City of Chowchilla

Local Roadway Safety Plan

05/24/2022

Final Report

Contents

List of Figures

List of Tables

Appendices

Appendix A: Matrix of Planning Goals, Policies, and Projects
Appendix B: Consolidated Collision Database
Appendix C: HSIP Eligible Countermeasures
Appendix D: Countermeasure Toolbox
Appendix E: B/C Ratio Calculation - LRSM (2020)

Executive Summary

The City of Chowchilla'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 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 takes a proactive approach to addressing safety needs. It is viewed as a guidance document that can be a source of information and ideas. It can also be a living document, one that is routinely reviewed and updated by City staff and their safety partners to reflect evolving collision trends and community needs and priorities. With the LRSP as a guide, the City will be able to ready to apply for grant funds, such as the federal Highway Safety Improvement Program (HSIP).

Chapter 1 – Introduction

The Introduction presents the project, describes how this report is organized, summaries the vision and goals, the study area for the LRSP, details how the report is organized and introduces the safety partners.

Chapter 2 – Existing Planning Efforts

This chapter summarizes existing City and regional planning documents and projects that are relevant to the LRSP. It ensures that the recommendations of the LRSP are in line with existing goals, objectives, policies, or projects. This chapter summarized the following documents: City of Chowchilla 2040 General Plan, Madera County Active Transportation Plan (2018), Downtown Design Guidelines (2017), Chowchilla Industrial Park Specific Plan (2018), Chowchilla City Budget 2020-2021, Short Range Transit Development Plan FY 2017/18- 2020/22, 2018 Regional Transportation Plan Sustainable Communities Strategy and SR 233/Robertson Boulevard Corridor Planning Study and Downtown Master Plan (2020).

Chapter 3 – Collision Data Collection and Analysis

Collision data was obtained and analyzed for a five-year period from 2015 to 2019 from the California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS) and the University of California at Berkeley SafeTREC's Transportation Injury Mapping Service (TIMS).

The collision analysis identified general trends of collisions in the City of Chowchilla. For collisions of all severity, including PDO collisions, 85% collisions occurred at intersections.

For collisions of all severity, including PDO collisions, 99 percent collisions have occurred at intersections. The most common collision type for collisions occurring at intersections is broadside collisions. One of the top priorities of the LRSP will be to address intersection safety at all intersections where collisions have historically occurred.

For fatal and severe injury (F+SI) collisions, major collision types include: broadside, head-on and pedestrian collisions. The broadside and head-on collisions predominantly occur at intersections. This calls for evaluating intersection conditions at these locations and throughout the City. Improvements at these locations may include larger or more signal heads at signalized intersections and installing roundabouts at unsignalized intersections. Replacing a two way stop controlled intersection with a roundabout can reduce severe collisions by 82% (FHWA, 2017)[1] by lowering speeds and reducing conflict points which may benefit locations such as the intersection of Avenue 24 1/2 and Road 16.

About 38 percent of F+SI collisions involve a pedestrian. The maximum number of vehicle-pedestrian collisions have been observed along the corridor Robertson Boulevard/SR 233. This calls for evaluating pedestrian conditions along this corridor and throughout the City that are unsafe for pedestrians. For example, improvements like reducing pedestrian crossing distances and installing pedestrian refuge islands, and bulb outs can help make these locations safer for pedestrians. Robertson Boulevard/Route 233 is in Caltrans right-of-way and the City would need to work with them to implement safety countermeasures.

About 46 percent of F+SI collisions have occurred at night. The maximum number of nighttime collisions have been observed along the corridor Robertson Boulevard/ SR233 and Avenue 24 1/2. This may indicate that lighting at these locations should be evaluated to insure lumen levels are adequate. Many different factors can contribute to nighttime collisions, such as low lighting levels that can be targeted with countermeasure, but extraneous factors can also contribute to nighttime injury such as alcohol use, sleep and fatigue. This calls for evaluating lighting conditions at these locations and installing segments lighting, installing or upgrade to larger or adding additional stop signs or other intersection warning/regulatory signs, installing backplates with retroreflective boarders, and upgrade signs with new fluorescent sheeting.

[1] FHWA. (2017). Proven Safety Countermeasures 2017. FHWA-SA-055. https://safety.fhwa.dot.gov/provencountermeasures/roundabouts/

Chapter 4 - Emphasis Areas

Emphasis areas are a focus of the LRSP that are identified through the various collision types and factors resulting in fatal and severe injury collisions within the City of Chowchilla. The nine emphasis areas for Chowchilla are:

- Improve Intersection Safety
- Reduce Broadside Collisions
- Improve Pedestrian Safety
- Reduce Hit Object Collisions
- Reduce Head-on Collisions
- Reduce DUI Collisions
- Reduce School Collisions
- Reduce Younger Adult (Party at Fault) Collisions

Chapter 5 – Countermeasure Identification

Engineering countermeasures were selected for each of the high-risk locations and for the emphasis areas. These were based off of approved countermeasures from the Caltrans Local Roadway Safety Manual (LRSM) used in HSIP grant calls for projects. The intention is to give the City potential countermeasures for each location that can be implemented either in future HSIP calls for projects, or using other funding sources, such as the City's Capital Improvement Program. Non-engineering countermeasures were also selected using the 4 E's strategies, and are included with the emphasis areas.

Chapter 6 – Safety Projects

A set of four safety projects were created for high-risk intersections and roadway segments, using HSIP approved countermeasures. These safety projects are:

Project 1: Systemic Improvements at Unsignalized Intersections
Project 2: Pedestrian Improvements at Unsignalized Intersections
Project 3: Systemic Roadway Segment Improvements
Project 4: Pedestrian and Other Roadway Segment Improvements

Chapter 7 – Evaluation and Implementation

The LRSP is a guidance document that is recommended to be updated every two to five years in coordination with the safety partners. 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 emphasis areas and countermeasures should be re-evaluated.

1. Introduction

What is a LRSP?

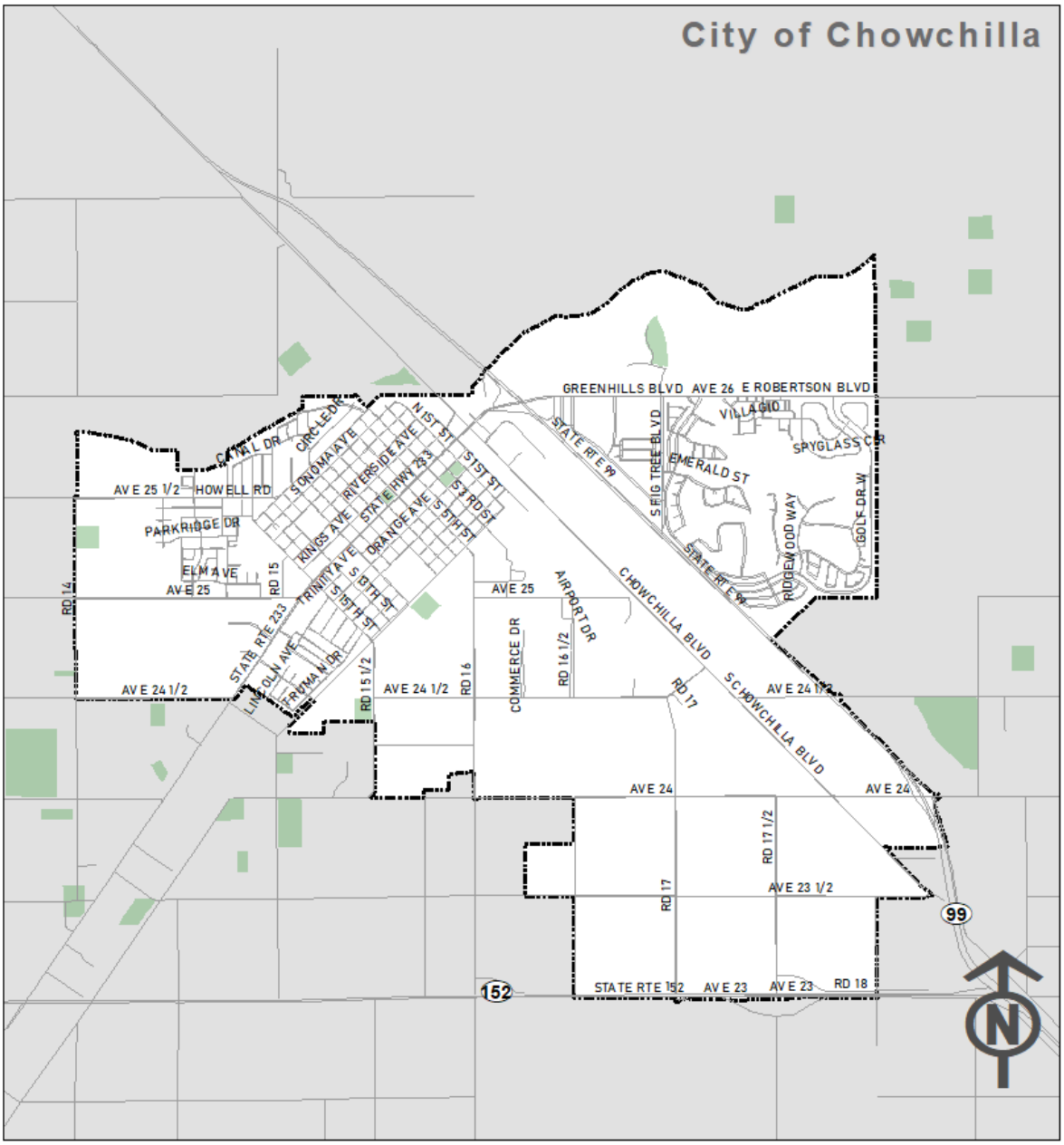
The Local Roadway Safety Plan (LRSP) is a localized data-driven traffic safety plan that provides opportunities to address unique highway safety needs and reduce the number of fatal and severe injury collisions. The LRSP creates a framework to systematically identify and analyze traffic safety-related issues, and recommend safety projects and countermeasures. The LRSP facilitates the development of local agency partnerships and collaboration, resulting in the development of a prioritized list of improvements that can qualify for Highway Safety Improvement Program (HSIP) funding.

The LRSP is a proactive approach to addressing safety needs and is viewed as a living document that can be constantly reviewed and revised to reflect evolving trends, and community needs and priorities.

Vision and Goals of the LRSP

- Goal #1: Systematically identify and analyze roadway safety problems and recommend improvements
- Goal #2: Improve the safety of all road users by using proven effective countermeasures
- Goal #3: Ensure coordination and response of key stakeholders to implement roadway safety improvements within Chowchilla
- Goal #4: Serve as a resource for staff who continually seek funding for safety improvements
- Goal #5: Recommend how safety improvements can be made in a manner that is fair and equitable for all Chowchilla residents

Figure 1. City of Chowchilla



Study Area

The City of Chowchilla is located in Madera County, California covering a total area of about 11 square miles, located in the Central Valley, 30 miles north of Fresno. The City's estimated population is 18,310 (ACS 2019 1-year estimate). State Route (SR) 99 is the major highway that connect the City of Chowchilla to Fresno, Merced and other nearby cities.

Safety Partners

Safety partners are vital to the development and implementation of an LRSP. For Chowchilla, these include Chowchilla Public Works, Chowchilla Police Department and the local school districts. A virtual stakeholder meeting among these departments/agencies was held on June 15, 2021 to review project goals and findings, and to solicit feedback from the group. The draft LRSP was then shared with stakeholders in March 2022 for final comments.

2. Existing Planning Efforts

This section summarizes the planning documents, projects underway, and studies reviewed for Chowchilla Local Roadway Safety Plan (LRSP). The purpose is to ensure the LRSP vision, goals, and E's strategies are aligned with prior planning efforts, planned transportation projects and non-infrastructure programs. The documents reviewed are listed below:

1. City of Chowchilla 2040 General Plan;
2. Madera County Active Transportation Plan (2018);
3. Downtown Design Guidelines (2017);
4. Chowchilla Industrial Park Specific Plan (2018;
5. Chowchilla City Budget 2020-2021;
6. Short Range Transit Development Plan FY 2017/18- 2020/22;
7. 2018 Regional Transportation Plan Sustainable Communities Strategy;
8. SR 233/Robertson Boulevard Corridor Planning Study and Downtown Master Plan (2020).

The following sections include brief descriptions of these documents and how they inform the development of the LRSP. A brief document summary is listed in **Table 1**. A more detailed list of upcoming projects and relevant policies is listed in **Appendix A**.

Table 1. Document Review Summary

Document	Highlights
City of Chowchilla General Plan (2003)	Circulation element of the plan details planned transportation improvements for the City of Chowchilla and includes bicycle, pedestrian, vehicle and transit policies.
Madera County Active Transportations Plan (2018)	Details bicycle and pedestrian improvements on County significant corridors. Includes many detailed priority bike and pedestrian projects, including 24 in bike projects and 10 pedestrian projects in Chowchilla.
Downtown Design Guidelines (2017)	Details circulation and access of Downtown Chowchilla. Pedestrian improvements will be given high priority in the downtown area, including marked thermoplastic decorative crosswalks and bulb outs.
Chowchilla Industrial Park Specific Plan (2018)	Details the land use plans for Chowchilla's industrial park, with an emphasis on long-term economic growth and vitality, job creation, and revenue.
Chowchilla City Budget 2020-2021	Details the City budget for 2020-2021 and summarizes the accomplishments of the 2019-2020 fiscal year.
Short Range Transit Development Plan FY 2017/18- 2020/22	Transit development plan for Madera County, which focuses on analyzing service needs and recommending improvements.
2018 Regional Transportation Plan Sustainable Communities Strategy	This is a very high-level plan, and it reaffirms Madera County's commitment to sustainable communities. Contains some projects in Chowchilla to be completed between 2020 and 2030.
SR 233/Robertson Boulevard Corridor Planning Study and Downtown Master Plan (2020)	The study entails conceptual alternatives and design recommendations that serve as a step towards reimagining Robertson Boulevard as a multi-modal corridor that will serve all its users.

City of Chowchilla 2040 General Plan

The General Plan presents a consolidated framework of decisions for guiding where and how development should occur in Chowchilla through 2040. The General Plan recognizes that the Circulation Element is crucial to improve Chowchilla's quality of life and economic prosperity. Circulation not only covers the movement of automobiles, but the whole range of transportation alternatives, such as pedestrian, bicycle, air, truck, and rail.

Madera County Active Transportation Plan (2018)

The Madera County Active Transportation Plan (ATP) envisions a comprehensive bicycle and pedestrian network across Madera County. As the region's Metropolitan Planning Organization (MPO), the Madera County Transportation Commission (MCTC) is responsible for the adoption of the County's Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) and Transportation Improvement Program (TIP) as required by State and Federal law. The proposed pedestrian and bicycle network for the City of Chowchilla will greatly improve access within Chowchilla.

Downtown Design Guidelines (2017)

The community believes that supporting and enhancing the unique character of Downtown Chowchilla is essential. These design guidelines are intended to create a positive impact on the physical appearance and function within the downtown core and to accomplish the following objectives

- Promote a refreshing and inviting atmosphere in which people live and conduct business, shop, and enjoy entertainment
- Create an identifiable sense of place, beauty, and comfort
- Enhance community pride
- Create an atmosphere that promotes and supports special events
- Appeal to a variety of age groups, incomes, and cultures
- Encourage creativity, architectural diversity, and exceptional design while recognizing the timeless character of existing buildings.

Chowchilla Industrial Park Specific Plan (2018)

The Chowchilla Industrial Park Specific Plan (Specific Plan) establishes long-term development goals, standards, and guidelines for the City of Chowchilla's industrial park. The primary land uses will be industrial and commercial and will provide the City with long-term economic growth and vitality, job creation, and revenue. An important feature of the Specific Plan's Circulation goal is to meet the City of Chowchilla's goals for a more walkable community.

Chowchilla City Budget 2020-2021

The Chowchilla City Budget details the budget for the coming year for the City of Chowchilla. The document has a specific street and roads division chapter that details the mission of the division as to provide the City's taxpayers the most cost effective infrastructure and services possible, to enable them to live their lives and conduct their business in a safe, healthy, and environmentally sound manner, in a community they can be proud of.

Short Range Transit Development Plan FY 2017/18- 2020/22

This plan reflects Madera County's "Short-Range Transit Development Plan" (SRTDP) for the five-year period, FY2017/18 through FY2021/22. The SRTDP is intended to serve as a guide for improving public transit agencies within Madera County. The plan reviews recent progress, evaluates existing operations and conditions, and recommends future strategic actions to effect positive changes. A key component of the SRTDP is the development of realistic operating and capital projections based on present and future performance of the existing systems over the next five years.

