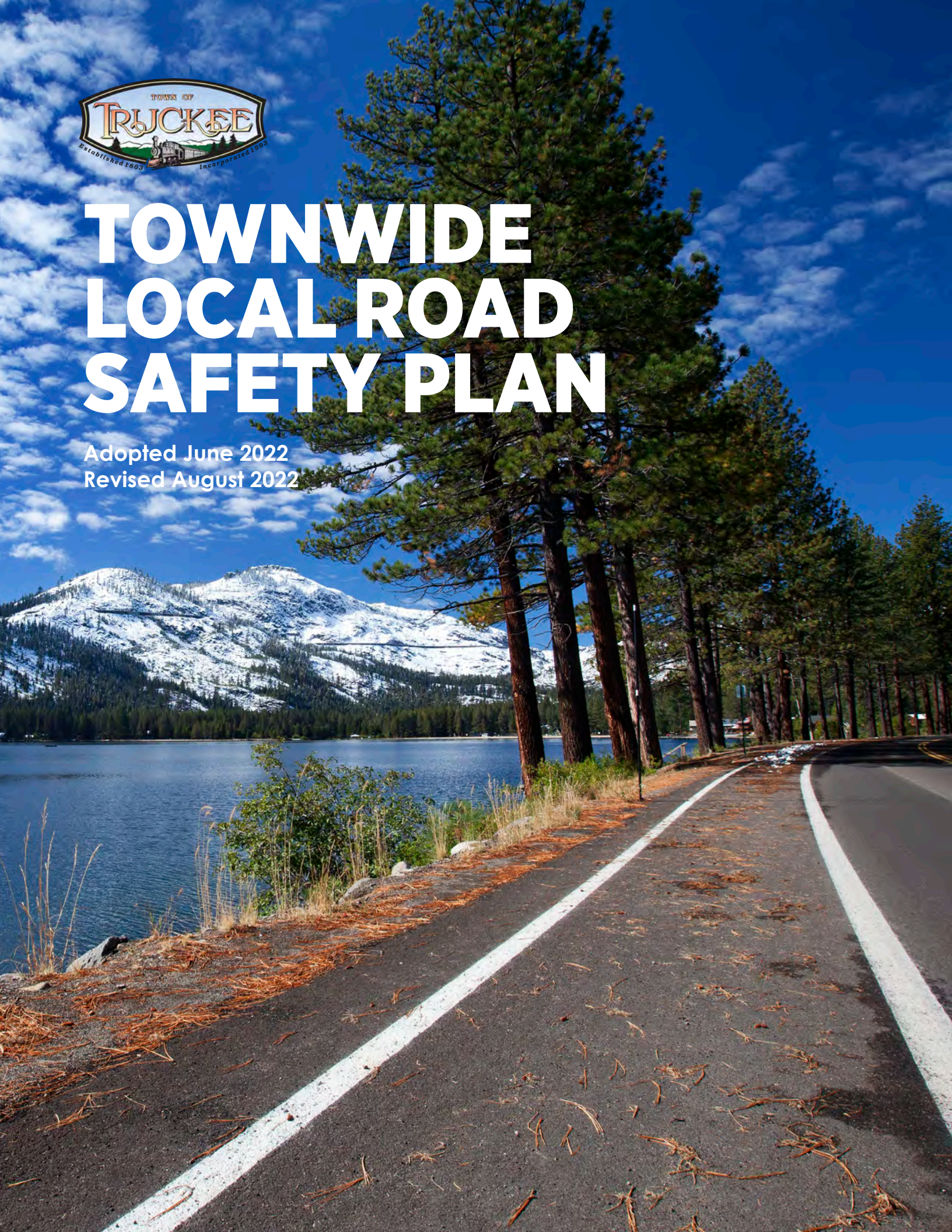


TOWNWIDE LOCAL ROAD SAFETY PLAN

Adopted June 2022
Revised August 2022

TOWNWIDE LOCAL ROAD SAFETY PLAN

Adopted June 2022
Revised August 2022

Prepared For:

Town of Truckee
10183 Truckee Airport Road
Truckee, CA 96161

Prepared By:

Kittelson & Associates, Inc.
2510 J Street, Suite 200
Sacramento, CA 95816

LSC Transportation Consultants, Inc
2690 Lake Forest Road, Suite C
P.O. Box 5875
Tahoe City, CA 96145

Project No. 25806

Cover Image: Donner Lake
Credit: Town of Truckee

CONTENTS

McIver Roundabout | Credit: Grant Kaye

1. INTRODUCTION

The Town of Truckee is committed to reducing deaths and serious injuries on its streets. To move forward this mission, the Town initiated the Townwide Local Road Safety Plan (LRSP). The LRSP is a comprehensive effort to provide a framework for understanding transportation related safety issues throughout the town and identify and prioritize strategic and proven solutions to address them.

The LRSP process combined data analysis with community and stakeholder input to develop a data informed approach to solving safety issues. The effort included reviewing crash data to identify trends or patterns that could be addressed through systemic treatments or strategies. Additionally, a high injury network was identified including streets and intersections that have historically experienced a greater frequency and/or severity of crashes. The culmination of this effort is the development of strategies and countermeasures to improve roadway safety in the Town.

The Town of Truckee's LRSP should be considered a living document that evolves as the Town works toward achieving its vision for a safer roadway system for every person. The safety story in the Town is complex, with a year-round population as well as a heavy seasonal influx in various parts of the year due to its status as a local and national hiking and skiing destination. The LRSP focuses on addressing the needs of all populations and is intended to evolve as the needs do.

Document Organization

1. Introduction	Introduces the plan, legal background, and context.
2. Vision & Goals:	lays out the transportation safety future envisioned in the Town and key strategies to reach it.
3. Plan Development Process:	describes how the LRSP was developed, including outreach and engagement.
4. Existing Safety Conditions:	summarizes current roadway safety performance, patterns, and trends and identifies priority emphasis areas safety strategies will focus on
5. Recommendations:	defines strategies, countermeasures, and projects intended to address safety needs
6. Funding:	identifies potential funding sources to implement recommendations.
7. Implementation:	discusses partnerships and to carry out the LRSP and track progress.

What is an LRSP?

Local agencies must have an LRSP or equivalent planning document to pursue Highway Safety Improvement Program (HSIP) grant funds from Caltrans.

An LRSP provides a local-level assessment of roadway safety, identifying locations for improvements and a range of strategies to implement. Local agencies collaborate and partner with key stakeholders who have a role in implementing the improvements. These stakeholders include representatives from law enforcement, education, and the broader community.

The collection of LRSPs across the state complement California's Strategic Highway Safety Plan, providing intentional and continual assessment and improvements to enhance roadway safety.

Safety at the State Level

Each state is required to develop a data-driven traffic safety plan called a strategic highway safety plan (SHSP). The 2020-2024 California Strategic Highway Safety Plan (SHSP) is a statewide, coordinated safety plan providing a comprehensive framework for reducing highway fatalities and severe injuries on public roads in California. It identifies key safety needs and guides investment decisions towards strategies and countermeasures with the most potential to save lives and prevent injuries.

The SHSP has historically addressed the four Es of traffic safety: engineering, enforcement, education, and emergency services. In 2020, state transportation officials shifted their focus to bolder and more innovative strategies to address the rise in serious injuries and fatalities. Adopting guiding principals to integrate equity, implement a safe systems approach, double down what works, and accelerate advanced technology, the plan highlights 16 "Challenge Areas." Of those 16 areas, 6 were integrated into a list of five High Priority areas identified as having the greatest opportunity to reduce fatalities and serious injuries on public roads as follows:

- Active Transportation: Pedestrians & Bicyclists
- Impaired Driving
- Intersections
- Lane Departures
- Speed Management / Aggressive Driving

Now, the agency is working to implement strategies to eliminate traffic deaths and serious injuries through a safe systems approach. Such strategies encourage things like slower vehicle speeds, systemically implementing changes to roadways before severe crashes occur, addressing a risk with multiple solutions, engaging more stakeholders to share in the responsibility of implementing changes, and serving road users to meet their needs rather than placing sole responsibility for safety on the road user themselves.

Safe Systems & the LRSP

While the state SHSP focuses on statewide issues, the Townwide LRSP brings the focus locally to Truckee. The LRSP identifies emphasis areas based on extensive crash and roadway data analysis. It also identifies multidisciplinary strategies to enhance roadway safety. It incorporates principles of the safe systems approach in the following ways:

- Establishing a vision and goals to further enhance roadway safety.
- Identifying systemic countermeasures that can be used proactively to improve roadway conditions by providing multiple messages to road users about conditions, make the consequences of mistakes less severe, and providing more protection to vulnerable road users, such as people on foot and riding bicycles.
- Providing educational materials to further communicate key roadway safety information and messages.
- Identifying potential funding and coordination sources to help implement projects.

Brickelltown | Credit: Town of Truckee

2. VISION & GOALS

The LRSP vision and goals were informed by best practices in safety planning and input gathered from stakeholders, residents, and visitors over the course of the LRSP's development.

Vision:

The Town of Truckee will improve the safety of all road users of all modes of transportation within the Town with a goal of eliminating all roadways fatalities and serious injuries by 2050.

Goals:

Goal 1

Maintain an accurate collision database and routinely evaluate roadway safety.

Goal 2

Educate motorists, bicyclists, and pedestrians on how to travel safely and limit the potential for collisions.

Goal 3

Implement projects that make streets safer for every person.

Goal 4

Integrate equity into the safety decision-making process.

Legacy Trail | Credit: Kyle Railton

3. PLAN DEVELOPMENT PROCESS

While data is an important and useful tool to help define safety issues, it is often incomplete for a variety of reasons. These might include inaccurate reporting, an inability to capture safety issues like near-misses, and difficulty pinpointing streets or areas people currently avoid because they feel unsafe. Therefore, the LRSP took a data-informed approach to planning, using data analysis in conjunction with engagement with the stakeholder working group and input gathered through community engagement activities. Through this approach, it was possible to highlight lived experience in addition to data to develop a more comprehensive view of the transportation safety issues in Truckee. This section discusses how the various participants in the process were engaged.

COVID-19 Pandemic Considerations

Because of the ongoing COVID-19 pandemic, all stakeholder and public engagement efforts were held virtually.

Stakeholder Working Group

A stakeholder working group (SWG) was developed to include representatives from a broad cross section of community, business, educational, and government interests. Each person represents a unique set of experiences, needs, and views on the transportation system in Truckee. The following were represented in the SWG:

Town Representatives

- Tahoe Truckee Unified School District
- Town of Truckee
- Truckee Fire Protection District

State Representatives

- California Highway Patrol
- Caltrans

Community Representatives

- Glenshire Devonshire Residents Association
- Sierra Community House
- Tahoe Donner Neighborhood Association
- Tahoe Forest Health System
- Truckee Trails Foundation

The SWG met twice over the course of the Townwide LRSP's development, as follows:

Meeting 1 | August 3, 2021

- Define LRSP purpose and scope
- Present and gather feedback on data analysis and network screening
- Discuss vision, goals, and objectives
- Review and discuss potential countermeasures and strategies

Meeting 2 | December 13, 2021

- Present outreach summary
- Finalize vision, goals, actions, and emphasis areas
- Discuss priority projects

More detailed information on the public engagement process is presented in the Public Engagement Technical Memorandum, included in Appendix A.

Outreach and Engagement

Community engagement is critical to the success of the LRSP, as the people who live, visit, and travel in Truckee have firsthand experience of the day-to-day challenges on the roadway network. It was critical to engage both the year-round and seasonal communities to understand the issues and challenges faces by each group. Year-round residents and workers better understand the seasonal differences and issues, while seasonal communities may have a better picture of issues arising from lack of familiarity with the area. To engage these communities, the Town conducted two methods of virtual outreach: a survey and an interactive map.

Online Public Survey

The survey was hosted and promoted by the Town between August and September 2021 in English and Spanish. It focused on travel patterns and perceptions of traffic safety issues related to infrastructure and individual behavior. A total of 181 people responded to the survey. Of those, approximately 86% were full time residents or commuters and 14% were visitors.

Major themes

- Speeding
- Lack & inadequacy of bike facilities
- Maintenance issues
- Poor quality of infrastructure
- Poor driver behavior

Suggestions

- Speed Management: Increased enforcement, road behavior education, traffic calming, additional signs, lowering speed limits
- Intersection/Crossing Improvements: Roundabouts, RRFBs, sight distance, right turn restrictions
- Biking Improvements
- Congestion Management
- Maintenance

Figure 1 Top Safety Problems People Have Experienced in Truckee in the Past Year

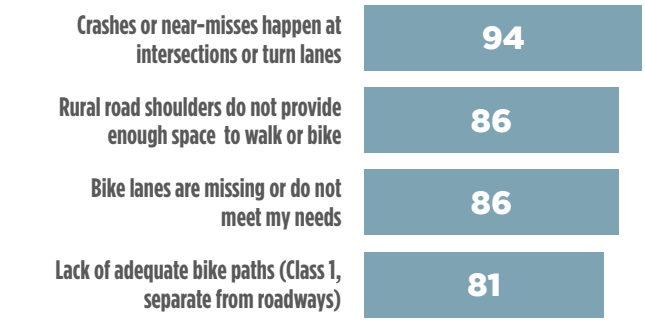
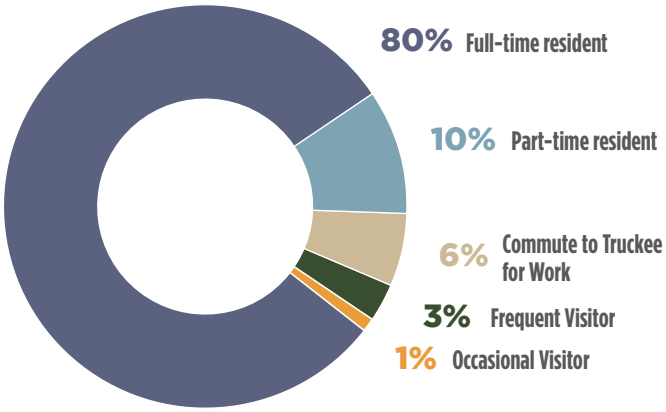


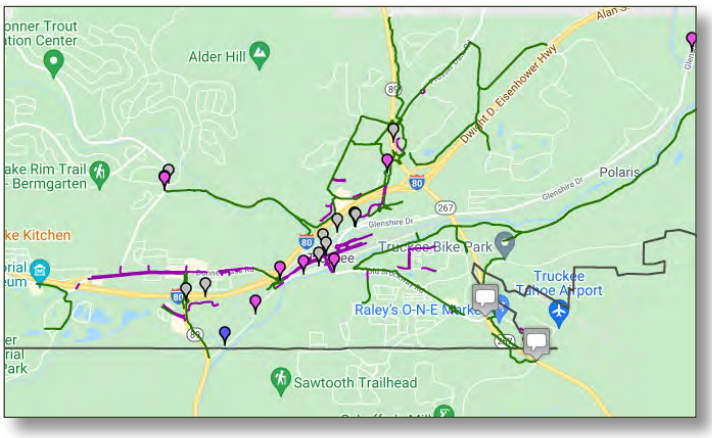
Figure 2 How Respondents Spend Time in Truckee



Interactive Map

The map was developed to allow people to identify location based roadway safety concerns and experiences. It was hosted between August and September 2021 in English and Spanish. A total of 37 comments were received and 29 "likes" were given. Comments largely reflected the issues uncovered in the survey, including concerns about speeding, confusing intersections, and biking and walking infrastructure and safety.

Figure 3 Interactive Map Screenshot



4. EXISTING SAFETY CONDITIONS

This section discusses current townwide roadway safety conditions at the time this report was written. It is organized into the following subsections:

- **Existing Safety Practice and Culture**—Highlights existing plans, studies, and practices that include roadway safety considerations.
- **Summary of Safety Performance**—Describes the crash patterns and trends for the Town and identifies the higher priority locations based on crash and roadway data analysis.
- **Emphasis Areas**—Identifies the emphasis areas for the Town based on the roadway safety performance assessment.

Existing safety conditions information was used to directly inform the RSP recommendations presented in Section 5.

Existing Safety Practice and Culture

The Town has been working to improve safety through planning efforts and capital projects. These efforts have informed the development of the LRSP and the strategies which were identified. A brief summary of relevant efforts is described here. For more information, please see the Document and Data Review Technical Memorandum.

Town Of Truckee 2025 General Plan (2006) & Draft Truckee 2040: General Plan And Downtown Specific Plan (In Progress)

The 2025 General Plan was adopted in 2006 and the 2040 update is currently ongoing. The plan identifies guiding principles and goals related to safety, including providing safe, comfortable, integrated networks of walking, biking, transit, and vehicular facilities with a focus on non-motorized modes.

The 2040 plan considers opportunity suites, roadway safety improvements, and crash history to provide a blueprint for the Town's future. The draft documents highlight a desire for a walkable downtown and maintains goals for safe, comfortable, and integrated networks for all modes.

Dorchester Drive | Credit: Town of Truckee

Truckee Trails and Bikeway Master Plan (2015)

The Truckee Trails and Bikeway Master Plan provides a guide to the implementation of the related goals, policies, and actions from the General Plan through future local, state, and federal roadway improvement projects, dirt trail projects, and identification of trail corridors. The master plan outlines goals for safety, comfort, and consistency throughout the Town and defines proposed trails, bikeway network, facilities, and sidewalks.

Envision Donner Pass Road Corridor Improvement Project – Western Segment Corridor Report (June 2018)

The Envision Donner Pass Road (DPR) Corridor Plan provides an assessment of existing conditions on the corridor and identifies potential corridor improvements to improve safety, circulation, multi-modal facilities and aesthetics. It includes an inventory of existing deficiencies and proposed improvements. It proposes several new roundabouts, new sidewalks and crosswalks, sidewalk widening and replacement, and center medians. Construction is complete for the first phase of the project, including new sidewalks and pedestrian refuge islands.

Donner Pass Road Corridor Improvement Study (November 2020)

The Town of Truckee authorized the Donner Pass Road Corridor Improvement study to evaluate transportation conditions along Donner Pass Road from Donner Memorial State Park to the East End of Donner Lake. The study evaluates parking conditions, traffic, pedestrian, and bike circulation, and safety along the corridor. The initial recommendations included prohibiting parking in some areas and constructing a new multiuse trail, although the Town has since been considering alternative solutions with a group of stakeholders, as directed by the Town Council. Improvements were made in 2021 to convert head in parking to parallel parking through the use of boulders and signage.

Other Active Projects

The Town has many active projects it is currently pursuing or will in the future. The 2020-2021 Annual Operating Budget and Five-Year CIP identifies 3 roundabout projects and 15 other streetscape improvement and roadway improvement projects. The Town also applied for and was awarded a Highway Safety Improvement Program (HSIP) grant to upgrade guardrails in five roadway segments throughout town.

