Local Roadway Safety Plan

City of Marysville

May 02, 2022

Acknowledgments

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Executive Summary

The City of Marysville is pleased to present its Local Roadway Safety Plan (LRSP). The purpose of this plan is to provide the City a framework and toolbox for identifying priority road safety improvements by performing collision analysis, identifying safety issues on Marysville's streets, and developing citywide systemic, as well as location specific countermeasures. The recommended countermeasures are multimodal and span four traffic safety disciplines: Engineering, Enforcement, Education, and Emergency Services. These countermeasures then can be used to identify priority projects and programs for capital & operating funding, the development of fee programs, identifying appropriate mitigation measures and conditions of approval for development, and prepare future grant funding applications such as but not limited to the Highway Safety Improvement Program (HSIP).

This LRSP is effectively divided into 3 core parts. The first is an assessment of historical collision trends and patterns. The second is identification of systemic Citywide collision patterns, with a framework and toolbox for countering those collision patterns. The third is identification of the highest location specific collision patterns, with recommended countermeasures to mitigate those patterns.

1.1 Historical Collision Trends

Section 7 of this report provides a comprehensive analysis of Marysville's collision trends between 2015 - 2019. Although 2020 data is available it has been omitted due to the unique nature of travel patterns during the global pandemic. Over the course of this five-year period overall collisions have fluctuated, peaking in both 2016 and 2018, with the lowest record of collisions in 2019. Collisions within the City have primarily been concentrated along 5th St, 10th St, 12th St, B St, and E St.

1.2 Systemic Citywide Patterns & Countermeasures

One of the most effective ways to reduce Citywide collisions is to identify the highest incident locations, analyze the collision patterns at those locations, develop targeted countermeasures to those patterns, then prioritize and implement the measures regularly and systematically.

Section 11 of this report assesses the most common collision types and the contributing factors leading to those collision trends. Speeding is the number one factor leading to collisions throughout the City, followed by automobile right-of-way, then traffic signals and signs. To counter these types of collisions the plan recommends a series of emphasis areas and toolboxes which follow these general approaches:

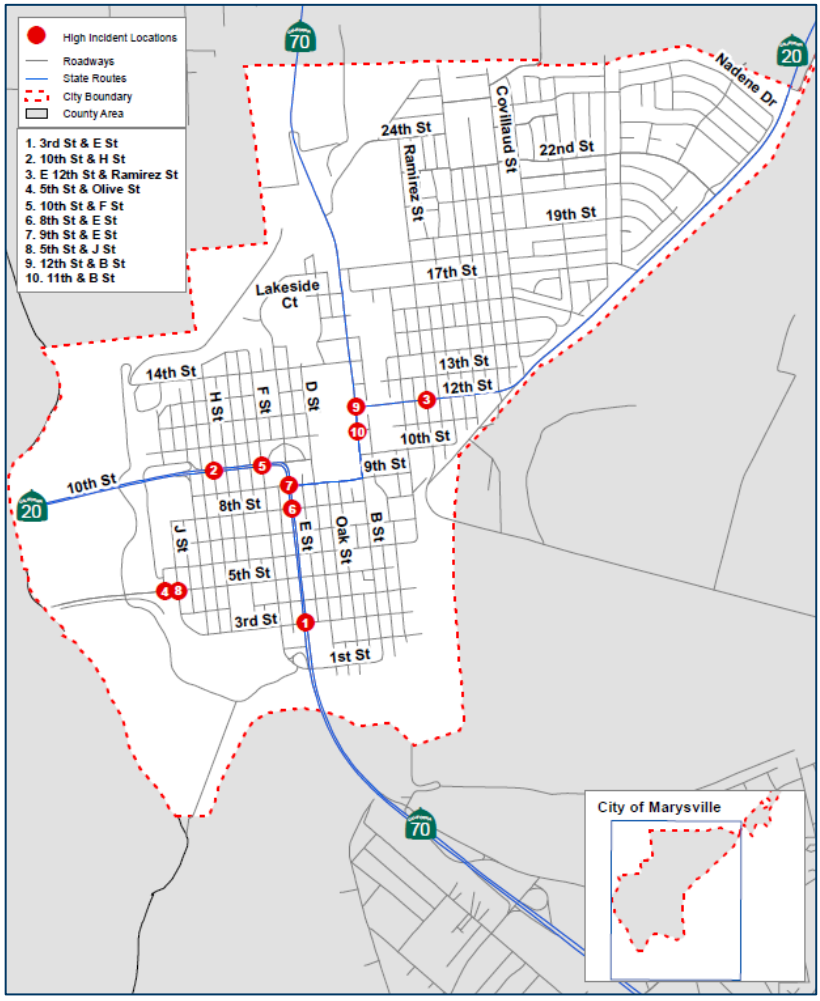
	Emphasis Areas
1	Making Safety Improvements at the Highest Incident Locations
2	Conducting Focused Speed Enforcement & Implementing Speed Reduction Measures
3	Ensuring Intersection Sight Lines are Clear of Obstructions & Managing Access at Private Driveways
4	Enhancing Traffic Signal & Stop Controls to Improve Timing Clearance for Safety
5	Modifications to address Wrong Way Driving

1.3 Location Specific Patterns & Countermeasures

Section 12 of this report identifies and ranks the top collision rate locations within the City, assesses the collision patterns and contributing factors at the highest ranking locations, and recommends countermeasures for those locations. The top 10 intersections were identified; these are listed in Table 1 below along with the types of countermeasures recommended.

Table 1 Recommended Intersection Countermeasures

Rank	Intersection	Countermeasures
1	E St at 3rd St	Signal Coordination & Various Signal Upgrades
2	10th St at H St	Left Turn Pockets & Signal Coordination
3	E 12 St at Ramirez St	Signal Coordination & Lane Markings
4	5th St at Olive St	Traffic Control Median & Sign Measures
5	10th St at F St	Signal Coordination & Various Signal Upgrades
6	E St at 8th St	Left Turn Pockets & Signal Coordination
7	9th St at E St	Signal Coordination & Various Signal Upgrades
8	5th St at J St	Lane Markings & Signal Coordination
9	B St at E 12 St	Signal Coordination & New Median
10	B St at 11th St	Lane Markings



1. Introduction

The City of Marysville is pleased to present the City's Local Roadway Safety Plan (LRSP). The purpose of this Safety Plan is to establish the framework and process for identifying, analyzing, and prioritizing roadway safety improvements on Marysville's streets. This Safety Plan identifies the top systemic collision patterns throughout the City and the top collision locations. This Safety Plan also provides a toolbox of countermeasures to address those systemic collision patterns and proposes projects to reduce collisions at the City's top collision locations.

Local Roadway Safety Plans are critically important. According to the Federal Highway Administration, over 80% of all public roads are operated by local or rural governments, and approximately 56% of all fatalities occur on these roads. Even beyond the tragedy of severely incapacitating injuries and deaths, traffic collisions have a significant cost to the community. The United States Department of Transportation (USDOT) estimated that in 2017 traffic collisions resulted in $836 billion in damages to quality of life and household productivity. The data presented in this report is from 2015 - 2019, as this is the most recent data available (typically due to the time it takes to process collision reports and late reporting by involved parties).

This Safety Plan has been prepared in compliance with State and Federal guidelines for eligibility to apply for Highway Safety Improvement Program (HSIP) funding and provides the necessary data to support current and future applications for the recommended projects. Future HISP grant cycles will require an adopted Safety Plan as a prerequisite for grant eligibility.

The City of Marysville is committed to improving transportation safety and reducing the risk of death and serious injury that result from incidents on its transportation systems. The purpose of this report is to establish the framework and process for identifying, analyzing, and prioritizing roadway safety improvements. As part of an ongoing effort to improve safety, this Safety Plan was developed in collaboration between the City, its partner agencies, organizations, and its residents.

The City of Marysville LRSP includes the following elements as illustrated in Figure 1:

Figure 1 Local Road Safety Plans courtesy of Federal Highway Administration

Section 2

VISION & GOALS

2. Visions and Goals

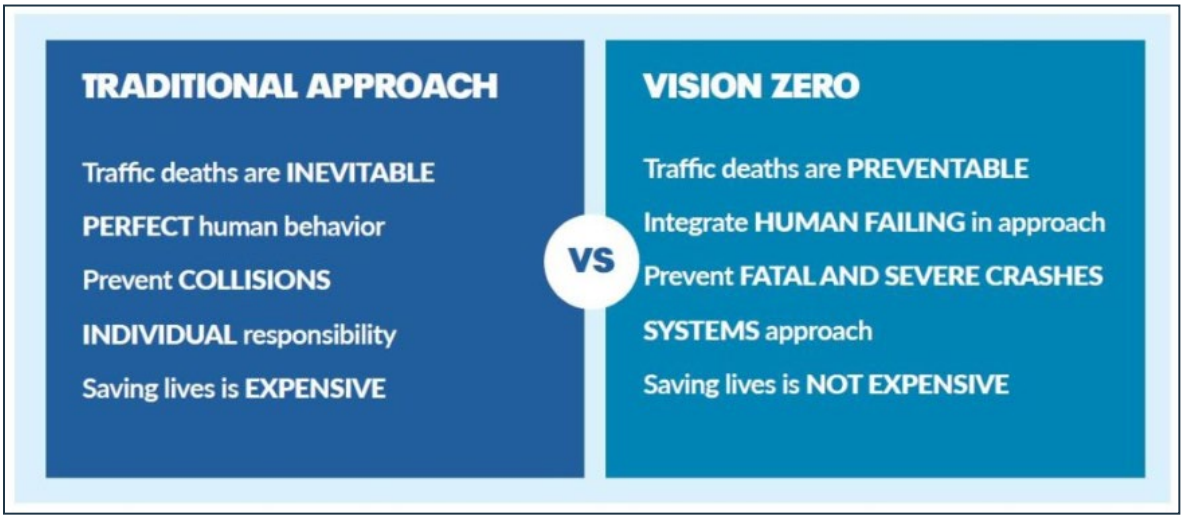
2.1 Vision Zero Statement

This plan strives towards eliminating all traffic fatalities and severe injuries, while increasing safe, healthy, and equitable mobility for all. Traditionally, traffic deaths and severe injuries have been considered inevitable side effects of modern life. The reality is that these tragedies can be addressed over time by taking a proactive, preventative approach that prioritizes traffic safety as a public health issue.

Vision Zero is a significant departure from the past in two major ways:

- Vision Zero recognizes that people will sometimes make mistakes, so the road system and related policies should be designed to minimize those inevitable mistakes and reduce their likeliness to result in severe injuries or fatalities. This means that system designers and policymakers are expected to improve the roadway environment, policies (such as speed management), and other related systems to lessen the severity of crashes. Roadway users are, however, still responsible for their mistakes and should follow all applicable laws, and use reasonable judgment, when conducting themselves within the public-right-of way.
- Vision Zero is a multidisciplinary approach, bringing together diverse and necessary stakeholders to address this complex problem. In the past, meaningful, cross-disciplinary collaboration amongst local traffic planners and engineers, policymakers, and public health professionals has not been the norm. Vision Zero acknowledges that many factors contribute to safe mobility -- including roadway design, speeds, behaviors, technology, and policies -- and sets clear goals to achieve the shared goal of zero fatalities and severe injuries.

Figure 2 A New Vision for Safety



2.2 Goals

272 traffic collisions occurred within the City of Marysville between 2015 - 2019, with 18 of these collisions ending in serious injuries or death. The economic impact of these collisions was greater than $13 million per year. Based on an assessment of collisions citywide, the major contributing factors to these collisions are unsafe speed, auto right-of-way violation, and traffic signals and signs violations. The Vision stated above, to eliminate all traffic fatalities & severe injuries while increasing safe, healthy, equitable mobility begins with a set of clear and achievable goals. The City has set a goal to eliminate all traffic fatalities & severe injuries while increasing safe, healthy, equitable mobility for all by:

Goal #1: Maintain accurate collision databases. Systematically identify & prioritize the City's highest collision locations. Analyze, develop countermeasures, and implement those countermeasures.

Goal #2: Revaluate collision trends and associated countermeasures in the LRSP every five years and engage community, stakeholders, and City management.

Goal #3: Develop an implementation priority for identified countermeasures. Implement countermeasures utilizing strategies across all traffic safety disciplines, engineering, enforcement, education, & emergency services.

Goal #4: Strive to reduce excessive speeding behavior leading to the City's primary contributing factor in traffic collisions.

Goal #5: Improve access management and side street/driveway visibility.

Section 3

PLAN DEVELOPMENT & PROCESS

3. Plan Development and Process

3.1 Highway Safety Improvement Program Funding

Beginning with HSIP Cycle 11, an approved LRSP will be a requirement for grant eligibility. The City of Marysville was awarded grant funding to prepare a combination LRSP, which has been developed to meet the application requirements of the HSIP program.

3.2 Systematic Citywide Safety Pattern Analysis

Citywide collision patterns were identified along with the most common related contributing factors to those collision patterns. These factors establish the top five emphasis areas the City should focus on to reduce traffic collisions. For each element, multidisciplinary countermeasures were developed, including engineering, education, and enforcement.

3.3 Site Specific Analysis

In addition to Systemic Citywide Patterns, the collision incident locations in the City were identified, prioritized, and ranked. The collisions patterns at each location were evaluated to determine potential countermeasures. Those countermeasures were then developed into the recommendations included within this report.

3.4 City Leadership Review

City leadership (Public Works, Community Development, Police & Fire) were engaged in the process throughout the plan's development.

3.5 Public Outreach

GHD to incorporate City Public Outreach efforts and results.

Section 4

ORGANIZATION & SAFETY PARTNERS

4. Organization & Safety Partners

Safety partners are those departments, agencies, and organizations whose input and support are foundational to a successful plan. The safety leadership team is primarily comprised of City departments that have critical roles in the development, implementation, and operation of safety projects, programs, and policies. The leadership team is ultimately responsible for developing, adopting, and implementing the plan and program. The stakeholder team is distinguished from the leadership team and is comprised of partner agencies and organizations who collaborate with the City and contribute to, and assist with, developing and implementing the plan. These agencies and their roles in the plan's development and implementation are provided below:

4.1 Safety Leadership

i. City Council

The legislative body ultimately responsible for approving/adopting the final plan, setting safety policies, and approving budget and funding levels.

ii. Public Works

Public Works is the lead City Department in development and production of the plan and its periodic updates. The Public Works Department is responsible for coordinating with emergency services and collaborating with Stakeholders. Public Works is responsible for capital project implementation. The City's Public Works staff may also lead or collaborate in education campaigns.

iii. Police Department

The City's Police Department collaborates with and assists the City's Public Works Department in the development and production of the plan and its periodic updates. The Police Department maintains collision records and is responsible for carrying out enforcement practices and activities. The City's Police Department may also lead or collaborate in education campaigns.

iv. Community Development

The Community Development Department supports implementation of the plan through its development review responsibilities and through updates of City planning documents and Land Use code revision. The Community Development Department assigns conditions of approval and mitigation measures to new development applications in collaboration with Public Works when nexus is found, and ensures new development requirements are implemented.

v. Fire Department

The City's Fire Department primarily serves as a support role to other City leadership in proactive traffic safety measures and also functions as a primary first responder to injury traffic collisions.

vi. Caltrans

Caltrans District 3 has jurisdiction over Highway 20 and Highway 70 through the City's limits. Caltrans also provides oversight to various grant funding sources. Many of the City's streets and intersections border State controlled roadways and ramps. Caltrans provides feedback on the development of this plan and confirms its compliance with HSIP requirements for future funding eligibility.