2018 Regional Transportation Plan/Sustainable Communities Strategy (San Joaquin Concil of Governments)

The RTP is a long-range transportation plan providing a vision for regional transportation investments over at least a 20-year period. The RTP provides an opportunity to identify transportation strategies that address mobility needs for the future. The RTP is updated every four (4) years to reflect changes in economic trends, State and federal project and funding requirements, progress made toward project implementation, and current socioeconomic trends.

SR 233/Robertson Boulevard Corridor Planning Study and Downtown Master Plan (2020)

SR 233/Robertson Boulevard is a major regional corridor, acting as a spine for the local street network for the City of Chowchilla as well as a regional connector connecting cities across the region. The study entails conceptual alternatives and design recommendations that serve as a step towards reimagining Robertson Boulevard as a multi-modal corridor that will serve all its users.

3. Collision Data Collection and Analysis

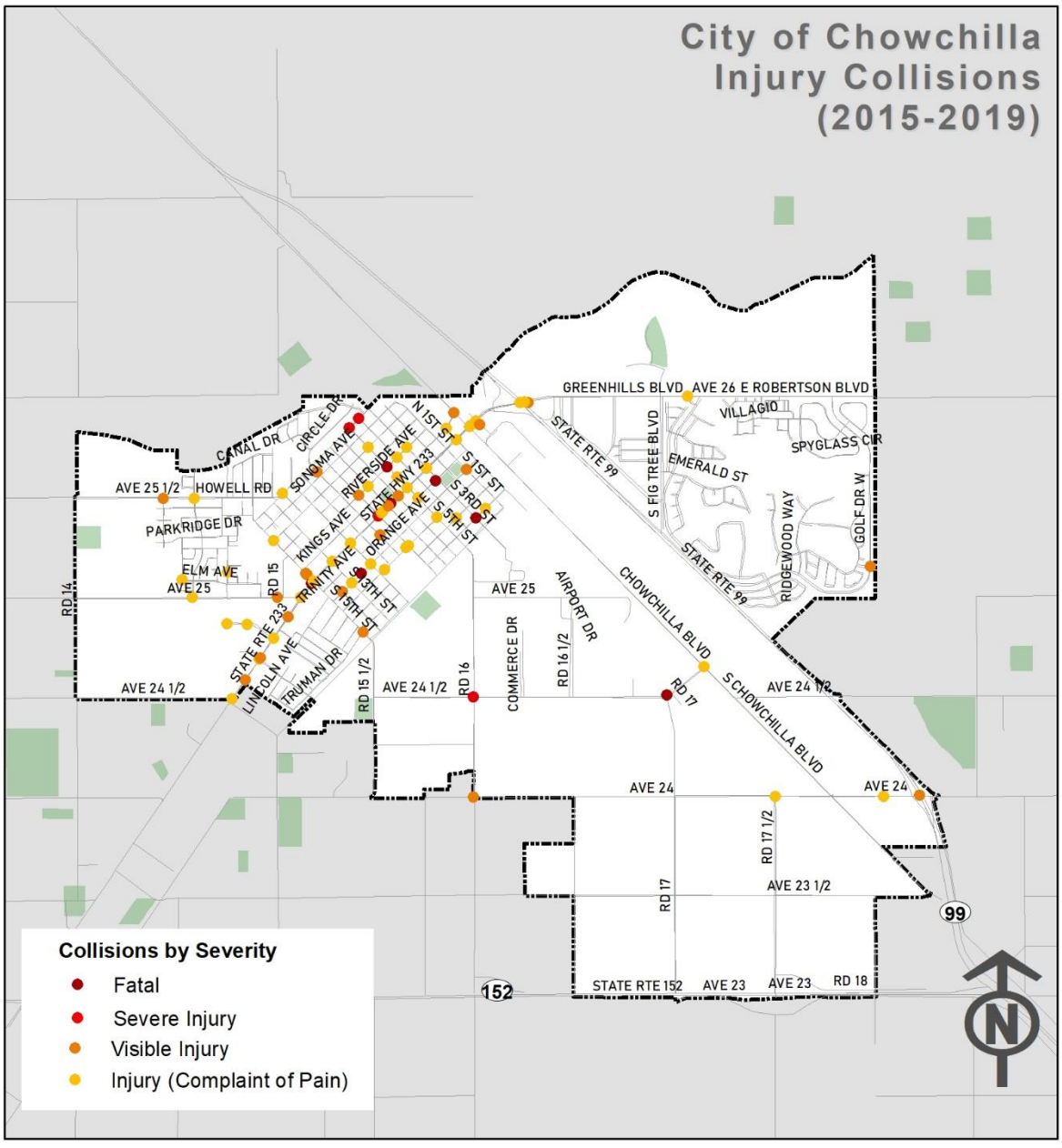
This chapter summarizes the results of a citywide collision analysis for collisions that have occurred in the City of Chowchilla between January 2015 and December 2019. A five-year city-wide collision data set was retrieved from Transportation Injury Mapping System (TIMS) and Statewide Integrated Traffic Records System (SWITRS).

The LRSP focuses on systemically identifying and analyzing traffic safety issues to recommend appropriate safety strategies and improvements. This chapter starts with an analysis of citywide collisions of all severity, including Property Damage Only (PDO) collisions, retrieved from Transportation Injury Mapping System (TIMS) and Statewide Integrated Traffic Records System (SWITRS). Further on, a detailed analysis was conducted for high-injury collisions, including fatal and severe injury (F+SI) collisions that have occurred on Chowchilla's roadways. After this data was separated, a comprehensive evaluation was conducted based on factors such as collision severity, type of collision, primary collision factor, lighting, weather and time of the day. The following is a brief overview of the sections:

1. Data Collection
2. Preliminary Collision Data
3. Fatal and Severe Injury Collisions
4. Geographic Collision Analysis
5. High Injury Network
6. Summary

Figure 2 illustrates all the injury collisions that have occurred in Chowchilla from January 2015 to December 2019.

Figure 2. All Injury Collisions on City Roadways (2015 – 2019)



Data Collision

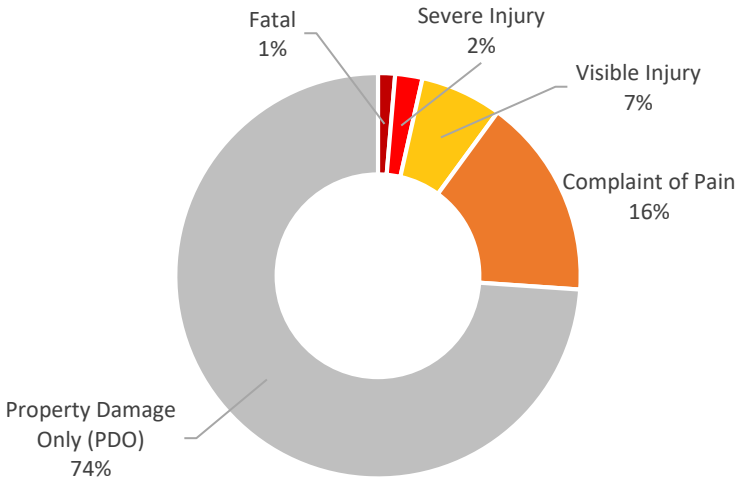
Collision data helps to understand different factors that might be influencing collision patterns and various factors leading to collisions in a given area. For the purpose of this analysis, a five-year city-wide collision data, from 2015 to 2019 was retrieved from Transportation Injury Mapping System (TIMS) and Statewide Integrated Traffic Records System (SWITRS). State route roadways were excluded from this analysis, with the exception of Robertson Boulevard/Route 233. Robertson Boulevard/Route 233 is a major roadway through the City of Chowchilla and accounts for a large share of fatal and severe injury collisions.

Preliminary Collision Data Analysis

Collision Classification

There were a total of 377 collisions reported City-wide from 2015 to 2019. There were 13 F+SI (fatal and severe injury) collisions, of which 8 collisions (2%) led to a severe injury and 5 collisions (1%) led to a fatality. Out of the remaining collisions, 279 collisions (74%) were PDO collisions, 61 collisions (16%) led to complaint of pain injury and 24 collisions (7%) led to a visible injury. **Figure 3** illustrates the classification of all collisions based on severity.

Figure 3. Collisions by Severity (2015-2019)



The analysis first includes a comparative evaluation between all collisions and F+SI collisions, based on various factors including but on limited to: the collision trend, primary collision factor, collision type, facility type, motor vehicle involved with, weather, lighting, and time of the day. Further on, a comprehensive analysis is conducted for only F+SI collisions. F+SI collisions cause the most damage to those affected, infrastructure and the aftermath of these collisions lead to

great expenses for City administration. The LRSP process thus focuses on these collision locations to proactively identify and counter their respective safety issues.

The collision data was separated by facility type, i.e. based on collisions occurring on intersections and roadway segments. For the purposes of the analysis, a collision was said to have occurred at an intersection if it occurred within 250 feet of it. The reported collisions categorized by facility type and collision severity are presented in **Table 2**.

Table 2. Collisions by Severity and Facility Type

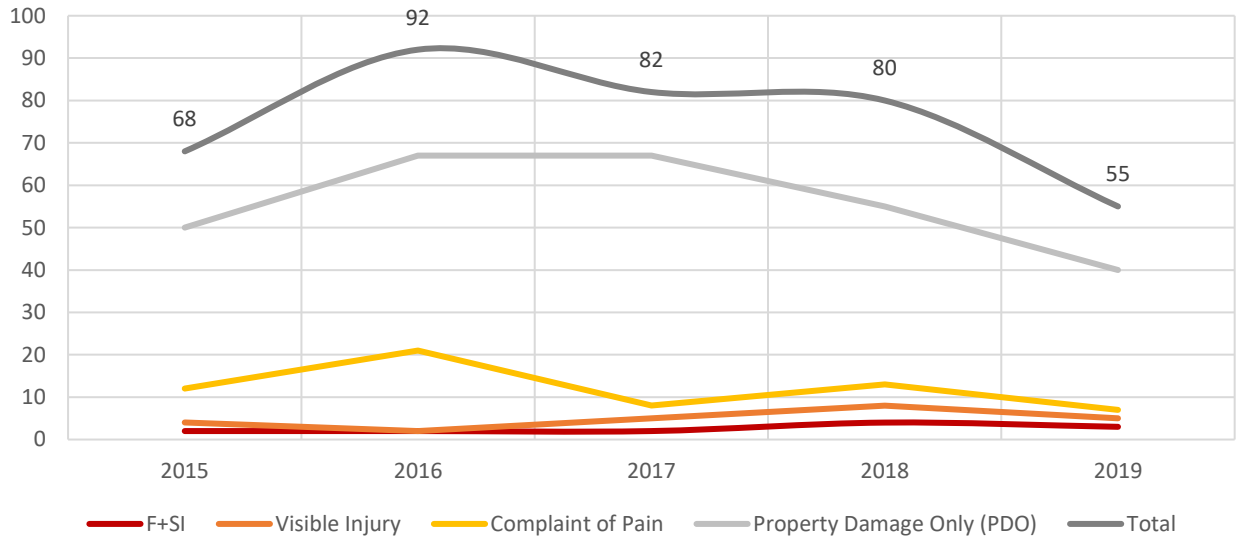
Collision Severity	Roadway Segment	Intersection	Total
Fatal	0	5	5
Severe Injury	0	8	8
Visible Injury	0	24	24
Complaint of Pain	1	60	61
Property Damage Only (PDO)	4	275	279
Total	**5**	**372**	**377**

Year Trend

Of the total 377 collisions (including PDO collisions), the highest number of collisions (92 collisions) were observed in 2016 and the lowest number of collisions (55) were observed in 2019. Injury collisions were observed to increase from 2015 to 2016 and then decrease in 2019.

A total of 13 F+SI collisions occurred in the City of Chowchilla during the study period. They were observed to be the lowest (2 collision) in 2016 and 2017. Overall, F+SI collisions were observed to rise from 2016 to 2018, before decreasing in 2019. The highest number of F+SI collisions (4 collisions) occurred in the year 2018. **Figure 4** illustrates the five-year collision trend for all collisions, F+SI collisions and also PDO collisions.

Figure 4. Five Year Collision Trend (2015-2019)



Intersection vs. Roadway Segment Collisions

When evaluating roadway segment vs. intersection collisions, it was observed that the majority of collisions occurred at intersections. In the City of Chowchilla, 1% of all collisions (5 collisions) occurred on roadway segments whereas 99% (372 collisions) occurred at intersections. When only F+SI collisions are considered, an even greater percentage of collisions occurred at intersections, with 100% (13 collisions) occurred at intersections. No F+SI collisions occurred on roadway segments. This classification by facility type can be observed in **Figure 5** and **Figure 6**.

Figure 5. Intersection vs. Roadway Collisions - All Collisions

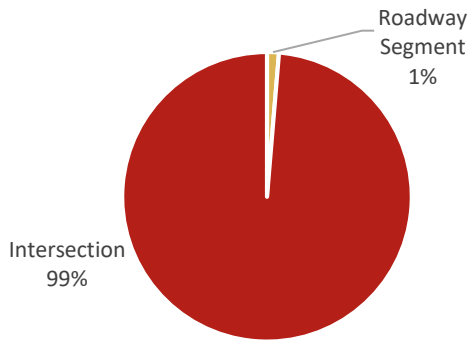
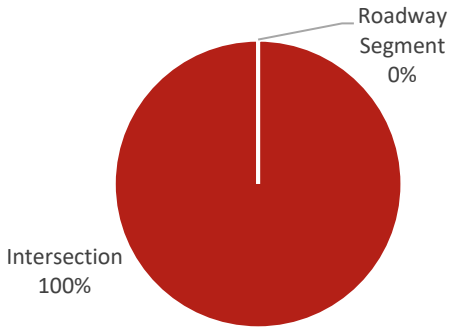


Figure 6. Intersection vs. Roadway Segment Collisions - Fatal and Severe Collisions

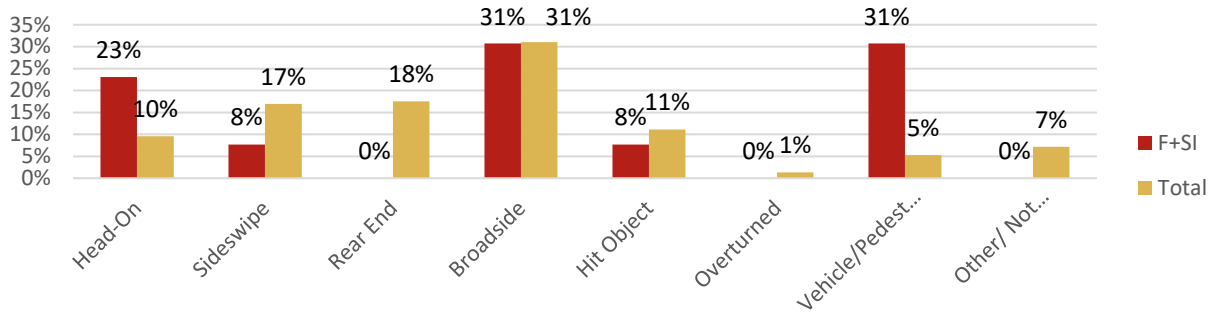


Collision Type

Considering all collisions, the most commonly occurring collision type was broadside collisions (31%), followed by rear end collisions (18%) and sideswipe collisions (17%). When only F+SI collisions were considered, the most commonly occurring collision types were vehicle-

pedestrian (31%) and head-on collisions (23%). **Figure 7** illustrates the collision type for all collisions as well as F+SI collisions.

