improve pavement friction (High Friction Surface Treatments) • R05, Install impact attenuators • R06, Flatten side slopes • R15, Widen shoulder • R27, Install delineators, reflectors and/or object markers • R30, Install centerline rumble strips/stripes • R31, Install edgeline rumble strips/stripes • Reflective paint at intersection objects, guard walls and poles	Reduction in the frequency of roadway departures.	Number of frequent roadway departure locations improved.	Frequency of roadway departures crashes compared to the previous year.	HSIP ATP BTP SB1 RSTP MTIP STIP
EMS	Improve resource deployment for emergency responses at collision sites.	Decrease response time.	EMS vehicle response time.	Response time compared to the previous year.	OTS

*Countermeasures labeled S (Signalized), NS (Non-Signalized) and R (Roadway Segment) and their corresponding countermeasure number should be referred from the Local Roadway Safety Manual (LRSM, 2020)

Table 6. Emphasis Area 4 - Pedestrian Safety Improvements

Pedestrian Safety Improvements					
Objectives			Success Indicator		
Improve pedestrian network and develop safe walking environment for pedestrians.			Reduction in the number of pedestrian-related collisions within the City.		
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Education	• Pedestrian safety campaigns and outreach to raise their awareness of pedestrian safety needs through media outlets and public events. • Post signage along roadways in areas of anticipated or known high pedestrian activity advising motorists of zero-tolerance motor vehicle law enforcement. • Provide public outreach to advise of City efforts toward zero-tolerance motor vehicle law enforcement in high pedestrian activity.	Increase awareness for pedestrian safety.	Number of outreach events for pedestrian safety campaigns.	Number of attendees and responses for pedestrian safety campaigns.	ATP BTP OTS
Enforcement*	• Conduct frequent daytime and nighttime sobriety checkpoints throughout the City with a focus on areas of known or anticipated high pedestrian activity. • Targeted and zero-tolerance enforcement of motor vehicle speed limit violations, signal/right-of-way violations, aggressive driving, distracted driving, DUI, and illegal vehicle modifications in areas with known or anticipated high pedestrian activity.	Reduction in pedestrian right-of-way violation and vehicle-pedestrian conflict.	Number of citations issued for violating pedestrian right-of-way.	Number of citations issued for violating pedestrian right-of-way compared to the previous year.	ATP OTS
Engineering**	• S03, Improve signal timing (coordination, phases, red, yellow, or operation) • S09, Install raised pavement markers and striping (Through Intersection) • S19PB, Pedestrian Scramble • S21PB, Modify signal phasing to implement a Leading Pedestrian Interval	Safe walking environment for pedestrians by reducing the number of pedestrian-related collisions.	Number of pedestrian-related collisions.	Number of pedestrian-related collisions compared to the previous year.	HSIP ATP BTP SB1 RSTP MTIP STIP

Table 6. Emphasis Area 4 - Pedestrian Safety Improvements (Continued)

Pedestrian Safety Improvements					
Engineering**	• NS07, Upgrade intersection pavement markings (NS.I.) • NS19PB, Install raised medians (refuge islands) • NS21PB, Install/upgrade pedestrian crossing at uncontrolled locations (with enhanced safety features) • High-visibility ladder crosswalks • Mid-block curb extension • Pedestrian crossing flags and yield sign for pedestrian at crosswalk				
EMS	Develop programs that would enable residents to coordinate with EMS to understand strategies in dealing pedestrian casualties.	Residents equipped with in-hand EMS strategies till EMS arrival.	Number of pedestrian collision-related casualty dealt by EMS.	Number of pedestrian-related casualty dealt by EMS compared to the previous year.	OTS

*The purpose of increased enforcement is not to increase the number of citations but to encourage drivers to adhere to traffic laws.

**Countermeasures labeled S (Signalized), NS (Non-Signalized) and R (Roadway Segment) and their corresponding countermeasure number should be referred from the Local Roadway Safety Manual (LRSM, 2020)

Table 7. Emphasis Area 5 - Bicycle Safety Improvements

Bicycle Safety Improvements					
Objectives			Success Indicator		
Improve bicycle network and develop safe walking environment for bicyclists.			Reduction in the number of bicycle-related collisions within the City.		
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Education	• Conduct public education and outreach to raise their awareness of bicyclist safety needs, and promote helmet use. • Post signage along roadways throughout the City advising motorists of zero-tolerance motor vehicle law enforcement. • Provide public outreach to advise of City efforts toward zero-tolerance motor vehicle law enforcement.	Increase awareness for bicycle safety and helmet use.	Number of outreach events for pedestrian safety campaigns.	Number of attendees and responses for pedestrian safety campaigns.	ATP BTP OTS
Enforcement*	• Conduct frequent daytime sobriety checkpoints throughout the City. • Targeted and zero-tolerance enforcement of motor vehicle speed limit violations, signal/ right-of-way violations, aggressive driving, distracted driving, DUI, and illegal vehicle modifications throughout the City.	Reduction in bicycle right-of-way violation and vehicle-bicycle conflict.	Number of citations issued for violating bicycle right-of-way, and helmet use.	Number of citations issues for violating bicycle right-of-way, and helmet use compared to the previous year.	ATP OTS
Engineering**	• S03, Improve signal timing (coordination, phases, red, yellow, or operation) • S20PB, Install advance stop bar before crosswalk (Bicycle Box) • NS06, Install/upgrade larger or additional stop signs or other intersection warning/ regulatory signs • Highlighted crossing for bicyclists • Curb extensions at wide approaches • Avoid road construction and maintenance projects that eliminate or reduce bicycle facilities.	Safe bicycling environment by reducing the number of bicycle-vehicle collisions.	Number of bicycle-related collisions.	Number of bicycle-related collisions compared to the previous year.	HSIP ATP BTP SB1 RSTP MTIP STIP

