

City of Lakeport Local Road Safety Plan (LRSP)

December 30, 2021

Prepared for:



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Lakeport, CA 95453

Lake Area Planning Council
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Prepared by:



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Acknowledgements

The Lake Area Planning Council, City of Lakeport staff and project stakeholders were instrumental in the creation of this Local Road Safety Plan. The local knowledge and collaborative attitude of all stakeholders involved helped create a holistic LRSP. Headway Transportation would like to express appreciation to the staff and project stakeholders who contributed to this plan.

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Statutory Notice

23 U.S.C. 409: US Code – Section 409: Discovery and admission as evidence of certain reports and surveys

Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway- highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

California Government Code - GOV § 7550

This section is included per California Government Code - GOV § 7550 which states that:

“(a) Any document or written report prepared for or under the direction of a state or local agency, that is prepared in whole or in part by nonemployees of the agency, shall contain the numbers and dollar amounts of all contracts and subcontracts relating to the preparation of the document or written report; if the total cost for the work performed by nonemployees of the agency exceeds five thousand dollars (\$5,000). The contract and subcontract numbers and dollar amounts shall be contained in a separate section of the document or written report.

(b) When multiple documents or written reports are the subject or product of the contract, the disclosure section may also contain a statement indicating that the total contract amount represents compensation for multiple documents or written reports.”

The contract amount for this Lakeport LRSP is \$79,971.00. The total contract amount, which included preparation of two LRSPs for the Cities of Lakeport and Clearlake, is \$129,951.00.



Table of Contents

Executive Summary.....	1
Introduction.....	2
Vision and Mission Statement	2
LRSP Process	3
Planned Projects and Initiatives.....	4
Stakeholder Engagement	6
Focus Area Development	7
Public Outreach.....	8
Crash Data Analysis.....	15
Countermeasures.....	40
Implementation Plan	51
Next Steps.....	57

List of Figures

Figure 1. Primary Transportation Mode	9
Figure 2. Respondents by Age Range	10
Figure 3. Travel Habits during Covid.....	10
Figure 4. Interactive Map Comments by Focus Area.....	12
Figure 5. All Interactive Map Public Comments	14
Figure 6. Total Crashes by Year	16
Figure 7. Fatal and Serious Injury Crashes by Year.....	16
Figure 8. Crash Severity	17
Figure 9. Crashes by Severity (2015-2019).....	18
Figure 10. Crash Heatmap (2015-2019).....	19
Figure 11. Primary Collision Factors	21
Figure 12. At-Fault Party Ages.....	21
Figure 13. Top Crash Intersections Crash Types.....	23
Figure 14. Top Crash Intersections Primary Factors.....	23
Figure 15. Geolocated Intersection Crash Totals (2015-2019).....	24
Figure 16. Top Total Crash Roadways (Intersection and Non-Intersection Crashes) and Crash Type	25
Figure 17. Top Non-Intersection Crash Segments (2015-2019)	28
Figure 18. Intersection Crashes.....	29
Figure 19. Intersection Crash Types by Severity.....	30
Figure 20. Lane Departure Crash Severities on Roadway Segments.....	31
Figure 21. Pedestrian Actions.....	32
Figure 22. Bicycle & Pedestrian Crashes (2015-2019)	33
Figure 23. Unsafe Speed Crashes & Dark Lighting Condition Crashes (2015-2019)	36
Figure 24. Crash Types Involving Impairment.....	37



Figure 25. Lighting Conditions.....	37
Figure 26. Crash Data Summary	39
Figure 27. Potential Engineering Projects.....	48

List of Tables

Table 1. Focus Area Priority Ranking	11
Table 2. Most frequent Question 5 Survey Response Categories.....	12
Table 3. Top Three Interactive Map Hot Spots	13
Table 4. Crash Types	20
Table 5. Top Crash Intersections	22
Table 6. Top Non-Intersection Crash Roadway Segments.....	26
Table 7. Top Non-Intersection Crash Roadway Segments – Primary Collision Factor.....	27
Table 8. Top Non-Intersection Crash Roadway Segments – Crash Type	27
Table 9. Lane Departure Crash Types	31
Table 10. Crash Severity by Crash Type for Crashes with Unsafe Speed as PCF	35
Table 11. Age Ranges for Impairment Crashes	35
Table 12. Distracted Driving Focus Area Strategy Table	42
Table 13. Impaired Driving Focus Area Strategy Table	42
Table 14. Speeding Focus Area Strategy Table.....	43
Table 15. Intersection Safety Focus Area Strategy Table.....	43
Table 16. Pedestrian and Bicycle Safety Focus Area Strategy Table	44
Table 17. Lighting Focus Area Strategy Table.....	45
Table 18. Lane Departures Focus Area Strategy Table	45
Table 19. Motorcycle Safety Focus Area Strategy Table.....	45
Table 20. Potential Engineering Projects	49

List of Appendices

Appendix A – Stakeholder Working Group Member List
Appendix B – Initial Data Analysis
Appendix C – Public Outreach Results
Appendix D – Focus Area Strategy Tables
Appendix E – Potential Engineering Projects
Appendix F – HSIP Analyzer Manual and Countermeasure Table
Appendix G – Project Layouts, Cost Estimates and Benefit-Cost Ratio Calculations



Executive Summary

The City of Lakeport Local Roadway Safety Plan (LRSP) established the framework and processes for identifying, evaluating, and prioritizing transportation safety improvements with a goal of reducing fatalities and serious injuries on the local road network. The City of Lakeport LRSP was developed through a process of stakeholder collaboration, public outreach, and crash data analysis.

The stakeholder’s working group (**page 6**) provided key input and guidance in developing the project vision and mission statements, identifying focus areas, and considering safety strategies and recommendations in line with community goals and other planned projects. The stakeholders will also be key in implementing the plan, measuring outcomes, and updating the plan in the future. The public outreach (**page 8**) prioritized overall safety concerns as well as identified specific locations via an interactive online map. The in-depth crash data analysis (**page 15**) revealed both overall trends as well as “hot spots” of crash densities.

Lakeport Focus Areas

- ✓ Distracted Driving
- ✓ Impaired Driving
- ✓ Speeding
- ✓ Intersection Safety
- ✓ Pedestrian Safety
- ✓ Bicycle Safety
- ✓ Roadway/Intersection Lighting
- ✓ Lane Departures

Identified focus areas represent the greatest opportunity for reducing fatal and serious injury crashes throughout the city based on public outreach results and crash data analysis. *Focus Area Strategy Tables* (**page 40**) organized countermeasures and strategies across the four ‘E’s’ of traffic safety- *Engineering, Enforcement, Education, and Emergency Services*.

The Strategy Tables, summarized in **Tables 12-19** and detailed in **Appendix D**, also identify actions, target outputs, responsible parties, performance measures and potential funding opportunities. The document details key steps for successful implementation (**page 51**), non-engineering programs (**page 52**), and details of potential funding sources (**page 54**). This document also includes project packages, concept layouts, cost estimates and Benefit-Cost Ratio (BCR) calculations for two projects that can be used in potential Highway Safety Improvement Program (HSIP) grant applications.

This plan was developed through close coordination with stakeholders, and the public in compliance with the State and Federal guidelines for eligibility to apply for HSIP funding. This document includes the necessary data and analysis to support future grant funding applications for recommended systemic and location specific projects. The LRSP is intended to be a living document, which will be updated every five years using the most up to date crash data to evaluate the performance of implemented countermeasures and re-evaluate focus area selection.



Introduction

Crashes result in almost 3,700 daily fatalities globally and are a leading cause of death for people ages 1-54¹. The Local Road Safety Plan (LRSP) is a critical need as local roads are less traveled but tend to have a higher rate of serious injury and fatal crashes. The City of Lakeport is comprised primarily of local roads, and the Office of Traffic Safety Crash Rankings for Caltrans ranked Lakeport in the top third (25 out of 75) for total fatal and injury crashes in 2018 (the most recent year available). To improve roadway safety, agencies across the US are using historical crash data and input from the public to identify and address the safety issues unique to their local roadways.

Vision and Mission Statement

The vision and mission statements were developed to guide the LRSP and ensure that the final recommendations improve safety while furthering the vision and existing efforts of the City of Lakeport.

Vision Statement

“To help all transportation users in Lakeport reach their destination safely.”

Mission Statement

“To reduce the number of fatalities and serious injuries occurring on the roadway system in Lakeport for all users.”



¹ <https://www.cdc.gov/injury/features/global-road-safety/index.html>



LRSP Process

The LRSP process is a standard format for local agencies to evaluate crash data, identify safety focus areas, and select appropriate countermeasures. This process is applied across the US by local agencies and counties alike. The simple six-step LRSP process includes evaluating and updating the plan at regular intervals, typically every four to five years. An LRSP provides the framework for identifying systemic safety issues along local roads based on historical crash data. By evaluating crash data systemically, the LRSP identifies specific focus areas which represent the largest opportunities to improve safety such as pedestrian safety or impaired driving. The LRSP process also identifies hot spot locations with a high number of crashes historically as well as locations which have similar roadway characteristics but may lack a history of crashes.

Following the crash analysis, countermeasures are identified based on the types, frequency, and contributing elements of crashes, with a focus on reducing fatal and serious injury crashes. Identified countermeasures fall under one of the four “E’s” of

4 E's of Traffic Safety

Engineering

Education

Enforcement

Emergency Services

traffic safety which include Engineering, Enforcement, Education, and Emergency Services. Countermeasures

and strategies in all “E’s” are included in the applicable Focus Area and are divided based on the “E” which they address. Education and Enforcement strategies are often best implemented following buy-in from community partners and stakeholders. Developing countermeasures across these four areas of traffic safety ensures a plan which improves traffic safety through a variety of approaches. “Emerging Technologies” is considered a new 5th category and was considered in the countermeasure process.

Implementation of identified countermeasures typically requires additional grant funding for many agencies. As of 2020, the LRSP will be a required document for any agencies applying for HSIP funding. The HSIP is a federal aid program which requires states to develop comprehensive Statewide Highway Safety Plans (SHSPs) focused on reducing fatal and serious injury crashes. The HSIP Grant Program is one of the primary funding mechanisms for roadway safety enhancements across the United States. Each state department of transportation can allocate HSIP funding to local entities for traffic safety projects focused on reducing fatal and serious injury crashes. The California Department of Transportation (Caltrans) will require any agency applying for HSIP funding to first complete an LRSP for funding Cycle 11 and beyond.

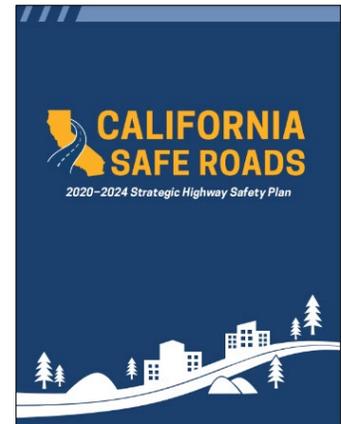


Exhibit 1. LRSP Development Process (FHWA)



Connection with the SHSP

This LRSP builds off the current *2020-2024 Statewide Highway Safety Plan “California Safe Roads” (SHSP)* developed by Caltrans to provide technical assistance in prioritization and deployment of safety countermeasures across the state. The SHSP identifies countermeasures and strategies to address specific safety issues which allows local agencies to leverage road safety planning processes to identify and address local needs based on the SHSP countermeasures. Caltrans identified five “high priority” challenge areas which represent the greatest opportunity for reducing fatal and serious injury crashes across the state:



- ▶ Pedestrians & Bicyclists
- ▶ Intersections
- ▶ Impaired Driving
- ▶ Lane Departures
- ▶ Speed Management / Aggressive Driving

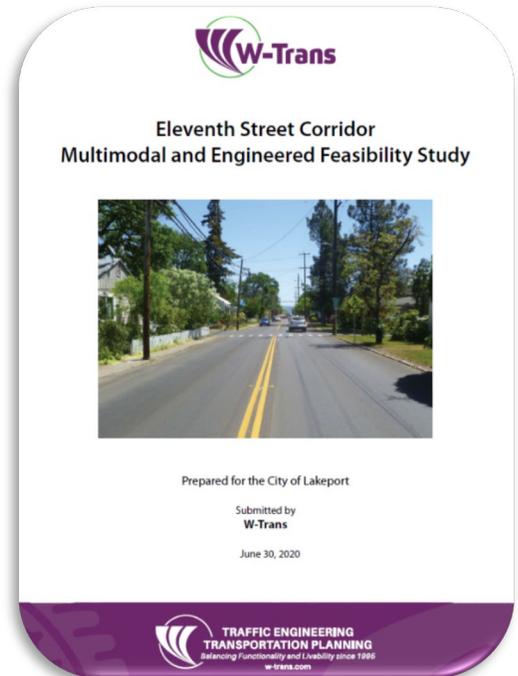
The City of Lakeport LRSP identifies these five high priority challenge areas as focus areas based on the crash data analysis.

Planned Projects and Initiatives

The purpose of the LRSP is to enhance and expand upon other planned projects and safety initiatives in the City of Lakeport. Several roadway improvements projects have been identified in Lakeport. These studies and projects were considered in the LRSP process and countermeasure selection.

11th Street Corridor

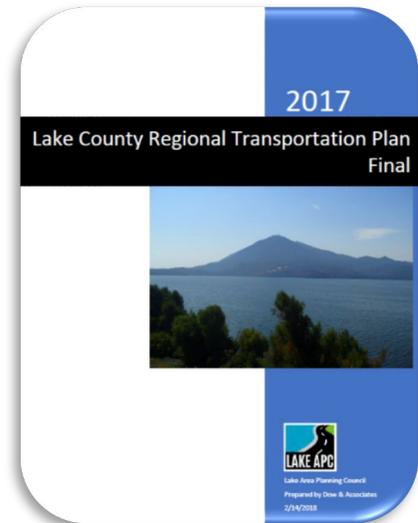
This multimodal project is detailed in the *Eleventh Street Corridor Multimodal and Engineered Feasibility Study* (W-Trans, June 2020). The study provided recommendations for 11th Street from SR 29 to North Main Street, such as adding bicycle lanes, providing sidewalks, improving pedestrian crosswalks, and converting the Forbes Street/11th Street intersection to a mini-roundabout.



2017 Lake County Final Regional Transportation Plan

The Regional Transportation Plan lists the financially constrained projects planned over the next 20 years. This list includes projects on State Highways and local roads. Projects potentially impacting the countermeasures for the LRSP are:

- ▶ SR 29/ Lakeport Blvd: ADA upgrade to pedestrian facilities
- ▶ Pavement Management Program
- ▶ Roundabout: Lakeport Boulevard/ Main Street
- ▶ Roundabout: 11th Street/ Central Park Ave
- ▶ Roundabout: 11th Street/ Main Street
- ▶ Roadway Reconstruction/Rehabilitation
- ▶ Roadway Overlay
- ▶ Alden Ave extension to 11th Street at Central Park Ave



Active Transportation Plan for Lake County (2016)

The Projects potentially impacting the countermeasures for the LRSP are:

- ▶ Hartley Street Safe Route to School Project

The draft form of the **2022 Lake County Regional Transportation Plan/Active Transportation Plan** is anticipated for adoption in December 2021. Financially constrained projects in the City of Lakeport are:

- ▶ Roundabout: Lakeport Boulevard/ Main Street
- ▶ Lakeport Boulevard Rehabilitation
- ▶ Roadway Reconstruction/Rehabilitation
- ▶ Roadway Overlay
- ▶ 10th Street Bike Boulevard Improvement Project - Active Transportation
- ▶ Hartley Road pedestrian improvements (Twentieth Street to City Limits) – Active Transportation

Financially unconstrained projects in the City of Lakeport are:

- ▶ Roundabout: 11th Street/ Forbes Street
- ▶ Roadway Reconstruction/Rehabilitation
- ▶ Roadway Overlay
- ▶ Approximately 24 Active Transportation projects



Lake Walks Study/Lake County Pedestrian Facility Needs Inventory and Engineered Feasibility Study (2019)

The study recommended 40 projects for pedestrian access and safety improvements throughout Lake County. Projects potentially impacting the countermeasures for the LRSP are:

- ▶ Lakeshore Boulevard
- ▶ N. High Street
- ▶ N. Main Street/ 16th Street
- ▶ 11th Street
- ▶ 6th Street
- ▶ Martin Street/ S. High Street/
S. Forbes Street/ 1st Street/ C Street
- ▶ S. Main Street
- ▶ Armstrong Street
- ▶ Esplanade Street
- ▶ Lakeport Boulevard



Stakeholder Engagement

The stakeholder working group was developed to provide important input and guidance throughout the project including assisting in the development of the project vision and mission statements, identifying focus areas, and considering safety strategies and recommendations. The stakeholders will also be key in implementing the plan, measuring outcomes, and updating the plan in the future.



Source: FWHA

The stakeholder working group included representatives from numerous City departments and local agencies:

- ▶ Lake Area Planning Council
- ▶ City of Lakeport
- ▶ Lakeport Police Department
- ▶ Lake Transit Authority
- ▶ Lake County Fire Protection District
- ▶ California Department of Transportation (Caltrans) District 1 Office



The first stakeholder working group meeting was held on April 6, 2021, to identify initial issues, concerns, and the LRSP focus areas based on local knowledge and analysis of the most recent five years of crash data. The second stakeholder working group meeting was held June 10, 2021 and discussed the results of the detailed crash data analysis and public outreach efforts. The third stakeholder working group meeting was held on August 24, 2021, and discussed countermeasures, Focus Area Strategy Tables and potential projects.

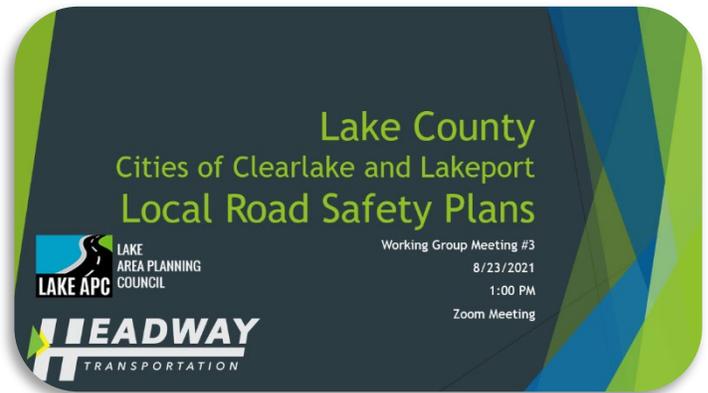


Exhibit 2. Stakeholders Working Group Meeting

A list of stakeholders working group members are included in **Appendix A**.

Focus Area Development

Initial Data Analysis

The first step in the process was to identify the focus areas for the purposes of detailed crash data analysis and public outreach. The initial data analysis reviewed crash patterns and factors. This initial analysis is included in **Appendix B** and summarized as:

- ▶ Fatal and serious injury crashes account for 5% of all crashes.
- ▶ The most common collision types are Hit Object, Rear-End and Sideswipe.
- ▶ Non-Motorized users (pedestrians and bicyclist) represented a low percentage of crashes; however, both categories were ranked in the top 25 in the Office of Traffic Safety (OTS) crash rankings.
- ▶ Automobile Right-of-Way and Unsafe Speed were the highest primary collision factor for all crash types.
- ▶ Unsafe Speed and Impairment were the top collision factors for fatal and serious injury crashes.
- ▶ 30% of fatal and serious injury crashes occur during non-day light hours.
- ▶ 50% of fatal and 75% of serious injury crashes involve Impairment (even if this was not listed as the top collision factor).
- ▶ Motorcycles are involved in 40% of fatal and serious injury crashes.



Source: FHWA



Focus Areas

Based on this initial data analysis and stakeholder input, the following focus areas were identified:

- ▶ Bicycle Safety
- ▶ Distracted Driving
- ▶ Impaired Driving
- ▶ Intersection Safety
- ▶ Lane Departures
- ▶ Pedestrian Safety
- ▶ Roadway/Intersection Lighting
- ▶ Speeding



Public Outreach

Public Outreach Methodology

Typical in-person outreach methods were not practical for the public outreach due to the COVID-19 pandemic. Therefore, all public outreach was exclusively online. The project team developed a virtual survey² through ArcGIS Survey123 and an interactive public comment map through ArcGIS Online. The survey and map were made open to the public on April 15, 2021 - May 19, 2021. The survey contained a total of five questions including demographics, travel habits, focus area prioritization and an opportunity to provide any comments related to transportation safety. The questions were used to identify the highest priority safety concerns of residents. Survey respondents were provided a link to an interactive map following completion of the survey. The interactive map provided residents with an opportunity to identify specific locations in the City of Lakeport with transportation safety concerns using a georeferenced dot. Respondents could categorize their comments on the map as one of the eight identified focus areas or select the “Other”

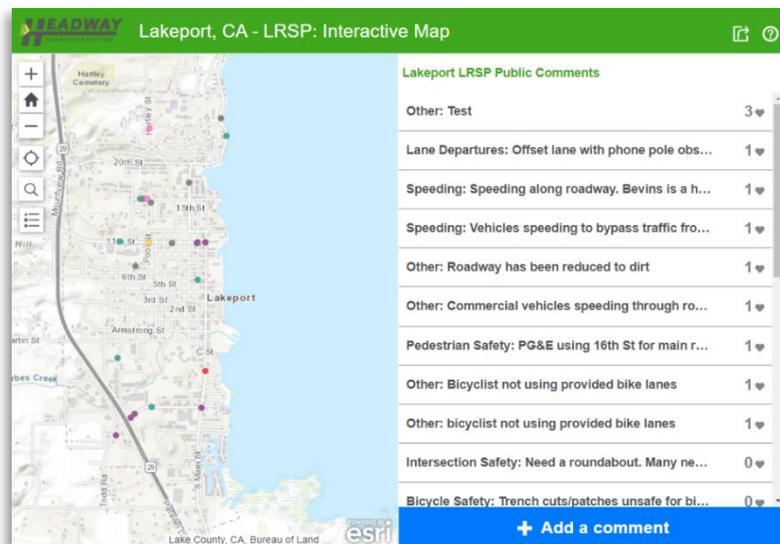


Exhibit 3. Lakeport Public Outreach Interactive Map

² Responses were limited to a single completed survey per IP address.



category if the comment did not fall under one of the focus areas. Respondents were also able to vote in support of comments from other respondents.

A weblink to the survey was distributed to the public through:

- ▶ City of Lakeport website
- ▶ Lake Area Planning Council Website and Facebook page
- ▶ Caltrans Facebook

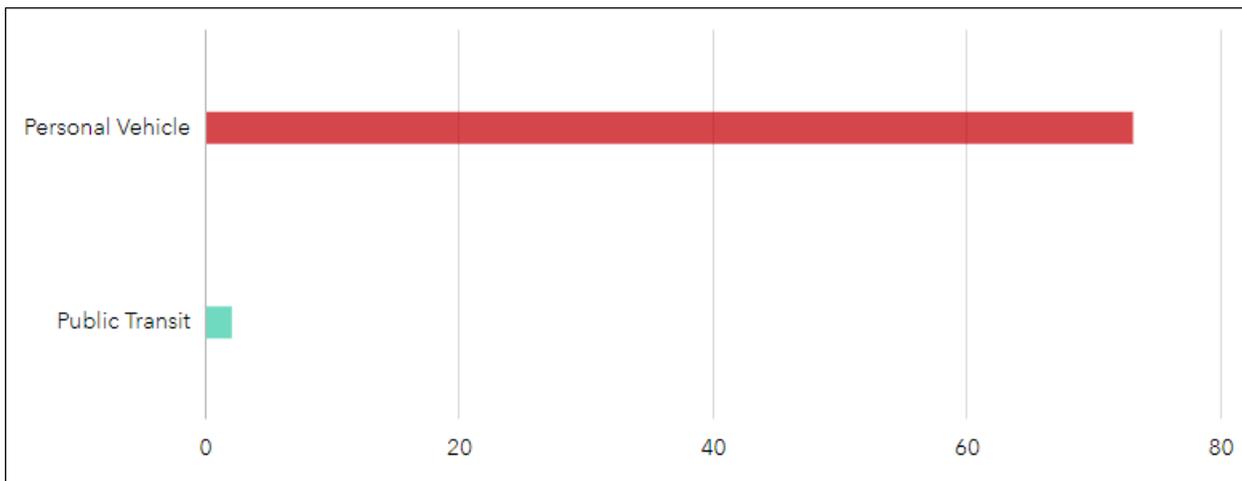
The initial outreach effort produced a total of:

- ▶ 75 completed surveys
- ▶ 24 individual georeferenced comments through the interactive map

Public Outreach Survey Results

Input provided through the public outreach survey helped to identify specific locations with perceived safety concerns as well as general input on transportation safety and the roadway network. Full survey responses and interactive map data (withholding respondents' personal information) are included in **Appendix C** and the results are summarized below.

Question 1 – What is your primary mode of transportation?



The choices were personal vehicle, bicycle, walking, public transportation, carpool/rideshare or other. Most respondents (97.33%) indicated that their primary mode of transportation is a personal vehicle with public transit as the only other mode selected at 2.67%.



Question 2 – What is your age range?

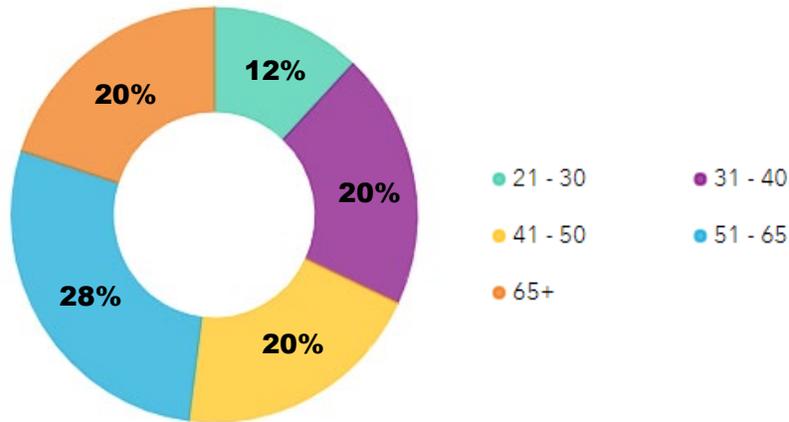


Figure 2. Respondents by Age Range

Survey responses were received from all age ranges, however, respondents tended to be over 40-years-old. Nearly one-third (32 %) of respondents were below the age of 40. There were no respondents from the “20 and below” category.

Question 3 - Did your travel habits change during COVID restrictions (approximately March 2020-present)?

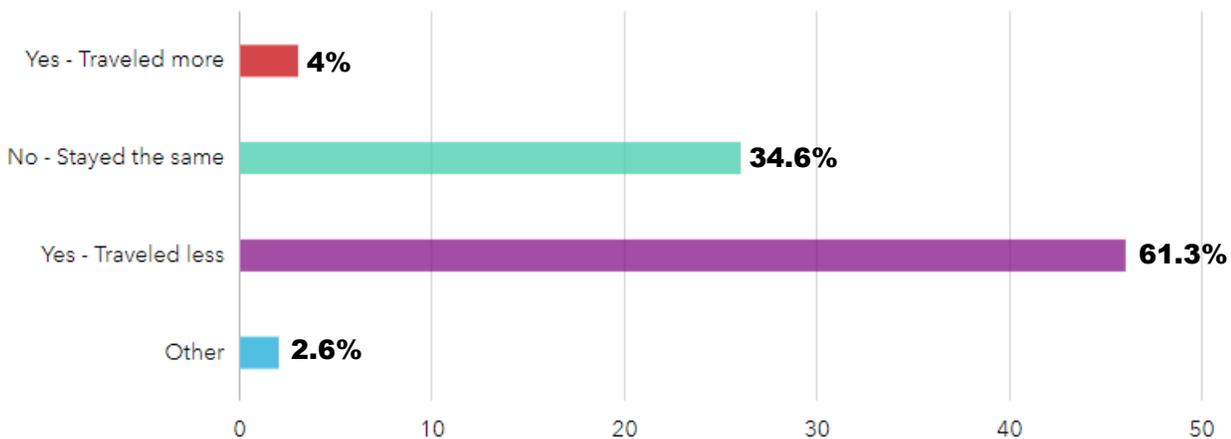


Figure 3. Travel Habits during Covid

This question was included to gauge the impacts of COVID-19 on the transportation network. The response may be used to identify if any planning strategies should be adapted, or how future updates of the LRSP may be impacted. Only 4% of respondents indicated that the change to their travel habits during COVID-19 restrictions resulted in an increase of travel. Based on the survey results, no respondents changed their mode of travel due to the COVID-19 restrictions.



Question 4 – Please rank the following categories based on your personal level of concern regarding each category, with "1" representing the highest concern.

The responses to this question indicated the highest priority transportation safety focus areas for survey respondents. Respondents were asked to place focus areas in a ranked list based on which they were most concerned about. **Table 1** lists the focus areas in order based on their average weighted scores with the higher scores indicating more priority/level of concern³.

Table 1. Focus Area Priority Ranking

Focus Area	Weighted Score
1. Distracted Driving	5.97
2. Impaired Drivers	5.63
3. Speeding	5.37
4. Intersection Safety	4.65
5. Pedestrian Safety	4.29
6. Bicycle Safety	4.04
7. Lighting	3.53
8. Lane Departures	2.51

Based on the survey responses distracted driving, impaired drivers, and speeding were highest priority focus areas.

Question 5 – Please enter any comments relating to transportation safety in the City of Lakeport below:

Each response to this question was assessed by the project team and categorized. The most frequent comment categories are shown in **Table 2**. The top comment category was on the pavement conditions of the roadway with a focus on Main Street and Palm Drive. Excessive vehicle speeds were also identified as an issue generally and specifically on 11th Street, Forbes Street, Main Street, Bevins Street, and 16th Street which is reportedly used by commercial vehicles. Intersection safety ranked as the third most frequent comment with a focus on the 11th Street/ Forbes Street intersection. Bicycle & Pedestrian safety concerns focused on a lack of bicycle and pedestrian facilities as well as poor crosswalk lighting.

³ An inverse weighting system was applied to survey responses. For example, a focus area ranked as number one was assigned eight points and a focus area ranked number eight was assigned one point.



Table 2. Most frequent Question 5 Survey Response Categories

Comment Category	Total Comments
Poor Roadway Conditions	14
Speeding	13
Intersection Safety	6
Bicycle Safety	4
Pedestrian Safety	4
Lack of Sidewalks	3
Poor Lighting	2

Interactive Map Results

The purpose of the interactive City of Lakeport map is to identify the locations with the most public concerns. The interactive public outreach map provided respondents with an opportunity to place a georeferenced dot on a virtual map, select a category from the focus areas, and provide a corresponding transportation safety comment. As shown in **Figure 4**, most comments submitted through the interactive map focused on Intersection Safety and Speeding. This reflects the results of the focus area priority ranking from Question 4 of the public outreach survey, except for distracted driving and impaired driving which are typically not location specific.

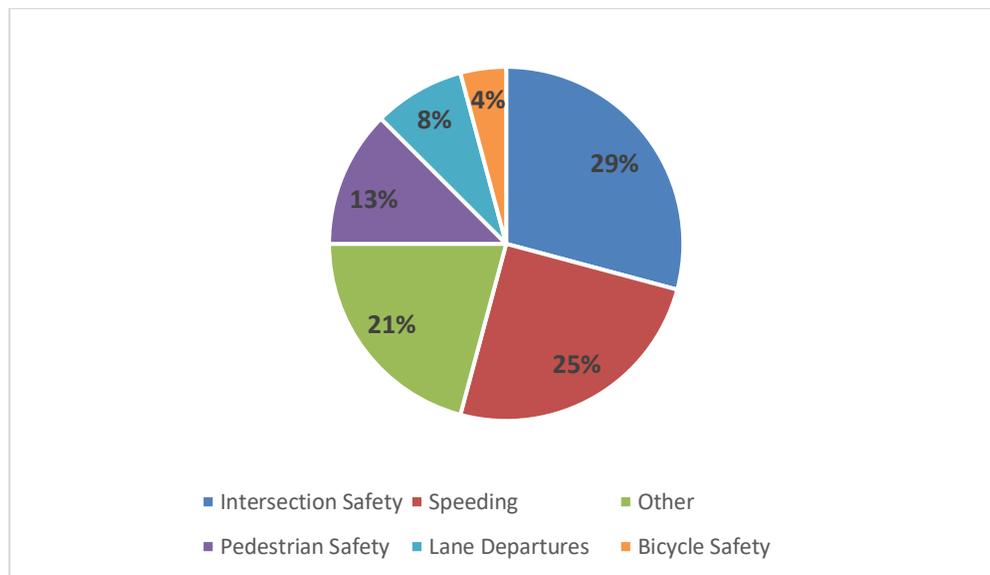


Figure 4. Interactive Map Comments by Focus Area

As seen in **Figure 5**, comments were received across the City with a geographic emphasis on the urban core. The heatmap in **Figure 5**, showing the concentration of comments, highlights three distinct hot spots. The hotspot locations and corresponding focus areas are included in **Table 3** below.



Table 3. Top Three Interactive Map Hot Spots

Interactive Map Hot Spots			
Number	Location	Comment Type(s)	Crash History
#1	16th Street Palm Drive to Mellor Drive	1 - Pedestrian Safety (speeding related) 1 - Speeding 1 - Other (speeding related)	0 Crashes
#2	11th Street Main Street to Forbes St	3 - Intersection Safety	3 – Other Visible Injury 4 – Complaint of Pain
#3	Lakeport Boulevard Bevins Street to Northbound SR 29 Ramps	2 - Intersection Safety	0 Crashes

Appendix C includes a summary table and map of all the interactive map comments. The specific comments and locations identified through the interactive map process, in coordination with the crash data analysis, helped to guide the development of strategies and recommendations to address each focus area.



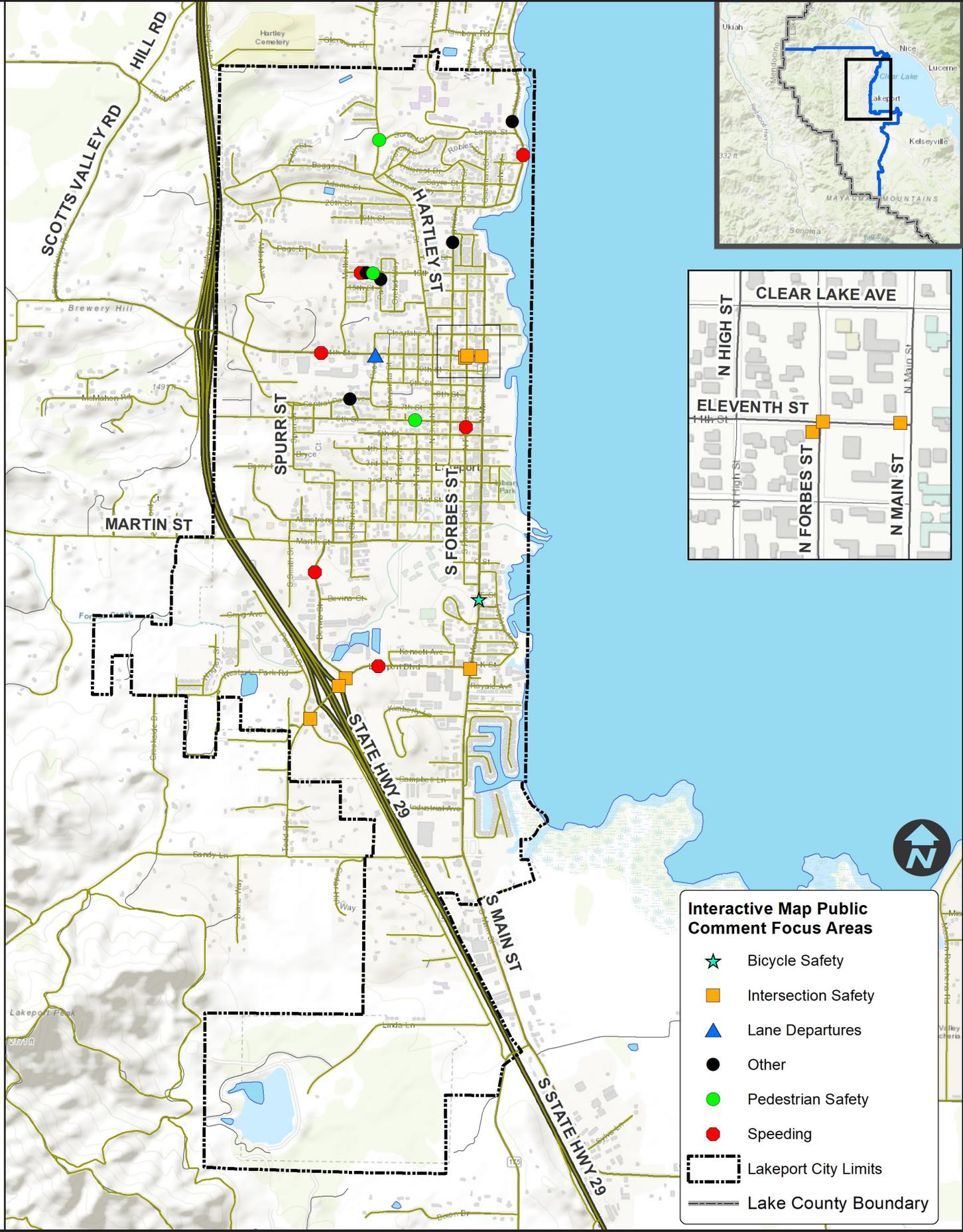


Figure 5

Crash Data Analysis

Methodology

Crash data for the most recent five years (2015-2019) was obtained from two primary sources, SWITRS and TIMS. The Statewide Integrated Traffic Records System (SWITRS) is a web-based database that collects and processes crash data. It includes all crash severities with limited geospatial data. The Transportation Injury Mapping System (TIMS) is a geo-referenced web-based database that includes only serious injury and fatal crashes. The SWITRS data was used to identify overall crash trends, while the TIMS data was primarily used to identify hot spots and location-specific safety concerns given the advanced geospatial information. Location-based data from SWITRS was used as available.

The crash data was utilized to identify crash trends and high frequency crash intersections and roadway segments overall and by focus area. Crash rates were considered as traffic volume data was available. Crash rates determine the relative safety considering traffic volumes and length (for roadway segments).

Crash Data Considerations

The LRSP process is largely dependent on the quality of existing crash data records. The data available in the City of Lakeport allows for the identification of overall crash trends and to identify the highest priority areas. However, data fields often have a higher percent of “Not Stated”, “Unknown”, or blank records. This is a typical condition for crash data across the country and is not unique to the City of Lakeport. The analysis is conducted using the best available data.

Overall Crash Trends

Reviewing the total number of crashes year by year helps to identify how the frequency changes year to year. **Figures 6 and 7** show the total number of crashes and the severity by year across the City of Lakeport between 2015 and 2019.



Crashes per Year

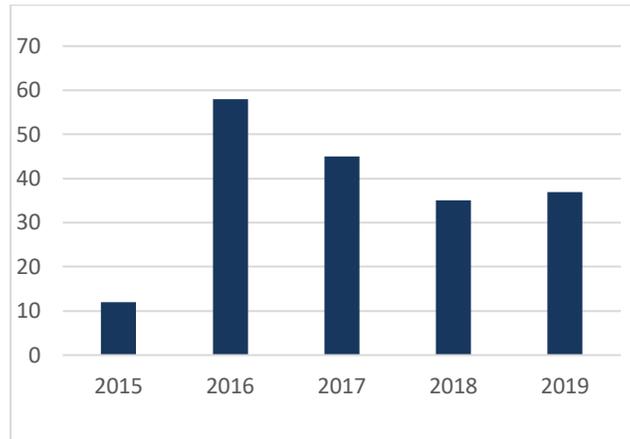


Figure 6. Total Crashes by Year

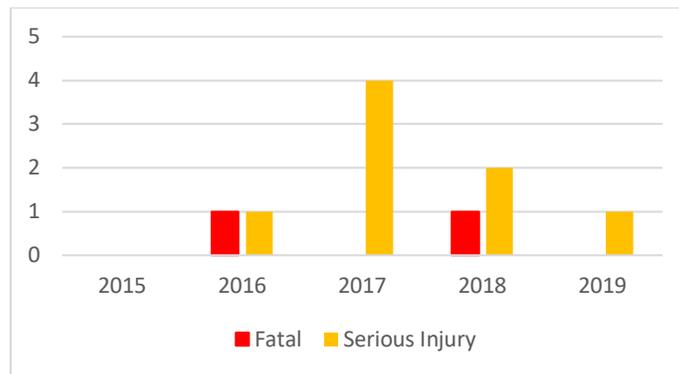


Figure 7. Fatal and Serious Injury Crashes by Year

Crashes by Severity

Figure 8 shows the breakdown of all severities.