4.2 Stakeholders

Stakeholders generally include the City's partner agencies, advocacy groups, and interested parties. Stakeholders play a key role in the development and implementation of this plan by providing insight and recommendations based on their unique roles within the community that may not be evident to City Staff.

i. Marysville Joint Unified School District

Working and continuing the collaboration with the Marysville Joint Unified School District to maintain and promote safety for all students within the city.

ii. Marysville Planning & Historic Preservation Commission

Their mission is to promote and ensure the comprehensive and adequate planning and historic preservation of the City.

iii. Sacramento Area Council of Governments

The Sacramento Area Council of Governments (SACOG) coordinates regional transportation programs and projects as well as regional funding allocations. SACOG provides feedback on the development of the plan and updates in context to regional planning activities and potential funding allocations.

iv. General Public

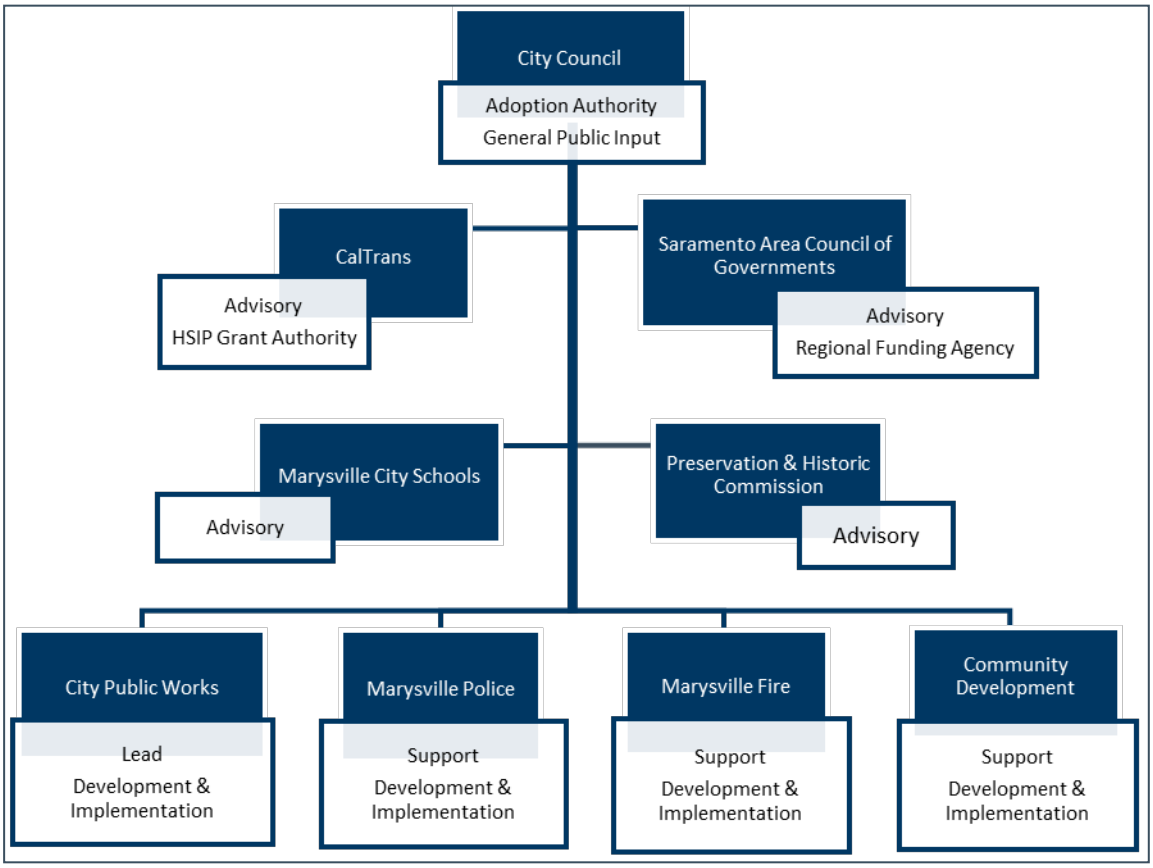
The general public provides feedback and insight on recommended emphasis areas, high incident locations, countermeasures, and implementation. Although collision records and statistics are foundational to this plan, public feedback is a critical supplement to that data. This feedback provides staff with a holistic view of safety issues and a gauge for what types of countermeasures are, and are not, desired by the community.

v. Yuba County & Sheriff's Office

Roadways and functional areas of intersections along these borders require communication and collaboration, with the Sheriff Office and County of Yuba to implement this plan. Yuba County and the Sheriff's Office oversee bordering facilities, regional safety goals and policies, as well as cooperative funding arrangements.

Figure 3 depicts the organization structure and hierarchy for how the City conducts is comprehensive systematics traffic safety analysis and engages with its partner agencies & organizations. The figure on the next page also indicates each agency or City department's role in the sustained implementation of this plan. Starting at the bottom are agencies and department primarily responsible for development and implementation of the plan, moving up are those partner agencies that provide an advisory role as well as collaboration on joint safety projects & efforts, and at the top is the final decision-making authority for approving the plan, as well as approving staffing and funding resources for implementation.

Figure 3 Systemic Traffic Safety Assessment Organization & Hierarchy



Section 5

EVALUATION & IMPLEMENTATION

5. Evaluation & Implementation

This LRSP is a living document. The list of emphasis areas and recommended countermeasures should be updated approximately every five years to coincide with the City's Capital Improvement Budget and HSIP grant cycles for potential inclusion. Emphasis areas and countermeasures for Citywide systemic patterns should be updated approximately every five years. Updated high incident lists and emphasis areas should be presented to the City's Public Works Department for review and feedback and also presented to the City Council as an informational item for review, with an opportunity for public feedback.

Grant Funding

This Safety Plan is primarily a requirement for the Highway Safety Improvement Program funding. However, this document will provide valuable justification and guidance for other grant applications such as Active Transportation Program (ATP), Regional State Highway Account (RSHA), Congestion Management and Air Quality (CMAQ), and other available funding sources.

Fee Programs

The City of Marysville has adopted development impact fee programs for transportation improvements. Countermeasures for high incident locations & corridors should be considered for inclusion if justified, and a nexus can be established as part of AB1600 studies. An example of nexus is if a project increases the volume of a particular turning movement that has been specifically identified as a contributing factor in a primary collision pattern. Safety Plan recommendations should be considered for inclusion when updating fee programs or developing/updating development reimbursement agreements.

City Capital Improvement Program

The recommendations identified in this plan, and the high incident location list, serve as a source for capital project request consideration. The recommendations also serve as a cross-reference for other capital projects that could be leveraged to implement the recommendations. For example, a roadway resealing project may provide an opportunity to revise a corridor lane re-configuration by installing proposed safety plan striping recommendations instead of reusing prior striping. The City's Capital Improvement Program and operating budget will also continue to provide a source of funding for local match grant requirements.

The recommendations identified in this plan should be referenced when conducting roadway maintenance activities. Priority should be considered for maintenance activities that further the recommendations of this plan or provide opportunities to implement countermeasures at high incident locations.

Development Review

The safety plan's recommendations and high incident locations should be referenced when considering new and/or redevelopment applications. City staff should recommend conditions of approval and mitigation measures for consistency and CEQA findings support. This evaluation provides more opportunity such as SB 743, AB 43 and other legislative action that provide for implementation for traffic safety measures.

City Public Works and Development Review should review development proposals requiring administrative or higher levels of review to identify implementation opportunities for this plan.

Section 6

EXISTING EFFORTS

6. Existing Efforts

The City is actively implementing its various safety policies/guidelines from the General Plan Circulation Element and Pedestrian/Bicycle Master Safety Plan (2012). The City of Marysville identified several safety projects and programs that are either currently in progress, nearly complete, recently completed or will begin soon. These projects are listed below:

- **5th Street Rehab Project** – This project involves the rehabilitation of 5th Street between J Street and E Street.
- **Marysville Ring Levee Project** – Relocation of existing PG&E utility poles (https://www.yubawater.org/CivicAlerts.aspx?AID=108)
- **B street between 1st and 3rd** – Street rehabilitation of B Street between 1st Street and 3rd Street
- **1st street between B St and E St** – Street rehabilitation of 1st Street between B Street and E Street
- **F street between 3rd and 6th** – Street rehabilitation of F Street between 3rd Street and 6th Street
- **B street at 16th Street, E Street at 11th Street, and Ramirez Street at E.18th Street** – High visibility crosswalks were added along with a flashing beacon for school crossing
- **5th street between E St / SR70 and J St** – Complete Street reconstruction of 5th Street between E St/SR70 and J Street
- **ATP project**
  - Adding sidewalk on F Street / 1st Street,
  - Downtown bike racks,
  - Speed signs on E St., D St. pedestrian Crossing,
  - Bike lanes and shared lanes at various locations around town in accordance with the Bike Master Plan.

Section 7

DATA ANALYSIS

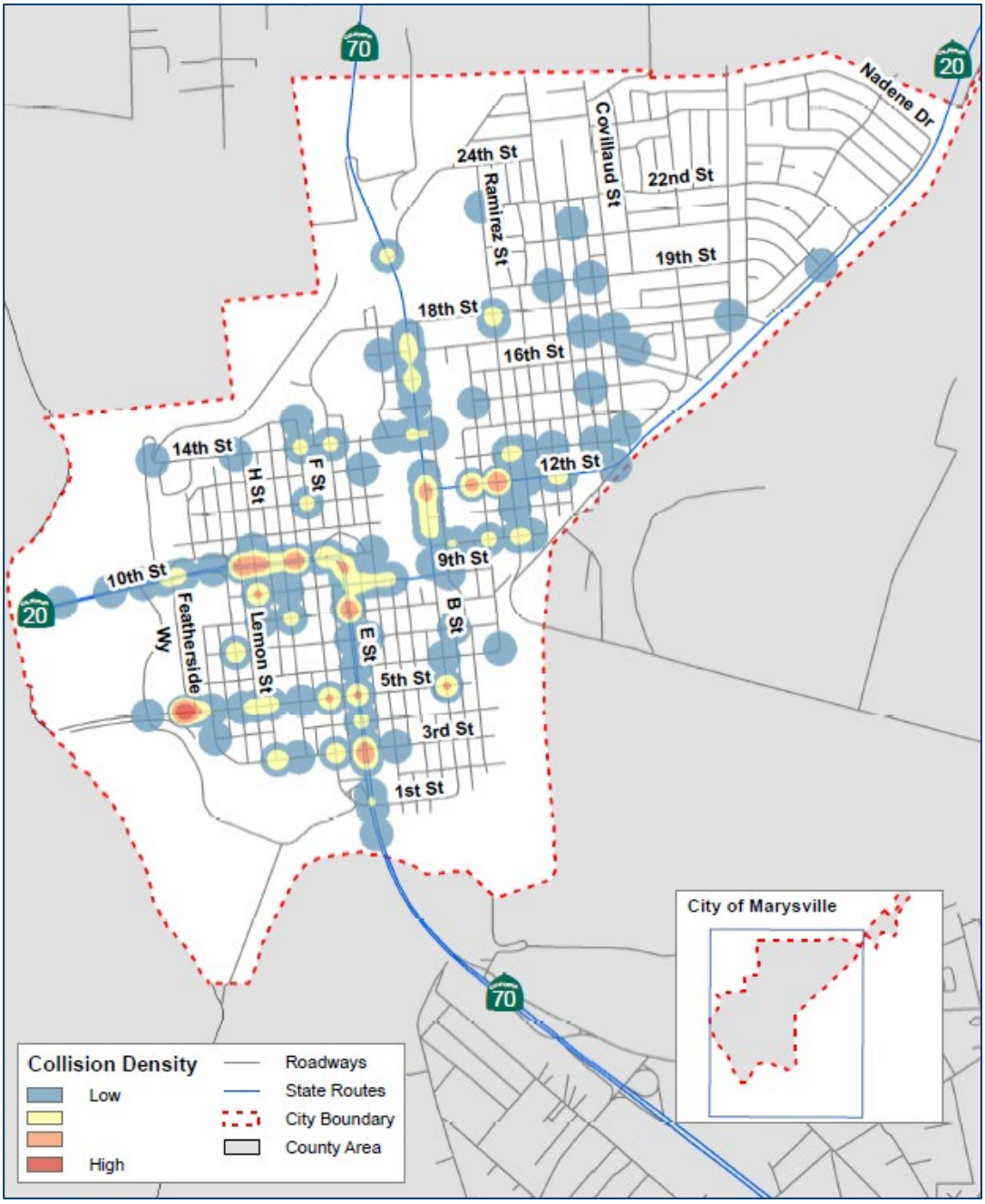
7. Data Summary

7.1 Citywide Collision Trend

Traffic Collision data for the past five complete years (2015-2019) was obtained and processed from the Statewide Integrated Traffic Records System (SWITRS) and Transportation Injury Mapping System (TIMS) Analytic Database. This data was refined to only include collisions on city approaches, which did not include Hwy 20 and 70 collisions on Caltrans's right-of-way.

Figure 4 depicts the citywide collision frequency; areas in red have the highest frequency of traffic collisions, and areas in blue have the lowest. As shown, the highest concentration of collisions within the City are along 5th St, 10th St, 12th St, B St and E St.

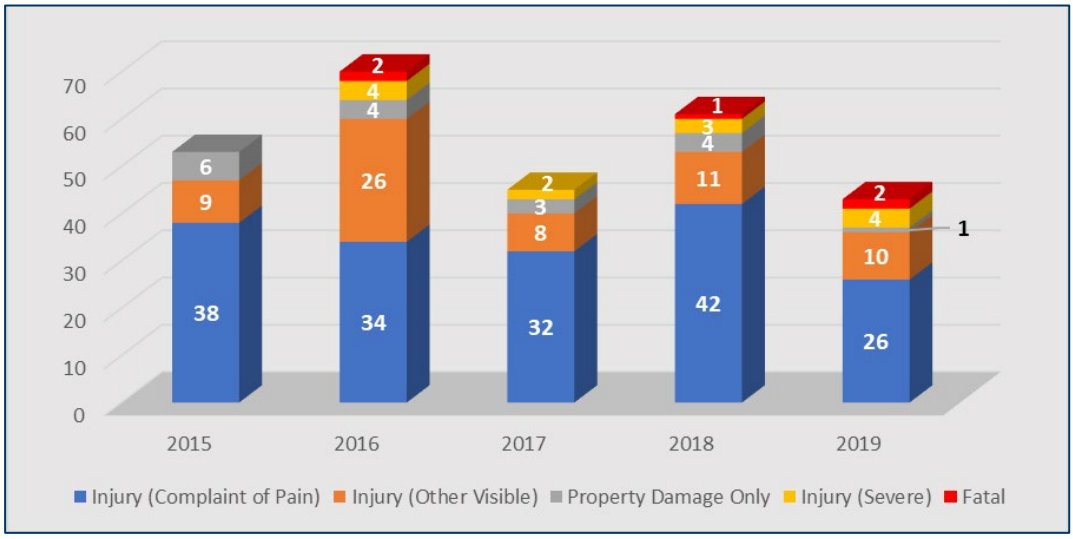
Figure 4 Citywide Collision Concentrations



7.2 Overall Collision Trend

Figure 5 shows collisions between 2015 – 2019. The total reported collisions in the City remained relatively stable with an increase in 2016 and 2018. This only represents collision trends and does not include other external factors. It should be noted that the overall collision chart below does not represent all collisions that may have occurred in the City—instead, only incidents are included where a collision report is generated. Many collisions are either unreported by the involved parties, or reported by the parties without an officer investigation.

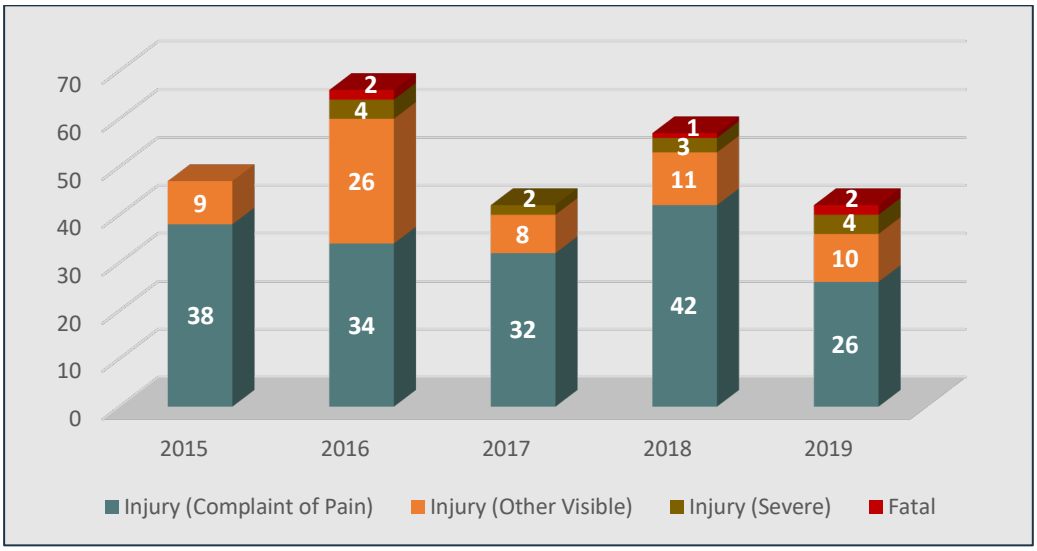
Figure 5 Overall Collision Injury Severity



7.3 Injury and Fatal Collision Trends

Injury collisions are the most accurate representation of overall collision trends because these types of collisions are the most consistently reported and investigated. In 2019, injury collisions decreased by 26% compared to 2018 and had no change compared to 2017.

Figure 6 Injury and Fatal Collisions



It's challenging to identify a trend in fatal collisions for the City of Marysville because these types of collisions are typically sporadic, uncommon, and occur under unusual circumstances. There were five fatal collisions between 2015 and 2019.

7.4 Pedestrian Trend

A collision is classified as a pedestrian collision when a pedestrian is identified as at least one of the parties struck in the collision itself. Pedestrian collisions have been relatively static since 2015, with an unexpected spike in 2016 where 11 pedestrian collisions were reported including one fatality. Because of pedestrians' vulnerable nature compared to motor vehicles, pedestrian collisions typically have a higher number of injuries, serious injuries, and/or fatalities.