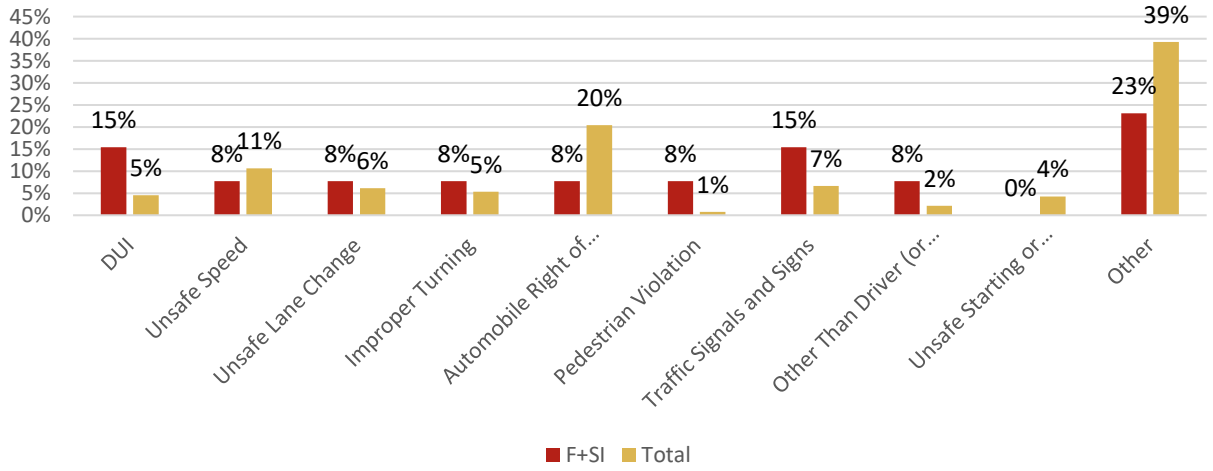
Figure 7. Collision Type – All Collisions vs. F+SI Collisions



Violation Category

The most common violation category among all collisions was observed to be automobile right of way (20%), followed by unsafe speed (11%). The violation category for F+SI collisions are noticeably different. Driving under the influence (15%) and traffic signals and signs (15%) was observed to be major collision factors for F+SI collisions. **Figure 8** illustrates the primary collision factor for all collisions and F+SI collisions.

Figure 8. Violation Category: All Collisions vs. F+SI Collisions

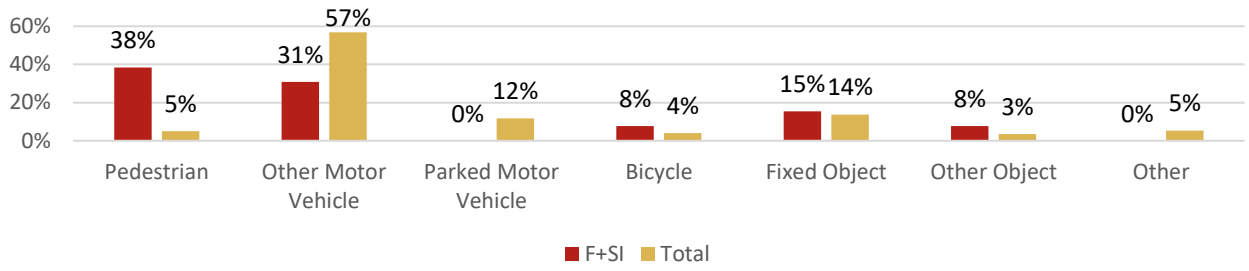


Motor Vehicle Involved With

57% of all collisions were motor vehicle involved with other motor vehicle collisions. The remaining collisions include motor vehicle involved with fixed object (14%), motor vehicle involved with parked motor vehicle (12%) and motor vehicle involved with pedestrian (5%). The trends are noticeably different for fatal and severe injury collisions. Considering only F+SI

collisions, 38% of the collisions are motor vehicles involved with a pedestrian and 31% are motor vehicle involved with other motor vehicles. **Figure 9** illustrates the percentage for motor vehicle involved with, in all collisions as well as F+SI collisions.

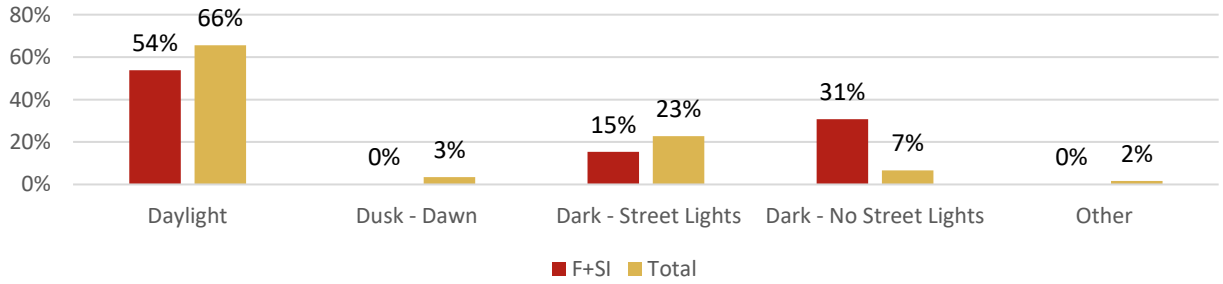
Figure 9. Motor Vehicle Involved With: All Collisions vs. F+SI Collisions



Lighting

For collisions of all severity, 66% of collisions occurred in daylight and 23% of collisions occurred in the dark on streets with street lights. For F+SI collisions, 54% of collisions occurred in daylight and 31% of collisions occurred in the dark on streets with no street lights. The over occurrence of F +SI collisions compared to the total collisions during the night on streets with no street lights suggests lighting may be a factor. **Figure 10** illustrates the lighting condition for all collisions and F+SI collisions.

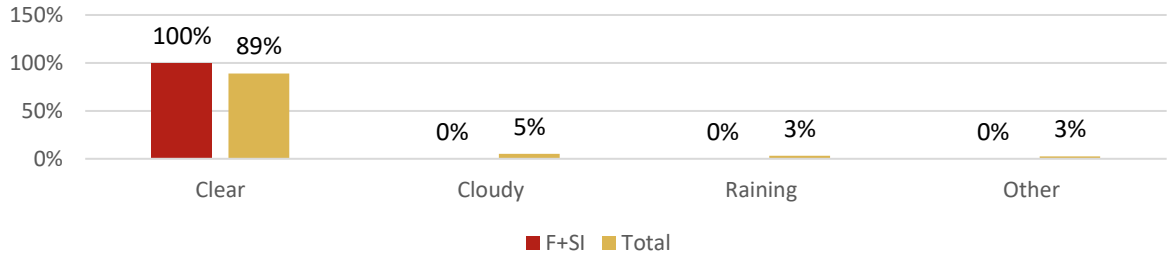
Figure 10. Lighting Conditions: All Collisions vs. F+SI Collisions



Weather

For all collisions, 89% of the collisions occurred during clear weather conditions, while 5% collisions occurred during cloudy weather conditions. For F+SI collisions, 100% of the collisions have occurred during clear weather conditions. **Figure 11** illustrates the percentage distribution of weather conditions during occurrence of collisions of all severity as well as F+SI collisions.

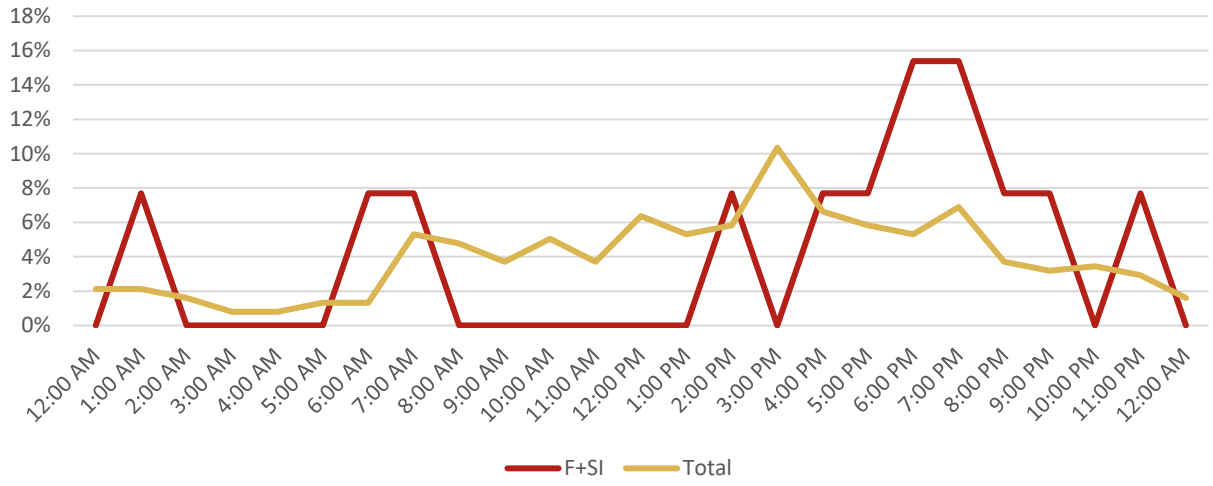
Figure 11. Weather Conditions: All Collisions vs. F+SI Collisions



Time of the Day

For collisions of all severity, the maximum number of collisions occurred between 3:00 p.m. to 4:00 p.m. (10%) and the minimum number of collisions have occurred between 3:00 a.m. to 4:00 a.m. (1%). For all F+SI collisions, maximum number (15%) of collisions have occurred between 6:00 p.m. to 8:00 p.m. **Figure 12** illustrates the percentage of collisions occurring during the day for all collisions as well as F+SI collisions.

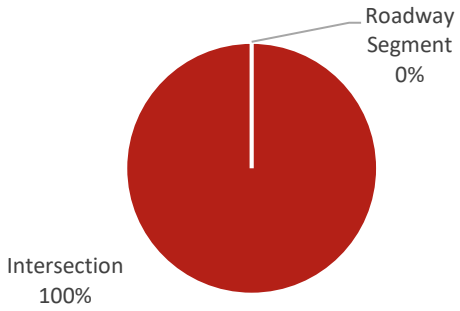
Figure 12. Time of the Day: All Collisions vs. F+SI Collisions



Fatal and Severe Injury Collisions

This section describes a detailed collision analysis performed for F+SI collisions occurring at roadway segments and intersections in the City of Chowchilla. Of the total 13 F+SI collisions that occurred in the City, 13 collisions (100%) occurred at intersections and 0 collisions occurred at roadway segment locations. This distribution is illustrated in **Figure 13**.

Figure 13. F+SI Collisions: Roadway Segments and Intersections

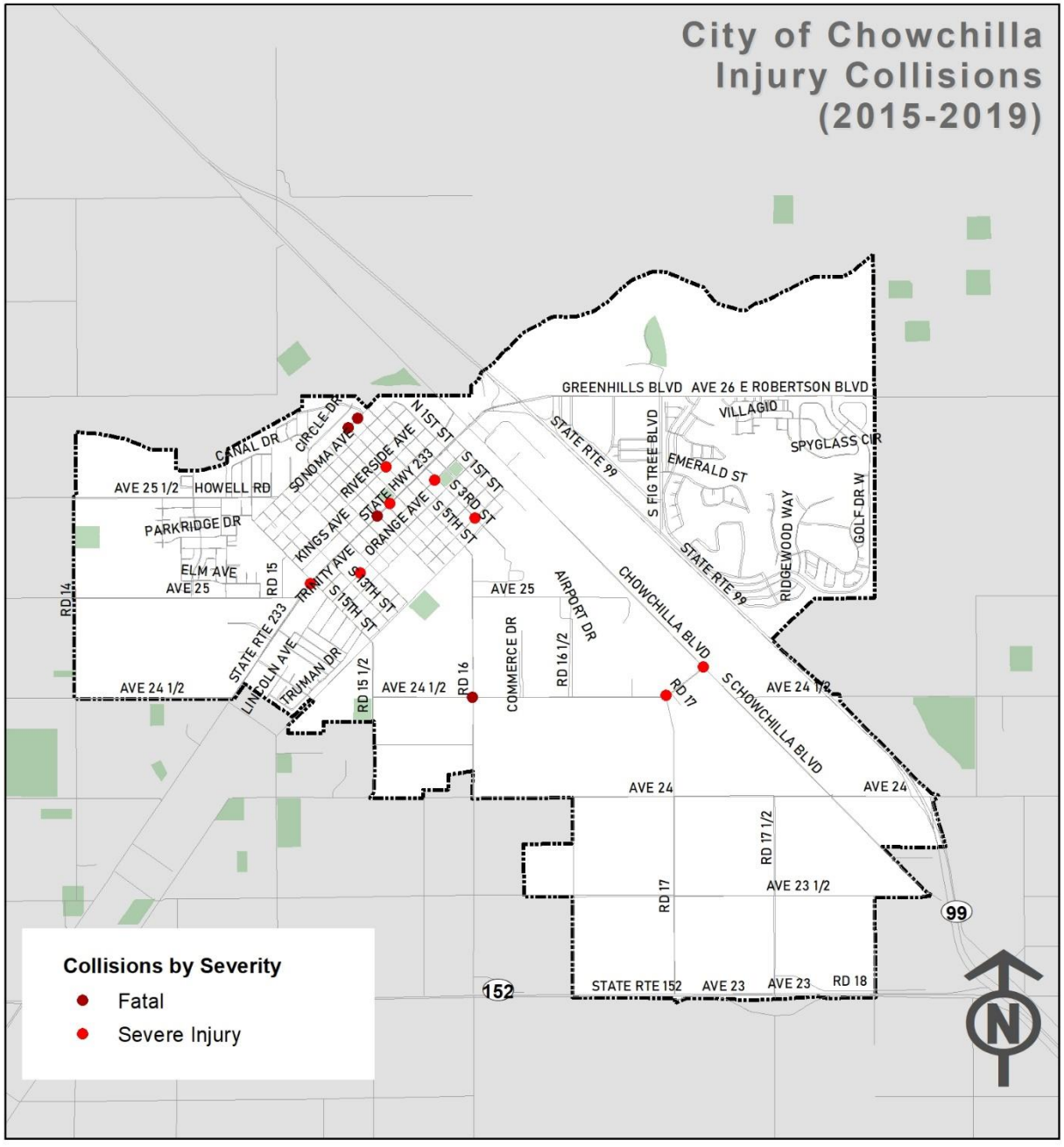


The detailed collision analysis is effective for identifying high-risk locations by evaluating a shorter list of collisions that have led to a fatality or a severe injury. Collisions have been segregated by facility type and further analyzed taking into account the following five collision attributes:

- Collision Type
- Violation Category
- Lighting Conditions
- Time of Day

Figure 14 illustrates the F+SI collisions that occurred in the City from 2015 to 2019 by severity. Of the 13 collisions, 5 led to fatalities that occurred at intersections and 8 led to severe injuries that occurred at intersections.

Figure 14. Fatal and Severe Injury Collisions City of Chowchilla (2015-2019)

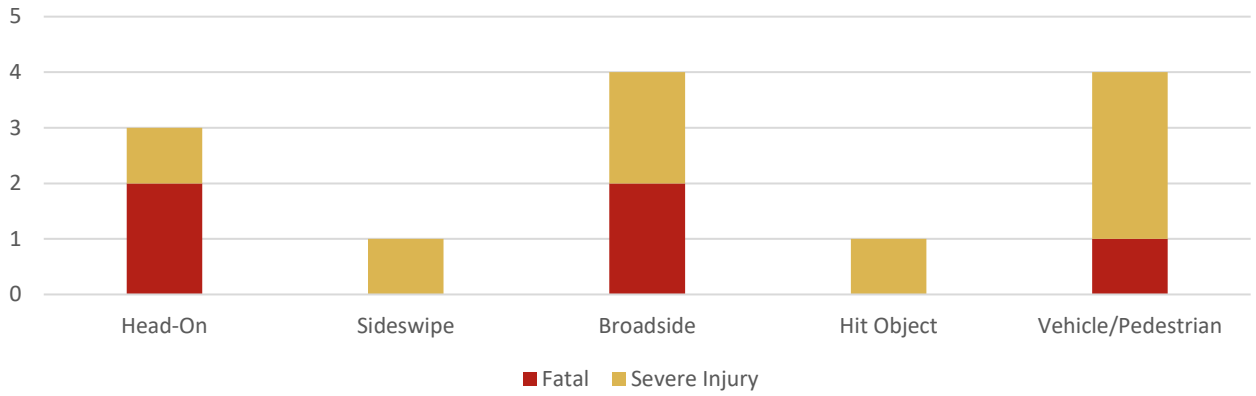


Collision Type and Severity

For all the collisions that led to a fatality or severe injury at intersections, the most common collision types were head-on, broadside and vehicle/pedestrian collisions. Two of each of the

head-on and broadside collisions led to a fatality and one vehicle/pedestrian collisions lead to a fatality. **Figure 15**Error! Reference source not found. illustrates the type of collision as well as the resulting severity and location type for F+SI collisions.