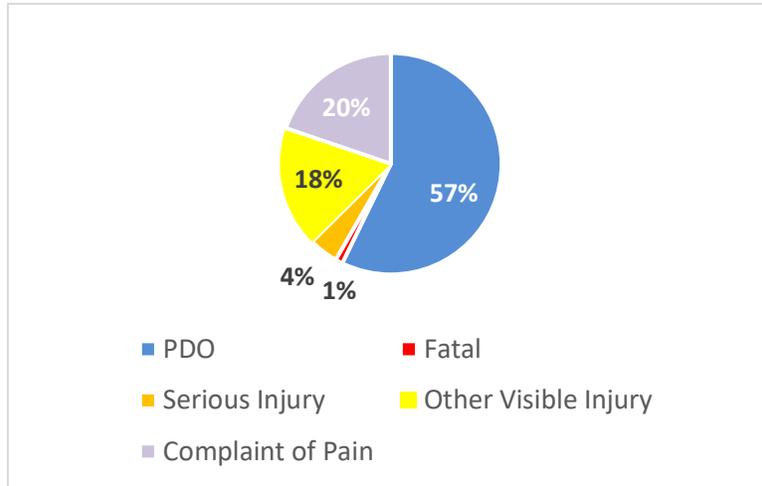
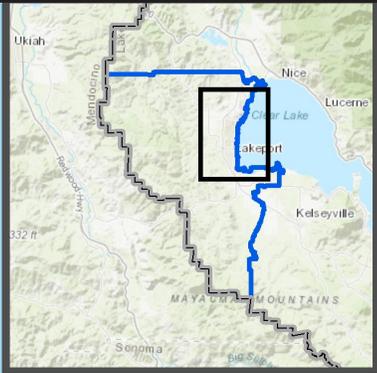
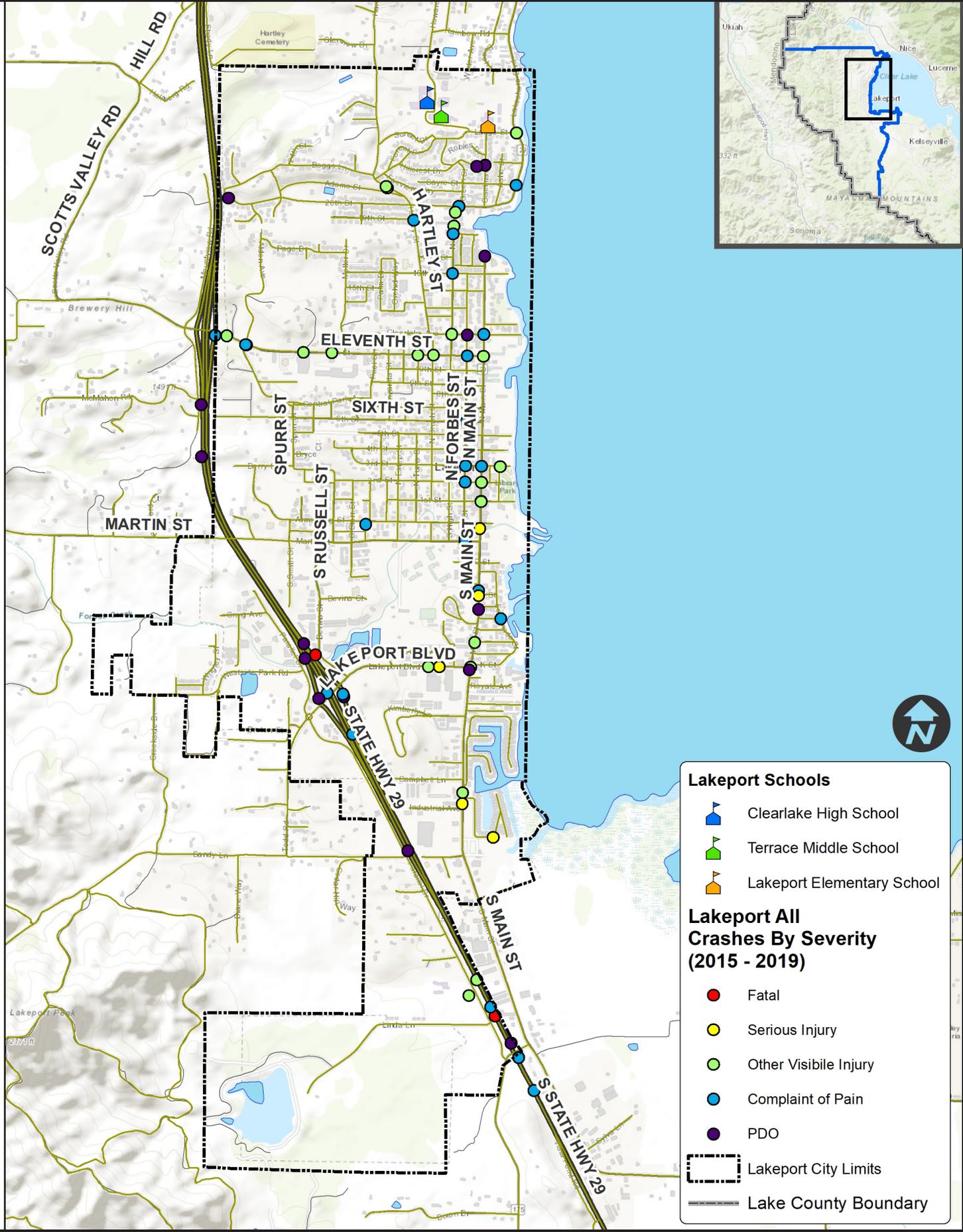


Figure 8. Crash Severity

A total of 187 crashes were recorded in Lakeport between 2015 and 2019. Of these, 10 crashes, or 5% resulted in a serious injury or fatality. The year 2015 had the lowest reported crashes, while 2016 had the highest. The year 2017 had the highest number of serious injury crashes. Two fatalities occurred, one in 2016 and one in 2018.

A map showing the location and type of all crashes is included in **Figure 9**, and **Figure 10** shows a heatmap of crashes in Lakeport.





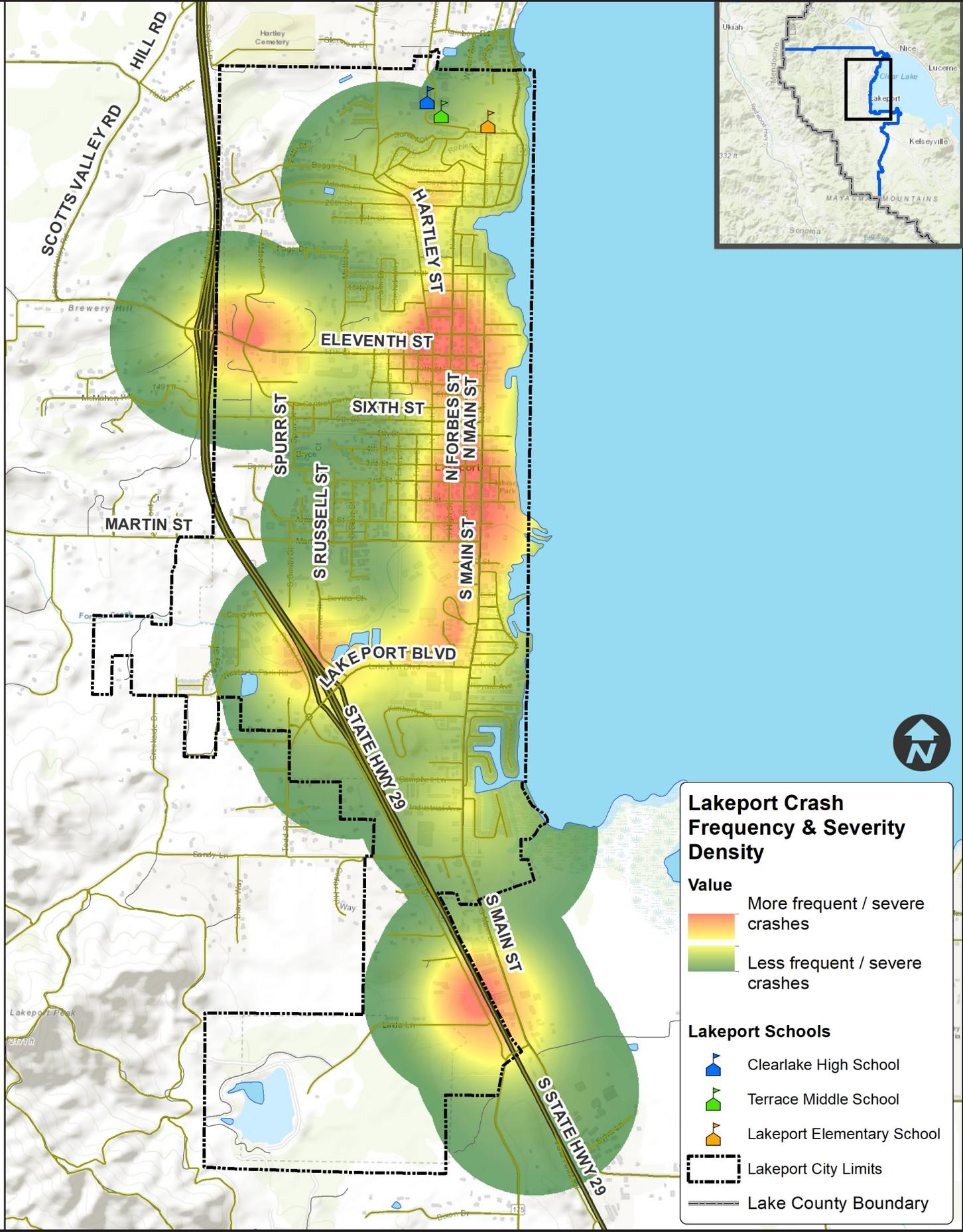
Lakeport Schools

-  Clearlake High School
-  Terrace Middle School
-  Lakeport Elementary School

Lakeport All Crashes By Severity (2015 - 2019)

-  Fatal
-  Serious Injury
-  Other Visible Injury
-  Complaint of Pain
-  PDO
-  Lakeport City Limits
-  Lake County Boundary





Lakeport Crash Frequency & Severity Density

Value

- More frequent / severe crashes
- Less frequent / severe crashes

Lakeport Schools

- Clearlake High School
- Terrace Middle School
- Lakeport Elementary School
- Lakeport City Limits
- Lake County Boundary



Figure 10

Crash Types

The overall crash types are presented in **Table 4** and identify systemic safety issues and trends.

Table 4. Crash Types

Crash Type	Total Crashes	Percent of All Crashes	Percent of Fatal & Serious Injury Crashes
Hit Object	48	25.7%	20.0%
Rear-End	39	20.9%	10.0%
Sideswipe	33	17.6%	0.0%
Broadside	30	16.0%	10.0%
Head-on	17	9.1%	20.0%
Other	11	5.9%	10.0%
Vehicle / Pedestrian	5	2.7%	20.0%
Overtaken	4	2.1%	10.0%
Total:	187	100%	100%

The most common crash types were hit object, rear-end, and sideswipe. The most common type of serious injury and fatal crashes were hit object, head-on, and vehicle/pedestrian.

Primary Collision Factor

Crash records typically include a ‘Primary Collision Factor’ (PCF) which can help to identify systemic and location specific crash trends. A PCF represents the leading factor that contributed to the crash. This data attribute helps identify major issues, but may overshadow secondary factors such as distracted driving, unsafe speeds, or lighting conditions. The top PCFs are shown in **Figure 11** for all crashes compared to the PFC for serious injury and fatal crashes only.



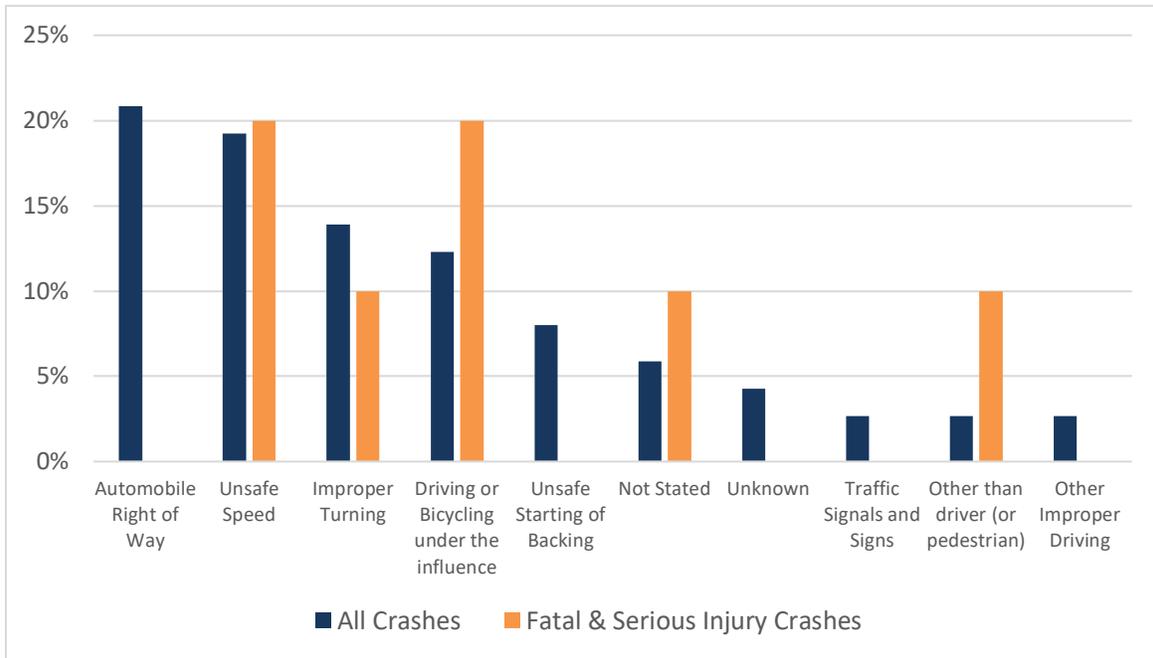


Figure 11. Primary Collision Factors

Automobile right-of-way, unsafe speed and improper turning were the most frequent PFCs among all crashes, while unsafe speed and impairment were the highest factors among serious injury and fatal crashes.

Age Ranges

The age ranges for the at-fault party can identify if a particular age group, typically young or elderly drivers, should be a specific focus area. The age ranges for all crash types, and serious injury and fatal crashes, is shown in **Figure 12**.

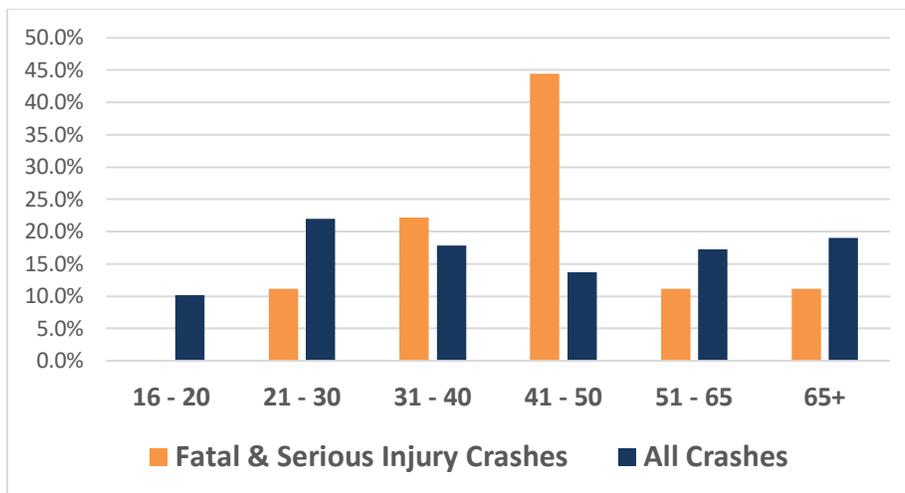


Figure 12. At-Fault Party Ages



The data shows a nearly even distribution across age ranges, except for a near majority of fatal and serious injury crashes occurring in the 41-50 age range. The data does not indicate that young or elderly drivers are significantly more likely to be in a serious collision.

Top Intersections

Top intersections with the highest number of crashes were identified using the best georeferenced data available. The intersections in Lakeport with the highest number of crashes are shown in **Table 5**:

Table 5. Top Crash Intersections

Intersection	Control	Total Crashes	Serious Injury and Fatal Crashes	Public Outreach Support
11 th St. / N Forbes St.	Unsignalized	6	0	2
Rt 29 / Rt 175	Signalized	3	0	0
11 th St. / Central Park	Unsignalized	3	0	0
Main St. / 1 st St.	Unsignalized	2	0	1
Forbes St. / 3 rd St.	Unsignalized	2	0	1
Forbes St. / Martin St.	Unsignalized	2	0	0
11 th St. / Tunis St.	Unsignalized	2	1	0
S. Main St. / E St.	Unsignalized	1	1	0

The intersection of 11th Street/ N Forbes Street had the most crashes and was identified as a safety concern by multiple survey respondents.

No fatal crashes occurred at intersections in the City of Lakeport between 2015 and 2019. Both fatal crashes which occurred in the City during this period were on State Route 29, outside of an intersection. Both serious injury intersection crashes identified in the Table above involved a motorcyclist with “Unsafe Speed” as the Primary Collision Factor.



Exhibit 4. N Forbes Street/ 11th Street

The crash types and PCFs for top total crashes at intersections are shown in **Figure 13 and 14**.



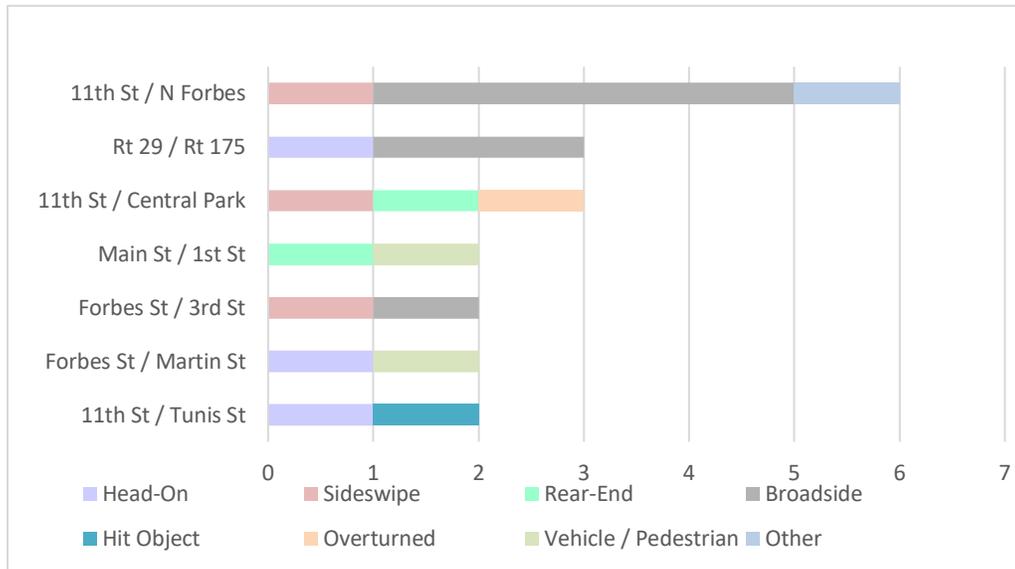


Figure 13. Top Crash Intersections Crash Types

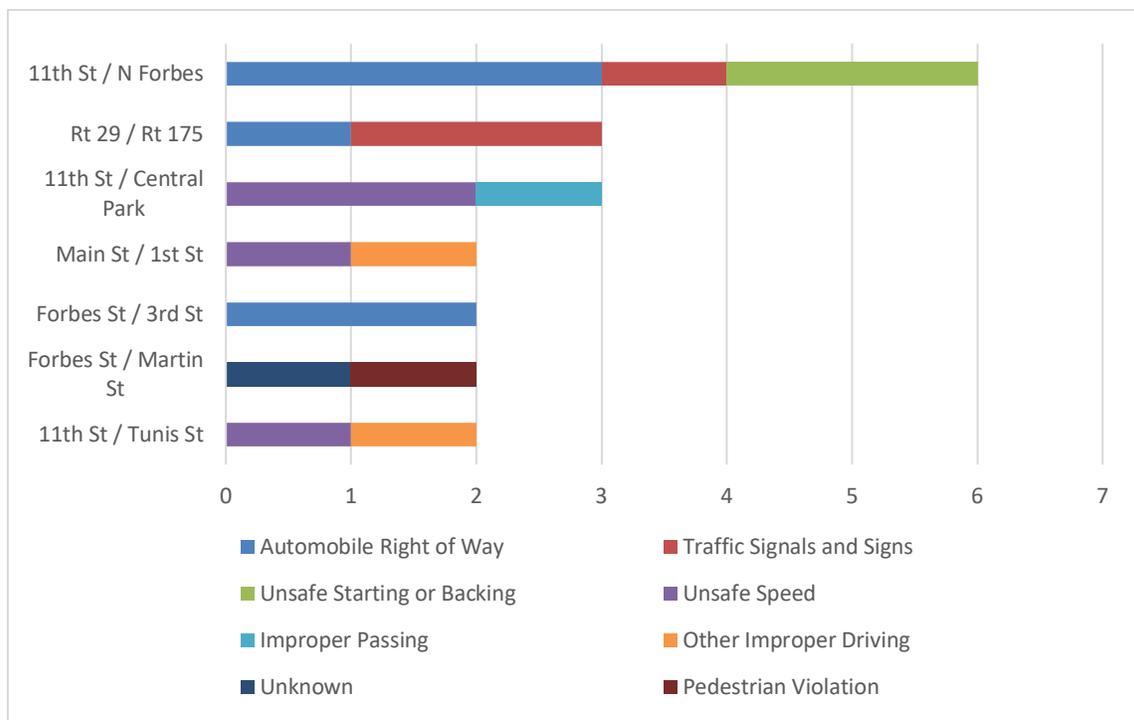
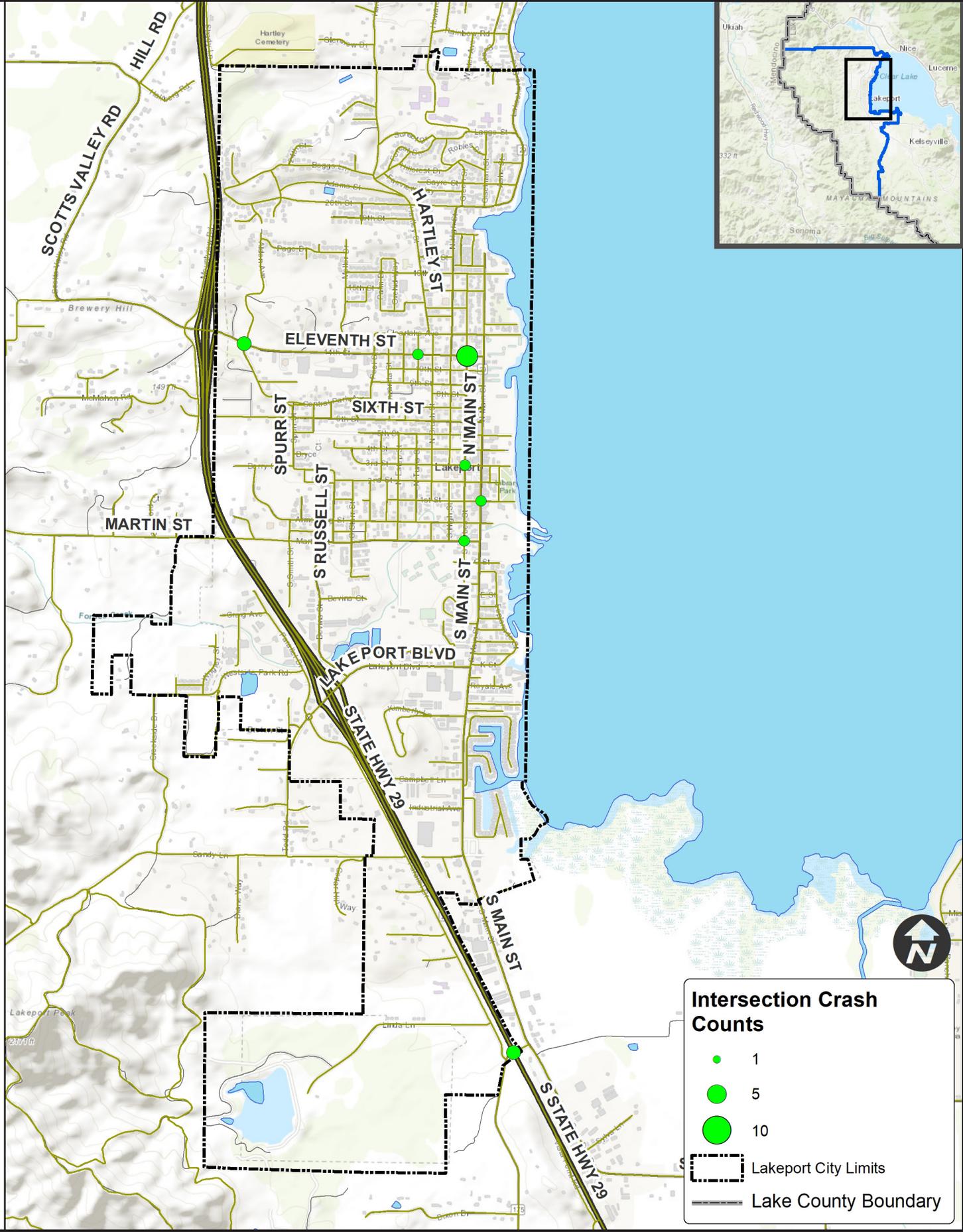


Figure 14. Top Crash Intersections Primary Factors

The top crash type at the highest intersection (11th Street/ N Forbes Street) is broadside and the top primary factor is automobile right-of-way. A map of top intersection crash locations counts is included in **Figure 15**.





Intersection Crash Counts

- 1
- 5
- 10

Lakeport City Limits
 Lake County Boundary

Figure 15

City of Lakeport - Local Road Safety Plan
Geolocated Intersection Crash Totals (2015 - 2019)

Top Roadway Segments

Figure 16 shows the top roadway segments for total crashes, including intersection and non-intersection crashes.

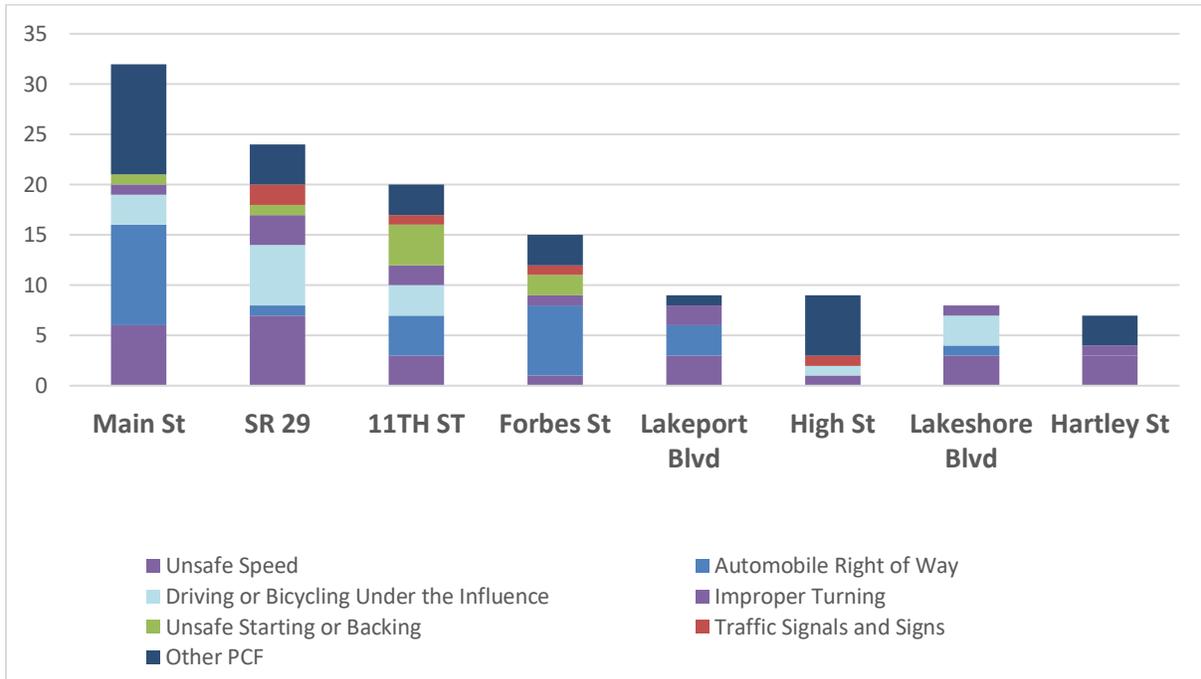


Figure 16. Top Total Crash Roadways (Intersection and Non-Intersection Crashes) and Crash Type

The top roadway segments are Main Street, SR 29, and 11th Street for total crashes, both intersection and non-intersection crashes included. The crash types on these top segments are hit object, rear-end, and broadside.

The roadway segments with the highest number of non-intersection crashes are shown in Table 6 on the following page.



Table 6. Top Non-Intersection Crash Roadway Segments

Roadway Segment	Segment Length (Miles)	Non-Intersection Crashes Per Mile	Crash Severity					Total Non-Intersection Crashes	Percent of All Non-Intersection Crashes
			Fatal	Serious Injury	Other Visible Injury	Complaint of Pain	PDO		
State Route 29	5.16	3.9	2	0	2	4	12	20	25%
Main St	2.06	4.9	0	3	1	1	5	10	13%
Hartley St	0.91	6.6	0	1	1	1	3	6	8%
Lakeshore Blvd	0.59	6.8	0	0	1	0	3	4	5%
Top Roadway Segments			2	4	5	6	23	40	51%
All Other Segments:			0	0	6	7	26	39	49%
Total:			2	4	11	13	49	79	100%

Based on the overall segment length and total number of non-intersection crashes on each roadway, the roadway with the highest number of non-intersection crashes per mile is Lakeshore Boulevard from North High Street to Beach Lane. This stretch of roadway is primary connection for the elementary, middle, and high schools in the City of Lakeport. With an average of 6.8 non-intersection crashes per mile over the past five years of data this stretch of roadway, Lakeshore Blvd had the highest crash frequency for non-intersection crashes across all roads in the City of Lakeport. Both fatal crashes occurred on SR 29 with “Head-On” and “Overturned” crash types. The Primary Collision Factor for both crashes was identified as ‘Driving Under the Influence’. Although there was a total of 20 crashes on SR 29 during this period, due to the long segment length, the total crashes per mile ranks below the top crash segments in the City. The calculated crash rate on the SR 29 segment was lower than statewide averages.



Exhibit 5. Lakeshore Boulevard

The primary crash factors and crash types for roadways with the highest number of non-intersection crashes are shown in **Tables 7 and 8**.



Table 7. Top Non-Intersection Crash Roadway Segments – Primary Collision Factor

Roadway Segment	Segment Length	Unsafe Speed	Driving Under the Influence	Improper Turning	Other Than Driver	Automobile Right of Way	Other PCFs	Total
State Route 29	5.16	7	6	3	3	0	1	20
Main St	2.06	2	1	1	0	2	4	10
Hartley St	0.91	3	0	1	1	0	1	6
Lakeshore Blvd	0.59	1	2	0	0	1	0	4
Total:		13	9	5	4	3	6	40

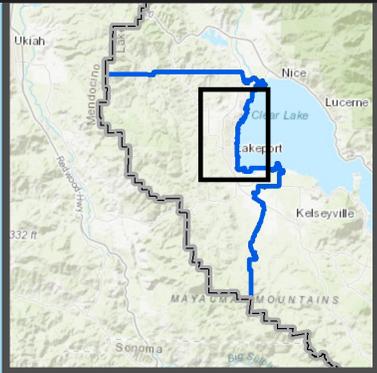
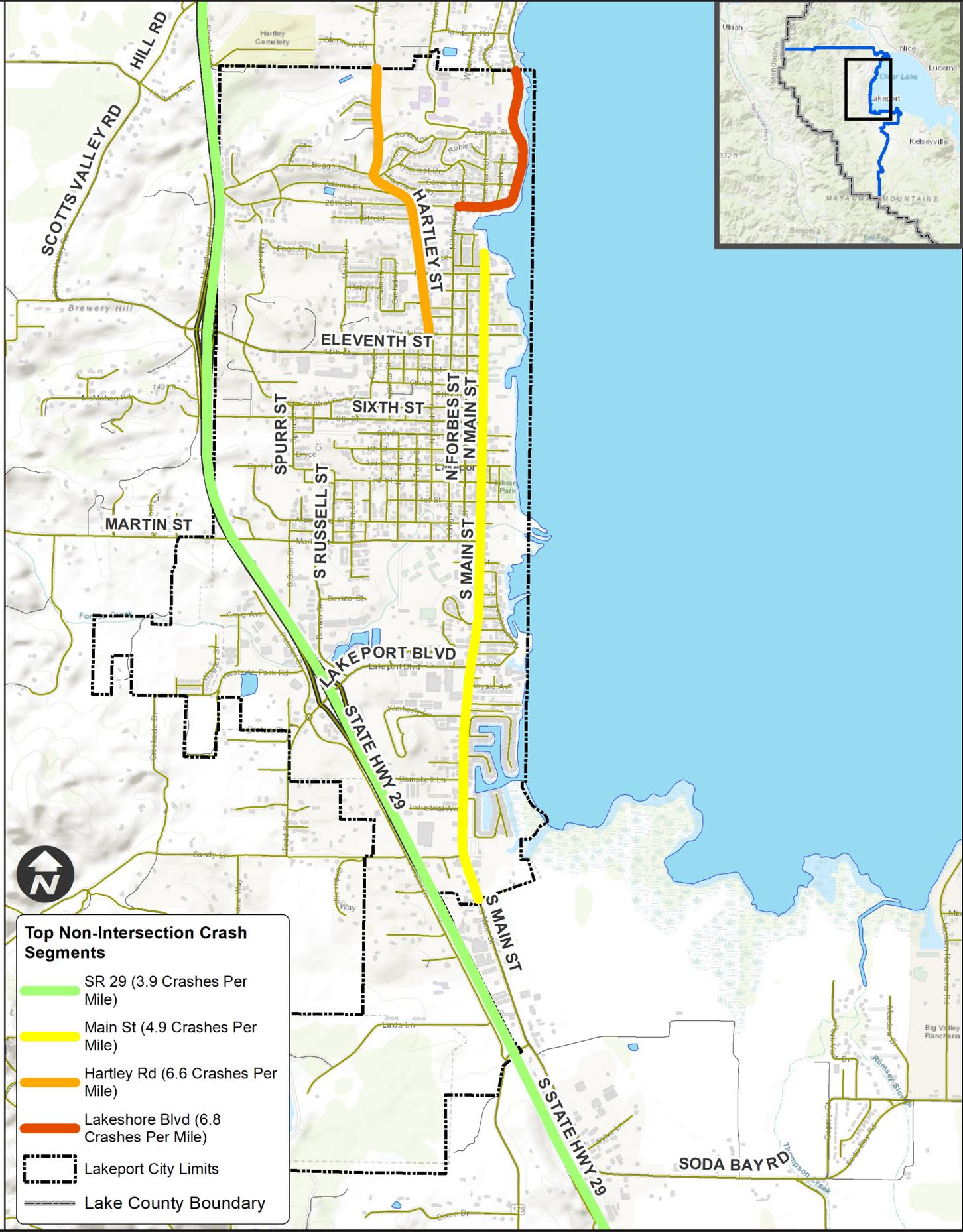
Table 8. Top Non-Intersection Crash Roadway Segments – Crash Type

Roadway Segment	Segment Length	Rear-End	Hit Object	Sideswipe	Broadside	Overtaken	Other	Other PCFs	Total:
State Route 29	5.16	9	5	2	0	1	2	1	20
Main St	2.06	3	1	1	4	0	0	1	10
Hartley Rd	0.91	1	4	1	0	0	0	0	6
Lakeshore Blvd	0.59	0	2	1	0	1	0	0	4
Total:		13	12	5	4	2	2	2	40

The crash types indicate that speeding and driving under the influence are leading crash factors and rear-end and hit object crash types were the most common on these four roadway segments.

A map of the highest crash segments is shown in **Figure 17**.





Crash Data Analysis by Focus Area

Focus areas established the priorities of the LRSP and typically relate to areas with the greatest opportunity for reducing fatal and serious injury crashes through safety strategies and countermeasures. The following focus areas represent opportunities to improve roadway safety across the City of Lakeport. Each focus area was identified and verified through a combination of crash data analysis, stakeholder engagement and public outreach. Crash data patterns and trends were analyzed for specific focus areas.

Intersection Safety

Intersection safety is a primary focus area for improving safety in Lakeport with 56% of crashes, and 40% of all fatal and serious injury crashes occurring at an intersection⁴, as shown in **Figure 18**.

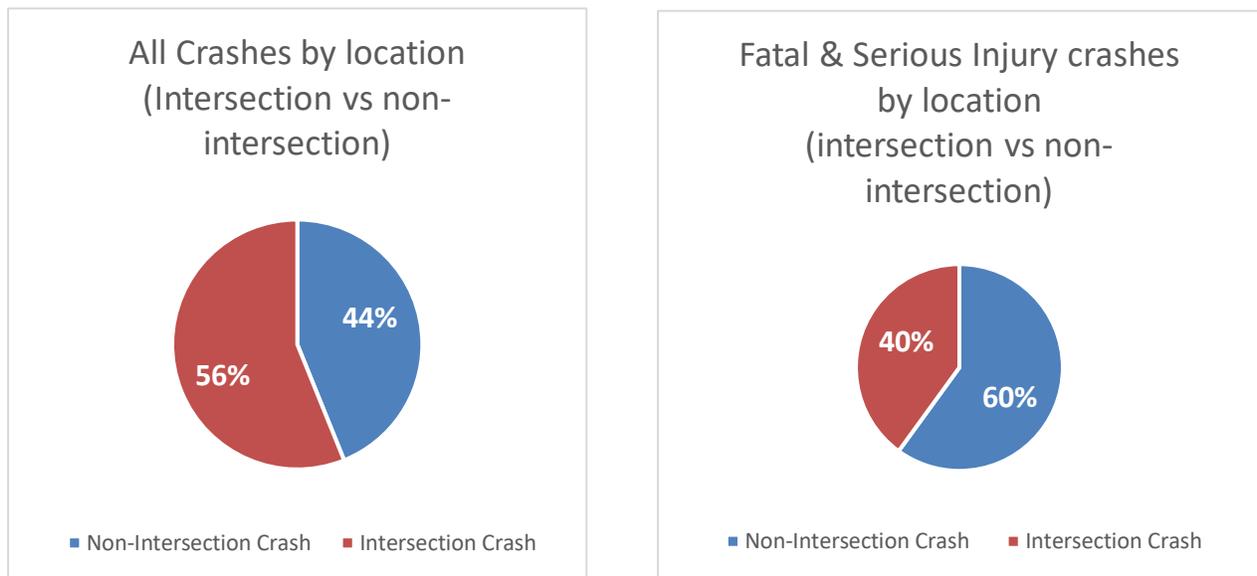


Figure 18. Intersection Crashes

Figure 19 shows the crash types at intersections by severity.

⁴ Determined by the responding police officer filing the crash data record.



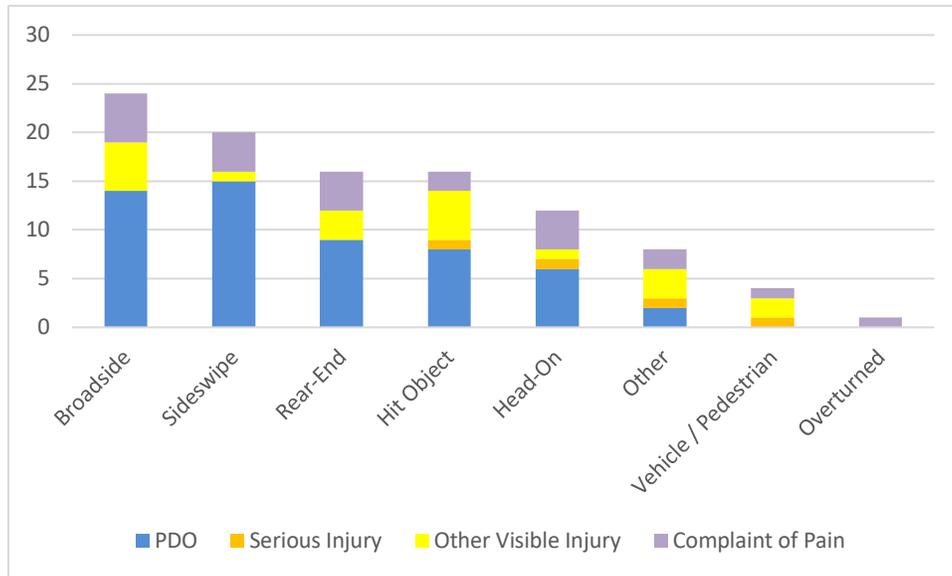


Figure 19. Intersection Crash Types by Severity

Broadside and sideswipe were the most common crash types at intersections while hit object, head-on, other and vehicle/ pedestrian crash types all had a serious injury. Most of the top crash intersections are unsignalized (stop-controlled).

Multiple intersections were identified specifically by survey respondents as having safety issues. These include:

- ▶ 11th St/ N. Forbes St
- ▶ 2nd St/ N. Forbes St
- ▶ Hartley St/ Boggs Ln
- ▶ Lakeport Blvd/ SR 29 Ramp (Northbound)
- ▶ Main St/ 1st St
- ▶ 11th St/ Mellor St

Lane Departures

Lane departures focuses on crash types associated with vehicles veering out the lane and can include head-on, sideswipe, hit object, and overturned type crashes, including when a vehicle runs off the road or crosses into the opposing lane prior to the crash. As shown in **Table 9**, this accounts for half of the total crashes, and half of the serious injury and fatal crashes.



Table 9. Lane Departure Crash Types

Crash Type	Total Crashes	Percent of All Crashes	Percent of Fatal & Serious Injury Crashes
Hit Object	48	25.7%	20.0%
Sideswipe	33	17.6%	0.0%
Head-on	17	9.1%	20.0%
Overturned	4	2.1%	10.0%
Total:	102	54.5%	50.0%

Crashes by severity typically associated with lane departures along roadway segments is shown in **Figure 20**.

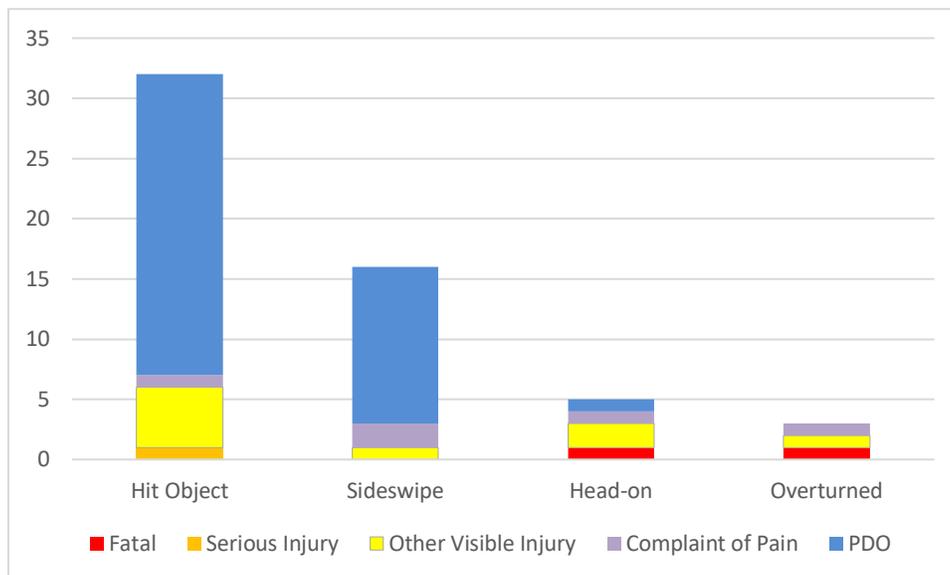


Figure 20. Lane Departure Crash Severities on Roadway Segments

Additionally, a deeper look into the crash data indicated that “ran off the road” was the movement preceding the crash in approximately 12% of all crashes, 22% of the serious injury and fatal crashes. At the highest crash segments, lane departure type crashes accounted for approximately 50% of all crashes. However, “lane departures” ranked as the lowest priority focus area in the survey and was the second lowest ranking focus area on interactive map comments.