Table 7. Emphasis Area 5 - Bicycle Safety Improvements (Continued)

Bicycle Safety Improvements					
Engineering**	• Provide bicycle lanes or otherwise accommodate the safe movement of on-road bicyclists as a component of all new road construction. • Provide improved intersections of Class I bicycle trails with City streets to provide increased visibility, increased bicycle ingress/merging priority.				
EMS	Develop programs that would enable residents to coordinate with EMS to understand strategies in dealing bicycle-vehicle collision casualties.	Residents equipped with in-hand EMS strategies till EMS arrival.	Number of bicycle collision-related casualty dealt by EMS.	Number of bicycle-related casualty dealt by EMS compared to the previous year.	OTS

*The purpose of increased enforcement is not to increase the number of citations but to encourage drivers to adhere to traffic laws.

**Countermeasures labeled S (Signalized), NS (Non-Signalized) and R (Roadway Segment) and their corresponding countermeasure number should be referred from the Local Roadway Safety Manual (LRSM, 2020)

Table 8. Emphasis Area 6 - Reduce Broadside Collisions due to Automobile Right-of-Way Violation

Reduce Broadside Collisions due to Automobile Right-Of-Way Violation					
Objectives			Success Indicator		
Reduce the number of automobile right-of-way violations that lead to broadside collisions.			Reduction in the number of automobile right-of-way violations that lead to broadside collisions on arterials and collectors.		
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Education	Distribute brochures/fliers with basic automobile right-of-way rules and illustrations at public events.	Educate drivers about automobile right-of-way rules and penalties associated.	Number of materials, with response survey, distributed.	Number of responses received, compared to the previous year.	ATP BTP OTS
Enforcement*	Targeted enforcement at locations with most automobile right-of-way violations, and implement strict penalties for such violations.	Reduction in the number of automobile right-of-way violations.	Number of citations issued for automobile right-of-way violations.	Number of citations issued for automobile right-of-way violations, compared to the previous year.	ATP OTS
Engineering**	• S02, Improve signal hardware: lenses, back-plates with retro-reflective borders, mounting, size, and number • S03, Improve signal timing (coordination, phases, red, yellow, or operation) • S09, Install raised pavement markers and striping (Through Intersection) • NS02, Convert to all-way STOP control (from 2-way or Yield control) • NS06, Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs • NS07, Upgrade intersection pavement markings (NS.I.) • NS11, Improve sight distance to intersection (Clear Sight Triangles) • R21, Improve pavement friction (High Friction Surface Treatments) • R30, Install centerline rumble strips	Reduction in the number of automobile right-of-way violations leading to broadside collisions.	Number of automobile right-of-way violations leading to broadside collisions.	Number of automobile right-of-way violations leading to broadside collisions, compared to the previous year.	HSIP ATP BTP SB1 RSTP MTIP STIP
EMS	Improve resource deployment for emergency responses at collision sites.	Decrease response time.	EMS vehicle response time.	Response time compared to the previous year.	OTS

*The purpose of increased enforcement is not to increase the number of citations but to encourage drivers to adhere to traffic laws.

**Countermeasures labeled S (Signalized), NS (Non-Signalized) and R (Roadway Segment) and their corresponding countermeasure number should be referred from the Local Roadway Safety Manual (LRSM, 2020)

Table 9. Emphasis Area 7 - Reduce Hit Object Collisions due to Speeding and Impaired Driving

Reduce Hit Object Collisions due to Speeding and Impaired Driving					
Objectives			Success Indicator		
Reduce the number of collisions due to unsafe speeding and impaired driving that result in hit object collisions.			Reduction in the number of fatal and severe injury collisions due to unsafe speeding and impaired driving on all City roads.		
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Education	Conduct public education and outreach activities that elevate the awareness of the dangers of speeding and impaired driving	Awareness about the dangers of speeding and impaired driving.	Number of public outreach events.	Number of attendees of public outreach events.	ATP BTP OTS
Enforcement*	• Increase the number of sobriety checkpoints and saturation patrol to increase visibility of enforcement. • Increase penalties for repeat offenders.	Reduce the number of DUI and unsafe speeding violations.	Number of citations issued for DUI and unsafe speeding.	Number of citations issued for DUI and unsafe speeding, compared to the previous year.	ATP OTS
Engineering**	• S02, Improve signal hardware: lenses, back-plates with retro-reflective borders, mounting, size, and number • S03, Improve signal timing (coordination, phases, red, yellow, or operation) • S09, Install raised pavement markers and striping (Through Intersection) • S11, Improve pavement friction (High Friction Surface Treatments) • S12, Install raised median on approaches (S.I.) • NS06, Install/upgrade larger or additional stop signs or other intersection warning/ regulatory signs • NS07, Upgrade intersection pavement markings (NS.I.) • NS10, Install transverse rumble strips on approaches • NS11, Improve sight distance to intersection (Clear Sight Triangles)				HSIP ATP BTP SB1 RSTP MTIP STIP

Table 9. Emphasis Area 7 - Reduce Hit Object Collisions due to Speeding and Impaired Driving (Continued)