More detailed information on associated studies can be found in the Document and Data Review Technical Memorandum, included in Appendix B.

Summary of Townwide Safety Performance

The following section describes regional roadway safety performance in two ways:

Townwide Crash Patterns & Trends

The first analysis identifies recurring crash patterns and trends for the Town. It is based on reported crash data over a 10-year period from January 1, 2010 through December 31, 2019. The longer reporting period is useful in highlighting issues and key findings over time.

Network Screening

The network screening analysis identifies intersections and segments with the highest crash severity in an effort to target locations where improvements may have the highest impact. The analysis is based on a 5-year crash reporting period, from January 1, 2015 to December 31, 2019. The shorter period helps to focus the efforts on immediate needs and meets state grant timeframe requirements.

Townwide Crash Patterns and Trends

The crash data analysis revealed key findings which can help contextualize the safety needs in Truckee.

Crash Data - 2010 to 2019

27 Pedestrian

56 Bicycle

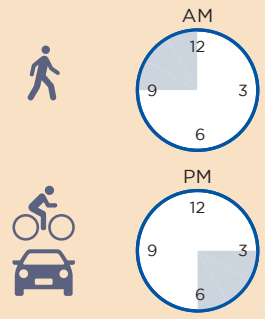
1,167 Vehicle

Peak Crash Months

43% Occurred in Winter (Dec, Jan, Feb)

55% Occurred in Summer (Jul & Aug)

Peak Crash Time Periods



6	Fatal	1	3	2
389	Injury	26	50	313
855	Property Damage Only	0	3	852

2/3 Occurred during Daytime in Clear & Dry Conditions

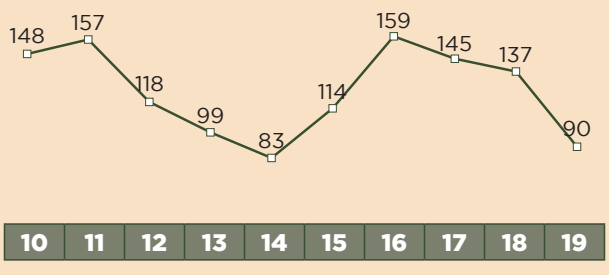
Most Common Crash Types

32% Were Due to Excessive Speeds

13% Involved Alcohol and/or Drugs

13% Involved Drivers Violating other Driver's Right of Way

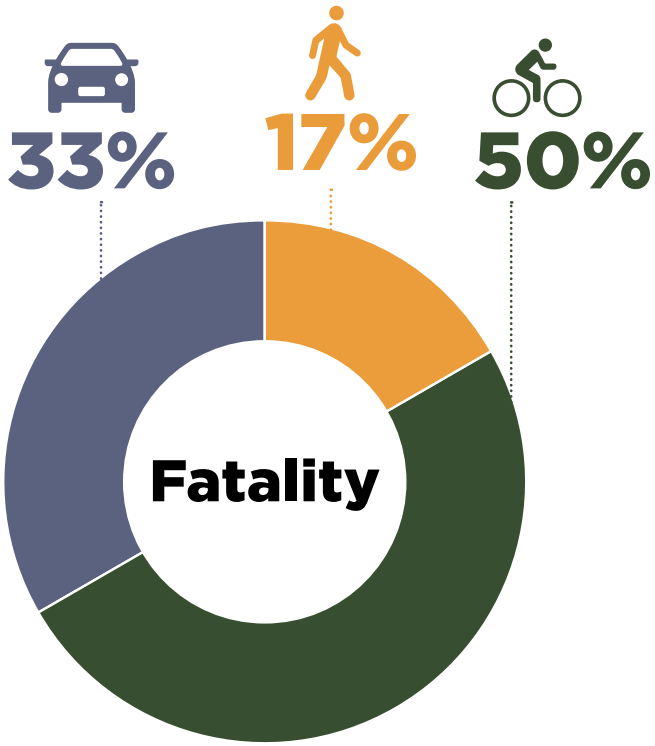
Crashes by Year

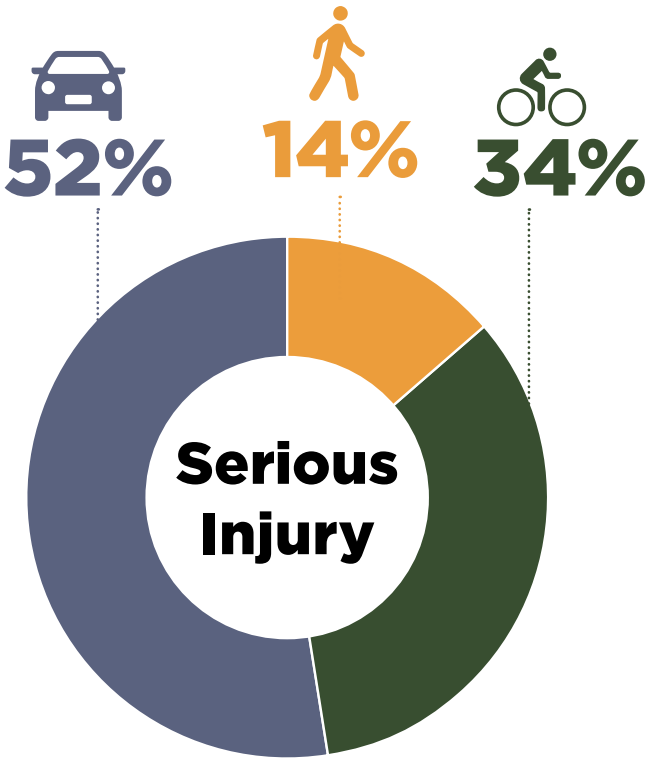


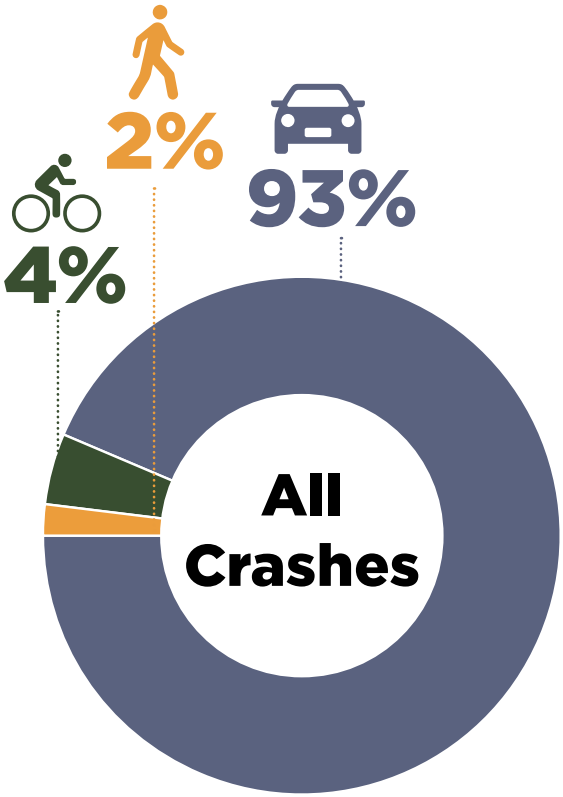
While people who walk and bike make up a small percentage of the total crashes, reviewing the trends in crashes reveals some telling trends:

- Pedestrians are overrepresented in fatal and severe injury crashes. Pedestrians are involved in 2 percent of total reported crashes, but 17 and 14 percent of reported fatal or severe injury crashes.
- Bicyclists are also overrepresented in fatal and severe injury crashes. Bicyclists are involved in 2 percent of reported crashes but 50 and 34 percent of fatal and severe injury crashes, respectively.

The following graphics show a percentage breakdown fatal, serious injury, and all crashes by mode







More detailed information on crash history can be found in the Crash and Roadway Data Analysis Technical Memorandum, included in Appendix C.

Network Screening

A network screening was undertaken to evaluate the safety performance for the entire town. To undertake the screening, a crash severity score was developed. The crash severity score assigns weight to individual crashes based on the crash severity and location of the crash. Deaths and serious injuries are provided the highest severity score in recognition that a death versus a severe injury is often a function of the individual involved or of emergency response time. Therefore, both outcomes represent locations where the Town may want to prioritize improvements.

It should be noted that the crash severity score ranks the intersections and segments based on their relative severity to other intersections and segments in the Town; these scores do not necessarily reflect severity as compared to the rest of the state.

The screening was undertaken for roadway intersections and segments (roadway stretches between intersections). Private, emergency access, maintenance, and county roads were excluded as well as the Interstate 80 mainline to focus the analysis on areas where the Town could implement improvements.

Figure 4 shows the results of the network screening. The analysis highlights higher scores in Downtown and along major roads like Northwoods Boulevard and Donner Pass Road, among others.

A screening was also undertaken focused on bicycle and pedestrian crashes. The results are displayed in Figure 5. The analysis highlights higher scores generally concentrated in Downtown and along Donner Pass Road, especially around Donner Lake.

Other analyses were conducted to consider the winter and summer seasons, separately. The results showed:

- **Summer Month Crashes:** show similar results to all crashes, but are especially focused around Downtown, Donner Pass Road / Donner Lake, and Brockway Road and along the northern city limits along Alder Creek Road and Northwoods Boulevard (Figure 6)
- **Winter Month Crashes:** also show similar results to all crashes, with a focus around Downtown, Donner Lake, Donner Pass Road, Northwoods Boulevard, and Brockway Road (Figure 7)

Statewide Comparison

A comparison with statewide averages was conducted using the most recent statewide report - the 2017 Annual Report of Fatal and Injury Motor Vehicle Traffic Crashes prepared by the California Highway Patrol (CHP). The comparison showed:

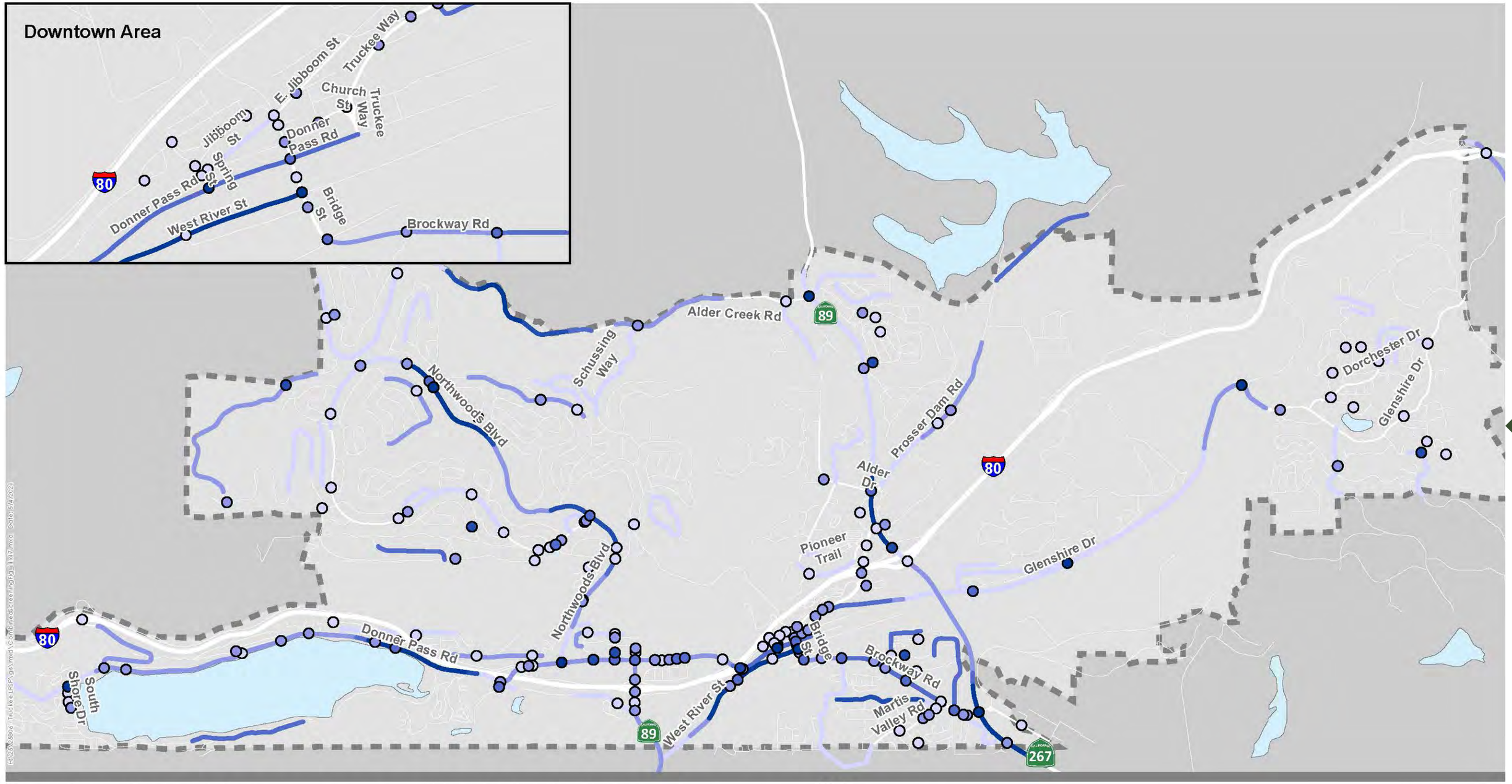
- Statewide crash frequency is highest in October and November, while in Truckee it is highest in the winter / snowy months.
- "Broadside" crashes were the most frequent crash types for fatal crashes statewide. In Truckee, these crashes account for 16% of crashes while "hit object" crashes are the most frequent at 22% of fatal/severe crashes.
- "Rear end" crashes were the most frequent crash types for injury crashes statewide, making up 41% of injury crashes. In Truckee, the most common types were "rear end" and "broadside," each making up 21%.
- 50% of all fatalities in Truckee had alcohol involved while 33.9% fatalities statewide had alcohol involved.
- In Truckee and statewide, unsafe speed was the top primary crash factor making up 20% of all crashes. For fatal and severe crashes, unsafe speed and driving or bicycling under the influence were the top primary crash factors.
- Overall, the proportion of fatal and injury accidents involving pedestrians in Truckee is lower than the state average.
- Overall, the proportion of fatal and injury accidents involving bicyclists in Truckee is higher than the state average.

Emphasis Areas

Based on recurring crash patterns and trends, the greatest opportunity to improve roadway safety in Truckee comes through implementing strategies that are effective at addressing the following emphasis areas:

- **High crash frequency and severity locations**
- **Speed management**
- **Safety for people who walk and bike**
- **Driving under the influence**
- **Coordination and evaluation**

Figure 4 Crash Severity Scores for All Crashes



Roadway Segment Crash Severity Scoring

- 95 - 100th Percentile
- 90 - 94th Percentile
- 80 - 89th Percentile
- 50 - 79th Percentile
- 0 - 49th Percentile

Intersection Crash Severity Scoring

- 95 - 100th Percentile
- 90 - 94th Percentile
- 80 - 89th Percentile
- 50 - 79th Percentile
- 0 - 49th Percentile

Town Limits

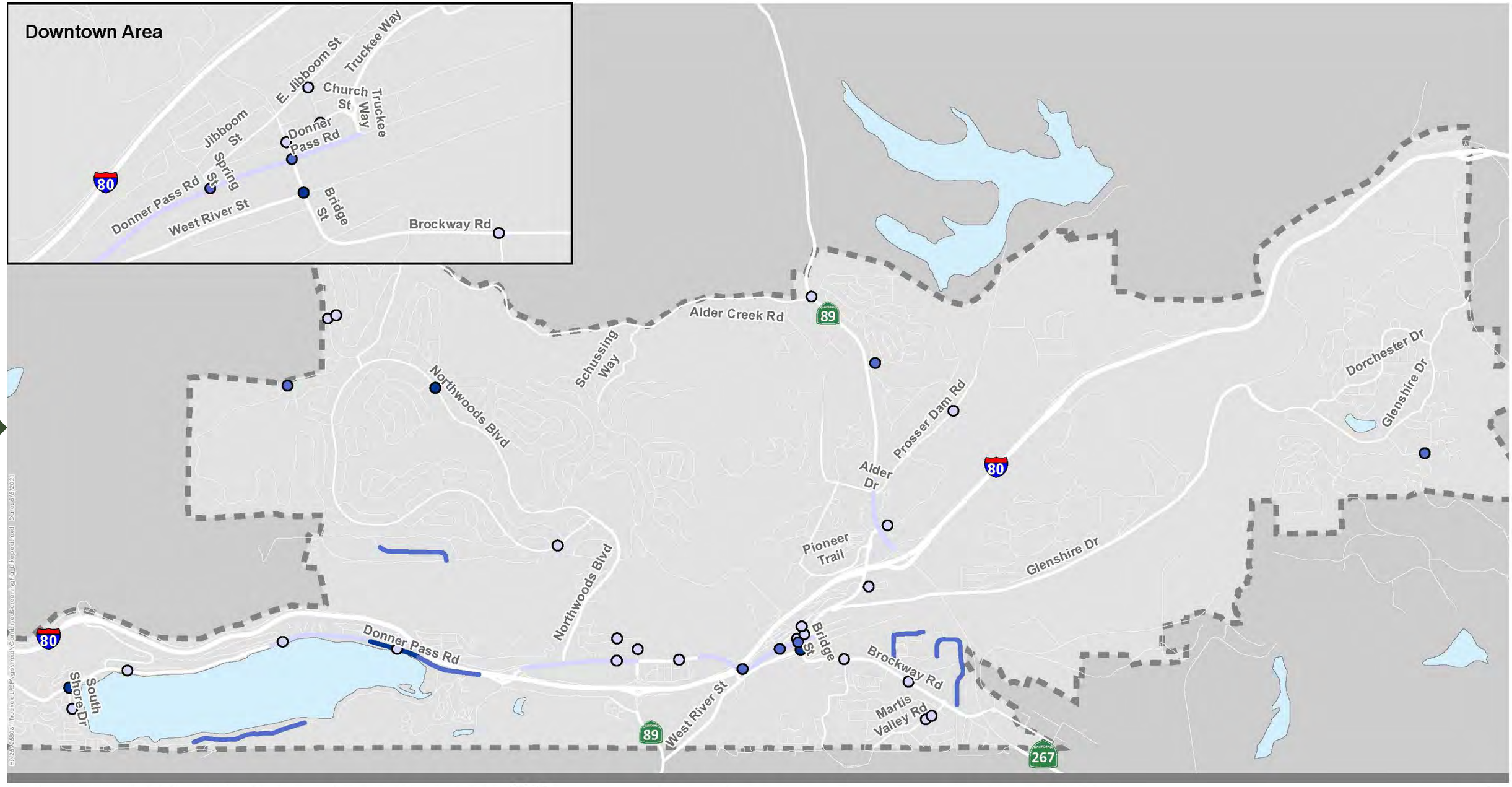
0 5,250 Feet

Screening includes all crashes from 2015-2019

KITTELSON & ASSOCIATES

Crash Severity Scores (All Crashes)
Roadway Segment and Intersection Screening
Truckee LRSP