Pedestrian Safety

Pedestrians are vulnerable roadway users and 20% of the serious injury and fatal crashes involved a pedestrian. **Figure 21** shows the pedestrian actions by severity.



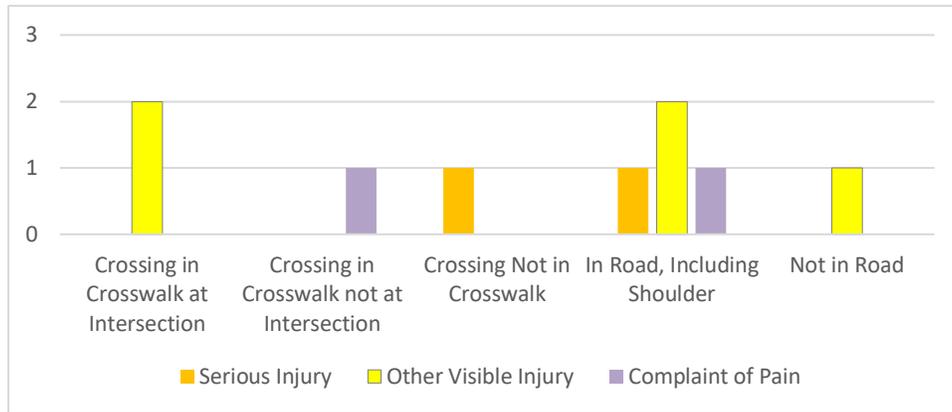


Figure 21. Pedestrian Actions

The pedestrian actions varied, but were most common in the roadway and not at an intersection. In addition, the Office of Traffic Safety (OTS) ranked the City of Lakeport in the top third of similar sized cities for crashes involving a pedestrian under the age of 15⁵. Pedestrian crashes are shown on a map in **Figure 22**.

Intersection safety was ranked as the fourth highest concern by the public. Survey respondents highlighted Lakeport Blvd as a pedestrian safety concern due to the lack of a continuous sidewalk along the corridor. Comments also focused on the need for increased lighting at crosswalks throughout the City of Lakeport with Main Street drawing a particular focus. Additionally, public comments also highlighted the desire for an improved pedestrian crossing across 11th Street at Mellor Drive.



Exhibit 6. Pedestrian Crosswalk on Main Street near Lakeport Boulevard

⁵ Source: 2017 and 2018 Office of Traffic Safety Crash Rankings - Caltrans <https://www.ots.ca.gov/media-and-research/crash-rankings-results/>





Lakeport Schools

- Clearlake High School
- Terrace Middle School
- Lakeport Elementary School

Lakeport - Pedestrian & Bicycle Crashes

- Ped - Serious Injury
- Ped - Other Visible Injury
- Bicycle - Complaint of Pain
- Lakeport City Limits
- Lake County Boundary



Figure 22

City of Lakeport - Local Road Safety Plan
Bicycle & Pedestrian Crashes (2015 - 2019)

Bicycle Safety

Bicyclists also represent vulnerable roadway users. Based on the crash data, only one bicycle crash occurred in the City of Lakeport during this time, shown on **Figure 22** above. It was located at the intersection of Clearlake Avenue/ North Main Street. It was a “complaint of pain” severity crash during normal weather and normal lighting conditions. This crash was recorded as an “other” crash type and the PCF was automobile right-of-way violation. Another data source, the OTS ranked the City of Lakeport in the top third of similar sized cities for crashes involving a bicyclist under the age 15 in the year 2017.

Bicycle safety was ranked sixth in the public survey. Public comments related to bicycle safety focused on lack of bicycle facilities generally throughout the City of Lakeport with a particular focus on Lakeshore Blvd. Additionally, poor roadway conditions were included in public comments as a safety concern for bicyclists.

Distracted Driving

Crash data typically does not show “distracted driving” as a PCF; however, many crashes are at least partially a result of distracted driving. Over the past decade, the number of potential distractions for drivers has increased dramatically from cellphone usage to on-board touch screen displays within vehicles. This is the most common type of distraction and has resulted in an increase in distracted driving across the nation. The newest crash records include an attribute for cellphone usage and this data attribute should be utilized to evaluate distracted driving in future versions of this LRSP.

Distracted driving was ranked as the highest priority focus area through the public survey, but received zero comments through the interactive map. This is because distracted driving is not location specific and may occur along any portion of the roadway.

Speeding

Speeding was a primary issue in the data analysis with unsafe speed as the highest PCF in serious injury and fatal crashes (tied with impairment), and the second highest PCF for all crashes. **Table 10** shows the detailed breakdown for crashes with Unsafe Speed as the PCF.



Table 10. Crash Severity by Crash Type for Crashes with Unsafe Speed as PCF

Crash Type	Crash Severity				Grand Total
	PDO	Severe Injury	Other Visible Injury	Complaint of Pain	
Rear-End	8	0	3	10	21
Hit Object	7	0	1	0	8
Head-On	1	1	0	1	3
Sideswipe	1	0	0	1	2
Overtaken	0	0	0	1	1
Other	0	1	0	0	1
Total:	17	2	4	13	36

As shown in **Table 10**, crashes involving speeding were more likely to result in rear-end type crashes. A map highlighting the location of crashes involving speeding as a PCF is included in **Figure 23**. The location of crashes which occurred outside of normal daylight conditions are highlighted in the map. Lighting was ranked as a low priority through the public survey and interactive map, however, there were a small number of comments relating to poor lighting at crosswalks.

Speeding ranked as the third highest ranking safety concern for survey respondents, below distracted driving and impaired driving. Additionally, speeding was the second most identified safety issue in Question 5 of the public survey. Specific roadways identified as having speeding concerns focused on Main Street, 11th Street, 16th Street, Bevins Street, and Forbes Street.

Impaired Driving

Impairment, or driving/bicycling under the influence, was tied with unsafe speed as the highest PCF in serious injury and fatal crashes and was the fourth highest collision factor in all crashes. **Table 11** shows the age ranges associated with impaired driving crashes.

Table 11. Age Ranges for Impairment Crashes

Age Range	Total Crashes - Alcohol/Drug Impairment
<20	5
21-30	5
31-40	7
41-50	4
51-64	3
65+	2



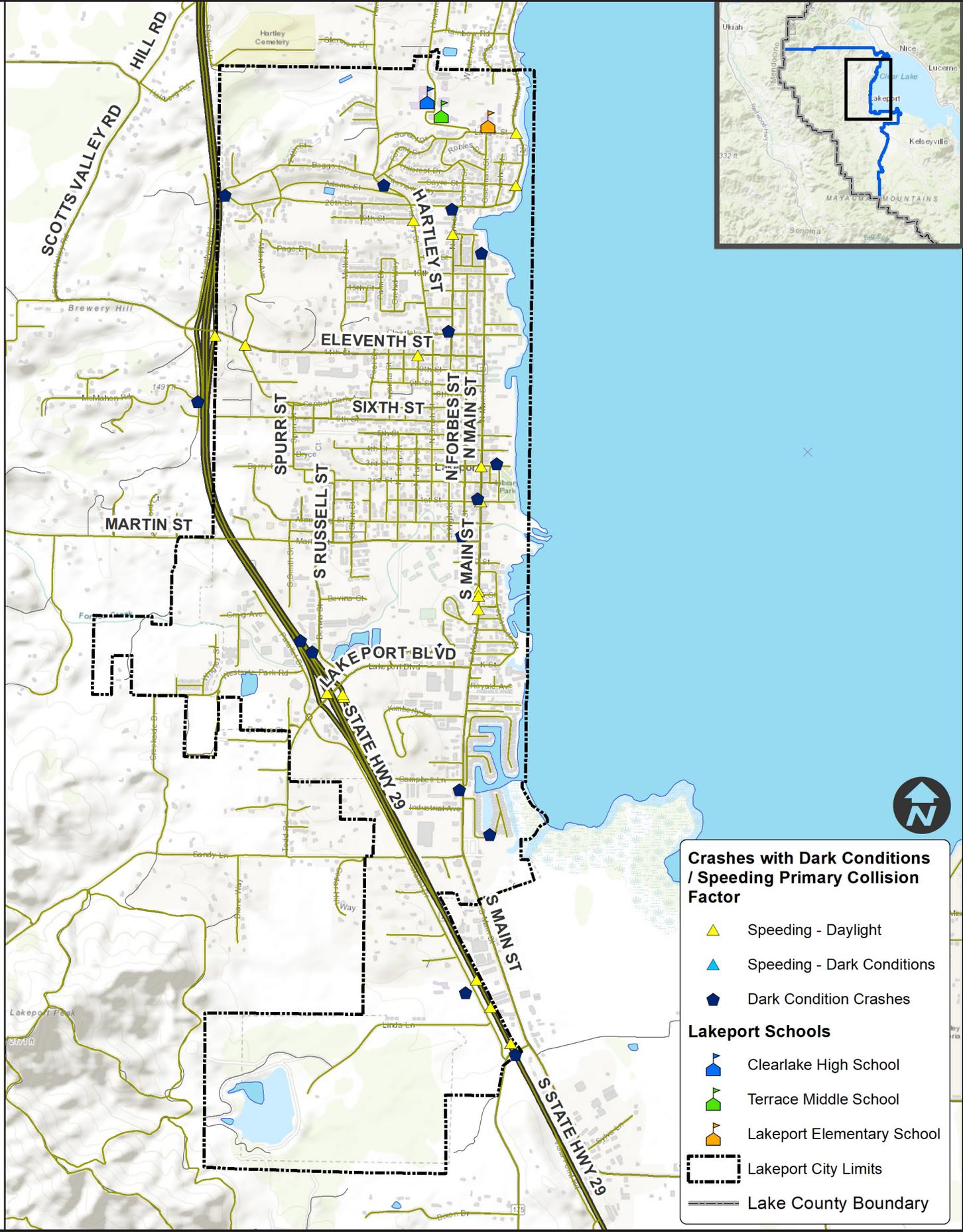


Figure 23

Figure 24 shows the crash types associated with impaired driving accidents. Hit object and rear-end were the most common types.

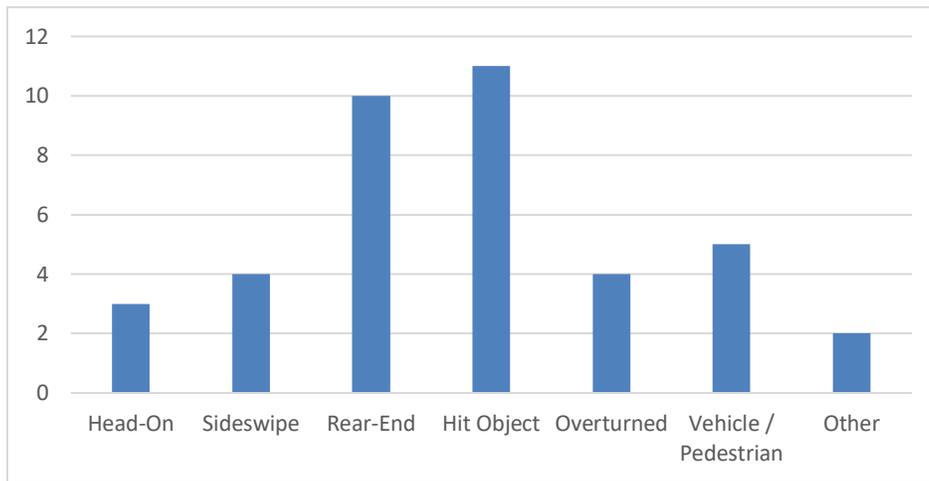


Figure 24. Crash Types Involving Impairment

Impaired drivers were identified as the second highest priority focus area through the public survey and no locations were identified through the interactive map.

Roadway/Intersection Lighting

As shown in **Figure 25**, 26% of all crashes and 30% of serious injury and fatal crashes occur during non-daylight hours.

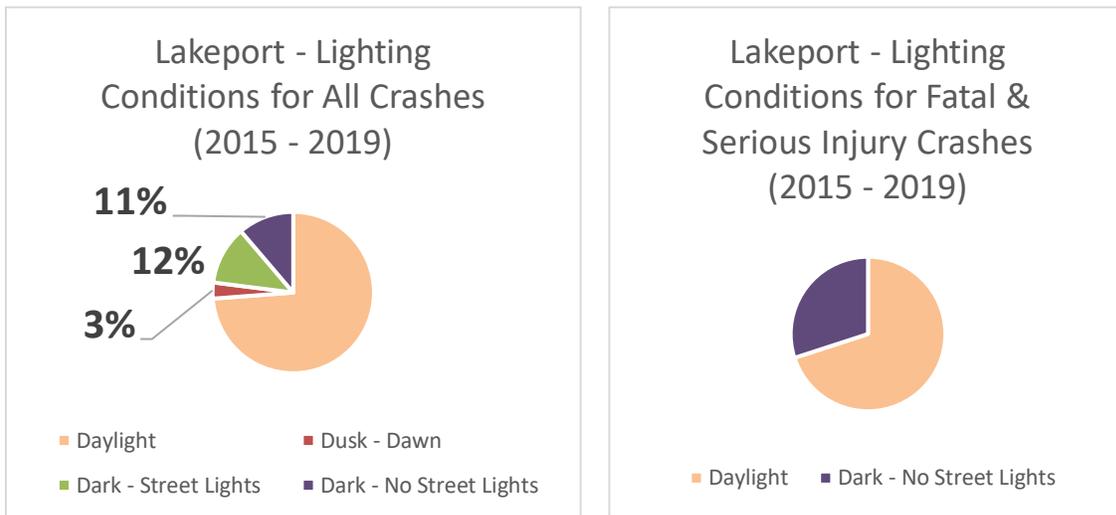


Figure 25. Lighting Conditions



Motorcycle Safety

Motorcycle safety was added as a focus area after the public outreach phase. Motorcycles are involved in 40% of fatal and serious injury crashes, and both serious injury intersection crashes involved a motorcyclist with “Unsafe Speed” as the PCF.

Key Takeaways from the Data Analysis and Public Outreach

- ✓ The public is most concerned with poor roadway conditions, impaired drivers, distracted driving, and speeding.
- ✓ Engineering countermeasures will primarily focus on systemic safety measures at intersections and along roadway segments with high number of crashes and will build upon other planned projects.
- ✓ Main Street, 11th Street, Forbes Street, Hartley Street, and Lakeshore Boulevard were identified through both the public outreach and data analysis efforts as having the highest priority safety issues and greatest potential to increase safety.
- ✓ Enforcement and education initiatives will be recommended to reduce crashes due to distracted, impaired driving, and motorcycle safety.

Figure 26 provides a graphical summary of the data analysis and outreach efforts.



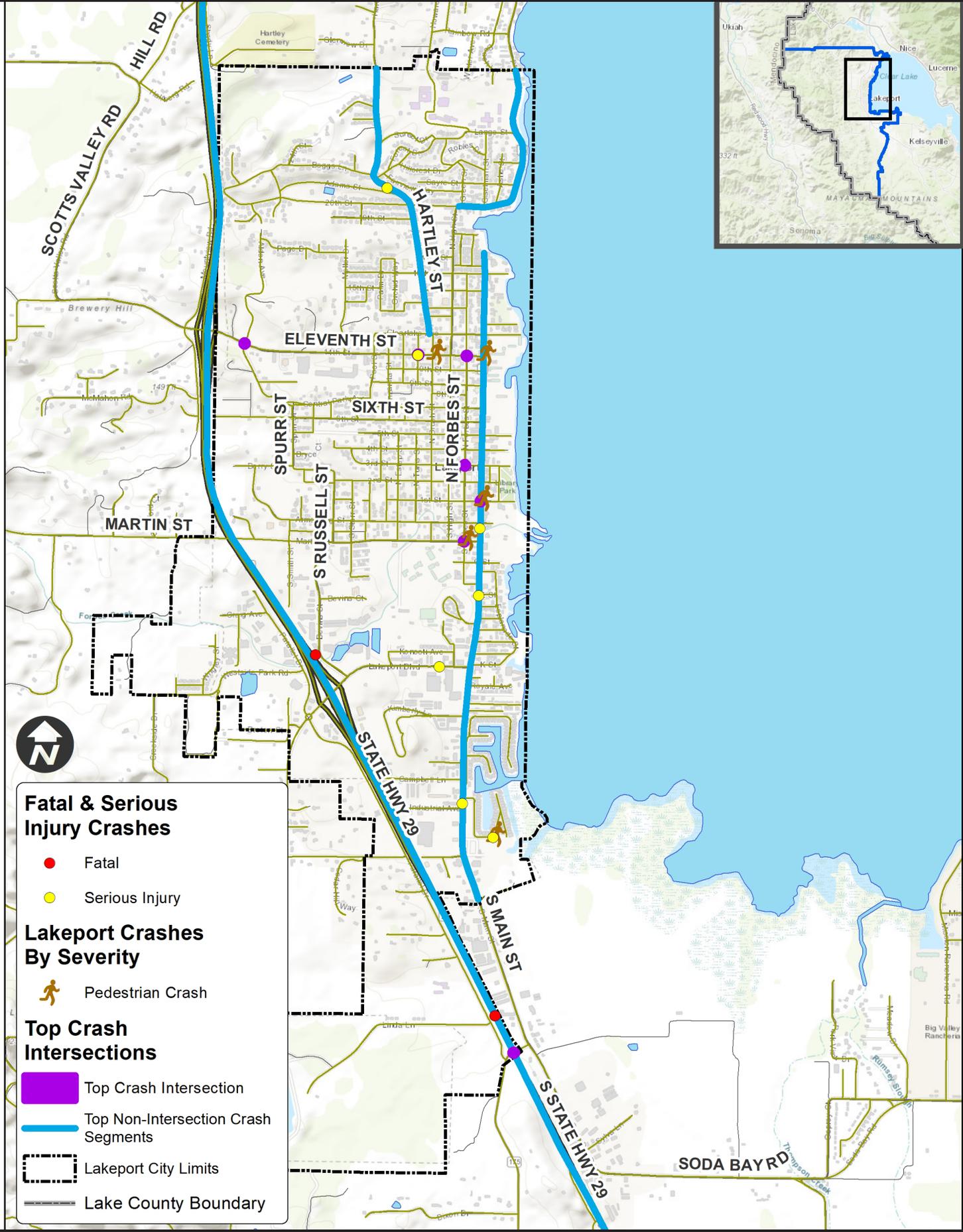


Figure 26

Countermeasures

Countermeasures are an action or device designed to negate or offset another⁶. Potential actions, or countermeasures, addressing each Focus Area were compiled into Strategy Tables highlighting the overarching strategy and responsible parties. A separate strategy table was developed for each focus area identifying the key information such as the objectives, success indicators, plan for implementation, and potential funding sources.



Source: FWHA

The Four E's of Traffic Safety

Developing a program of countermeasures and strategies across the four E's of safety planning (Engineering, Education, Enforcement, and Emergency Services) is critical to ensure that the complex issue of local road safety is being addressed in a holistic manner. Countermeasures were developed across the 4 E's specifically selected to address the focus areas in the City of Lakeport. Emerging Technologies, considered a 5th "E", were also explored.

Strategy Tables

Addressing focus areas can involve the implementation of numerous simultaneous strategies across the four E's by a variety of stakeholders including City departments and community partners. The Lakeport *Focus Area Strategy Tables* were developed to clearly define planning level strategies, responsible parties, completion goals, and performance measures for all recommendations.

Focus Area Strategy Tables include categories for:

- ▶ *Engineering* projects and countermeasures to be applied systemically or at spot locations
- ▶ *Education* programs designed to address driver behaviors
- ▶ *Enforcement* initiatives to increase visibility and curb unwanted driver behavior
- ▶ *Emergency Services* projects to increase response times



Not all categories had recommendations for each focus area. Emerging Technologies of traffic safety is future focused and intended to promote the incorporation of advanced technologies in roadway infrastructure to improve safety. The significant cost of stand-alone emerging technology components typically associated with "Smart-City" installations such as a robust 5G network and *smart* infrastructure sensors significantly limits their practical application within many smaller communities. Small communities can continue to support emerging

⁶ <https://www.merriam-webster.com/dictionary/countermeasure>



technologies without significant capital expenditures by making small enhancements to the network. By maintaining high quality lane markings, the City of Lakeport will help to facilitate autonomous vehicles and driver safety features such as “lane departure assist” systems in modern vehicles.

The Strategy Tables include:

- ▶ Strategic Linkage
- ▶ Objectives and Success Indicators
- ▶ Actions and Target Outputs
- ▶ Responsible Parties
- ▶ Date of completion (short, medium, or long-term)
- ▶ Monitoring and Evaluation Parameters
- ▶ Potential Funding Opportunities

These Strategy Tables are created to foster collaboration and generate buy-in from stakeholders. A summary of the Strategy Tables is presented in **Tables 12-19**, following the order of priority identified in the public outreach. The full tables are in **Appendix D**.



Table 12. Distracted Driving Focus Area Strategy Table

Distracted Driving			
	Actions	Target Output	Potential Funding Opportunities
Education	Distracted Driving Public Outreach Campaign	Local distracted driving messaging campaign using a variety of media outlets	NHTSA 402, NHTSA 405(e)
Enforcement	High-Visibility Cell Phone/Text Messaging Enforcement Campaign	Conduct high visibility enforcement program, contingent on staff resources, to provide citations as needed. <i>May be combined with High Visibility Enforcement programs from other Focus Areas.</i>	CTFGP, NHTSA 402, NHTSA 405(e)
Engineering	Engineering projects for Pedestrian/Bicycle Safety, Intersection Safety, and Lane Departures will contribute to improvements to Distracted Driving		

Table 13. Impaired Driving Focus Area Strategy Table

Impaired Driving			
	Actions	Target Output	Potential Funding Opportunities
Education	Drunk & Impaired Driving Awareness Campaign	Reduced number of alcohol-involved serious injuries and fatalities	NHTSA 402, NHTSA 405(e)
Enforcement	Passive Alcohol Sensors (PAS)	Equip officers with Passive Alcohol Sensors to increase efficiency of Alcohol Checkpoints and normal traffic stops	NHTSA 402, NHTSA 405(e)
	Publicized Sobriety Checkpoints	Highly publicized sobriety checkpoints conducted regularly to increase perceived risk of arrest for impaired driving	CTFGP, NHTSA 402, NHTSA 405(d)
	High-Visibility Saturation Patrols	Focused patrols around specific areas where impaired-driving crashes are common as part of an on-going saturation program	CTFGP, NHTSA 402, NHTSA 405(d)



Table 14. Speeding Focus Area Strategy Table

Speeding			
	Actions	Target Output	Potential Funding Opportunities
Education	Speed Kills Campaign	Conduct public outreach campaign about the importance of driving the speed limit and the impact just 5 mph can have on the severity of a crash	NHTSA 402, NHTSA 405(e)
Enforcement	Targeted Speed Enforcement Program	Reduced speeding issues along select corridors through regular and targeted enforcement patrols	NHTSA 402, NHTSA 405(e)
Engineering	Systemic Speeding Management Project	Dynamic Speed Signs and/or portable trailers to inform motorist of speeding. See details in Appendix E.	HSIP, NHTSA 402

Table 15. Intersection Safety Focus Area Strategy Table

Intersection Safety			
	Actions	Target Output	Potential Funding Opportunities
Engineering	Site Specific Project- 11th St/Forbes St	Safety Improvements implemented at selected locations throughout the City. See additional in Appendix E.	HSIP
	Site Specific Project - Rt 29/ Rt 175		
	Systemic Unsignalized Intersections Project 1 (Intersection Improvements)		
	Systemic Unsignalized Intersections Project 2 (Intersection Improvements)		
EMS	Evaluate emergency vehicle detection along priority emergency routes	Increase emergency vehicle detection and response times along priority routes	HSIP*, Other *If Emergency Vehicle involved crashes have occurred at the project location. If not, other funding necessary.



Table 16. Pedestrian and Bicycle Safety Focus Area Strategy Table

Pedestrian & Bicycle Safety			
	Actions	Target Output	Potential Funding Opportunities
Education	Safe Routes to School	Safe Routes to School plan created for local elementary and middle school with identified projects and recommended improvements.	ATP
	Bike Safety Education for Children	Bike safety instruction for Lakeport children through school or City program.	ATP, NHTSA 402
	Active Lighting/ Conspicuity Enhancement	Make pedestrians & bicyclists in the City of Lakeport more visible at night to avoid collisions by providing free lighting equipment and retroreflective clothing.	NHTSA 402 NHTSA 405(h)
	Share the Road & Pedestrian Safety Awareness Messaging	Increase driver awareness of pedestrian & bicyclist rights and needs on the roadway	NHTSA 402
Enforcement	Pedestrian Crosswalk Sting Program	Conduct intermittent crosswalk sting operation in high pedestrian areas (Main Street, Forbes St, etc.) to increase driver awareness of pedestrian safety.	CTFGP, NHTSA 402, NHTSA 405(e)
Engineering	Systemic Pedestrian Crosswalk project at Unsignalized Intersections	Pedestrian crosswalks implemented at select locations. See details in Appendix E.	HSIP, ATP
	Systemic Sidewalk Project	Sidewalks constructed in various locations throughout the City. See details in Appendix E.	HSIP, ATP



Table 17. Lighting Focus Area Strategy Table

Roadway & Intersection Lighting			
	Actions	Target Output	Potential Funding Opportunities
Engineering	Perform lighting analysis at select locations, starting with those with nighttime crashes, or suspected to have poor lighting.	Identify list of locations, potential HSIP project	<i>Public Works Operational Funding</i>

Table 18. Lane Departures Focus Area Strategy Table

Lane Departures			
	Actions	Target Output	Potential Funding Opportunities
Engineering	Site Specific - Systemic Clear Recovery Zone	Remove obstacles in the clear zone at select locations. See details in Appendix E.	HSIP, CMAQ
	Site Specific - 11th St Corridor	Roadway improvements to augment intersection projects. See details in Appendix E.	
	Site Specific - Main Street Access Management	Access Management and other improvements. See details in Appendix E.	
	Site Specific - Lakeshore Boulevard	Curve warning safety Improvements. See details in Appendix E.	

Table 19. Motorcycle Safety Focus Area Strategy Table

Motorcycle Safety			
	Actions	Target Output	Potential Funding Opportunities
Education	Motorcycle Safety awareness messaging	Increased driver awareness of motorcyclists & reduction in motorcyclist involved crashes.	NHTSA 402, NHTSA 405(e)



Engineering Countermeasures

Engineering countermeasures can be applied at site-specific locations or systemically. HSIP countermeasures are provided in the *Local Roadway Safety: A Manual for California's Local Road Owners (April 2020)* and as part of the *HSIP Analyzer Manual for BCR Applications*. A table of the countermeasures is included in **Appendix F**. The table shows the countermeasure name, type, applicable crash type(s), crash reduction factors (CRFs), federal funding eligibility, and opportunity for systemic implementation, divided into three groups - signalized intersections, non-signalized intersections, and roadway segments. This data was used as a guide to develop improvements that will provide potential for funding opportunity. The table is not an exhaustive list of safety improvements; other non-HSIP eligible improvements are also considered and recommended as applicable.

Systemic Applications

Systemic countermeasures were applied to multiple locations based on crash data and similar geometric features. This approach can also be used proactively to apply countermeasures at locations without a significant crash history, but high-risk factors. The HSIP countermeasure table in **Appendix F** indicates if the countermeasure is a "Low" to "Very High" opportunity for systemic implementation. Systemic improvements may be incorporated into regular maintenance activities as budgets allow or achieved through HSIP grant funds.

Site Specific Applications

Projects were also developed for high crash frequency site-specific locations if the risk factors and recommended improvements did not fit into a systemic application.

Other Considerations

Emergency response and evacuation were also considered in the countermeasure selection process. Countermeasures were recommended that would facilitate or not hinder emergency vehicles or an evacuation on key routes.

Potential Engineering Projects

Engineering Countermeasure Projects

Engineering countermeasures were developed through a methodical process. The top locations (roadways and intersections) for crashes or public comments were reviewed to determine the risk factors.

Risk factors identify common roadway or intersection characteristics which may contribute to past crashes or increase the risk of future crashes. *The Federal Highway Administration (FHWA) Systemic Safety Project Selection*



*Tool*⁷ includes a list of common risk factors for intersections and roadway segments. Site evaluations were conducted to identify specific risk factors in the roadway network that may be contributing to crash trends noted in the data analysis.

Based on the crash data and risk factors, projects were identified as site specific, or systemic if multiple locations exhibited similar features. Projects were assessed at a high-level for the potential for HSIP funding based on the number and severity of crashes, the selected countermeasures, and initial costs estimate. The annual societal costs from the *FHWA BCA Systemic Project Selection Tool*⁸ were utilized to quantify crash costs and potential safety benefits.

Projects Overview

Table 20 and **Figure 27** provides an overview of the potential engineering projects and locations. Project descriptions are included in **Appendix E**.

Potential Risk Factors

Roadway and Intersection Features

- Number of lanes
- Lane width
- Shoulder surface width and type
- Median width and type
- Horizontal curvature, superelevation, delineation,
- Horizontal curve density

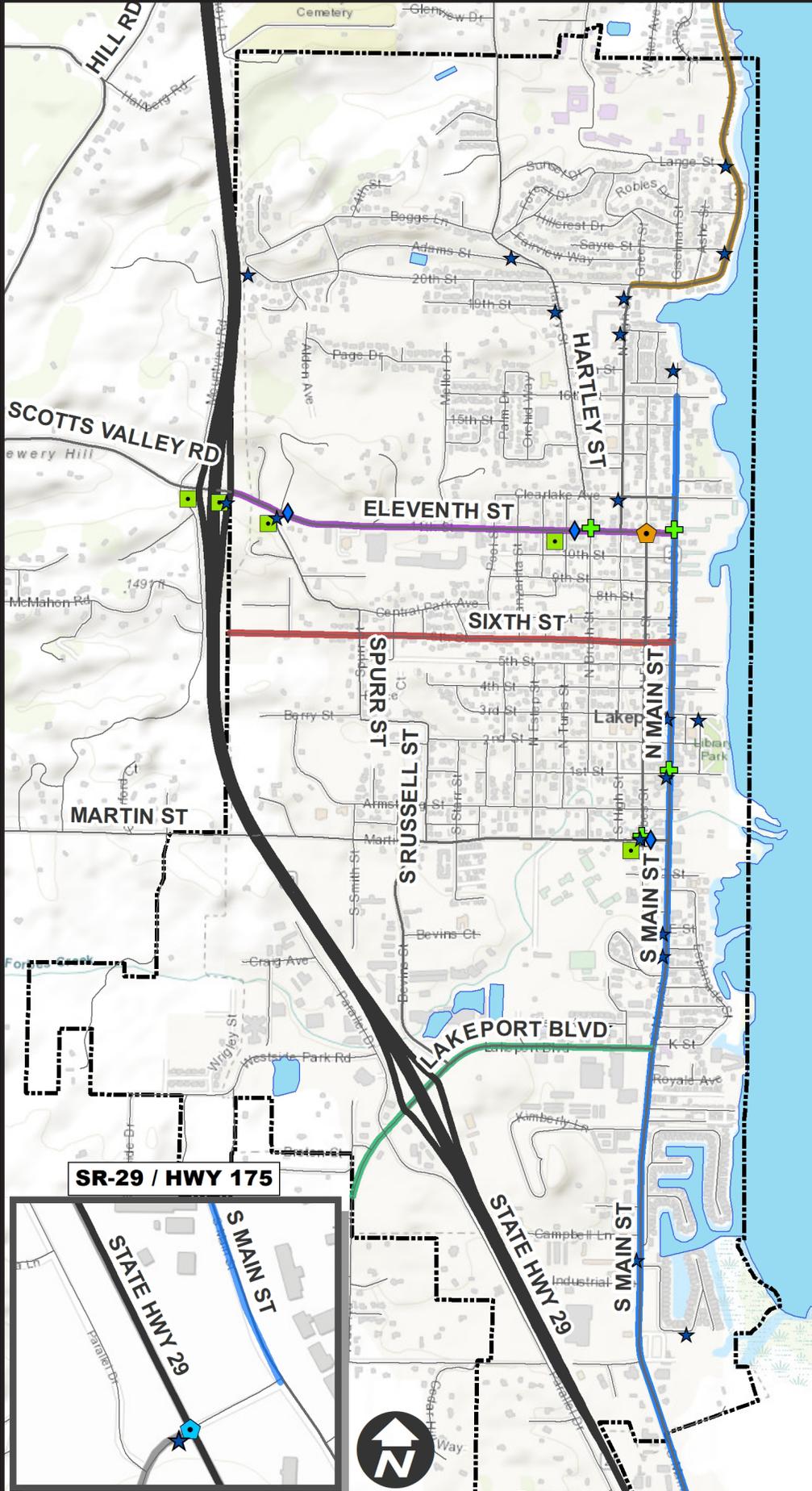
Exhibit 7. Subset of Roadway and Intersection Risk Factors

Source: FHWA Systemic Safety Project Selection Tool

⁷ Source: <https://safety.fhwa.dot.gov/systemic/fhwasa13019/element1.cfm#el12>

⁸ Source: <https://safety.fhwa.dot.gov/hsip/planning.cfm>





Potential Engineering Projects

Intersections

- 1 - Site Specific, 11th St / Forbes St
- 2 - Site Specific, Rt 29 / Rt 175
- 3 - Systemic Unsignalized Intersections 1
- 4 - Systemic Unsignalized Intersections 2
- 5 - Systemic Pedestrian Crosswalk at Unsignalized Intersections
- 11 - Lighting Study

Corridors

- 11th Street
 - 6 - Systemic Sidewalk
 - 7 - Systemic Clear Recovery Zone
 - 9 - Site Specific
 - 12 - Systemic Speed 1
- Lakeshore Blvd
 - 6 - Systemic Sidewalk
 - 7 - Systemic Clear Recovery Zone
 - 8 - Site Specific
 - 12 - Systemic Speed 1
- Main Street
 - 7 - Systemic Clear Recovery Zone
 - 10 - Site Specific
 - 12 - Systemic Speed 1
- Lakeport Blvd
 - 12 - Systemic Speed 1
- 6th Street
 - 6 - Systemic Sidewalk
- Lakeport City Limits
- Lake County Boundary

Table 20. Potential Engineering Projects

ID #	Focus Area	Potential Project	Potential Location(s)
1*	Intersection Safety	Site Specific	11th St./ Forbes - Unsignalized Intersection
2	Intersection Safety	Site Specific	Rt 29/ Rt 175 - Signalized Intersection
3	Intersection Safety	Systemic Unsignalized Intersections 1	11 th St./ Central Park
			11th St./ Tunis
			Forbes St./ Martin St.
			11th/ Rt 29
			N. Forbes St./ 3rd St.
			S. Main St./ E St.
			S. Main St./ Lakeport Blvd.
4	Intersection Safety	Systemic Unsignalized Intersections 2	11 th St./ Central Park
			11th St./ Tunis
			Forbes St./ Martin St.
5	Pedestrian Safety	Systemic Pedestrian Crosswalk at Unsignalized Intersections	Forbes St./ Martin St.
			11th/ Brush
			11th/ Main
			Main/ 1st
			Clearlake/ N. Main St
6	Pedestrian Safety	Systemic Sidewalk	11th St. Corridor
			6th Street
			Lakeshore Blvd
7	Lane Departures	Systemic Clear Recovery Zone	11th St. Corridor
			Lakeshore Blvd
			Main St.
8	Lane Departures	Site Specific	Lakeshore Blvd
9	Lane Departures	Site Specific	11th St. Corridor
10	Lane Departures/ Distracted Driving/ Intersection Safety	Site Specific	Main St.
11	Lighting	Systemic Lighting Study	Multiple, See Figure 27
12	Speeding	Systemic Speed 1	Lakeshore Blvd
			11th St.
			Main St.
			Lakeport
13	Speeding	Systemic Speed 2	Various

*May be combined into systemic Unsignalized Intersection Project



Selected Projects

Methodology

Two projects were selected from the list of thirteen “Potential Engineering Projects” (**Table 20**) for further detail including conceptual layouts, cost estimates, and Benefit-Cost calculations. This supplemental data can be used in preparing an HSIP or other grant application. Additional or different locations and/or countermeasures may be substituted.

The projects, site locations and countermeasures were selected and refined in coordination with the City considering:

- ▶ Possibility of reducing crashes
- ▶ BCR and HSIP Potential
- ▶ Public outreach
- ▶ Fit with community goals or other planned projects
- ▶ Considering recently or soon-to-be constructed projects

The HSIP Analyzer Manual (in **Appendix F**) provides guidance, with exceptions, indicating:

- ▶ One application may include one or multiple locations
- ▶ All the locations in the application must be of the same type: Signalized Intersections (S), Non-Signalized Intersections (NS), or Roadways (R)
- ▶ All the locations in the application must receive the same proposed safety improvements, i.e. all the safety countermeasures (CMs) must be applied to all the locations. Up to three (3) safety countermeasures may be used in calculating the benefit of the project. The guidance provides an exception if a few locations are different.
- ▶ Project costs should be between \$100,000 - \$10,000,000

The projects selected were:

- ▶ **Intersection Safety – Systemic Unsignalized Intersections**
- ▶ **Pedestrian Safety – Systemic Pedestrian Crosswalk at Unsignalized Intersections**

For each project, layouts were prepared showing potential countermeasures selected to reduce crashes and estimated costs. The BCR calculations were performed using the FHWA “Highway Safety Benefit-Cost Analysis Model” spreadsheet. This spreadsheet estimates the BCR considering:

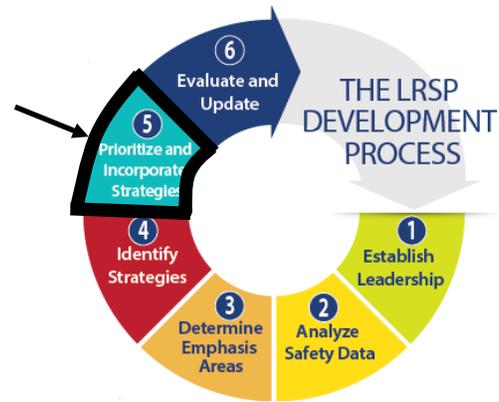
- ▶ The existing average annual crashes at the combined site by severity, derived from the existing crash data.
- ▶ Estimated project costs including engineering, construction, and maintenance
- ▶ The life of the countermeasures and the crash reduction factors, both derived the HSIP analyzer data in **Appendix F**.
- ▶ Other parameters were the defaults built into the spreadsheet.

The project layouts and analysis reports from the BCR spreadsheet are in **Appendix G**.



Implementation Plan

This plan was developed as a guide to facilitate the implementation of the countermeasures and strategies identified under each area. This implementation plan focuses on addressing the high priority or “low-hanging fruit” safety issues first. The plan also focuses on identifying systemic safety improvements to be incorporated into on-going maintenance and safety programs as well as future grant applications. The following sections summarize the plan, highlight key considerations, and identify the next steps. Additional detail for each countermeasure including tentative date of completion, performance measures, and responsible parties, are provided in the *Focus Area Strategy Tables*.



Source: FHWA

Key Steps for Successful LRSP Implementation

In July 2020, the FHWA released guidance (*Implementing a Local Road Safety Plan*) based on best practices and lessons learned by agencies around the country for implementing LRSPs. This guidance identified six key steps:

- 1. Maintain Buy-In and Support:** Maintaining and expanding the stakeholder and public support fostered during the development of this LRSP will require on-going communication and coordination through educational materials, news releases, and meetings. Implementation of many non-engineering countermeasures will require partnerships with stakeholders to achieve a successful outcome. The City should identify the specific outreach methods and level of detail that is achievable for continued communications with stakeholders, the general public, and decision makers. Education and Enforcement strategies are often best implemented following buy-in from community partners and stakeholders. It will be critical to work closely with stakeholders and community partners in order to ensure that resources and efforts are shared whenever possible.
- 2. Identify funding mechanisms:** LRSPs are required for future HSIP funding, however, other funding mechanisms can also be used to improve local safety, as identified in the *Focus Area Strategy Tables*.
- 3. Identify and prioritize projects:** Projects, programs, and initiatives should be prioritized based on the potential safety improvement and ease of obtaining funding and implementation.
- 4. Determine project delivery methods:** Projects identified through this LRSP will be primarily pursued through grant funded projects and initiatives due to existing funding constraints. When possible, countermeasures should be included in on-going maintenance programs and incorporated into other projects.



5. **Evaluate effectiveness:** Performance measures and evaluation metrics are included in the Focus Area Strategy Tables for each countermeasure to assist the City of Lakeport in monitoring progress towards implementation and impacts on crash frequency and severity. This living document is intended to be updated every four years. However, the City would benefit from tracking safety metrics annually in order to gauge implementation outcomes on a more frequent basis.
6. **Continue communication and coordination:** Similar to #1, it is important to maintain close communication with stakeholders to coordinate efforts whenever possible and provide the public with updates regarding implementation progress and outcomes.

Key Components of Non-Engineering Implementation

The most critical steps for implementation of the non-engineering LRSP countermeasures are building strong public outreach messaging; expanding and leveraging partnerships and collaborations with stakeholders and local agencies; and obtaining grant funding for expanded initiatives and outreach. While all countermeasures identified in the plan are important for improving safety in the City of Lakeport, the following countermeasures and general strategies are most feasible for early implementation and provide the greatest safety benefit from non-engineering countermeasures.