Reduce Hit Object Collisions due to Speeding and Impaired Driving					
Engineering**	• NS12, Improve pavement friction (High Friction Surface Treatments) • R05, Install impact attenuators • R06, Flatten side slopes • R15, Widen shoulder • R22, Install/Upgrade signs with new fluorescent sheeting (regulatory or warning) • R27, Install delineators, reflectors and/or object markers • R30, Install centerline rumble strips/stripes • R31, Install edgeline rumble strips/stripes • Decrease width of travel lanes. • Simplify turn configurations. • Decrease curb radius of intersections.	Reduce the number of fatal and severe injury collisions resulted from unsafe speeding and impaired driving.	Number of fatal and severe injury collisions resulted from unsafe speeding and impaired driving.	Number of fatal and severe injury collisions resulted from unsafe speeding and impaired driving, compared to the previous year	
EMS	Improve resources to handle collisions resulted because of impaired driving.	Reduce fatalities in impaired driving collisions.	Number of fatalities in impaired driving collisions.	Number of fatalities in impaired driving collisions, compared to the previous year.	OTS

*The purpose of increased enforcement is not to increase the number of citations but to encourage drivers to adhere to traffic laws.

**Countermeasures labeled S (Signalized), NS (Non-Signalized) and R (Roadway Segment) and their corresponding countermeasure number should be referred from the Local Roadway Safety Manual (LRSM, 2020)

Table 10. Emphasis Area 8 - Reduce Collisions by Young-Adult Drivers and Aggressive Driving

Reduce Collisions by Young-Adult Drivers and Aggressive Driving					
Objectives			Success Indicator		
Instill safe-driving behavior among young adults (between the ages of 18 to 24).			Reduction in the number of collisions where young-adults (between the ages of 18 to 24) were involved.		
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Education	• Pre and post license safe-driving education for young drivers. Conduct formal courses for beginner drivers at schools, and community centers. • Ensure City public outreach regarding increased and strict traffic law enforcement uses media commonly used by young adults.	Awareness about safe driving behavior among young drivers.	Number of formal courses for safe-driving education for young drivers.	Number of attendees of formal courses for safe-driving education for young drivers	ATP BTP OTS
Enforcement*	Increase enforcement, penalties and prosecution of young drivers who violate traffic laws.	Reduction in the number of young drivers involved in collisions.	Number of citations issued to young-adults between the ages of 18 to 24.	Number of citations issued to young-adults between the ages of 18 to 24, compared to the previous year.	ATP OTS
Engineering**	• S02, Improve signal hardware: lenses, back-plates with retro-reflective borders, mounting, size, and number • S03, Improve signal timing (coordination, phases, red, yellow, or operation) • S09, Install raised pavement markers and striping (Through Intersection) • S11, Improve pavement friction (High Friction Surface Treatments) • S12, Install raised median on approaches (S.I.) • NS06, Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs • NS07, Upgrade intersection pavement markings (NS.I.)	Reduction in the number of collisions caused due to improper driving, improper turning, right-of-way violations and speeding, among young adults.	Number of collisions caused by young-adults between the ages of 18 to 24.	Number of collisions caused by young-adults between the ages of 18 to 24, compared to previous year.	HSIP ATP BTP SB1 RSTP MTIP STIP

Table 10. Emphasis Area 8 - Reduce Collisions by Young-Adult Drivers and Aggressive Driving (Continued)

Reduce Collisions by Young-Adult Drivers and Aggressive Driving					
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Engineering**	• NS10, Install transverse rumble strips on approaches • NS12, Improve pavement friction (High Friction Surface Treatments) • R03, Install Median Barrier • R06, Flatten side slopes • R15, Widen shoulder • R22, Install/Upgrade signs with new fluorescent sheeting (regulatory or warning) • R27, Install delineators, reflectors and/or object markers • R30, Install centerline rumble strips/ stripes • R31, Install edgeline rumble strips/stripes • Decrease width of travel lanes. • Decrease curb radius of intersections.				
EMS	Improve resource deployment for emergency responses at collision sites.	Decrease response time.	EMS vehicle response time.	Response time compared to the previous year.	OTS

*The purpose of increased enforcement is not to increase the number of citations but to encourage drivers to adhere to traffic laws.

**Countermeasures labeled S (Signalized), NS (Non-Signalized) and R (Roadway Segment) and their corresponding countermeasure number should be referred from the Local Roadway Safety Manual (LRSM, 2020)

Table 11. Emphasis Area 9 - Reduce Distracted Driving and Increase Driver Awareness

Reduce Distracted Driving and Increase Driver Awareness					
Objectives			Success Indicator		
Reduce distracted driving and increase driver awareness.			Reduction in the number of collisions resulted from distracted driving.		
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Education	Public service announcements informing residents of the dangers of distracted driving and encourage residents to be aware of their surroundings.	Awareness regarding the dangers of distracted driving and increase driver awareness.	Number of public service announcement issued.	Number of responses received from residents.	ATP BTP OTS
Enforcement*	Implement strict penalty for distracted driving.	Alert while driving.	Number of citations issued for distracted driving.	Number of citations issued for distracted driving, compared to the previous year.	ATP OTS
Engineering**	• S02, Improve signal hardware: lenses, back-plates with retro-reflective borders, mounting, size, and number • S03, Improve signal timing (coordination, phases, red, yellow, or operation) • S09, Install raised pavement markers and striping (Through Intersection) • S11, Improve pavement friction (High Friction Surface Treatments) • NS02, Convert to all-way STOP control (from 2-way or Yield control) • NS06, Install/upgrade larger or additional stop signs or other intersection warning/ regulatory signs • NS07, Upgrade intersection pavement markings (NS.I.) • NS11, Improve sight distance to intersection (Clear Sight Triangles) • NS10, Install transverse rumble strips on approaches	Reduction in broadside, rear-end, and head-on collisions caused due to distracted driving.	Number of collisions resulted from distracted driving.	Number of collisions resulted from distracted driving, compared to the previous year.	HSIP ATP BTP SB1 RSTP MTIP STIP