Figure 7 Citywide Pedestrian Collision Injury Severity

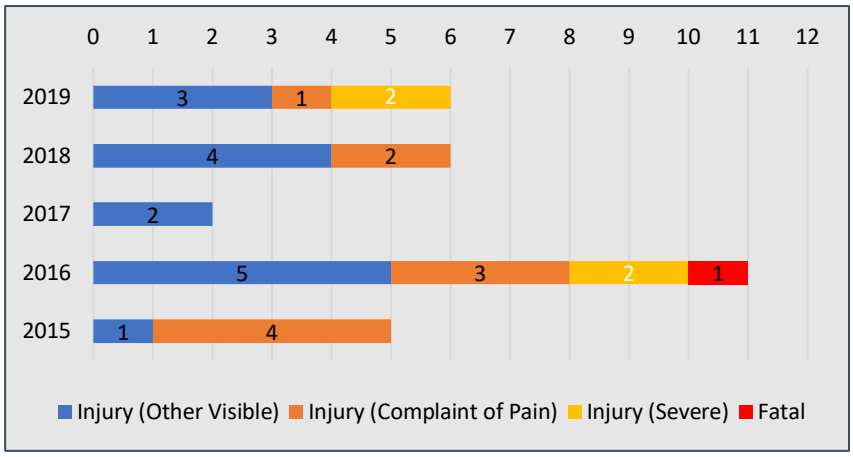
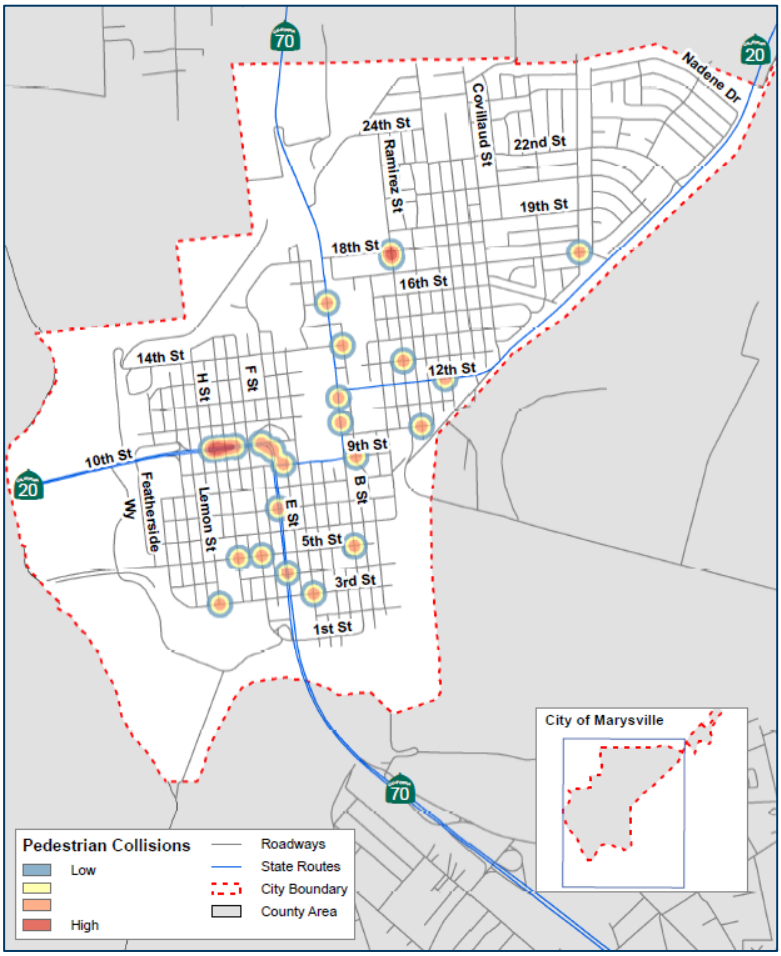


Figure 8 Citywide Pedestrian Collision Concentrations



7.5 Bicycle Collision Trend

Bicycle collisions saw a positive trend for the years 2015 through 2019. 2016 recorded the highest bicycle collisions; 7 collisions, whereas 2019 recorded 3 collisions, the lowest reported bicycle collisions on record. Like pedestrians, the bicyclist is also considered a vulnerable user and requires special attention when it comes to safety.

Figure 9 Citywide Bicycle Collision Trend

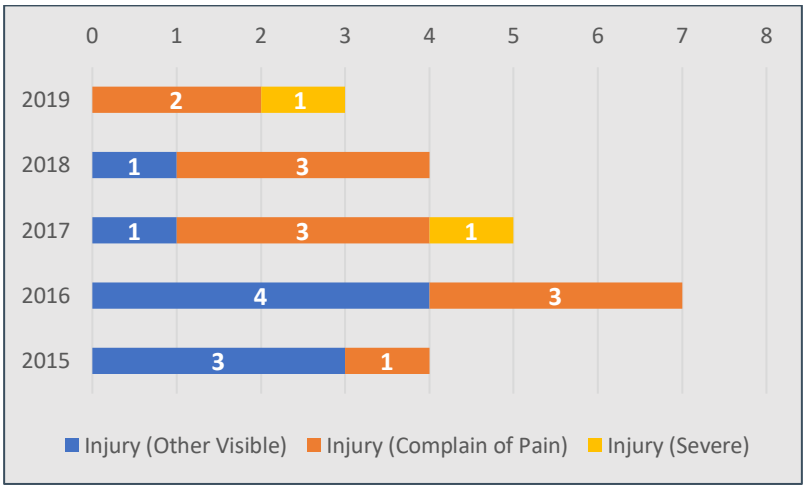
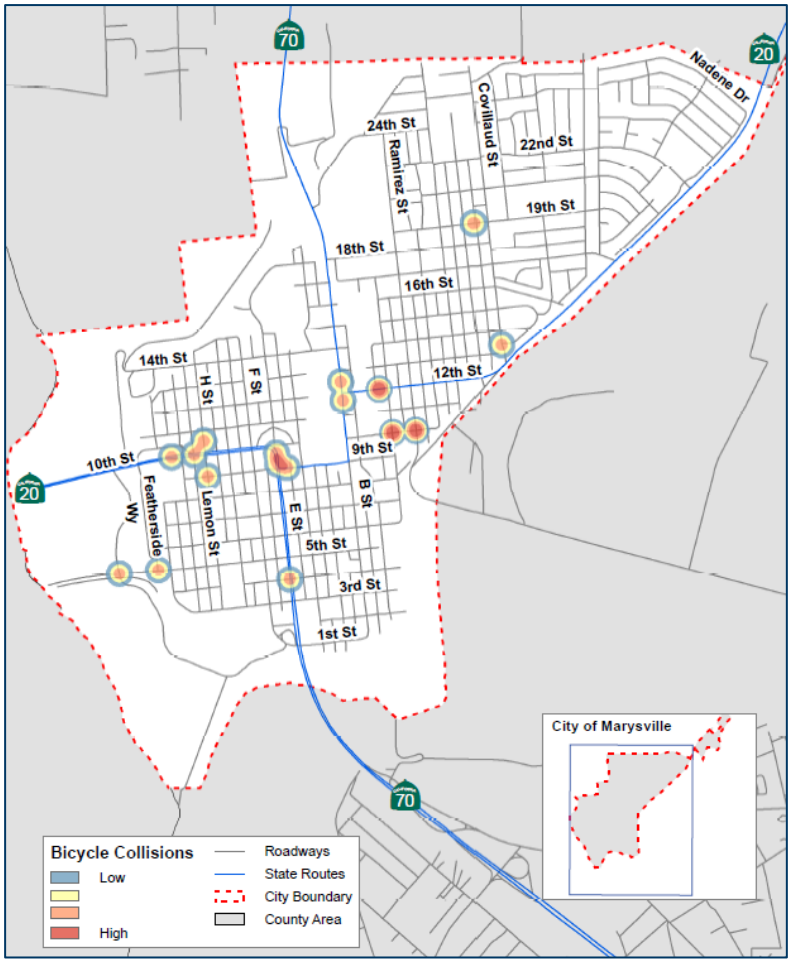


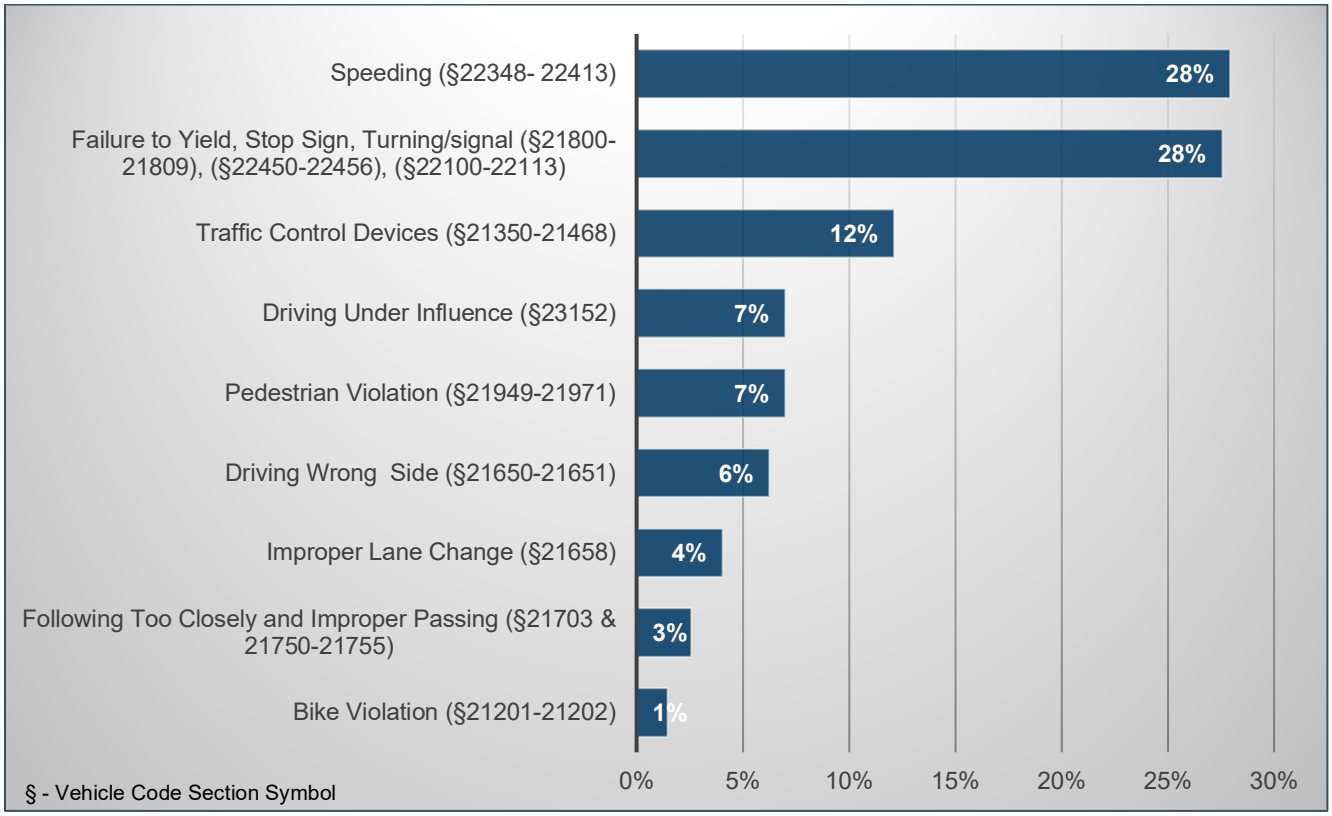
Figure 10 Citywide Bicycle Collison Concentrations



7.6 Factors Contributing to Collisions

Figure 11 depicts the distribution of vehicle code violations by type between 2015-2019. 28% of the violations reported in Marysville involved unsafe speed. Speeding is one of the top collision factors in the City, accounting for over a fourth of all collisions. Driving offenses such as failure to yield, failure to follow stop sign, and turning/signals, contributed to 28% of citywide traffic collisions. Due to the state of data sources and information availability, collisions data involving residents or drivers passing through is not feasible.

Figure 11 Violation by Vehicle Code Section



7.7 Human and Economic Impact

Traffic collisions result in indirect economic costs to those involved. These costs include wages and productivity losses, medical expenses, and legal fees. However, this represents only a portion of total costs associated with collisions. Traffic collisions also have indirect impacts on the families of those involved, their employers, as well as society as a whole. The National Highway Transportation Safety Administration (NHTSA) found that more than 75% of collision costs are born by society in the form of insurance premiums, taxes, and congestion-related costs such as travel delay, excess fuel consumption, and lost quality of life associated with deaths and injuries (Blincoe, 2015).

Comprehensive costs include not only the economic cost component, but also indirect societal costs. Using cost estimates by crash severity published in the American Association of State Highway Transportation Officials' (AASHTO) Highway Safety Manual (adjusted to reflect 2019 dollars) the comprehensive costs associated with the 274 Citywide traffic collisions occurring in 2019 were calculated to be almost $19 million. Comprehensive collision costs for 2019 by collision type are summarized in Table 2.

Table 2 2019 City of Marysville Comprehensive Collision Cost

Collision Severity	Number of collisions	Cost per Collision	Total Cost
Fatal	2	$6,655,420	$13,310,840
Disabling injury	4	$358,500	$1,434,000
Non-Incapacitating Injury	26	$131,100	$3,408,600
Possible injury	10	$74,500	$745,000
Property damage only	1	$12,200	$12,200
Total			**$18,910,640**

Source: Crash Cost Estimates based on AASHTO's Highway Safety Manual, 2010. Costs adjusted to 2019 dollars based on Consumer Price Index and Employment Cost Index per Highway Safety Manual guidance.

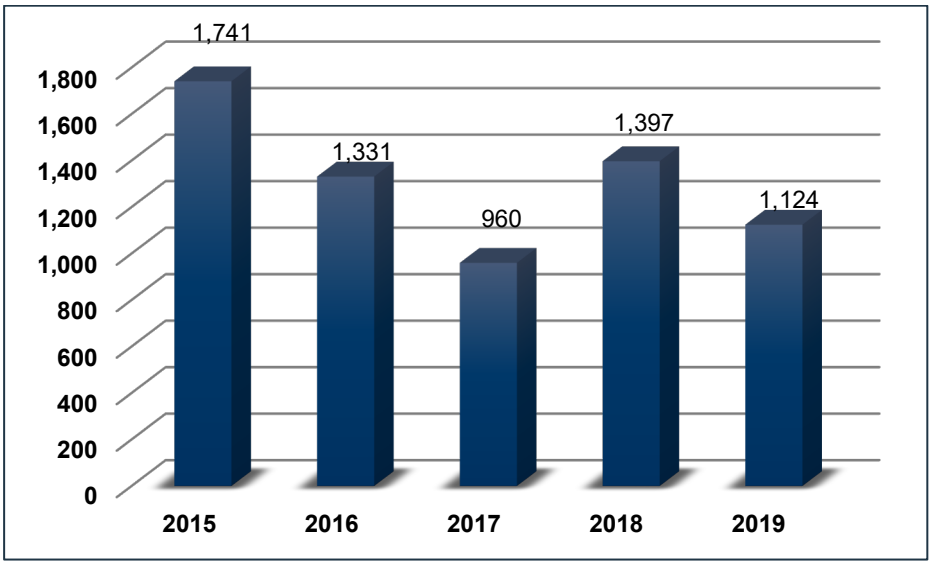
Section 8

TRAFFIC ENFORCEMENT

8. Traffic Enforcement

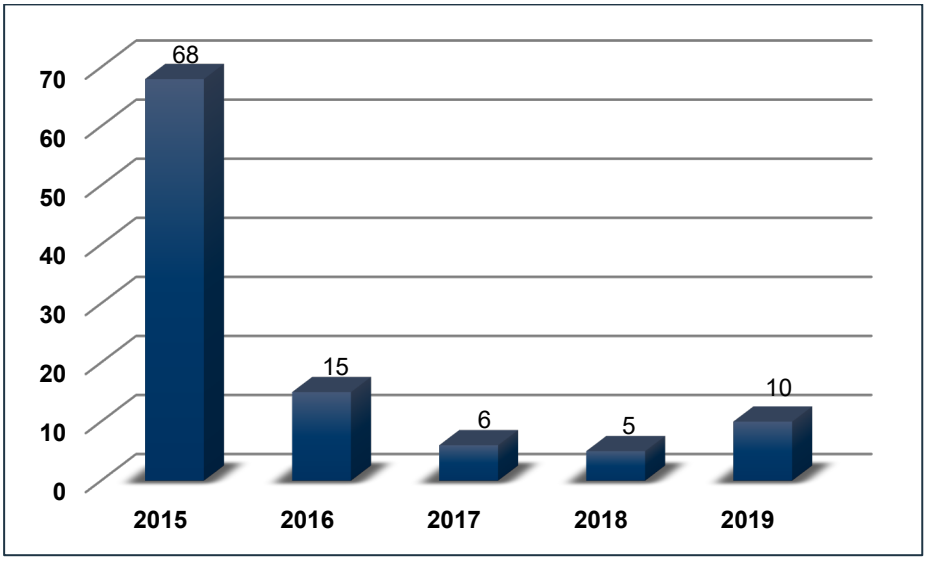
Enforcement is one of the key disciplines for achieving a reduction in collision trends and improving overall safety. Figure 12 depicts the total citations (hazardous and non-hazardous) by the Police Department between 2015 - 2019. This trend shows a general decline. 2015 recorded the highest citations in the five years, whereas 2017 showed the least.