Figure 5 Crash Severity for Bicycle and Pedestrian Crashes



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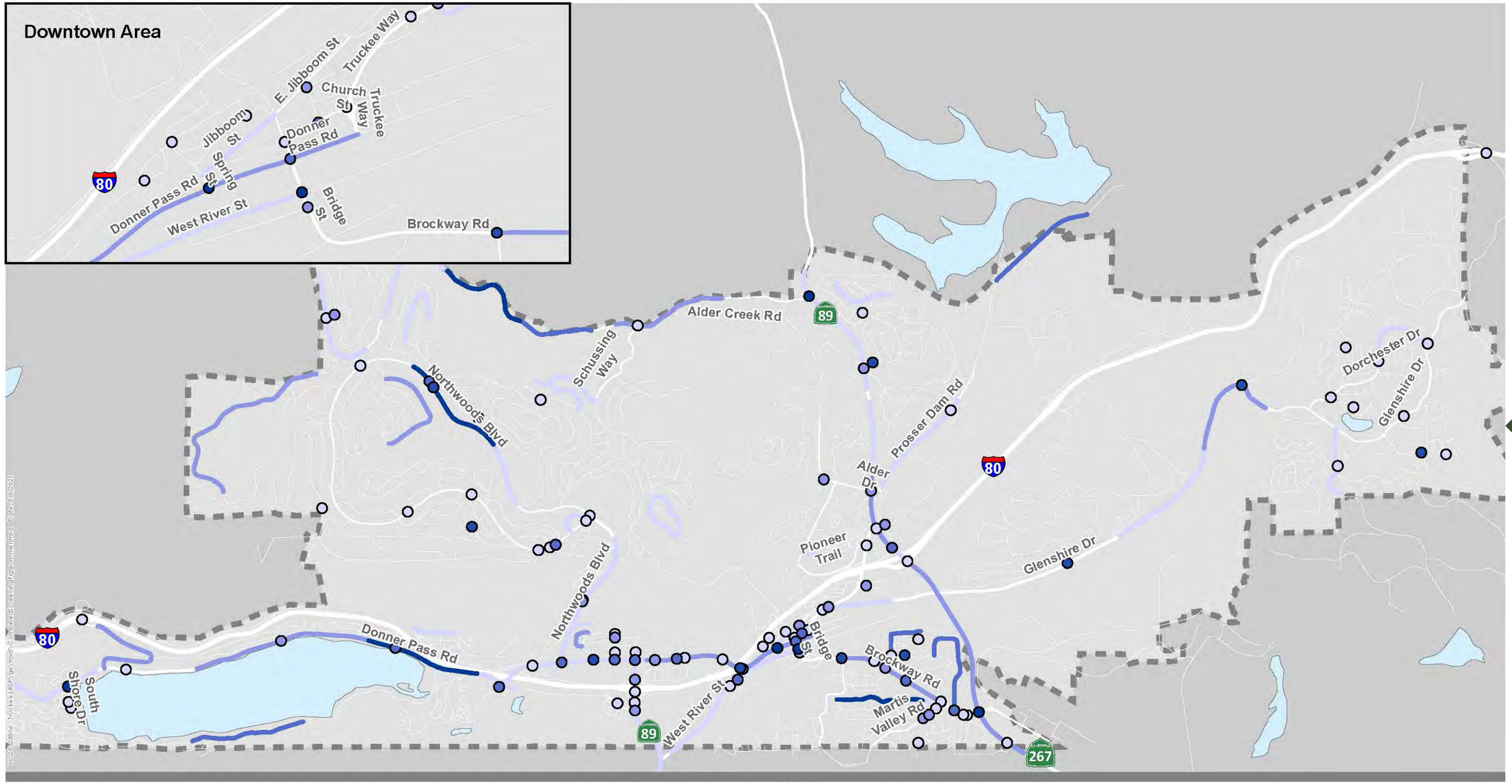
Crash Severity Scores (Bicycle and Pedestrian Crashes)
Roadway Segment and Intersection Screening
Truckee LRSP

Figure 6 Crash Severity for Crashes Occurring During Summer Months



Roadway Crash Severity Scoring
- 0 - 49th Percentile
- 50 - 79th Percentile
- 80 - 89th Percentile
- 90 - 100th Percentile

Intersection Crash Severity Scoring
- 0 - 49th Percentile
- 50 - 69th Percentile
- 70 - 84th Percentile
- 85 - 94th Percentile
- 95 - 100th Percentile

Town Limits

0 5,400 Feet

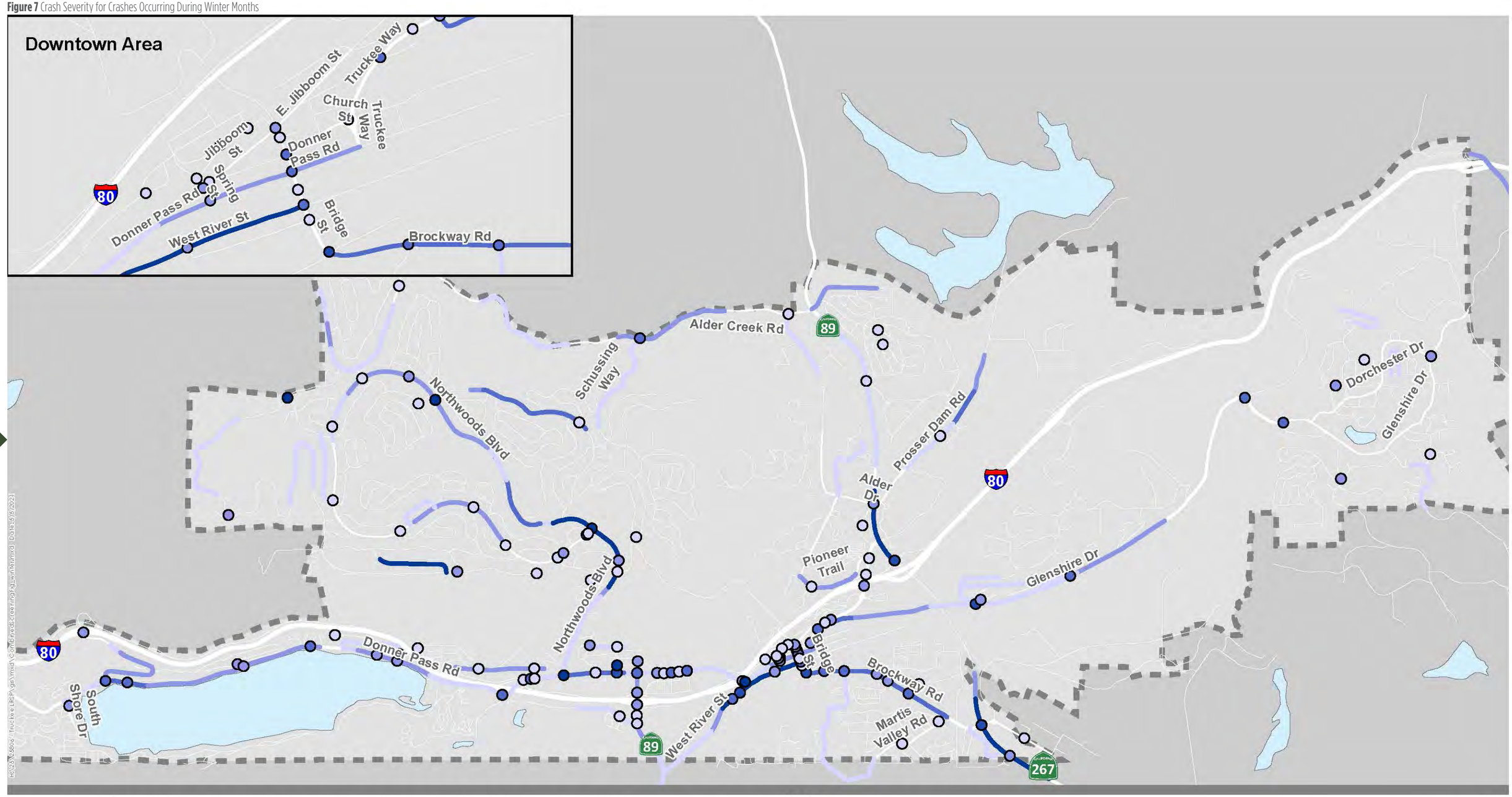
Screening includes all crashes from May 1 to October 30 (2015-2019).

KITTELSON & ASSOCIATES

Figure 4

Crash Severity Scores (Summer Crashes)
Roadway Segment and Intersection Screening
Truckee LRSP

Figure 7 Crash Severity for Crashes Occurring During Winter Months



Screening includes all crashes from November 1 to April 30 (2015-2019).

Figure 3

Crash Severity Scores (Winter Crashes)
Roadway Segment and Intersection Screening
Truckee LRSP

KITTELSON & ASSOCIATES

5. RECOMMENDATIONS

Making Truckee's Transportation System Safer for Everyone

Improving roadway safety in Truckee will take coordinated effort. This section presents multidisciplinary recommendations for the Town to consider as they make investments and advancements in improving roadway safety across the region. The recommendations are organized into the following categories:

ENGINEERING STRATEGIES

EDUCATION AND PROMOTION STRATEGIES

EQUITABLE ENFORCEMENT STRATEGIES

EMERGENCY SERVICES STRATEGIES

INNOVATIVE STRATEGIES

The following strategies have been chosen based on local safety performance. As conditions change over time in the region and as the transportation planning and engineering profession's approach to roadway safety progresses, the strategies in this section should be reviewed and updated to remain relevant and useful to the Town.

Engineering Strategies

These countermeasures were selected based on the crash patterns and trends described in the previous section. The countermeasure treatments have been grouped into five treatment groups.

- Pedestrian Crossing Enhancements;
- Bicycle Intersection Treatments;
- Signalized Intersection Treatments;
- Unsignalized Intersection Treatments; and,
- Roadway Segment Treatments.

For each of the five categories, Table 1 briefly describes each countermeasure, the crash reduction factor (CRF), and the planning level cost estimate. Information regarding the estimated crash reduction is from the Local Roadway Safety Manual for California's Local Road Owners (LRSM, 2020), unless otherwise noted.

It should be noted that any project involving striping requires ongoing maintenance 2-3 times per year to address impacts from weather conditions. These maintenance costs are in addition to installation costs and not reflected here, and should be considered prior to the selection of a striping strategy.

More detailed information on strategies can be found in the Crash and Roadway Data Analysis Technical Memorandum, included in Appendix C.

Table 1 Engineering Countermeasures

Treatment	Planning-Level Cost Range	Crash Reduction Factor	Treatment Addresses	Brief Description
Pedestrian Treatments				
Crosswalk Visibility Enhancements	$1,000 - $10,000 / location	25-35%	Drivers failing to yield, visibility concerns, noted crossing conflicts, may be implemented with other elements	High-visibility crosswalk markings, improved nighttime lighting, advance or in-street warning signage, curb extensions, and parking restrictions to increase visibility.
Rectangular Rapid Flashing Beacons (RRFBs) Note: The Town only recommends RRFBs if paired with other improvements like pedestrian refuge islands or curb extensions.	$15,000 / location	35%	Mid-block crossing demand, drivers failing to yield, visibility concerns	Helps reduce pedestrian-vehicle conflicts, increase the visibility of pedestrian crossing locations, and reduces pedestrians trapped in the roadway.
Pedestrian Hybrid Beacon (PHB)	$150,000 - $250,000 / location	55%	Long pedestrian delay due to few available gaps in traffic, drivers failing to yield, noted crossing conflicts	Provide active warning to drivers when a pedestrian is in the crosswalk to increase yielding.
Pedestrian Refuge Island	Up to $150,000 / island	45%	Visibility concerns, long crossings, excessive vehicle speeds	Reduces crossing distance and provides a place for pedestrians to wait for traffic to pass.
Signalized Intersection Treatments	LPI: $550 - $6,000 / location	LPI: 60% (NCDOT, 2021)	High elderly populations, high crash history, school crossings	Leading Pedestrian Intervals (LPI) provide pedestrians a head start when crossing at a signalized intersection, increasing visibility.
	No RTOR: $200 - $6,000 / location	No RTOR: 25% (NCDOT, 2021)	Exclusive pedestrian phase, school crossings	No Right-Turn on Red (No RTOR) restricts motorists on turning right during the red light, reducing conflicts with crossing pedestrians.
Sidewalk/ Pathway Installation	Dirt Trail: $200,000 / mile	65-89%	Where there is no dedicated space and there is noted demand or crashes have occurred	Provide space to travel within the public right-of-way that is separated from other vehicles.
	Paved Trail: $1.5 - $2.5 million / mile			
	Sidewalk: $70 / linear foot			

Treatment	Planning-Level Cost Range	Crash Reduction Factor	Treatment Addresses	Brief Description
Bicycle Treatments				
Bike Lanes	Bike Lanes: $16,000 / mile Buffered Bike Lanes: $20,000 / mile	35-45%	Sidewalk / wrong way riding, existing demand and / or crash history, limited connectivity / access to bicyclists	Dedicates space for bicyclists within the public right-of-way to limit conflicts; can be striped, buffered, or contraflow.
Bike Lane Extension Through Intersections	$200 - $5,000 / intersection	39% (ODOT, 2021)	Right or left-turning conflicts between bicyclists and motor vehicles, separated bike lanes	Indicate the intended path of bicyclists through an intersection or across a driveway or ramp raising visibility for all users.
Bike Boxes	$5,000 / bike box	35% (ODOT, 2021)	Right or left-turning conflicts between bicyclists and motor vehicles, need to accommodate turning bicycle traffic, heavy vehicular turning movements	Provides a designated space for bicyclists to wait ahead of traffic at signalized intersections, raising visibility and reducing right-hook crashes.
Signalized Intersection Treatments				
Improve Signal Hardware, Striping, Timing, or Lighting	$4,000 - $250,000 / location	10-74%	Vehicular crashes at signalized intersections, poor visibility, complex intersection geometry, nighttime crashes	Improve visibility and navigation through intersections.
Unsignalized Intersection Treatments				
Install or Upgrade Signing and Pavement Markings	$500 - $5,000 / approach	15-25%	Poor visibility and related crash history, high speeds, complex intersection geometry	Advance intersection warning signs, STOP AHEAD pavement markings, transverse rumble strips on the approach, stop bars, and upgraded warning or control signs to increase visibility.
Improve Sight Distance to Intersection	$1,000 - $100,000 / approach	20%	Poor visibility, limited sight distance	Clearing vegetation, roadside objects, on-street parking, fences, buildings, snow, or other objects in the right-of-way to increase visibility.
Install Roundabouts	Costs vary significantly / site	12-78%	High frequency of crashes, traffic delays, complex geometry, frequent left turns, relatively balanced traffic flow	Slow vehicular speeds, improve traffic flow, eliminate left turns, and reduce potential conflict points through intersections

Treatment	Planning-Level Cost Range	Crash Reduction Factor	Treatment Addresses	Brief Description
Roadway Segment Treatments				
Segment Curve Treatments	$4,000 - $20,000 / curve	Install or Upgrade Signs: 15-40%	Limited visibility approaching curve, run-off road crashes	Provides drivers with advance warning of the approaching curve and can help them navigate safely through the curve.
Delineation Treatments	$500 - $10,000 / curve	Delineators: 15%	Limited visibility approaching curve, run-off road crashes	Delineators, reflectors, and object markers provide drivers with a visual cue of the approaching horizontal curve and help drivers navigate safely through the curve.
	$500 - $5,000 / direction	Edge-Lines and Centerlines: 20%	Limited visibility approaching curve, run-off road crashes, roads without existing edge- or centerlines, wide travel lanes	Help clarify and increase the visibility of the edge of the roadway and lane boundaries.
Median-Related Treatments	$100,000 / 100 feet	Raised Median: 20-75%	Head-on, left turn, and access related crashes	Reduces conflicts by restricting access-related movements to the roadway.
Speed Management	$2,000 - $11,000 / display	Speed Feedback Signs: 0-41%	Excessive speeds, sharp curves.	Provide drivers with feedback / visual warnings about their speed in relationship to the posted speed limit.
Note: Please review the Town's existing speed limit policy prior to implementing speed management strategies.				

Education Strategies

To make Truckee's roadways safer, the Town will need everyone to pitch in. Educating and informing the public is an important part of this plan. The following six education-related strategies were identified for the Town of Truckee.

Road Safety Education to Children

These strategies promote road safety to all users, particularly for pedestrians and bicyclists. Introducing these strategies to children can help begin teaching safety early, enlighten families to walking and biking as viable transportation modes, and improve health, well-being, and safety. Thy can also result in less traffic congestion and emissions caused by school-related travel. Some options include:

Safe Routes to School: encourages and enables children to walk and bike to school through messaging and infrastructure improvements.

Walking School Buses and Bicycle Trains: encourage groups of children walking or biking to school, with one or more adults.

Speed Monitoring Awareness Radar Trailer

The speed trailer is an educational device that helps drivers become more aware of their speed in relation to the posted speed. This awareness tool can also help residents survey the traffic speeds in their own neighborhood. This trailer is usually deployed in a street or neighborhood for a few days so the residents can monitor the speeds on their own streets and become aware of their own driving behaviors.

Conspicuity Enhancements and Education

A campaign to encourage people to wear reflective clothing and/or walk in well lit areas could help to increase visibility for all road users in dark or low visibility areas. These campaigns are especially effective for people who walk, bike, and run recreationally. Equity and location should be considered in such a campaign, with an understanding that in areas like Downtown, the onus of safety is still on drivers who should be navigating with caution in a high activity area.

Vulnerable Road User Education

This educational campaign would be targeted at drivers to teach them about navigating the roadway in a way that is safe and considerate to all roadway users, specifically people who walk and bike who are most vulnerable. Police officers can hand out informational flyers describing the rules of the road to help drivers modify their behavior.

High-Visibility Media Campaign

A high visibility campaign targeting safety issues such as drinking and driving can include safety messaging on TV, radio, online, and via billboards, as well as press events and news releases covering the efforts. These efforts can help to increase awareness of road safety, and could be expanded to focus on general roadway safety messaging.

Enforcement Strategies

Even when engineering countermeasures are implemented, road users failing to adhere to traffic laws can result in crashes of varying severity. Police enforcement can increase driver awareness and consequently reduce traffic crashes.