Table 11. Emphasis Area 9 - Reduce Distracted Driving and Increase Driver Awareness (Continued)

Reduce Distracted Driving and Increase Driver Awareness					
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Engineering*	• NS12, Improve pavement friction (High Friction Surface Treatments) • R03, Install Median Barrier • R22, Install/Upgrade signs with new fluorescent sheeting (regulatory or warning) • R27, Install delineators, reflectors and/or object markers • R30, Install centerline rumble strips/stripes • R31, Install edgeline rumble strips/stripes				
EMS	Improve resource deployment for emergency responses at collision sites.	Decrease response time.	EMS vehicle response time.	Response time compared to the previous year.	OTS

*The purpose of increased enforcement is not to increase the number of citations but to encourage drivers to adhere to traffic laws.

**Countermeasures labeled S (Signalized), NS (Non-Signalized) and R (Roadway Segment) and their corresponding countermeasure number should be referred from the Local Roadway Safety Manual (LRSM, 2020)

Table 12. Emphasis Area 10 - Reduce Collisions near School

Reduce Collisions Near School					
Objectives			Success Indicator		
Reduce the number of collisions within 500 feet of school properties.			Reduction in the number of collisions at intersections and roadway segments within 500 feet of school properties within the City.		
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Education	Develop safe routes to school (SRTS) program to educate school-goers about safe walking practices and activities on road safety.	Awareness about safe walking practices and road safety.	Number of schools participating in SRTS the program.	Number of responses received through the SRTS program.	ATP BTP OTS SR2S
Enforcement*	Targeted enforcement at intersections and roadway segments around schools during pick-up and drop-off hours.	Reduce vehicle violations against school-goers	Number of citations issued around school properties.	Number of citations issued around school properties, compared to the previous year.	ATP OTS
Engineering**	• S09, Install raised pavement markers and striping (Through Intersection) • S12, Install raised median on approaches (S.I.) • S21PB, Modify signal phasing to implement a Leading Pedestrian Interval (LPI) • NS06, Install/upgrade larger or additional stop signs or other intersection warning/ regulatory signs • NS07, Upgrade intersection pavement markings (NS.I.) • NS08, Install Flashing Beacons at Stop-Controlled Intersections • NS21PB, Install/upgrade pedestrian crossing at uncontrolled locations (with enhanced safety features) • NS22PB, Install Rectangular Rapid Flashing Beacon (RRFB)	Reduce the number of collisions within 500 feet school properties.	Number of collisions near school properties.	Number of collisions near school properties, compared to the previous year.	HSIP ATP BTP SB1 RSTP MTIP STIP

Table 12. Emphasis Area 10 - Reduce Collisions near School (Continued)

Reduce Collisions Near School					
	Action	Target Output	Performance Measure	Monitoring and Evaluation	Potential Funding Sources
Engineering**	• R14, Road Diet (Reduce travel lanes from 4 to 3 and add a two way left-turn and bike lanes) • R22, Install/Upgrade signs with new fluorescent sheeting (regulatory or warning) • R35PB, Install/upgrade pedestrian crossing (with enhanced safety features) • R37PB, Install Rectangular Rapid Flashing Beacon (RRFB)				
EMS	Improve resource deployment for emergency responses at collision sites within 500 feet of schools.	Decrease response time to collision sites near 500 feet of school.	EMS vehicle response time to collision sites near 500 feet of school.	Response time to collision sites near 500 feet of school, compared to the previous year.	OTS

*The purpose of increased enforcement is not to increase the number of citations but to encourage drivers to adhere to traffic laws.

**Countermeasures labeled S (Signalized), NS (Non-Signalized) and R (Roadway Segment) and their corresponding countermeasure number should be referred from the Local Roadway Safety Manual (LRSM, 2020)

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8 IDENTIFICATION OF NEEDS

This chapter summarizes the community's needs as collected through project website, virtual workshop, interactive map input, and social media comments. A total of 97 responses were collected through the project website, virtual workshop, and social media platforms. The results of the public outreach were pulled and summarized on August 6, 2020. Out of the 97 total responses, 62 responses (40 points and 22 lines drawn) were received through the virtual workshop. Detailed information on responses collected through various online platforms can be found in **Appendix G**. The most common responses were related to the following:

- Speeding
- Dangerous for Walking or Cycling
- Lack of Signage

Figure 25 shows the responses noted at least twice in the virtual workshop, website, email correspondence, and social media comments. Virtual workshop results can be seen in **Figure 26.**