Figure 12 Total Citations



According to NHTSA in general, speeding was the primary contributing factor in approximately one-third of all motor vehicle fatalities. Speed also affects your safety even when driving at the speed limit but too fast for road conditions, such as during bad weather, when a road is under repair, or in an area at night that isn't well lit. Between 2015-2019, the Police Department has cited 104 speeding citations, with 2015 recording the highest speeding citations at 68 with a substantial decline for the following four years.

Figure 13 Speeding Citations



8.1 DUI Arrests

Driving under the influence (DUI) arrests have been a focal point of enforcement in an effort to reduce injury traffic collisions. Typically, DUI is associated with drunk driving however, DUI also include operating a motor vehicle while impaired by drugs (including recreational drugs). Since 2015 the Police Department has averaged 103 DUI arrests each year, as shown in Figure 14. The number of DUI collision related cases are illustrated in Figure 15.

Figure 14 DUI Arrests

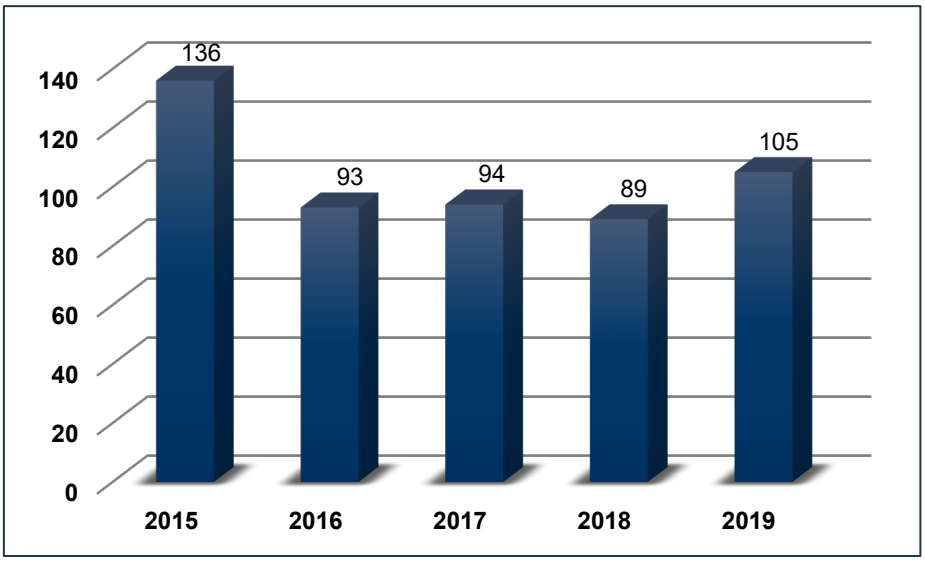
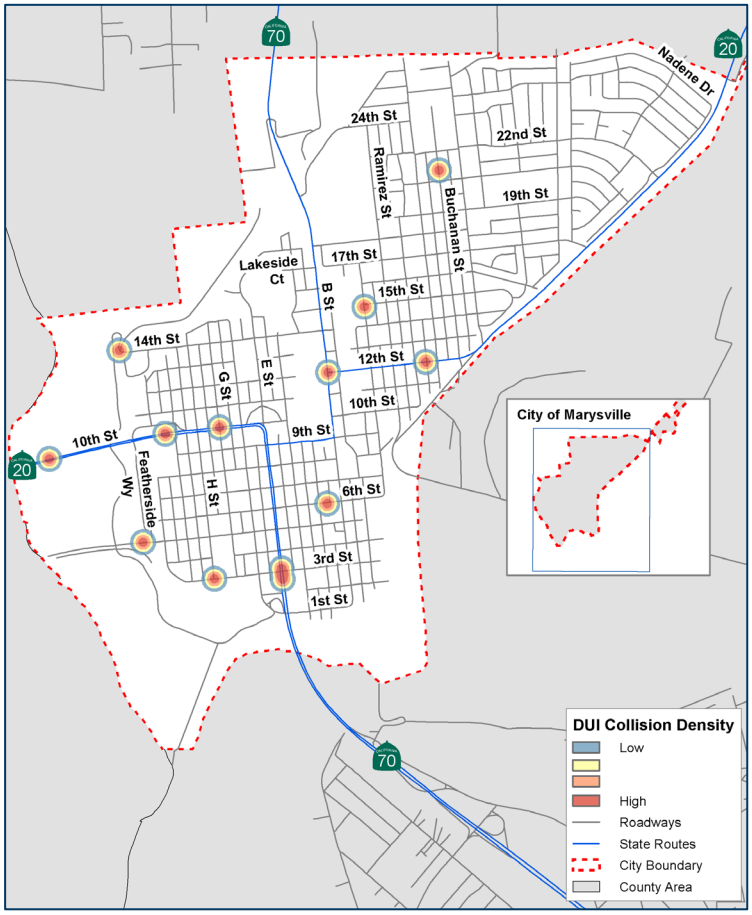


Figure 15 DUI Collision Concentrations



9. Education Campaigns

There are several ongoing traffic safety education and outreach campaigns provided to the community of Marysville each year, key education and outreach activities are summarized below:

Yuba County Bikeway Master Plan

The Bikeway Master Plan was funded through a 2010 SACOG Regional Bicycle and Pedestrian Funding Program grant and developed through Yuba County Public Works. The purpose, to encourage the role of the bicycle as a viable mode of transportation the community by laying out on updated version of connected bikeways that links together neighborhoods, places of employment, shopping centers, parks, and schools. (Photo source: Yuba County Bikeway Master Plan)

Yuba County Safe Routes to School Coalition

The goal of Safe Routes to School programs is to address safety and accessibility of walking and biking to school in the area. Coalition involved school administration, Marysville Unified School District staff, Yuba County Sherriff's Office, Yuba County Public works, and other community members. WALKSacramento created the Yuba County Safe Routes to School/Bike to School Program Guide for the coalition as a sustainability plan to continue efforts already in place. SRTS programs use an integrated approach that includes five E's - encouragement, education, evaluation, engineering, and enforcement.

Every 15 Minutes Program

Multiple department and agency event simulating the psychological effects of student fatalities as a result of traffic collisions at Marysville High School.

National Night Out

Annual community-building campaign that promotes police-community partnerships and neighborhood camaraderie to make our neighborhoods safer, more caring places to live.

Office of Traffic Safety Grant

To conduct public education campaigns and increase traffic enforcement related to Bicycle / Pedestrian Safety, Driving under the Influence, Driving while unlicensed, and conduct DUI Checkpoints.

Section 10

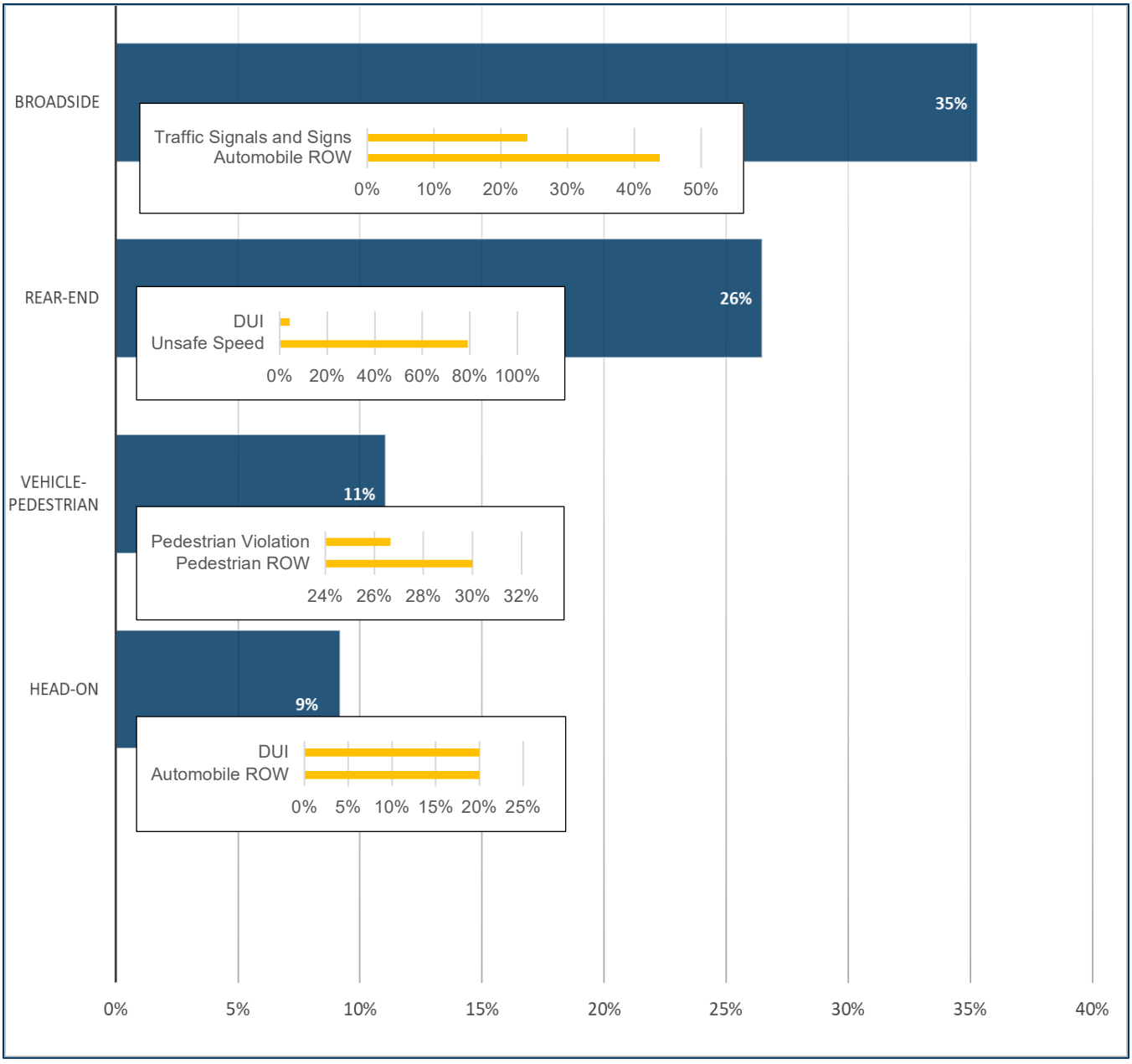
CITYWIDE SYSTEMIC COLLISION PATTERN ANALYSIS

10. Citywide Systemic Collision Pattern Analysis

10.1 Collision Types and Predominate Contributing Factors

As shown in Figure 16 below, Broadside, rear-end, and traffic and vehicle-pedestrian were the most common types of collisions reported in 2015-2019, representing 72% of the total recorded incidents. Broadside and rear-end collisions were the most prominent, with auto right of way violation and unsafe speed as the leading contributing factors.

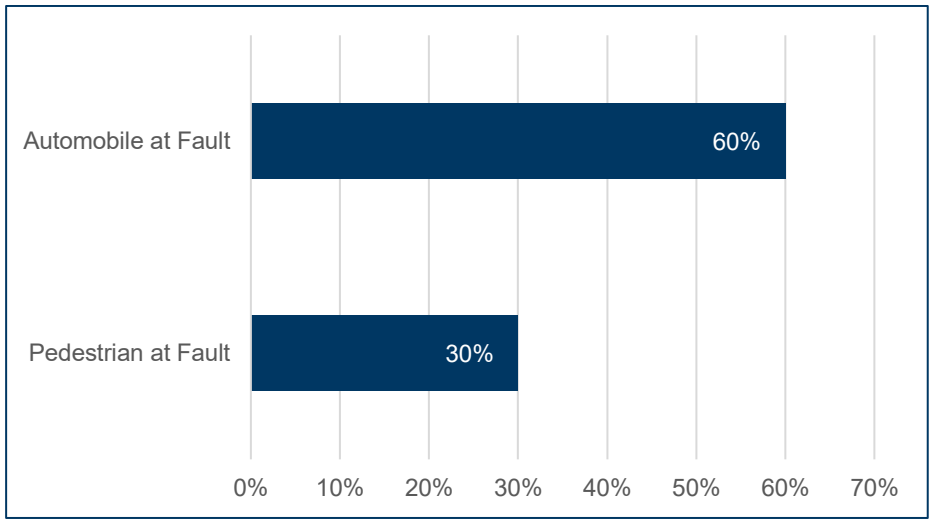
Figure 16 Predominant Collision Factors



10.2 Pedestrian Collision Types and Contributing Factors

Between 2015-2019, vehicles failing to yield to pedestrians have been the leading pedestrian contributing factor. As shown in figure 17 below drivers were at fault in approximately 60% of a vehicle versus pedestrian collisions.

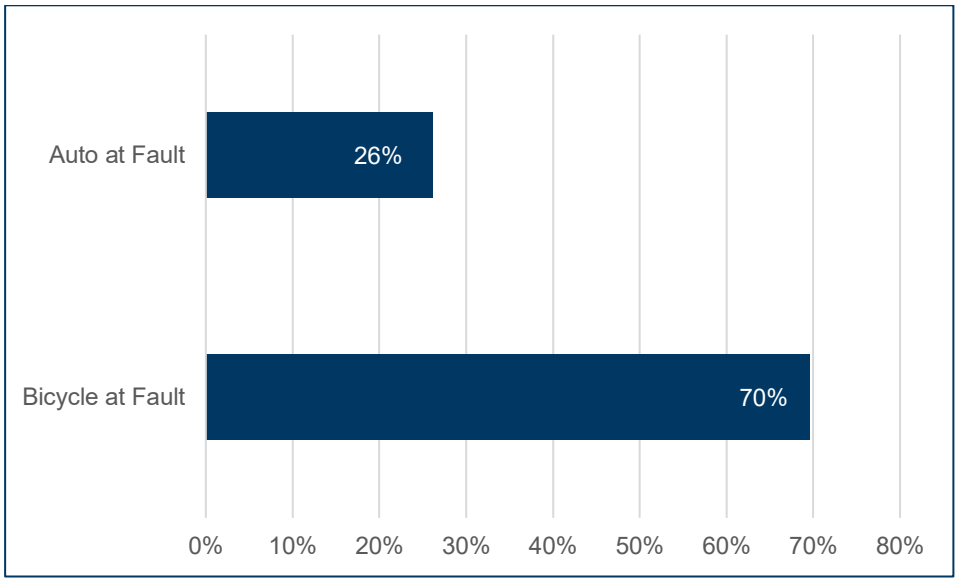
Figure 17 Collision At Fault



10.3 Bicycle Collision Types and Contributing Factors

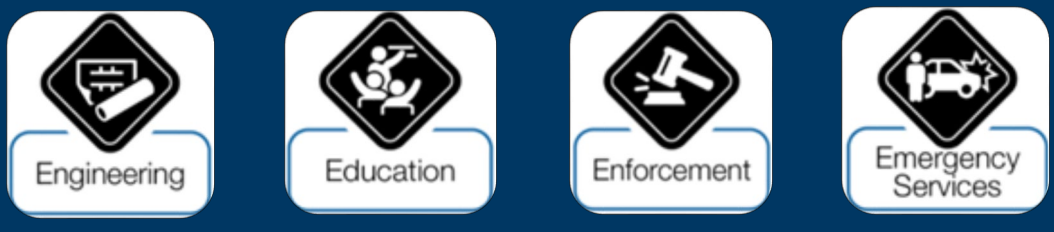
Broadside collisions were the most common type of bicycle collisions reported beside sideswipe in 2015-2019, with wrong side of the road as the leading contributing factors. As shown in figure 18 below Bicycle were at fault in approximately 70% of a vehicle versus bicycle collisions

Figure 18 Collisions At Fault



Section 11

EMPHASIS AREAS



11. Emphasis Areas

The City's Local Roadway Safety Plan is a tool intended to assist City staff in most efficiently focusing on engineering, education, enforcement, and emergency response resources towards the highest priority systemic and location-specific collision patterns for safety improvements.