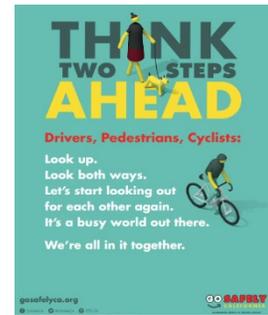
Exhibit 8. Distracted Driving Campaign

Social Media Campaign and Continued Outreach

Providing the public with important safety information and messaging through a variety of platforms including social media, online advertisements, TV, and radio is an important strategy for increasing awareness around safety and reducing crashes. The specific type of media used for each campaign depends on the audience, the message, and available resources. Some outreach campaigns may focus exclusively on social media, and some may require more holistic approaches including more traditional media like TV, newspaper, and radio. However, these larger outreach campaigns may require long time frames for implementation and higher budget considerations. A targeted social media campaign can be implemented quickly with very little budget by utilizing existing messaging, such as those provided by the Caltrans Office of Traffic Safety through the “Go Safely, California” program, highlighted below.



“Go Safely, California” – Public outreach and education materials covering a variety of safety topics including impaired driving, distracted driving, and bicycle and pedestrian safety are available through the “Go Safely, California” website. These resources provide local agencies with free and compelling materials to educate the public on the dangers of distracted driving, impaired driving, pedestrian & bicyclist safety, and speeding. Pre-made toolkits are available to supplement existing outreach efforts.



Source: www.gosafelyca.org

Targeted social media messaging campaigns can focus outreach efforts to a particular demographic, such as young drivers between 15 and 23 years of age regarding the potential risks of distracted driving and impaired driving. Targeted messaging campaigns through social media will help to ensure their message is received by those in the target group with minimal budget impacts. Additionally, the reach of social media messages and campaigns may be amplified many times if stakeholders share the safety campaign messages through their own social media accounts. This strategy was utilized during the public outreach process, which resulted in a significantly higher rate of responses than anticipated by the project team.

Partnerships & Collaborations

Roadway safety is a shared responsibility and so too is the implementation of roadway safety plans. The City of Lakeport must work collaboratively with numerous stakeholders and form interdepartmental and interagency partnerships to successfully implement many of the identified strategies. The following strategies will require direct partnerships and close collaboration to be successful:

Bicycle & Pedestrian Trainings

Incorporating pedestrian and bicycle training into the physical education curriculum for elementary school students will require close collaboration between the City, school district, parents, teachers, and students.

The City may work collaboratively to support and enhance existing bicycle safety courses offered by various entities. This may include providing course materials, sponsoring American League of Bicyclists Certified Instructors to train the course, or providing bicycle safety materials to support these on-going trainings. The City should collaborate with these organizations to identify the greatest need.



Exhibit 9. Enhance pedestrian and bicycle training/safety.



The City may work with the Department of Motor Vehicles and other driver instruction providers to include information about bicyclist safety and bicyclists' rights into driver training materials. Changing existing driver training materials is anticipated to be a long process which may require convening driver instruction providers to address the issue holistically at a local level.

Sober Ride Home

Transportation Network Companies such as Uber and Lyft as well as traditional taxi companies may work with the City of Lakeport to provide discounted or free rides home to intoxicated individuals to avoid driving while under the influence of drugs or alcohol. This program may first be focused on specific time periods such as Saint Patrick's Day, New Year's Eve, or Halloween and expanded, based on funding and need, later on.

Responsible Beverage Service (RBS)

Following the passage of Assembly Bill 82, any alcohol server and their manager will be required to have a valid RBS certification from an ABC accredited RBS training provider and pass an online ABC administered RBS exam within 60 calendar days from the first date of employment as of July 1, 2022⁹. The City of Lakeport may work with the local chamber of commerce and local alcohol server training providers to promote face-to-face training programs (taking COVID-19 protocols into consideration) as the standard for local businesses as these programs have been shown to be more effective.



Crash Data Update Process

To ensure that local data represents the most accurate information, the City Public Works department should update the crash data received from Caltrans with the most up-to-date local data. A lag in reporting periods may result in a crash victim passing away from their injuries, which requires the crash data record to be updated to a fatality. Caltrans currently has a process for updating crash data records; however, data inaccuracies may still exist. To reduce inaccuracies, the City Public Works department and Police departments should convene to conduct a data reconciliation process between the data received from Caltrans and the crash data records collected by the Police department annually. This process will also provide opportunities to re-evaluate how data is collected and reported to best support future safety analysis and include outside agencies (Caltrans, CHP, etc.) in the overall discussion about improving local crash data records and the record keeping process, as appropriate.

Grant Funding

The City and local stakeholders will likely pursue grant opportunities to implement many of the identified countermeasures and strategies. Additionally, the timeframes for implementation will be contingent on obtaining grant funding as well as maintaining existing maintenance and construction funding levels. The following section highlights key considerations for each potential grant funding opportunity. Funding opportunities for each countermeasure and strategy have also been identified in the *Focus Area Strategy Tables*.

⁹ https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa09028/resources/countermeasures.pdf



Highway Safety Improvement Program (HSIP)

This federal program is managed by Caltrans and focused on infrastructure projects with nationally recognized crash reduction factors. This is one of the major funding mechanisms for safety projects across California and is closely tied to the LRSP. Agencies must have completed LRSP plans prior to submitting future HSIP applications. Calls for projects under this funding program are typically announced every other year. The next round of HSIP funding is anticipated to open in April 2022. Two potential projects were developed as part of the LRSP for cost estimates and BCR calculations to facilitate HSIP application.

Active Transportation Program (ATP)

This competitive statewide program, managed by Caltrans, consolidates federal and state funding from several sources including the State Senate Bill 1 (SB1), Transportation Alternatives Program (TAP), Bicycle Transportation Account (BTA), and State Safe Routes to School (SRTS). This program is focused on increasing the use of walking and biking by increasing safety and mobility for non-motorized users, advancing regional active transportation efforts, and providing a broad spectrum of projects to benefit many types of active transportation users. Eligible grant applicants include public schools and school districts as well as local, regional, or state agencies. For a project to qualify as a Safe Routes to School project, it must be within two miles of a public school or within the vicinity of a public-school bus stop with the students intended



Exhibit 10. Increase safety and mobility for non-motorized users

as the primary beneficiaries of the project. This program typically releases calls for projects annually, however, this may be impacted due to COVID-19 and should be monitored closely.

Congestion Mitigation and Air-Quality Improvement Program (CMAQ)

This flexible federal funding program managed by Caltrans may be used for a variety of projects which further the goals of the Clean Air Act and its amendments on a reimbursable basis. Projects must be included in the Transportation Improvement Program (TIP) to be eligible for this funding stream. This funding may be used for bicycle & pedestrian outreach programs, constructing bicycle and pedestrian facilities which are not exclusively recreational and reduce vehicle trips, and public education and outreach activities.

National Highway & Traffic Safety Administration (NHTSA)

The NHTSA provides traffic safety grants through the California Office of Traffic Safety. Based on the most recent guidance, Caltrans OTS accepts applications for this funding program on a regular annual basis with an annual deadline of January 30th. This timeline may have changed based on impacts from COVID-19. The following grant opportunities were identified as the most applicable to the City of Lakeport’s needs.



- ▶ **Section 402: State & Community Highway Safety Grant Program** – This versatile funding program can be used for a variety of initiatives focused on reducing deaths and serious injuries on our roadways including enhancing pedestrian and bicycle safety, increasing enforcement of traffic safety laws, improving traffic records, or reducing speeding.

- ▶ **Section 405: National Priority Safety Program** – This program authorizes funding to address high priority safety issues across the nation including impaired driving, distracted driving, and non-motorized safety. Funding for each issue is authorized as a separate tier under the Section 405 program.
 - » **Section 405(d): Impaired Driving Countermeasures** – This tier represents 52.5% of the total annual funding for full Section 405 program. These funds are intended for programs which reduce the risk of driving under the influence of alcohol or drugs. A matching share of 20% must be provided by the local agency.

 - » **Section 405(e): Distracted Driving** – A total of 8.5% of Section 405 funds are allocated for distracted driving incentive grants. Funds are intended for programs which reduce the risk of distracted driving.

 - » **Section 405(h): Non-motorized Safety** – 5% of Section 405 is available under this tier for states where the combined bicycle and pedestrian fatalities represent more than 15% of all roadway fatalities in that state based on the most recent FARS data from NHTSA. Funding under this tier requires a 20% match and is only eligible for training law enforcement on state laws applicable to pedestrian and bicycle safety, enforcement mobilizations and campaigns designed to enforce those state laws, or public education and awareness programs designed to inform motorists, pedestrians, and bicyclists.

California Highway Patrol (CHP) Cannabis Tax Fund Grant Program (CTFGP)

Funding for this program comes from the passage of Proposition 64, The Control, Regulate, and Tax Adult Use Marijuana Act (AUMA) in 2016. The intent of this program is to reduce the number of crashes by impaired drivers, increase public awareness related to the dangers of impaired driving, and improve highway safety. The purpose of the funds is to supplement and not supplant funding for current activities and programs. The next application window is anticipated to open in February 2022.

Implementation Timeframes

The desirable timeframe for completion of each countermeasure is identified in each *Focus Area Strategy Table*. The approximate timeframe for completion was broken into three possible timeframes:

- ▶ Short-Term: 1 – 2 years
- ▶ Medium-Term: 3 – 5 years
- ▶ Long-Term: 6 – 10 years



Countermeasures and strategies with Medium- and Long-term implementation timeframes may be revisited during future LRSP update cycles.

Next Steps

This Local Road Safety Plan (LRSP) used a methodical process and input from stakeholders and the public to identify focus areas, analyze crash trends and develop countermeasures across the four E's of safety planning (Engineering, Education, Enforcement, and Emergency Services). The plan includes strategy tables identifying strategies, responsible parties, completion goals, and performance measures, and outlines an implementation plan and potential funding sources.

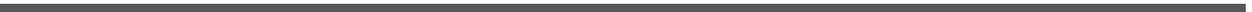
The LRSP is a living document. The document should be updated every four to five years using the most up to date crash data to evaluate the performance of implemented countermeasures and re-evaluate focus areas.



Source: FWHA

Appendix A

Stakeholder Working Group Member List



**Lake County
Lakeport Local Road Safety Plan
Stakeholders***

Name	Title	Agency
Alexis Pedrotti	Associate Program Planner / Administrator	Lake Area Planning Council
Brad Rasmussen	Police Chief	Lakeport Police Department
Clarissa Kincy	CEO/Mobility Manager	Lake Links
Danielle Casey	Project Coordinator	Lake Area Planning Council
Doug Grider	Public Works Director	Lakeport Public Works
James Sookne	Transit Coordinator	Lake Transit Authority/Lake APC
Jim Kennedy	Public Works Superintendent	Lakeport Public Works
Kevin Ingram	Community Development Director	City of Lakeport
Lisa Davey-Bates	Executive Director	Lake Area Planning Council
Mark Mueller	District Area Engineer	Caltrans
Olivia Grupp	Public Works Projects Coordinator	Lakeport Public Works
Ron Ladd	Public Works Superintendent	Lakeport Public Works
Willie Sapeta	Fire Chief	Lake County Fire Protection District

*This list reflects stakeholders that were contacted and participated.



Appendix B

Initial Data Analysis

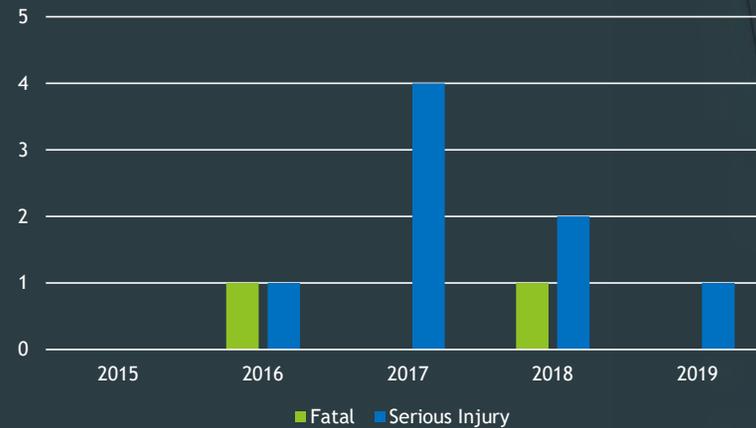


Preliminary Analysis - Overall Lakeport

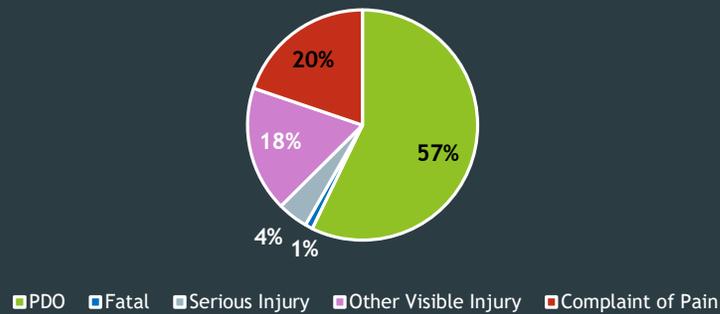
Lakeport - Total Crashes By Year (2015 - 2019)



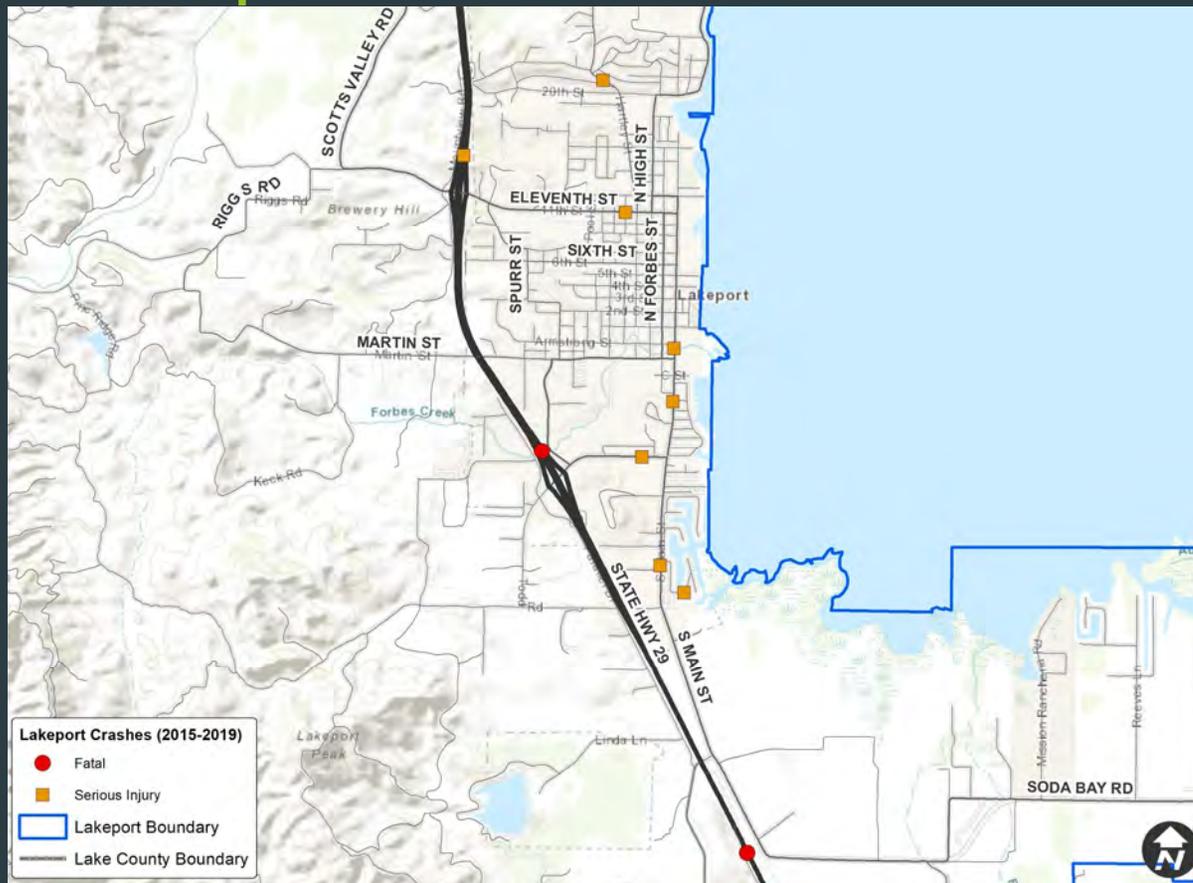
Lakeport - Fatal & Serious Injury Crashes by Year (2015 - 2019)



Lakeport - Crash Severity (2015 - 2019)

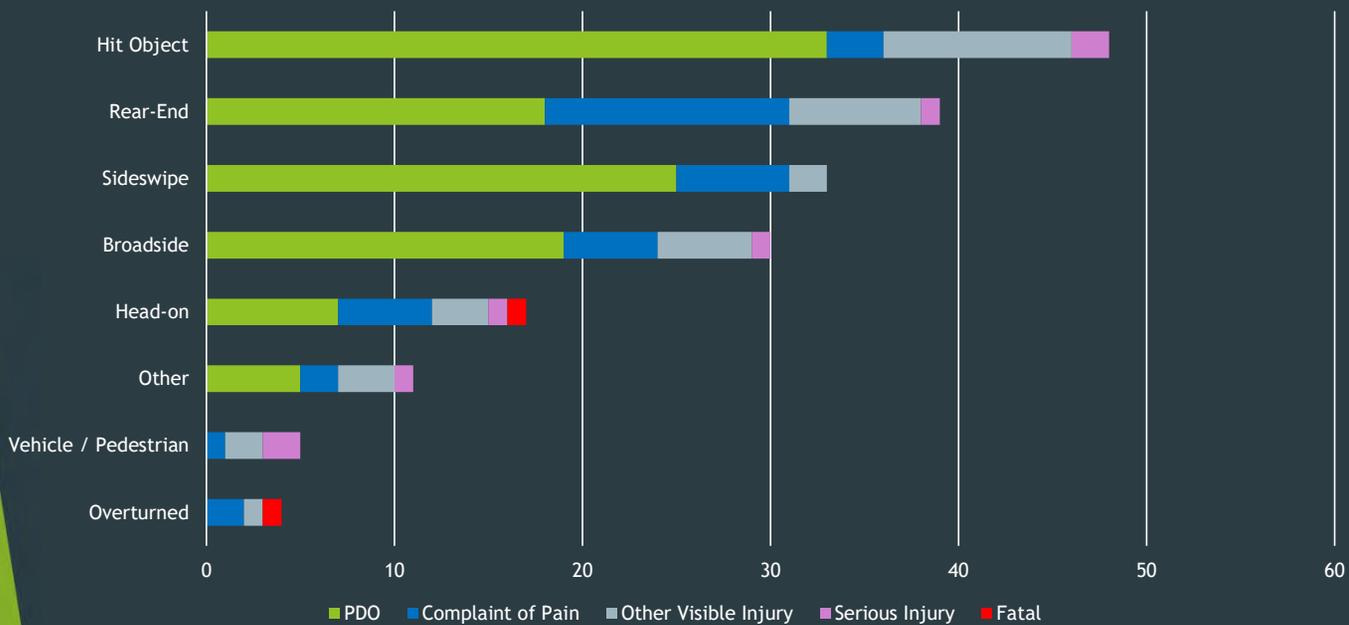


Preliminary Analysis - Injury and Fatal Crashes - Lakeport



Preliminary Analysis - Overall Crash Type - Lakeport

Lakeport - Crash Severity by Crash Type (2015 - 2019)



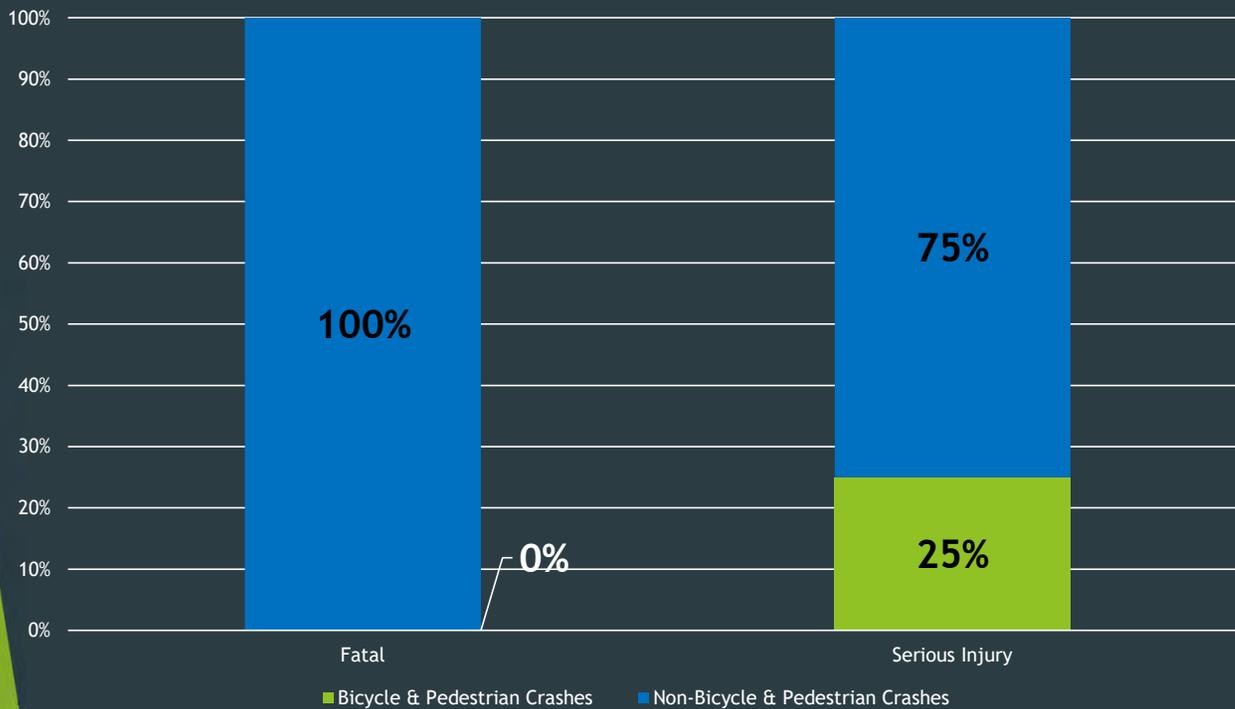
Hit Object accounts for the highest percentage of overall crashes with 25%

Pedestrian crashes account for 2.7% of overall crashes but 20% of fatal & serious injury crashes



Preliminary Analysis - Bicycle and Pedestrian Crashes - Lakeport

Lakeport Bicycle & Pedestrian Fatal & Serious Injury Crashes
(2015 - 2019)

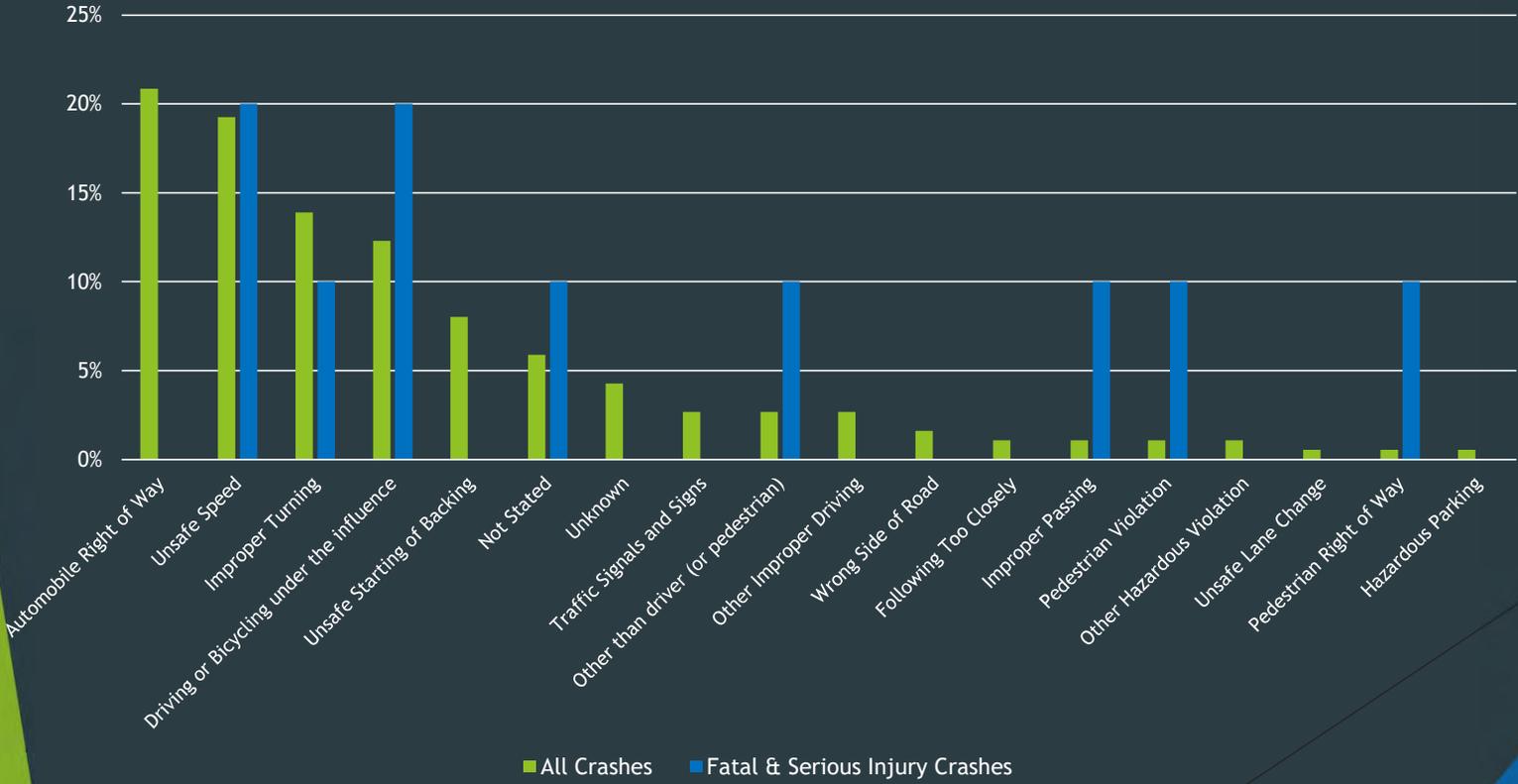


1 Crash involving a bicycle was identified in the data. Which is 0.5% of all crashes.



Preliminary Analysis - Overall Crash Factors - Lakeport

Lakeport Primary Collision Factors - All Crashes & Fatal / Serious Injury Crashes (2015 - 2019)

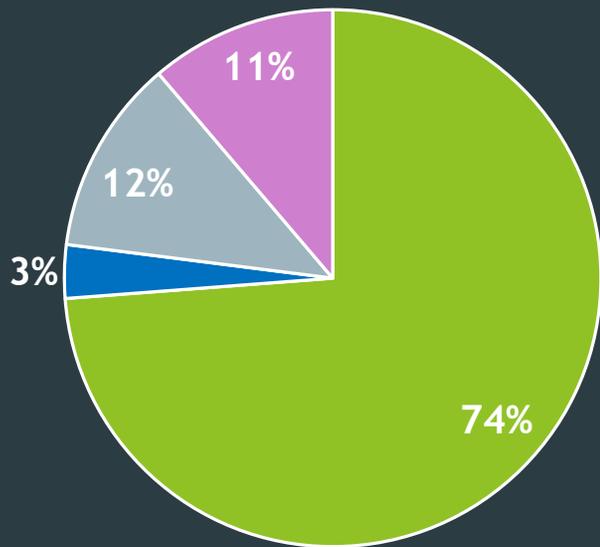


Unsafe Speed & Driving Under the Influence account for 40% of Fatal & Serious Injury crashes



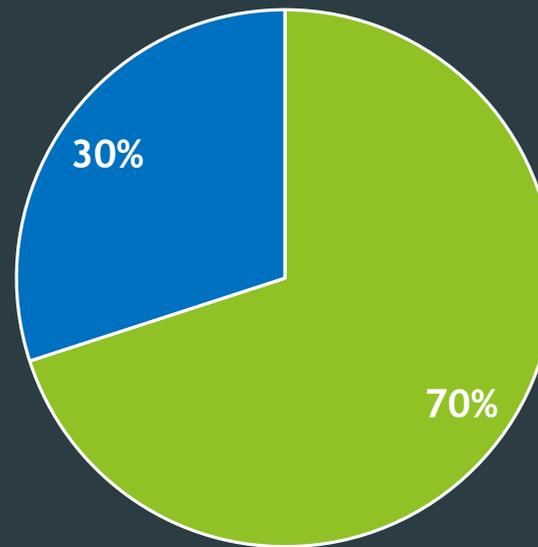
Preliminary Analysis - Lighting Conditions - Lakeport

Lakeport - Lighting Conditions for All Crashes (2015 - 2019)



■ Daylight ■ Dusk - Dawn ■ Dark - Street Lights ■ Dark - No Street Lights

Lakeport - Lighting Conditions for Fatal & Serious Injury Crashes (2015 - 2019)



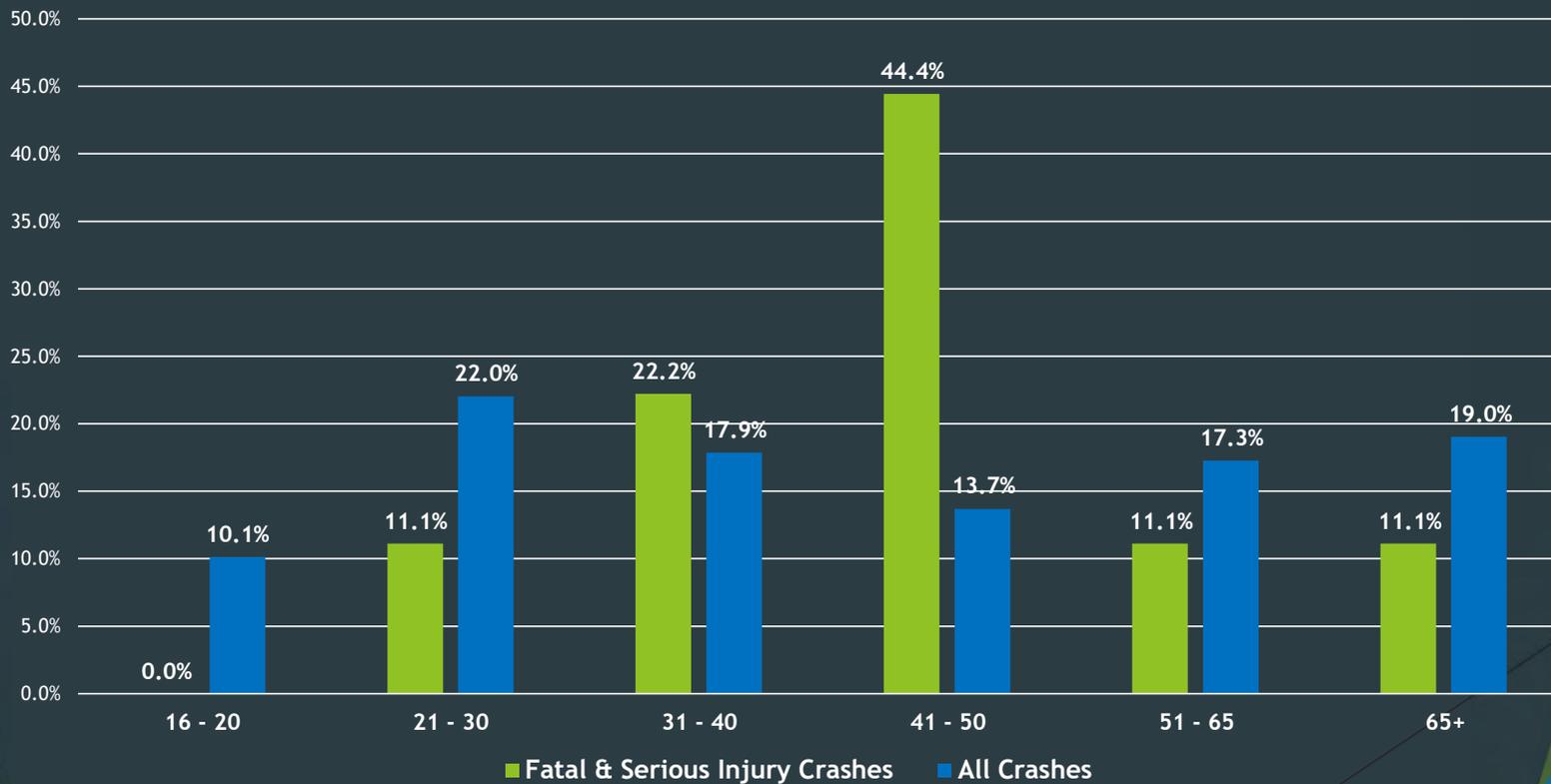
■ Daylight ■ Dark - No Street Lights

30% of injury and fatal crashes occur in non-daylight conditions



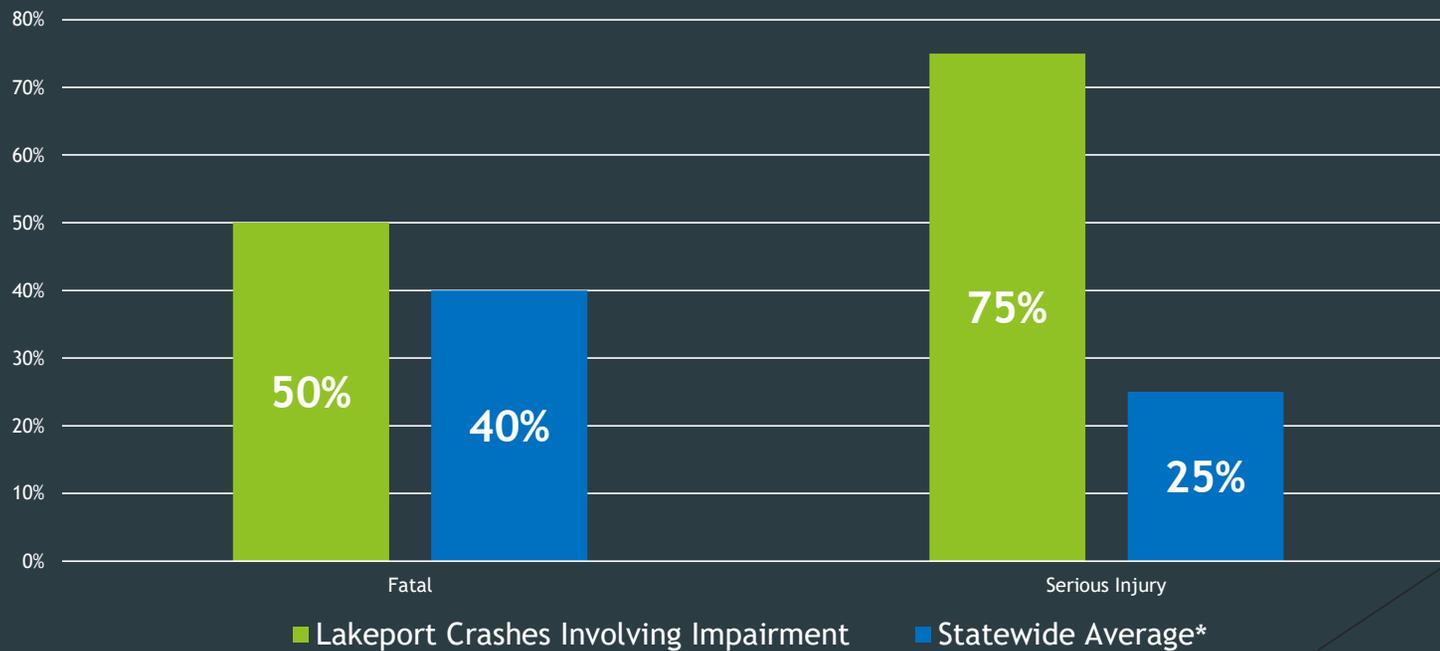
Preliminary Analysis - Age - Lakeport

Lakeport - At Fault Party Ages All Crashes vs Fatal & Serious Injury Crashes
(2015 - 2019)



Preliminary Analysis - Impaired Driving - Lakeport

Impaired Driving Fatal & Serious Injury Crash Percent
(Lakeport vs Statewide Average)



*Source: California Safe Roads 2020 - 2024 SHSP

OTS Crash Rankings - Lakeport

TYPE OF CRASH	VICTIMS KILLED & INJURED	OTS RANKING
Total Fatal and Injury	21	20/66
Alcohol Involved	3	19/66
Had Been Drinking Driver < 21	0	31/66
Had Been Drinking Driver 21 - 34	2	5/66
Motorcycles	1	23/66
Pedestrians	4	5/66
Pedestrians < 15	0	24/66
Pedestrians 65+	0	36/66
Bicyclists	0	53/66
Bicyclists < 15	0	22/66
Composite	11	14/66

TYPE OF CRASH	FATAL & INJURY CRASHES	OTS RANKING
Speed Related	2	35/66
Nighttime (9:00pm - 2:59am)	3	4/66
Hit and Run	1	23/66

40% of Serious and Injury Crashes involve a motorcycle



OTS Crash Rankings - Lakeport

TYPE OF CRASH	VICTIMS KILLED & INJURED	OTS RANKING
Total Fatal and Injury	19	25/75
Alcohol Involved	2	26/75
Had Been Drinking Driver < 21	0	33/75
Had Been Drinking Driver 21 - 34	0	56/75
Motorcycles	2	14/75
Pedestrians	1	30/75
Pedestrians < 15	0	24/75
Pedestrians 65+	0	35/75
Bicyclists	1	37/75
Bicyclists < 15	0	29/75
Composite	11	18/75

TYPE OF CRASH	FATAL & INJURY CRASHES	OTS RANKING
Speed Related	4	21/75
Nighttime (9:00pm - 2:59am)	4	2/75
Hit and Run	1	25/75

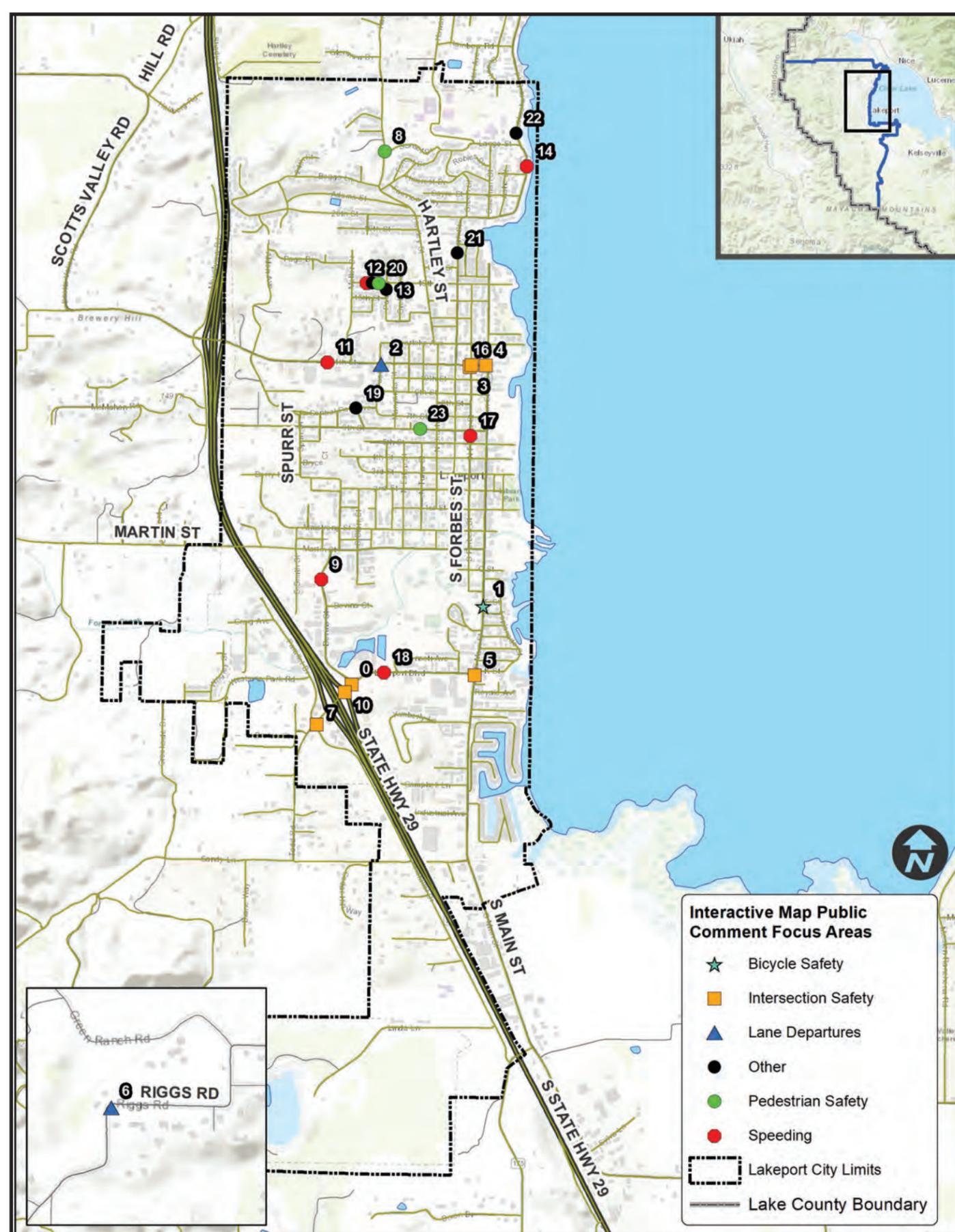


Source: 2018 Office of Traffic Safety Crash Rankings - Caltrans

Appendix C

Public Outreach Results





Comment Number (Map ID)	Focus Area	Comment
1	Bicycle Safety	Trench cuts/patches unsafe for bicycles.
5	Intersection Safety	All way stop at capacity.
10	Intersection Safety	Bevins and highway offload is dangerous. Turning left towards fast food usually results in close calls with the condition of the road.
16	Intersection Safety	Highly trafficed area with poor intersection usability. Many drivers rely on N. Forbes to bypass Main St.
0	Intersection Safety	Need a roundabout. Many near misses.
3	Intersection Safety	Phone pole too close to corner.
7	Intersection Safety	Uneven road surface in circular roadway (motorcycle safety)
4	Intersection Safety	Valley gutter makes harder to turn.
2	Lane Departures	Offset lane with phone pole obstruction.
6	Lane Departures	Travel lanes very narrow.
21	Other	Bicyclist not using provided bike lanes
22	Other	bicyclist not using provided bike lanes
15	Other	Commercial vehicles speeding through roadway from PGE
13	Other	Roadway has been reduced to dirt
19	Other	The road conditions are horrible
23	Pedestrian Safety	Incomplete sidewalk network. Haphazard locations of existing sidewalks along Sixth St and nearby.
8	Pedestrian Safety	No sidewalk in neighborhood areas and near school
20	Pedestrian Safety	PG&E using 16th St for main route to and from yard
17	Speeding	Speeding along all of Forbes Dr
9	Speeding	Speeding along roadway. Bevins is a hill which I have seen Sheriff officers vehicles jumping the hill.
11	Speeding	Speeding frequent with cars leaving highway.
14	Speeding	Speeding on entire Lakeshore Blvd.
12	Speeding	Vehicles speeding to bypass traffic from 11th St.
18	Speeding	Vehicles Speeding up hill towards highway