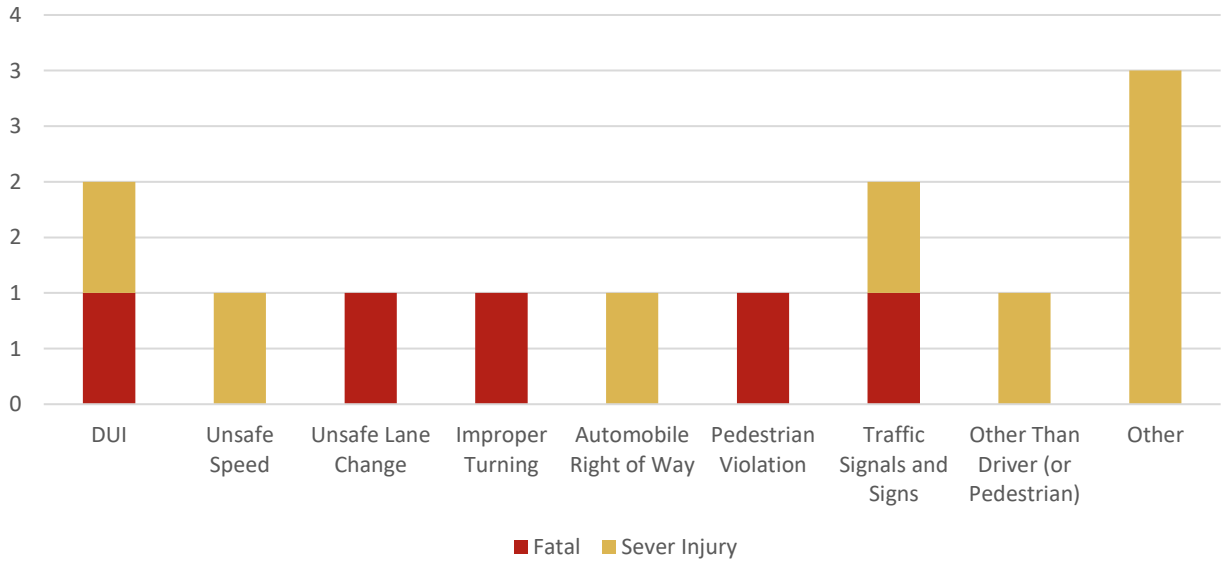
Figure 15. F+SI Collisions by Type and Location



Violation Category and Severity

For all collisions that led to a fatality or severe injury, two were DUI collisions and two were traffic signals and signs violations. Other violations that occurred at an intersection that led to a fatality were unsafe lane change, improper turning and a pedestrian violation. The results, with collision type, are shown in **Figure 16.**

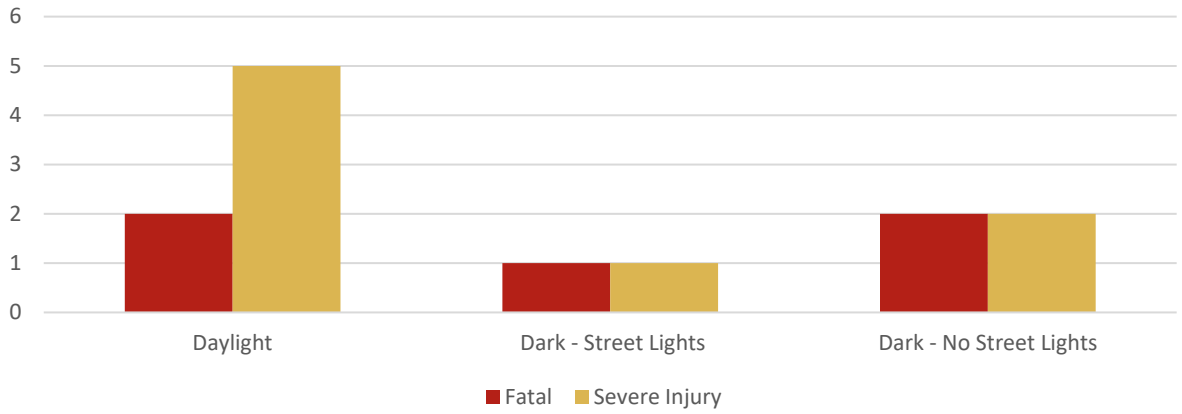
Figure 16. F+SI Collisions by Violation Category and Severity



Lighting Condition and Severity

For all F+SI collisions, the highest number of collisions were severe injury collisions that occurred at an intersection during the daylight. **Figure 17**Error! Reference source not found. illustrates the lighting condition and the collision type as observed for F+SI collisions.

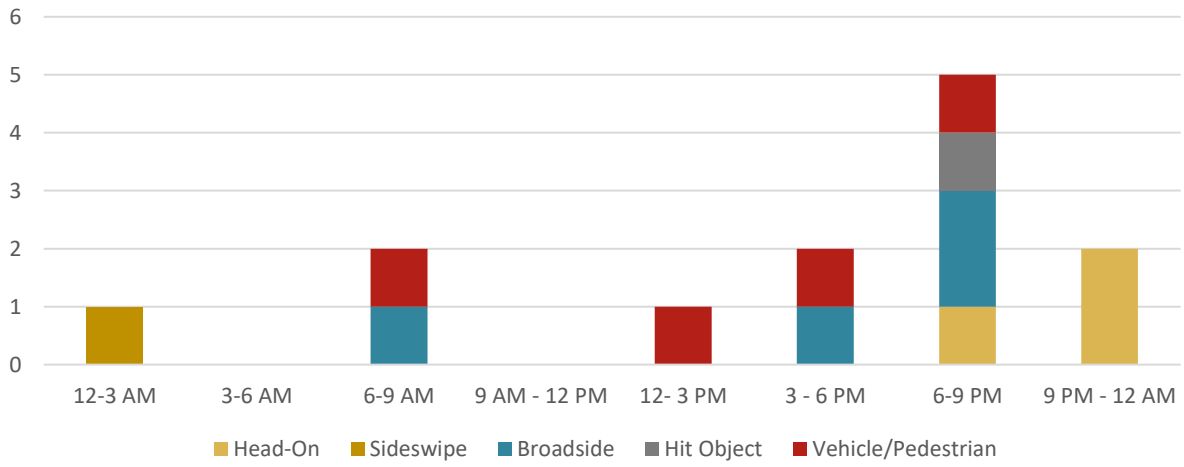
Figure 17. F+SI Collisions by Lighting and Location



Time of the Day and Collision Type

For all the F+SI collisions that occurred, three of them were head-on collisions that occurred primarily in the evening and early morning (between 6:00 pm and 3:00 am). Sideswipe and hit object collisions also occurred in the evening and early morning. Vehicle/pedestrian and broadside collisions occurred throughout the day. **Figure 18** illustrates the collision type by the time of the day for all F+SI collisions.

Figure 18. F+SI Collisions at Intersections by Time of the Day



Geographic Collision Analysis

This section describes a detailed geographic collision analysis performed for all injury collisions occurring at roadway segments and intersections in the City of Chowchilla. This analysis helps identify the hot-spots in the City, where certain type of collisions are historically observed to have occur. The above collision analysis was used to identify five main collision attributes that were found to be predominantly collision attributes of fatal and severe collisions in Chowchilla. These five collision factors were identified to be **nighttime collisions, pedestrian collisions, broadside collisions head-on collisions and DUI collisions**.

Nighttime Collisions

For F+SI collisions in Chowchilla, 46% of collisions occurred at night compared to just 29% of all collisions, meaning nighttime collisions are more likely to result in a fatal or severe injury. **Figure 19** shows the distribution of nighttime collisions throughout Chowchilla between 2015 and 2019. Robertson Blvd/ Route 233, Avenue 24 1/2, and North 8th Street have a higher concentration of nighttime collisions, compared to other Chowchilla roads. The Office of Traffic Safety ranked Chowchilla 7th out of 102 similar California cities with high levels of nighttime collisions (one being the highest, or worst)[1]**.**

Pedestrian Collisions

For F+SI collisions in Chowchilla, 38% of collisions were pedestrian collisions compared to just 5% of all collisions, meaning pedestrian collisions are more likely to result in a fatal or severe injury. **Figure 20** shows the distribution of pedestrian collision locations throughout Chowchilla between 2015 and 2019. North 15th Street, Robertson Boulevard/Route 233, North 3rd Street and South 14th Street have a higher concentration of pedestrian collisions, compared to other roads. The Office of Traffic Safety ranked Chowchilla 30th out of 102 similar California cities with high levels of pedestrian collisions (one being the highest, or worst)[2].

Broadside Collisions

For F+SI collisions in Chowchilla, 31% of collisions were broadside collisions. Figure 23**Figure 21** shows the distribution of broadside collisions throughout Chowchilla between 2015 and 2019. North 5th Street, North 3rd Street, and South 3rd Street have a higher concentration of broadside collisions, compared to other Chowchilla roads.

[2] California Office of Traffic Safety. (2018). Office of Traffic Safety Rankings 2018. https://www.ots.ca.gov/media-and-research/crash-rankings-results/?wpv-wpcf-year=2018&wpv-wpcf-city_county=Chowchilla&wpv_filter_submit=Submit

Head-on Collisions

For F+SI collisions in Chowchilla, 23% of collisions were head-on collisions compared to just 10% of all collisions. **Figure 22** shows the distribution of head-on collisions throughout Chowchilla between 2015 and 2019. North 15th Street, Avenue 24 1/2, and Robertson Boulevard/Route 233 have a higher concentration of head-on collisions, compared to other Chowchilla roads.

Driving Under Influence (DUI) Collisions

For F+SI collisions in Chowchilla, 15% of collisions were DUI collisions. **Figure 23** shows the distribution of collisions throughout Chowchilla between 2015 and 2019. North 15th Street, Robertson Boulevard/Route 233, and Ventura Avenue have a higher concentration of DUI collisions, compared to other Chowchilla roads. The Office of Traffic Safety ranked Chowchilla 23rd out of 102 similar California cities with high levels of alcohol involved collisions (one being the highest, or worst)[3].

[3] California Office of Traffic Safety. (2018). Office of Traffic Safety Rankings 2018. https://www.ots.ca.gov/media-and-research/crash-rankings-results/?wpv-wpcf-year=2018&wpv-wpcf-city_county=Chowchilla&wpv_filter_submit=Submit