Figure 25. Responses Received from Residents

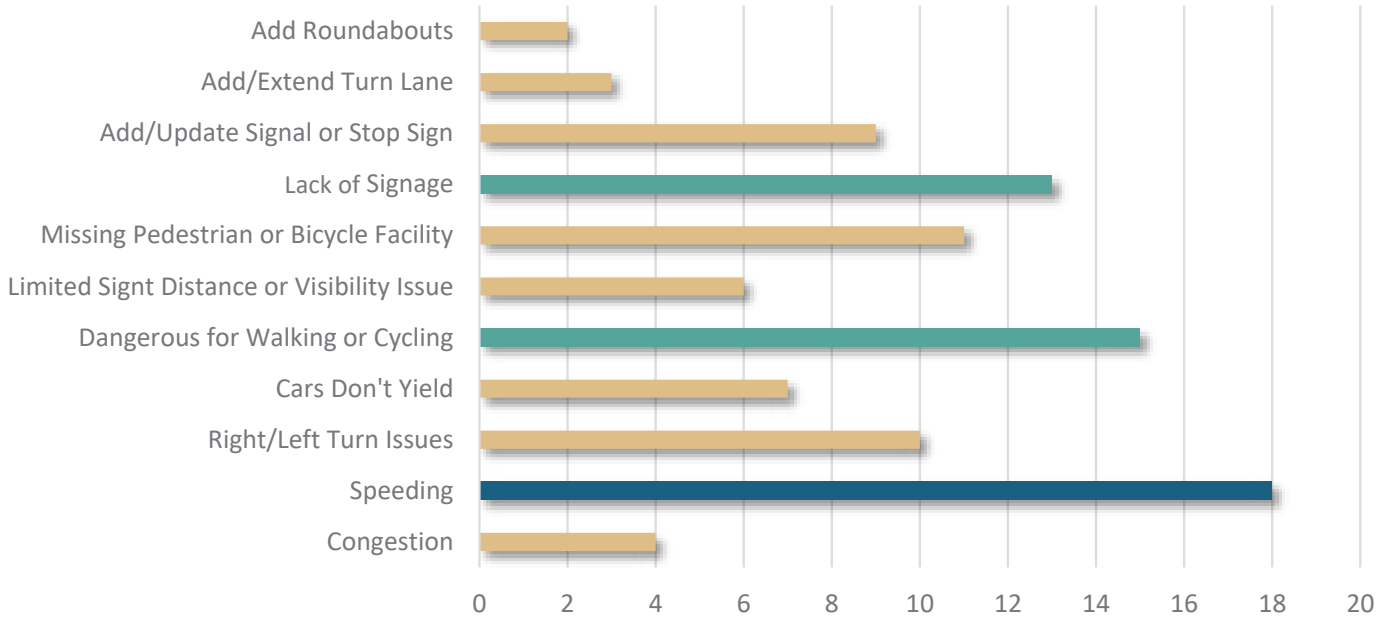
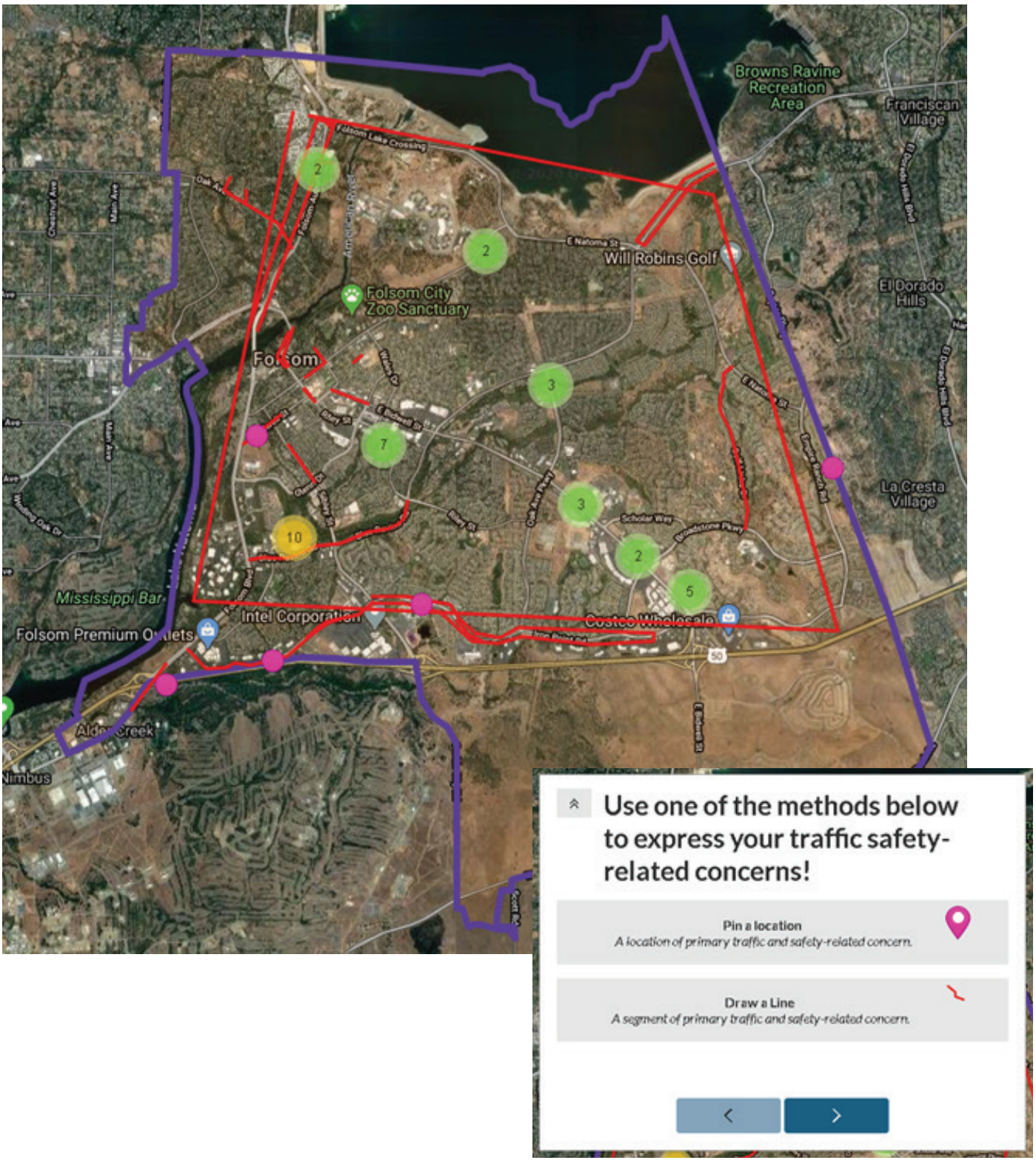