Lakeport LRSP Survey Results

Object ID	Global ID	CreationDate	What is your primary mode of transportation?	What is your age?	Did your travel habits change during COVID restrictions (approximately March 2020 - Present)?	Please rank the following categories based on your personal level of concern regarding each category, with "1" representing the highest level of concern.	Please enter any comments relating to transportation safety in the City of Lakeport below.
	4af4e50c-4b82-4fdd-85be-8cce9cf78c1e2	4/20/2021 20:56	personal_vehicle	51-65	Yes_Traveled_less	speeding,Lane_Departures,pedestrian_safety,impaired_driver_s,lighting,distracted_driving,intersction_safety,bicycle_safety	NB 29 Ramp at Lakeport Blvd/Bevins St. - high speed, limited sight distances have led to many near misses/accidents. Main Street - I ride a motorcycle and there are so many potholes/roadway patches/ uneven pavement that it is perilous to just ride down the road. Poor pavement conditions. Martin Street - Poor pavement condition in front of the fairgrounds. Unsafe for bicycles/motorcycles.
	32585dc6-b0b2-49fc-8b97-972c87904290	4/26/2021 23:31	personal_vehicle	21-30	Yes_Traveled_less	pedestrian_safety,distracted_driving,impaired_drivers,lighting,Lane_Departures,speeding,intersction_safety,bicycle_safety	I feel like the crosswalk on the corner of 11th street and Mellor street needs a light to let drivers know that there are pedestrians crossing. I work at the business on the corner and have to walk across the street daily and it's very scary because people don't pay attention to pedestrians.
	dec7bded-fcf-47c3-851d-83f0b28091b6	4/26/2021 23:33	personal_vehicle	21-30	No_Stayed_the_same	lighting,intersction_safety,distracted_driving,Lane_Departures,peeding,bicycle_safety,impaired_drivers,pedestrian_safety	
	8368d774-44a8-4108-81c9-2d8939fbd1b	4/26/2021 23:35	personal_vehicle	41-50	No_Stayed_the_same	pedestrian_safety,distracted_driving,impaired_drivers,lighting,intersction_safety,peeding,Lane_Departures,bicycle_safety	Roads need to be repaired and the ped crosswalks should be lit up!!!
	2585b56e-241f-4336-850f-032ef39f8189	4/27/2021 0:00	personal_vehicle	21-30	No_Stayed_the_same	impaired_drivers,peeding,intersction_safety,distracted_driving,Lane_Departures,pedestrian_safety,bicycle_safety,lighting	
	da739444-89c6-44d0-84a2-ee8cb4204fe9	4/27/2021 0:09	personal_vehicle	21-30	Yes_Traveled_more	lighting,bicycle_safety,distracted_driving,impaired_drivers,intersction_safety,pedestrian_safety,peeding,Lane_Departures	Road are trash, pot holes and uneven pavement, lighting sucks, can't see street signs, water pools especially on Main Street
	a9fb28c5-9014-4b6e-85ee-583a2be085aa	4/27/2021 0:15	personal_vehicle	41-50	Yes_Traveled_less	impaired_drivers,intersction_safety,distracted_driving,pedestrian_safety,peeding,Lane_Departures,bicycle_safety,lighting	The speed limit is too high on Forbes St in front of the Courthouse and on Main St in the downtown area.
	ec6d6159-d0f4-419a-8390-5cf01bade039	4/27/2021 0:19	personal_vehicle	51-65	Yes_Traveled_less	speeding,distracted_driving,pedestrian_safety,bicycle_safety,intersction_safety,impaired_drivers,Lane_Departures,lighting	The Hartley and Boggs Lane intersection is very dangerous to both drivers, pedestrians and bikers. People blow through the stop signs there.
	d878d7fe-da35-4ac2-83bb-4ae5ca22ad8b	4/27/2021 0:26	personal_vehicle	65+	Yes_Traveled_less	distracted_driving,impaired_drivers,Lane_Departures,pedestrian_safety,intersction_safety,bicycle_safety,lighting,peeding	
	83f80253-7547-4b70-86ee-5ac0d910fdc	4/27/2021 0:31	personal_vehicle	31-40	No_Stayed_the_same,other	impaired_drivers,pedestrian_safety,bicycle_safety,distracted_driving,peeding,lighting,intersction_safety,Lane_Departures	
	279f16ac-13f1-4e45-89aa-1a831b7e70dc	4/27/2021 0:35	personal_vehicle	41-50	No_Stayed_the_same	speeding,distracted_driving,intersction_safety,bicycle_safety,impaired_drivers,lighting,pedestrian_safety,Lane_Departures	I feel the intersection at 11t st. And Forbes needs attention, 2nd st and Forbes and 3rd st and Forbes by the courthouse. A lot of pedestrian traffic during business hours. Jay walkers are the worst. They just cross the street where ever they feel like it. Frustrating.
	d1cf8148-1591-4dd7-87ad-72c7091e776	4/27/2021 1:30	personal_vehicle	51-65	Yes_Traveled_less	distracted_driving,impaired_drivers,intersction_safety,peeding,pedestrian_safety,bicycle_safety,lighting,Lane_Departures	Please please pave main street
	6b83e7f9-f523-4339-8143-159fb7b55627	4/27/2021 1:32	personal_vehicle	65+	Yes_Traveled_less	pedestrian_safety,peeding,bicycle_safety,intersction_safety,impaired_drivers,distracted_driving,lighting,Lane_Departures,intersction_safety,bicycle_safety,distracted_driving,pedestrian_safety,Lane_Departures,impaired_drivers,lighting,peeding	Cars speed on Main street and Forbes, should be more stop signs to slow traffic
	3e5b54a4-bec0-4b8c-8e15-3a46a80221c1	4/27/2021 1:43	personal_vehicle	31-40	Yes_Traveled_less	impaired_drivers,distracted_driving,pedestrian_safety,peeding,bicycle_safety,intersction_safety,lighting,Lane_Departures	
	40e27fb4-775d-407f-84c3-2e212ebd855f	4/27/2021 1:43	personal_vehicle	41-50	Yes_Traveled_less	distracted_driving,peeding,pedestrian_safety,Lane_Departures,impaired_drivers,intersction_safety,lighting,bicycle_safety	
	44f0f324-18dc-457e-8cdc-9dd56411e735	4/27/2021 2:03	personal_vehicle	51-65	Yes_Traveled_less	distracted_driving,peeding,pedestrian_safety,Lane_Departures,impaired_drivers,intersction_safety,lighting,bicycle_safety	Bevin's Street has way too much traffic. People stop without using blinkers. They pull in and out of businesses without looking.

Lakeport LRSP Survey Results

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24	f75a49f1-39e1-4342-8c9f-ee2e0e1fbfba	4/27/2021 2:05	personal vehicle	21-30	Yes_Traveled_less	bicycle_safety,pedestrian_safety,distracted_driving,impaired_drivers,intersection_safety,speeding,lighting,Lane_Departures	I used to be an avid cyclist but have stopped due to the road safety. Drivers are distracted and the lanes are too narrow. Same concern now with a baby. Walking on the street is too dangerous.
25	e871af3e-9938-4f11-8283-ac782204fd0b	4/27/2021 2:31	personal vehicle	51-65	Yes_Traveled_less	lighting,Lane_Departures,pedestrian_safety,bicycle_safety,distracted_driving,impaired_drivers,intersection_safety,speeding	
26	94ecdd43-5562-4700-8b7c-330ab428cf03	4/27/2021 2:51	personal vehicle	21-30	No_Stayed_the_same	speeding,distracted_driving,intersection_safety,impaired_drivers,lighting,bicycle_safety,Lane_Departures,pedestrian_safety	
27	f67a6cf3-da16-41a7-8e1d-52e46f50b69a	4/27/2021 2:57	personal vehicle	65+	Yes_Traveled_less	pedestrian_safety,intersection_safety,speeding,impaired_drivers,bicycle_safety,distracted_driving,lighting,Lane_Departures	
28	bf94a8f1-e083-43ff-8c07-96f4fc7f2211	4/27/2021 3:55	personal vehicle	21-30	Yes_Traveled_less	impaired_drivers,Lane_Departures,distracted_driving,intersection_safety,lighting,pedestrian_safety,speeding,bicycle_safety	
29	3e4bb4b6-47c5-466d-8aba-807f4dfba5e0	4/27/2021 3:58	personal vehicle	51-65	Yes_Traveled_less	distracted_driving,speeding,impaired_drivers,bicycle_safety,intersection_safety,lighting,pedestrian_safety,Lane_Departures	
30	db0075d8-fed4-4384-8d29-52d22b20ac33	4/27/2021 4:34	personal vehicle	41-50	Yes_Traveled_less	bicycle_safety,distracted_driving,impaired_drivers,pedestrian_safety,speeding,lighting,Lane_Departures,intersection_safety	
31	a36fcec-a84c-4620-850e-742412a3775f	4/27/2021 4:35	personal vehicle	41-50	Yes_Traveled_less	impaired_drivers,bicycle_safety,distracted_driving,intersection_safety,pedestrian_safety,speeding,lighting,Lane_Departures	11th St west of the post office,drivers driving so fast,like it's a freeway,if you look at the records of how many car accidents on 11th,its crazy,no one follows the speed limit,I have many times called police Dept,what I get is there is nowhere to pull speeding cars? How about pulling people over on the side streets?
32	6cf2a051-4586-4d34-803b-e3be564441e6	4/27/2021 5:08	personal vehicle	21-30	No_Stayed_the_same	speeding,bicycle_safety,distracted_driving,impaired_drivers,intersection_safety,lighting,pedestrian_safety,Lane_Departures	Some lines at streets at lakeport city don't have lines to stop, a lot of holes at lakeport
33	a37d19be-4086-4c82-8cc3-c809cc0c1a14	4/27/2021 5:29	personal vehicle	51-65	No_Stayed_the_same	Lane_Departures,speeding,distracted_driving,impaired_drivers,pedestrian_safety,intersection_safety,bicycle_safety,lighting	
34	35379ca8-5439-4f45-828b-7c156a7d709e	4/27/2021 5:42	personal vehicle	31-40	No_Stayed_the_same	distracted_driving,impaired_drivers,speeding,Lane_Departures,intersection_safety,lighting,bicycle_safety,pedestrian_safety	
35	5d9dc274-93ab-450d-89ad-6c6fed1e010e	4/27/2021 12:07	personal vehicle	41-50	Yes_Traveled_less	distracted_driving,impaired_drivers,bicycle_safety,intersection_safety,lighting,speeding,pedestrian_safety,Lane_Departures	
36	974fcfb-232a-4bf6-8416-543bdb84b70	4/27/2021 19:18	personal vehicle	65+	No_Stayed_the_same	speeding,bicycle_safety,distracted_driving,intersection_safety,impaired_drivers,pedestrian_safety,lighting,Lane_Departures	11th St. has speeding, drivers driving overly aggressive and under utilizing lanes appropriately. Lakeshore Dr. has drivers speeding throughout with passing along double yellow lines. 16th St has commercial vehicles running up and down constantly in a residential area and using Mellor Dr. (Which is being destroyed and was left unrepaired with 16th street repaving). Palm Dr is turning into a dirt road. Main St. Lakeport is horrendous and the stop signs downtown were inappropriately placed initially leaving a secondary stop sign needed. Forbes st has speeding trying to bypass all traffic on Main st. Bevins St. has speeding issues. Sheriffs officers leaving their office and going on Bevins has been seen gaining air going over Bevins St.
37	8d3b5398-65c2-472e-8433-17c85674dca7	4/27/2021 21:39	personal vehicle	31-40	Yes_Traveled_more	speeding,impaired_drivers,intersection_safety,lighting,distracted_driving,bicycle_safety,pedestrian_safety,Lane_Departures	
38	6c098737-bf0f-4360-8f98-cff0f1662e0f	4/27/2021 21:40	personal vehicle	31-40	No_Stayed_the_same	speeding,impaired_drivers,pedestrian_safety,distracted_driving,intersection_safety,bicycle_safety,lighting,Lane_Departures	

Lakeport LRSP Survey Results

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39	902ce060-ae83-4548-8b81-a04a0d6bed70	4/27/2021 21:40	personal_vehicle	65+	Yes_Traveled_less	distracted_driving,impaired_drivers, speeding, pedestrian_safety, intersection_safety, bicycle_safety, Lane_Departures, lighting	
40	3c065595-973a-499b-8489-772f398ff95c	4/27/2021 21:48	personal_vehicle	51_65	Yes_Traveled_less	Lane_Departures, bicycle_safety, distracted_driving, impaired_drivers, intersection_safety, lighting, pedestrian_safety, speeding	Fix the roads properly. All of them. And I don't mean patching the same potholes a thousand with a lump of asphalt over and over and over, year after year after year!
41	bfd05ec-5601-4a56-80eb-fd603703ee32	4/27/2021 21:53	personal_vehicle	31_40	No_Stayed_the_same	speeding, distracted_driving, impaired_drivers, lighting, pedestrian_safety, bicycle_safety, intersection_safety, Lane_Departures	
42	3aa928eb-60c1-48e2-862d-521813edc44a	4/27/2021 21:55	personal_vehicle	51_65	Yes_Traveled_less	speeding, bicycle_safety, distracted_driving, impaired_drivers, lighting, intersection_safety, pedestrian_safety, Lane_Departures	3rd and main is notorious for speeders. Cars and trucks speeding off the stop sign like it's a racetrack. Police have been notified several times but never seem to catch the culprits. Needs to be more police presence at that corner.
43	237b0fde-e229-4d90-8de3-f4793902024d	4/27/2021 22:00	personal_vehicle	51_65	Yes_Traveled_less	distracted_driving, impaired_drivers, intersection_safety, lighting, bicycle_safety, pedestrian_safety, speeding, Lane_Departures	
44	bad64697-c162-499d-8a13-80653e13d47f	4/27/2021 22:01	personal_vehicle	65+	Yes_Traveled_less	bicycle_safety, pedestrian_safety, speeding, distracted_driving, impaired_drivers, intersection_safety, lighting, Lane_Departures	We live off Lakeshore Blvd by Hill Road East. People speed constantly. We are afraid to ride our bikes now. There have been deaths on the road. There isn't enough room to walk on the road let alone ride a bike. I wish the would fix it. Please put out more police patrol and ticket the speeders.
45	c49d69d8-cccf-4bd7-8e7b-d6c6cd4f7f7f	4/27/2021 22:14	personal_vehicle	65+	other	speeding, lighting, distracted_driving, impaired_drivers, Lane_Departures, intersection_safety, pedestrian_safety, bicycle_safety	
46	08662c45-6bd7-49fe-8b62-b1316f95c7fe	4/27/2021 22:17	personal_vehicle	31_40	No_Stayed_the_same	impaired_drivers, speeding, distracted_driving, lighting, intersection_safety, Lane_Departures, pedestrian_safety, bicycle_safety	
47	e0252d73-056a-49a6-8d9a-4b67426fb19f	4/27/2021 22:35	personal_vehicle	31_40	No_Stayed_the_same	speeding, impaired_drivers, pedestrian_safety, bicycle_safety, distracted_driving, intersection_safety, lighting, Lane_Departures	Streets need to be better maintained/paved. Central Park, 6th Street, Shady Oak, Pool Street, 9th Street, Manzanita, Hillcrest, the streets are in desperate need of repairs to make it safer to drive on and not cause damage to our vehicles.
48	eb0072e3-3b1b-4555-8b76-b50897714bc4	4/27/2021 22:43	personal_vehicle	65+	No_Stayed_the_same	impaired_drivers, distracted_driving, speeding, intersection_safety, Lane_Departures, pedestrian_safety, lighting, bicycle_safety	
49	6374187f-28c9-4d17-8f49-ccbca48f72ea	4/27/2021 23:11	personal_vehicle	51_65	No_Stayed_the_same	distracted_driving, intersection_safety, speeding, pedestrian_safety, impaired_drivers, bicycle_safety, Lane_Departures, lighting	People texting while driving on Lakeshore is horrible. The intersection at 1st and Main needs to be a 4 way stop as there is nearly a wreck there daily. Speeding along Lakeshore is horrible.
50	be571fc3-0509-49d4-83a0-0b11ad7fc137	4/27/2021 23:14	personal_vehicle	41_50	No_Stayed_the_same, Yes_Traveled_less	impaired_drivers, distracted_driving, pedestrian_safety, intersection_safety, lighting, bicycle_safety, speeding, Lane_Departures	can't get to the map-the cross walks on main street starting at Lakeport Blvd. through the entire town other than the 1 at 4th street with the 4 way stop are all dangerous especially at night. Also, walking on Lakeport Blvd. except for a small section in front of Tribble Health is scary also walking on Bevins from Lakeport Blvd. to Martin street is scary. Biking in almost the entirety of Lakeport is dangerous there needs to be more lighting in general
51	036d8d8d-617f-44b5-8d4b-012067c88041	4/27/2021 23:48	personal_vehicle	65+	Yes_Traveled_less	intersection_safety, impaired_drivers, distracted_driving, pedestrian_safety, speeding, bicycle_safety, lighting, Lane_Departures	Eleventh and North Forbes. Reduce from six lanes to four and make Forbes one way going north, north of the intersection. Maybe reverse flow from on North High from Clear Lake to 12th.
52	3faddbc0-32f0-400b-86b7-5697ac3215b0	4/28/2021 0:01	personal_vehicle	65+	Yes_Traveled_less	impaired_drivers, speeding, distracted_driving, pedestrian_safety, intersection_safety, lighting, bicycle_safety, Lane_Departures	
53	a51e484f-c73d-4db7-88c1-fc72f0c5d4a8	4/28/2021 0:35	personal_vehicle	31_40	Yes_Traveled_less	distracted_driving, speeding, impaired_drivers, bicycle_safety, lighting, Lane_Departures, intersection_safety, pedestrian_safety	
54	fd4dff1d-df24-430f-8a75-e7160818aa81	4/28/2021 0:38	personal_vehicle	31_40	No_Stayed_the_same	speeding, impaired_drivers, lighting, Lane_Departures, distracted_driving, intersection_safety, bicycle_safety, pedestrian_safety	

Lakeport LRSP Survey Results

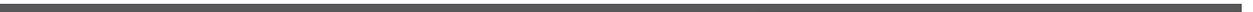
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55	e9409c57-09d6-412a-809c-24f33a47d513	4/28/2021 0:40	personal vehicle	41_50	Yes_Traveled_less	intersection_safety,lighting,speeding,pedestrian_safety,distracted_driving,bicycle_safety,impaired_drivers,Lane_Departures	
56	f411d031-3ebc-401a-8cdc-d00c15e23fcf	4/28/2021 0:45	personal vehicle	51_65	Yes_Traveled_less	speeding,bicycle_safety,distracted_driving,impaired_drivers,intersection_safety,lighting,pedestrian_safety,Lane_Departures	
57	91eabc89-31dc-4092-8220-034423f8e220	4/28/2021 1:33	personal vehicle	51_65	No_Stayed_the_same	intersection_safety,speeding,distracted_driving,pedestrian_safety,Lane_Departures,lighting,impaired_drivers,bicycle_safety	1) PG&E rigs using 16th St (residential) as their main route to and from the yard. 2)The pavement on Palm drive is down to rock and dirt. Hazardous for vehicle, pedestrian and bicycle traffic. 3) Speeding traffic on 16th St 4) Speeding on Bevins St by the Sheriffs Dept. There are many businesses on this street that has a blind crest. I have witnessed both marked and unmarked cars travelling at an extremely high rate of speed (50mph+) up over that crest. 6)Bicyclist not following traffic laws, Stop signs, using the bike lanes ect. I am not talking about kids riding bicycles here. 7) Drug addicts/homeless randomly walking out in the middle of the road. It has happened 2 times to me in the last couple of years. Once on 11th st and once on Hwy 29 /Martin St overpass when one homeless person popped out from under the overpass and proceeded to walk right out on the freeway.
58	21633a54-e7ab-435a-8697-6ba4cbdddf4c	4/28/2021 2:18	personal vehicle	31_40	Yes_Traveled_less	bicycle_safety,distracted_driving,impaired_drivers,intersection_safety,lighting,pedestrian_safety,speeding,Lane_Departures	Fix the roads
59	536b5781-55b5-4644-82c2-2fe8914a3214	4/28/2021 3:43	personal vehicle	65+	Yes_Traveled_less	distracted_driving,impaired_drivers,Lane_Departures,speeding,bicycle_safety,intersection_safety,lighting,pedestrian_safety	
60	28401aed-6c3f-4f17-85c2-894f0b7d30ec	4/28/2021 15:39	personal vehicle	65+	Yes_Traveled_less	intersection_safety,impaired_drivers,distracted_driving,lighting,bicycle_safety,pedestrian_safety,speeding,Lane_Departures	Road surfaces in poor condition, seems even newer roads are not constructed competently as they crumble, buckle so quickly.
61	0d32c0f2-b1bc-4092-87fb-0a968882619d	4/28/2021 20:57	personal vehicle	41_50	Yes_Traveled_less	impaired_drivers,distracted_driving,pedestrian_safety,intersection_safety,lighting,bicycle_safety,Lane_Departures,speeding	
62	beb832c2-4c14-4e88-843a-d9ad25e3029b	4/28/2021 21:52	personal vehicle	51_65	Yes_Traveled_less	intersection_safety,bicycle_safety,distracted_driving,impaired_drivers,lighting,pedestrian_safety,speeding,Lane_Departures	
63	b3478160-e8f8-45f3-8c4a-c70f0a02927d	4/28/2021 21:53	public transit	41_50	No_Stayed_the_same	speeding,bicycle_safety,distracted_driving,impaired_drivers,intersection_safety,lighting,pedestrian_safety,Lane_Departures	
64	4ce669b3-50d1-4bde-878a-5037df1a2110	5/1/2021 3:19	personal vehicle	65+	Yes_Traveled_less	impaired_drivers,distracted_driving,speeding,intersection_safety,bicycle_safety,pedestrian_safety,lighting,Lane_Departures	
65	d228b053-92ff-4b7d-88ed-5b10208b6f5	5/1/2021 3:56	personal vehicle	21_30	Yes_Traveled_less	distracted_driving,speeding,impaired_drivers,intersection_safety,lighting,Lane_Departures,pedestrian_safety,bicycle_safety	Every time I drive somewhere people tailgate me. I am doing the speed limit but they ride my back bumper for miles. This is usually at the point where 29 has no passing lanes in Kelseyville.
66	9d0d1656-e9d1-4f66-89c7-43fa62336204	5/5/2021 23:12	personal vehicle	51_65	Yes_Traveled_less	pedestrian_safety,intersection_safety,lighting,bicycle_safety,speeding,distracted_driving,impaired_drivers,Lane_Departures	I believe the City should require sidewalk improvements in conjunction with more residential and commercial improvement projects. The incomplete network of sidewalks in our neighborhood in central Lakeport is a major concern and could be improved.

Lakeport LRSP Survey Results

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67	7cbee1b6-0769-4b3f-85df-2d9c91e23246	5/5/2021 23:13	personal vehicle	41-50	Yes_Traveled_less	intersection_safety,pedestrian_safety,distracted_driving,spedding,lighting,bicycle_safety,impaired_drivers,Lane_Departures	
68	0e5895e6-e74e-4109-863b-501e1a71be36	5/5/2021 23:14	public transit	51-65	No_Stayed_the_same	lighting,bicycle_safety,distracted_driving,impaired_drivers,intersection_safety,pedestrian_safety,spedding,Lane_Departures	
69	3804ca37-9df0-4886-819d-a5bba62cf115	5/5/2021 23:16	personal vehicle	51-65	Yes_Traveled_less	pedestrian_safety,bicycle_safety,distracted_driving,impaired_drivers,intersection_safety,spedding,lighting,Lane_Departures	
70	b2951def-50e4-4f33-8dbc-7c9f5e7f2146	5/5/2021 23:33	personal vehicle	31-40	No_Stayed_the_same	intersection_safety,spedding,pedestrian_safety,Lane_Departures,bicycle_safety,distracted_driving,impaired_drivers,lighting	Road are bad. Lots of pothole and uneven pavement on 3rd st
71	110b6908-8999-4c74-8c1f-73c9135c1fcd	5/5/2021 23:56	personal vehicle	31-40	Yes_Traveled_less	pedestrian_safety,lighting,bicycle_safety,impaired_drivers,spedding,distracted_driving,intersection_safety,Lane_Departures	walkable sidewalks are essential. So many of our streets have beat up or little-to-no sidewalks and makes it difficult when you have children and strollers.
72	1058fa0d-1390-4fdd-83d2-411d1ecc69349	5/6/2021 0:15	personal vehicle	65+	Yes_Traveled_less	spedding,impaired_drivers,bicycle_safety,pedestrian_safety,distracted_driving,intersection_safety,lighting,Lane_Departures	Most of my concerns are for the area north of 11th Street to the Nice-Lucerne Cutoff; downtown and parallel streets really pretty nice, peaceful and rarely any problems. Thank you for your wonderful city, kudos to the Public Works Department!
73	26e4933-d4bc-495b-8bdb-69d310a3f7bf	5/6/2021 18:52	personal vehicle	31-40	Yes_Traveled_less	impaired_drivers,spedding,distracted_driving,intersection_safety,pedestrian_safety,lighting,bicycle_safety,Lane_Departures	
74	e35d13e2-1dd0-4b3e-8572-a3b7b9bd7b02	5/6/2021 21:16	personal vehicle	41-50	No_Stayed_the_same	pedestrian_safety,intersection_safety,spedding,Lane_Departures,bicycle_safety,distracted_driving,impaired_drivers,lighting	
75	7b794d6a-913e-4955-8dab-802f8760efd7	5/6/2021 21:49	personal vehicle	51-65	Yes_Traveled_less	spedding,Lane_Departures,impaired_drivers,pedestrian_safety,lighting,bicycle_safety,intersection_safety,distracted_driving	
76	16a7385e-f43b-48a0-8432-774d33c03907	5/7/2021 15:40	personal vehicle	31-40	No_Stayed_the_same	pedestrian_safety,spedding,intersection_safety,lighting,bicycle_safety,impaired_drivers,distracted_driving,Lane_Departures	Lack of places for kids to ride bikes \ scooters along with parents walking. Multiple streets have vehicles who speed or intersections that are blocked by trees, bushes, weeds, parked cars, etc
77	3dd24eaa-541f-4fe3-84ee-fe3a9ed21b2	5/10/2021 18:59	personal vehicle	41-50	Yes_Traveled_less	spedding,distracted_driving,impaired_drivers,pedestrian_safety,intersection_safety,bicycle_safety,lighting,Lane_Departures	
78	bdf549fe-fa60-4d9f-8f17-a031f55f0ca0	5/12/2021 22:00	personal vehicle	65+	Yes_Traveled_less	distracted_driving,impaired_drivers,spedding,intersection_safety,lighting,Lane_Departures,pedestrian_safety,bicycle_safety	
79	6e0fe918-9965-45dc-8241-605af9a974f5	5/12/2021 22:25	personal vehicle	51-65	Yes_Traveled_less	spedding,bicycle_safety,distracted_driving,pedestrian_safety,impaired_drivers,lighting,intersection_safety,Lane_Departures	
80	53f9806f-98b3-4f0d-8b32-5d8073b79dc0	5/13/2021 0:31	personal vehicle	51-65	No_Stayed_the_same	lighting,distracted_driving,impaired_drivers,intersection_safety,spedding,Lane_Departures,pedestrian_safety,bicycle_safety	
81	b04cd45c-2cab-46a7-8445-af0f4e13f63	5/13/2021 12:26	personal vehicle	51-65	No_Stayed_the_same	distracted_driving,impaired_drivers,spedding,intersection_safety,bicycle_safety,pedestrian_safety,Lane_Departures,lighting	
82	274735f3-1c31-4c0c-8236-35f0de80088e	5/13/2021 13:59	personal vehicle	41-50	Yes_Traveled_more	lighting,distracted_driving,impaired_drivers,intersection_safety,Lane_Departures,spedding,pedestrian_safety,bicycle_safety	

Appendix D

Focus Area Strategy Tables



Distracted Driving

Focus Area Strategy Table

City of Lakeport Local Road Safety Plan

Strategic Linkage

Identified as one of 16 Challenge Areas in the latest California Strategic Highway Safety Plan (SHSP).
Distracted Driving ranked as the highest safety priority for Lakeport residents based on the public survey results.

Objectives

Success Indicators

Increased awareness of safety impacts of distracted driving.
 Implement successful public outreach and driver engagement efforts to increase awareness.

Overall reduction in crashes, injuries, and fatalities related to distracted driving.

	Actions	Target Output	Responsible Parties (<i>Secondary Party</i>)	Date of Completion	Performance Measures	Monitoring and Evaluation	Potential Funding Opportunities
Education	Distracted Driving Public Outreach Campaign	Local distracted driving messaging campaign using a variety of media outlets	City of Lakeport - Public Works & Police <i>Lake Area Planning Council</i>	Medium-term	1. Grant funding obtained for specific Distracted Driving outreach campaign 2. Implemented outreach campaign for full quarter (3 months)	Total, fatal & serious injury crashes involving distracted driving (cellphone usage, or other distraction)	NHTSA 402, NHTSA 405(e)
Enforcement	High-Visibility Cell Phone / Text Messaging Enforcement Campaign	Conduct high visibility enforcement program, contingent on staff resources, to provide citations as needed. <i>May be combined with High Visibility Enforcement programs from other Focus Areas .</i>	City of Lakeport - Police Department	Short-term / Medium - Term	Short-term: Grant funding obtained for increased High Visibility Enforcement Program Medium-term: High Visibility Enforcement Program established & implemented quarterly	Total, fatal & serious injury crashes involving distracted driving (cellphone usage, or other distraction) Number of distracted driving or distracted driving related violations issued during High Visibility program and annually	CTFGP, NHTSA 402, NHTSA 405(e)
Engineering	Engineering projects for Pedestrian/Bicycle Safety, Intersection Safety, and Lane Departures will contribute to improvements to Distracted Driving						
EMS	None Identified.						

Impaired Driving

Focus Area Strategy Table

City of Lakeport Local Road Safety Plan

Strategic Linkage

Identified as one of sixteen Challenge Areas in the California Strategic Highway Safety Plan (SHSP) and a High Priority Challenge Area in the latest Caltrans SHSP.

Impaired Driving was the most common Primary Collision Factor for fatal & serious injury crashes (tied with 'Unsafe Speed'). Impaired drivers were ranked as the second highest safety priority for Lakeport residents based on the results of the public survey.

Objectives

Success Indicators

Alcohol/drug involved crashes, injuries, and fatalities are reduced.

Reduction in frequency of crashes, injuries, and fatalities involving alcohol and drugs.

	Actions	Target Output	Responsible Parties (Secondary Party)	Date of Completion	Performance Measures	Monitoring and Evaluation	Potential Funding Opportunities
Education	Drunk & Impaired Driving Awareness Campaign	Reduced number of alcohol-involved serious injuries and fatalities	City of Lakeport Public Information & Police Department <i>Lake Area Planning Council</i>	Short-term	1. Specific Impaired Driving outreach campaign funded (Grant or existing funding) 2. Implemented outreach campaign for full quarter (3 months)	Total Alcohol-involved fatal & serious injury crashes	NHTSA 402, NHTSA 405(e)
Enforcement	Passive Alcohol Sensors (PAS)	Equip officers with Passive Alcohol Sensors to increase efficiency of Alcohol Checkpoints and normal traffic stops	City of Lakeport Police Department, Lakeport Public Works <i>Lake Area Planning Council</i>	Medium - Term	1. Grant funding obtained for PAS units to correspond with Publicized Sobriety Checkpoints	Annual number of alcohol/drug-involved crashes Annual DUI Arrests	NHTSA 402, NHTSA 405(e)
	Publicized Sobriety Checkpoints	Highly publicized sobriety checkpoints conducted regularly to increase perceived risk of arrest for impaired driving			1. Grant funding obtained for increased DUI checkpoints 2. DUI Checkpoints publicized and conducted		CTFGP, NHTSA 402, NHTSA 405(d)
	High-Visibility Saturation Patrols	Focused patrols around specific areas where impaired-driving crashes are common as part of an on-going saturation program			1. Grant funding obtained for increased High Visibility Enforcement Program 2. High Visibility Enforcement Program established & implemented quarterly		CTFGP, NHTSA 402, NHTSA 405(d)
Engineering	None Identified						
EMS	None Identified						

Speeding

Focus Area Strategy Table City of Lakeport Local Road Safety Plan

Strategic Linkage

Speed management / Aggressive driving is one of sixteen Challenge Areas in the California Strategic Highway Safety Plan (SHSP) and a High Priority Challenge Area in the latest Caltrans SHSP

'Unsafe Speed' was the most common Primary Collision Factor (PCF) for serious injury & fatal crashes (tied with 'Impairment') and the second highest PCF for all crashes. Speeding ranked as the third highest priority safety concern for residents based on the public survey.

Objectives

Success Indicators

Reducing speeding and other aggressive driving behaviors

Serious injury & fatal crashes involving 'Unsafe Speed' are reduced.

	Actions	Target Output	Responsible Parties (Secondary Party)	Date of Completion	Performance Measures	Monitoring and Evaluation	Potential Funding Opportunities
Education	Speed Kills Campaign	Conduct public outreach campaign about the importance of driving the speed limit and the impact just 5 mph can have on the severity of a crash	City of Lakeport Public Works & Public Information <i>Lake Area Planning Council</i>	Short-term	1. Grant funding obtained for specific Speeding focused outreach campaign 2. Implemented outreach campaign for full quarter (3 months)	Total, fatal & serious injury crashes involving 'Unsafe Speed' Primary Collision Factor	NHTSA 402, NHTSA 405(e)
Enforcement	Targeted Speed Enforcement Program	Reduced speeding issues along select corridors through regular and targeted enforcement patrols	City of Lakeport Public Works <i>Lake Area Planning Council</i>	Medium-term	1. Grant funding obtained for Targeted Speed Enforcement Program 2. Targeted Speed Enforcement implemented quarterly along at least three corridors for a full calendar year.	Total, fatal & serious injury crashes involving 'Unsafe Speed' Primary Collision Factor	NHTSA 402, NHTSA 405(e)
Engineering	Systemic Speeding Management Project	Dynamic Speed Signs and/or portable trailers to inform motorist of speeding. See details in Appendix E.	City of Lakeport Public Works <i>Lake Area Planning Council</i>	Short-term / Long-term	Short-term: Grant Application(s) completed Long-term: Constructed safety countermeasures	Total, fatal & serious injury crashes involving 'Unsafe Speed' Primary Collision Factor	HSIP, NHTSA 402
EMS	None identified.						

Intersection Safety

Focus Area Strategy Table

City of Lakeport Local Road Safety Plan

Strategic Linkage

Identified as one of sixteen Challenge Areas in the California Strategic Highway Safety Plan (SHSP) and a High Priority Challenge Area in the latest Caltrans SHSP.

40% of all fatal & serious injury crashes occurred at an intersection. Intersection safety ranked as the 4th highest priority (out of 8) and numerous intersections with safety concerns were identified through the public outreach process

Objectives			Success Indicators				
Crashes, injuries, and fatalities at signalized and non-signalized intersections are reduced.			Reduction in frequency of crashes, injuries, and fatalities at signalized and non-signalized intersections.				
	Actions	Target Output	Responsible Parties (Secondary Party)	Date of Completion	Performance Measures	Monitoring and Evaluation	Potential Funding Opportunities
Education	None identified.						
Enforcement	Identified enforcement countermeasures in other focus areas also benefit Intersection Safety						
Engineering	Site Specific Project- 11st St/Forbes St Site Specific Project - Rt 29 / Rt 175 Systemic Unsignalized Intersections Project 1 (Intersection Improvements) Systemic Unsignalized Intersections Project 2 (Intersection Improvements)	Safety Improvements implemented at selected locations throughout the City, see additional details in Appendix E .	City of Lakeport Public Works <i>Lake Area Planning Council</i>	Short-term / Long-term	Short-term: Grant Application(s) completed Long-term: Constructed safety countermeasures	Number of total, serious injury & fatal crashes which occur at signalized & non-signalized intersections	HSIP
EMS	Identified countermeasures under other E's will also benefit Emergency Response Safety						
	Evaluate emergency vehicle detection along priority emergency routes	Increase emergency vehicle detection and response times along priority routes	City of Lakeport	Medium-term	Emergency vehicle detection system installed along highest priority emergency routes	Number of corridors with emergency vehicle detection systems operational	HSIP*, Other

**If Emergency Vehicle involved crashes have occurred at the project location. If not, other funding necessary.*

Pedestrian & Bicycle Safety

Focus Area Strategy Table

City of Lakeport Local Road Safety Plan

Strategic Linkage

Identified as one of sixteen Challenge Areas in the California Strategic Highway Safety Plan (SHSP) and a High Priority Challenge Area in the latest Caltrans SHSP.

20% of the serious and fatal crashes involve a pedestrian. Pedestrian and bicycle safety were ranked 5th and 6th out of the 8 priorities in the public outreach, respectively, and 30% of the public comments related to pedestrian and bicycle safety.

Objectives

Success Indicators

Pedestrian & Bicyclist crashes, injuries, and fatalities are reduced.

Reduction in frequency of crashes, injuries, and fatalities of bicyclists & pedestrians in the City of Lakeport.

	Actions	Target Output	Responsible Parties (Secondary Party)	Date of Completion	Performance Measures	Monitoring and Evaluation	Potential Funding Opportunities
Education	Safe Routes to School	Safe Routes to School plan created for local elementary and middle school with identified projects and recommended improvements	Lake Area Planning Council, City of Lakeport, Lakeport Unified School District	Short-term / Medium-term	Short-term: ATP Application submitted for Safe Routes to School Plan (City of Lakeport) Medium-term: Safe Routes to School Plan completed for all eligible LUSD schools	Percentage of students biking & walking to school (gathered during safe routes to school plan and through annual evaluation / monitoring) Total Bicyclists & Pedestrians-involved fatal & serious injury crashes	ATP
	Bike Safety Education for Children	Bike safety instruction for Lakeport children through school or City program	Lake Area Planning Council, City of Lakeport, Lakeport Unified School District	Long-term	Short-term: Pilot bicycle safety program initiated at least one Lakeport Unified School District affiliated school Long-term: Bicycle safety program incorporated into Physical Education curriculum across all Lakeport Unified elementary schools	Percentage of students biking to school (gathered during safe routes to school plan and through annual evaluation / monitoring)	ATP, NHTSA 402
	Active Lighting / Conspicuity Enhancement	Make pedestrians & bicyclists in the City of Lakeport more visible at night to avoid collisions by providing free lighting equipment and retroreflective clothing	City of Lakeport Public Works & Police Department	Medium-term	Obtain high visibility / retroreflective materials for pedestrians through grant funding or standard procurement Provide high visibility / retroreflective materials for pedestrians at in-person events on a regular and on-going basis (at least semi-annually)	Percent of pedestrian crashes which occur outside of 'Daylight' lighting conditions	NHTSA 402 NHTSA 405(h)
	Share the Road & Pedestrian Safety Awareness Messaging	Increase driver awareness of pedestrian & bicyclist rights and needs on the roadway	City of Lakeport Public Works & Public Information	Short-term	Specific Bicycle & Pedestrian Safety focused outreach campaign funded (grant or existing funding) Implemented outreach campaign for full quarter (3 months)	Bicyclist-involved crashes percent of all fatal & serious injury crashes Pedestrian-involved crashes percent of all fatal & serious injury crashes	NHTSA 402

Pedestrian & Bicycle Safety (Continued)
Focus Area Strategy Table
City of Lakeport Local Road Safety Plan

	Actions	Target Output	Responsible Parties (Secondary Party)	Date of Completion	Performance Measures	Monitoring and Evaluation	Potential Funding Opportunities
Enforcement	Pedestrian Crosswalk Sting Program	Conduct intermittent crosswalk sting operation in high pedestrian areas (Main Street, Forbes St, etc.) to increase drive awareness of pedestrian safety.	City of Lakeport - Police Department	Short-term / Medium - Term	Short-term: Grant funding obtained for Pedestrian Crosswalk Sting Program Medium-term: Pedestrian Crosswalk Sting Program established & implemented quarterly	Total fatal & serious injury crashes involving Pedestrian	CTFGP, NHTSA 402, NHTSA 405(e)
Engineering	Systemic Pedestrian Crosswalk project at Unsignalized Intersections	Pedestrian crosswalks implemented at select locations. See details in Appendix E.	City of Lakeport and Lake Area Planning Council	Short-term / Long-term	Short-term: Grant Application(s) completed Long-term: Constructed safety countermeasures	Percent of pedestrian crashes which occur at unsignalized intersections	HSIP, ATP
	Systemic Sidewalk Project	Sidewalks constructed in various locations throughout the City. See details in Appendix E.				Pedestrian involved crashes along roadway segments	HSIP, ATP
EMS	None Identified.						

Roadway & Intersection Lighting

Focus Area Strategy Table City of Lakeport Local Road Safety Plan

Strategic Linkage

30% of all fatal & serious injury crashes occur during non-daylight hours and lighting at crosswalks was identified as a safety issue through the public survey.