Figure 19. Nighttime Collisions

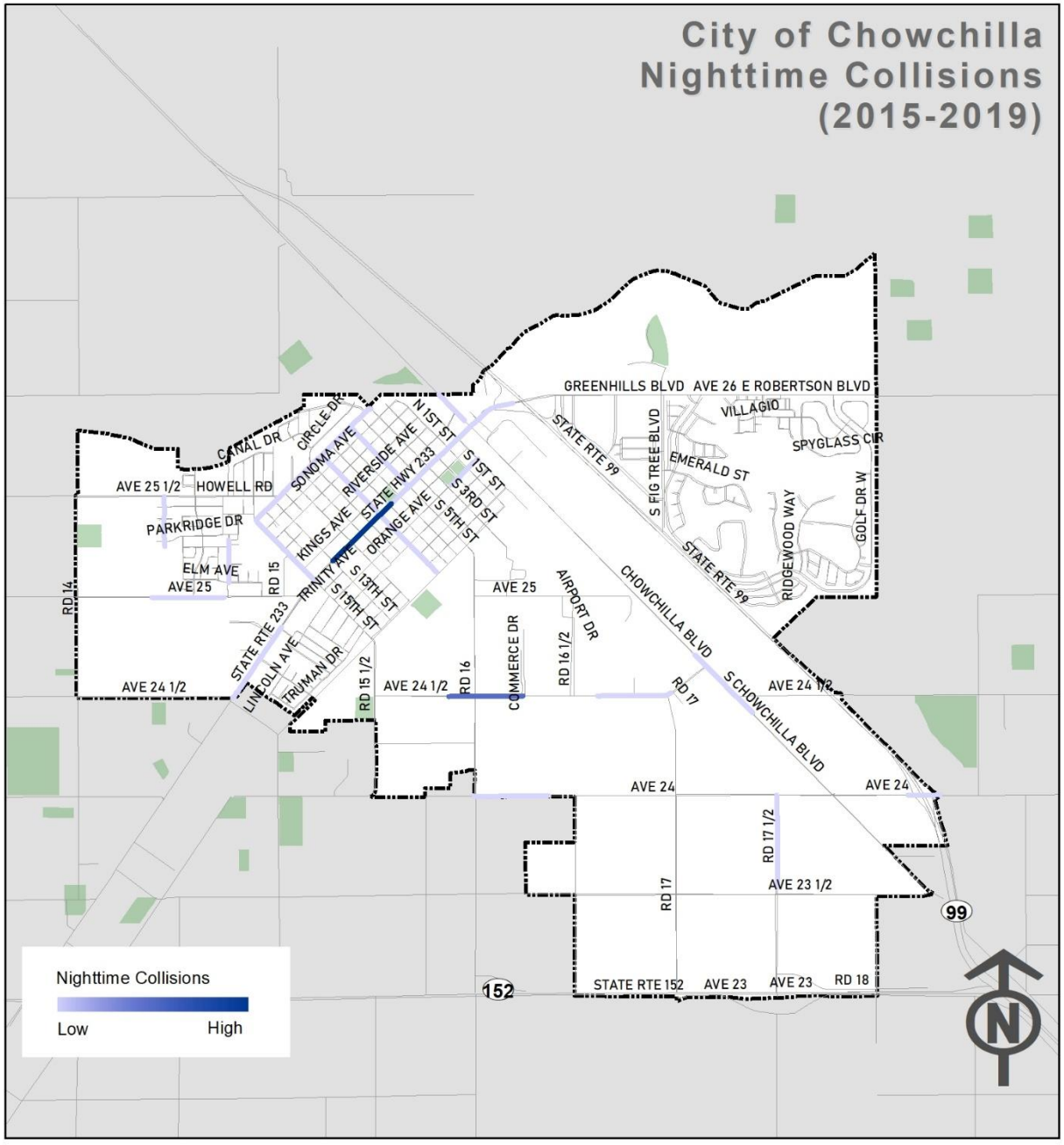


Figure 20. Pedestrian Collisions

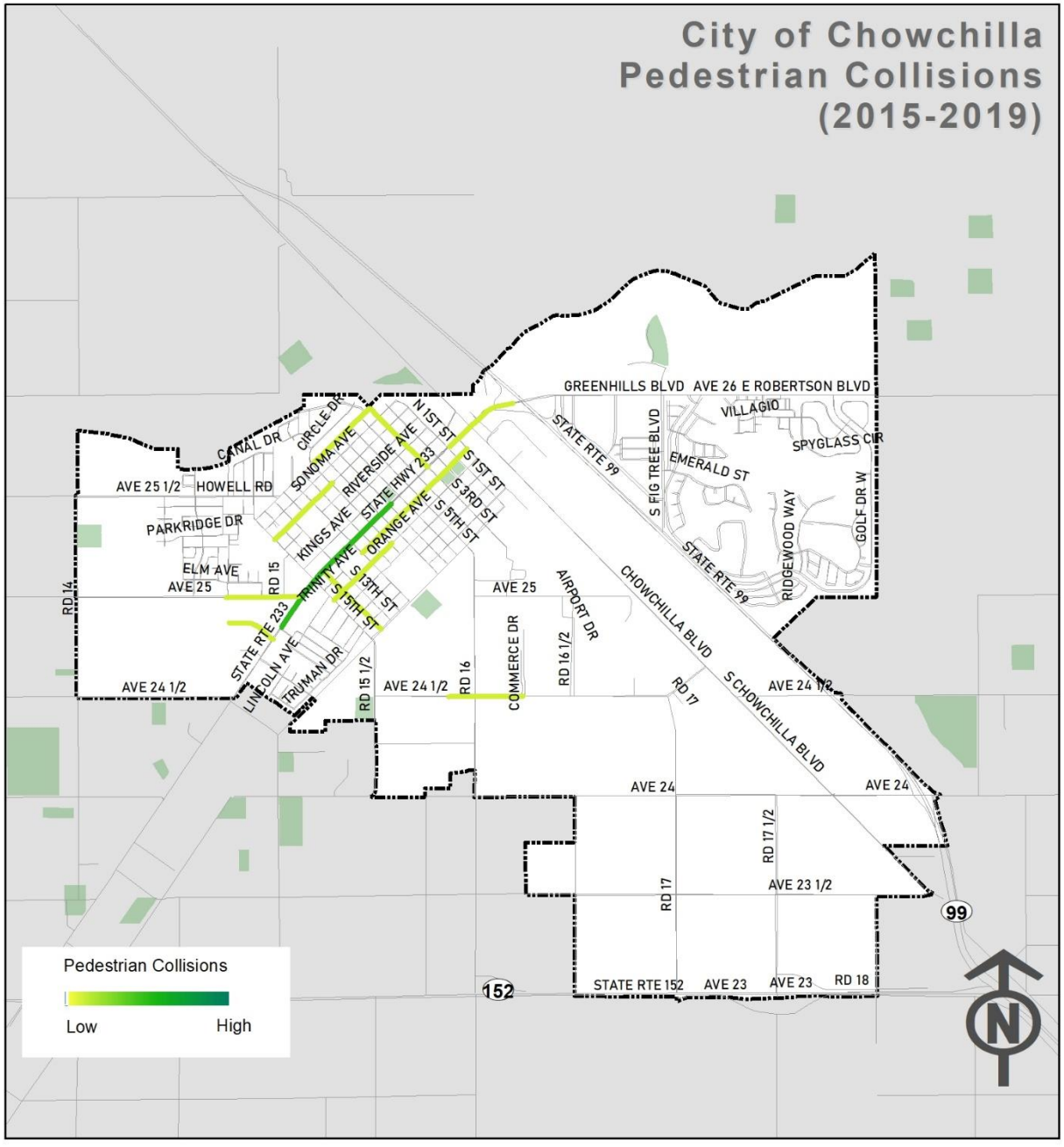


Figure 21. Broadside Collisions

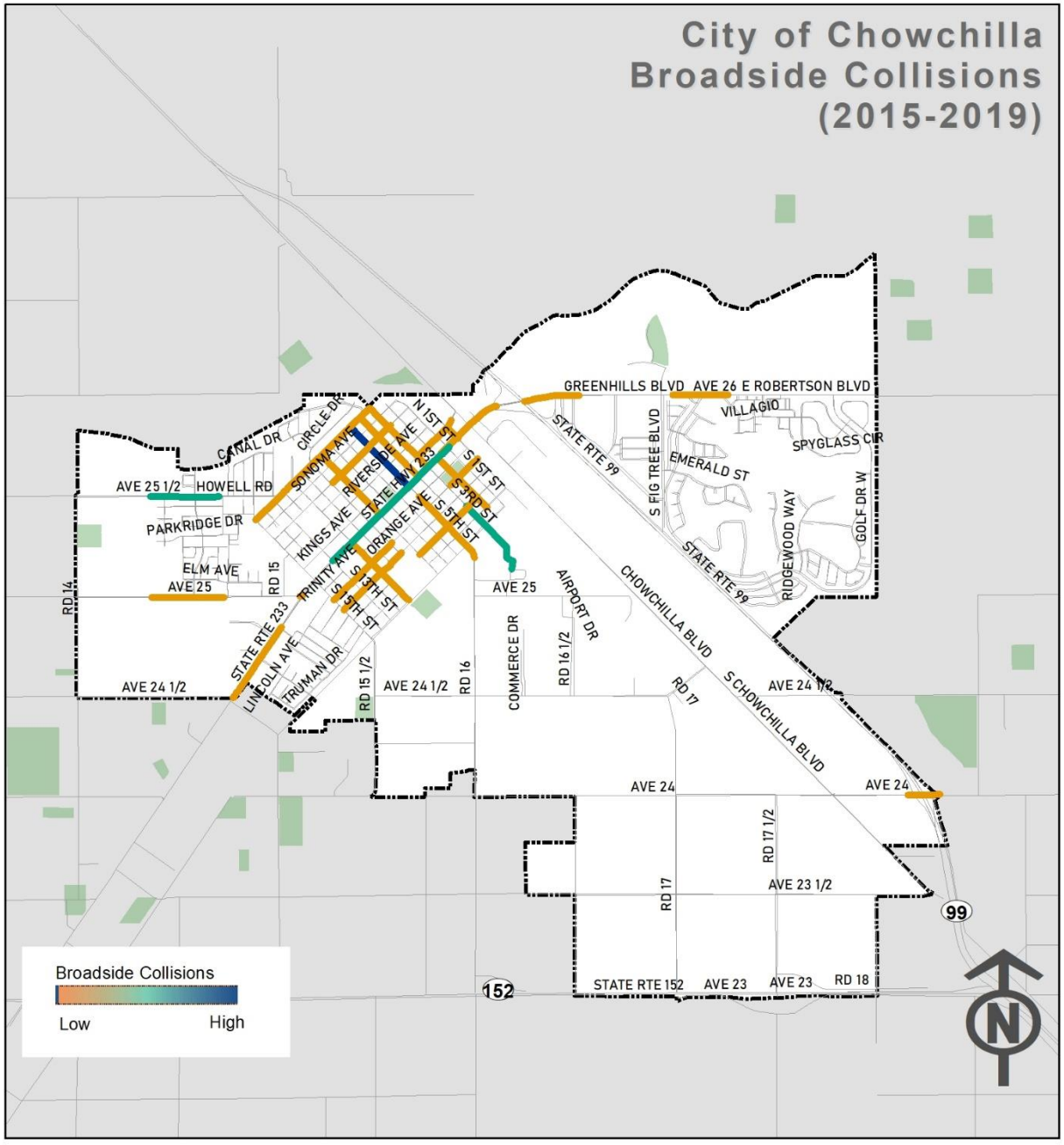


Figure 22. Head-on Collisions

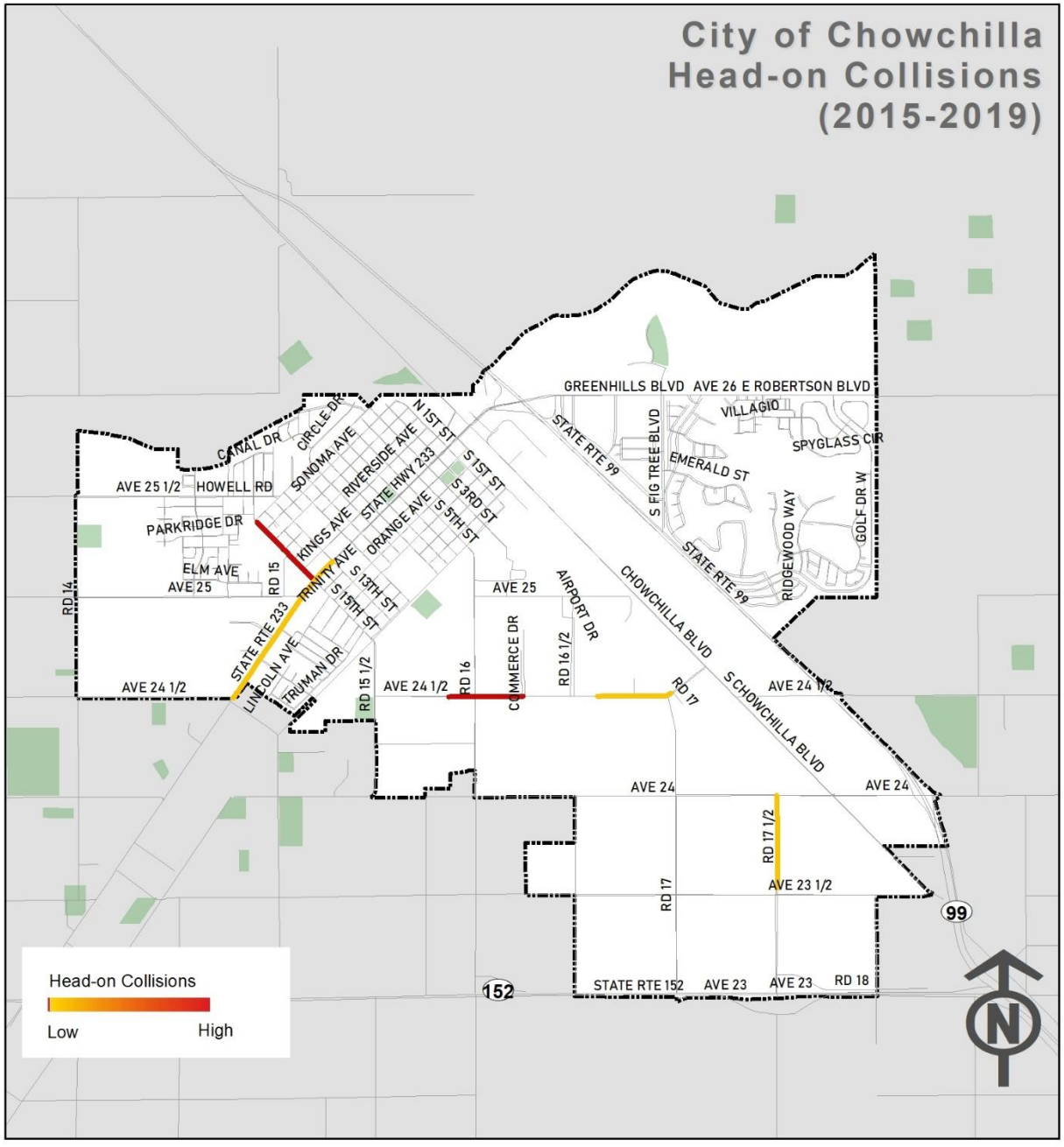
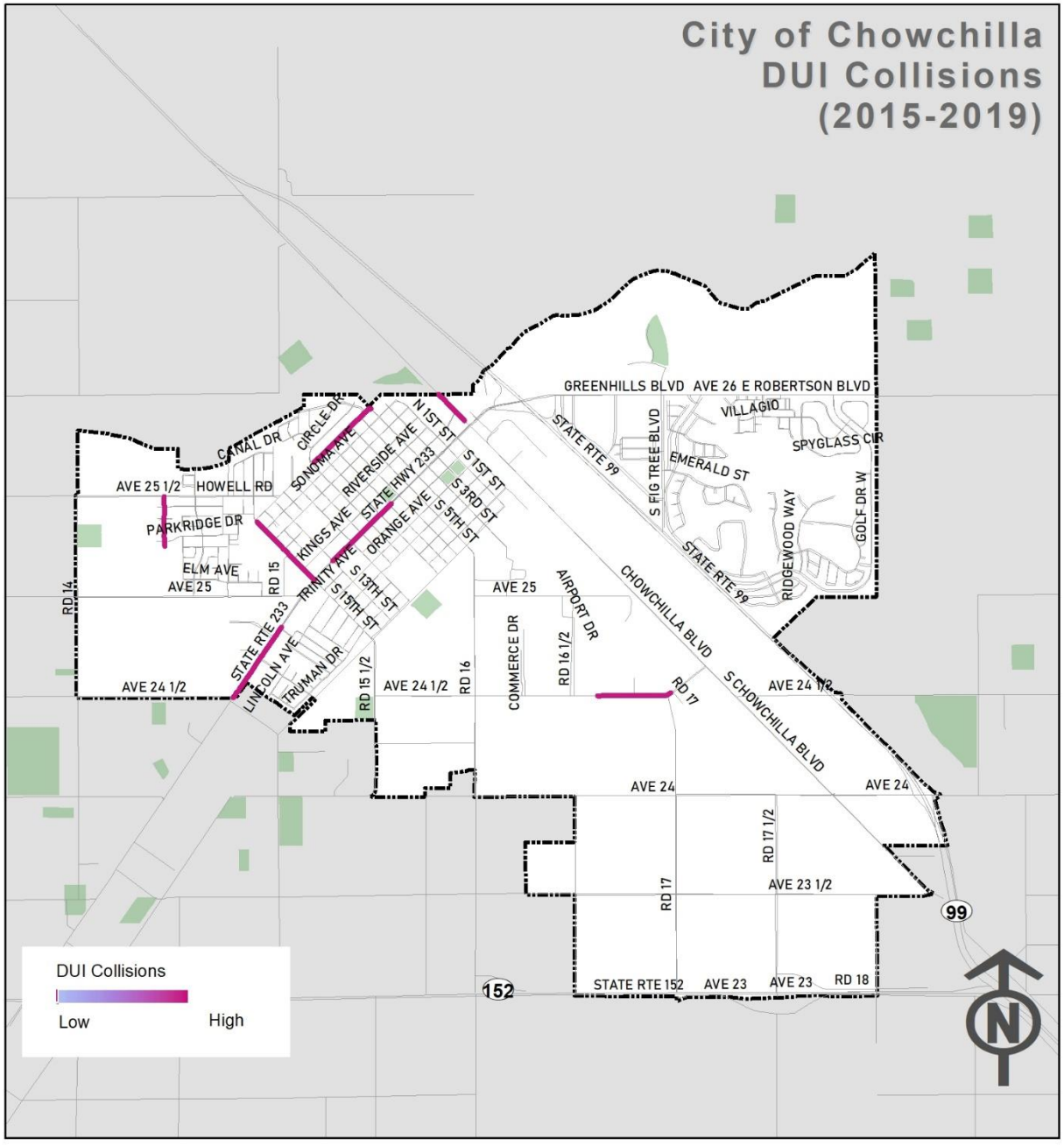


Figure 23. DUI Collisions



Collision Severity Weight

A collision severity weight was used to identify the high severity collision network, using the Equivalent Property Damage Only (EPDO) method. The EPDO method accounts for both the severity and frequency of collisions by converting each collision to an equivalent number of property damage only (PDO) collisions. The EPDO method assigns a crash cost and score to each collision according to the severity of the crash weighted by the comprehensive crash cost. These EPDO scores are calculated using a simplified version of the comprehensive crash costs per HSIP Cycle 10 application. The weights used in the analysis are shown below in **Table 3**.

Table 3. EPDO Score used in HSIP Cycle 10

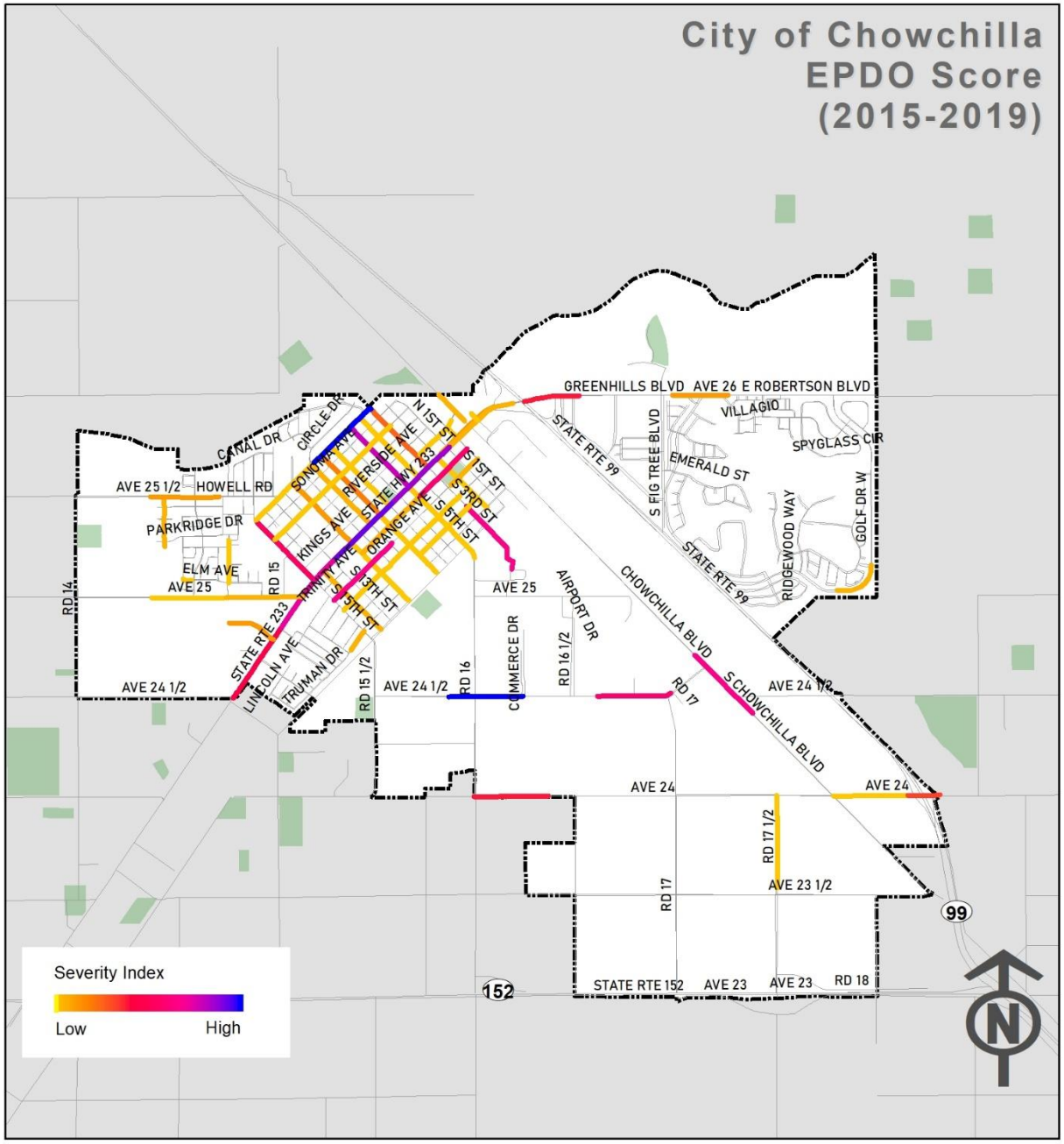
Collision Severity	EPDO Score
Fatal and Severe Injury	165*
Visible Injury	11
Complaint of Pain	6
PDO	1

*This is the score used in HSIP Cycle 10 (2020) for collisions on roadways segments, to simplify the analysis this study uses the same score for all F+SI collisions regardless of location

The score for each high-risk location is calculated using the following formula:
EPDO *= 165 x Fatal + 165 x Severe Injury + 11 x Visible Injury + 6 x Complaint of Pain + 1 x PDO*

The EPDO scores for all collisions can then be aggregated in a variety of ways to identify collision patterns, such as location hot-spots. The weighted collisions for Chowchilla were geolocated onto Chowchilla's road network. **Figure 24** shows the location and geographic concentration of collisions by their EPDO score.