> Enforcement strategies should be undertaken with due caution to avoid inequitable enforcement activities and evaluated to determine the strategy's impact.

Research has found that most enforcement strategies have limited long-term impacts for changing road user behavior. Therefore, the most effective enforcement strategies tend to be those that can be done transparently, consistently, and in coordination with education or outreach campaigns such as enforcement in school zones during school hours.

The following considerations can help lead to more successful outcomes for roadway safety enforcement strategies:

- Police officers should be trained properly beforehand.
- Campaigns should be tailored to suit the needs of different neighborhoods and demographics and should be designed and carried out to avoid targeting disadvantaged communities.
- Enforcement should be conducted with the help of staff support and awareness of the courts.
- Enforcement operations should begin with warnings and flyers before moving on to issuing citations.

The following strategies were identified for the Town of Truckee.

Progressive Ticketing

Progressive ticketing is a method for introducing ticketing through a three-staged process. Issuing tickets is the strongest strategy of an enforcement program and it is usually reserved for changing unsafe behaviors that other strategies failed to change or that pose a real threat to the safety of road users. There are three main steps of an effective progressive ticketing program:

- Educating - Establish community awareness of the safety problem created by speeding. Education campaigns are intended to encourage people to alter their own behavior.
- Warning - Announce what action will be taken and why, providing people with time to change behaviors before ticketing starts. Fliers, signs, newspaper stories and official warnings from officers can all serve as reminders.
- Ticketing – After the "warning" period, hold a press conference announcing when and where the police operations will occur and ticket drivers who continue to operate in an unsafe manner.

Speed Enforcement in School Zones

Strict enforcement of speed laws in school zones can improve the safety for children walking and bicycling to school as well as drivers. Potential strategies include a 'zero tolerance' policy for speeders in school zones or an increase in fines for drivers who violate the posted school zone speed limit.

Emergency Response Strategies

Emergency response is critical in reducing the severity of injuries sustained from collisions. Effective emergency response allows for high quality medical care at the scene and during transport to a trauma center. It is integral to helping the Town reduce fatal and severe injury collisions. The effectiveness of emergency response is tied closely to the time it takes for a person injured in a crash to receive medical care. Research indicates there is a "golden hour"—total pre-hospital time under 60 minutes is associated with a decrease in patient mortality. The following considerations can help lead to more successful outcomes for these strategies.

Implementing new Technology

Technological developments are being applied to improve emergency response. Drones and roadway video are being explored to better understand the details of collisions in real-time in order to send proper care as soon as possible. This can also maximize resources utilized for care at the collision.

Partner with Local Hospitals or Outreach Groups

Partnering with local hospitals or outreach groups can help provide bystander training courses to the public (i.e., train members of the public to respond to emergencies since they are sometimes the first on the scene at a collision and may be the only one for some time in rural areas). Opportunities for this strategy include:

- Partner with hospitals offering public education courses
- Promote the Community Emergency Response Team (CERT) program, which trains community members in first responder skills
- Work with local groups, such as fire departments, to be trainers themselves and then offer training more frequently in their local community
- Partner with local trauma centers which are required to provide injury prevention programs
- Consider a collaborative media campaign to inform and educate motorists on how to help emergency vehicles move faster by slowing down and moving over

Work with Stakeholders

The Town can work with stakeholders such as emergency service groups to:

- Maximize efficiency with urban and rural response times through evidence-based techniques
- Build advanced education EMS personnel capacity in rural areas
- Identify reasons for delay in transport for both ground Emergency Medical Services (EMS) (using registry data and EMS records)
- Identify equipment upgrades, training, or enhancements that would improve patient outcomes
- Identify barriers, if any, to rapid transfer of patients from lower-acuity hospitals to nearby trauma centers

Work with the Town 911 Team

The Town can also improve emergency response time by working with the local 911 team. Priorities in doing so include:

- Involving them in appropriate project planning and design review to identify opportunities to improve EMS access and location identification
- Involve them in enforcement and EMS grant opportunities
- Develop and purchase a system that allows local 911 dispatchers to quickly input reported road issues and send the information to the appropriate agency

Innovative Approaches

As in other areas, technology regarding road safety is rapidly evolving. This technology can help to create more sustainable and safer transportation systems. Emerging technologies can enhance the strategies discussed in the previous sections by implementing dynamic engineering treatments (e.g., operational under specific weather conditions), leveraging social media for education programs, streamlining crash reporting for enforcement, providing automated data enforcement, and improving emergency service dispatch and response.

Technologies that are applicable to roadway safety at the vehicle level can be broken into five categories. While some of the categories listed below are applicable and actionable for the Town of Truckee, others are generally out of jurisdictional control and are informational in nature. These categories are discussed below.

Alerting Drivers at Risk

One of the main ways to use emerging technologies to limit collisions is to alert drivers when they are at risk, whether due to their own behavior or the behavior of others. This includes technologies that monitor speed, indicate blind spots, alert driver to actions of other vehicles, alert driver to maintenance needs, and more. Visual and/or audio alerts, depending on the urgency of a given situation, can quickly change the behavior of the driver. Such technologies are being integrated into the national vehicle fleet, although it will take time for them to become widespread.

Protecting the Vehicle Occupants

Protecting the vehicle occupants includes physical, in-vehicle protections in the case of a collision. These protections range from seatbelts to vehicle structure, both of which are being continuously developed. In the case that a collision is unavoidable, physical protections can help reduce crash severity and protect lives.

Communicating with Drivers and the Environment

Communication with drivers and the environment is critical for safety and is a constantly developing field. Communication can come in the form of vehicle-to-driver (blind spot detection), environment-to-driver (signals), vehicle-to-vehicle, and vehicle-to-environment (the latter two methods will likely become more relevant as the fleet of autonomous vehicles develops further).

Vehicle Performing as Designed

Another way to use technology to increase roadway safety is to ensure vehicles are performing as designed. This includes vehicle upkeep, maintenance, and record keeping. Although the Town may have a limited ability to enforce these activities, it may consider producing media campaigns encouraging maintenance, provide programs to alleviate maintenance costs, and partner with local organizations, mechanics, and auto shops to promote upkeep.

Mobile Technology and Applications

Many of the currently emerging technologies applicable to roadway safety come in the form of mobile applications. Many of these are used to support Transportation Network Companies (TNCs) such as Uber or Lyft in providing rideshare, bike share, and scooter rental services, which collectively may have significant impacts in reducing impaired driving collisions. Several county sheriffs have partnered with TNCs, particularly during holidays, to reduce the number of impaired drivers on the road. There are also applications that work to restrict drivers' use of mobile devices while driving. Some of these are apps in and of themselves, while others are integrated into existing apps. Encouraging the use of such apps may be useful for the Town.

6. FUNDING

Government agencies nationwide are being challenged to do more with less. In Truckee, the Town must balance transportation funding needs with the needs of other Townwide programs, policies, and projects. To supplement or enhance funding opportunities, there are additional funding sources available at the federal and state levels. While not comprehensive, this section summarizes a set of the most relevant potential funding sources.

Federal Programs

Surface Transportation Block Grant (STBG) Program

Managing Agency: Federal Highway Administration

The Fixing America's Surface Transportation (FAST) Act converts the long-standing Surface Transportation Program (STP) into the Surface Transportation Block Grant Program (STBG) acknowledging that this program has the most flexible eligibilities among all federal-aid highway programs and aligning the program's name with how the Federal Highway Administration (FHWA) has historically administered it. The STBG promotes flexibility in State and local transportation decisions and provides flexible funding to best address State and local transportation needs. STBG funding may be used for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on qualifying public roads, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.

Website: https://www.fhwa.dot.gov/special_funding/stp/

Land And Water Conservation Fund (LWCF)

Managing Agency: National Park Service

The LWCF provides matching grants to states and local governments for acquisition and development of public outdoor recreation areas and facilities. The LWCF has provided more than $16.7 billion to acquire new federal recreation lands as grants to state and local governments. Projects can include acquisition of open space, development of small city and neighborhood parks, and construction of trails or greenways.

Website: https://www.nps.gov/subjects/lwcf/stateside.htm

Rivers, Trails, and Conservation Assistance Program

Managing Agency: National Park Service

The National Park Service Rivers, Trails, and Conservation Assistance program supports community-led natural resource conservation and outdoor recreation projects across the nation. The National Park Service helps community groups, nonprofits, tribes, and state and local governments design trails and parks, conserve and improve access to rivers, protect special places, and create recreation opportunities.

Website: https://www.nps.gov/orgs/rtca/index.htm

Other Federal Grants

The continued existence of these grant programs is at the discretion of Congress. Potential applicants should research the current state of funding before considering these sources.

Rebuilding American Infrastructure With Sustainability and Equity, (RAISE) Grant

Managing Agency: United States Department of Transportation (USDOT)

The RAISE Discretionary Grant program provides a unique opportunity for USDOT to invest in road, rail, transit and port projects that promise to achieve national objectives. Previously known as Better Utilizing Investments to Leverage Development (BUILD) and Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants, Congress has dedicated nearly $9.9 billion for thirteen rounds of national infrastructure investments to fund projects that have a significant local or regional impact. The eligibility requirements of RAISE allow project sponsors at the state and local levels to obtain funding for multimodal, multi-jurisdictional projects that are more difficult to support through traditional department of transportation programs.

Website: https://www.transportation.gov/BUILDgrants

Infrastructure for Rebuilding America (INFRA) Grant

Managing Agency: USDOT

The INFRA Grants program funds transportation projects with a focus on rebuilding existing infrastructure. To be eligible, projects must be on the National Highway System, a railway/highway grade separation project, or a freight project that is rail or intermodal, or improves freight movement within an intermodal facility. Most governmental bodies are eligible applicants (e.g., unit of local government, port authority, groups of jurisdictions). Minimum awards for large projects are $25 million and $5 million for small projects.

Website: https://www.transportation.gov/buildamerica/infragrants

State Programs

Active Transportation Program (ATP) Grants

Managing Agency: California Transportation Commission (CTC)

The California Active Transportation Program consolidated multiple existing federal and state funding sources into a single program aimed at encouraging increased use of active transportation in the state. The program seeks to increase the proportion of active transportation trips, increase safety and mobility for non-motorized users, and provide a broad range of projects to benefit active transportation users. Active Transportation Program calls for project cycles are released biennially during even years, with funding adopted the following odd year.

Website: https://catc.ca.gov/programs/active-transportation-program

Highway Safety Improvement Program (HSIP) Grants

Managing Agency: Caltrans

The HSIP is a federal-aid program to states for the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads. In California, Caltrans' Division of Local Assistance (DLA) manages the local agency share of HSIP funds. California's Local HSIP focuses on infrastructure projects with nationally recognized crash reduction factors (CRFs). Local HSIP projects must be identified on the basis of crash experience, crash potential, crash rate, or other data-supported means. To be eligible for HSIP grant funds, local agencies must have an adopted LRSP or equivalent. HSIP calls for project cycles are released biennially during odd years, with funding adopted the following year.

Website: https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvement-program

California Office of Traffic Safety (OTS) Grants

Managing Agency: Office of Traffic Safety

The California Office of Traffic Safety (OTS) strives to eliminate traffic deaths and injuries. It does this by making available grants to local and state public agencies for programs that help them enforce traffic laws, educate the public in traffic safety, and provide varied and effective means of reducing fatalities, injuries and economic losses from crashes.

Website: https://www.ots.ca.gov/

State-Local Partnership Program (LPP)

Managing Agency: CTC

The Road Repair and Accountability Act of 2017 (Senate Bill 1) created the Local Partnership Program (LPP), which is modeled closely on the Proposition 1B State Local Partnership Program. The purpose of the Senate Bill 1 LPP program is to provide local and regional transportation agencies that have passed sales tax measures, developer fees, or other imposed transportation fees with a continuous appropriation of $200 million annually from the Road Maintenance and Rehabilitation Account to fund improvements to aging Infrastructure, road conditions, active transportation, and health and safety benefits.

Website: https://catc.ca.gov/programs/sb1/local-partnership-program

Sustainable Transportation Planning (STP) Grants

Managing Agency: Caltrans

The Sustainable Transportation Planning Grant Program was created to support the Caltrans mission: provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability. Eligible planning projects must have a transportation nexus ideally demonstrating that planning projects directly benefit the multimodal transportation system. The STP includes two types of grants: Sustainable Communities Grants and Strategic Partnerships grants, the latter only apply to MPOs and RTPAs. Sustainable Communities Grants will also improve public health, social equity, environmental justice, the environment, and provide other important community benefits.

Website: https://dot.ca.gov/programs/transportation-planning/regional-planning/sustainable-transportation-planning-grants

State Highway Operation and Protection Program (SHOPP)

Managing Agency: Caltrans

The State Highway Operation and Protection Program (SHOPP) is the State Highway System's (SHS) "fix-it-first" program. It funds repair and preservation, emergency repairs, safety improvements, and some highway operational improvements on the SHS. Although SHOPP is intended for projects on statutorily designated State-owned roads, highways (including the interstate system) and bridges, it can be used for associated bicycle and pedestrian facilities. Revenues for the SHOPP are generated by federal and State gas taxes and are fiscally constrained by the State Transportation Improvement Program Fund Estimate that is produced by Caltrans and adopted by the California Transportation Commission.

Website: https://dot.ca.gov/programs/financial-programming/state-highway-operation-protection-program-shopp-minor-program-shopp

State Transportation Improvement Program (STIP)

Managing Agency: CTC

The State Transportation Improvement Program (STIP) is a biennial five-year plan adopted by the CTC for future allocations of certain state transportation funds for state highway improvements, intercity rail, and regional highway and transit improvements. State law requires the CTC to update the STIP biennially, in even-numbered years, with each new STIP adding two new years to prior programming commitments. CTC staff recommendations are based on the combined programming capacity for the Public Transportation Account (PTA) and State Highway Account (SHA) as identified in the fund estimate adopted by the CTC. Projects must first be nominated by the Metropolitan Transportation Commission in its Regional Transportation Improvement Program (RTIP), or by Caltrans in its Interregional Transportation Improvement Program (ITIP) to be included in the STIP that is adopted by the CTC.

Website: https://catc.ca.gov/programs/state-transportation-improvement-program

Recreational Trails Program (RTP)

Managing Agency: California Department of Parks and Recreation

The Recreational Trails Program (RTP) provides federal funds annually for recreational trails and trails-related projects. The RTP is administered at the federal level by the Federal Highway Administration (FHWA)and at the State level by the California Department of Parks and Recreation (DPR) and the Department of Transportation (Caltrans) Active Transportation Program (ATP). Eligible non-motorized projects include acquisition of easements and fee simple title to property for recreational trails and recreational trail corridors; and development, or rehabilitation of trails, trailside, and trailhead facilities.

Website: https://www.parks.ca.gov/?page_id=24324

Affordable Housing and Sustainable Communities (AHSC) Grant Program

Managing Agency: California Strategic Growth Council

The purpose of the AHSC Grant Program is to reduce GHG emissions through projects that implement land-use, housing, transportation, and agricultural land preservation practices to support infill and compact development, and that support related and coordinated public policy objectives. The AHSC program includes transportation focuses related to reducing air pollution, improving conditions in disadvantaged communities, supporting or improving public health, improving connectivity and access to jobs, increasing options for mobility, and increasing transit ridership. Funding for the AHSC Grant Program is provided from the Greenhouse Gas Reduction Fund (GGRF), an account established to receive cap-and-trade auction proceeds.

Website: http://www.sgc.ca.gov/programs/ahsc/

Transformative Climate Communities (TCC) Program

Managing Agency: California Strategic Growth Council

The TCC Program was established by Assembly Bill (AB) 2722 to fund development and implementation of neighborhood-level transformative climate community plans that include multiple, coordinated GHG emissions reduction projects that provide local economic, environmental, and health benefits to disadvantaged communities. The TCC Program is also an opportunity to realize the State's vision of Vibrant Communities and Landscapes, demonstrating how meaningful community engagement coupled with strategic investments in transportation, housing, food, energy, natural resources, and waste can reduce GHG emissions and other pollution, while also advancing social and health equity and enhancing economic opportunity and community resilience. The TCC Program funds both implementation and planning grants. While the program can fund a variety of projects, transportation-related projects can include, but are not limited to: developing active transportation and public transit projects; support transit ridership programs and transit passes for low-income riders; expanding first/last mile connections; building safe and accessible biking and walking routes; and encouraging education and planning activities to promote increased use of active transportation modes.

Website: http://www.sgc.ca.gov/programs/tcc/

Environmental Enhancement and Mitigation (EEM) Grant Program

Managing Agency: California Natural Resources Agency

This program authorizes the California state legislature to allocate up to $7 million each fiscal year from the Highway Users Tax Account. EEM projects must contribute to mitigation of the environmental effects of transportation facilities. The EEM Program does not generally fund commute-related trails or similar bicycle/pedestrian infrastructure. However, it does fund recreational and nature trails as part of storm water management or green infrastructure projects.

Website: http://resources.ca.gov/grants/environmental-enhancement-and-mitigation-eem/

7. IMPLEMENTATION

To improve roadway safety Townwide, the Town will need to implement roadway improvements alongside program, policy, and potentially funding changes. The implementation plan focuses on action items identified by the Town to address the goals and emphasis areas and identifies near term capital projects the Town is currently implementing or will consider moving forward to address identified needs.

Goals & Actions

As noted in Chapter 2, the Town has set a vision and goals for improving roadway safety in Truckee. The Town has also highlight action items to get the effort moving.

1 Maintain an accurate collision database and routinely evaluate roadway safety

- Collect and map crashes within the Town limits on an annual basis.
- Review the Town's crash database with currently available TIMS/SWITRS data to identify potential missing collisions in either database.
- Monitor crash patterns and trends to determine any changes over time.
- Update the LRSP goals, emphasis areas, and priorities every 5 years, or as needed to address any significant changes to crash patterns.
- Conduct outreach to identify and document locations where collisions or near misses are under reported, especially for bicycle and pedestrian crashes.

2 Educate motorists, bicyclists, and pedestrians on how to travel safely and limit the potential for collisions.

- Conduct safe routes to school educational training and encouragement using School Resource Officer, bicycle rodeos, and other events at Town schools.
- Establish educational programs to reduce driving under the influence.
- Work with the Town Public Information Officer to regularly communicate education on roadway, bicycle, and pedestrian safety, targeting full time and seasonal visitors, school-age children, and provide time-specific safety awareness messaging.
- Continue use of temporary speed trailer deployment to educate motorists of their speeds.
- Explore opportunities to acquire grant funds or partner with cycling community for education opportunities.