Objectives

Crashes, injuries, and fatalities during 'Dark' or 'Dusk' lighting conditions are reduced.
Higher roadway and intersection illumination

Success Indicators

Reduction in frequency of crashes, injuries, and fatalities during 'Dark' or 'Dusk' conditions.
Achieve higher level of illumination in areas with insufficient lighting

	Actions	Target Output	Responsible Parties (Secondary Party)	Date of Completion	Performance Measures	Monitoring and Evaluation	Potential Funding Opportunities
Education	None identified						
Enforcement	None identified						
Engineering	Perform lighting analysis at select locations, starting with those with nighttime crashes, or suspected to have poor lighting	Identified list of locations, potential HSIP project	City of Lakeport Public Works	Short-Term	All locations with crash during 'Dark' Conditions evaluated	Number of completed lighting studies	<i>Public Works Operational Funding</i>
EMS	Identified countermeasures under other E's will also benefit Emergency Response Safety						

Lane Departures

Focus Area Strategy Table

City of Lakeport Local Road Safety Plan

Strategic Linkage

Identified as one of sixteen Challenge Areas in the California Strategic Highway Safety Plan (SHSP) and a High Priority Challenge Area in the latest Caltrans SHSP

Lane departure type crashes (Hit object, Head-on, and Overturned) accounted for 50% of all Fatal & Serious Injury crashes in the City of Lakeport between 2015 - 2019.

Objectives

All Lane Departure type crashes (Head-on, sideswipe, hit object, and overturned) are reduced.

Success Indicators

Reduction in frequency of lane departure type crashes resulting in injuries, and fatalities.

	Actions	Target Output	Responsible Parties (Secondary Party)	Date of Completion	Performance Measures	Monitoring and Evaluation	Potential Funding Opportunities
Education	None identified.						
Enforcement	None identified.						
Engineering	Site Specific - Systemic Clear Recovery Zone	Remove obstacles in the clear zone at select locations. See details in Appendix E.	City of Lakeport Public Works	Short-term / Long-term	Short-term: Grant Application(s) completed Long-term: Constructed safety countermeasures	Lane departure crashes (head-on, sideswipe, hit object, and overturned) percent of all fatal & serious injury crashes Total lane departure type fatal & serious injury crashes	HSIP, CMAQ
Site Specific - 11th St Corridor	Roadway improvements to augment intersection projects. See details in Appendix E.						
Site Specific - Main Street Access Management	Access Management and other improvements. See details in Appendix E.						
Site Specific - Lakeshore Boulevard	Curve warning safety Improvements. See details in Appendix E.						
EMS	Identified countermeasures under other E's will also benefit Emergency Response Safety						

Motorcycle Safety

City of Lakeport Local Road Safety Plan

Focus Area Strategy Table

Strategic Linkage

Identified as one of sixteen Challenge Areas in the California Strategic Highway Safety Plan (SHSP).

40% of all fatal & serious injury crashes involved a motorcycle in the City of Lakeport

Objectives

Motorcycle involved crashes, injuries, and fatalities are reduced.

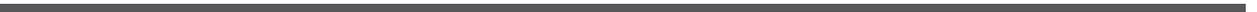
Success Indicators

Reduction in frequency of crashes, injuries, and fatalities of bicyclists.

	Actions	Target Output	Responsible Parties (Secondary Party)	Date of Completion	Performance Measures	Monitoring and Evaluation	Potential Funding Opportunities
Education	Motorcycle Safety awareness messaging	Increased driver awareness of motorcyclists & Reduction in motorcyclist involved crashes	City of Lakeport - Public Works, Public Information <i>Lake Area Planning Council</i>	Medium-term	1. Grant funding obtained for specific Motorcycle Safety outreach campaign 2. Implemented outreach campaign for full quarter (3 months)	Total Motorcycle-Involved fatal & serious injury crashes	NHTSA 402, NHTSA 405(e)
Enforcement	None Identified.						
Engineering	Engineering projects for Intersection Safety and Lane Departures will contribute to motorcycle awareness.						
EMS	None Identified.						

Appendix E

Potential Engineering Projects



Potential Projects Overview – Lakeport LRSP

1. Intersection Safety – Site Specific - 11th Street/ Forbes Street - Unsignalized Intersection

Project Description

The *Eleventh Street Corridor Multimodal and Engineered Feasibility Study* (W-Trans, June 2020) identified a mini-roundabout as the preferred improvement for the 11th Street/ Forbes Street intersection. The potential project is to convert this intersection from a side-street STOP (on Forbes Street) to a roundabout, or to an all-way stop as an alternative if the roundabout is not feasible. *This will require an evaluation to determine if the all-way stop is an appropriate control.* The project can also potentially include upgrading the signage (larger stop signs and/or advanced warning signs) and/or flashing beacons to increase awareness at the intersection. Also, a site distance triangle analysis should be conducted and any obstacles blocking the line of site be cleared.



11th Street / Forbes Street

Reason for Inclusion

This intersection had the highest total crashes (6), and public comments regarding safety. Over half of the crashes were broadside.

The noted risk factors are:

- More lanes on the STOP controlled approach
- No pedestrian crosswalks
- Stop signs may be hard to see and unexpected
- Trees/obstructions may be blocking views

If a site-specific project is not feasible, this intersection should be included in the systemic unsignalized intersection project.



11th Street/ Forbes Street mini-roundabout
Source: Eleventh Street Corridor Study

Countermeasures selected (up to 3 may be included per HSIP application)

No.	Type	Countermeasures Name	Crash Type	CRF	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
NS02	Control	Convert to all-way STOP control (from 2-way or yield control)	All	50%	10	100%	High
NS05	Operation/Warning	Convert intersection to a roundabout (from stop or yield control on minor road)	All	varies	20	100%	Low
NS06	Operation/Warning	Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs	All	15%	10	100%	Very High
NS09	Operation/Warning	Install flashing beacons as advance warning (NS.I.)	All	30%	10	100%	High
NS11	Operation/Warning	Improve sight distance to intersection (Clear sight triangles)	All	20%	10	90%	High

Preliminary Costs, BCR and HSIP Potential

Project costs would be high for the mini-roundabout (estimated at \$450,000 from the corridor study), resulting in a low BCR. Other improvements would be low cost, with a high BCR but may require an exception for HSIP application minimum funding of \$100,000. *If a site project is not feasible, this intersection should be combined with systemic unsignalized intersection improvements.*



11th Street / Forbes Street

2. Intersection Safety – Site Specific - Rt 29/ Rt 175 - Signalized Intersection

Project Description

Safety improvements at a signalized intersection to increase visibility and improve signal operations.

Reason for Inclusion

This intersection is tied for the 2nd highest total crashes (3) and is the only signalized intersection in the top list. This intersection is not in the Lakeport City limits but is included as it may be annexed at some point.

The noted risk factors are:

- No signal backplates
- Additional signal heads are pole mounted which are less visible
- No protected Left-turn phase on Rt 175. Adding a left turn phase would require geometric modifications for a left-turn lane.



Rt 29 / Rt 175

Countermeasures selected

No.	Type	Countermeasures Name	Crash Type	CRF	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
S02	Signal Modification	Improve signal hardware: lenses, back plates with retroreflective borders, mounting, size, and number	All	15%	10	100%	Very High
S03	Signal Modification	Improve signal timing (coordination, phases, red, yellow, or operation)	All	15%	10	50%	Very High

S06 – Signal Modification – Install left turn lane and turn phase would carry a CRF of 55%, a strong safety improvement, but is not expected to be justified given the costs and number of crashes.

Preliminary Costs, BCR and HSIP Potential

This project has low HSIP potential. Project costs are low, and the BCR is expected to be medium given the crash data. The project may require an exception for HSIP application minimum funding of \$100,000 as a stand-alone project and combining with other signalized locations for a systemic project would lower the BCR.



Rt 29 / Rt 175

3. Intersection Safety – Systemic Unsignalized Intersections 1

Project Description

The *Eleventh Street Corridor Multimodal and Engineered Feasibility Study* (W-Trans, June 2020) identified corridor-wide improvements. This systemic project could implement improvements at some of the intersections by improving safety and visibility with additional signage, flashing beacons and upgraded pavement markings.

Intersections:

- 11th Street / Central Park Street
- 11th Street / Tunis Street
- Forbes Street / Martin Street
- 11th Street / SR 29

Other intersections with similar characteristics may be added, potentially other intersections on 11th Street. If a roundabout is planned for Central Park Street (from the 2017 RTP), this intersection should be removed. 11th Street/ Forbes Street should be added if a site-specific project is not feasible.

Reason for Inclusion

These intersections were in the top crash locations, and all have risk factors consistent with the countermeasures.



11th Street/ Central Park



Forbes Street/ Martin Street

Countermeasures selected

No.	Type	Countermeasures Name	Crash Type	CRF	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
NS06	Operation/Warning	Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs	All	15%	10	100%	Very High
NS07	Operation/Warning	Upgrade intersection pavement markings (NS.I.)	All	25%	10	100%	Very High
NS08	Operation/Warning	Install Flashing Beacons at Stop-Controlled Intersections	All	15%	10	100%	High

Preliminary Costs, BCR and HSIP Potential

Project costs would vary with the number of intersections, signs, striping quantities, etc but are relatively low. The BCR is expected to be high given the crash frequency; therefore, this project has high HSIP potential.

4. Intersection Safety – Systemic Unsignalized Intersections 2

Project Description

Perform site distance triangle evaluations to determine where vegetation and other obstructions should be cleared.

Locations:

- 11th Street / Central Park Street
- 11th Street / Tunis Street
- Forbes Street / Martin Street



11th Street / Tunis Street

If the roundabout is pursued for 11th Street / Central Park Street as indicated in the 2017 RTP, this intersection should be removed from consideration. Other intersections with similar characteristics may be added for a systemic approach.

Reason for Inclusion

These intersections were in the top crash locations, and all have potential sight distance issues, to be confirmed through evaluation.

Countermeasures selected

No.	Type	Countermeasures Name	Crash Type	CRF	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
NS11	Operation / Warning	Improve sight distance to intersection (Clear sight triangles)	All	20%	10	90%	High

Preliminary Costs, BCR and HSIP Potential

The costs, BCR, and HSIP potential would be identified when the number of sites requiring clearing was determined.

5. Pedestrian Safety – Systemic Pedestrian Crosswalk at Unsignalized Intersections

Project Description

Install or upgrade pedestrian crosswalks with continental crosswalks, signage, flashing beacons and/or other advanced safety features.

Reason for Inclusion

These locations had a pedestrian crash and lack upgraded crosswalks. The locations are:

- Forbes Street / Martin Street – no crosswalks
- 11th Street / Brush Street – no crosswalks
- 11th Street / Main Street – crosswalk on north leg (Main Street)
- Main Street / 1st Street – crosswalks all legs



11th Street / Brush Street

It is noted that the crosswalk locations on 11th Street differ from those in the *Eleventh Street Corridor Study*. Crosswalks should be installed at the most beneficial locations, and not necessarily where a crash occurred. If an adjacent location is more practical to construct a crosswalk this provides a safety benefit for the surrounding area. If the roundabout at 11th Street/ Main Street is planned as included in the *2017 RTP*, this intersection should be removed from consideration. Other locations may be added as identified. Crosswalk legs should be determined considering pedestrian travel patterns and should connect to sidewalks.

Countermeasures selected

No.	Type	Countermeasures Name	Crash Type	CRF	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
NS21PB	Ped and Bike	Install/upgrade pedestrian crossing at uncontrolled locations (with enhanced safety features)	P & B	35%	20	100%	Medium
NS22PB	Ped and Bike	Install Rectangular Rapid Flashing Beacon (RRFB)	P & B	35%	20	100%	Medium

Preliminary Costs, BCR and HSIP Potential

Project costs would vary with the number of intersections, signs, and advanced crosswalk features. The BCR is expected to be high given the crash frequency and low project cost. This project has high HSIP potential. If it is desired to keep the crosswalk locations in the 11th Street Study instead of the locations in the crash data, proper justification must be presented in the HSIP application.



Main Street / 11th Street

6. Pedestrian Safety – Systemic Sidewalk

Project Description/ Reason for Inclusion

Construct sidewalks and/or fill in sections of missing sidewalks along various routes:

- 11th Street Corridor (Main Street to SR 29) – This roadway had 2 pedestrian crashes and public comments. The corridor services residential and commercial. Some sidewalks exist on both sides, with missing sections. The need for sidewalks was identified in the *Eleventh Street Corridor Study*.
- 6th Street - This roadway had public comments regarding pedestrian safety and discontinuous sidewalks. The corridor services residential. Some sidewalks exist on both sides, with missing sections.
- Lakeshore Boulevard - This is a top crash roadway (not pedestrian related). Some sidewalks exist on both sides, with missing sections.
- Hartley Street is noted as a top crash roadway (not pedestrian) and for the public comments. However, this roadway is planned to be improved through *Safe Routes to Schools* and is removed from further consideration.



Lakeshore Boulevard

These locations were all included in the *Lake Walks Study*.

Countermeasures selected

No.	Type	Countermeasures Name	Crash Type	CRF	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
R34PB	Ped and Bike	Install sidewalk / pathway (to avoid walking along roadway)	P & B	80%	20	90%	Medium

Preliminary Costs, BCR and HSIP Potential

This project has low potential for HSIP funding as the project costs are expected to be high and the BCR is expected to be low. This project may be combined with others for a systemic roadway project with other countermeasures.

7. Lane Departures – Systemic Clear Recovery Zone

Project Description

Investigate corridors with lane departure-type crashes that appear to have vegetation or other obstacles in the clear zone. As identified, remove, shield or mark obstacles in the clear zone.

Roadways:

- 11th Street
- Lakeshore Boulevard
- Main Street

Other locations should be included as identified. Hartley Street was a top location in the crash data but is planned to be improved. Should safety issues persist, consider evaluating the clear zone on this roadway.



11th Street Corridor

Reason for Inclusion

Crash data, public comments and initial field review indicated that these corridors may have obstacles in the clear zone.

Countermeasures selected

No.	Type	Countermeasures Name	Crash Type	CRF	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
R02	Remove/ Shield Obstacles	Remove or relocate fixed objects outside of Clear Recovery Zone	All	35%	20	90%	High

Preliminary Costs, BCR and HSIP Potential

The costs would be determined following an evaluation. The project is expected to have low potential for HSIP funding.

8. Lane Departures – Site Specific – Lakeshore Boulevard

Project Description

This project would increase curve warning signage along Lakeshore Boulevard.

Reason for Inclusion

Lakeshore Boulevard is a top crash roadway, with public comments on speeding and bicycle safety. Several curves lack warning signs.



Lakeshore Boulevard

Countermeasures selected

No.	Type	Countermeasures Name	Crash Type	CRF	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
R22	Operation / Warning	Install / Upgrade signs with new fluorescent sheeting (regulatory or warning)	All	15%	10	100%	Very High
R23	Operation / Warning	Install chevron signs on horizontal curves	All	40%	10	100%	Very High
R24	Operation / Warning	Install curve advance warning signs	All	25%	10	100%	Very High

Preliminary Costs, BCR and HSIP Potential

Project costs are low. This project has low HSIP potential as a stand-alone project but may be combined with others as a systemic project.



Lakeshore Boulevard

9. Lane Departures – Site Specific – 11th Street Corridor

Project Description

This project is to update any striping or reflectors along the corridor to compliment the intersection safety improvements on 11th Street. This project may be combined with the intersection safety improvements for a corridor-wide project, or with Lakeshore Boulevard as a systemic project.



Reason for Inclusion

11th Street is a top crash corridor with most crashes occurring at intersections. Several intersection projects are proposed.

11th Street Corridor

Countermeasures selected

No.	Type	Countermeasures Name	Crash Type	CRF	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
R27	Operation / Warning	Install delineators, reflectors, and/or object markers	All	15%	10	100%	Very High
R28	Operation / Warning	Install edge-lines and centerlines	All	25%	10	100%	Very High

Preliminary Costs, BCR and HSIP Potential

Project costs are relatively low, to be determined depending on the length of segments to be updated. The BCR and HSIP potential are expected to be low as a corridor project since most crashes occur at intersections. This project may be combined with others for a systemic roadway project with other countermeasures.

10. Lane Departures/Distracted Driving/Intersection Safety – Site Specific – Main Street

Project Description

Deploy access management and complete street strategies on Main Street.



Main Street Corridor

Reason for Inclusion

Main Street is a top crash corridor and a primary route through Lakeport. The corridor has a high concentration of driveways, faded striping, long continuous driveways, worn pavement, some unprotected crosswalks, utility poles/objects near the roadway, and on-street parking.

Countermeasures

Overtime, access management strategies should be applied to consolidate driveways and create more defined driveway egress/ingress points. As possible, on-street parking should be moved to parking lots, and the roadway should be upgraded for multimodal use including bicycle lanes and separated sidewalks.

Preliminary Costs, BCR and HSIP Potential

This project has low potential for HSIP funding.

11. Lighting – Systemic Lighting Project

Project Description

Consider evaluation of lighting conditions at locations with nighttime crashes or any roadways with potentially insufficient lighting. Upgrade illumination at any locations found to have low levels.

Reason for Inclusion

The locations with nighttime crashes are shown in **Figure 1**. This alone does not indicate a lighting deficiency but rather to consider evaluating the conditions.

Countermeasures selected

For locations with low levels of lighting, Countermeasures RSO1, NSO1, SO1 should be pursued for funding.

Preliminary Costs, BCR and HSIP Potential

The costs, BCR and HSIP potential would be determined after evaluation of lighting levels.



Roadway Lighting

12. Speeding – Systemic Speed Project 1

Project Description

Install variable speed signs on various corridors:

- Lakeshore Blvd
- 11th St
- Main St
- Lakeport Blvd

Reason for Inclusion

These corridors are top crash roadways with speed as the primary crash factor (PCF) for some crashes and/or referenced in the public comments.



Variable Speed Sign

Countermeasures selected

No.	Type	Countermeasures Name	Crash Type	CRF	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
R26	Operation / Warning	Install dynamic/variable speed warning signs	All	30%	10	100%	High

Preliminary Costs, BCR and HSIP Potential

The costs, BCR and HSIP potential are low to medium, depending on the number of signs deployed. This project may be combined with others for a systemic roadway project with other countermeasures.

13. Speeding – Systemic Speed Project 2

Project Description

Deploy portable speed trailers throughout Lakeport.

Reason for Inclusion

Speeding is a focus area and was identified throughout Lakeport as a PCF and in the public comments. Portable trailers will allow for citywide deployment with the ability to move to various locations.

Preliminary Costs, HSIP Potential

The costs are estimated at \$20,000 per portable trailer. This is not an HSIP eligible countermeasure or project.



Portable Speed Trailer

Appendix F

HSIP Analyzer Manual and Countermeasure Table



HSIP ANALYZER MANUAL

(FOR BCR APPLICATIONS)

HSIP Analyzer is a PDF form-based software that streamlines the process of cost estimate, safety improvement countermeasure evaluation, crash data input and Benefit Cost Ratio (BCR) calculation. The use of the HSIP Analyzer is required for all applications for Highway Safety Improvement Program (HSIP) Cycle 10 Call for Projects. The completed HSIP Analyzer is one of the required attachments to the HSIP Application Form (Attachment No. 5, last page of the application form).

There are two HSIP application categories: BCR and Funding Set-asides. **This manual provides instructions for using the HSIP Analyzer to prepare a BCR application. Please use the other manual for Funding Set-aside Applications.**

Please review these instructions thoroughly before you start to prepare a BCR application.

For more information regarding the HSIP program, please review the HSIP Guidelines, Local Roadway Safety Manual for California Local Road Owners and other related information at <https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvement-program>.

Table of Contents

GENERAL INFORMATION.....	3
SECTION I: CONSTRUCTION COST ESTIMATE AND COST BREAKDOWN.....	6
SECTION II: PROJECT COST ESTIMATE.....	7
SECTION III: CRASH DATA.....	8
SECTION IV: CALCULATION AND RESULTS.....	13
APPENDIX: LIST OF COUNTERMEASURES.....	14

For an application that needs a BCR, the HSIP Analyzer consists of the below sections:

➤ **General Information**

Provides Application ID, Project Location, Project Description, type of project locations (signalized intersections, non-signalized intersections or roadways), safety countermeasures to be applied, estimated project schedule and other general information.

➤ **Section I: Construction Cost Estimate and Cost Breakdown**

Provides estimate for construction items, determines the project’s maximum Funding Reimbursement Ratio (FRR).

➤ **Section II: Project Cost Estimate**

Provides the cost estimate for the entire project, including all phases (PE, ROW, CON and CE). Also determines the requested HSIP funding amount.

➤ **Section III. Crash Data**

Provide crash data for the purpose of calculating the project benefit in Section IV.

➤ **Section IV. Calculation and Results**

Calculate the project benefit, the BCR and provide calculation result summaries. Errors are displayed in lieu of calculation results if detected.

One BCR application may include one or multiple locations. Please note:

- a. All the locations in the application must be of the same type: Signalized Intersections (S), Non-Signalized Intersections (NS), or Roadways (R). For example, an application may have 5 Non-Signalized Intersections, but it cannot have 2 Non-Signalized Intersections, 1 Signalized Intersection and 2 roadway sections.
- b. All the locations in the application must receive the same proposed safety improvements, i.e. all the safety countermeasures (CMs) must be applied to all the locations. Up to three (3) safety countermeasures may be used in calculating the benefit of the project.

If the above criteria are not met, please break your proposed project into multiple applications. Applicants may consider combining the applications into one project during implementation if multiple applications of small sizes are selected for funding. The purpose of this requirement is to evaluate the locations of same characteristics with similar safety concerns together and justify the selection of the locations based on their own expected safety benefits.

Example:

A project includes 20 signalized intersections. CMs “Add Intersection Lighting” (S01) and “Install pedestrian countdown signal heads” (S17PB) will be applied to all 20 intersections. If for another set of 12 intersections only CM S17PB will be installed since lighting exists, these 12 intersections should have a separate application.

Exception 1: If your project has only very few locations that the situation is different from the majority, you may include all locations in one application. Multiple HSIP Analyzer files will be needed if the project includes locations/sites of different types (S, NS and R). Please attach all your HSIP Analyzer files to the application form. Please sum the benefits and calculate the application’s BCR as (Total benefits/Total Project Cost). Enter the BCR into the application form.

Example:

A project includes 20 signalized intersections. CMs “Add Intersection Lighting” (S01) and “Install pedestrian countdown signal heads” (S17PB) will be applied to all 20 intersections. If you have 2 more intersections that only CM S17PB will be applied, you may include all 22 intersections in one application. Since all locations are of the same type (S), only one HSIP Analyzer file is needed.

Exception 2: If your project proposes corridor safety improvements which may include a number of signalized intersections, non-signalized Intersections, and roadway sections, you may include all locations in one application which then needs multiple HSIP Analyzer files. All HSIP Analyzer files pertaining to your application must be attached to the last page of the application form. Please sum the benefits and calculate the application's BCR manually as (Total benefits/Total Project Cost). Enter the BCR into the application form.

Exception 3: If your project uses a systemic approach, you may include all locations in one application though the proposed safety improvements may be different. For example, for a project that includes many curve road segments that have an existing or potential roadway-departure crash problem, all road segments can be in one application, though the safety countermeasures may vary. Since all locations are of the same type (R), only one HSIP Analyzer file is needed. Please note the maximum number of safety countermeasures allowed in one HSIP Analyzer file is 3.

General Information

Application ID: Enter the exact Application ID from the Application Form, e.g. 03-Sacramento-1.

Save the completed HSIP Analyzer as file name “HA” + Application ID before you attach it to the last page of the Application Form (e.g. "HA03-Sacramento-1.pdf").

If your application has multiple HSIP Analyzer files (this is rare), please use different file names and attach all to the application form. See the previous page for more explanation.

Project Location: Enter (copy & paste) the exact Project Location from the Application Form.

Project Description: Enter (copy & paste) the exact Project Description from the Application Form.

Application Category, Location Type and Countermeasures:

- Select “Benefit Cost Ratio (BCR)” from the drop-down list;
- Select the location type (“Signalized Intersections”, “Non-Signalized Intersections” or “Roadway Sections”). only countermeasures (CMs) pertaining to the selected location type will be displayed in the below drop-down lists for CM selection.
- Number of Intersections and Miles of Roadway: provide number of intersections (if (“Signalized Intersections” or “Non-Signalized Intersections” is selected above) or the length of roadways (if “Roadway Sections” is selected above).
- Select number of countermeasures for the project (1, 2 or 3); and
- Select the name for each countermeasure.

The countermeasures selected here will be populated in Section I (Construction Cost Estimate and Cost Breakdown) and Section III (Crash Data).

If an error message is displayed at the bottom of this page, the message must be cleared before proceeding to the next page. An error message will be displayed if one of the following specific CM rules is violated:

- 1) S08 and S02 should not be selected together.

S08 (“Convert signal to mast arm (from pedestal-mounted)”) and S02 (“Improve signal hardware: lenses, back-plates, mounting, size, and number”) should not be selected together as the work of S02 is considered part of CM S08.

- 2) Any of the below CMs should not be selected in combination with any other CMs:

- S16 - Convert intersection to roundabout (from signal);
- NS03 - Install signals;
- NS04 - Convert intersection to roundabout (from all way stop);
- NS05 - Convert intersection to roundabout (from stop or yield control on minor road).

Project information

Most of the information requested in this session is required for Caltrans to meet its annual safety program reporting requirements to the FHWA. Responses to these questions will NOT be used in the scoring, ranking or selection process. The responses will be incorporated in statewide and national safety program assessments and used to determine the health of the overall program and potential areas of focus for future program improvements.

Some of the questions are self-explanatory so not all questions are explained here.

Functional Classification (FC):

Visit <https://dot.ca.gov/programs/research-innovation-system-information/office-of-highway-system-information-performance>, click “California Road System (CRS) maps” in the middle of the webpage, and determine the Functional Classification (FC) of the road(s) where most of the work will be constructed. If the amounts of work are equal among multiple FCs, use the highest FC. Select the FC from the drop-down list.

Urban/Rural Area:

Select “Urban” or “Rural” from the drop-down list, when most of the proposed work is in urban or rural area.

What is the approximate total cost percentage that is HR3 eligible?

Work in **rural** area and associated with roads functionally classified as “Major Collector”, “Minor Collector” and/or “Local”, is High-Risk-Rural-Roads (HR3) eligible. HR3 eligible projects, when selected for funding, will be tracked separately due to the FHWA’s special requirements. Provide an approximate total cost percentage that is HR3 eligible (rounded to the nearest ten percent).

Annual Average Daily Traffic and Year Collected:

Indicate the existing (or most current) Annual Average Daily Traffic (AADT) volume at the project location and the year the data were collected.

- If the proposed improvement is on a road segment, the AADT is the number of vehicles that use that section of roadway, in both directions, on an average day. You may enter the same number for the Major Road and Minor Road.
- If the proposed improvement is at an intersection, separate the AADT volumes approaching the intersection into Major Road and Minor Road.
- If the proposed improvements span a large distance and/or are spread out over several routes/locations, provide the range of AADT volumes with the high-end input in the "Major Road" field and the low-end input in the "Minor Road" field.

Posted Speed Limit (mph):

Input the highest posted speed within the project limits.

SHSP Challenge Area:

The goal of this question is to tie the improvements to California’s Strategy Highway Safety Plan (SHSP). Most projects should fall within one of the Challenge Areas. Select the primary one if multiple Challenge Areas apply. Visit <https://dot.ca.gov/programs/traffic-operations/shsp> for more details on the California SHSP Challenge Areas.

Is the project focused primarily on “spot location(s)” or “systemic” improvements?

The [Local Roadway Safety Manual](#) includes a detailed description of these two approaches. When more than one type of systemic improvements is proposed in one application, applicants need to select a single “primary type”.

Approximate percentage of project cost going to improvements related to motorized travel:

HSIP projects benefit a mix of roadway users and modes of travel. For statewide tracking purposes, Caltrans needs to approximate the percent of the overall project costs going to improvements for motorized vs. non-motorized roadway users. Please make the best approximation of the percentage related to motorized travel based on the estimated project cost and the primary goals and objectives of the project.

Project Schedule:

The local agency is expected to deliver the project per [the HSIP Program Delivery requirements](#). The delivery requirements for HSIP Cycle 10 projects are: (1) Preliminary Engineering (PE) Authorization by 9/30/2021; and (2) Construction (CON) Authorization by 12/31/2023.

The exceptions are:

- The milestone of PE authorization does not apply if the project will not use the HSIP funds for PE;
 - For a project that a consultant is used for the PE work, an additional time of 6 months is allowed for meeting the CON Authorization milestone. The additional time is for the agency to advertise and select the consultant for the work of the PE phase.
-

Please answer the below two questions:

- Will this project use HSIP funds for Preliminary Engineering (PE) Phase?
- Will an external consultant be hired to do the PE work?

Then specific delivery requirements for your proposed project, if selected for funding, will be displayed.

Please provide your best estimated dates for the following implementation milestones (leave blank if not applicable). Please make sure the proposed schedule will meet the above delivery requirements.

- PE Authorization Date;
- Environmental Clearance Date;
- Right of Way Clearance Date;
- Final PS&E Date;
- CON Authorization Date;
- Construction Contract Award Date;
- Construction Completion Date; and
- Project Close-Out Date.

Section I: Construction Cost Estimate and Cost Breakdown

The purpose of this section is to:

- Provide a detailed engineer's estimate for construction items. The costs for other phases i.e. Preliminary Engineering (PE), Right of Way (ROW), and Construction Engineering (CE) will be accounted for in Section II.
- Determine the maximum Funding Reimbursement Ratio (FRR) of the project.

I.1 Countermeasures (CMs) applied to all locations (from Page No. 1)

The CM information comes from Page No. 1.

I.2 Detailed Engineer's Estimate for Construction Items:

➤ **Table for Detailed Engineer's Estimate:**

The gray fields are calculated and read-only. Each line is for one construction item. Click + or – buttons to add a new line or delete an existing line.

In each line, enter the construction item description, quantity, unit, unit cost, and the cost percentages that are directly attributed to each of the countermeasures (CMs) and OS (“other safety-related components”). The remaining percentage is calculated and goes to NS (“non-safety-related components”).

At the bottom of the table, an overall cost percentage will be calculated for each CM, OS and NS.

➤ **Contingencies:**

In general, not all project construction costs are well defined at the time the HSIP applications are prepared. For this reason, applicants are allowed to include Construction Item Contingencies as a percentage of the known construction costs. This is the only project contingencies allowed in an HSIP application. When applicants calculate their Preliminary Engineering (PE) and Construction Engineering (CE) costs as a percentage of the Total Construction Cost, contingencies will automatically be built into the PE and CE costs.

➤ **Total Construction Cost:**

The total construction cost is the sum of the construction item costs and the contingencies, rounded up to the nearest hundreds.

I.3 Funding Reimbursement Ratio

The project's maximum FRR is calculated as:

- The smallest of the Funding Eligibility (FE) percentages of the selected CMs, when the percentage of the non-safety-related components is no more than 10%;

For example, if the FEs of the 3 CMs are 100%, 90% and 100%, and the % of the non-safety-related components is 8%, the project's maximum FRR will be 90%.

- OR the smallest of the FE percentages of the selected CMs minus the percentage of the non-safety-related-components exceeding 10%, when the percentage of the non-safety related components is more than 10%.

For example, if the FEs of the 3 CMs are 100%, 90% and 100%, and the % of the non-safety-related components is 18%, the project's maximum FRR will be $90\% - (18\% - 10\%) = 82\%$.

After the completion of Section I, the following data will be transferred to Section II (Project Cost Estimate) automatically: (1) Total Construction Cost; and (2) Maximum Funding Reimbursement Ratio (FRR). FRR will be used as the maximum "HSIP/Total" percentage allowed in Section II.

Section II: Project Cost Estimate

Section II of the application form is used for the overall project cost estimate including all applicable phases, i.e. Preliminary Engineering (PE), Right of Way (ROW), Construction (CON), and Construction Engineering (CE). All project costs (all phases and funding sources) must be accounted for in this section.

The costs included in the application represent the likely total project cost necessary to fully construct the proposed scope. If the proposed project is a piece of a larger construction project, the entire scope of the larger project must be identified and included in this section even if substantial elements are to be funded by other sources. The Total Project Cost from this section will be used in the later Benefit Cost Ratio (BCR) calculation.

The following data are transferred to this section from Section I:

- Total Construction Cost;
- Maximum Funding Reimbursement Ratio (FRR), i.e. Maximum "HSIP/Total" percentage allowed for this project.

All the grey fields contain formulas and are read-only.

For each line in the table, enter the total cost (rounded up to the nearest hundred dollars) and the desired HSIP/Total Cost ratio. The desired HSIP/Total ratio cannot be more than the project's maximum FRR. You may click the "Set" button on top of the table to set all "HSIP/Total" percentages to the project's max FRR. The amounts of HSIP Funds and Local/Other Funds will be calculated by the form.

Check Box indicating Agency does NOT request HSIP funds for PE Phase:

If no HSIP funds for the PE Phase are requested, this Check Box will be checked automatically. This information will only be used for project delivery tracking. It will not affect the ranking or selection of applications for funding.

Automatic Data Validation:

Once all costs and ratios are entered, a message will appear if errors are detected, based on the below criteria. Please fix the errors unless justification for exceptions is provided in narrative question no. 3 in the Application Form.

- 1) The "HSIP Funds" for Construction Items may not be zero.
- 2) "HSIP Funds" for Preliminary Engineering may not exceed 25% of the HSIP Construction Cost.
Exception: for low cost systematic projects such as Roadway Safety Signing Audits (RSSA), Caltrans anticipates approving PE costs over 25%. For more information on this type of project, see the example document at [the HSIP website](#).
- 3) "HSIP Funds" for Right of Way may not exceed 10% of the HSIP Construction Cost.
- 4) "HSIP Funds" for Construction Engineering may not exceed 15% of the HSIP Construction Cost.
- 5) "HSIP Funds" may not exceed \$10,000,000.
- 6) To maintain efficiencies in the overall Program and Project Management, the "Total HSIP Funds" must be \$100,000 or more. If needed, agencies should consider extending the project limits and /or adding another safety improvement in order to increase both the total project Benefits and Costs.

Exception: (1) Caltrans recognizes that for some rural agencies with extremely small numbers of crashes, this \$100,000 minimum HSIP funding requirement may not be achievable without their applications having low B/C ratios, which may not be fundable. If an agency believes their jurisdiction falls into this category, they may request an exception to this \$100,000 minimum funding requirement through their District Local Assistance Engineer; (2) You may combine multiple applications (if selected for funding) in implementation so the combined project has more than \$100,000 of HSIP funds.

After the completion of the project cost estimate, "Total Project Cost" will be automatically transferred to Section IV (Calculation and Results).

Section III: Crash Data

The benefit of an HSIP safety project is achieved by reducing potential future crashes due to the application of the safety countermeasures (CMs). In this section, you will need to provide information regarding the historical crash data at the project sites.

Different CMs will reduce crashes of different types during the life of the safety improvements. Depending on the selected CMs for the application, you will be required to fill in one or more crash data tables, for any combination of the five crash types (datasets): "All" , "Night" , "Ped& Bike" , "Emergency Vehicle" , and "Animal" (Each of the later four datasets is a sub-dataset of the "All" dataset.)

If a Roundabout CM (S16 or NS04 or NS05) is selected, additional information (such as roundabout configuration and ADT) is required.

Please refer to the [Local Roadway Safety Manual](#) for information.

Please answer the below two questions:

- Please indicate the sources of the crash data. Typical sources include Statewide Integrated Traffic Records System (SWITRS), UC Berkeley SafeTREC TIMS, your locally preferred mapping software (such as Crossroads) or any other data sources.
- Please explain how “incremental approach” has been pursued If CM R15, R16, R17 or R18 is proposed. Please skip this question of none of these CMs are being proposed.

Countermeasure R15 (Widen shoulder), R16 (Curve shoulder widening (outside only)), R17 (Improve horizontal alignment (flatten curves)) and R18 (Flatten crest vertical curve) are not eligible unless they are done as the last step of an "incremental approach". Applicants need to document they have already installed lower cost and lower impact CMs but the crash rate is unacceptably high. What safety improvements have been pursued and installed at the project sites within the last ten years?

Applicants need to demonstrate lower cost and lower impact CMs have already installed, such as signing/stripping upgrades to MUTCD standards/recommendations, rumble strips, improving pavement friction (High Friction Surface Treatment, or HFST), etc. You have already monitored the crash occurrences after these improvements were installed, and the 'after' crash rate is still unacceptably high. In addition, a summary of the 'before' and 'after' crash analysis is preferred and provided as the last attached to the HSIP Application Form).

If “incremental approach” has not been pursued while CM R15, R16, R17 or R18 is proposed, please explain why a special exception should be made to your application.

III.1: List of project locations

List all locations/sites included in this project. Please note all locations/sites must be of the location type as entered on page 1.

Location groups: all locations (sites) in the same group must have exactly the same safety countermeasures. No location (site) may be in multiple groups.

One location is pre-populated for each location group. Click “+” button to add a new line, or click “-“ to delete an existing line. Enter a location description for each line.

The locations may be intersections or roadway sections, e.g. “Intersection of A St. and B St.”, “A St. between B St. and C St.”, etc. If your project has a large number of locations, please aggregate some locations into one description, e.g. 10 stop controlled intersections, 5 horizontal curves, etc., as long as they have similar features and the safety improvements to be implemented are the same. Please limit the number of rows in the table to no more than 25.

The locations in this list will be pre-populated in the crash data table(s) for each group in Section III.2.

Grouping example:

A project has 5 road segments. All 5 segments (A, B, C, D & E) utilize CM “Install curve advance warning signs” (R24). In addition, 3 of the 5 segments (C, D & E) utilize “Install edgeline rumble strips/stripes” (R31) as well.

There will be 2 groups for this project:

Group 1: Segments A & B, with CM = R24 only;

Group 2: Segments C, D & E, with 2 CMs (R24 & R31).

Note: we cannot have only one group with all 5 segments, as that will imply all segments will be treated with both R24 and R31.

III.2: Countermeasures and crash data

- 1) Countermeasures to be applied: The CM information is pre-populated from the inputs on page 1. Each CM has a corresponding crash type that the CM targets. The crash types are: “All”, “Night”, “Ped & Bike”, “Emergency Vehicle” and “Animal”. Each of the later four is a subset of the first. Based on the CMs for the project, only the tables for the required crash data types are displayed.

Note: If a “roundabout” CM, i.e. S16, NS04 or NS05 (CM ID), is used, the below information is required as the benefit calculation for roundabouts is different from the other CMs.

- Project location: “Urban” or “Rural” (select from dropdown list)
 - Intersection type: “Full Intersection” or “T intersection” (select from dropdown list)
 - Roundabout: “1 lane” or “2 lanes” (select from dropdown list)
 - Average Daily Traffic (ADT), Major Road: ADT on the major road of the intersection
 - Average Daily Traffic (ADT), Minor Road: ADT on the cross road of the intersection
- 2) Enter the date range of the crash data. The crash data time period must be a minimum of 3 years and a maximum of 5 years. The most recent available crash data must be used.
 - 3) Based on the CMs that are selected, crash data tables of the required categories ("All", "Night", "Ped & Bike", "Emergency Vehicle", and "Animal") are displayed for data entry.

Important information regarding countermeasures and crash data

Below is more information and explanations regarding countermeasures and crash data. Please read and make sure the data provided are correct. Past HSIP calls for projects indicated that the most flaws found in disqualified applications are related to misapplication of countermeasures and miscounting of crash data.

Safety Countermeasures vs. Crash Data Tables

A total of 82 countermeasures are available to be utilized in the HSIP Analyzer. Different countermeasures may target different crash types. For example, installing a new signal at an intersection intends to reduce crashes of all types, while installing pedestrian countdown signal heads only reduces crashes related to pedestrians and bicyclists (Ped & Bike), and adding intersection lighting targets crashes at night only.

For the use of the HSIP Analysis, there are 5 different crash types: “All”, “Night”, “Ped & Bike”, “Emergency Vehicle” and “Animal”. Each of the later four datasets is a sub-dataset of the "All" dataset. Refer to the Appendix for more information. In the 82 countermeasures listed in the Appendix, 59 are for crashes of all types, 18 for Ped&Bike crashes, 3 for night crashes, 1 for crashes with emergency vehicles, and 1 for crashes with animals involved.

Depending on the selected countermeasures, you will be required to fill in one or more crash data tables, for one or a combination of the five crash types. For example, if two countermeasures are utilized in a group – “Install flashing beacons as advance warning” (Countermeasure S10) and “Add intersection lighting” (Countermeasure S01), two crash data tables are required, one for all crashes (for S10) and the other for night crashes (for S01).

Crash Data Table

A Crash Data Table is a summary table of crash data for all the locations included in the project, with one row for one location and one column for a severity. Below is the structure of a Crash Data Table for Ped&Bike crashes.

Example: Crash Data Table for Crash Type: Pedestrians and Bicyclists Involved

Location	Fatality	Severe Injury	Injury - Other Visible	Injury - Complaint of Pain	Property Damage Only	Total
Intersection of A St. & B St.	0	1	0	2	4	7
Intersection of A St. & C St.	1	1	1	5	4	12
Intersection of A St. & D St.	0	2	1	2	10	15
Total	1	4	2	9	18	34

Safety countermeasures available for use in HSIP Analyzer

The available countermeasures are broken down into three groups (Signalized Intersection, Non-signalized Intersection, and Roadway Segment). The Appendix of this document provides a complete list of the countermeasures. Review **Section 4.0 and Appendix B of the California Local Roadway Safety Manual** before making the final selection of countermeasures to utilize in the BCR calculations. The detailed description of the countermeasures and guidance on how they can be applied will help applicants ensure they are utilizing the most appropriate countermeasures for their projects.

Any single project may use up to three countermeasures. When a countermeasure of a major safety improvement is selected, other incidental elements of the major countermeasure should be not used together with the major one. For example: A project proposing a new signal shall not include countermeasures for lighting, signing, striping, or minor median improvements as they are incidental elements of the new signal and do not represent stand-alone improvements.