Figure 24. Chowchilla EPDO Score

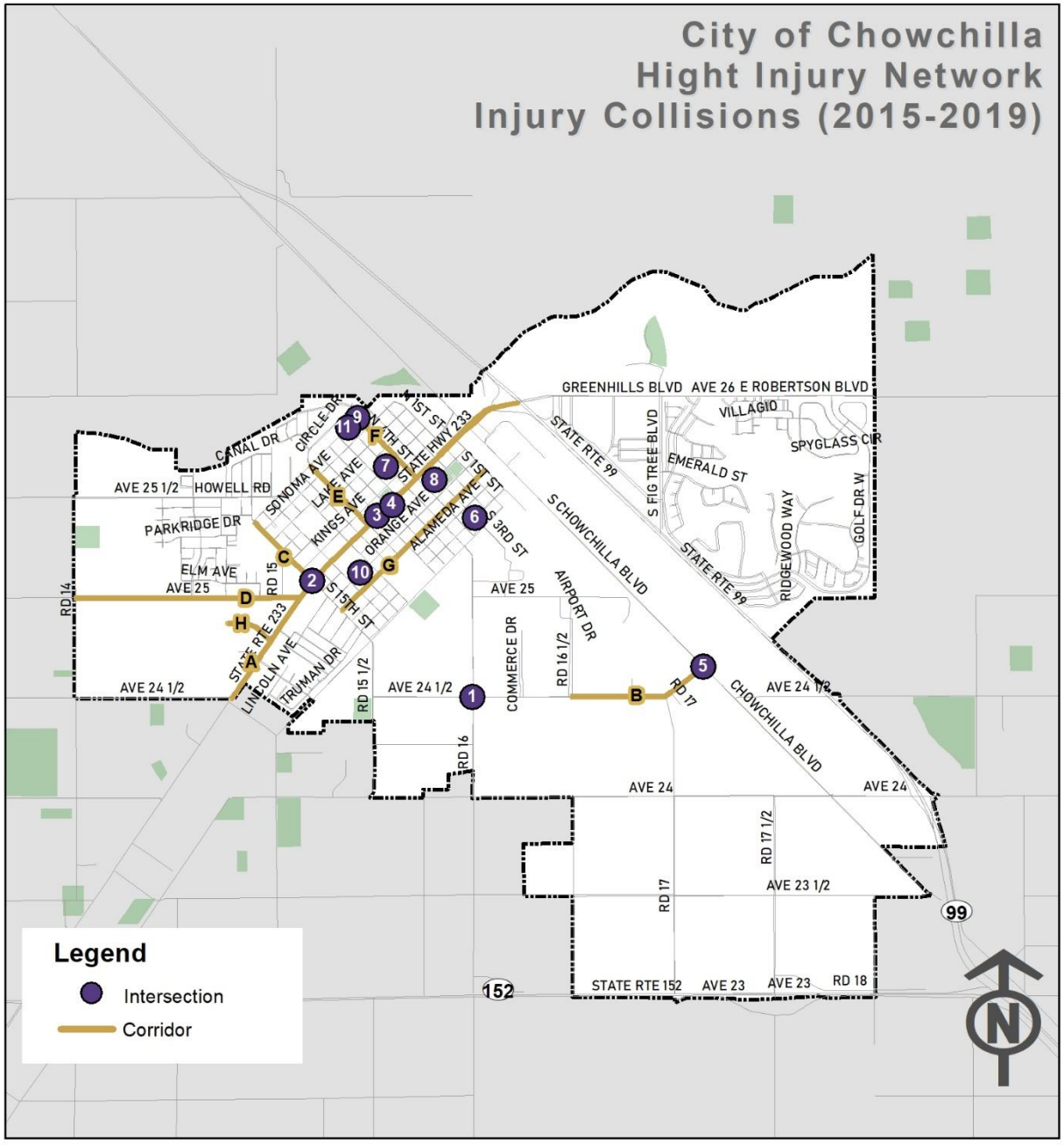


High-Injury Network

Following the detailed collision analysis, the next step was to identify the high-risk roadway segments and intersections in the City. The methodology for scoring and identifying the high injury locations is the same method used in the severity index section. **Figure 25** shows the top 8 high-collision roadway segments, and top 11 high-collision intersections in the City of Chowchilla. This high collision network has a total of 34 injury collisions with 13 F+SI collisions, which represents 34% of injury collisions and 100% of F+SI collisions in the City of Chowchilla, but only about 7% of Chowchilla's roadway network.

For the purposes of the high collision network analysis, intersections collisions include collisions that occurred within 250 feet of it and roadways include all collisions that occurred along the roadway except for collisions that occurred occur directly at an intersection, or collisions that are at a distance of 0 feet from the intersection as listed in the collision database.

Figure 25. High Injury Network



High Injury Intersections

11 intersections were identified as high injury intersections. There were a total of 12 F+SI collisions that occurred at these intersections. Out of the 12 collisions, 5 led to fatalities and 7 led to severe injury collisions. The intersection of Ave 24 ½ and Road 16 had the highest number of F+SI collisions, both of which were head-on collisions that led to a fatality.

Table 4. High Injury Intersections**Table 4** lists the top 11 identified high injury intersections along with their collision total, number of F+SI collisions and their EPDO scores.

Table 4. High Injury Intersections

ID	Intersections	Total	F+SI	Ped	Night	DUI	Broad-side	Head-On	EPDO Score
		Collisions							
1	Ave 24 1/2 and Rd 16	2	2	1	2	0	0	2	330
2	15th and West Robertson Blvd	6	1	5	0	0	0	0	194
3	West Robertson Blvd and 8th St	4	1	0	2	1	1	0	183
4	7th and West Robertson Blvd	3	1	1	3	0	1	0	182
5	Ave 24 1/2 and South Chowchilla Blvd	2	1	0	1	0	0	0	171
6	South 3rd St and Colusa Ave	2	1	0	0	0	2	0	171
7	North 5th Street and Riverside Ave	1	1	0	0	0	1	0	165
8	Trinity Ave and South 3rd St	1	1	1	0	0	0	0	165
9	North 4th St and Ventura Ave	1	1	1	0	0	0	0	165
10	Orange Ave and South 12th St	1	1	1	0	0	0	0	165
11	North 5th St and Ventura Ave	1	1	0	1	1	1	0	165

High Injury Corridors

Eight corridors were identified as high injury corridors. Out of the 15 injury collisions that occurred on these corridors, 2 were F+SI collisions. The corridor with the highest EPDO score was along Robertson Boulevard/SR 233.

Table 5 lists the top eight identified high injury corridors along with the number of F+SI collisions, total collisions and EPDO scores.

Table 5. High Injury Corridors

ID	Corridors	Total	F+SI	Ped	Night	DUI	Broad-side	Head-on	Length (miles)	EPDO Score
		Collisions								
A	Robertson Blvd: Ave 24 1/2 to 99 SB On Ramp/Off Ramp	7	1	2	3	0	1	0	2.0	201
B	Ave 24 ½: Road 16 ½ to Chowchilla Blvd	1	1	0	0	1	0	1	0.6	165
C	North 15th: Ventura Ave to Robertson Blvd	2	0	1	1	1	0	2	0.6	22
D	Washington Rd: Kites Way to Robertson Blvd	1	0	1	0	0	0	0	0.6	11
E	North 9th St: Ventura Ave to Robertson Blvd	1	0	0	0	0	0	0	0.6	11
F	North 4th St: Ventura Ave to Robertson Blvd	1	0	0	0	0	1	0	0.6	6
G	Humboldt Ave: South 15th St to South 9th St	1	0	0	0	0	1	0	0.6	6
H	Myer Dr: Kites Way to Robertson Blvd	1	0	1	0	0	0	0	0.4	6

4. Emphasis Areas

Emphasis areas are focus areas for the Local Roadway Safety Plan (LRSP) that are identified through the comprehensive collision analysis of the identified high injury network within the City of Chowchilla. Emphasis areas help in identifying appropriate safety strategies and countermeasures with the greatest potential to reduce collisions occurring at these high-risk locations. In addition, traffic safety related concerns were heard at the Stakeholders Meeting conducted for this plan on June 15, 2021.

This chapter summarizes the identified top eight emphasis areas, which includes a demographic analysis of the parties involved in the injury collisions that occurred in the City. These emphasis areas were derived from the systemic safety analysis of injury collisions (**Appendix B**) that occurred in the City from January 1, 2015 to December 31, 2019, along with safety concerns that were received as a part of the Stakeholder Outreach.

The 4 E's of Traffic Safety

LRSP utilizes a comprehensive approach to safety incorporating "4 E's of traffic safety": **E**ngineering, **E**nforcement, **E**ducation and **E**mergency Medical Services. This approach recognizes that not all locations can be addressed solely by infrastructure improvements. Incorporating the 4 E's of traffic safety is often required to ensure successful implementation of significant safety improvements and reduce the severity and frequency of collisions throughout a jurisdiction. It is essential to identify emphasis area as they are area of opportunity to improve safety through the 4 E's since they help address safety issues by incorporating element from each of the 4 Es.

- Education – An important tool in modifying behavioral aspects of traffic safety, education helps distribute knowledge about traffic safety. Educational campaigns for issues such as 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 higher penalties and visible police presence often lead to awareness and instill safe driving behavior among motorists.
- Engineering - These are high-level solutions that require analysis and construction, and lead to roadway infrastructure development to reduce collisions. Engineering solutions defer by locations and collision attributes and alter the structure or the flow of the roadway.
- Emergency Medical Services (EMS) – Collaboration with EMS leads to rapid responses to collision sites, and improved quality of care for roadway collision victims. The solutions involve strategies to decrease response times.

Existing Traffic Safety Efforts

The City of Chowchilla already has implemented safety strategies corresponding to the 4 E's of traffic safety. The strategies detailed in this memorandum can supplement these existing programs and concentrate them on high injury collision locations and crash types. These initiatives are summarized in the **Table 6**Error! Reference source not found. below:

Table 6. Existing Programs

Document/ Program	Description	E's Addressed
Madera Safe Routes to School Program	Madera Safe Routes to School (SRTS) is a countywide program that encourages and enables school children to walk and bicycle to school by implementing projects and activities that improve the health, well-being, and safety of children and result in less traffic congestion and emissions caused by school-related travel.	Engineering, Education, Enforcement
Traffic Undulation (Street Hump) Policy	Details the process to install speed humps on roads requested by residents.	Engineering
Police Department/School Partnership	Targeted enforcement and education outreach coordinated between the school and police department	Enforcement, Education

Factors Considered in the Determination of Emphasis Areas

This section presents collision data analysis of collision type, collision factors, facility type, roadway geometries, analyzed for the various emphasized areas. Emphasis areas were determined by factors that led to the highest amount of injury collisions, with a specific emphasis on fatal and severe (F+SI) injury collisions. This section also presents comprehensive programs, policies and countermeasures to reduce collisions in specific emphasis areas.

Based on the systemic safety analysis that helped identified high-injury intersections and roadway segments, the top risk factors and emphasis areas determined are as follows:

1. Intersection safety

    a. Collisions within 250 feet radius of intersections
2. Broadside collisions
3. Pedestrian safety
4. Hit object collisions
5. Head on collisions
6. Driving Under the Influence (DUI) collisions
7. School area collisions (within one block of schools)
8. Reduce Young Adult (Party at Fault) collisions

Emphasis Area 1: Improve Intersection Safety

Emphasis Area 1 - Improve Intersection Safety				
Objectives			**Success Indicator**	
Improve intersection safety at high-risk intersections.			A reduction in the number of fatal and severe injury collisions at high-risk intersections.	
	Action	**Target Output**	**Performance Measure**	**Monitoring and Evaluation**
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.	Number of people reached by education campaigns.
Enforcement	Targeted enforcement at high-risk intersections to monitor traffic law violations right-of-way violations, and speed limit regulations.	Reduction in intersection collisions due to traffic law violations, right-of-way violations, and speed limits.	Number of citations and/or warning tickets issued.	Number of intersection collisions related to traffic law violations, right-of-way violations, and speeding compared to the previous year.
Engineering	• S02, Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number • S03, Improve signal timing (coordination, phases, red, yellow, or operation) • S08, Convert signal to mast arm (from pedestal-mounted) • S09, Install raised pavement markers and striping (Through Intersection) • S16/NS04/NS05, Convert intersection to roundabout • 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	Reduction of traffic safety complaints at intersections.	Number of intersections improved.	Number of intersection crashes related to traffic movement compared to the previous year.
EMS	S05, Install emergency vehicle pre-emption systems. Coordinate with Public Works on designated or frequently used emergency routes to maintain clear line of sight at those intersections for emergency access.	Decreased delay of response time to intersection collisions.	EMS vehicle response time.	Response time compared to the previous year.

Emphasis Area 2: Reduce Broadside Collisions

Emphasis Area 2 – Reduce Broadside Collisions				
Objectives			**Success Indicator**	
Reduce the number of fatal and severe injury broadside collisions.			A reduction in the number of fatal and severe injury broadside collisions.	
	Action	**Target Output**	**Performance Measure**	**Monitoring and Evaluation**
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.
Enforcement	Targeted enforcement at high-risk intersections to monitor traffic law violations right-of-way violations, and traffic signals and signs violations.	Reduction in intersection collisions due to traffic law violations, right-of-way violations, and speed limits.	Number of citations and/or warning tickets issued.	Number of broadside collisions related to traffic law violations, right-of-way violations, and speeding compared to the previous year.
Engineering	• S02, Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number • S03, Improve signal timing (coordination, phases, red, yellow, or operation) • S08, Convert signal to mast arm (from pedestal-mounted) • S09, Install raised pavement markers and striping (Through Intersection) • S16/NS04/NS05, Convert intersection to roundabout • 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	Reduction of traffic movement conflicts.	Number of intersections improved.	Number of broadside crashes related to traffic movement compared to the previous year
EMS	S05, Install emergency vehicle pre-emption systems	Decreased response time to collisions.	EMS vehicle response time.	Response time compared to the previous year.

Emphasis Area 3: Improve Pedestrian Safety

Emphasis Area 3 – Improve Pedestrian Safety				
Objectives			**Success Indicator**	
Improve pedestrian infrastructure 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**
Education	• Pedestrian safety campaigns and outreach to raise their awareness of pedestrian safety needs through media outlets and public events. • Create a simple pocket guide of pedestrian laws for Chowchilla	Increase awareness for pedestrian safety.	Number of outreach events for pedestrian safety campaigns.	Number of attendees and responses for pedestrian safety campaigns.
Enforcement	• Implement strict penalties for violating pedestrian laws. • Continue to place a high priority on enforcement of motorist and pedestrian violations that most frequently cause injuries and fatalities among pedestrians.	Reduction in pedestrian right-of-way violation and vehicle-pedestrian conflict.	Number of citations issued for violating pedestrian right-of-way.	Number of citations issues for violating pedestrian right-of-way compared to the previous year.
Engineering	• S21PB, Modify signal phasing to implement a Leading Pedestrian Interval (LPI) • NS07, Upgrade intersection pavement markings (NS.I.) • NS19PB, Install raised medians (refuge islands) • NS21PB/R35PB, Install/upgrade pedestrian crossing (with enhanced safety features) • R36PB, Install raised pedestrian crossing • R37PB, Install Rectangular Rapid Flashing Beacons (RRFB) • High-visibility ladder crosswalks • Mid-block curb extension • Yield sign for pedestrian crossing at crosswalk	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.
EMS	Improve resource deployment for emergency responses at collision sites.	Decrease response time.	Number of pedestrian collision-related casualty dealt by EMS.	Number of pedestrian collision-related casualty dealt by EMS compared to the previous year.