Donner Pass Road | Credit: Town of Truckee

3 Implement projects that make streets safer for every person.

- Expand the non-motorized infrastructure, including sidewalks and paved bike paths including consideration of pilot projects for bike boxes and/or colored bike lanes as funding allows.
- Continue to install roundabouts throughout the town and strive to replace existing traffic signals with roundabouts, particularly where single-lane roundabouts can be provided.
- Identify context-appropriate opportunities for traffic calming or speed management and implement appropriate treatments. Impacts to emergency services and evacuation routes should be considered when identifying treatments.
- Identify opportunities for pilot projects to test new countermeasures or safety strategies. Monitor and evaluate pilot effectiveness.

4 Integrate equity into the safety decision-making process

- Incorporate equity considerations when prioritizing implementation and assessment plans, such as prioritizing safety improvements in areas with traditionally underserved populations and prioritizing safety improvements for all modes of travel (bicycle, pedestrian, and transit in addition to private automobile).
- Consider equity implications for all safety enforcement activities.
- Explore opportunities to review crash and enforcement activity demographic data to address equity in safety strategy implementation, including the annual Racial and Identity Profiling Advisory (RIPA) reporting.
- Conduct outreach to or form a stakeholder group of traditionally underserved populations to help identify safety strategies or improvements to address historical underinvestment/inequities.

Addressing the Emphasis Areas

As noted in Chapter 4, the safety analysis highlighted five emphasis areas. The Town has identified action items which could be implemented to begin addressing the emphasis areas.

1 High Crash Frequency and Severity Locations

- Review periodically and identify systemic and capital improvements to address high crash frequency and severity locations.
- Monitor new and innovative countermeasures supported by Caltrans or FHWA for effectively addressing common crash patterns or trends.
- Pursue grant funding to address high frequency and severity crash locations, as well as systemic risk factors across Town.
- Evaluate sight distance on individual service requests and as a part of development review.

2 Speed Management

- Implement traffic calming measures, such as roundabouts, visual or physical roadway narrowing, and curb extensions, within neighborhoods if speeding occurs or there is a high frequency of crashes. Impacts to emergency services and evacuation routes should be considered when identifying treatments.
- Review opportunities to adjust speed limits after implementation of traffic calming.
- Coordinate with enforcement to identify areas with frequent unsafe speed crashes.
- Implement education programs that target seasonal visitors to encourage safe driving, bicycling, walking, and transit use in Truckee during summer and winter seasons.

3 Safety for People who Walk and Bike

- Monitor bicycle and pedestrian activity throughout the Town.
- Review bicycle and pedestrian crash reports to identify behavioral and engineering opportunities.
- Provide education on safe driving, walking, and biking in the Town for residents and visitors.
- Expand infrastructure for walking and biking, including intersection treatments.

4 Driving Under the Influence

- Work with stakeholder partners to identify opportunities to influence driving under the influence behaviors.
- Coordinate with enforcement to identify focus locations for enforcement activities and education opportunities.
- Implement education programs with local school districts to target underage impaired driving.

5 Coordination and Evaluation

- Revisit plan every 5 years to update emphasis areas, actions, goals, and countermeasures as needed.
- Coordinate with CHP and Truckee Police Department.
- Coordinate with Caltrans on improvements to state facilities.
- Coordinate with school district on SR2S and pick-up/drop-off safety opportunities.
- Coordinate with Emergency Operation agencies and personal to consider Emergency Access/Evacuation when developing projects.
- Communicate with school transportation representative regarding winter road conditions that impact school delayed starts and closures.

Stockcrest | Credit: Town of Truckee

Existing Capital Projects Addressing Goals Emphasis Areas

There are a number of projects highlighted in the existing fiscal yea (FY) 20/21 Capital Improvement Plan (CIP) which, when completed, will help address the emphasis areas and improve overall safety.

More detailed information on strategies can be found in the Town of Truckee FY 20/21 CIP sheets, included in Appendix D.

C0702

Truckee River Legacy Trail Phase 4

Environmental analysis, engineering, and construction of Phase 4 of the Truckee River Trail. Construction timing will be largely dependent on landowner cooperation and right-of-way acquisition.

C1503

Pioneer Trail and Bridge Street Extension

Construction of a new access road linking Tahoe Donner to SR 89 north/SR 267 via an extension of Pioneer Trail as well as a connection to Downtown Truckee via a Bridge Street extension using the Trout Creek I-80 underpass. It is intended to reduce congestion on Donner Pass Road and provide additional access to Tahoe Donner.

C1608

Northwoods Boulevard/Donner Pass Road Roundabout

Design and construction of a roundabout at the intersection of Donner Pass Road and Northwoods Boulevard.

C1703

West River Street Streetscape Improvement Project

Design and construction of streetscape improvements such as curb, gutter, sidewalk, landscaping, utility underground, and parking improvements on West River Street from Bridge Street to the intersection of Mill Street/Riverside Drive. The project includes underground utilities, Jax Diner parking lot improvements, sidewalk on the north and souths sides, a pedestrian median island, and the Mill Street parking lot. It is estimated to be completed in FY 23/24.

C1712

C1712 I-80/Donner Pass Road/Coldstream Road Roundabout

Design and construction of a single-lane roundabout at the intersection of I-80 / Donner Pass Road / Coldstream Road. The project is being implemented as a partnership between the Town and an affordable housing developer. The project is estimated to be completed in 2022.

C1805

C1805 Reimagine Bridge Street

Evaluation, design, and construction of improvements to the intersections of Bridge Street at Donner Pass Road and Bridge Street at West River Street. Improvements may include traffic signals, sidewalks, crosswalks, pre-emption infrastructure, and railroad gates with goals to consider traffic capacity, bicycle and pedestrian facilities, safety, aesthetics, and ability to implement a Union Pacific Railroad "Quiet Zone." The project is estimated to be completed in FY23/24.

C1806

Jibboom, Bridge, and Church Streetscape Improvements

Design and construction of streetscape improvements such as curb, gutter, sidewalk, landscaping, utility underground, and parking improvements on Jibboom Street between Spring Street and Bridge Street, Bridge Street between Church Street and the north side of Jibboom Street at the Trout Creek Pocket Park, and Church Street between Donner Pass Road and Bridge Street.

C1823

DPR Corridor Improvement Study (Between Donner Memorial and East End Donner Lake)

Short term improvements including placing boulders and signage to restrict on-street parking and the design of formal parallel parking and a sidewalk. It runs along Donner Pass Road adjacent to the Tahoe Donner Beach Club Marina and Donner Memorial State Park.

C1824

Jibboom Street Sidewalk Feasibility Study and Improvement Project

Prepare a study to evaluate potential improvements to pedestrian, bicycle, and vehicle infrastructure, circulation, and safety on Jibboom Street between Bridge Street and the Stoneridge Development.

C1913

Emergency Evacuation Planning

Emergency evacuation planning, including evaluation of evacuation routes and estimated time to evacuate residential areas under various scenarios such as the time of year and time of day. The plan will be revised every five years.

C1917

Innovate Gateway

An integrated land use, urban design and sustainable transportation plan for Donner Pass Road (DPR) from I-80/Coldstream Road to the McIver Roundabout in historic downtown Truckee. This plan will include complete streets, smart mobility and multi-modal transportation supporting the development of new affordable housing.

C2006

Envision DPR - Eastern Segment Improvements

Planning, design, and construction of streetscape and utility undergrounding improvements on Donner Pass Road between Frates Lane and the McIver roundabout. It also includes a public outreach process to inform a conceptual corridor plan. It is anticipated to be completed in FY 25/26.

C2008

2021 Roadways Brushing and Chipping Project

Vegetation removal and chipping along roadways in Glenshire, Sierra Meadows, and Prosser Lakeview subdivisions. The project is anticipated to be completed in FY 2022.

C2106

Downtown Railroad Pedestrian Crossing

Design and construction of a pedestrian railroad undercrossing or overcrossing connecting West River Street to Donner Pass Road west of Spring Street, including an initial feasibility analysis.

Dorchester Drive | Credit: Town of Truckee

Donner Pass Road | Credit: Town ot Truckee

Townwide Implementation of Roundabouts

The Town has been working to implement roundabouts and traffic circles at many intersections in order to improve traffic flow, provide traffic calming, and enhance safety at intersections. As shown in Figure 9, the proposed intersections include (in alphabetical order):

Roundabouts

Donner Pass Road & Cold Stream Road	*Major Roundabout*
Donner Pass Road & Donner Trail Road	*Minor Roundabout*
Donner Pass Road & Highway 89 South	*Major Roundabout*
Donner Pass Road & I 80 West	*Major Roundabout*
Donner Pass Road & I-80 East	*Major Roundabout*
Donner Pass Road & Meadow Way	*Minor Roundabout*
Donner Pass Road & Northwoods Boulevard	*Major Roundabout*
Donner Pass Road & Pine Ave	*Minor Roundabout*
Donner Pass Road & Richards Boulevard	*Minor Roundabout*
Donner Pass Road & Vista Ave	*Minor Roundabout*
Highway 89 & Deerfield Drive	*Major Roundabout*
I-80 East & Highway 89 / Highway 267	*Major Roundabout*
I-80 West & Highway 89 / Highway 267	*Major Roundabout*
Brockway Road & Highway 267	*Major Roundabout*
Brockway Road & Old Brockway Road	*Major Roundabout*
Brockway Road & Palisades Drive	*Major Roundabout*
West River Street & McIver Crossing	*Major Roundabout*

Trails and Bikeways Master Plan Implementation

Based on the analysis and outreach performed as part of the LRSP, the Town has identified several projects from the Town of Truckee's Trails and Bikeways Master Plan to explore further for potential near term implementation. As shown in Figure 9, the potential projects include:

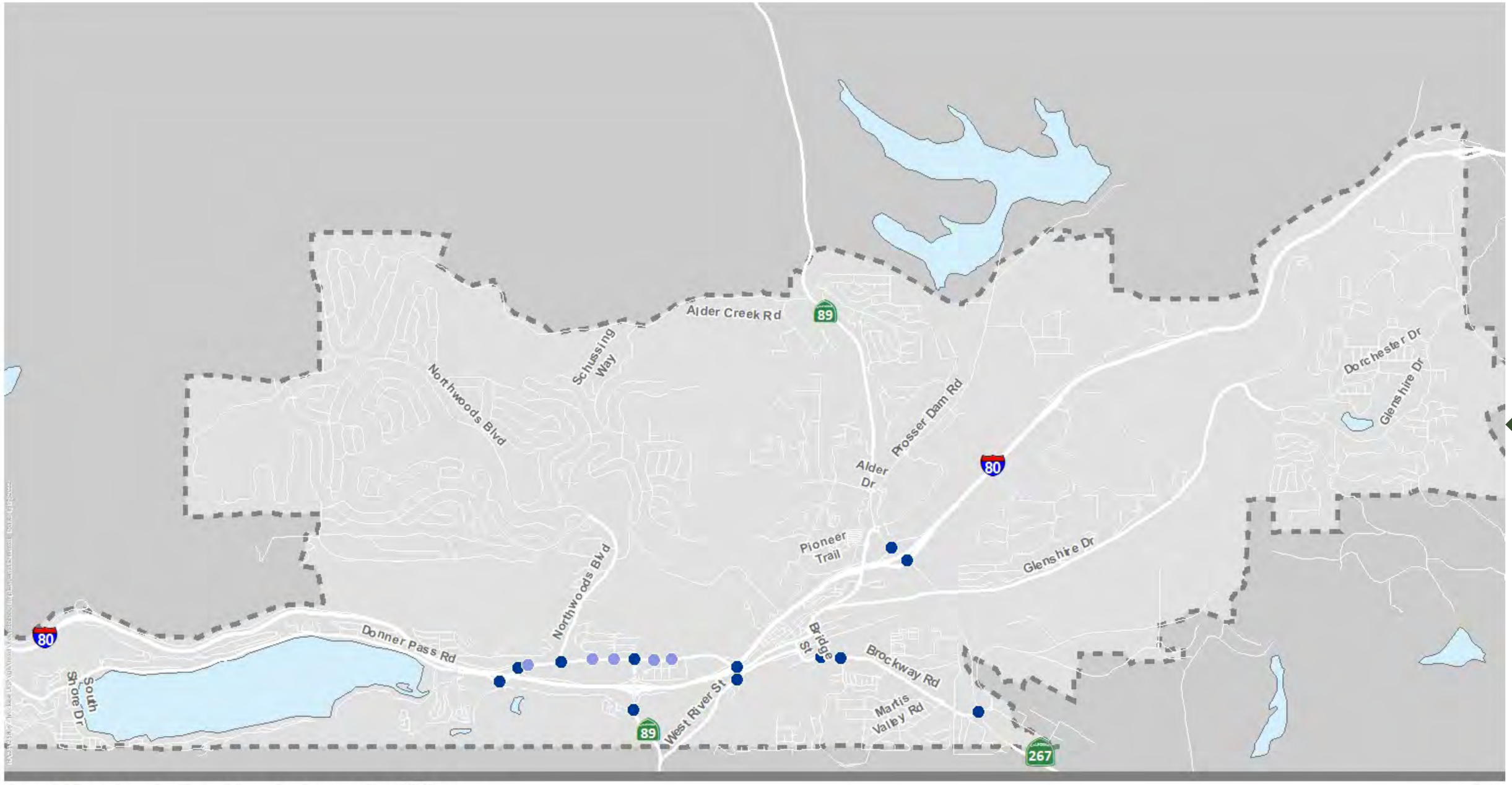
Bike Lanes

16. SR 89 from Truckee Way / Henness Road to north town limits
18. SR 89 from Donner Pass Road to south town limits
21. Highway 267 from Truckee Way / Henness Road to south town limits
27. Palisades Drive / Ponderosa Drive / Martis Valley Road from the intersection of Brockway Road & Palisades Drive to the intersection of Brockway Road & Martis Valley Road

Paved Trails

3. Truckee River Legacy Trail Phase 5A | SR 89 to Coldstream
5. Truckee River Legacy Trail Phase 4 | Palisades Drive to SR 89 (including bridge near SR 89)
6. Trout Creek Trail to Lausanne Way/Basel Place | End of Trout Creek Trail Phase I to Lausanne Way
8. Pioneer Bike Path Extension | Indian Jack Road to Frates Lane
11. Martis Creek Lake Trail | Truckee River Legacy Trail to Martis Creek Dam Road to Riverview Sports Park
13. Old Greenwood-Glenshire Drive Bridge Connector | Overland Trail / Fairway Drive Intersection to Glenshire Drive Truckee River Bridge

Figure 8 Potential Intersections to be Converted to Roundabouts or Traffic Circles



Potential Locations for Roundabout Implementation

Town Limits

- Major Roundabouts
- Minor Roundabouts or Traffic Circles

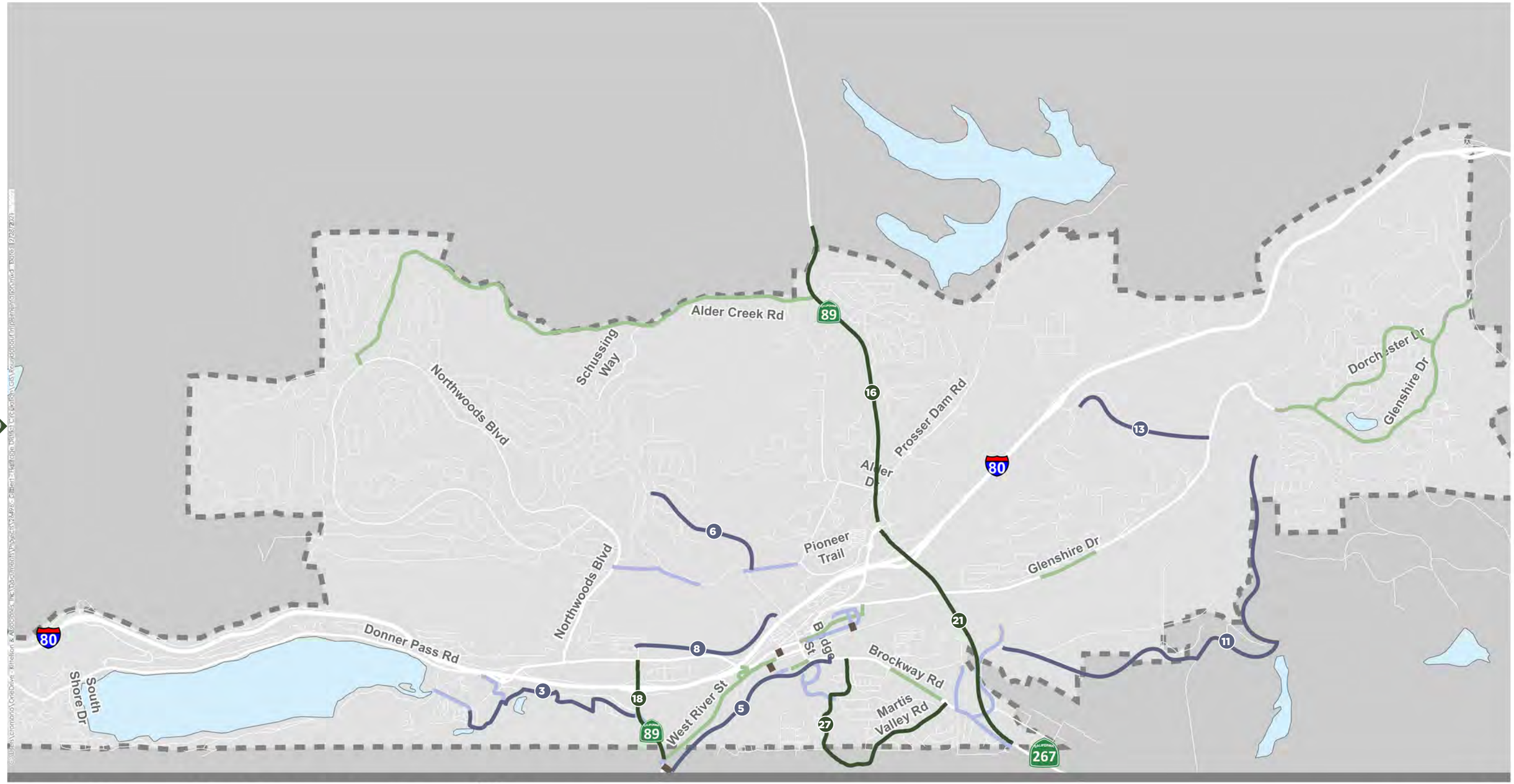
0 5,400 Feet

Source: Town of Truckee

KITTELSON & ASSOCIATES

Potential Intersections for Roundabout Implementation Truckee LRSP

Figure 9 Potential Near Term Implementation Projects from the Trails and Bikeways Master Plan



Potential Bike Lanes and Paved Trails for Implementation

- Potential Bike Lanes for Near Term Implementation and Corresponding Reference Number from Trails and Bikeways Master Plan
- Other Proposed Bike Lanes from Trails and Bikeways Master Plan
- Town Limits
- Potential Paved Trails for Near Term Implementation and Corresponding Reference Number from Trails and Bikeways Master Plan
- Other Proposed Paved Trails from Trails and Bikeways Master Plan
- Proposed Bridges and Railroad Crossings from Trails and Bikeways Master Plan

0 5,400 Feet

Source: Town of Truckee

KITTELSON & ASSOCIATES

Potential Bike Lanes and Paved Trails for Near Term Implementation Truckee LRSP

APPENDIX A

Public Engagement Technical Memorandum

KITTELSON & ASSOCIATES
2510 J Street, Suite 200
Sacramento, CA 95816
P 916.266.2190

Technical Memorandum

October 26, 2021

Project# 25806

To: Becky Bucar, Engineering Manager
Town of Truckee
10183 Truckee Airport Road
Truckee, CA 96161

From: Matt Braughton, RSP & Chris Romano, AICP, LEED AP ND

RE: DRAFT Truckee Local Road Safety Plan Outreach Summary

INTRODUCTION

In order to develop a Local Road Safety Plan (LRSP) that reflects the daily experiences of residents and visitors, the Town of Truckee conducted two methods of virtual public outreach. First, a survey was conducted that asked members of the public to share their experiences with roadway safety in the Town of Truckee. The second approach consisted of an interactive mapping activity to allow users to identify specific locations of safety concerns. Both efforts allowed respondents to identify location specific and area wide issues and opportunities affecting the safety and comfort of roadways in Truckee. This document summarizes the results of each activity. The information gathered will be used to identify areas for further study and to help develop potential solutions.