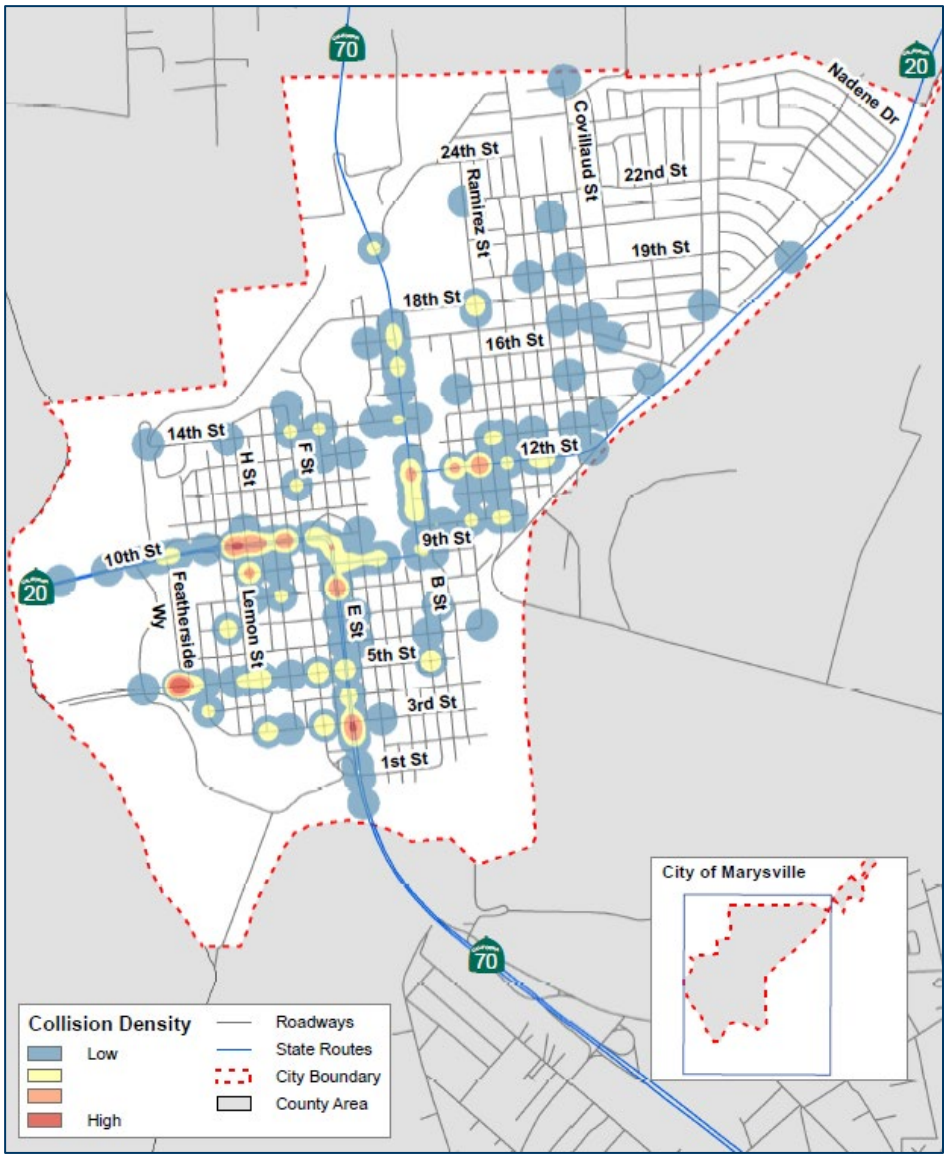
The Safety Plan relies on traffic collision history and professional judgment to the operational indicator of potentially needed safety improvements. This plan is required to apply for Highway Safety Improvement Program (HSIP) funds beginning in 2022. Since these funds are competitive in nature, the City must be judicious in identifying applicable safety projects that have a definite and measurable safety benefit.

Table 3 below identifies key systemic emphasis areas within the City for further focus, including the general purpose and how often it should be updated.

Table 3 City of Marysville Emphasis Areas

Emphasis Areas		Purpose	Update Frequency
1	High Incident Locations	To evaluate and enhance areas experiencing high collision rates	5 Years
2	Speeding	To evaluate and enhance areas experiencing high speed violation	5 Years
3	Automobile ROW	To identify high incidences of right-of-way violations that may have sight distance constraints or need for longer clearance intervals or that might benefit from access management	5 Years
4	Traffic Signal and Sign compliance	To evaluate and enhance areas experiencing signal and sign violation	5 Years
5	Wrong Side of the Road	To evaluate and enhance areas experiencing wrong side of the road violations	5 Years

11.1 Emphasis Area #1: High Incident Locations



Between 2015 and 2019 the City experienced 272 traffic collisions. The City's highest incident collisions occurred along 5th St, 10th St, 12th St, B St and E St.

One of the most effective ways to reduce Citywide collisions is to identify the highest incident locations, analyze the collision patterns at those locations, develop targeted countermeasures to those patterns, then prioritize and implement the measures regularly and systematically.

Car crash icon obtain from: https://www.clipart.email/download/24036160.html

Emphasis Area #1: High Incident Locations

Systemic Countermeasures

Engineering

Action:

- Identify and rank the highest incident locations within the City every two years. Consider information obtained from public input and feedback regarding unreported and "close call" collision to supplement collision data.
- Assess collision patterns at each of the highest incident locations and develop countermeasures to address those patterns.
- Maintain an official list of prioritized safety locations and the associated countermeasures for:
  - Grant Funding Requests such as HSIP, ATP, SHA, etc.
  - Capital Improvement Funding Requests
  - Leveraging other Capital Projects to Implement safety measures (i.e., changing striping as part of a roadway resurfacing project)
  - Informing Safety Analysis of Development Proposals and potentially establishing those as mitigation measures or conditions of approval where nexus is established.
  - Informing updates to existing fee programs or establishing new fee programs.
  - Leveraging the analysis and prioritization for defense against tort liability claims.
- Continue to monitor collision patterns after implementation of countermeasures.

Education

Action:

- Publish results of high incident location analysis and countermeasure recommendations.
- Regularly initiate and engage with local media outlets such as Appeal-Democrat, KCRA3, Marysville's Civic News & Announcements, and City's other own social media platforms to publish articles & interviews regarding high incident locations and contributing factors.
- Consider "pop-up" safety events on-site at high incident locations. (i.e., on-site staff handing out flyers and discussing the primary factors for bicycle collisions at a high bicycle incident location)

Enforcement

Action:

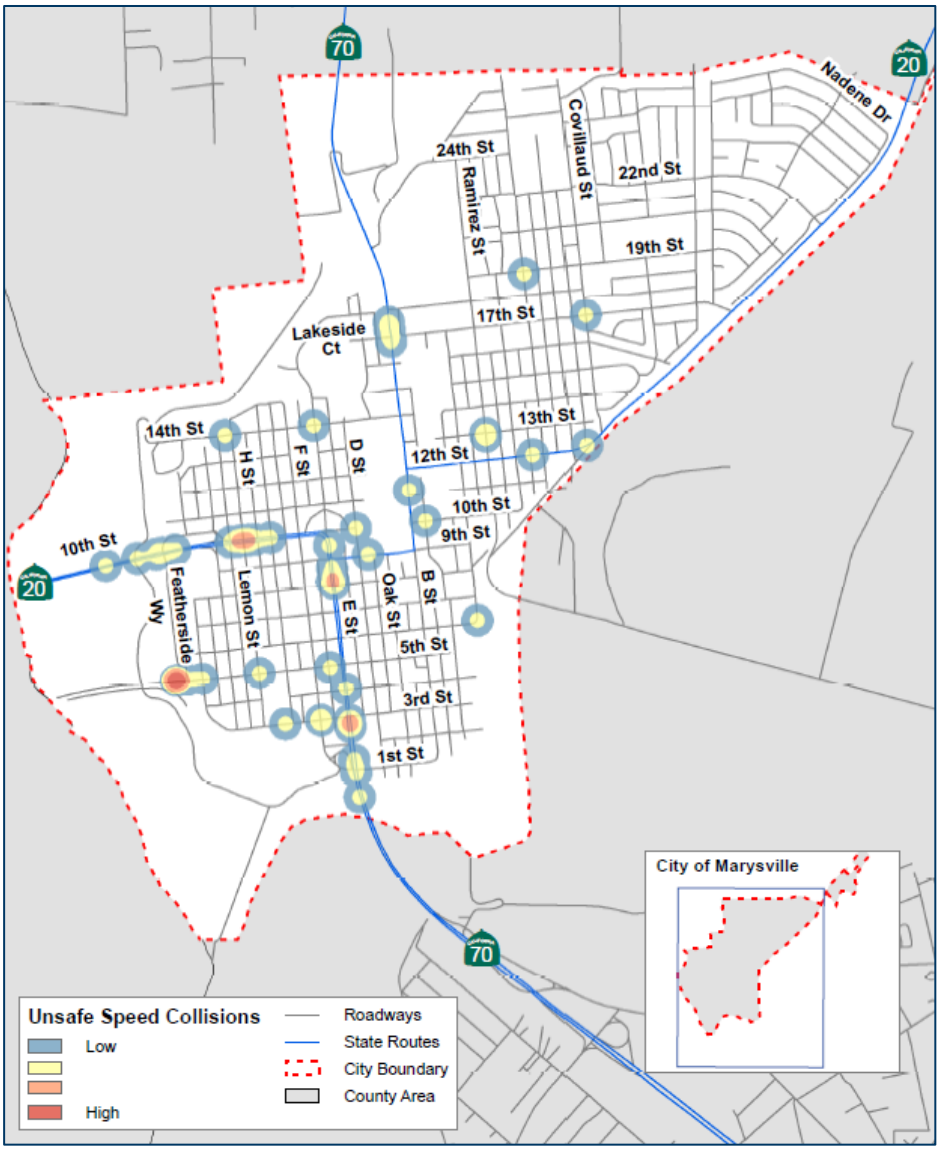
- Prioritize patrol patterns and overall presence at high incident locations.
- Target driver behavior that correlates with the predominant contributing factors for collisions at high incident locations.

Emergency

Action:

- Support Engineering, Education, & Enforcement, Activities.
- Consider targeted training for responding to specific high incident locations and treatment of predominant injury types at those locations.

11.2 Emphasis Area #2: Unsafe Speed



Speeding is one of the primary contributing factors for traffic collisions in the City of Marysville. Speeding collisions are most commonly occurring along 10th St and E St. It is estimated that the economic impact from these collisions was greater than $19 million in the span of 5 years.

Speeding-related collisions along 10th St and E St; are likely due to the relatively wide and straight geometry. These segments are relatively conducive to higher speeds, despite frequent driveways and cross streets present. Speeding behavior is most commonly resulting in rear-end collisions.

Speeding Icon obtain from https://www.clipart.email/download/21353324.html

Emphasis Area #2: Unsafe Speed

Intersection Safety Improvements

Engineering

Action:

- On signalized corridors consider management of traffic speeds with signal coordination and advanced dilemma zone detection.
- Where possible create a perceived sense of narrowed roadway through pavement treatments, street trees, and other roadside features.
- Where lanes are 12’ or more consider narrowing travel lanes and utilizing excess space for such features as buffered bike lanes, wider parking stalls, or medians as space permits. At intersections consider bulbouts, traffic circles, and dedicated turn lanes.
- Evaluate Speed Segment Transitions, install incremental downward speed zoning where necessary per MUTCD.
- Develop and implement Neighborhood traffic calming programs.

Education

Action:

- Consider the installation of speed feedback signs with photoflash simulation on approaches into areas with a high incidence of speed related collisions.
- Regularly Initiate and Engage with local media outlets such as the Appeal-Democrat, KCRA3, Marysville Civic News & Announcements, and City’s other social media platforms to publish articles & interviews regarding where high-speed collisions are occurring, the damages and injuries involved, and enhanced enforcement activities.

Enforcement

Action:

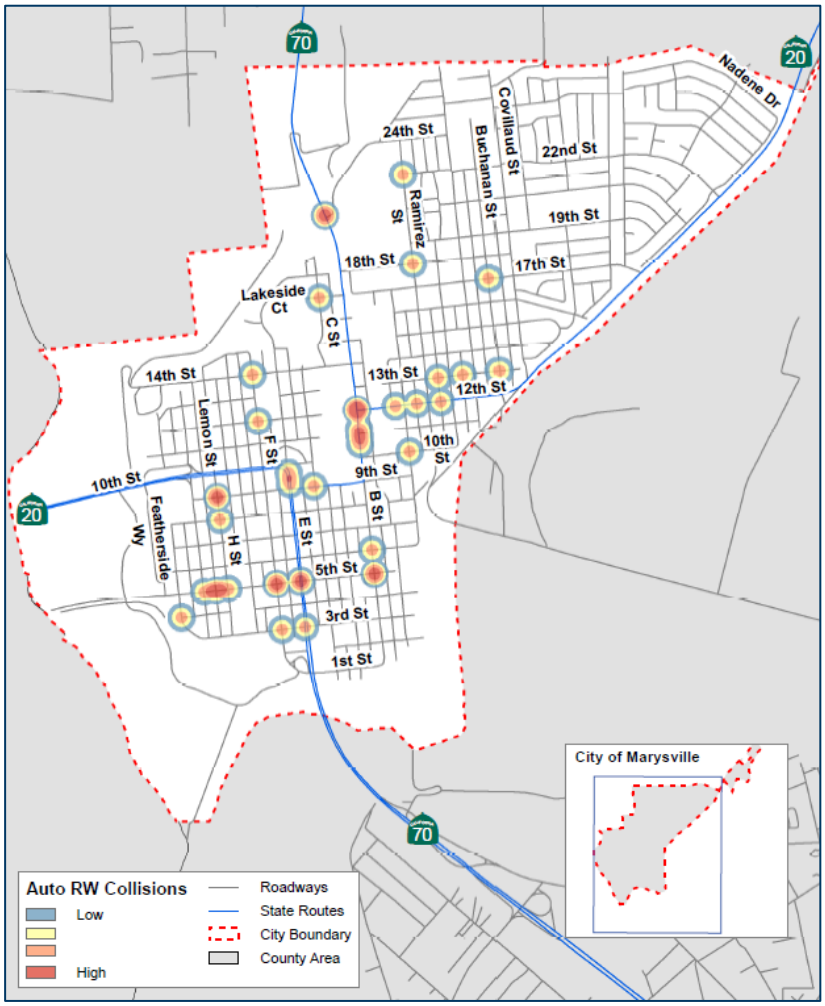
- Where possible Increase frequency and visual presence of patrol activity in high-speed incident areas.
- Consider conducting and advertising periodic speeding checkpoints in high-speed incidence areas.
- Increase Focused Speed Enforcement along 10th St and E St.

Emergency

Action:

- Continue to conduct training targeted at responding to speed related collisions.
- Consider prepositioning emergency assets such as fire and ambulance apparatus in close proximity to high incident areas.

11.3 Emphasis Area #3: Automobile Right of Way



The intersection of a public road and private driveway can be complex, unique, and affected by a number of potential conflicts. Drivers need an unobstructed horizontal and vertical view to be able to see oncoming traffic from any direction. In addition, a higher level of complexity and decision-making are required to navigate turning movements near each other and to controlled intersections to the degree that drivers are not typically accustomed.

Broadside and rear end collisions, primarily resulting from vehicles turning from a side street, are the City's most common collision type.

Intersection visibility has been the primary contributing factor in the vast majority of these collision types. Visibility limitations are most commonly on-street parking, street furniture, and vegetation. These collision types are most concentrated along 5th St, E St and B St.

Road Junction by Alexander Kowalski from noun project

Emphasis Area #3: Automobile Right of Way

Intersection Safety Improvements

Engineering

Action:

- Continue monitoring City's Municipal Code to require property owners to maintain vegetation clear of minimum sight distance requirements if vegetation is within their property line.
    - Annually inspect side street sight distance along high incident corridors and issue requests to property owners to trim vegetation where necessary.
- Where feasible move side street stops bars forward to the maximum extent possible without obstructing bike lanes maintaining ADA clearances.
- Require sight distance studies as part of development applications and require minimum visibility clearances at driveways and adjacent intersections.
- Consider conducting all-way stop control and signalization warrant studies at high incident locations and follow up with potential installations where warrants are satisfied, and public support is demonstrated.

Education

Action:

- Provide targeted public information and education on safety problems at specific intersections
- Consider installation of "cross-traffic does not stop" supplemental warning placards on side street approaches.
- Regularly initiate and engage with local media outlets such as the Appeal-Democrat, KCRA3, Marysville Civic News & Announcements, and City's other social media platforms to publish articles and interviews regarding turning onto areas of high collision concentrations and the importance of ensuring an adequate gap is available before proceeding from the side street.