Figure 26. Virtual Workshop Results



9 VIABLE SAFETY PROJECTS

This chapter summarizes the process of selecting safety projects as part of the analysis for the LRSP. The next step after the identification of high-risk locations, emphasis areas and applicable countermeasures is to identify location specific safety improvements for all high-risk roadway segments and intersections.

Specific countermeasures and improvements were selected from the Local Roadway Safety Manual (LRSM, 2020), where S refers to improvements at signalized locations, NS refers to improvements at non-signalized locations, and R refers to improvements at roadway segments. The corresponding numerical refers to countermeasure number in the LRSM (2020). The countermeasures were grouped into safety projects for high-risk intersections, and roadway segments. A total of 10 safety projects were developed. All countermeasures were identified based on extensive analysis, observations, and City staff input. The most applicable and appropriate countermeasures as identified have been grouped together to form projects that can help make high-risk locations safer.

Table 13 lists the safety projects for high-risk intersections and roadway segments, along total base planning level cost (2020 dollar amounts) and the resultant Benefit-Cost (B/C) Ratio. The "Total Benefit" estimates for the proposed improvements being evaluated in the proactive safety analysis is calculated. This is divided by the "Total Cost per Location" estimates for the proposed improvements, giving the resultant B/C Ratio. The B/C Ratio Calculation follows the methodology as mentioned in the LRSM (2020). **Appendix H** lists the detailed methodology to calculate B/C Ratio, the complete cost, benefit and B/C Ratio calculation spreadsheet.

Table 13. List of Viable Safety Projects

Location	CM1[1]	CM2[2]	CM3[3]	Cost per Location	B/C Ratio
Project 1. Upgrade Signal Hardware (S02) and Signal Timing (S03)					
Folsom Boulevard / Natoma Station Drive	S02	S03	-	$ 126,210	
Blue Ravine Road / Flower Drive	S02	S03	-	$ 126,210	
E Bidwell Street / Blue Ravine Road	S02	S03	-	$ 126,210	
Folsom Auburn Road / Oak Avenue Parkway	S02	S03	-	$ 126,210	
E Natoma Street / Golf Links Drive	S02	S03	-	$ 126,210	
Folsom Boulevard / Iron Point Road	S02	S03	-	$ 126,210	6.5
Riley Street / Scott Street	S02	S03	-	$ 126,210	
Oak Avenue and Ped Crossing (between N. Lexington and S. Lexington)	S02	S03	-	$ 126,210	
Riley Street / Russi Road	S02	S03	-	$ 126,210	
Blue Ravine Road / Russi Road	S02	S03	-	$ 126,210	
Golf Links Drive / Silberhorn Drive	S02	S03	-	$ 126,210	
Total Cost of Project				$ 1,388,310	
Project 2. Non-Signalized Intersection - Install/Upgrade Raised Pavement Markers (NS07) and Regulatory Signs (NS06)					
Leidesdorff Street / Reading Street	NS06	NS07	-	$ 7,112	
Cavitt Drive / 1800 Cavitt Drive	NS06	NS07	-	$ 7,112	
Russi Road / Grover Road	NS06	NS07	-	$ 7,112	
E Natoma Street / Cameron Drive	NS06	NS07	-	$ 7,112	
Empire Ranch Road / Woodhead Street	NS06	-	-	$ 5,880	
Glenn Drive / Coolidge Drive	NS06	NS07	-	$ 7,112	
Iron Point Road / Carpenter Hill Road	NS06	-	-	$ 5,880	
Glenn Drive / Market Street	-	NS07	-	$ 1,232	277.81
Golf Links Drive / Sturbridge Drive	NS06	NS07	-	$ 7,112	
Natoma Street / Sibley Street	NS06	NS07	-	$ 7,112	
E Natoma Street / Picasso Way	NS06	-	-	$ 5,880	
Riley Street / Figueroa Street	NS06	-	-	$ 5,880	
Folsom Auburn Road / Berry Creek Drive	NS06	NS07	-	$ 7,112	
Folsom Auburn Road / Oak Avenue	NS06	-	-	$ 5,880	
E Bidwell Street / Harrington Way	NS06	NS07	-	$ 7,112	

Table 13. List of Viable Safety Projects (Continued)