SURVEY

To understand the travel patterns and needs of residents, a survey was developed and hosted by the Town of Truckee between August and September 2021 in English and Spanish. It was advertised through social media and on the Town of Truckee's website by the Town and LRSP stakeholder partners. The following summarizes responses from the survey.

Background Information

To better understand the makeup of survey respondents, a series of questions were asked regarding demographic and other information. These responses help to create a picture of who is responding and how they travel. The questions also allow for a comparison of respondents to the general makeup of Truckee residents, which is a helpful tool in determining how representative the survey is of the population.

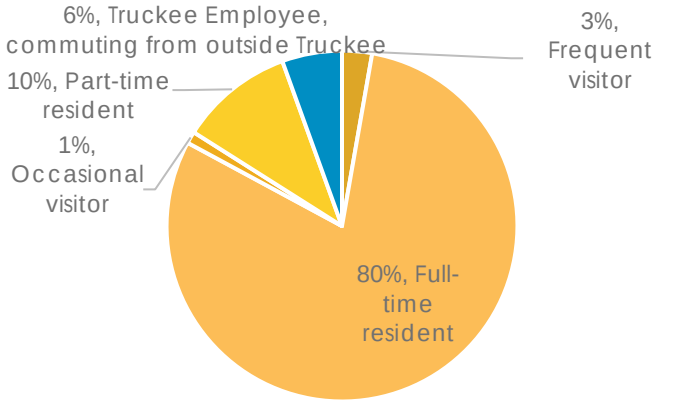
Living and Moving Around

As shown in FIGURE 1, of the 181 survey respondents, 80% reported they were full-time residents and 6% work in Truckee but live elsewhere. Of the 175 people who provided ZIP Code information, 150 live in the 96161 ZIP Code, where Truckee is located. Full time residents and employees can present a picture of year-round conditions and day to day operations.

Of the remainder, 10% reported they are part time residents, 3% are frequent visitors, and 1% are occasional visitors. Part-time residents and visitors can provide insight into challenges and opportunities that people who do not live in the area face due to unfamiliarity with the existing conditions as well as during seasonal peaks in visitor activity. Of those who did not live in Truckee year-round, the most common place where people reported living was the San Francisco Bay Area, Reno, and Lake Tahoe, as shown in TABLE 1. A full list of the ZIP Codes where people reported living can be found in APPENDIX A.

In general, most people (86%) report they drive to get around Truckee, and around 14% noted they mostly walk or bike (TABLE 2).

When it comes to where people are going, FIGURE 2 shows most people noted their most common reason for traveling is to get to work or school (48%) or to run errands (38%). Most people (88%) noted they make most of their trips around Truckee during the day, with 27% reporting traveling around sunrise or sunset and 7% traveling at night (FIGURE 3).



Total respondents: 181

Figure 1: How do you spend your time in Truckee?

REPORTED HOME LOCATION	#	%
BEYOND	7	4%
LAKE TAHOE (KINGS BEACH, TAHOE CITY, ETC.)	5	3%
N/A - I LIVE IN TRUCKEE YEAR-ROUND	145	80%
RENO	8	4%
SACRAMENTO	3	2%
SAN FRANCISCO BAY AREA	13	7%
TOTAL	181	

Table 1: If you are not a full-time resident, where do you most often travel from to reach Truckee?

MOST COMMON TRAVEL MODE	#	%
DRIVE AND WALK EQUALLY	1	1%
I DRIVE/SOMEONE DRIVES ME	154	86%
I RIDE A BICYCLE	18	10%
I WALK (THIS INCLUDES USING A WHEELCHAIR OR OTHER PERSONAL MOBILITY AID)	5	3%
RIDE A BICYCLE AND DRIVE EQUALLY	2	1%
TOTAL	180	

Table 2: What is the most common way you travel or get around?

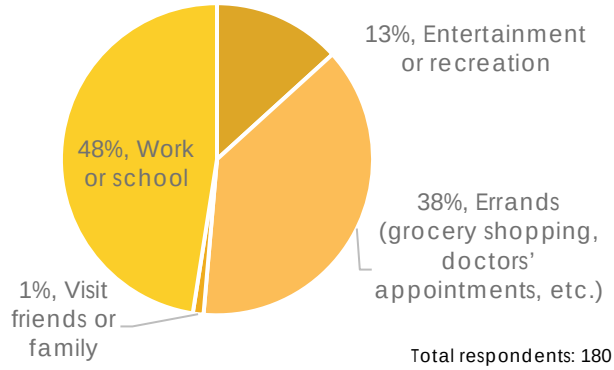


Figure 3: In a typical week, what is your most common reason for traveling?

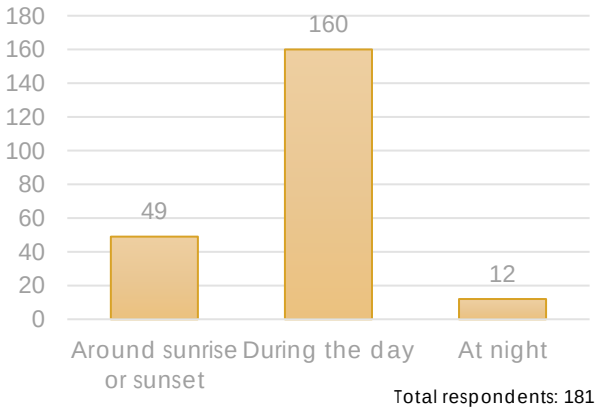


Figure 2: When do you make most of your trips around Truckee?

Respondents were also asked to note where they most commonly travel in the area. As shown in TABLE 3, the most cited location was Downtown Truckee (22%), with Gateway and Meadow Park (14%), Tahoe Donner (11%), Donner Lake (11%), and the Tahoe Communities to the South of Truckee (10%) trailing close behind.

Table 3: Where do your trips take you in a typical week?

DESTINATION	#	%
COMMUNITIES EAST AND NORTH OF TRUCKEE (RENO, VERDI, SIERRAVILLE, ETC.)	56	9%
DONNER LAKE	64	11%
DOWNTOWN TRUCKEE	132	22%
GATEWAY AND MEADOW PARK	82	14%
GLENSHIRE	51	9%
PROSSER LAKEVIEW AND PROSSER LAKE HEIGHTS	27	5%
SIERRA MEADOWS/PONDEROSA PALISADES	47	8%
TAHOE COMMUNITIES TO THE SOUTH OF TRUCKEE (SQUAW, ALPINE, MARTIS VALLEY, KINGS BEACH, ETC.)	57	10%
TAHOE DONNER	67	11%
COMMUNITIES TO THE WEST OF TRUCKEE (SODA SPRINGS, AUBURN, SACRAMENTO, ETC.)	17	3%
TOTAL	**600**	

Demographics

Understanding the demogrpahics of survey respondents allows for a better picture of how representative the survey results might be to the general population. Additionally, studies show people with different gender identies, races, ethnicities, ages, and income levels have different experiences, expectations, and needs when it comes to transportation.

Of the 160 people who responded to the question regaridng gender, 47% identify as male and 53% identify as female. According to the most recent U.S. Census estimates, the town has a population of 16,735 people with an approximatley 50/50 split of people who identify as male and female. [1] Therefore, the survey responses are within a similar range representing the general population.

Approximatley 141 people answered the question regarding race and ethnicity. 95% of respondents identify as White or Causasian, 3% identify as Asian or Pacific Islander, and one percent each identify as Latino/a/x or Hispanic and Multiracial. In comparison to Truckee as a whole, White or Caucasian people may be over represented in this survey. According to the most recent U.S. Census estimates, approximatley 82 percent of people in Truckee identify as White alone, not Hispanic or Latino, and 15% identify as Hispanic or Latino. No other racial or ethnic group makes up over 1%.[2]

Regarding age, 166 people responded to the survey question. As can be seen in TABLE 4, most people who responded were between the ages of 35 and 64. This age range was overrepresented in survey respondents when compared to the estimates for the Town as a whole.

Finally, TABLE 5 shows the incomes reported by the 130 survey respondents of answered the question. While the break points in income do not exactly match the categories as the Census reports income, it appears that the higher incomes are being overrepresented in the survey respondents. The Census estimates show about 15.7% of residents each are in the $100,000-149,999 and the over $150,000 categories, with approximately 12.8% in the $75,000 to %74,999 categories and the remainder below that.[4]

Table 4: Age of Survey Respondents vs. Census Estimates

AGE RANGE	SURVEY RESPONDENTS		US CENSUS ESTIMATE[3]	
	#	%	#	%
18 TO 34	15	9%	2695	16%
35 TO 49	51	31%	4175	25%
50 TO 64	68	41%	3425	21%
65 OR OLDER	32	19%	2170	13%

Table 5: Reported Income Levels

REPORTED INCOME	#	%
$250,000 OR HIGHER	26	20%
$150,000 - $249,999	27	21%
$100,000 - $149,999	38	29%
$75,000 - $99,999	18	14%
$50,000 - $74,999	9	7%
$35,000 - $49,000	8	6%
$20,000 - $34,999	4	3%

[1] U.S. Census Bureau. (2019). Population Estimates, July 1, 2019 – Truckee town, CA. Quick Facts. Retrieved from https://www.census.gov/quickfacts/fact/table/US/PST045219
[2] Ibid.
[3] U.S. Census Bureau. (2019). Age and Sex for Truckee town [data table for 2019]. 2015-2019 American Community Survey 5-Year Estimates (TableID: S0101). Retrieved from American FactFinder, https://data.census.gov/cedsci/table?q=age&g=1600000US0680588&tid=ACSST5Y2019.S0101
[4] U.S. Census Bureau. (2019). Income in the past 12 months (in 2019 inflation-adjusted dollars) for Truckee town [data table for 2019]. 2015-2019 American Community Survey 5-Year Estimates (TableID: S1901). Retrieved from American FactFinder, https://data.census.gov/cedsci/table?q=income&g=1600000US0680588&tid=ACSST1Y2019.S1901

Transportation Issues and Opportunities

The second portion of the survey asked respondents to provide feedback regarding the transportation network in Truckee, including providing several open-ended response questions allowing respondents to discuss location specific issues. This section of the report provides an overview of the responses provided, including high level discussions of the major issues identified and the locations most listed by respondents as needing improvements.

As shown in FIGURE 4, about 48% of survey respondents noted they always or often have road and traffic safety concerns about making trips in Truckee, with another 40% noting they sometimes have concerns.

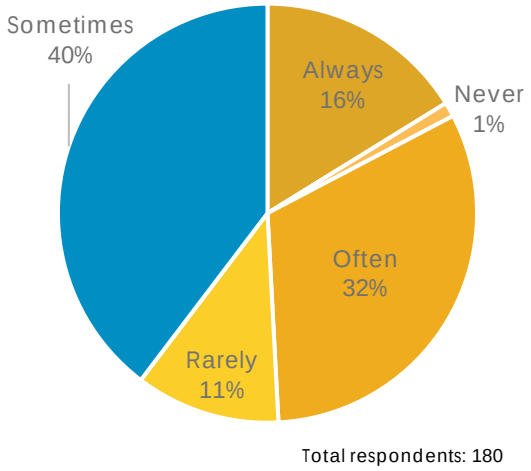


Figure 4: Do you have road and traffic safety concerns about making trips in Truckee?

Specifically, people noted they had safety concerns regarding crashes at intersections and that they had concerns about the lack of or adequacy of bikeways. In this question, respondents were asked to select all answers that apply. FIGURE 5 shows the remaining results for the pre-set survey options. Additionally, respondents were allowed to note other traffic and safety concerns. 600 individual responses were received, including the pre-set responses. Major themes include (in order of volume of responses):

- Poor driver behavior (running stop signs, driving in bike lane, etc.) (14)
- Speeding/speed limit too high (12)
- Poor quality of roads, bikeways, and sidewalks, including maintenance and faded striping (9)
- Issues regarding navigating and traffic in roundabouts (8)
- Concerns about head in parking and its impact on people biking (4)
- Concerns about nonmotorist behavior (jaywalking, unpredictably biking, etc.) (4)
- Concerns about providing emergency access and evacuation routes (3)

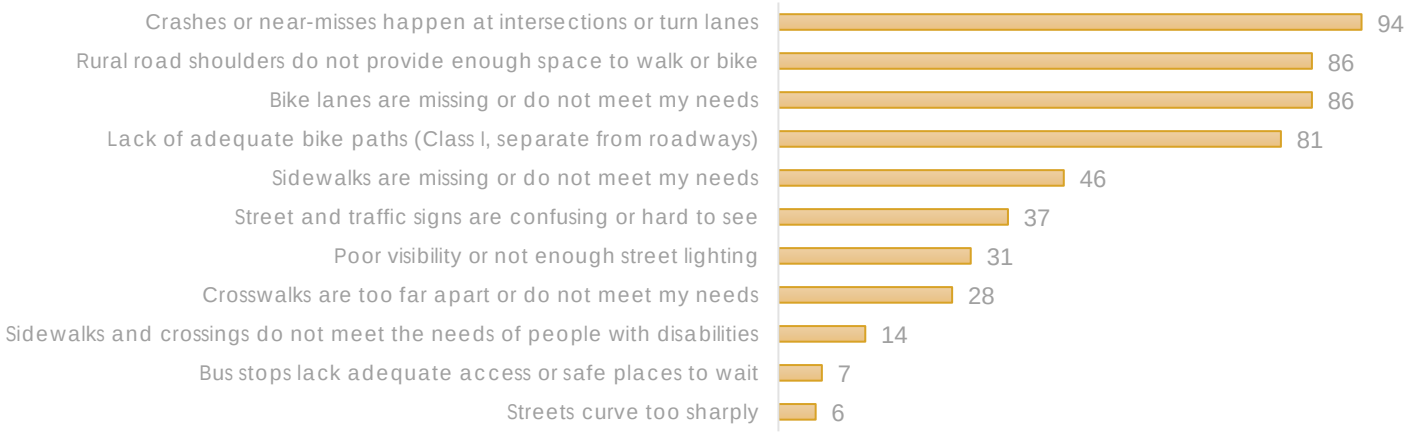


Figure 5: In the past year, what safety problems have you experienced while traveling in Truckee?

Respondents were also asked to note the types of unsafe behavior they experienced on Truckee streets in the past year. The most common responses were related to people driving too fast and people driving while on the phone, sleepy, or distracted. Other common responses had to do with people crossing at unsafe places or times and drivers running red lights/stop signs and not stopping for people crossing the street. In this question, respondents were asked to select all answers that apply. FIGURE 6 shows the remaining results for the pre-set survey options. Additionally, respondents were allowed to note other unsafe behaviors they had experienced. 752 individual responses were received, including the pre-set responses. Major themes include (in order of volume of responses):

- Drivers cutting off people biking or walking or encroaching in bike lanes (9)
- Tailgating (5)
- Bicyclist behavior (not obeying traffic laws) (4)
- People speeding on e-bikes (4)
- Issues regarding navigating and traffic in roundabouts (3)

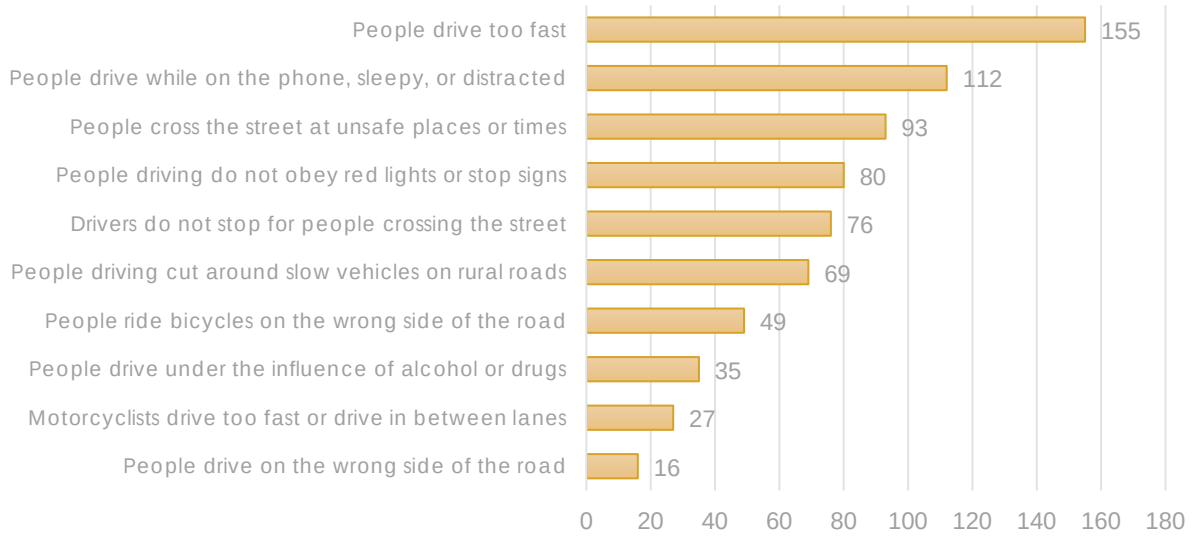


Figure 6: In the past year, what unsafe behavior have you observed while traveling in Truckee?