Specific rules for some particular countermeasures

Please pay attention to the specific rules and requirements pertaining to CMs NS03, NS14, NS23PB, R08 and R14 (Refer to Appendix B of the [California Local Roadway Safety Manual](#) for more details):

1) NS03, Install signals:

All new signals must meet [CA MUTCD](#) "safety" warrants: 4, 5 or 7;
No other intersection CMs can be applied to the intersection crashes in conjunction with this CM.

**2) NS14, Install raised median on approaches (NS.I.)
R08, Install raised median**

All new raised medians must not include the removal of the existing roadway structural section and must be doweled into the existing roadway surface.

3) NS23PB, Install Pedestrian Signal (including Pedestrian Hybrid Beacon (HAWK)):

For HAWK or other pedestrian signals, the justification may be Warrant 4, 5 and/or 7, or passing the test in Figure 4F-1/4F-2 in Chapter 4F of CA MUTCD. Please refer to Chapter 4F of CA MUTCD for more details.

4) R14, Road Diet (Reduce travel lanes from 4 to 3 and add a two way left-turn and bike lanes):

"Intersection" crashes can only be applied when they resulted from turning movements that had no designated turn lanes/phases in the existing condition and the Road Diet will provide turn lanes/phases for these movements. This CM does not apply to roadway sections that already included left turn lanes or two way left turn lanes before the lane reductions. New bike lanes are also expected to be part of these projects. Pre-approval from the HSIP program manager is needed for: 1) the use of this CM without removing a

travel lane in each direction and/or without adding new bike lanes; and/or 2) if any pavement is planned to be removed for the purpose of adding landscaping, planter-boxes, or other non-roadway user features.

Crash Data

1) Crash data time period:

The crash data time period must be **a minimum of 3 years and a maximum of 5 years** and the most recent available crash data must be used.

2) Multiple crash data tables may be needed for a group. Depending on the selected countermeasure(s), different categories of the crash data are required. Each table is for one of the 5 categories (dataset/sub-datasets): All; Night; Ped & Bike; Emergency Vehicle; and Animal.

3) There are three sub-severities of injury crashes: “Severe Injury”, “Injury – Other Visible” and “Injury – Complaint of Paint”. **If the injury crashes in your agency’s crash database do not have more detailed sub-severities, all of the injury crashes must be entered as “Injury – Other Visible”.**

4) Every occurrence of crash applied to the countermeasures is be counted as one crash, regardless of the number of vehicles and the number of people involved in the crash. For example, if there is one crash which involved three vehicles and caused two injuries and one fatality, the crash would be tracked in the application as 1 fatal crash.

5) Collision Diagrams and Collision lists:

Applicants are required to provide Collision Diagrams and Collision Lists as supporting documents (attachments) to the application. The Collision Diagrams and the Collision Lists should be organized so application reviewers can easily identify the collision data and their corresponding project locations.

6) **All crashes applied to a given countermeasure must be within the countermeasures influence-area.**

The following are some general criteria to guide the applicants in determining appropriate influence-areas for countermeasures. Before applying these general criteria, it is the applicant’s responsibility to ensure that they are reasonable for their particular application. (More guidance relating to each specific countermeasure is included in Section 4 and Appendix B of the [California Local Roadway Safety Manual](#)).

a) New Traffic Signals: All crashes within 250 feet of the new signal.

b) For intersection improvements, collisions that occurred within 250 feet of the intersection in all directions affected by the improvement may be used. If the distance to the nearest intersection is less than 500 feet, only those collisions that occurred from mid-block may be used.

c) Longitudinal Improvements (guardrail, raised median, turn pockets, etc): All crashes potentially effected by and within the limits of the improvement.

d) Signage, striping, delineators, or other warning devices: All crashes potentially effected by and/or within the limits of the driver's potential reaction to the improvements.

e) The influence-area may be extended beyond the physical improvements and/or the limits above if standard traffic engineering principles, as documented in Caltrans, American Association of State Highway and Transportation Officials (AASHTO) or FHWA publications, suggest it would be appropriate to do so. When the influence-area of the project is not obvious and judgment has been used in identifying the influence-area, it is the applicant’s responsibility to provide additional documentation showing the reasonableness of the judgment.

7) Do not include collisions unreported by law enforcement. Collision summary reports that corroborate the collision numbers must be attached to the application. Do not attach the actual collision reports prepared by the law enforcement officer. For applicants using [TIMS Query & Map tool](#) to analyze and summarize SWITRS crash data, applicants may find it necessary to add in known crashes that were not included in the TIMS summaries. These crashes may be added manually as long as the agency’s safety managers include supporting documentation and a comment and/or signature attesting to the source of these crashes and the accuracy of the total crash data.

- 8) The safety countermeasures constructed by the projects will not eliminate 100% of the safety risks and future crashes. This is especially true for lower-cost systemic improvements, such as signing and striping projects. Based on this, it is often reasonable for an agency to construct follow-up improvements along a corridor or at a location that has already had an HSIP project constructed. (Example: an agency has completed a striping upgrade project on a corridor. In a later HSIP cycle, the agency proposes a signing project on the same corridor based on an overlapping set of crashes.) For this reason, Caltrans allows agencies to reuse crashes in a current call for projects that have been used in a prior call for projects. It is the agency's responsibility to verify this and document it in the application in the Narrative Questions or separate backup documentation.

Section IV: Calculation and Results

Click the button Calculate to perform the calculation of the benefit and the BCR.

If errors are detected, the calculation will stop, and a table will display the errors. The errors must be fixed prior to the next calculation attempt.

The possible errors are:

- No location type (S/NS/R) is provided.
- No CMs are available for the location type.
- CMs S08 and S02 should not be used together.
The work of S02 (“Improve signal hardware”) is considered as part of CM S08 (“Convert signal to mast arm”).
- CM NS3 should not be used with any other CM.
CM NS3 (“Install signals”) should cover any other intersection improvements.
- Roundabout, when selected, should be the only CM.
The benefit calculation for a roundabout is unique. It is not allowed to have a roundabout and other safety countermeasures in the same project.
- Roundabout is the proposed work but roundabout information is not provided.
- Crash data period is not between 3 and 5 years.
- Num of crashes in a sub-dataset > the num in All dataset.
For at least one of the severities, the number of crashes in a subset (“Night”, “Ped & Bike”, “Emergency Vehicle”, or “Animal”) is more than the corresponding severity in “All” crashes.

After the errors are fixed and the calculation is successfully performed, the results are presented in two tables: “Benefit Summar” and “BCR and other key information”. Please transfer the "Total Project Cost" , "HSIP Funds Requested" and the BCR to Page 2 of the HSIP Application Form.

Appendix: List of Countermeasures (From [Local Roadway Safety Manual](#) – Section 4.2)

The list of countermeasures is from Section 4.2 of the Local Roadway Safety Manual. It is provided here for your convenience.

The countermeasures listed in the following three tables have been sorted into 3 categories: Signalized Intersection (S), Non-Signalized Intersection (NS), and Roadway Segment (R). Pedestrian and bicycle related countermeasures have been included in each of these categories, as the consideration of non-motorized travel is important for all roadway classifications and locations. The countermeasures included in these tables are used in the HSIP Analyzer. When selecting countermeasures and CRFs to apply to their specific safety needs, local agency safety practitioners should consider the **availability**, **applicability**, and **quality** of CMFs, as discussed in section 4.1 of the Local Roadway Safety Manual.

Only Crash Types, CRFs, Expected Lives, and Funding Eligibility of the countermeasures for use in Caltrans local HSIP program are provided. Fields in the countermeasure tables are:

- **Crash Types** - “All”, “P & B” (Pedestrian and Bicycle), “Night”, “Emergency Vehicle”, or “Animal”.
- **CRF** - Crash Reduction Factor used for HSIP calls-for-projects.
- **Expected Life** - 10 years or 20 years.
- **Funding Eligibility** – the maximum HSIP funding reimbursement ratio.
 - Forty (45) countermeasures: 100%
 - Thirty-five (36) countermeasures: 90%
 - One (1) countermeasure: 50% (CM No. S03: Improve signal timing, as this CM will improve the signal operation rather than merely the safety.)
- **Systemic Approach Opportunity** - Opportunity to Implement Using a Systemic Approach: “Very High”, “High”, “Medium” or “Low”.

Table 1. Countermeasures for Signalized Intersections

No.	Type	Countermeasure Name	Crash Type	CRF	Expected Life (Years)	HSIP Funding Eligibility	Systemic Approach Opportunity?
S01	Lighting	Add intersection lighting (S.I.)	Night	40%	20	100%	Medium
S02	Signal Mod.	Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number	All	15%	10	100%	Very High
S03	Signal Mod.	Improve signal timing (coordination, phases, red, yellow, or operation)	All	15%	10	50%	Very High
S04	Signal Mod.	Provide Advanced Dilemma Zone Detection for high speed approaches	All	40%	10	100%	High
S05	Signal Mod.	Install emergency vehicle pre-emption systems	Emergency Vehicle	70%	10	100%	High
S06	Signal Mod.	Install left-turn lane and add turn phase (signal has no left-turn lane or phase before)	All	55%	20	90%	Low
S07	Signal Mod.	Provide protected left turn phase (left turn lane already exists)	All	30%	20	100%	High
S08	Signal Mod.	Convert signal to mast arm (from pedestal-mounted)	All	30%	20	100%	Medium
S09	Operation/ Warning	Install raised pavement markers and striping (Through Intersection)	All	10%	10	100%	Very High
S10	Operation/ Warning	Install flashing beacons as advance warning (S.I.)	All	30%	10	100%	Medium
S11	Operation/ Warning	Improve pavement friction (High Friction Surface Treatments)	All	55%	10	100%	Medium
S12	Geometric Mod.	Install raised median on approaches (S.I.)	All	25%	20	90%	Medium
S13PB	Geometric Mod.	Install pedestrian median fencing on approaches	P & B	35%	20	90%	Low
S14	Geometric Mod.	Create directional median openings to allow (and restrict) left-turns and u-turns (S.I.)	All	50%	20	90%	Medium
S15	Geometric Mod.	Reduced Left-Turn Conflict Intersections (S.I.)	All	50%	20	90%	Medium
S16	Geometric Mod.	Convert intersection to roundabout (from signal)	All	Varies	20	100%	Low
S17PB	Ped and Bike	Install pedestrian countdown signal heads	P & B	25%	20	100%	Very High
S18PB	Ped and Bike	Install pedestrian crossing (S.I.)	P & B	25%	20	100%	High
S19PB	Ped and Bike	Pedestrian Scramble	P & B	40%	20	100%	High
S20PB	Ped and Bike	Install advance stop bar before crosswalk (Bicycle Box)	P & B	15%	10	100%	Very High
S21PB	Ped and Bike	Modify signal phasing to implement a Leading Pedestrian Interval (LPI)	P & B	60%	10	100%	Very High

Table 2. Countermeasures for Non-Signalized Intersections

No.	Type	Countermeasure Name	Crash Type	CRF	Expected Life (Years)	HSIP Funding Eligibility	Systemic Approach Opportunity?
NS01	Lighting	Add intersection lighting (NS.I.)	Night	40%	20	100%	Medium
NS02	Control	Convert to all-way STOP control (from 2-way or Yield control)	All	50%	10	100%	High
NS03	Control	Install signals	All	30%	20	100%	Low
NS04	Control	Convert intersection to roundabout (from all way stop)	All	Varies	20	100%	Low
NS05	Control	Convert intersection to roundabout (from stop or yield control on minor road)	All	Varies	20	100%	Low
NS06	Operation/ Warning	Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs	All	15%	10	100%	Very High
NS07	Operation/ Warning	Upgrade intersection pavement markings (NS.I.)	All	25%	10	100%	Very High
NS08	Operation/ Warning	Install Flashing Beacons at Stop-Controlled Intersections	All	15%	10	100%	High
NS09	Operation/ Warning	Install flashing beacons as advance warning (NS.I.)	All	30%	10	100%	High
NS10	Operation/ Warning	Install transverse rumble strips on approaches	All	20%	10	90%	High
NS11	Operation/ Warning	Improve sight distance to intersection (Clear Sight Triangles)	All	20%	10	90%	High
NS12	Operation/ Warning	Improve pavement friction (High Friction Surface Treatments)	All	55%	10	100%	Medium
NS13	Geometric Mod.	Install splitter-islands on the minor road approaches	All	40%	20	90%	Medium
NS14	Geometric Mod.	Install raised median on approaches (NS.I.)	All	25%	20	90%	Medium
NS15	Geometric Mod.	Create directional median openings to allow (and restrict) left-turns and u-turns (NS.I.)	All	50%	20	90%	Medium
NS16	Geometric Mod.	Reduced Left-Turn Conflict Intersections (NS.I.)	All	50%	20	90%	Medium
NS17	Geometric Mod.	Install right-turn lane (NS.I.)	All	20%	20	90%	Low
NS18	Geometric Mod.	Install left-turn lane (where no left-turn lane exists)	All	35%	20	90%	Low
NS19PB	Ped and Bike	Install raised medians / refuge islands (NS.I.)	Ped and Bike	45%	20	90%	Medium
NS20PB	Ped and Bike	Install pedestrian crossing at uncontrolled locations (new signs and markings only)	Ped and Bike	25%	10	100%	High
NS21PB	Ped and Bike	Install/upgrade pedestrian crossing at uncontrolled locations (with enhanced safety features)	Ped and Bike	35%	20	100%	Medium
NS22PB	Ped and Bike	Install Rectangular Rapid Flashing Beacon (RRFB)	Ped and Bike	35%	20	100%	Medium
NS23PB	Ped and Bike	Install Pedestrian Signal (including Pedestrian Hybrid Beacon (HAWK))	Ped and Bike	55%	20	100%	Low

Table 3. Countermeasures for Roadways

No.	Type	Countermeasure Name	Crash Type	CRF	Expected Life (Years)	HSIP Funding Eligibility	Systemic Approach Opportunity?
R01	Lighting	Add segment lighting	Night	35%	20	100%	Medium
R02	Remove/ Shield Obstacles	Remove or relocate fixed objects outside of Clear Recovery Zone	All	35%	20	90%	High
R03	Remove/ Shield Obstacles	Install Median Barrier	All	25%	20	100%	Medium
R04	Remove/ Shield Obstacles	Install Guardrail	All	25%	20	100%	High
R05	Remove/ Shield Obstacles	Install impact attenuators	All	25%	10	100%	High
R06	Remove/ Shield Obstacles	Flatten side slopes	All	30%	20	90%	Medium
R07	Remove/ Shield Obstacles	Flatten side slopes and remove guardrail	All	40%	20	90%	Medium
R08	Geometric Mod.	Install raised median	All	25%	20	90%	Medium
R09	Geometric Mod.	Install median (flush)	All	15%	20	90%	Medium
R10PB	Geometric Mod.	Install pedestrian median fencing on approaches	P & B	35%	20	90%	Low
R11	Geometric Mod.	Install acceleration/ deceleration lanes	All	25%	20	90%	Low
R12	Geometric Mod.	Widen lane (initially less than 10 ft)	All	25%	20	90%	Medium
R13	Geometric Mod.	Add two-way left-turn lane (without reducing travel lanes)	All	30%	20	90%	Medium
R14	Geometric Mod.	Road Diet (Reduce travel lanes from 4 to 3 and add a two way left-turn and bike lanes)	All	30%	20	90%	Medium
R15	Geometric Mod.	Widen shoulder	All	30%	20	90%	Medium
R16	Geometric Mod.	Curve Shoulder widening (Outside Only)	All	45%	20	90%	Medium
R17	Geometric Mod.	Improve horizontal alignment (flatten curves)	All	50%	20	90%	Low
R18	Geometric Mod.	Flatten crest vertical curve	All	25%	20	90%	Low
R19	Geometric Mod.	Improve curve superelevation	All	45%	20	90%	Medium
R20	Geometric Mod.	Convert from two-way to one-way traffic	All	35%	20	90%	Medium
R21	Geometric Mod.	Improve pavement friction (High Friction Surface Treatments)	All	55%	10	100%	High

Table 3. Countermeasures for Roadways (Continued)

No.	Type	Countermeasure Name	Crash Type	CRF	Expected Life (Years)	HSIP Funding Eligibility	Systemic Approach Opportunity?
R22	Operation/ Warning	Install/Upgrade signs with new fluorescent sheeting (regulatory or warning)	All	15%	10	100%	Very High
R23	Operation/ Warning	Install chevron signs on horizontal curves	All	40%	10	100%	Very High
R24	Operation/ Warning	Install curve advance warning signs	All	25%	10	100%	Very High
R25	Operation/ Warning	Install curve advance warning signs (flashing beacon)	All	30%	10	100%	High
R26	Operation/ Warning	Install dynamic/variable speed warning signs	All	30%	10	100%	High
R27	Operation/ Warning	Install delineators, reflectors and/or object markers	All	15%	10	100%	Very High
R28	Operation/ Warning	Install edge-lines and centerlines	All	25%	10	100%	Very High
R29	Operation/ Warning	Install no-passing line	All	45%	10	100%	Very High
R30	Operation/ Warning	Install centerline rumble strips/stripes	All	20%	10	100%	High
R31	Operation/ Warning	Install edgeline rumble strips/stripes	All	15%	10	100%	High
R32PB	Ped and Bike	Install bike lanes	P & B	35%	20	90%	High
R33PB	Ped and Bike	Install Separated Bike Lanes	P & B	45%	20	90%	High
R34PB	Ped and Bike	Install sidewalk/pathway (to avoid walking along roadway)	P & B	80%	20	90%	Medium
R35PB	Ped & Bike	Install/upgrade pedestrian crossing (with enhanced safety features)	P & B	35%	20	90%	Medium
R36PB	Ped and Bike	Install raised pedestrian crossing	P & B	35%	20	90%	Medium
R37PB	Ped and Bike	Install Rectangular Rapid Flashing Beacon (RRFB)	P & B	35%	20	100%	Medium
R38	Animal	Install animal fencing	Animal	80%	20	90%	Medium

Appendix G
Project Layouts, Cost Estimates and Benefit-Cost Ratio
Calculations



Project #1: Intersection Safety – Systemic Unsignalized Intersections

Reason for Selection

This project was selected because most crashes occur at unsignalized intersections, and the characteristics and risk factors of the top intersections was conducive to systemic improvements. In addition, many of the top locations were on 11th Street, which aligns with community goals of improvements to this corridor. The *Eleventh Street Corridor Multimodal and Engineered Feasibility Study* (W-Trans, June 2020) identified corridor-wide improvements. This systemic project could implement improvements at some of the intersections by improving safety and visibility with additional signage, flashing beacons, and upgraded pavement markings.



11th St. / Tunis Street

The sites were selected based on the crash history and characteristics; sites may be added or removed as applicable. Sites with no listed crashes are included based on risk factors.

Intersections Crashes by Severity

Systemic Unsignalized Intersections	Fatal	Serious Injury	Other Visible Injury	Complaint of Pain	PDO	Total
11 th St./ N. Forbes St.	0	0	2	4	0	6
11 th St./ Central Park Ave.	0	0	0	3	0	3
11 th St./ Tunis St.	0	1	1	0	0	2
S. Main St./ E St.	0	1	0	0	0	1
N. Forbes St./ 3rd St.	0	0	0	2	0	2
S. Main St./ Lakeport Blvd.*	0	0	1	0	1	2
Main St./ Clear Lake Ave.**	0	0	0	1	0	1
Bevins St./ Martin St.	0	0	0	0	0	0
Lange St./ Lakeshore Blvd.	0	0	1	0	0	1
Sayre St./ Lakeshore Blvd.	0	0	0	1	0	1
<i>Total</i>	<i>0</i>	<i>2</i>	<i>5</i>	<i>11</i>	<i>1</i>	<i>19</i>

*Listed in the 2022 Lake County Regional Transportation Plan/Active Transportation Plan for potential conversion to a roundabout.

**The City should verify the movements at this intersection and ensure that signage is appropriate to prevent traffic conflicts, in particular between eastbound and northbound vehicles.

Countermeasures and BCRs

The countermeasure information is provided by the *HSIP Analyzer Manual*.

No.	Type	Countermeasures Name	Crash Type	Crash Reduction Factor (CRF)	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
NS06	Operation/Warning	Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs	All	15%	10	100%	Very High
NS07	Operation/Warning	Upgrade intersection pavement markings (NS.I.)	All	25%	10	100%	Very High
NS08	Operation/Warning	Install Flashing Beacons at Stop-Controlled Intersections	All	15%	10	100%	High

The benefit-cost ratio (BCR) is calculated in the HSIP application process. The BCR was estimated to be **10.24** using the *Highway Safety Benefit/Cost Analysis Tool* by FHWA and the following assumptions:

- Construction and maintenance costs were derived from layouts (**Figures G1-G10**) and supporting documentation included.
- Estimated annual crashes were calculated as the average of the 5-year crash data.
- The Crash Modification Factor (CMF), calculated as $CMF = 1 - (CRF/100)$, was applied to calculate the predicted reduction in crashes with the countermeasures. This CMF is applied for the systemic project as a whole; it is noted that the flashing beacons are not applied at all locations which may impact the calculations. The *HSIP Analyzer Manual* indicates that all sites should receive the same countermeasures but allows for exceptions.

Prior to completing the HSIP application, the City should verify sites to include and countermeasures with HSIP regulations. The City should verify all improvements, signage, and cost estimates. If needed, the City may choose to break the systemic project into multiple applications, modify countermeasures, add or remove sites to align with community goals and/or to increase the BCR.

Project #2: Pedestrian Safety – Systemic Pedestrian Crosswalk at Unsignalized Intersections

Reason for Inclusion

These locations had a pedestrian crash history and lack upgraded or enhanced crosswalks. Sites may be added or removed as applicable.

- Forbes Street / Martin Street – no crosswalks
- 11th Street / Brush Street – no crosswalks
- 11th Street / Main Street – crosswalk on north leg/ currently under construction for improvements



N. Forbes St./ Martin St.

Other sites with pedestrian-related crashes were not included if projects were underway at these locations or for other various reasons.

It is noted that the crosswalk locations on 11th Street above differ from those proposed in the *Eleventh Street Corridor Study*. Crosswalks should be installed at the most beneficial locations, and not necessarily where a crash occurred. If an adjacent location is more practical to construct a crosswalk, this provides a safety benefit for the surrounding area.

Per the *HSIP Analyzer Manual* for BCR Applications, countermeasures should be within the influence area; however, it is noted that “the influence-area may be extended beyond the physical improvements and/or the limits above if standard traffic engineering principles, as documented in Caltrans, American Association of State Highway and Transportation Officials (AASHTO) or FHWA publications, suggest it would be appropriate to do so. When the influence-area of the project is not obvious and judgment has been used in identifying the influence-area, it is the applicant’s responsibility to provide additional documentation showing the reasonableness of the judgment.”

In this case, the pedestrian crash occurred at the 11th Street/ Brush Street intersection; however, it is preferred to instead encourage pedestrians to cross 11th Street/ Poole Street with crosswalks. Therefore, the crossing including the Rectangular Rapid Flashing Beacon (RRFB) is proposed at this location to address pedestrian safety on 11th Street. This exception should be documented in an application.

Intersections Crashes by Severity

Systemic Pedestrian Locations	Fatal	Serious Injury	Other Visible Injury	Complaint of Pain	PDO	Total
11th St./ Brush St.	0	0	1	0	0	1
Forbes St./ Martin St.	0	0	1	0	0	1
Main St. /11th St	0	0	1	0	0	1
<i>Total</i>	<i>0</i>	<i>0</i>	<i>3</i>	<i>0</i>	<i>0</i>	<i>3</i>

Countermeasures and BCRs

The countermeasure information is provided by the *HSIP Analyzer Manual*.

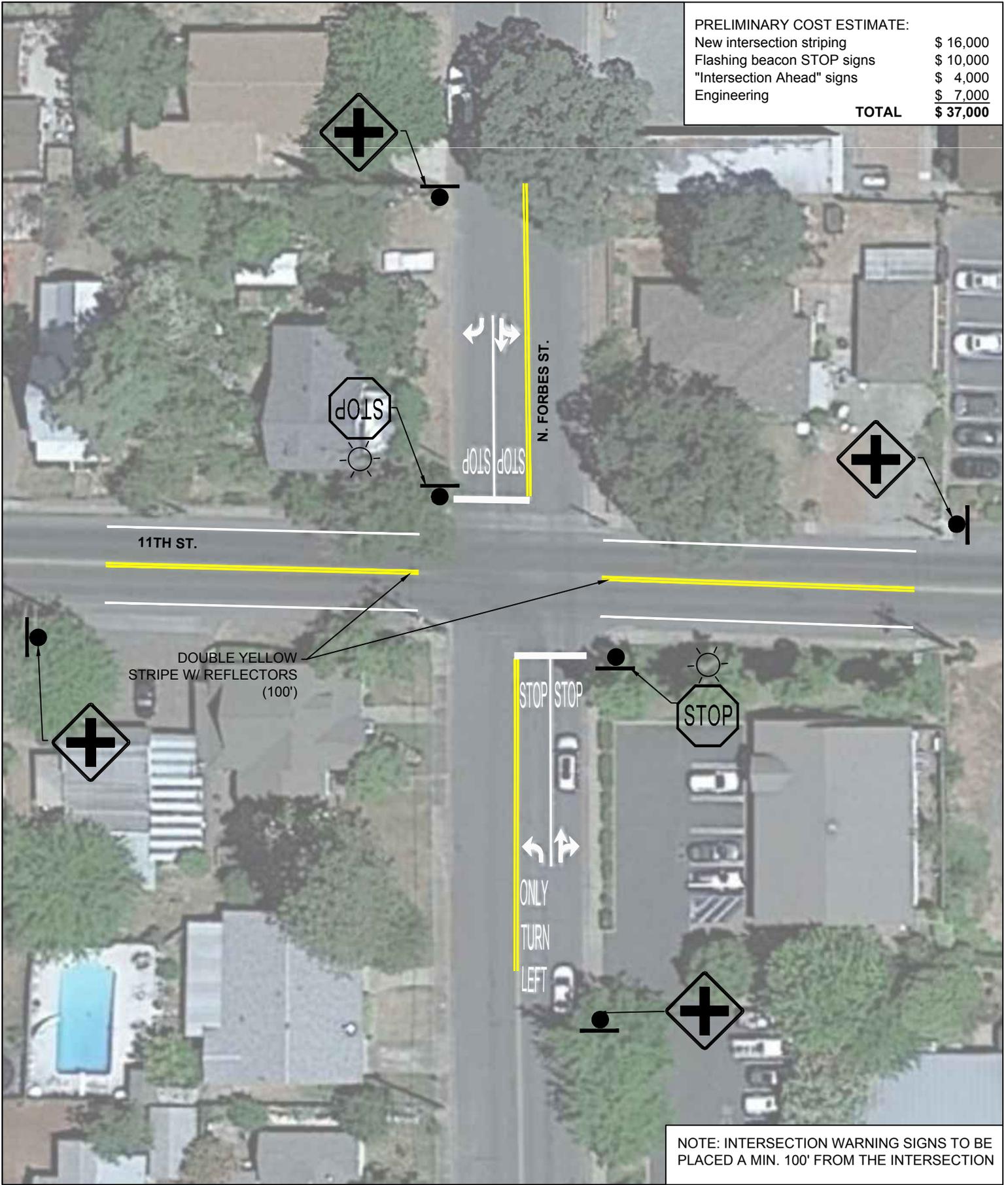
No.	Type	Countermeasures Name	Crash Type	Crash Reduction Factor (CRF)	Expected Life Years	HSIP Funding Eligibility	Systemic Approach Opportunity
NS21PB	Ped and Bike	Install/upgrade pedestrian crossing at uncontrolled locations (with enhanced safety features)	P & B	35%	20	100%	Medium
NS22PB	Ped and Bike	Install Rectangular Rapid Flashing Beacon (RRFB)	P & B	35%	20	100%	Medium

The BCR is calculated in the HSIP application process. The BCR was estimated to be **3.07** using the *Highway Safety Benefit/Cost Analysis Tool* by FHWA and the following assumptions:

- Construction and maintenance costs were derived from layouts (**Figures G11-G13**) and supporting documentation included.
- Estimated annual crashes were calculated as the average of the 5-year crash data.
- The Crash Modification Factor (CMF), calculated as $CMF = 1 - (CRF/100)$, was applied to calculate the predicted reduction in crashes with the countermeasures. This CMF is applied for the systemic project as a whole; it is noted that the RRFBs are not applied at all locations which may impact the calculations. The *HSIP Analyzer Manual* indicates that all sites should receive the same countermeasures but allows for exceptions.

The City should consider reducing project costs and/or adding locations to improve the BCR. Prior to completing the HSIP application, the City should verify sites to include and countermeasures with HSIP regulations. The City should verify all improvements, signage, and cost estimates.

PRELIMINARY COST ESTIMATE:	
New intersection striping	\$ 16,000
Flashing beacon STOP signs	\$ 10,000
"Intersection Ahead" signs	\$ 4,000
Engineering	\$ 7,000
TOTAL	\$ 37,000



NOTE: INTERSECTION WARNING SIGNS TO BE PLACED A MIN. 100' FROM THE INTERSECTION



LEGEND

NORTH

NEW ROADSIDE SIGN

PRELIMINARY COST ESTIMATE:	
New striping w/ reflectors	\$ 10,000
"Intersection Ahead" signs	\$ 2,000
"STOP Ahead" sign	\$ 1,000
Engineering	\$ 3,000
TOTAL	\$ 16,000



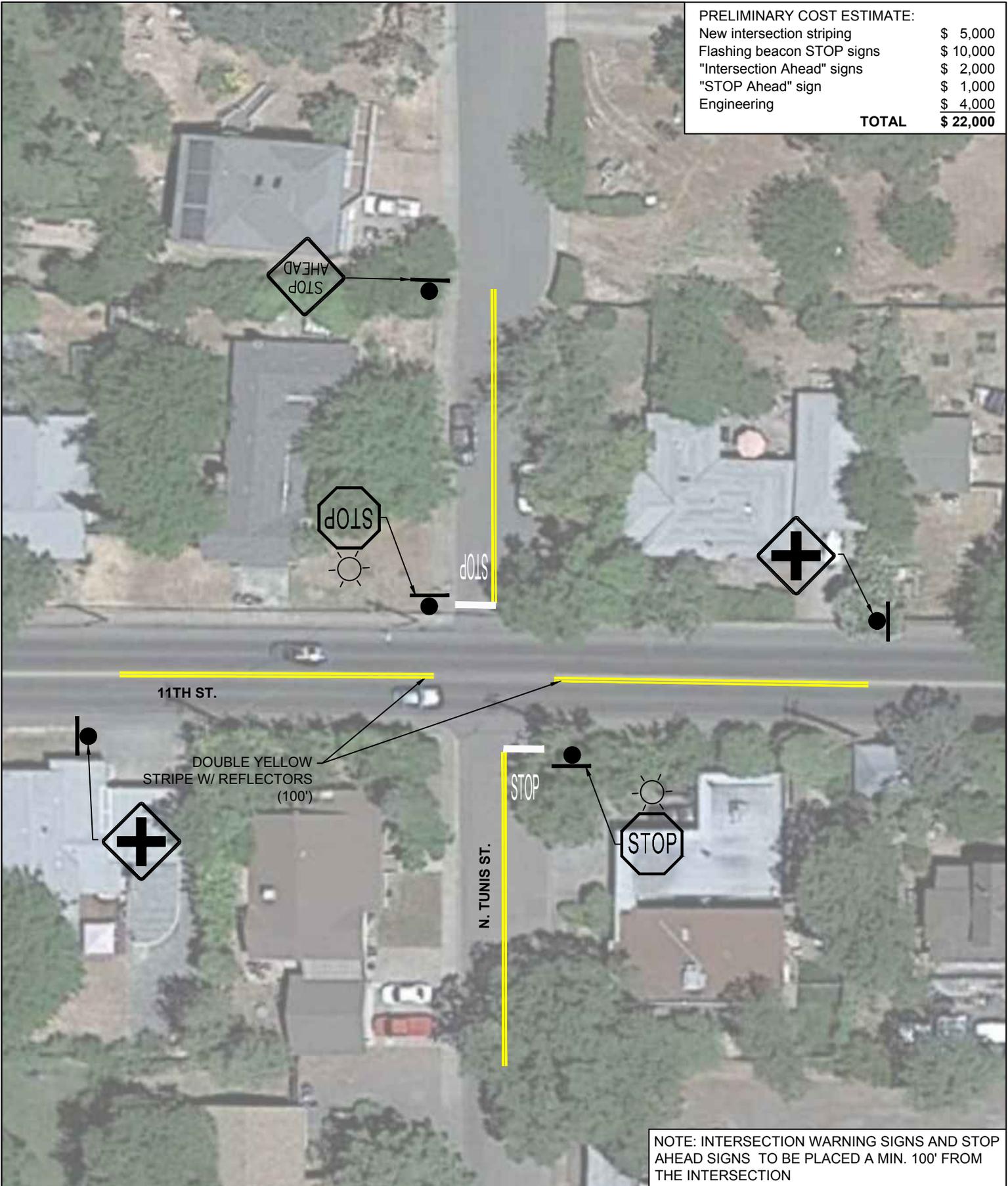
NOTE: INTERSECTION WARNING SIGNS AND STOP AHEAD SIGN TO BE PLACED A MIN. 200' AND 100' FROM THE INTERSECTION, RESPECTIVELY. ADDING LEFT TURN POCKET MAY REQUIRE BIKE LANES TO BE REMOVED TO MAINTAIN APPROPRIATE LANE WIDTHS. THIS IS A PRELIMINARY CONFIGURATION AND FIELD VERIFICATION OF ROADWAY WIDTH SHALL BE VERIFIED PRIOR TO THE CREATION OF CONSTRUCTION DOCUMENTS.

LEGEND



NEW ROADSIDE SIGN

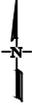
PRELIMINARY COST ESTIMATE:	
New intersection striping	\$ 5,000
Flashing beacon STOP signs	\$ 10,000
"Intersection Ahead" signs	\$ 2,000
"STOP Ahead" sign	\$ 1,000
Engineering	\$ 4,000
TOTAL	\$ 22,000



NOTE: INTERSECTION WARNING SIGNS AND STOP AHEAD SIGNS TO BE PLACED A MIN. 100' FROM THE INTERSECTION



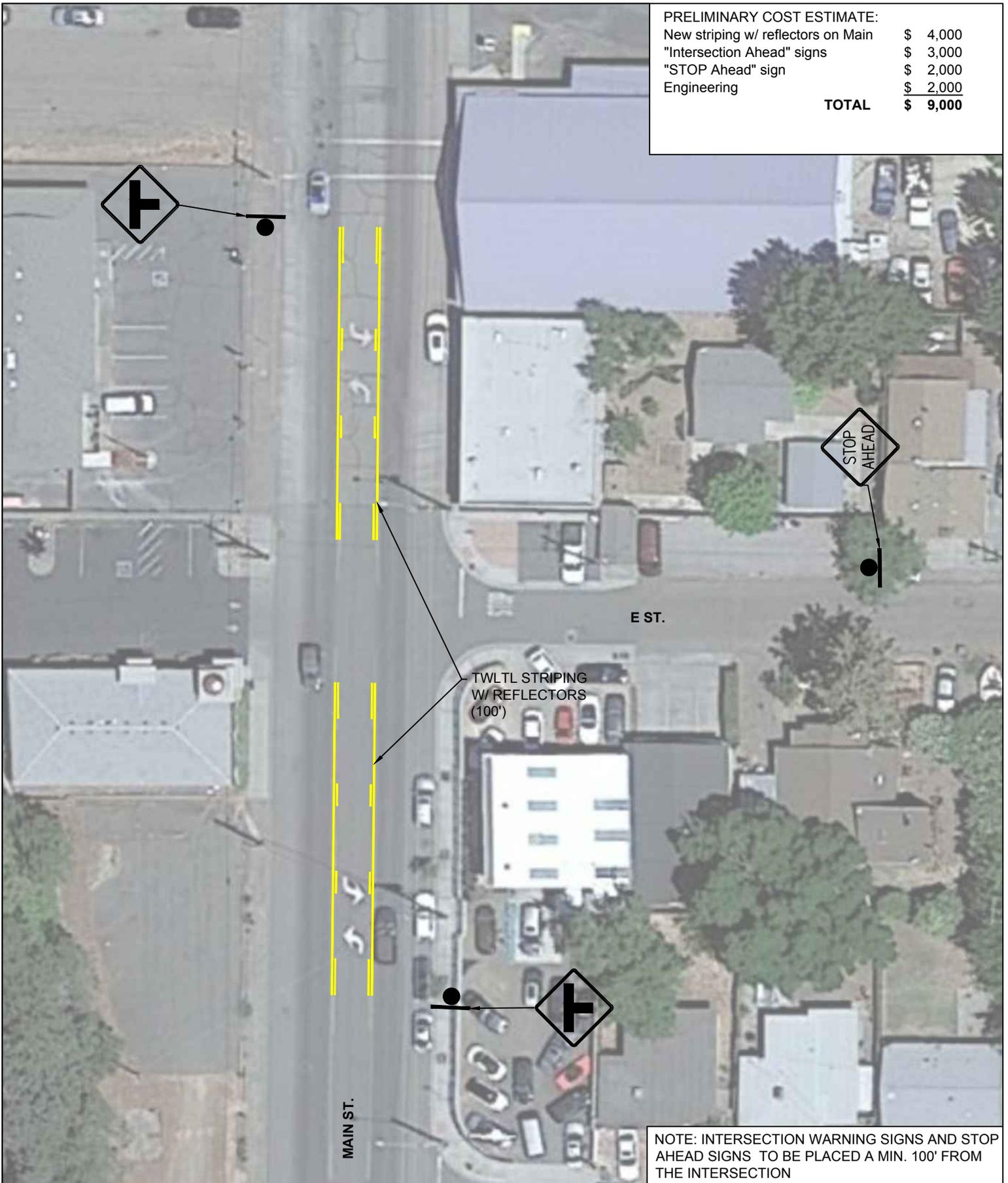
LEGEND




NEW ROADSIDE SIGN

PRELIMINARY COST ESTIMATE:

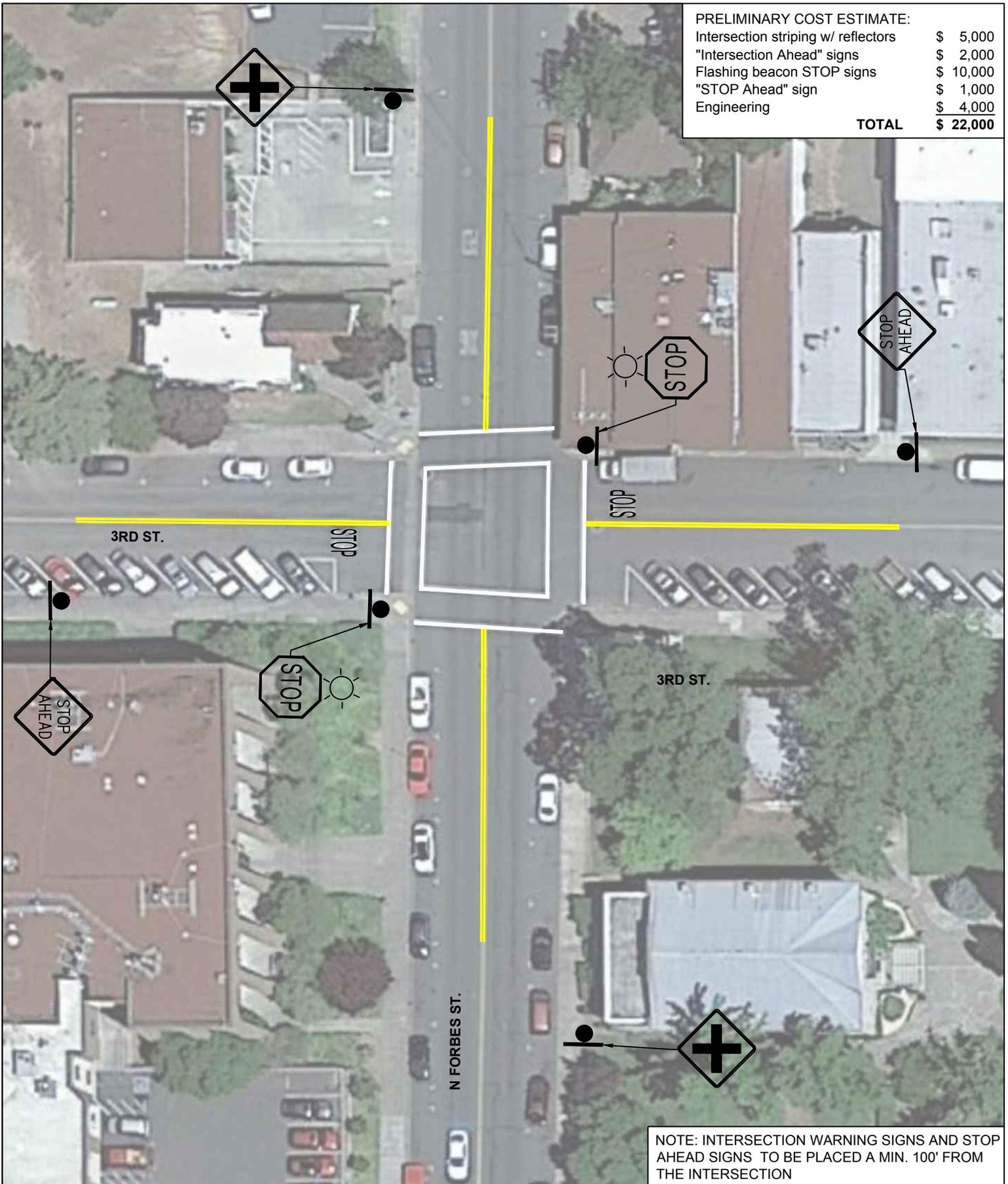
New striping w/ reflectors on Main	\$ 4,000
"Intersection Ahead" signs	\$ 3,000
"STOP Ahead" sign	\$ 2,000
Engineering	\$ 2,000
TOTAL	\$ 9,000



LEGEND

 NEW ROADSIDE SIGN

PRELIMINARY COST ESTIMATE:	
Intersection striping w/ reflectors	\$ 5,000
"Intersection Ahead" signs	\$ 2,000
Flashing beacon STOP signs	\$ 10,000
"STOP Ahead" sign	\$ 1,000
Engineering	\$ 4,000
TOTAL	\$ 22,000

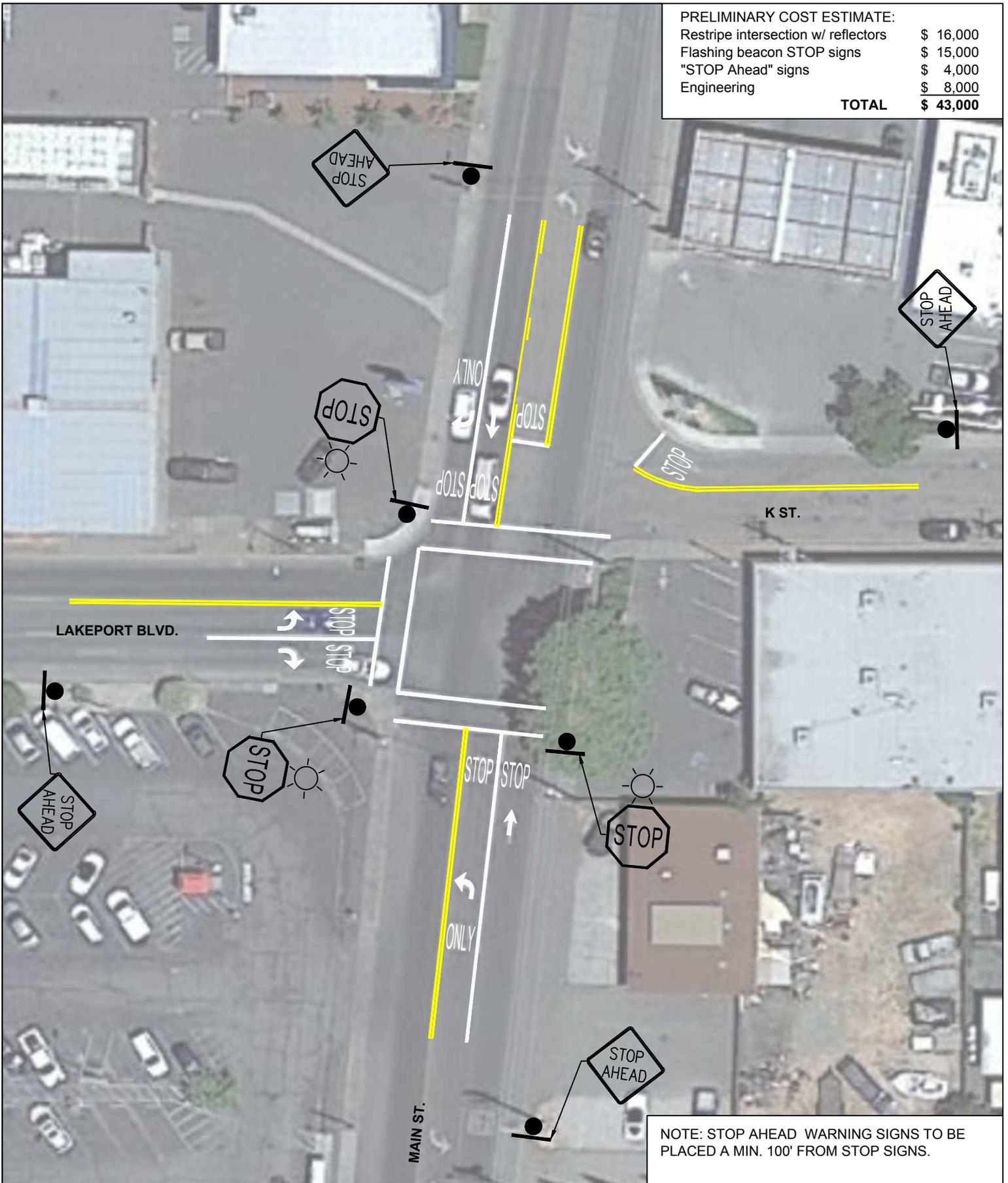


LEGEND

  NEW ROADSIDE SIGN

PRELIMINARY COST ESTIMATE:

Restripe intersection w/ reflectors	\$ 16,000
Flashing beacon STOP signs	\$ 15,000
"STOP Ahead" signs	\$ 4,000
Engineering	\$ 8,000
TOTAL	\$ 43,000



NOTE: STOP AHEAD WARNING SIGNS TO BE PLACED A MIN. 100' FROM STOP SIGNS.