Emphasis Area 4: Reduce Hit object Collisions

Emphasis Area 4 – Reduce Hit Object Collisions				
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 hit object collisions on all City roads.	
	Action	**Target Output**	**Performance Measure**	**Monitoring and Evaluation**
Education	Conduct public education and outreach activities that elevate the awareness of the dangers of speeding.	Awareness about the dangers of speeding.	Number of public outreach events.	Number of attendees of public outreach events.
Enforcemen	• Increase the number of sobriety checkpoints and saturation patrol to increase visibility of enforcement. • Increase penalties for repeat offenders.	Reduce the number of unsafe speeding violations.	Number of citations issued for unsafe speeding.	Number of citations issued for unsafe speeding, compared to the previous year.
Engineering	• 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.) • NS11, Improve sight distance to intersection (Clear Sight Triangles) • NS12, Improve pavement friction (High Friction Surface Treatments) • R05, Install impact attenuators • R22, Install/Upgrade signs with new fluorescent sheeting (regulatory or warning) • R27, Install delineators, reflectors and/or object markers • Simplify turn configurations. • Decrease curb radius of intersections.	Reduce the number of fatal and severe injury collisions resulted from unsafe speeding.	Number of fatal and severe injury collisions resulted from unsafe speeding.	Number of fatal and severe injury collisions resulted from unsafe speeding, compared to the previous year.
EM		Decrease response time.	EMS vehicle response time.	Response time compared to the previous year.

Emphasis Area 5: Reduce Head-on Collisions

Emphasis Area 5 – Reduce Head-On Collisions				
Objectives			**Success Indicator**	
Reduce the number of fatalities and severe injuries caused due to head on collisions.			A reduction in the number of fatal and severe injury head on collisions.	
	Action	**Target Output**	**Performance Measure**	**Monitoring and Evaluation**
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.
Enforcement	Targeted enforcement at high-risk intersections to monitor traffic law violations right-of-way violations, and speed limit laws.	Reduction in intersection collisions due to traffic law violations, right-of-way violations, and speed limits.	Number of tickets issued.	Number of head-on collisions related to traffic law violations, right-of-way violations, and speeding compared to the previous year.
Engineering	• S02, Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number • S03, Improve signal timing (coordination, phases, red, yellow, or operation) • S08, Convert signal to mast arm (from pedestal-mounted) • S09, Install raised pavement markers and striping (Through Intersection) • S16/NS04/NS05, Convert intersection to roundabout • 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	Reduction of traffic movement conflicts.	Number of intersections improved.	Number of head-on crashes related to traffic movement compared to the previous year
EMS	S05, Install emergency vehicle pre-emption systems	Decreased response time to collisions.	EMS vehicle response time.	Response time compared to the previous year.

Emphasis Area 6: Reduce DUI Collisions

Emphasis Area 6: Reduce Driving Under Influence (DUI) Collisions				
Objectives			**Success Indicator**	
Reduce the number of DUI collisions.			Reduction in the number of DUI collisions within the City.	
	Action	**Target Output**	**Performance Measure**	**Monitoring and Evaluation**
Education	Distribute brochures/fliers with DUI information at public events.	Educate drivers about DUI collisions and penalties associated.	Number of brochures/fliers, with response survey, distributed each year.	Number of survey responses received.
Enforcement	Targeted enforcement at locations with most DUI collisions during the nighttime, and implement strict penalties for such violations. DUI checkpoints during the nighttime.	Reduction in the number of DUI violations.	Number of citations issued for DUI violations.	Number of citations issued for DUI violations, compared to the previous year.
Engineering	• S02, Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number • S08, Convert signal to mast arm (from pedestal-mounted) • NS06, Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs	Reduction in the number of DUI violations leading to hit object and other collisions.	Number of DUI violations leading to hit object and other collisions.	Number of DUI violations leading to hit object and other collisions, compared to the previous year.
EMS	S05, Install emergency vehicle pre-emption systems	Decrease response time.	EMS vehicle response time.	Response time compared to the previous year.

Emphasis Area 7: Reduce School Collisions

Emphasis Area 7: Reduce School Area Collisions				
Objectives			**Success Indicator**	
Reduce the number of collisions near schools (within one block of schools).			Reduction in the number of collisions near schools (within one block of schools).	
	Action	**Target Output**	**Performance Measure**	**Monitoring and Evaluation**
Education	Distribute brochures/fliers with traffic safety information at schools.	Educate parents and students about traffic safety.	Number of brochures/fliers/e mails, distributed each year.	Number of brochures/fliers/emails, compared to the previous year.
Enforcement	Continued targeted enforcement at school.	Reduction in the number of school area collisions (within one block of schools).	Number of day of targeted enforcement near school areas (within one block of schools).	Number of day of targeted enforcement near school areas, compared to the previous year.
Engineering	• NS21PB/R35PB, Install/upgrade pedestrian crossing (with enhanced safety features such as bulb outs) • R36PB, Install raised pedestrian crossing • R37PB, Install Rectangular Rapid Flashing Beacons (RRFB) • High-visibility ladder crosswalks • Mid-block curb extension • In-road yield sign for pedestrian crossing at crosswalk • NS06, Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs	Reduction in the number of traffic violations near school areas (within one block of schools).	Number of traffic violations near school areas (within one block of schools).	Number of traffic violations near school areas, compared to the previous year.
EMS	S05, Install emergency vehicle pre-emption systems	Decrease response time.	EMS vehicle response time.	Response time compared to the previous year.

Emphasis Area 8: Reduce Young Adult (Party at Fault) Collisions

Emphasis Area 9: Reduce Young Adult (Party at Fault) Collisions				
Objectives			**Success Indicator**	
Reduce young adult party at fault collisions			Reduction in the number of fatal and severe injury collisions involving young adults.	
	Action	**Target Output**	**Performance Measure**	**Monitoring and Evaluation**
Education	Target education programs for young adults. Distribute brochures/fliers with basic red light running, speeding, distracted driving, aggressive driving and stop sign violations information at high schoolers and driver training programs. Include statistics of young adult larger risks of fatalities. Expand the use of web-based social media resources such as YouTube, Facebook and Twitter for teens and young adults	Educate younger drivers about running red lights, aggressive driving, intoxicated driving, distracted driving, speeding and stop signs rules and consequences associated.	Number of brochures/fliers, with response survey, distributed each year, number of collisions involving young adults.	Number of educational materials distributed.

5. Countermeasure Identification

This section summarizes the process of selecting countermeasures on Chowchilla streets as part of the analysis for the LRSP. Countermeasures were selected for each of the identified high-risk intersections and roadway segments based on extensive review of existing conditions at the site and characteristics of identified collisions on the High Injury Network.

Identified collision factors and existing conditions were cross referenced with the Caltrans LRSM identified countermeasures that are HSIP approved. Countermeasures that best fit the site and had the highest opportunity for systemic implementation were selected. Countermeasures were selected not only for each high-risk location, but also for each identified citywide Emphasis Area.

Identification of Countermeasures

In 2010, the Federal Highway Administration (FHWA) published a set of three manuals local and rural road owners to present a simple, data driven safety analysis framework for rural agencies across the country. In conjunction with these documents, California Department of Transportation (Caltrans) developed the Local Roadway Safety Manual (LRSM). The goal of this manual is to "*maximize the safety benefits for local roadways by encouraging all local agencies to proactively identify and analyze their safety issues and to position themselves to compete effectively in Caltrans' statewide, data-driven call-for-projects*."[4] Although, the LRSM identifies all of California's local roadway safety issues and the countermeasures that address them, this document only highlights the issues and countermeasures relevant to the local roads of the City of Chowchilla. This section identifies the different solutions for the City from HSIP-qualified and non-HSIP countermeasures. It also provides a brief description along with their corresponding crash reduction factors (CRF), expected life and baseline cost. An excerpt of the LRSM, detailing each available HSIP countermeasure referenced in the recommendations tables, is included as **Appendix C**.

The countermeasures have been divided into three categories:

- Signalized (S) – countermeasures only applicable for signalized intersections;
- Non-Signalized (NS) – countermeasures only applicable to stop-controlled, or uncontrolled intersections;
- Roadway Segment (RS) – countermeasures only applicable to roadway segments;
- Other (O) – countermeasures that do not qualify for HSIP funding.

[4] https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2020/lrsm2020.pdf

Draft Countermeasure Toolbox

Appendix D detail the draft countermeasures for each high-risk location and Emphasis Area, separated by intersections and roadway segments. While not all of these countermeasures will be included in the resulting safety projects, they are included to give the City a toolbox for implementing future safety improvements through other means, such as the City's Capital Improvement Program.

Signalized Intersections Countermeasures

S02 – Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number. Signalized intersections with a high frequency of right-angle and rear-end crashes occurring because drivers are unable to see traffic signals sufficiently in advance to safely negotiate the intersection being approached.

- Crash Reduction Factor – 15%
- Expected Life – 10 years
- Baseline Cost – Approximately $40,000 per intersection

S13 – Install pedestrian median fencing on approaches

Signalized Intersections with high pedestrian-generators nearby (e.g. transit stops) may experience a high volumes of pedestrians J-walking across the travel lanes at mid-block locations instead of walking to the intersection and waiting to cross during the walk-phase. When this safety issue cannot be mitigated with signal timing and shoulder/sidewalk treatments, then installing a continuous pedestrian barrier in the median may be a viable solution.

- Crash Reduction Factor – 35%
- Expected Life – 20 years
- Baseline Cost – Approximately $2,000 per intersection

S21PB - Modify signal phasing to implement a Leading Pedestrian Interval (LPI). A leading pedestrian interval (LPI) gives pedestrians the opportunity to enter an intersection 3-7 seconds before vehicles are given a green indication. With this head start, pedestrians can better establish their presence in the crosswalk before vehicles have priority to turn left.

- Crash Reduction Factor – 15%
- Expected Life – 10 years
- Baseline Cost – Approximately $4,000 per intersection

Non-Signalized Intersections Countermeasures

NS01 – Add intersection lighting. Non-signalized intersections that have a disproportionate number of night-time crashes and do not currently provide lighting at the intersection or at its approaches. Crash data should be studied to ensure that safety at the intersection could be improved by providing lighting (this strategy would be supported by a significant number of crashes that occur at night).

- Crash Reduction Factor – 40%
- Expected Life – 20 years
- Baseline Cost – Approximately $100,000 per intersection

NS06 – Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs. The visibility of intersections and, thus, the ability of approaching drivers to perceive them can be enhanced by installing larger regulatory and warning signs at or prior to intersections. A key to success in applying this strategy is to select a combination of regulatory and warning sign techniques appropriate for the conditions on a particular unsignalized intersection approach.

- Crash Reduction Factor – 15%
- Expected Life – 10 years
- Baseline Cost – Approximately $4,200 per intersection

NS07 – Upgrade intersection pavement markings (NS.I.). Unsignalized intersections that are not clearly visible to approaching motorists, particularly approaching motorists on the major road. The strategy is particularly appropriate for intersections with patterns of rear-end, right-angle, or turning crashes related to lack of driver awareness of the presence of the intersection

- Crash Reduction Factor – 25%
- Expected Life – 10 years
- Baseline Cost – Approximately $900 per intersection

NS20 – Install pedestrian crossing at uncontrolled locations (signs and markings only). Adding pedestrian crossings has the opportunity to enhance pedestrian safety at locations noted as being problematic. Pavement markings delineate a portion of the roadway that is designated for pedestrian crossing. These markings will often be different for controlled verses uncontrolled locations

- Crash Reduction Factor – 25%
- Expected Life – 10 years
- Baseline Cost – Approximately $5,000

NS21 – Install/upgrade pedestrian crossing at uncontrolled locations (with enhanced safety features). Adding pedestrian crossings that include enhances safety features has the opportunity to enhance pedestrian safety at locations noted as being especially problematic. The enhanced safety elements help delineate a portion of the roadway that is designated for pedestrian crossing.

- Crash Reduction Factor – 35%
- Expected Life – 20 years
- Baseline Cost – Approximately $15,000

Roadway Countermeasures

R01 – Add segment lighting. Providing roadway lighting improves the safety during nighttime conditions by (1) making drivers more aware of the surroundings, which improves drivers' perception-reaction times, (2) enhancing drivers' available sight distances to perceive roadway characteristic in advance of the change, and (3) improving non-motorist's visibility and navigation.

- Crash Reduction Factor – 35%
- Expected Life – 20 years
- Baseline Cost – Approximately $100,000

R21 – Improve pavement friction (High Friction Surface Treatments). Nationally, this countermeasure is referred to as "High Friction Surface Treatments" or HFST. Areas as noted having crashes on wet pavements or under dry conditions when the pavement friction available is significantly less than actual roadway speeds; including but not limited to curves, loop ramps, intersections, and areas with short stopping or weaving distances.

- Crash Reduction Factor – 55%
- Expected Life – 10 years
- Baseline Cost – Approximately $15,000

R22 – Install/Upgrade signs with new fluorescent sheeting (regulatory or warning). The target for this strategy should be on roadway segments with patterns of head on, nighttime, non-intersection, run-off road, and sideswipe crashes related to lack of driver awareness of the presence of a specific roadway feature or regulatory requirement. Ideally this type of safety CM would be combined with other sign evaluations and upgrades (install chevrons, warning signs, delineators, markers, beacons, and relocation of existing signs per MUTCD standards.).

- Crash Reduction Factor – 15%
- Expected Life – 10 years
- Baseline Cost – Approximately $2,000

R27 – Install delineators, reflectors and/or object markers. Roadways that have an unacceptable level of crashes on curves (relatively flat to sharp) during periods of light and darkness. Any road with a history of fixed object crashes is a candidate for this treatment, as are roadways with similar fixed objects along the roadside that have yet to experience crashes.

- Crash Reduction Factor – 15%
- Expected Life – 10 years
- Baseline Cost – Approximately $2,000

R28 – Install edge-lines and centerlines. Any road with a history of run-off-road right, head-on, opposite-direction-sideswipe, or run-off-road-left crashes is a candidate for this treatment - install where the existing lane delineation is not sufficient to assist the motorist in understanding the existing limits of the roadway. Depending on the width of the roadway, various combinations of edge line and/or center line pavement markings may be the most appropriate.

- Crash Reduction Factor – 25%
- Expected Life – 10 years
- Baseline Cost – Approximately $10,000

R34PB – Install sidewalk/pathway (to avoid walking along roadway). Sidewalks and walkways provide people with space to travel within the public right-of-way that is separated from roadway vehicles. The presence of sidewalks on both sides of the street has been found to be related to significant reductions in the "walking along roadway" pedestrian crash risk compared to locations where no sidewalks or walkways exist.

- Crash Reduction Factor – 80%
- Expected Life – 20 years
- Baseline Cost – Approximately $150,000

R35PB – Install/upgrade pedestrian crossing (with enhanced safety features). Adding pedestrian crossings has the opportunity to greatly enhance pedestrian safety at locations noted as being problematic. The enhanced safety elements, which may include curb extensions, medians and pedestrian crossing islands, beacons, and lighting, combined with pavement markings delineating a portion of the roadway that is designated for pedestrian crossing.

- Crash Reduction Factor – 35%
- Expected Life – 20 years
- Baseline Cost – Approximately $25,000

Other Countermeasures

Bulb outs/curb extensions. Curb extensions (also called bulb-outs) extend the sidewalk into the parking lane to narrow the roadway and provide additional pedestrian space at key locations; they can be used at corners and at mid-block. Curb extensions enhance pedestrian safety by increasing pedestrian visibility, shortening crossing distances, slowing turning vehicles, and visually narrowing the roadway.

Speed Feedback Signs. Speed feedback signs, also known as dynamic speed displays, provide drivers with feedback about their speed in relationship to the posted speed limit. When appropriately complemented with police enforcement, speed feedback signs can be an effective method for reducing speeds at a desired location.