Location	CM1[1]	CM2[2]	CM3[3]	Cost per Location	B/C Ratio
Folsom Auburn Road / Hillswood Drive	NS06	NS07	-	$ 7,112	
Total Cost of Project				**$ 95,872**	
Project 3. Signalized Intersection - Install/Upgrade Raised Pavement Markers (S09)					
E Bidwell Street / Oak Avenue Parkway	S09	-	-	$ 3,024	213.60
Empire Ranch Road / Broadstone Parkway	S09	-	-	$ 3,024	
E Natoma Street / Prison Road	S09	-	-	$ 3,024	
Iron Point Road / Willard Drive	S09	-	-	$ 3,024	
E Natoma Street / Green Valley Road	S09	-	-	$ 3,024	
Folsom Boulevard / Natoma Station Drive	S09	-	-	$ 3,024	
E Bidwell Street / Broadstone Parkway	S09	-	-	$ 3,024	
Blue Ravine Road / Natoma Station Drive	S09	-	-	$ 3,024	
E Bidwell Street / Glenn Drive	S09	-	-	$ 3,024	
E Bidwell Street / Creekside Drive	S09	-	-	$ 3,024	
Folsom Auburn Road / Oak Avenue Parkway	S09	-	-	$ 3,024	
Folsom Auburn Road / Folsom Lake Crossing	S09	-	-	$ 3,024	
Total Cost of Project				**$ 36,288**	
Project 4. Improve Pedestrian and Bicyclist Safety at Intersections					
E Bidwell Street / Oak Avenue Parkway	S20PB	-	-	$ 26,544	140.01
Iron Point Road / Willard Drive	S20PB	-	-	$ 26,544	
Iron Point Road / Serpa Way	S20PB	-	-	$ 26,544	
Folsom Boulevard / Natoma Station Drive	S20PB	-	-	$ 26,544	
Oak Avenue Parkway / S Lexington Drive	S20PB	-	-	$ 26,544	
E Bidwell Street / Wales Drive	-	S21PB	S17PB	$ 16,240	
Blue Ravine Road / Natoma Station Drive	-	S21PB	S17PB	$ 16,240	
Blue Ravine Road / Big Valley Road	-	S21PB	S17PB	$ 16,240	
E Bidwell Street / Glenn Drive	S20PB	-	-	$ 26,544	
E Bidwell Street / Blue Ravine Road	-	S21PB	S17PB	$ 16,240	
Folsom Auburn Road / Oak Avenue Parkway	S20PB	-	-	$ 26,544	

Table 13. List of Viable Safety Projects (Continued)

Location	CM1[1]	CM2[2]	CM3[3]	Cost per Location	B/C Ratio
Folsom Boulevard / Natoma Street	-	S21PB	S17PB	$ 16,240	
Greenback Lane / American River Canyon Drive	-	S21PB	S17PB	$ 16,240	
Total Cost of Project				**$ 283,248**	
Project 5. Non-Signalized Intersection - Install Rumble Strips (NS10) and Medians at Approaches (NS14)					
Russi Road / Grover Road	NS10	NS14	-	$ 294,973	12.76
Natoma Street / Sibley Street	NS10	NS14	-	$ 294,973	
Folsom Auburn Road / Berry Creek Drive	NS10	NS14	-	$ 294,973	
E Natoma Street / Picasso Way	NS10	-	-	$ 14,280	
Glenn Drive / Market Street	-	NS14	-	$ 280,693	
Total Cost of Project				**$ 1,179,892**	
Project 6. Signalized Intersection - Improve pavement friction (High Friction Surface Treatments) (S11)					
Empire Ranch Road / Broadstone Parkway	S11	-	-	$ 268,800	7.55
E. Natoma Street / Harvest Loop	S11	-	-	$ 268,800	
Oak Avenue Parkway / S. Lexington Drive	S11	-	-	$ 268,800	
Riley Street / Leidesdorff Street	S11	-	-	$ 268,800	
Total Cost of Project				**$ 1,075,200**	
Project 7. Upgrade Signs (R22) and Pedestrian Crossing (R35PB) at Roadway Segments					
American River Canyon Drive, between Oak Canyon Way and Canyon Rim Drive	R22	-	-	$ 4,534	141.69
Greenback Lane, between Madison Avenue and Folsom City Boundary	R22	R35PB	-	$ 40,314	
E. Bidwell Street, between College Parkway and 900 feet north of College Parkway	R22	-	-	$ 4,534	
E. Bidwell Street, between Scholar Way and Powercenter Drive	R22	-	-	$ 4,534	
Folsom Boulevard, between US-50 and Iron Point Road	R22	-	-	$ 4,534	
Total Cost of Project				**$ 58,449**	

Table 13. List of Viable Safety Projects (Continued)

Location	CM1[1]	CM2[2]	CM3[3]	Cost per Location	B/C Ratio
Project 8. Install Segment Lighting (R01), and Delineators/Reflectors/Marked Objects (R27)					
Glenn Drive, between 360 feet west from Sibley Street and 1,050 feet east from Folsom Boulevard	-	R27	-	$ 22,050	
Blue Ravine Road between 1,200 ft south of Crossing Way and 400 ft north of Riley Street	-	R27	-	$ 22,050	
Blue Ravine Road between 750 ft south of E. Bidwell Street and 400 ft north of Crossing Way	-	R27	-	$ 22,050	
Greenback Lane, between Jedidiah Smith Memorial Trail and Folsom Auburn Road	-	R27	-	$ 22,050	
Greenback Lane, between Folsom Auburn Road and Folsom Ranch Road	-	R27	-	$ 22,050	
Folsom Auburn Road, between Berry Creek Drive and 560ft north of Oak Avenue	-	R27	-	$ 22,050	13.68
Folsom Auburn Road, between Berry Creek and 900 ft north of Berry Creek Drive	-	R27	-	$ 22,050	
Folsom Boulevard between Figueroa Street and American Bike	-	R27	-	$ 22,050	
Folsom Boulevard, between US-50 and Iron Point Road	-	R27	-	$ 22,050	
Prairie City Road, between 2,000 ft north of White Rock Road and 4,200 ft north of White Rock Road	R01	-	-	$ 680,680	
E. Bidwell Street, between Old Ranch Road and Mangini Parkway	R01	-	-	$ 680,680	
Total Cost of Project				**$ 1,559,810**	
Project 9. Install Rumble Strips (R30, R31), and Widen Shoulders (R15) along Segments					
Glenn Drive, between 360 feet west from Sibley Street and 1,050 feet east from Folsom Boulevard	R15	-	R31	$ 114,387	57.85