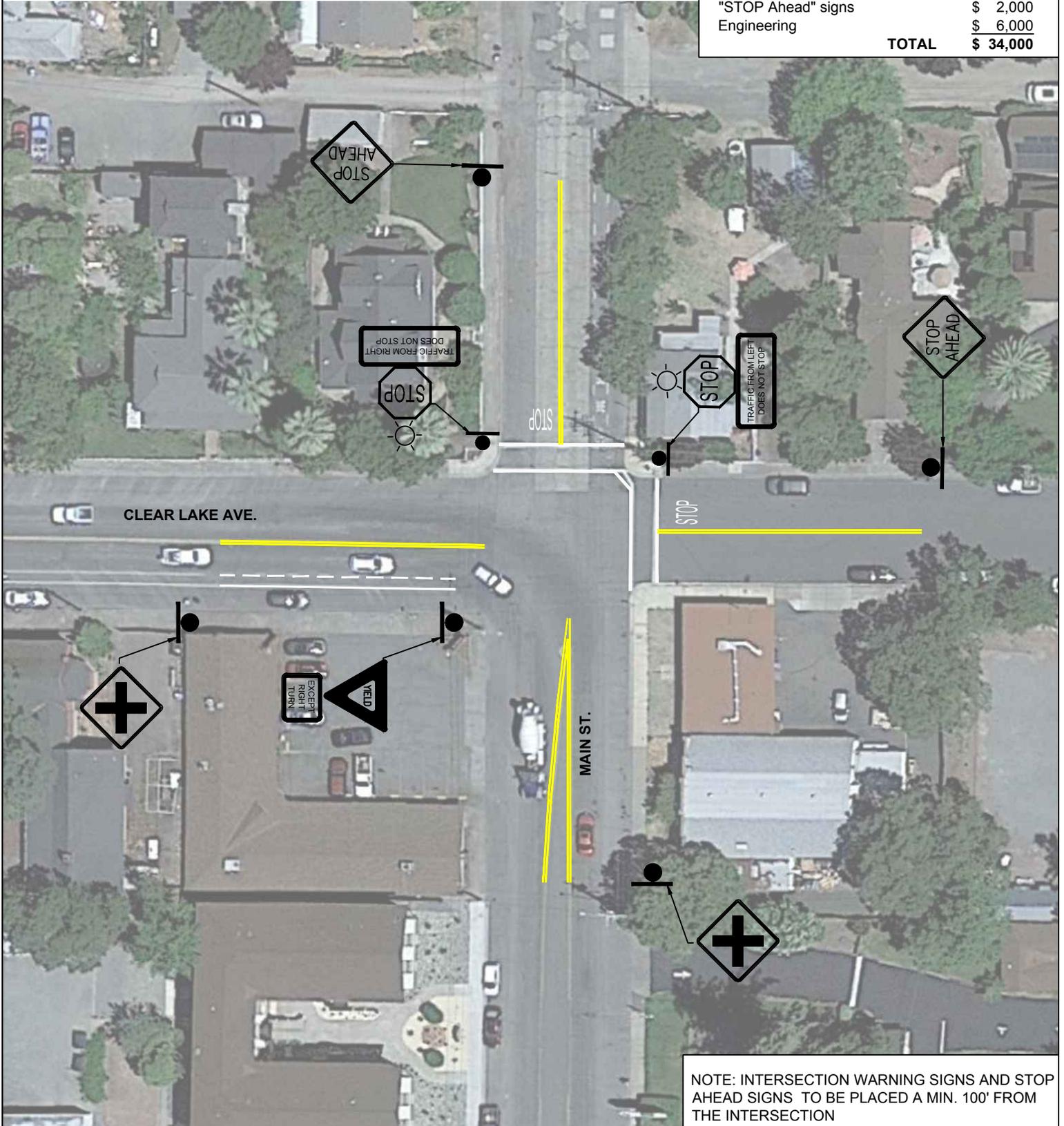


NEW ROADSIDE SIGN

LEGEND

PRELIMINARY COST ESTIMATE:

Restripe crosswalks	\$ 5,000
Intersection restriping	\$ 7,000
"Intersection Ahead" signs	\$ 2,000
Flashing beacon STOP signs	\$ 10,000
"Yield" sign	\$ 2,000
"STOP Ahead" signs	\$ 2,000
Engineering	\$ 6,000
TOTAL	\$ 34,000



NOTE: INTERSECTION WARNING SIGNS AND STOP AHEAD SIGNS TO BE PLACED A MIN. 100' FROM THE INTERSECTION



LEGEND

NEW ROADSIDE SIGN

PRELIMINARY COST ESTIMATE:	
Restripe intersection w/ reflectors	\$ 5,000
Intersection restripe	\$ 2,000
Flashing beacon STOP signs	\$ 5,000
"Intersection Ahead" signs	\$ 4,000
Engineering	\$ 3,000
TOTAL	\$ 19,000



NOTE: INTERSECTION WARNING SIGNS TO BE PLACED A MIN. 100' FROM THE INTERSECTION

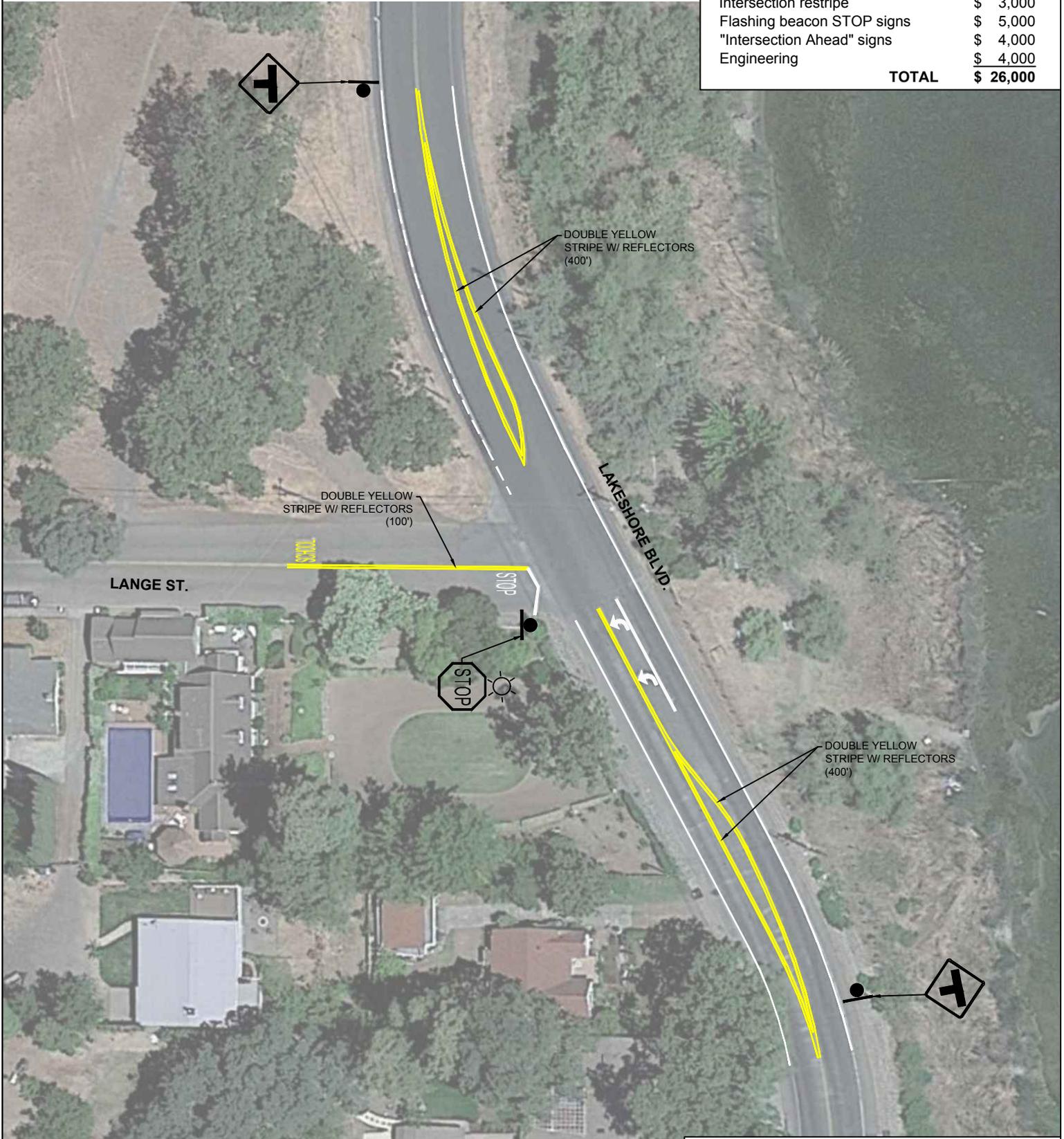


LEGEND

  NEW ROADSIDE SIGN

PRELIMINARY COST ESTIMATE:

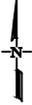
Restripe intersection w/ reflectors	\$ 10,000
Intersection restripe	\$ 3,000
Flashing beacon STOP signs	\$ 5,000
"Intersection Ahead" signs	\$ 4,000
Engineering	\$ 4,000
TOTAL	\$ 26,000



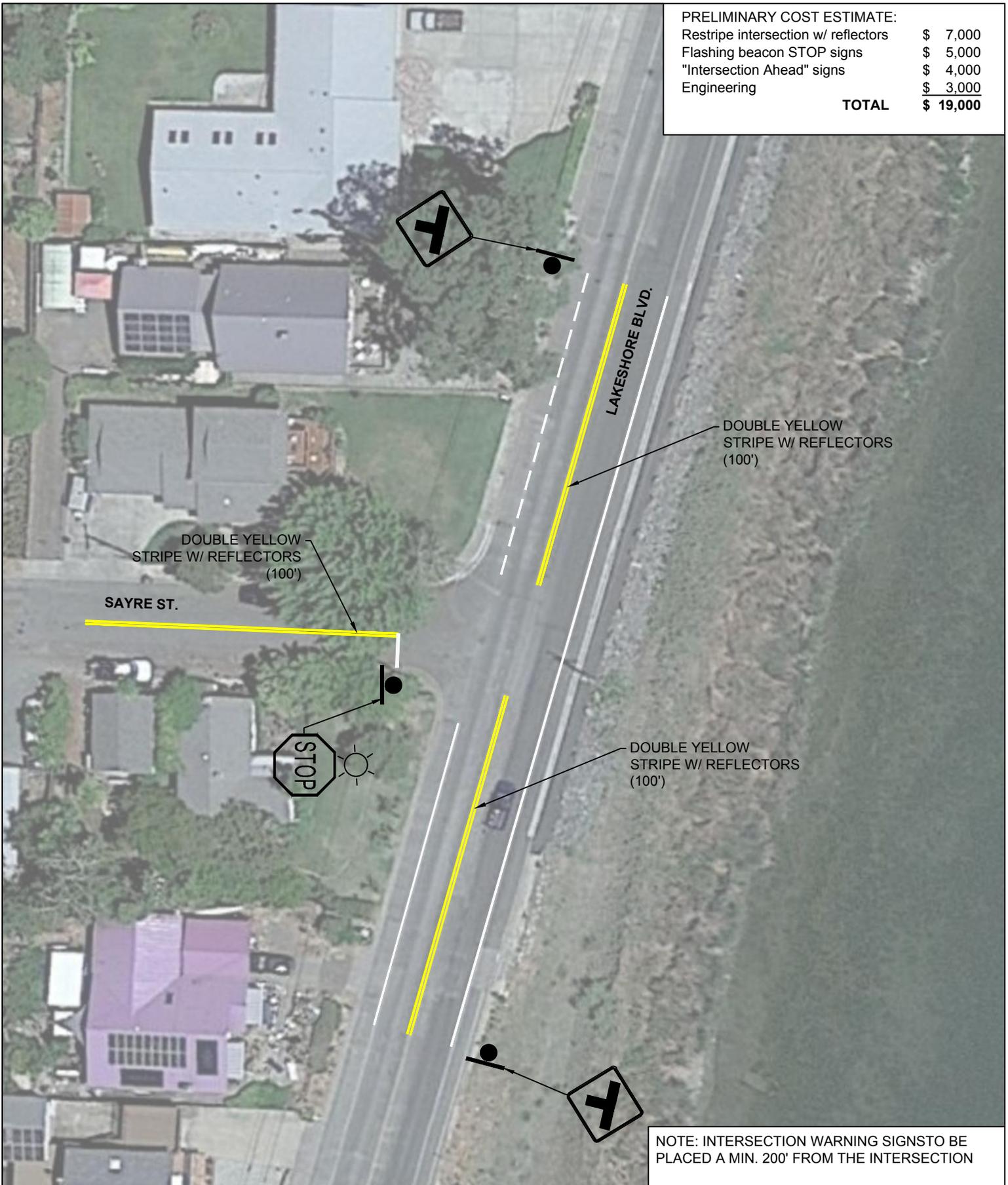
NOTE: INTERSECTION WARNING SIGNS TO BE PLACED A MIN. 200' FROM THE INTERSECTION



LEGEND

  NEW ROADSIDE SIGN

PRELIMINARY COST ESTIMATE:	
Restripe intersection w/ reflectors	\$ 7,000
Flashing beacon STOP signs	\$ 5,000
"Intersection Ahead" signs	\$ 4,000
Engineering	\$ 3,000
TOTAL	\$ 19,000

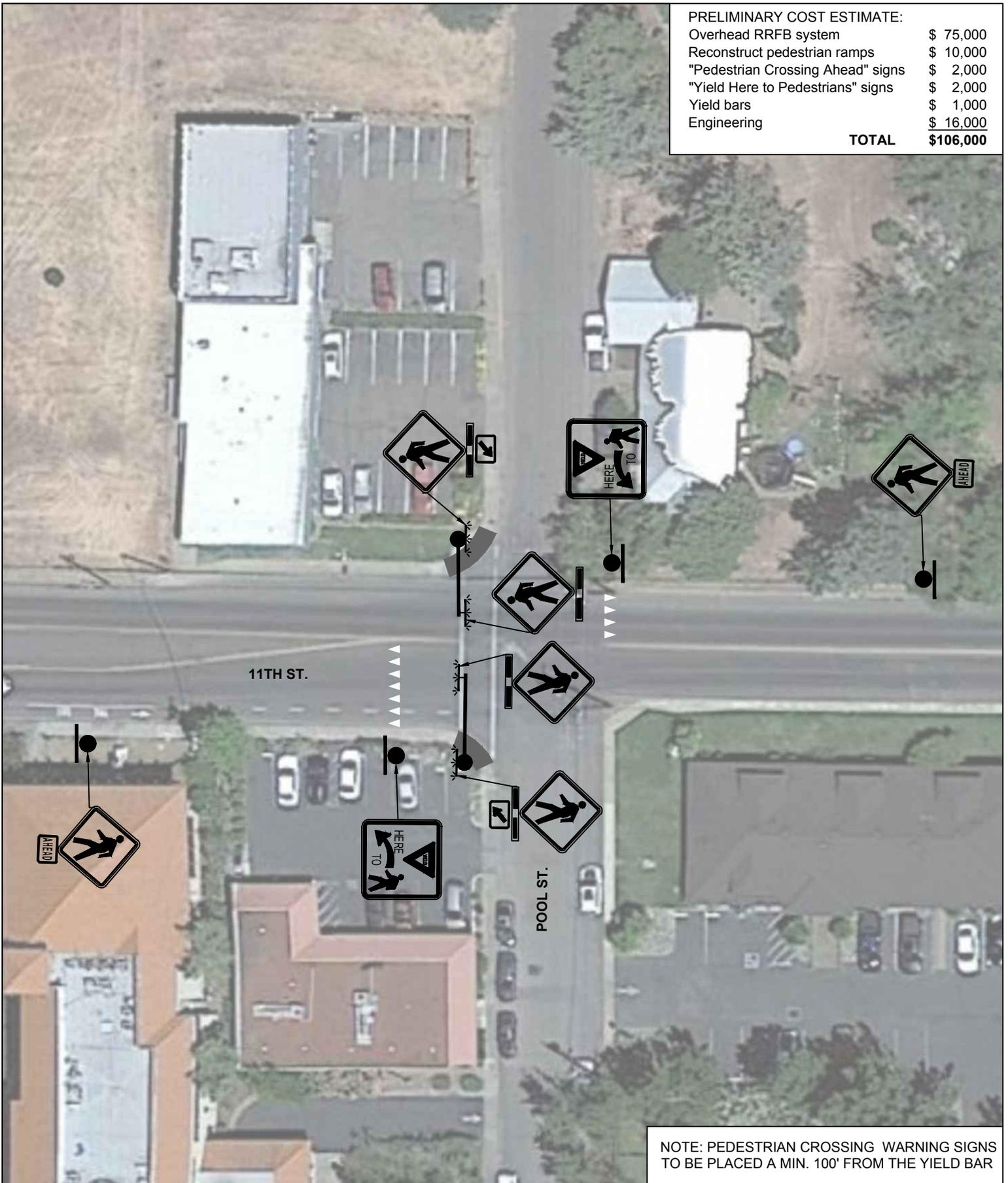


LEGEND

NEW ROADSIDE SIGN

NOTE: INTERSECTION WARNING SIGNSTO BE PLACED A MIN. 200\') FROM THE INTERSECTION

PRELIMINARY COST ESTIMATE:	
Overhead RRFB system	\$ 75,000
Reconstruct pedestrian ramps	\$ 10,000
"Pedestrian Crossing Ahead" signs	\$ 2,000
"Yield Here to Pedestrians" signs	\$ 2,000
Yield bars	\$ 1,000
Engineering	\$ 16,000
TOTAL	\$106,000

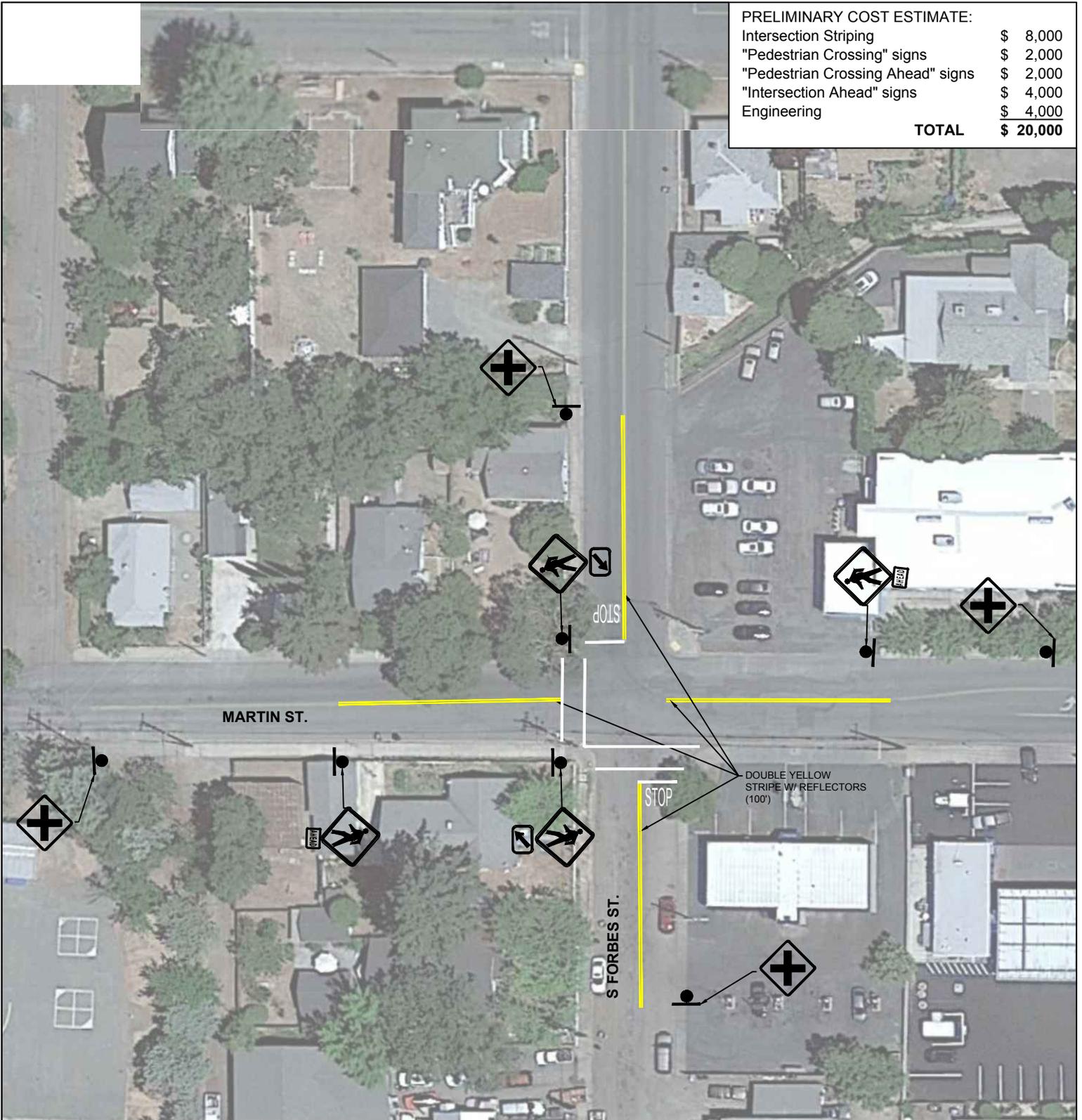


NOTE: PEDESTRIAN CROSSING WARNING SIGNS TO BE PLACED A MIN. 100' FROM THE YIELD BAR



LEGEND	
	NEW ROADSIDE SIGN
	POLE MOUNTED RRFB SYSTEM
	RECONSTRUCTED PEDESTRIAN RAMP

PRELIMINARY COST ESTIMATE:	
Intersection Striping	\$ 8,000
"Pedestrian Crossing" signs	\$ 2,000
"Pedestrian Crossing Ahead" signs	\$ 2,000
"Intersection Ahead" signs	\$ 4,000
Engineering	\$ 4,000
TOTAL	\$ 20,000



NOTE: INTERSECTION WARNING SIGNS AND PEDESTRIAN CROSSING WARNING SIGNS TO BE PLACED A MIN. 100' FROM THE INTERSECTION

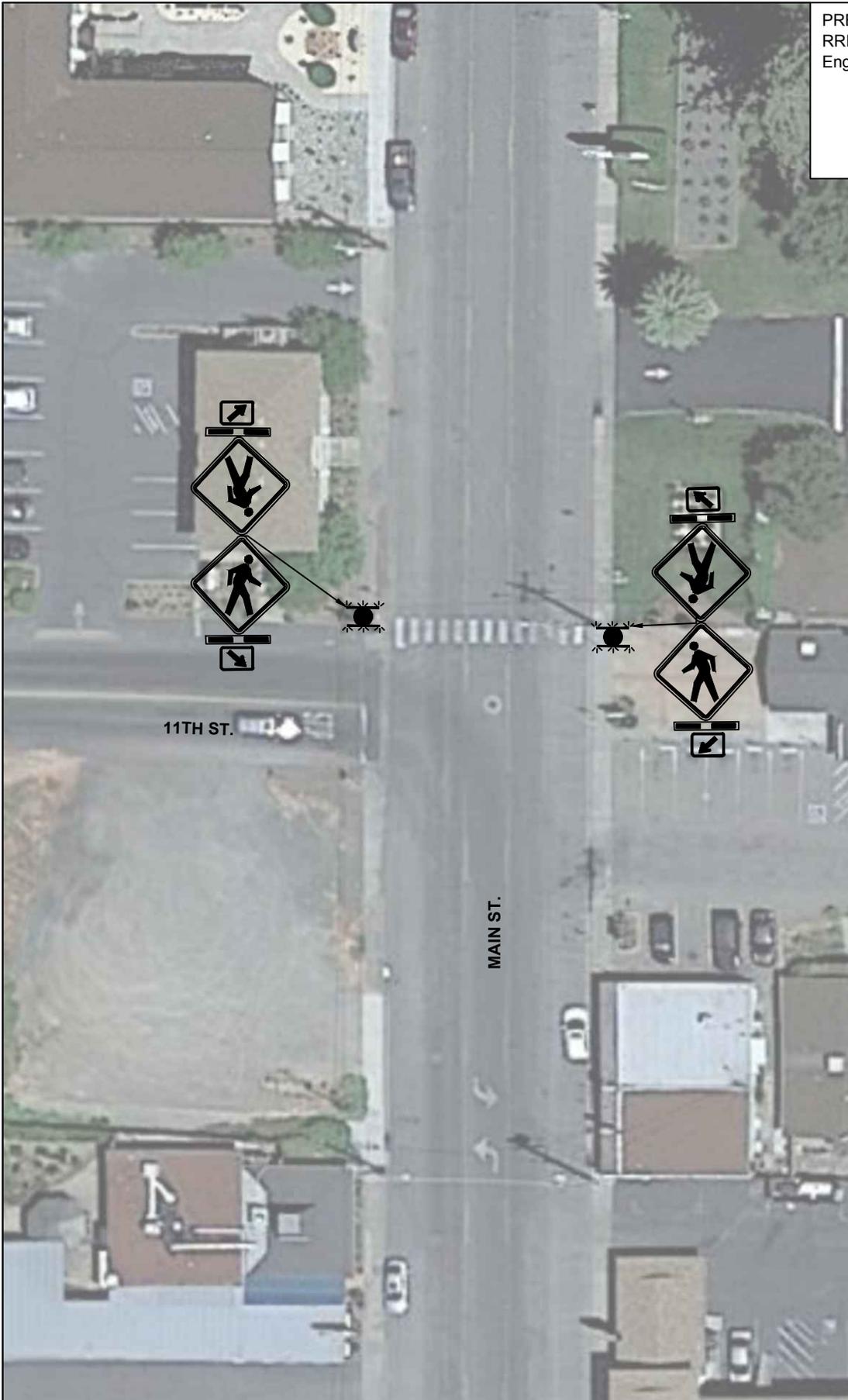


LEGEND

NORTH

NEW ROADSIDE SIGN

PRELIMINARY COST ESTIMATE:	
RRFB system	\$ 35,000
Engineering	\$ 8,500
TOTAL	\$ 43,500



11TH ST.

MAIN ST.



LEGEND

		NEW POST MOUNTED RRFB
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Figure #	Project Location	Countermeasures	Systemic Unsignalized Intersections				
			Initial Cost	HSIP #	Life Cycle	Maintenance Costs	Unit
G-1 Systemic Intersections	11th / Forbes	New intersection striping Flashing beacons STOP signs on Forbes "Intersection Ahead" signs on all approaches Engineering	\$16,000	NS07	10	\$1,500	3 years
			\$10,000	NS08	10	\$1,000	5 years
			\$4,000	NS06	10		
			\$7,000				
			SUBTOTAL (Initial Costs 11th/Forbes)		\$37,000		
G-2 Systemic Intersections	11th / Central Park	New striping / reflectors on 11th in vicinity of intersection "Intersection Ahead" signs on 11th approaching Central Park "Stop Ahead" sign on Central Park Engineering	\$10,000	NS07	10	\$1,000	3 years
			\$2,000	NS06	10		
			\$1,000	NS06	10		
			\$3,000				
			SUBTOTAL (Initial Costs 11th/Central Park)		\$16,000		
G-3 Systemic Intersections	11th / Tunis	New intersection striping Flashing beacons STOP signs on Forbes "Intersection Ahead" signs on Tunis approaches "Stop Ahead" sign on one Tunis approach Engineering	\$5,000	NS07	10	\$500	3 years
			\$10,000	NS08	10	\$1,000	5 years
			\$2,000	NS06	10		
			\$1,000	NS06	10		
			\$4,000				
SUBTOTAL (Initial Costs 11th/Tunis)		\$22,000					
G-4 Systemic Intersections	Main / E	New striping / reflectors on Main St in vicinity of intersection Intersection warning signs on Main St. approaches "Stop Ahead" sign on E St Engineering	\$4,000	NS07	10	\$500	3 years
			\$2,000	NS06	10		
			\$1,000	NS06	10		
			\$2,000				
			SUBTOTAL (Initial Costs Main/East)		\$9,000		
G-5 Systemic Intersections	Forbes / 3rd	New striping / reflectors in vicinity of intersection Intersection warning signs on Forbes approaches Flashing beacons STOP signs on Forbes "Stop Ahead" sign on 3rd St. Engineering	\$5,000	NS07	10	\$500	3 years
			\$2,000	NS06	10		
			\$10,000	NS08	10	\$1,000	5 years
			\$1,000	NS06	10		
			\$4,000				
SUBTOTAL (Initial Costs Forbes/3rd)		\$22,000					
G-6 Systemic Intersections	Lakeport / Main	New striping / reflectors in vicinity of intersection Flashing beacons STOP signs on Forbes "Stop Ahead" signs Engineering	\$16,000	NS07	10	\$1,500	3 years
			\$15,000	NS08	10	\$1,500	5 years
			\$4,000	NS06	10		
			\$8,000				
			SUBTOTAL (Initial Costs Lakeport/Main)		\$43,000		
G-7 Systemic Intersections	Clear Lake / Main	Restripe crosswalks Intersection restriping Intersection Ahead signs Flashing beacon STOP signs Yield sign STOP Ahead signs Engineering	\$5,000	NS07	10	\$500	3 years
			\$7,000	NS07	10	\$500	3 years
			\$2,000	NS06	10		
			\$10,000	NS08	10	\$1,000	5 years
			\$2,000	NS06	10		
SUBTOTAL (Initial Costs Clear Lake/Main)		\$34,000					
G-8 Systemic Intersections	Bevins / Martin	Restripe intersection w/ reflectors Intersection restripe Flashing beacon STOP signs Intersection Ahead signs Engineering	\$5,000	NS07	10	\$500	3 years
			\$2,000	NS07	10	\$500	3 years
			\$5,000	NS08	10	\$1,000	5 years
			\$4,000	NS06	10		
			\$3,000				
SUBTOTAL (Initial Costs Bevins/ Martin)		\$19,000					
G-9 Systemic Intersections	Lange / Lakeshore	Restripe intersection w/ reflectors Intersection restripe Flashing beacon STOP signs Intersection Ahead signs Engineering	\$10,000	NS07	10	\$1,000	3 years
			\$3,000	NS07	10	\$500	3 years
			\$5,000	NS08	10	\$1,000	5 years
			\$4,000	NS06	10		
			\$4,000				
SUBTOTAL (Initial Costs Lakeshore/ Lange)		\$26,000					
G-10 Systemic Intersections	Sayre / Lakeshore	Restripe intersection w/ reflectors Flashing beacon STOP signs Intersection Ahead signs Engineering	\$7,000	NS07	10	\$1,000	3 years
			\$5,000	NS08	10	\$1,000	5 years
			\$4,000	NS06	10		
			\$3,000				
			SUBTOTAL (Initial Costs Lakeshore/ Sayre)		\$19,000		
Total Systemic Unsignalized Project Construction Costs			\$247,000				
Figure #	Project Location	Countermeasures	Systemic Pedestrian Improvements				
			Initial Cost	HSIP #	Life Cycle	Maintenance Costs	Unit
G-11 Systemic Pedestrian	11th / Pool	Overhead RRFB system Reconstruct pedestrian ramps "Crossing Ahead" signs on 11th "Yield Here to Pedestrian" signs Yield bars Engineering	\$75,000	NS22PB	20	\$5,000	5 years
			\$10,000	NS21PB	20	\$1,000	10 years
			\$2,000	NS21PB	20	\$1,000	10 years
			\$2,000	NS21PB	20	\$1,000	10 years
			\$1,000	NS21PB	20	\$500	5 years
			\$16,000				
SUBTOTAL (Initial Costs 11th/Pool)		\$106,000					
G-12 Systemic Pedestrian	Forbes / Martin	New striping in vicinity of intersection "Pedestrian Crossing" signs "Pedestrian Crossing Ahead" signs "Intersection Ahead" signs Engineering	\$8,000	NS21PB	20	\$2,000	3 years
			\$2,000	NS21PB	20	\$1,000	10 years
			\$2,000	NS21PB	20	\$1,000	10 years
			\$4,000	NS21PB	20	\$1,000	10 years
			\$4,000				
SUBTOTAL (Initial Costs Forbes/Martin)		\$20,000					
G-13 Systemic Pedestrian	Main / 11th	RRFB System Engineering	\$35,000	NS22PB	20	\$5,000	5 years
			\$8,500				
SUBTOTAL (Initial Costs Main/11thn)		\$43,500					
Total Systemic Pedestrian Project Construction Costs			\$169,500				

Lakeport Systemic Unsignalized Intersections

Benefit-Cost Analysis Summary Results

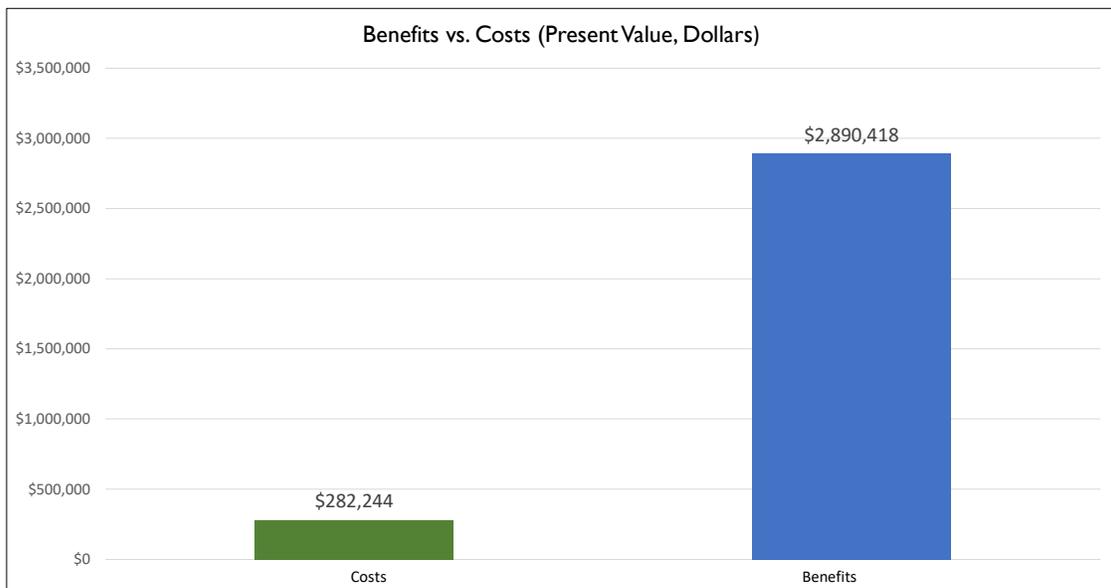
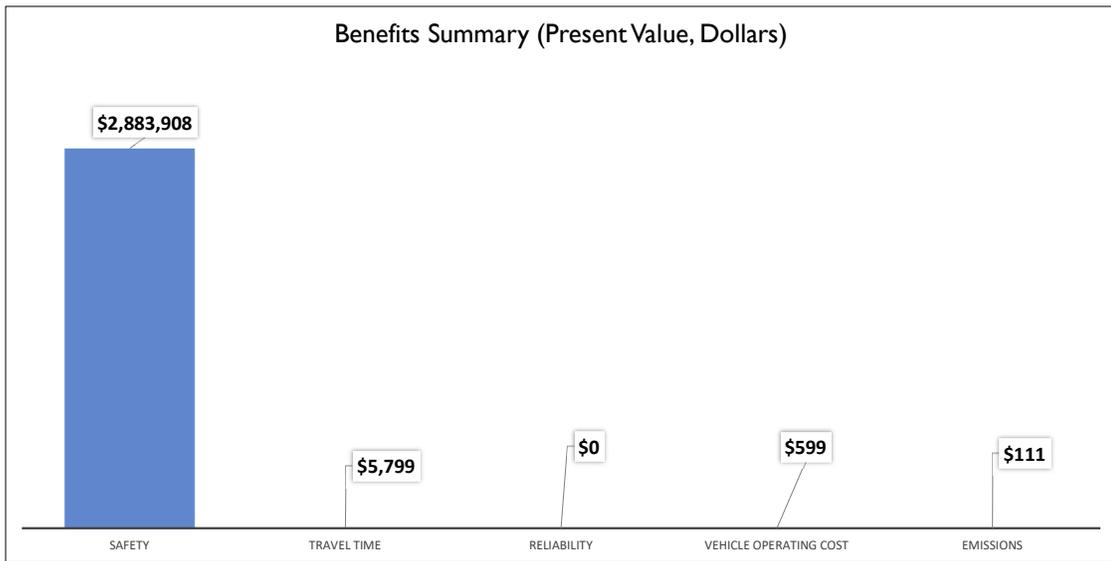
AGENCY: **Lake APC**

DATE

1/0/1900

Present Value Costs (\$ Dollars)	\$282,244
Present Value Benefits (\$ Dollars)	\$2,890,418
Net Present Value (\$ Dollars)	\$2,608,174
Benefit / Cost Ratio:	10.24
Discount Rate	3.0%

ITEMIZED BENEFITS (\$ Dollars)	Present Value
Safety	\$2,883,908
Travel Time	\$5,799
Reliability	\$0
Vehicle Operating Cost	\$599
Emissions	\$111
TOTAL BENEFITS	\$2,890,418



Lakeport Systemic Pedestrian Crosswalks at Intersection

Benefit-Cost Analysis Summary Results

AGENCY: **Lake APC**

DATE: **11/10/2021**

Present Value Costs (\$ Dollars)	\$211,385
Present Value Benefits (\$ Dollars)	\$647,965
Net Present Value (\$ Dollars)	\$436,580
Benefit / Cost Ratio:	3.07
Discount Rate	3.0%

ITEMIZED BENEFITS (\$ Dollars)	Present Value
Safety	\$645,637
Travel Time	\$2,049
Reliability	\$0
Vehicle Operating Cost	\$213
Emissions	\$66
TOTAL BENEFITS	\$647,965