Enforcement

Action:

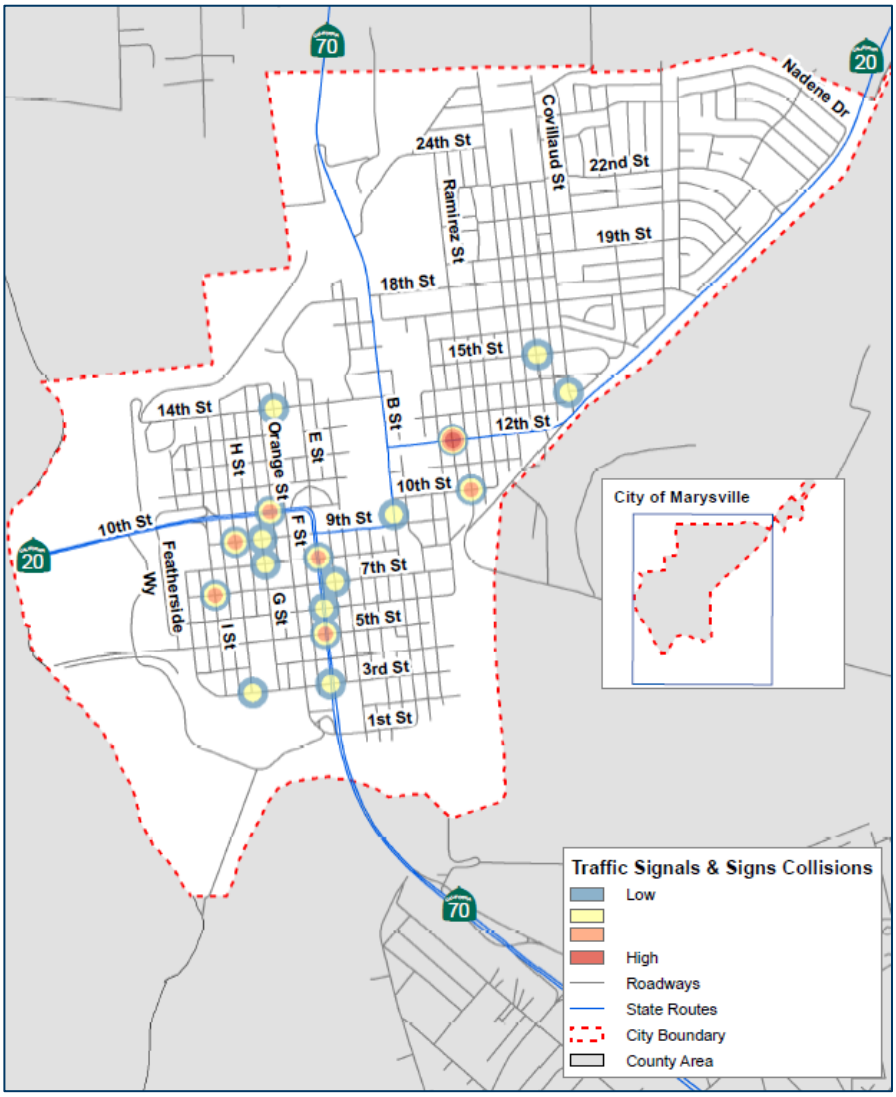
- Provide targeted enforcement to reduce stop sign violations
- Prioritize patrol patterns and overall presence at high incident location

Emergency

Action:

- Support Engineering, Education, and Enforcement Activities

11.4 Emphasis Area #4: Traffic Control Compliance



Another top collision trend in the City of Marysville involves failing to comply with traffic controls and vehicular signage. This collision pattern derives from drivers disobeying traffic signals, control devices or signs such as traffic lights, turn restriction, yield signs, school zone markings, etc.

Traffic light "icon by Chameleon from the noun Project

Emphasis Area #4: Traffic Control Compliance

Intersection Safety Improvements

Engineering

Action:

- Upgrade signalized intersections to 12” indications
- Upgrade signalized intersections with retroreflective backplates.
- Implement Advanced Dilemma Zone Detection at signals with low red-light compliance.
- Review and increase signal clearance timing as necessary.
- Proactively monitor traffic sign retro reflectivity and replace when signs fade to non-conformance levels per California MUTCD Table 2A-3.
- Monitor vegetation overgrowth that could obstruct signage, signals, or visibility of side streets and maintain as appropriate.
- Install warning devices & beacons on approaches to signalized or stop controlled intersections with high collision concentrations

Education

Action:

- Consider published results of high incident location analysis and countermeasure recommendations.
- Regularly initiate and engage with local media outlets such as the Appeal-Democrat, KCRA3, Marysville Civic News & Announcements, and the City’s social media platforms to publish articles & interviews regarding stop sign and red light running.

Enforcement

Action:

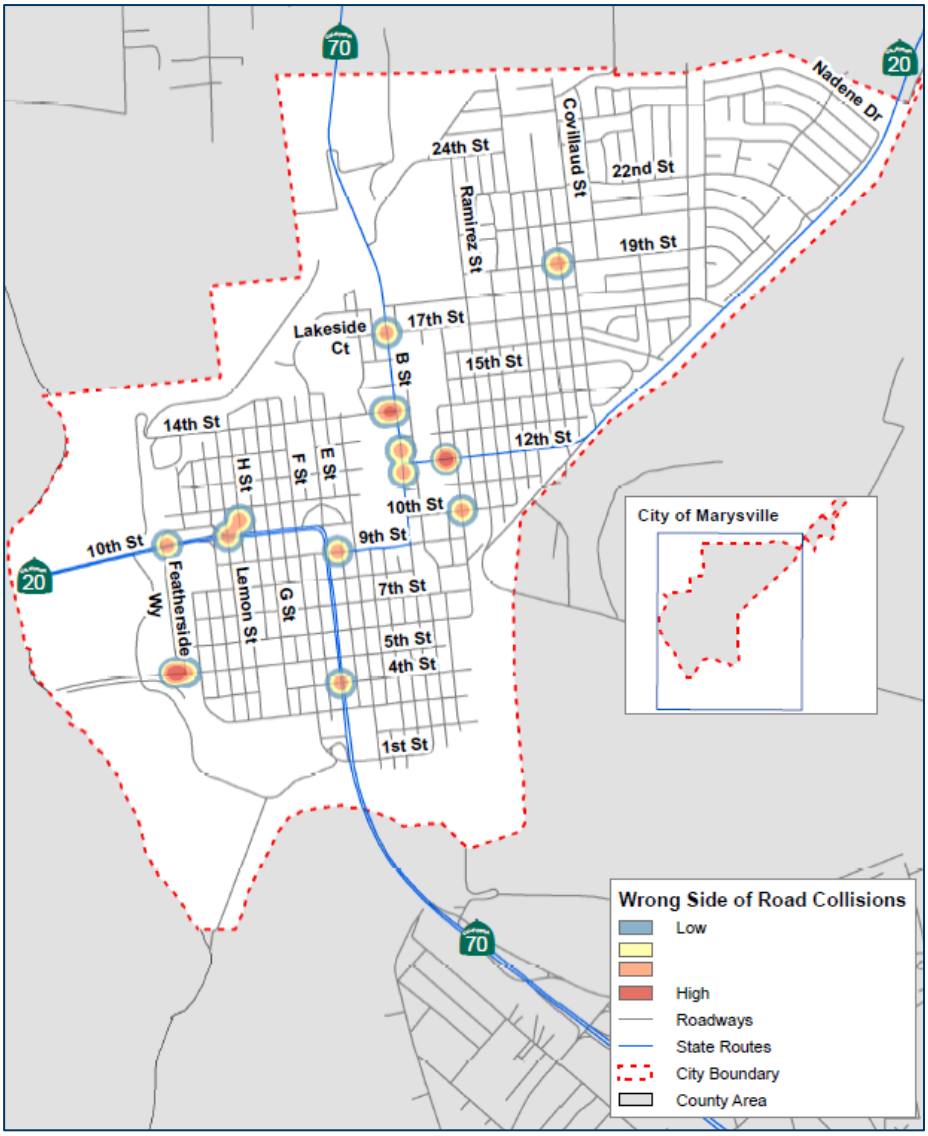
- Installation of red-light indicators for officers at signalized intersections.
- Prioritize patrol patterns and overall presence at low compliance locations.
- Target driver behavior associated with stop sign and red light running, i.e., inattention, speeding, talking/texting on mobile devices.

Emergency

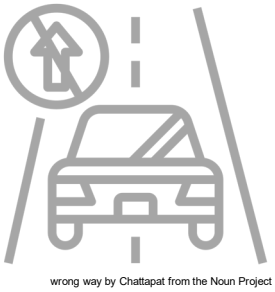
Action:

- Targeted training for responding to specific high incident locations and treatment of predominant injury types at those locations.

11.5 Emphasis Area #5: Wrong Side of the Road



Wrong way driving collisions are much more likely to result in fatalities or severe injuries than other highway collision types. Additionally, environmental factors, such as nighttime conditions or elevated traffic activity related to events on weekends can greatly increase the likelihood for this type of collision to occur. From 2015-2019, 17 reported collisions in the City of Marysville involves Wrong side of the road.



wrong way by Chattapat from the Noun Project

Emphasis Area #5: Wrong Side of the Road

Intersection Safety Improvements

Engineering

Action:

- Install or upgrade the type of number of signing and pavement markings per MUTCD.
- Consider modification to roadways such as raised curb median.
- Researching ITS applications that focus on both the transportation infrastructure and vehicles, as well as integrated applications between the two.
- Upgrade lighting on high incident intersection.

Education

Action:

- Publish results of high incident location analysis and countermeasure recommendations.
- Regularly initiate and engage with local media outlets such as the Appeal-Democrat, KCRA3, Marysville Civic News & Announcements, and the City's social media platforms to publish articles & interviews regarding wrong side driving.

Enforcement

Action:

- Prioritize patrol patterns and overall presence at low compliance locations.
- Target driver behavior associated with wrong way driving.

Emergency

Action:

- Support Education, Enforcement, & Emergency Services Activities.

12. High Incident Location Pattern Analysis

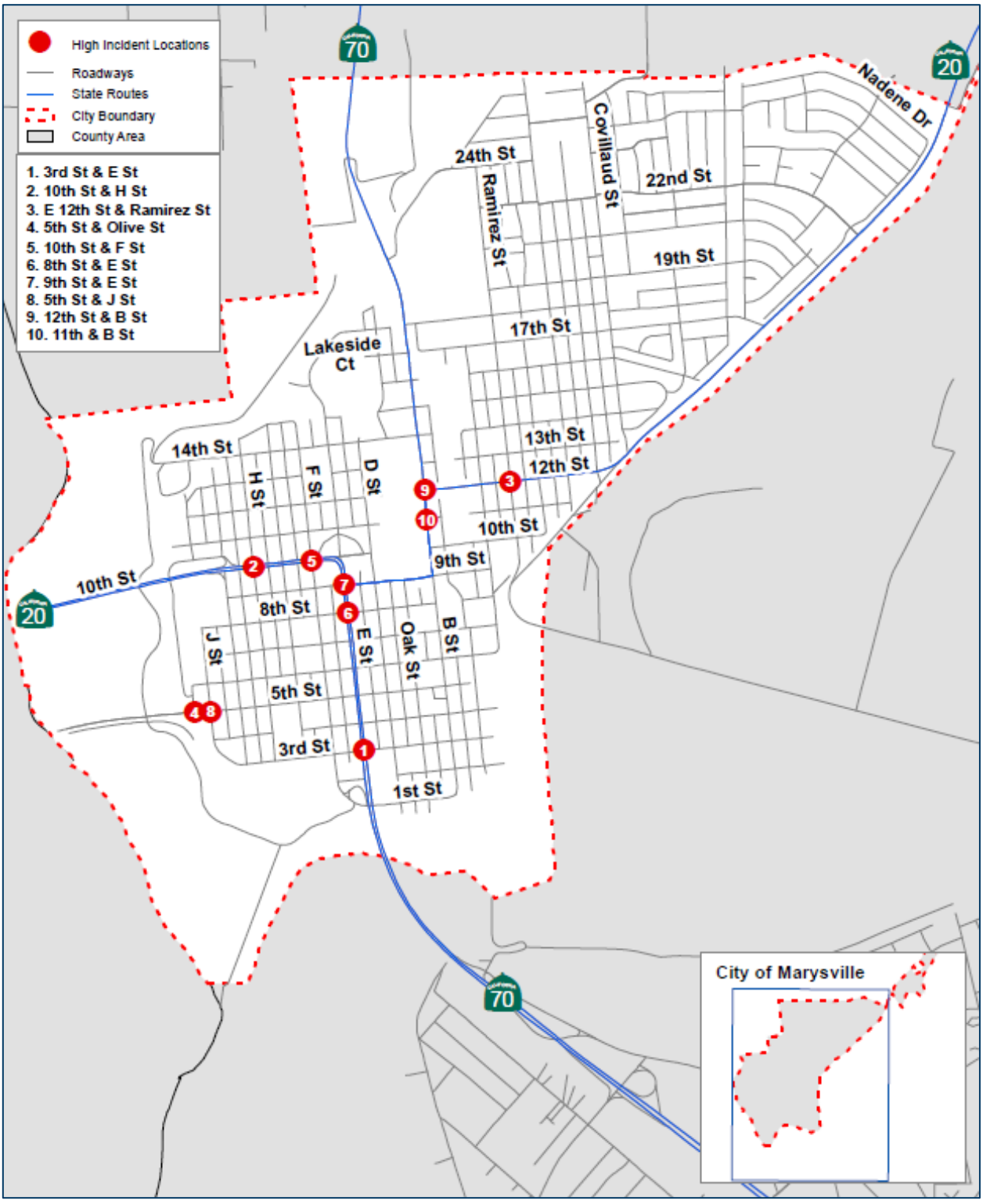
12.1 Intersections

Table 5 and figure 19 below depicts a focused view of the areas with the highest concentration of collisions in the City. Most collisions within this section involved a rear end collision from an unsafe speed. The intersections are listed and presented with recommended countermeasures in order of highest to the lowest collision rate.

Table 4 Citywide High Collision Rate Intersections

#	Intersection	Control	2015--2019 Collisions
1	E St at 3rd St	Signal	13
2	10th St at H St	Signal	12
3	E 12 St at Ramirez St	Signal	8
4	5th St at Olive St	Uncontrolled	8
5	10th St at F St	Signal	7
6	E St at 8th St	Signal	7
7	9th St at E St	Signal	7
8	5th St at J St	Signal	7
9	B St at E 12 St	Signal	5
10	B St at 11th St	OWSC	5

Figure 19 Top 10 High Incident Intersections

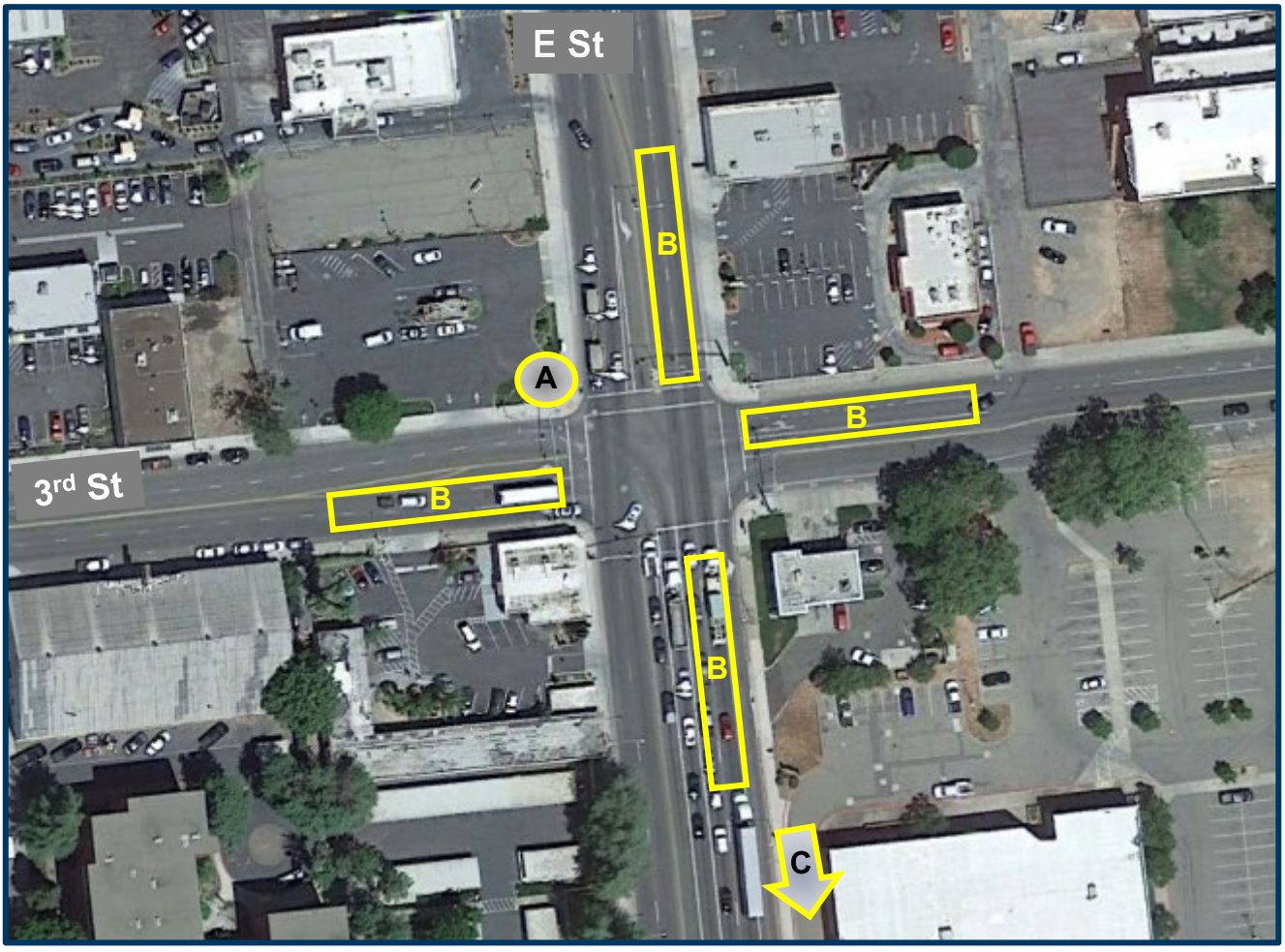


1. 3rd St & E St

Pattern: NB rear-end collisions caused by unsafe approach speeds.