Table 13. List of Viable Safety Projects (Continued)

Location	CM1[1]	CM2[2]	CM3[3]	Cost per Location	B/C Ratio
Blue Ravine Road between 1,200 ft south of Crossing Way and 400 ft north of Riley Street	R15	-	R31	$ 114,387	
Folsom Auburn Road, between Berry Creek and 900 ft north of Berry Creek Drive	R15	-	R31	$ 114,387	
Prairie City Road, between 2,000 ft north of White Rock Road and 4,200 ft north of White Rock Road	R15	-	R31	$ 114,387	
Greenback Lane, between Jedidiah Smith Memorial Trail and Folsom Auburn Road	-	R30	-	$ 11,550	57.85
American River Canyon Drive, between Oak Canyon Way and Canyon Rim Drive	-	R30	R31	$ 34,650	
E. Bidwell Street, between US-50 and Old Ranch Road	-	R30	R31	$ 34,650	
E. Bidwell Street, between Old Ranch Road and Mangini Parkway	-	R30	R31	$ 34,650	
Folsom Boulevard, between US-50 and Iron Point Road	-	-	R31	$ 23,100	
Total Cost of Project				**$ 596,148**	
Project 10. Install Segment Lighting (R01), Median Barrier (R03) and Dynamic Speed Sign (R26)					
Folsom Lake Crossing, between Folsom Dam Road and Johnny Cash Trail entrance	R01	R03	R26	$ 588,875	
E. Natoma Street between Folsom Lake Crossing and Gionata Way	R01	R03	R26	$ 548,065	16.06
E. Natoma Street between Cimmaron Circle and Fargo Way	R01	R03	R26	$ 479,430	
Folsom Auburn Road between Pinebrook Drive and Folsom Dam Road	R01	R03	R26	$ 616,700	
Total Cost of Project				**$ 2,233,070**	

[1] CM1 - 1st Countermeasure
[2] CM2 - 2nd Countermeasure
[3] CM3 - 3rd Countermeasure

10 IMPLEMENTATION AND EVALUATION

The LRSP is a guidance document that requires an update every two years. Each update will be led by the City of Folsom's Department of Public Works in coordination with the potential safety partners. The Traffic Safety Committee will oversee the LRSP process. It will be adopted after approval from the City Council. This document was developed based on community needs, stakeholder input, and collision analysis conducted to identify priority emphasis areas throughout the City. The implementation of strategies under each emphasis area would aim to reduce fatal and severe injury collisions in the coming years.

This chapter describes how the LRSP should be implemented, monitored, evaluated, and updated. A step-by-step implementation process is illustrated in **Figure 27**.

10.1 IMPLEMENTATION

The LRSP document provides engineering, education, enforcement, and emergency medical service-related countermeasures that can be implemented throughout the City to reduce fatal and severe injury collisions. It is recommended that the City of Folsom implement the selected projects (as shown in **Chapter 9**) at high-risk locations in coordination with other projects proposed for the City's infrastructure development in their future Capital Improvement Plans.

The success of the LRSP can be achieved by fostering communication among the City and the stakeholders.

10.2 MONITORING AND **EVALUATION**

For the success of the LRSP, it is crucial to monitor and evaluate the various E-strategies continuously. Monitoring and evaluation help provide accountability, ensures the effectiveness of the countermeasures for each emphasis area, and help making decision on the need for new strategies. The process would help the City make informed decisions regarding the implementation plan's progress and accordingly, update the goals and objectives of the plan.

After implementing countermeasures, the strategies should be evaluated annually as per their performance measures (as shown in **Tables 3 to 12**). The evaluation should be recorded in a before-after study to validate the effectiveness of each countermeasure as per the following observations:

- Number of fatal and severe injury collisions
- Number of police citations and warnings
- Number of public comments and concerns

Evaluation should be conducted during similar time periods and durations every year. The most important measure of success of the LRSP should be the reduction in fatal and severe injury collisions throughout the City. If the number of fatal and severe injury collisions doesn't decrease initially, then the countermeasures should be evaluated as per the other observations, as mentioned above. The effectiveness of the countermeasures should be compared to the goals for each emphasis area.

10.3 LRSP **UPDATE**

The LRSP is a guidance document and is recommended to be updated every two years after monitoring performance measures focused on the status and progress of the E-strategies for each emphasis area. The City of Folsom's Public Works Department will be accountable for the progress of the plan goals. An annual stakeholder meeting with the safety partners is also recommended to be hosted to discuss the progress for each emphasis area and oversee the implementation plan. The document should then be updated as per the latest collision data, emerging trends, and the E-strategies' progress and implementation. The Traffic Safety Committee will oversee the LRSP process. It should be adopted after approval from the City Council.

Figure 27. Implementation Process of the LRSP