For each question in this section, respondents were asked to note any specific locations where they have noticed safety issues. The following locations were the most frequently noted:

Intersections
- Donner Pass Road at Bridge St
- W/E River St at Bridge St

Streets
- Donner Pass Rd
- West River St
- CA 367/89
- Glenshire Dr
- Northwoods Blvd

Neighborhoods
- Downtown
- Tahoe Donner

A full list of locations noted can be found in APPENDIX B.

Additionally, respondents were asked to note where they had experienced near misses while walking and biking. The following locations were the most frequently noted.

Intersections
- Donner Pass Road at Bridge St
- W/E River St at Bridge St
- Glenshire Dr at Truckee Way
- I-80 Ramp at CA 89
- Northwoods Blvd at Northwoods Blvd
- Donner Pass Rd at Pine Ave
- Donner Pass Rd at Cold Stream Rd

Streets
- Donner Pass Rd
- West River St

Neighborhoods
- Downtown
- Donner Lake

Trails
- Legacy Trail
- Trout Creek Bike Path

A full list of locations noted can be found in **Appendix B**.

Respondents were also asked if they had any suggestions regarding how to eliminate severe crashes in Truckee. The following themes were synthesized from the information provided. The full list of unedited suggestions can be found in **Appendix C**.

Speed Management

More Enforcement: The most commonly noted suggestion was to increase and improve enforcement. Specifically, speeding enforcement was requested. Additionally, enforcement for parking, use of turn signals, cell phone usage while driving, parking, and reckless bicycling were all suggested.

Education: Many people noted a need for education for people who drive, walk, and bike regarding the rules of the road as well as elements specific to Truckee. Specifically, education on roundabouts, 3-way stops, winter driving, and summer driving were suggested.

Infrastructure: Several infrastructure improvements aimed at traffic calming were suggested. These include speed humps, street trees, and more traffic circles/roundabouts. Additional safety related infrastructure improvements included suggestions for no passing on CA-267 and the addition of a safety barrier or median.

Signage: Many people suggested additional speed limit signage as well as warning signage (watch for pedestrians, etc.), including electronic speed feedback signs.

Speed Limit Reduction: Lowering speed limits was mentioned many times.

Intersection/Crossing Improvements

Infrastructure: While some people noted not liking roundabouts, many more noted the roundabouts created safer intersections and suggested constructing more of them. Some suggested more signalized intersections downtown as well as suggesting adding a stop sign to the fourth leg at Donner Pass Road and Bridge Street.

RRFBs: Rectangular rapid-flashing beacons, or RRFBs, are flashing beacons which are intended to signal to drivers that a person on foot or bike is crossing the street. These were suggested to better help people cross streets, including at trail crossings.

Sightline Evaluation: It was noted that it is difficult to see around corners at intersections. There were requests for sightline evaluation and improvements to help address sight distance concerns.

No Right Turn on Red: Limiting right turn movements at red lights was suggested to help make it safer to cross at intersections.

Biking Improvements

More and Better Bicycling Facilities: Many respondents brought up a desire for more Class IV protected bikeways to create an environment that is safer and more comfortable to bike in for people of all ages and abilities. People also noted a desire to separate bikeways from walkways to limit conflicts between the two types of movements. A suggestion to require dogs to be kept on leashes on paths and trails was made to help address conflicts between people biking and dog walkers.

Congestion Management

Increase Multimodal Options: in order to address downtown traffic, suggestions were made to add more, better, and more frequent transit options connection residential areas to destinations. Creating safer and more comfortable biking connections was also suggested.

Traffic Pattern Changes: Suggestions were made to develop plans for tourist traffic in and out of town during busy seasons. Some people also suggested creating a one-way pair downtown. Widening roads to accommodate increased traffic was also suggested.

Limit Development / Rentals: Some respondents noted concerns with short term rentals and vacation home construction and suggested limiting it to reduce stress on the community. Other suggestions including building workforce housing so people who work in Truckee can afford to live there.

Technology: Several people noted that self-driving cars may help improve the safety and congestion concerns.

Maintenance

Winter Maintenance: Suggestions included increasing de-icing on hills and snow plowing.

Restriping: Many people noted striping should be repainted earlier in the spring for better visibility.

Potholes: Several people noted potholes in the road make it difficult to drive and bike.

Landscape Maintenance: Suggestions were made to increase tree-trimming to improve visibility and make it easier to bike and drive.

INTERACTIVE MAP

Background

An interactive mapping tool was created to allow respondents to identify location-based roadway safety concerns and experiences. The website address shared was maps.kittelson.com/TruckeeLRSP, and instructions were provided in both English and Spanish. The tool was available from between August and September 2021, and it was advertised by the Town of Truckee through social media the Town's website, and LRSP stakeholder partners. FIGURE 7 shows a screenshot of the website. To make a comment, respondents were able to click on a location on the map, bringing up a text box which allowed them to type a comment and classify it as either a walking, biking, or vehicle concern. Respondents were also able to enter contact information, if desired. Respondents were also able to view the whole list of comments and "like" or "reply" to each one.

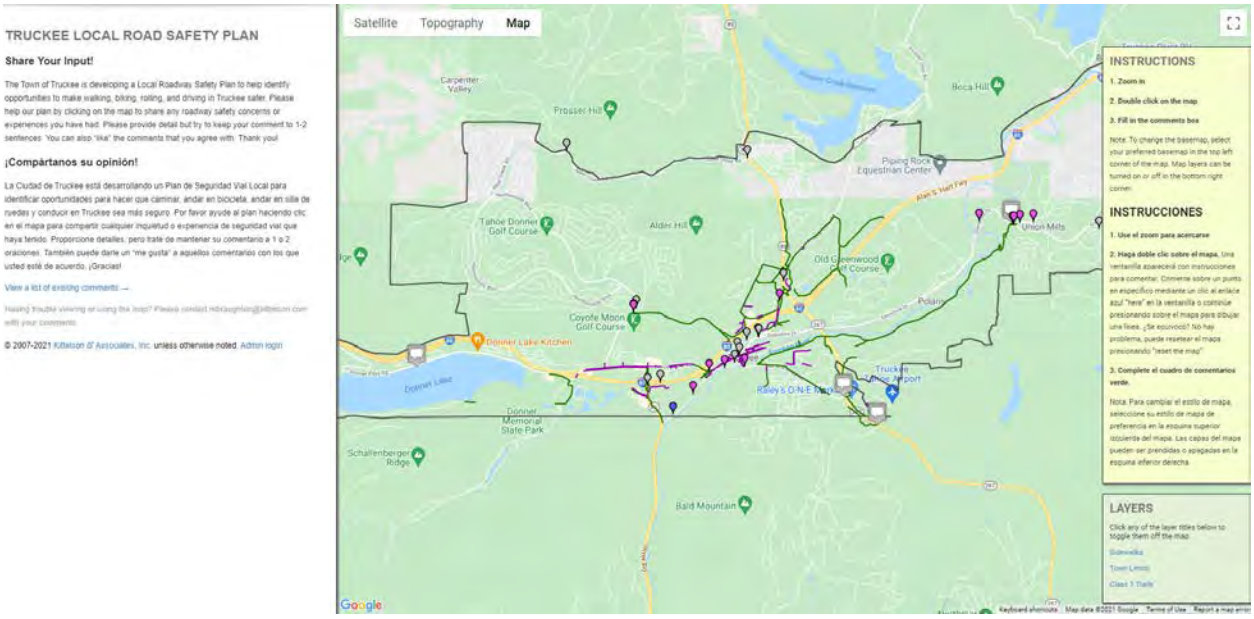


Figure 7: Interactive Map

Mapping Comment Summary

A total of 37 comments were received and 29 "likes" were given. Of the comments, 17 had to do with vehicles, 12 with biking, 1 with walking, and 7 were not classified, as shown in FIGURE 8. It should be noted that while 7 comments were not initially classified, they were arranged into the three categories post data collection based on a review of the subject matter. The following themes were summarized from the comments. A full list of unedited comments can be found in APPENDIX D.

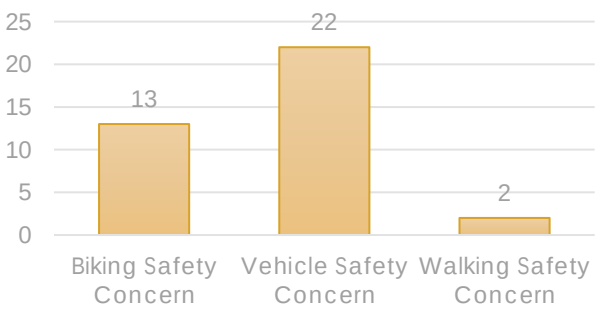


Figure 8: Comment Classification

Vehicular Comments

Regarding the comments classified as having to do with driving, the following locations were noted:

Intersections

- I-80 Ramp at CA 89
- Northwoods Blvd at Northwoods Blvd
- Northwoods Blvd at Lausanne Way
- Canterbury Ln at Wiltshire Ln
- Glenshire Dr at Truckee Way
- Shaffer Mill Rd at CA 267/Shore Rd
- Donner Pass Rd at Bridge St
- Jibboom St at Bridge St
- Glenshire Dr at Marts Peak Rd
- Glenshire Dr at River Parkway
- Jibboom St at Keiser Ave
- Alder Creek Rd at Carpenter Valley Rd
- CA 89 at Alder Creek Rd
- Brockway Rd at CA 267/Shore Rd

Roads

- Northwoods Blvd
- West River St
- CA 89
- Donner Pass Rd (near Donner Lake)

Concerns raised generally included speeding or posted speed limit too high, traffic congestion, poor visibility at intersections, confusing or inadequate traffic control at intersections, icy conditions, lack of signage, and issues with parking spaces (specifically, oversized vehicles in spaces). Regarding suggestions to address these issues, comments included lowering speed limits, fixing traffic control (making signalized or all way stop), limiting right turns on red, adding speed limit and warning signs, and adding turn lanes.

Walking and Bicycling Comments

Because the two comments classified as having to do with walking had to do with both walking and biking, these two comment types were combined. Regarding these comments, the following locations were noted:

Intersections

- Glenshire Dr at Dorchester Dr
- Glenshire Dr at Glenshire Bridge Parking
- Legacy Trail Parking
- Donner Pass Rd at McRiver Crossing
- Truckee Way at Pioneer Trail
- Northwoods Blvd at Truckee Trails Trailhead
- E/W River St at Bridge St / Brockway Rd
- W River St Bridge over Donner Creek
- Glenshire Dr at Legacy Trail

Roads

- West River St
- CA 267/N Shore Rd
- Northwoods Blvd

Concerns raised included vehicles driving in the bike lanes, drivers making rolling stops or otherwise not yielding to people biking at intersections, drivers speeding, line of sight issues, and poor crossings at trails and intersections for people walking and biking. Most of the suggestions had to do with adding bike infrastructure (including bike lanes and sharrows in roundabouts), improving roadway crossings, adding signage warning drivers to watch for people walking and biking, and improving sight lines at intersections.

NEXT STEPS

The public engagement feedback will be incorporated with the stakeholder engagement feedback from the LRSP's first stakeholder meeting and the technical analysis of safety performance within the Town to help develop the goals, actions, emphasis areas, and strategies for roadway safety management. These items will be used to develop the Town's first LRSP and provide a roadmap for improving transportation safety in the Town of Truckee.

APPENDIX A

The following home zip codes were reported by survey respondents.

ZIP CODE	# RESPONSES
96161	150
96160	4
96148	1
96145	2
96141	1
96140	1
96126	1
96118	1
95662	1
95120	1
94611	2
94401	1
94114	1
94070	1
94002	1
93561	1
89523	2
89509	1
89439	1
895236	1

APPENDIX B

The following locations were identified as areas where survey respondents have experienced traffic and safety issues in Truckee. Question 1 and Question 2 respond to the following prompts:

- Safety Problems: In the past year, what safety problems have you experienced while traveling in Truckee?
- Unsafe Behavior: In the past year, what unsafe behavior have you observed while traveling in Truckee?
- Near Misses: Do you have locations that you have experienced crashes or near misses in Truckee in vehicles, bicycling, or as a pedestrian? Please describe the location and situation?

INTERSECTIONS	QUESTION			ROADS	QUESTION		
	SAFETY PROBLEMS	UNSAFE BEHAVIOR	NEAR MISSES		SAFETY PROBLEMS	UNSAFE BEHAVIOR	NEAR MISSES
DONNER PASS ROAD AT BRIDGE ST	20	3	20	Donner Pass Road	18	17	17
W/E RIVER ST AT BRIDGE ST/BROCKWAY RD	8	4	14	West River St	14	5	8
DONNER PASS RD AT CA 89	3		1	CA 267/89	13	4	4
DONNER PASS RD AT PINE AVE	3	2	5	Glenshire Dr	12	16	3
GLENSHIRE DR AT TRUCKEE WAY	3		6	Northwoods Blvd	8	8	4
DONNER PASS RD AT W/E RIVER ST	2	1	1	Brockway Rd	5	3	4
NORTHWOODS BLVD AT LAUSANNE WAY	2		1	Martis Valley Rd	3		
DONNER PASS ROAD AT GLENSHIRE DR	1			I-80	3		1
CA 89 AT ALDER CREEK DR	1	1	3	McRiver Crossing	2	1	
DONNER PASS RD AT NORTHWOODS BLVD	1	1	4	East River St	2	1	
BRIDGE ST AT CHURCH ST	1			Palisades Rd	2		
I-80 RAMP AT TRUCKEE WAY	1		1	Hansel Ave	1		
I-80 RAMP AT DONNER PASS RD	1		3	The Strand	1	2	1
I-80 RAMP AT CA 89	1		6	Jibboom St	1	1	1
BRIDGE ST AT JIBBOOM ST	1		4	Grays Crossing	1		
DONNER PASS RD AT TRUCKEE WAY	1			Estates Dr	1		
DONNER PASS RD AT BROCKWAY RD	1			Skislope Way	1	1	1
CA 267 AT TRUCKEE AIRPORT WAY	1	1	1	Coldstream Rd		2	
GLENSHIRE DR AT DORCHESTER DR	1	1	4	Wiltshire Ln		1	
NORTHWOODS BLVD AT NORTHWOODS BLVD	1	2	6	Courtenay Ln		1	
CA 267 AT SCHAFFER MILL RD		1	2	Rolands Way		1	
GLENSHIRE DR AT THE STRAND		1	2	Truckee Way		1	
BROCKWAY DR AT MARTIS VALLEY RD		1	2	Lausanne Way		1	
BROCKWAY DR AT RIVERSIDE DR		1		Riverside Dr		1	
DONNER PASS RD AT COLD STREAM RD			5	Dorchester Dr		1	1

INTERSECTIONS	QUESTION		
	SAFETY PROBLEMS	UNSAFE BEHAVIOR	NEAR MISSES
DONNER PASS RD AT RAILROAD TRACKS			2
CA 89 AT RAINBOW DR			1
PALISADES RD AT PINE CONE RD			1
CA 89 AT DEERFIELD DR			1
ALDER DR AT ALDER CREEK MIDDLE SCHOOL			1
WILTSHIRE LN AT CANTERBURY LN			1
W RIVER ST AT MCRIVER CROSSING			1
GLENSHIRE DR AT MARTIS PEAK RD			1
DONNER PASS RD AT MCRIVER CROSSING			1
JIBBOM ST AT KEISER AVE			2
GLENSHIRE DR AT WOODBRIDGE LN			2
SOARING WAY AT JOERGER DR			1
I-80 RAMP AT DONNER LAKE RD			1
CA 89 AT PROSSER DAM RD			1

ROADS	QUESTION		
	SAFETY PROBLEMS	UNSAFE BEHAVIOR	NEAR MISSES
Prosser Dam Rd		1	
Donner Lake Rd		1	
Hillside Dr			1
Bridge St			1
Comstock Dr			1
Alder Creek Rd			1

NEIGHBORHOODS	QUESTION		
	Safety Problems	Unsafe Behavior	Near Misses
DOWNTOWN	9	13	16
TAHOE DONNER	7	7	2
DONNER LAKE	4	4	9
SIERRA MEADOWS	2	1	
PROSSER-LAKEVIEW	1	1	
MARTIS WOODS ESTATES	1		

TRAILS	QUESTION		
	Safety Problems	Unsafe Behavior	Near Misses
Trout Creek Bike Path	1	1	1
Legacy Trail		1	2
Pioneer Bike Path	1		
Bike Path at Estates Dr			1

APPENDIX C

The following suggestions represent the raw survey data in response to the questions below. The two columns were maintained as they were answered. For example, if a respondent answered the first question and not the second, the second column will appear blank.

- Do you have a suggestion to help eliminate severe traffic crashes?
- Other comments or concerns:

DO YOU HAVE A SUGGESTION TO HELP ELIMINATE SEVERE TRAFFIC CRASHES?	OTHER COMMENTS OR CONCERNS:
Redlight cameras	
Signals downtown please. My teenage neighbor got run over by a car in front of jax bc the driver claims he didn't see her. Nightmare. So many near misses there and i avoid the intersection like the plague.	
Traffic lights instead of roundabouts. They're not good for the plows either	
Flashing pedestrian signs	
Enforcement of speeding, both auto and bicyclists, and proper use of turn signals	Drivers of all vehicles, bicyclists included, operate their vehicles as if it is a "free for all"
	Passing on double yellow is most common infraction i see
Limit short term rental options	
No turn on red at intersections of old brockway and shaeffer mill rds with 267. Cars turning right on red cannot accurately estimate the closing speed of cars going 55mph+ on 267.	Educate pedestrians to walk facing car and bike traffic. Aggressive speed enforcement and aggressive ticketing of cars parked in bike lane. Lower speed limit on DPR along the lake.
Add more wide serving public transit to allow people to get to/from downtown bars without needing to drive. More obvious bike lanes with buffers.	
Make the yield signs bigger and light them up at night with reflective tape.	The intersection at bridge and west river is getting pretty bad, depending on the time of day, needs a roundabout or a light at this point. The traffic turning left at Jax, from west river to bridge or someone coming from east river usually get sick of waiting and do something illegal and cut someone off on bridge street. I would say there's a near miss there every morning and every afternoon when people are traveling to and from work.
Striping these locations and roundabouts earlier in the spring and if needed during the winter when weather allows. Paint crosswalk borders in downtown so they are visible to peds and drivers.	
Traffic circles.	
Improve de-icing on the hill on palisades road near pine cone. There were several accidents last winter due to ice there	

DO YOU HAVE A SUGGESTION TO HELP ELIMINATE SEVERE TRAFFIC CRASHES?	OTHER COMMENTS OR CONCERNS:
More police presence. Greater enforcement.	
Enforce speed limits	
	There are lots of potholes (Hwy 89 and Donner pass) in need of repair as well as cracks in the roads(west river east end)
Round about good. Traffic lights bad.	
Routinely cut and/or kill/roundup vegetation at intersections and shoulders; especially where brush and willows grow quickly	Thank you for doing this survey!!
Limit speed over 10 mph over posted speed	
Limit speed over 10 mph over posted speed	
Speed reminder signage (could be electronic speed gauge signs at key locations)	Glad this initiative is taking place. Town-wide we need speed limit reminders & wildlife crossing warning signs in key locations. Reminder signs do work.
More roundabouts. More enforcement from police. Education to public regarding biking and walking on which side of the street rules.	More traffic enforcement is needed. Come sit near the crosswalk at the hospital from 12-1 pm weekdays and you will see a lot of drivers ignoring rules of the crosswalk.
Stop medical facilities from increasing on dpr	
I like round abouts a lot. I think they help.	can't' we make DP Road downtown a one way road and the road at the post office a one way going the opposite direction. It seems like it would be a lot safer
Please put those how fast you're going permanent signs on the strand and glenshire drive. The ones by elementary school should be on the strand and glenshire drive. The ones that are solar powered. More deer crossing signs too	Please give more tickets for speeding and cell phones while driving
	Traffic jams during the winter when the interstate closes.
Speed bumps or speed dips.	I wish the town would do something about speed limits (changing Glenshire Drive along the railroad to 55, for example). But most importantly, I wish the town would install stop signs where needed in neighborhoods and place other signage or add speed bumps where there are speeding problems.
I normally dislike stop signs everywhere, but it seems like more stop signs at cross streets and intersections within residential neighborhoods would slow down the majority of traffic.	25mph speed limit in the downtown core feels too fast with so many pedestrians.
Greater police enforcement	E bike speed limits on paved trails need to be posted and enforced.
Improve line of sight	
No passing on 267; put up a center crash divider; widen the road; decrease speed limit	I rarely if ever see highway patrol cars out and around in Truckee.