Recommended Measures:

	Countermeasure	FHWA CMF Code	Crash Reduction Factor
A	Review and increase signal clearance timing as necessary.	S03	0.15
B	Install Advanced Dilemma Zone Detection.	S04	0.40
C	Install Advanced Traffic Control Sign W16-9P sign below W3-3 (NB direction).	S10	0.03

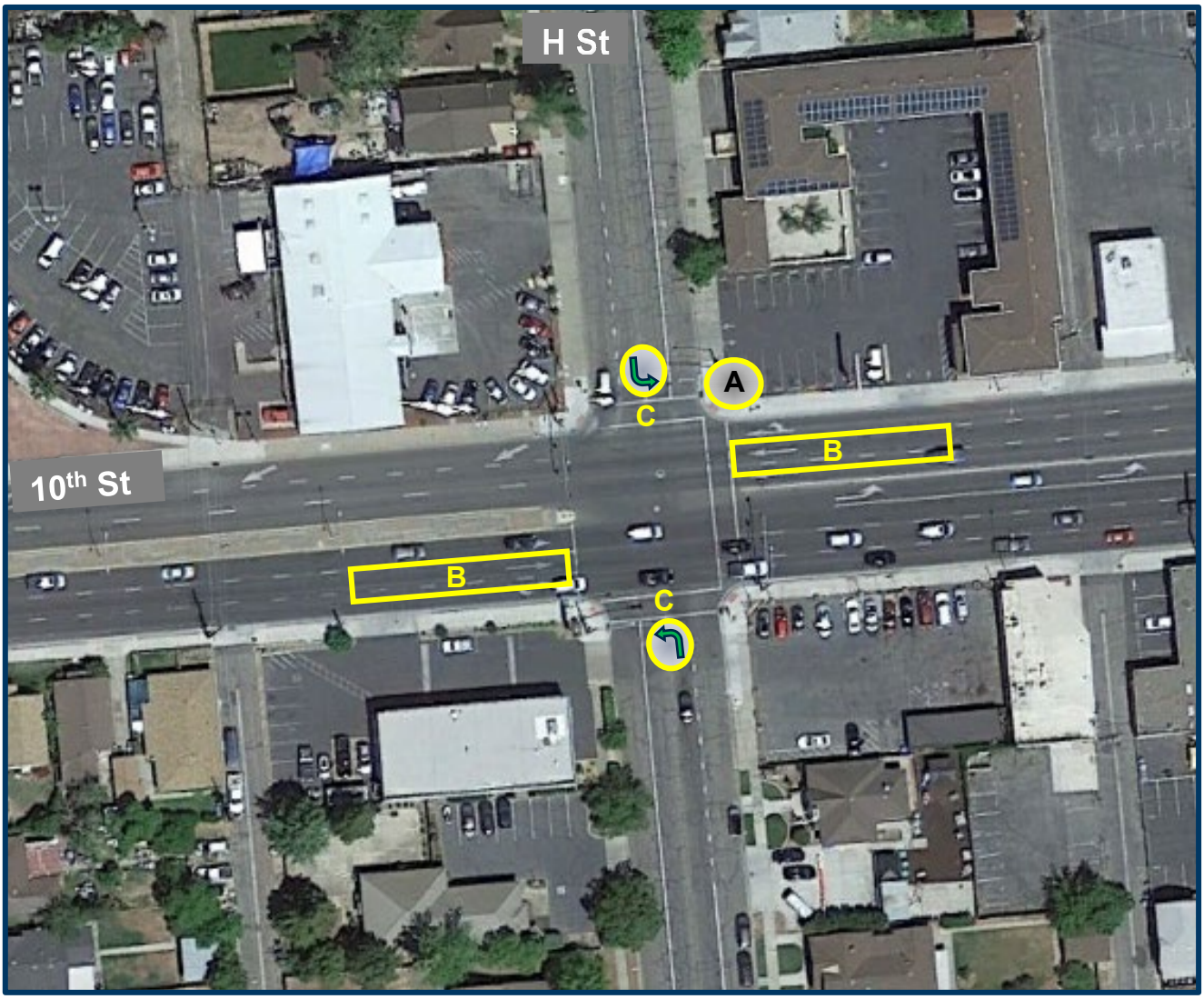


2. 10th St & H St

Pattern: EB & WB rear-end collisions caused by unsafe approach speeds and NB left turn broadside collisions during permissive interval.

Recommended Measures:

	Countermeasure	FHWA CMF Code	Crash Reduction Factor
A	Review and increase signal clearance timing as necessary.	S03	0.15
B	Install Advanced Dilemma Zone Detection along EB & WB approaches.	S04	0.40
C	Install / upgrade dedicated left turn phases on NB & SB approach. Restripe approaches to accommodate dedicated left turn lane.	S02	0.15



3. E 12th St & Ramirez St

Pattern: Broadside collisions caused by unsafe approach speeds on all approaches and NB left turn head on collisions for failure to obey signal light.

Recommended Measures:

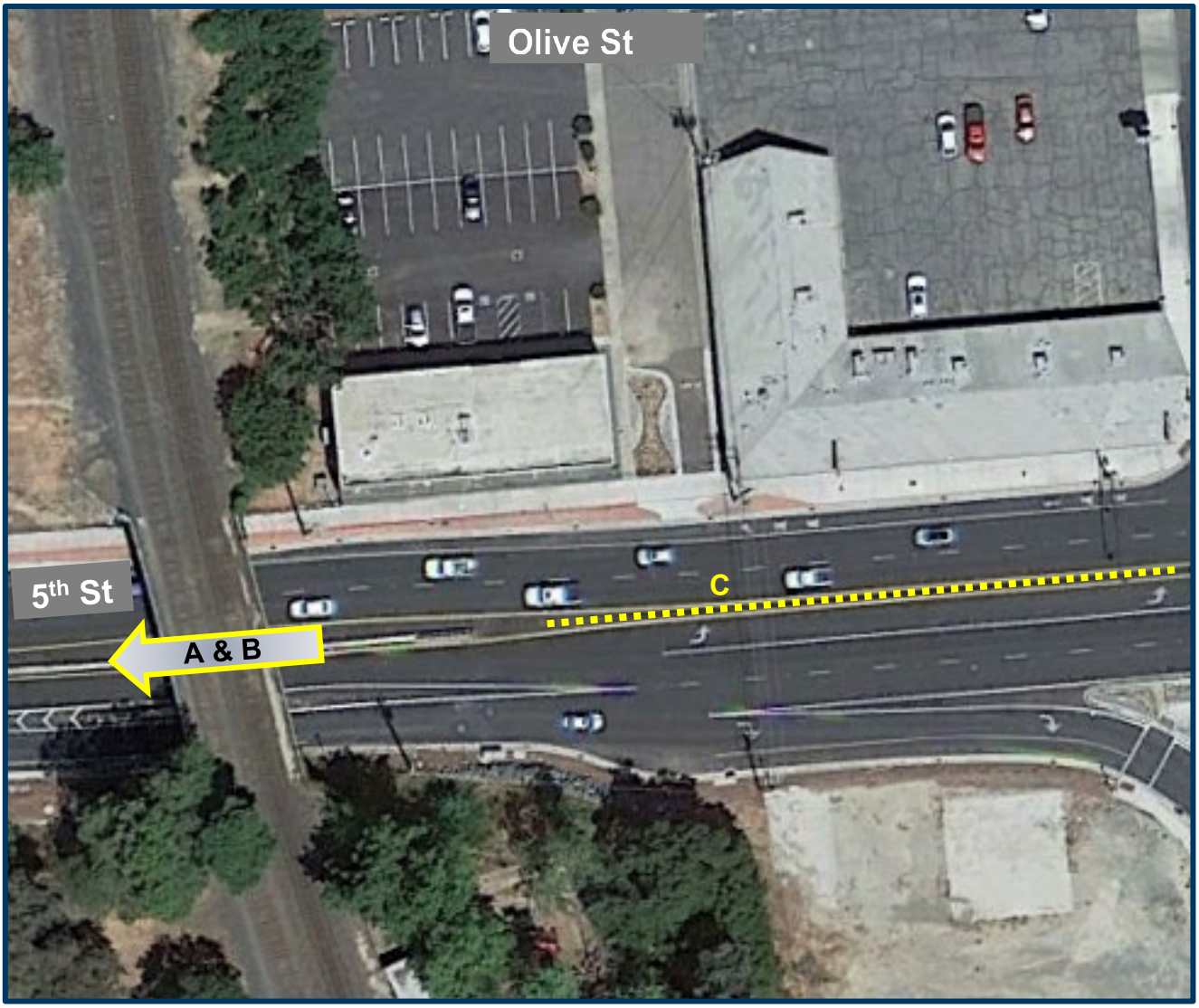
	Countermeasure	FHWA CMF Code	Crash Reduction Factor
A	Upgrade 8” signal heads to 12” and replace/upgrade signal backplates with retroreflective boarder.	S02	0.15
B	Review and increase signal clearance timing as necessary.	S03	0.15
C	Install Advanced Dilemma Zone Detection.	S04	0.40
D	Upgrade / restripe NB “Signal Ahead” pavement markings.	NS07	0.25

4. 5TH St & Olive St

Pattern: EB rear-end collisions caused by unsafe approach speeds.

Recommended Measures:

	Countermeasure	FHWA CMF Code	Crash Reduction Factor
A	Install Advanced Traffic Control Sign W3-3 with W16-9P sign (EB direction).	S10	0.03
B	Install posted speed limit sign (EB direction).	S10	0.03
C	Install Type Q object markers (visible in all directions) to emphasize no EB left turn movements onto Olive St.	S10	0.03

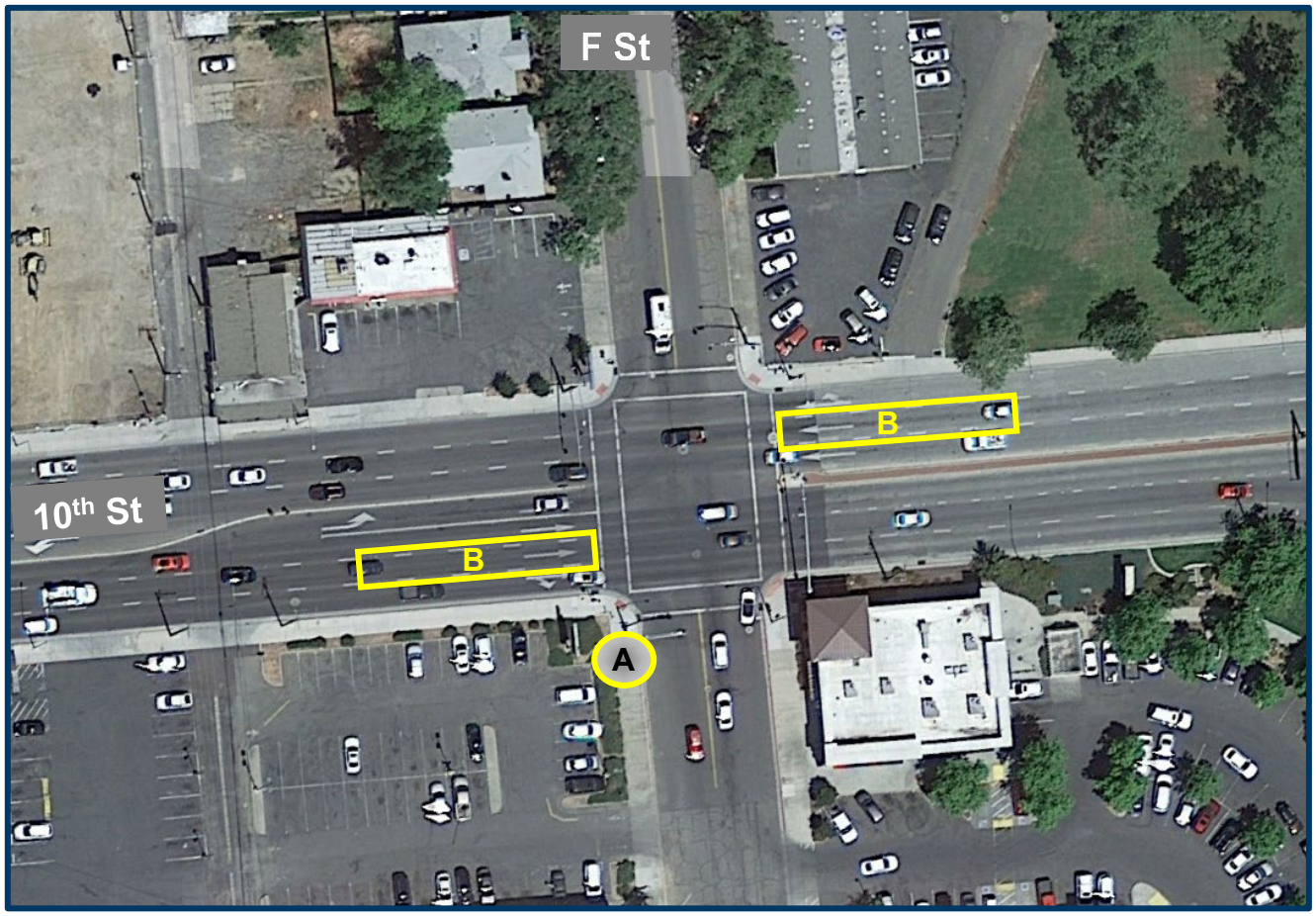


5. 10TH St & F St

Pattern: Broadside collisions caused by failure to obey signs/signals on EB and SB approaches.

Recommended Measures:

	Countermeasure	FHWA CMF Code	Crash Reduction Factor
A	Review and increase signal clearance timing as necessary.	S03	0.15
B	Install Advanced Dilemma Zone Detection (EB & WB approaches).	S04	0.40

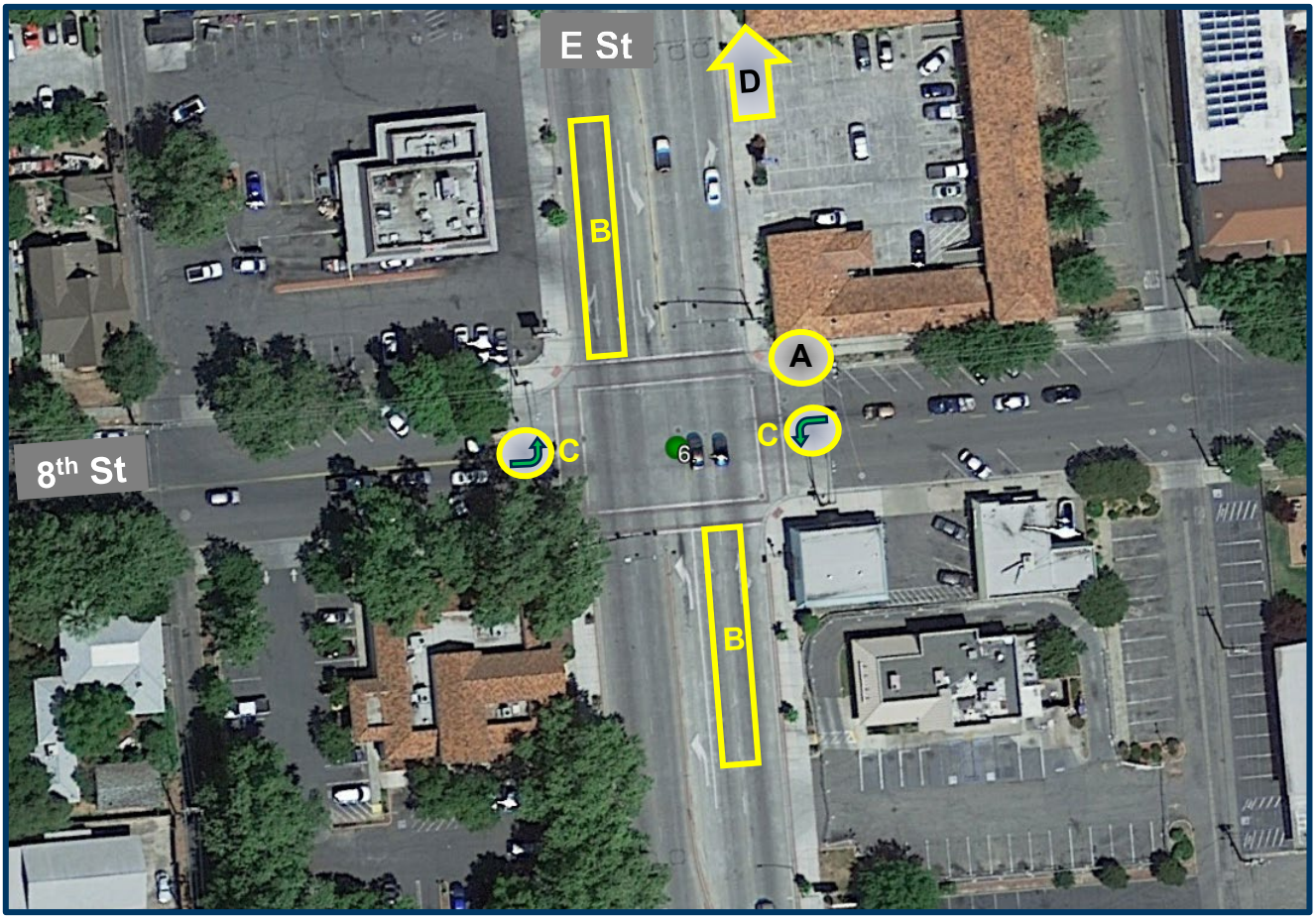


6. E St & 8TH St

Pattern: NB & SB rear end collisions caused by unsafe approach speeds and broadside collisions caused by failure to obey signs/signals during permissive interval on EB & WB approaches.