In Road Yield/stop Signs. In-street pedestrian crossing signs (MUTCD R1-6 or R1-6a) are placed within the roadway, either between travel lanes or in a median. The sign may be used to remind road users of laws regarding right-of-way at an unsignalized pedestrian crossing. This countermeasure is used with other crosswalk visibility enhancements to indicate optimal or preferred locations for people to cross and to help reinforce the driver requirement to yield the right-of-way to pedestrians at crossing locations.

6. Safety Projects

High-Collision Network Projects

This section summarizes the process of selecting safety projects as part of the analysis for the City of Chowchilla's 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 2020 LRSM, 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 number refers to the countermeasure number in the LRSM (2020). The countermeasures were grouped into safety projects for high-risk intersections and roadway segments. A total of six safety projects were developed. All countermeasures were identified based on the technical teams' assessment of viability that consisted of 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 7 lists the safety projects for high-risk intersections and roadway segments, along with total base planning level cost (2021 dollar amounts) estimates and the resultant preliminary Benefit-Cost (B/C) Ratio. The "Total Benefit" estimates were calculated for the proposed improvements being evaluated in the proactive safety analysis. This "Total Benefit" 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). This calculation is outlined in **Appendix E**.

Table 7. Safety Projects

Location	CM1	CM2	CM3	Cost per Location	B/C Ratio
Project 1 - Systemic Improvements at Unsignalized Intersections					
Ave 24 1/2 and Rd 16	NS01	NS06	NS07	$ 88,480	51.37
West Robertson Blvd and 8th St	NS01	NS06	NS07	$ 68,250	
7th and West Robertson Blvd	NS01	NS06	NS07	$ 69,440	
Ave 24 1/2 and South Chowchilla Blvd	NS01	NS06	NS07	$ 81,704	
South 3rd St and Colusa Ave	NS01	NS06	NS07	$ 77,070	
North 5th Street and Riverside Ave	NS01	NS06	NS07	$ 61,544	
North 4th St and Ventura Ave	NS01	NS06	NS07	$ 60,284	
Orange Ave and South 12th St	NS01	NS06	NS07	$ 129,024	
North 5th St and Ventura Ave	NS01	NS06	NS07	$ 61,488	
Project 2: Pedestrian Improvements at Unsignalized Intersections					
South 3rd St and Colusa Ave	NS20PB			$ 14,700	14.91
North 5th Street and Riverside Ave	NS20PB			$ 13,160	
Trinity Ave and South 3rd St	NS20PB			$ 10,640	
North 4th St and Ventura Ave	NS20PB			$ 2,940	
Orange Ave and South 12th St	NS20PB			$ 1,120	
Robertson Blvd and 13th St			NS22PB	$ 208,600	
Orange St and S 11th St	NS20PB			$ 16,660	
Orange St and S 13th St	NS20PB			$ 18,620	

Location	CM1	CM2	CM3	Cost per Location	B/C Ratio
Trinity Ave and S 11th St	NS20PB			$ 40,474	
Trinity Ave and S 13th St	NS20PB			$ 11,970	
Riverside Ave and N 13th St	NS20PB			$ 7,980	
West Robertson Blvd and 8th St		NS21PB		$ 24,080	
7th and West Robertson Blvd		NS21PB		$ 10,080	
Project 3: Systemic Roadway Segment Improvements					
Robertson Blvd: Ave 24 1/2 to 99 SB On Ramp/Off Ramp	R01	R22	R27	$ 125,955	9.52
Ave 24 ½: Road 16 ½ to Chowchilla Blvd	R01	R22	R27	$ 150,280	
North 15th: Venutra Ave to Robertson Blvd	R01	R22	R27	$ 88,064	
Washington Rd: Kites Way to Robertson Blvd	R01	R22	R27	$ 46,260	
North 4th St: Ventura Ave to Robertson Blvd	R01	R22	R27	$ 90,820	
Humboldt Ave: South 15th St to South 9th St	R01	R22	R27	$ 83,540	
Myer Dr: Kites Way to Robertson Blvd	R01	R22	R27	$ 55,124	
Project 4: Pedestrian and Other Roadway Segment Improvements					
Robertson Blvd: Ave 24 1/2 to 99 SB On Ramp/Off Ramp	R28	R34PB	R35PB	$ 1,713,194	5.87

Location	CM1	CM2	CM3	Cost per Location	B/C Ratio
Washington Rd: Kites Way to Robertson Blvd	R28		R35PB	$ 34,664	
North 9th St: Ventura Ave to Robertson Blvd	R28	R34PB		$ 349,986	
North 4th St: Ventura Ave to Robertson Blvd	R28	R34PB		$ 241,892	
Humboldt Ave: South 15th St to South 9th St	R28	R34PB	R35PB	$ 170,660	
Myer Dr: Kites Way to Robertson Blvd	R28		R35PB	$ 30,926	

Notes: CM – countermeasure. B/C ratio is the dollar amount of benefits divided by the cost of the countermeasure.

Table 8. List of Countermeasure Names

Countermeasure Name
NS01- Add intersection lighting
NS06 –Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs
NS07 - Upgrade intersection pavement markings
NS20PB - Install pedestrian crossing at uncontrolled locations (new signs and markings only)
NS21PB - Install/upgrade pedestrian crossing at uncontrolled locations (with enhanced safety features)
NS22PB - Install Rectangular Rapid Flashing Beacon (RRFB)
R01- Add segment lighting
R22 - Install/Upgrade signs with new fluorescent sheeting (regulatory or warning)
R27- Install delineators, reflectors and/or object markers
R28 - Install edge-lines and centerlines
R34PB- Install sidewalk/pathway (to avoid walking along roadway)
R35PB - Install/upgrade pedestrian crossing (with enhanced safety features)

7. Evaluation and Implementation

This chapter describes the steps the City may take to evaluate the success of this plan and steps needed to update the plan in the future. The LRSP is a guidance document and requires periodic updates to assess its efficacy and re-evaluate potential solutions. It is recommended to update the plan every two to five years in coordination with the identified safety partners. 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.

Funding is a critical component of implementing any safety project. While the HSIP program is a common source of funding for safety projects, there are numerous other funding sources that could be pursued for such projects. Potential funding sources are listed below in **Table 9**.

Table 9. Potential Funding Sources

Funding Source	Funding Agency	Amount Available	Next Estimated Call for Projects	Applicable E's	Notes
Active Transportation Program	Caltrans, California Transportation Commission	~$223 million per year	2022	Engineering, Education	Can use used for most active transportation related safety projects as well as education programs
Highway Safety Improvement Program	Caltrans	TBD	Early 2022	Engineering	Most common grant source for safety projects
Surface Transportation Block Group Program	FHWA (Administered through MCTC)	Varies by FY	TBD	Engineering	Typically used for roadway projects
Congestion Mitigation and Air Quality (CMAQ)	FHWA (Administered through MCTC)	Varies by FY	TBD	Engineering	Focused on projects that improve air quality
Office of Traffic Safety Grants	California Office of Traffic Safety	Varies by grant	Closes January 31st annually	Education, Enforcement, Emergency Response	10 grants available to address various components of traffic safety

Funding Source	Funding Agency	Amount Available	Next Estimated Call for Projects	Applicable E's	Notes
Affordable Housing and Sustainable Communities Program	Strategic Growth Council and Dept. of Housing and Community Development	~$405 million	2022	Engineering, Education	Must be connected to affordable housing projects; typically focuses on bike/ped infrastructure/programs
Urban Greening	California Natural Resources Agency	$28.5 million	2022	Engineering	Focused on bike/pedestrian infrastructure and greening public spaces
Local Streets and Road Maintenance and Rehabilitation	CTC (distributed to local agencies)	$1.5 billion statewide	N/A; distributed by formula	Engineering	Typically pays for road maintenance type projects
RAISE Grant	USDOT	~$1 billion	2022	Engineering	Typically used for larger infrastructure projects
Sustainable Transportation Equity Project	California Air Resources Board	~$19.5 million	TBD; most recent call in 2020	Engineering, Education	Targets projects that will increase transportation equity in disadvantaged communities
Transformative Climate Communities	Strategic Growth Council	~$90 million	TBD; most recent call in 2020	Engineering	Funds community-led projects that achieve major reductions in greenhouse gas emissions in disadvantaged communities.

Implementation

The LRSP document provides engineering, education, enforcement, and emergency medical service related countermeasures that can be implemented throughout the City to reduce F+SI collisions. It is recommended that the City of Chowchilla implement the selected projects high-collision 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 safety partners.

Monitoring and Evaluation

For the success of the LRSP, it is crucial to monitor and evaluate the four E-strategies continuously. Monitoring and evaluation help provide accountability, ensures the effectiveness of the countermeasures for each emphasis area, and help making decisions 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. 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
- Number of public comments and concerns

Evaluation should be conducted during similar time periods and durations each year. The most important measure of success of the LRSP should be reduction in fatal and severe injury collisions throughout the City. If the number of F+SI 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.

LRSP Update

The LRSP is a guidance document and is recommended to be updated every two to five years after adoption. After monitoring performance measures focused on the status and progress of the E's strategies in each emphasis area, the next LRSP update can be tailored to resolve any continuing safety problems. The City of Chowchilla'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 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's strategies' progress and implementation.

Appendices:

Appendix A: Table of Policies and Projects from the Literature Review:

Document	Relevant Goals, Policies, and Projects
City of Chowchilla General Plan (2003)	**Goals** • Plan for, create, and maintain an efficient, cost effective, safe, and coordinated multi-modal circulation system, serving the needs of a variety of users. • Plan for and develop streets in accordance with the ultimate functions they have been designated to serve. • Minimize conflicts between different types of vehicular traffic and to discourage the intrusion of both through traffic and truck traffic into residential areas. • Provide for reasonably safe and efficient non-motorized (bicycle facilities and pedestrian) access within the City.
Madera Active Transportation Plan 2018	**Bicycle Priority Projects** • SR 233 (E/W Robertson Blvd) Class IV Separated Bikeways • SR 233 (E/W Robertson Blvd) Class II Bike Lanes • Kings Avenue Class II Bike Lanes • 11th Street Class III Bike Boulevard with Traffic Calming • Ventura Avenue Class II Bike lanes • Riverside Avenue Class III Bike Boulevard with Traffic Calming • Ave 25 ½ Howell Road Class II Bike Lanes • Santa Cruz Boulevard Class II Bike Lanes • Humboldt Avenue Class III Bike Boulevard with Traffic Calming • 1st Street Class III Bike Boulevard with Traffic Calming • Road 15 ½ Class II Bike Lanes • Road 24 ½ Class II Bike Lanes **Pedestrian Priority Projects** • Robertson Boulevard & S 11th Street - Install crosswalks, curb extensions and ped countdown heads • Kings Avenue – Sidewalk gap closure • 11th Street – Sidewalk gap closure • S 11th Street and Humboldt Avenue – Install high visibility crosswalks and curb extensions • Ventura Ave – Install crosswalks, curb extensions • Riverside Ave – Sidewalk gap closure • N 15th Street – Install crosswalks and curb extensions

	• S 8th Street – Sidewalk gap closure • Stephens Elementary School 6th Street – Sidewalk gap closure, RRFB and curb extensions • CA-233 – Sidewalk gap closure
Downtown Design Guidelines	**Sidewalk Policies** • All sidewalks shall have a clear minimum four (4') feet width for unfettered pedestrian movement (six (6') feet minimum is preferred). • A portion of the sidewalk should include colored and stamped concrete along the curb and around the area for tree cut-outs at a minimum. **Crosswalk Policies** • Provide visual clues to alert drivers that pedestrians have the right of way such as the following: • Provide special paving textures and/or colors for pedestrian crossings at intersections and parking areas. Use of Thermoplastic in crosswalks is preferred. Thermoplastic improves pedestrian safety at intersections and midblock crossings, is durable, and provides decorative enhancement to the streetscape.
Chowchilla Industrial Park Specific Plan (2018)	**Bicycle Projects** • Class I Multi Use Trail- Berenda Slough, the entire length of the Plan Area • Class I Multi Use Trail - Road 16 from Mariposa Street to Berenda Slough • Class II Bike Lane - New collector street (Prosperity Boulevard) from Robertson Boulevard to Chowchilla Boulevard • Class II Bike lane Mariposa Street, from Road 16 to Front Street
Chowchilla City Budget 2020-2021	**Service Description** • Provide safe and efficient streets for residents and workers; • Actively participate in the collective effort with engineering, staff, and the public on Capital Improvement Projects; • Overlay/reconstruct streets as identified by the Pavement Management Plan and maintain streets with an emphasis on prevention; • Maintain and improve traffic signs road stripping and other markings. **Major Accomplishments in FY 2019-2020** • Completed Fuller Street Safe Routes to School Project; • Completed Wilson School improvement project; • Completed 5th Street curve to road 16 rehabilitation project; • Received "Buy American Waiver" from federal government, and completed procurement of new CNG street sweeper with CMAQ (California Mitigation and Air Quality) fund;

	• Completed ADA Master Plan Assessment project funded through Caltrans Sustainable Transportation Planning Sustainable Communities Grant; • Implemented monthly Street Sweeping Services with Clean Street and City Staff; • Implemented a multi-year Street Striping schedule; • Updated Standard Operating Procedures for Streets and Roads operations; • Completed City Capital Improvement Projects (CIP) Planning Document; • Coordinated the construction of new Transit Equipment Room Addition to the Public Works office at City Corp yard; • Purchase of a new dump truck to be delivered October 2020; • Purchase one new Chevy 1/2-ton truck. **FY 2020-2021 Goals & Objectives** *The notation in parenthesis corresponds to the City Council Strategic Plan Goals and Objectives listed as the goal number followed by the objective number, ex. G1.1.* • Continue the process of street striping the City; • Begin implementation of ADA Master Plan; • Begin project Ave 24-1/2 shoulder improvements (G2.1, G2.4); • Continued Implementation of the City's Pavement Management Program (G2.1, G2.2); • Complete plans, specs, and estimate for rehabilitation of Humboldt Avenue (G2.1, G2.4
Short Range Transit Development Plan FY 2017/18- 2020/22	**Primary Objectives:** 1. Assess the efficiency and effectiveness of existing transit services throughout Madera County. 2. Develop cost-effective recommendations and a five-year service plan to improve transit services based upon rider and community input. 3. Provide marketing and outreach strategies to promote services based on an understanding of the needs of current and potential riders. 4. Develop financially feasible capital and operating plans that support the five-year service plan and that address existing and future transit needs in Madera County. **Goals pertaining to safety:** Attend local rail committee meetings to increase rail safety and ridership of Amtrak services.

2018 Regional Transportation Plan Sustainable Communities Strategy	**Goal** • To maintain the efficiency, safety, and security of the region's transportation system. • Conduct effective outreach to ensure fiscally sound transportation investments that result in improved system mobility and safety. • Improve and maintain an integrated transportation network that reduces congestion and minimizes safety issues. • Enhance public health and safety by eliminating transportation-related deaths and injuries. **Planned Projects** • Humboldt 13th Street (planned 2020) 3rd to 6th Street – Reconstruct • Humboldt Ave/ 13TH St (planned 2025) 6th St to 12th St – Reconstruct • Humboldt Ave/ 13TH St (planned 2025) 12th St to 13th St – Reconstruct • Humboldt Ave/ 13TH St (planned 2030) 13th St to 15th St/ Mariposa Ave to Orange Ave – Reconstruct 2-lane collector, incl. curb gutter, sw, ramps, ect • 13th Street (planned 2030) Orange Ave to Kings Ave – Reconstruct 2-lane collector incl. curb gutter, sw, ramps • 13th Street Monterey Ave (planned 2030) Kings Ave to Ventura Ave 3rd St to 4th St – Reconstruct 2-lane collector incl. curb gutter, sw, ramps • Monterey Ave (planned 2030) 4th St to 7th St – Reconstruct 2-lane collector incl. curb gutter, sw, ramps • Monterey Ave (planned 2030) 7th St to 12th St – Reconstruct 2-lane collector incl. curb gutter, sw, ramps • Monterey Ave (planned 2030) 12th St to 15th St – Reconstruct 2-lane collector incl. curb gutter, sw, ramps
SR 233/Robertson Boulevard Corridor Planning Study and Downtown Master Plan (2020	**Install improvements along Robertson Blvd:** • RRFB System Installation • High Visibility Crosswalks • Bulb out Installation • ADA Compliant Curb Ramps • Class II Bike Lane/ Class IV Protected Bike Lane • Sidewalk Installation • Crosswalk Marking Upgrades • Bus stop upgrades