Recommended Measures:

	Countermeasure	FHWA CMF Code	Crash Reduction Factor
A	Review and increase signal clearance timing as necessary.	S03	0.15
B	Install Advanced Dilemma Zone Detection.	S04	0.40
C	Install protected-split left turn phasing indications on EB & WB approach. Restripe approaches to accommodate dedicated left turn lane.	S02	0.15
D	Install posted speed limit sign (NB direction between 9th and 8th St).	S10	0.03
E	Install signal interconnect and coordinate with 9th St & E St.	S02	0.15

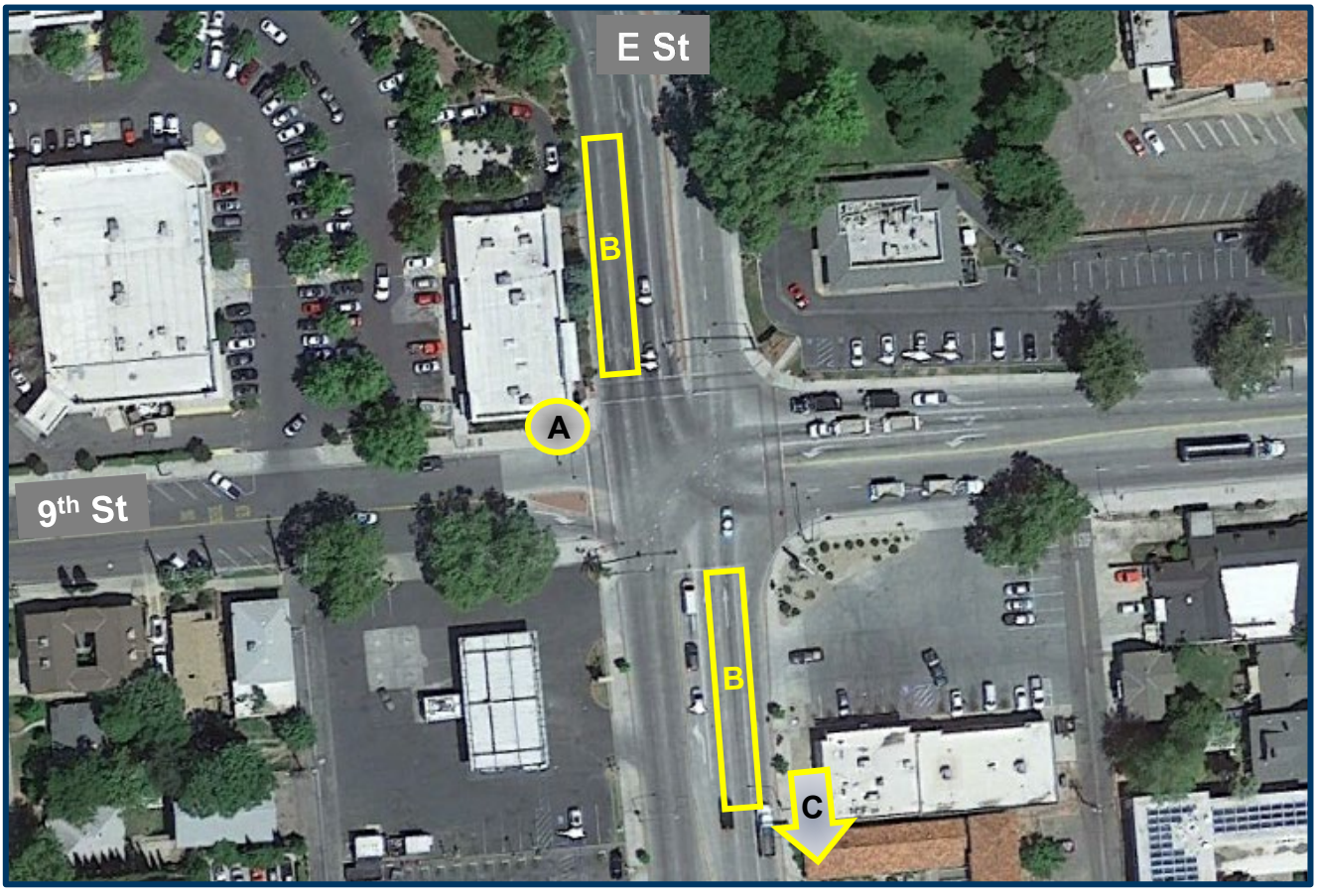


7. 9TH St & E St

Pattern: WB & NB rear end and broadside collisions caused by unsafe approach speeds and improper turning.

Recommended Measures:

	Countermeasure	FHWA CMF Code	Crash Reduction Factor
A	Review and increase signal clearance timing as necessary.	S03	0.15
B	Install Advanced Dilemma Zone Detection (NB & SB approach).	S04	0.40
C	Install posted speed limit sign (NB direction between 9th and 8th St).	S10	0.03
D	Install signal interconnect and coordinate with 8th St & E St.	S02	0.15

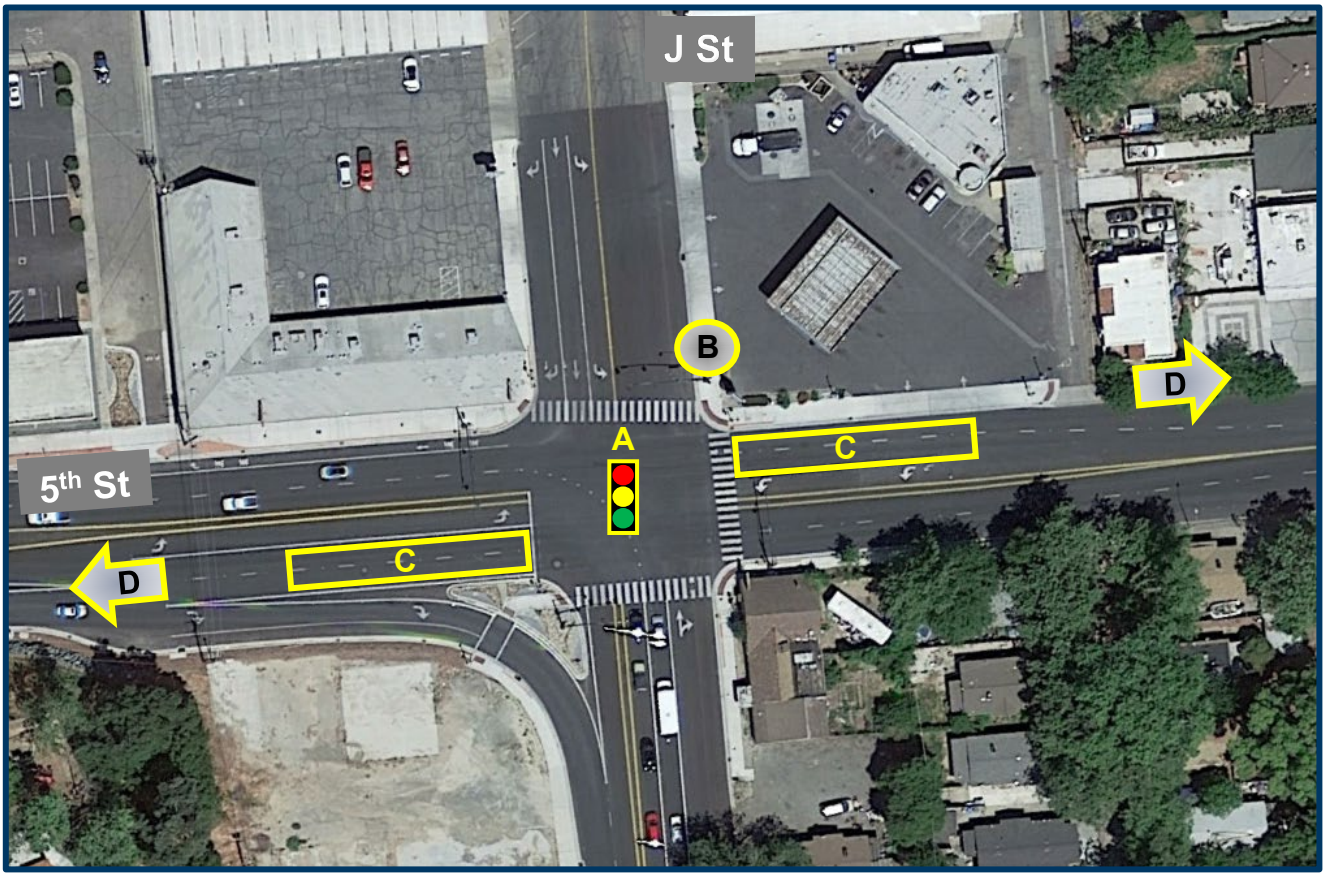


8. 5TH St & J St

Pattern: EB Rear end collisions from unsafe speed.

Recommended Measures:

	Countermeasure	FHWA CMF Code	Crash Reduction Factor
A	Upgrade 8” signal heads to 12” and replace/upgrade signal backplates with retroreflective boarder.	S02	0.15
B	Review and increase signal clearance timing as necessary.	S03	0.15
C	Install Advanced Dilemma Zone Detection.	S04	0.40
D	Upgrade / restripe “Signal Ahead” pavement markings on EB & WB approaches.	NS07	0.25



9. B St & E 12th St

Pattern: Head-On collisions due to right-of-way factors followed by broadside and rear ends.

Recommended Measures:

	Countermeasure	FHWA CMF Code	Crash Reduction Factor
A	Review and increase signal clearance timing as necessary.	S03	0.15
B	Install Advanced Dilemma Zone Detection.	S04	0.40
C	Install median restricting EB left turn movements.	R08	0.25

10. B St & 11th St

Pattern: Broadside collisions due to limited gap availability and failure to yield. Head-on collisions due to unsafe speed and failure to yield.

Recommended Measures:

	Countermeasure	FHWA CMF Code	Crash Reduction Factor
A	Stripe "Keep Clear" in the middle of the intersection.	NS07	0.25
B	Restrict 11th Street to right-in/right-out only and add right turn only pavement marking.	NS07	0.25

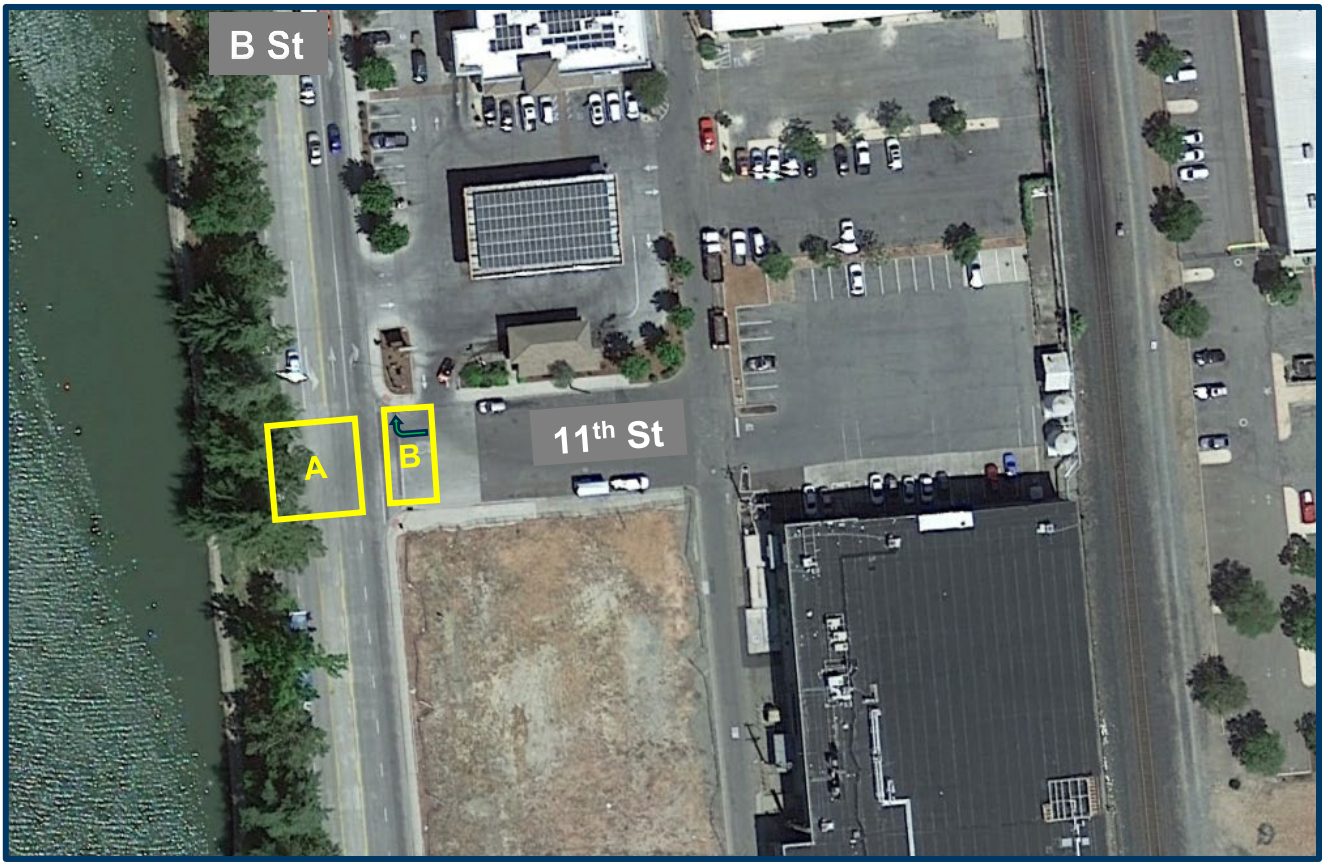


Table 5 High Collision Rate Intersections – Pedestrians and Bike

#	Intersection	Control	5 Yr. Collisions
1	E St at 9th St	Signal	7
2	9th St at D St	Signal	5
3	B St at 11th St	OWSC	2
4	10th St at G St	Signal	2
5	B St at E 12 St	Signal	2

Table 6 High Pedestrian and Bike Incident Intersection Recommendations

1. E St at 9th St	
Pattern:	Vehicle R/W violations from improper turn movements Unsafe speed/Pedestrian violation from proceeding straight movements
Recommendations:	A. Focused speed enforcement. B. Upgrade Intersection crossing marking and signing to most current MUTCD and NACTO guidance. C. Monitor intersection for an AWS signal warrant.
2. 9th St at D St	
Pattern:	Collisions with ped from auto not stopping at red light Vehicle R/W violations from improper turn movements
Recommendations:	A. Install Advanced Dilemma Zone Detection. B. Focused speed enforcement. C. Replace or upgrade signal backplates with retroreflective boarder and upgrade 8” signal heads to 12”. D. Install leading interval count for pedestrian crossing. E. Upgrade Intersection crossing marking and signing to most current MUTCD and NACTO guidance.
3. B St at 11th St	
Pattern:	NS Pedestrian and bike R/W violations entering traffic.
Recommendations:	A. NB & SB focused speed enforcement. B. Install high visibility crosswalk. C. Bike lane.

4. 10th St at G St	
Pattern:	No collision patter could be determined.
Recommendations:	A. Continue to monitor the intersection
5. B St at E 12 St	
Pattern:	No collision patter could be determined.
Recommendations:	A. Reduce 12th St EB from 2 lanes to 1 lane from B St to Blue St. B. Stripe Class IV bike facility on southside of E 12th St from B Street to Blue St. C. Continue to monitor the intersection.


GHD