DO YOU HAVE A SUGGESTION TO HELP ELIMINATE SEVERE TRAFFIC CRASHES?	OTHER COMMENTS OR CONCERNS:
Self driving cars eventually. Round abouts near old downtown? 1 way streets near downtown for traffic flow and improved visibility if round abouts are not possible.	
Cop standing at roundabouts	
Slow down!	
Better bike network.	
More patrolling of 267.	
I do think roundabouts help a lot to slow people down and i have not witnessed severe accidents there. The town has gone crazy and put them in too many intersections i believe, but in general they are safe for the larger intersections as they slow people down and create a smoother experience than traffic lights or four-way stops.	Please more bike lanes & paths! Bikers do not feel safe riding in Truckee, and I believe more people commuting & riding bikes will ease traffic congestion and accidents. Roundabout at major intersections reduce speed and keep traffic flowing smooth (DOES NOT mean town needs to overkill and put them at every intersection). Thanks!
	There should be bus service to Tahoe Donner and Glenshire. Also expand the hours of Dial A Ride
Decrease speed, install traffic camera/red light tickets	
Toll booth	Thanks for asking!!
Lower speed limit on brockway. 45 mph is too fast.	
Better signage maybe on the pavement	I go to work early and stay out of heavy traffic areas. Most people are doing good here driving in Truckee. Just a lot more traffic. Around Safeway that area gets congested
Traffic is increasing so regretfully, some of our 2 lane roads need to be 4 lane (89, dpr)	
More posted speed limit signs on northwoods blvd and on neighborhood	
I don't think more signs are the answer. People already do not respect existing signage. More and stricter enforcement?	
	Need traffic lights to control traffic.
Enforcement of existing laws and safe driving.	NONE
	e-bikes in bike lanes / bike paths need to be limited to 15mph or use traffic lanes.
Provide a bypass bike route to keep bicyclists off donner pass rd.	
Give information about winter driving... Slow down, get good snow tires, allow plenty of time to get where you're going. Be prepared for bad weather (watch for weather alerts)	Thanks for reaching out to the community!
	We need adequate fire egress prior to encouraging even more visitation during a state of emergency.

DO YOU HAVE A SUGGESTION TO HELP ELIMINATE SEVERE TRAFFIC CRASHES?	OTHER COMMENTS OR CONCERNS:
	Too many speeders in and around Truckee, and not enough police enforcement on speeders and illegal parking.
Better town police presence and enforcement of existing laws	Cyclist enforcement and education is non existent; wrong side of road, two or more across in bike lane, excessive speed, failure to yield/stop, passing on the right are all common occurrences
Reduce speed limit in glenshire drive between woodbridge and wellington. There are no speed limit signs in this section.	
Self driving cars.	
Enforce speed limits	
More police presence, more newspaper articles	This has been an ongoing and ever growing dangerous problem with no end in sight
Enforce speed limits occasionally	I really think a higher police presence on all of DPR would help focus drivers attention on driving.
76 station crossing clear signage, elementary school basic driving rules for bicycle , hand signs, stop signs etc... Rules. Helmet mandatory. Exits from 80 not curvy or turn so cars see you are stopped farther in advance. I was rear ended last year entering truckee.	
Better enforcement of speed limits	
	Please don't turn the intersection of DPR and Northwoods into a traffic circle, anytime traffic is backed up (3 pm on school days, storms, etc) traffic isn't going to move which will send more people we did through the neighborhoods. Why does all the school traffic come out to donner pass Rd, couldn't there be an exit that goes behind SELS and dumps out to 89 between DMV and the 80 on ramp?
Enforce speed limits/stops and educate bicyclists to follow road rules	Speeding
89 has seen some bad crashes, divide the highway, put in some passing lanes. Put in a special bus lane to promote public transportation, especially during ski season. Utah uta has done a very good job transporting ski'ers to ski resorts to cut down on traffic. Out of towners should have a large parking area outside of town then get on a bus to go to ski resorts.	A traffic plan really needs to be made for the ski season, 89 and 267 are way to congested going to the ski resorts. Public buses are needed to move the out of towners through town and to the ski resorts. Maybe large parking lots on the summit or somewhere else on the outside of town to consolidate the traffic. Utah has this figured out, send someone to talk with UTA and they're system. I have used it for going to the cottonwood canyons and it works great.
	I would prefer to bike more often if safer bike lanes existed.
I don't think you will be able to do anything because our roads are old and there are to many people leaving here now. Town of truckee was never meant to have this many people living here. The truckee police department is stretch thin.	
More enforcement!!!	

DO YOU HAVE A SUGGESTION TO HELP ELIMINATE SEVERE TRAFFIC CRASHES?	OTHER COMMENTS OR CONCERNS:
Fix the downtown railroad crossing and 3-way stop at donner pass road and bridge st.	The 1" to 2" gaps in the streets in Old Greenwood are causing damage to cars, golf carts and bicycles. They are very dangerous to bicycle riding.
Need a stop sign or at a minimum a cross walk near the bike path out in glenshire (glenshire and dorchester intersection). Would really like to see dogs required to be on leash while on the legacy bike path - have had numerous issues with unleashed dogs that owners cannot or will not control.	
More police patrolling all the streets in and around downtown. Not just at night looking for impaired people.	Too many people driving on insufficient roads. Evacuation of the entire Truckee area do to a wildfire would be impossible due to the lack of roadways. Too many TOURISTS.
Lower speed limits if possible in many locations where bikes, cars and parking zone complicate decision making. Also 45 degree parking on west river and downtown is tough with large trucks that stick out into the street. Many drivers do not understand obligation to yield at roundabouts.	
Painted lines earlier in the season	
Consider an 8-yo riding a bike from sierra meadows to truckee el. Dpr not safe. Educate kids to follow basic traffic safety rules.	Martis Valley Rd. from Golden Pine to Brockway has no bike lane or sidewalk (only on east side near Jeffrey Pine bus stop) and is a critical ped and bike connection within neighborhood and to Brockway Rd. It is a really an unfortunate safety oversight.
Have better signage at the downtown intersection	
Add cross walk with blinking yellow light across northwoods at the top of trout creek bike path near coyote moon	
More stop signs, speed bumps, roundabouts, automated speed detection signs. Warnings signs about pedestrians, trailheads, and hills and curves.	Traffic easing improvements on Glenshire Dr in the residential section noted above are beyond critical.
People just need to pay attention	
Lower speed limits. Install more automated signs showing speed and issue more tickets	
Ticket road bikers	Road bikers blowing through stop signs constantly. I'm scared for their lives. I'm surprised more are not killed.
Enforce speed limits .	Speeding . Vehicles detouring abs speeding through Glenshire instead of going through agricultural station on I80.
More roundabouts!	
Set lower speed limits, vs the “85th percentile speed”. (https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/2020-california-manual-for-setting-speed-limits-a11y.pdf)	
Self-driving cars!	cars often parked blocking bike path along Donner Lake, So many aggressive drivers...

DO YOU HAVE A SUGGESTION TO HELP ELIMINATE SEVERE TRAFFIC CRASHES?	OTHER COMMENTS OR CONCERNS:
Downtown needs bike lanes. A separate bike lane or path away from motor vehicles would be beneficial, similar to the east end of donner lake.	With more traffic in Truckee, clearly marked bike lanes would be very helpful. To get to Trout Creek Bike path, a cyclist has to go through downtown which is dangerous.
Stop building so many investor str tract houses and rich people mega-mansions. Focus on workforce housing and stop destroying our town with over-development. You're ruining what makes truckee so special and you can't take it back (though mother nature may). Instead, build a few hotels/resorts to accommodate the tourists and give them easy transportation options to move them out of their cars (and out of our neighborhoods - time to ban strs).	We know why we have a traffic mess. Stop trying to ind bandaids and address the real problem: too many people.
Start enforcing existing laws	Our Town is NOT walk and bike friendly, we reward single occupancy motorists.
Alternative transportation, public transit, get people out of their cars, provide shuttles for hospital employees	Cars parked in bikes line; cars parked on sidewalks on Industrial Way and Trails End
Plant more traffic calming street trees between the sidewalks and the road. Creates more appealing space for walking, slower street speeds, cools roads, sidewalks, and bike lanes alike. Create protected bike lanes to eliminate the conflict on "multi use paths", sidewalks should be for walking, and protected bike lanes should be for biking. Open the bus shelters again so that users are protected from the sun and elements. Get people out of their cars by providing much more frequent bus service, once an hour is not useful.	Despite claiming to be concerned about green house gas emissions, Truckee continues to do everything in its power to promote vehicle usage and discourage pedestrian and bicycle usage. The newest pedestrian and cycling facilities are hostile in our warming environment, with all shade removed for ease of street maintenance, many class 1 bike paths are cracked and broken and encroached by shrubs. The town needs to stop requiring parking space minimums at new developments and require investment of that money into alternative transportation modes. Stop blaming pedestrians for crossing at "inappropriate" locations and give those not in a car the priority.
Traffic calming barriers, separate bike lanes from roadway	We need to encourage people to get out of their cars and onto their bikes, we need more bike lanes and bike paths.
	Many kids riding bikes to school now, look at safer routes and adding bike lanes from neighborhoods to middle and high schools
Recessed rumble strips on round about approaches, temporary solutions during large tourist weeks/weekends.	
Finding a better way to direct traffic and pedestrians at the donner pass/bridge street intersection	
3way signage at bridge and donner, better cross walks	Need better pedestrian crossing of the train tracks, slower traffic coming into town from brockway.
We need to clear up all blind corners, we need traffic lights not round abouts especially on donner pass road near the hospital. Pedestrian safety is important and round abouts will kill pedestrians	The town needs to support more parking as Lyft and Uber and taxis are faltering or not available and its a very wrong or false notion to think that TAAS will be relevant in a rural mountain area with a very tough 4 seasons. It would be better to look at sun angles and put parking in the front of buildings vs in the back where its in the shade which creates a long term unsafe ice rink. If buildings are close to road, the risk of vehicles running into buildings is high if a vehicle loses control.
Harsher tests to be able to get a driver's license	

DO YOU HAVE A SUGGESTION TO HELP ELIMINATE SEVERE TRAFFIC CRASHES?	OTHER COMMENTS OR CONCERNS:
Same as above	
Make donner pass road downtown one way from the round-about to bridge street and make west river street from bridge street to mclver crossing one way the other direction.	
	when traffic backs up on west river at old brockway cars always go down riverside dr. the wrong way. very dangerous
Yes. There is a sign above the curve, i believe. Adding a 20 mph and/or a "slow" sign to it would help.	Thanks for your consideration. Please call if you'd like to talk. ###-###-#### cell
	I love riding my bike around Truckee as much as I can. I love that I can ride from Prosser to Old Greenwood, Downtown, Tahoe Donner, to Glenshire and to Raleys. I want to ride more, but have had too many near misses downtown, by donner lake, and on 89 between Truckee and Squaw. There are just too many people not paying attention when they are driving. I would love for wider bike lanes or more bike paths to connect the various places around Truckee to make it more bike friendly. I feel so much safer on a bike path knowing I won't have to worry about car traffic.
Consider posting reduced speed limits for winter months, signage of tips of winter safe driving posted in truckee, summer safety tips of watching for animals and people on the roads, sand/plow more frequently - invest in state of the art equipment for snow removal and training	Roundabout tips on how to use, esp the double round about - can't see if anyone is coming when going Southbound on 97 just before going under freeway - the mound is too high to see over to see if cars will be coming around to get on HWY 80 from Northbound 97.
Traffic is what concerns me, not accidents necessarily. Accidents are due to traffic frustrations.	
My only concern is that there is discussion about a roundabout at northwoods and donner pass rd. This is terrifying to envision due to 80 and stopped traffic. Roundabouts are great at slowing down traffic while allowing consistent flow but once a car stops in the roundabout, it exponentially decreases efficiency and causes more harm. If there is no way to get cars off of donner pass rd when 80 is closed, the stop light must remain. Residents living in tahoe donner will be trapped if there was an emergency evacuation, alder will not support the masses leaving, nor will 89 off of alder.	We need more routes to come and go from tahoe donner. Possibly a car road to town near the bike path?
Enforcement of traffic laws such as turn signal use!	
Slow traffic down, speed bumps, ticket for parking and speeding violations. The town would make a large revenue if it employed a parking officer to patrol donner lake during summer months.	
Police need to get serious about speed enforcement.	

APPENDIX D

The following comments represent those which were provided through the interactive mapping exercise, which can be found at maps.kittelson.com/TruckeeLRSP.

ID	COMMENT	TYPE	LIKES
1	Cars turning right on red from old brockway force cars on 267 to slam on the brakes. Speed limit on 267 (55 mph) is too high to allow safe turn on red.	Vehicle Safety Concern	1
2	Cars turning right on red onto 267 force oncoming cars to slam on the brakes. Speed limit on 267 is too high to allow right turn on red	Vehicle Safety Concern	2
3	Severe speeding--many cars doing 15 over and more. Cars parked in bike path. Pedestrians walking in the wrong direction and failing to yield to bikes when possible.	Vehicle Safety Concern	1
4	Vehicles driving north on 89 do not always watch for the vehicles in the circle who are going onto 80 east.	Vehicle Safety Concern	1
5	Vehicles coming up northwoods are usually going much faster than 35. Add that the vehicles going down northwoods are equally spaced due to the 3-way stop at northwoods/northwoods; make it extremely hard to go from lausanne onto northwoods. How about a 35 mph sign just before lausanne, rather than afterwards.	Vehicle Safety Concern	0
6	Oversized vehicles park here and stick out into traffic. This forces vehicles to go into the other lane of traffic. Consider making these parkins spaces "compact only" or changing to parallel parking.	Vehicle Safety Concern	2
7	Dorchester @ glenshire is a spot where cyclists usually have to swerve away from rolling stops. Cars frequently speed on dorchester and roll over the bike lane due to poor line-of-sight and visibility at this intersection. There is a large power pole and a fence that don't offer the best visibility when looking southeast from dorchester.	Biking Safety Concern	2
8	The older parts of glenshire have inadequate street signage. This intersection has poor visibility and no stop sign on wiltshire. As a result, cars turn from wiltshire onto canterbury and have near-misses with each other. To note, cars driving at night frequently blast through the intersection without stopping. Ask me to find footage from ~8 p.m. August 5 for an example of what i'm talking about.	Vehicle Safety Concern	0
9	This intersection has terrible visibility when turning left or right. You can't see oncoming traffic on glenshire drive when competing against a taller truck or moving van, for example.	Vehicle Safety Concern	1
10	Cars travelling southbound on glenshire drive will veer into the bike lane around a stationary car waiting to turn into the glenshire bridge parking area. Not only is it unsafe, but cars are doing so at high speed most of the time. Instead of waiting for the car to make its turn into the lot, most just pass on the right in the bike lane.	Biking Safety Concern	3
11	With the large increase in traffic, this intersection desperately needs a dedicated left turn signal or a more visible blinking yellow arrow. Most people turn left at this intersection (local traffic) and don't go straight to the airport or right. A simpler solution would be making a dedicated left turn lane, and change the right lane into a right-turn/straightaway lane.	Vehicle Safety Concern	0

ID	COMMENT	TYPE	LIKES
12	This is obviously out of the town's jurisdiction, but this onramp is horrible. There's not enough room to accelerate and merge safely. I'm sure caltrans knows about this, but i wanted to make it visible for forwarding on my concern.	Vehicle Safety Concern	2
13	This is the worst intersection in town. I avoid it because i can't get through sometimes without swearing (and i'd prefer my kids not to hear that). The signage is nonexistent, and i think tourists are too busy trying to figure it out that they miss the fact there's no stop sign. I know the town has this one in the works with a stop light, but it's just worth noting how bad this intersection is.	Vehicle Safety Concern	1
14	This intersection should really be an all-way stop. Locals know that traffic doesn't stop on bridge street, but visitors do not. Adding a stop sign would be nice, or at least adding some signage that reads, "this lane does not stop."	Vehicle Safety Concern	0
15	A speed limit sign here would be nice. Tbh i don't even know what the speed limit is! 35? Waze says 35, but i wouldn't know that with a lack of signage here.	Vehicle Safety Concern	0
16	Vehicle speed is too high on 89north. Speed should be decreased from first roundabout at truckee way/henness rd to at least hobart mills road. As more people move to the area, more traffic, rv, trucks using 89n to get to homes, hiking, campgrounds.	Vehicle Safety Concern	1
17	Need a turn pocket for left turn going west on glenshire drive as cars waiting to turn into river parkway lot cause others to veer around into bike lane	Vehicle Safety Concern	2
18	Need bike lanes & sidewalk from bridge street intersection to the existing bike lane near mciver crossing (this may be in the works, as with the planned 4 way stop light at w & e river streets)	Biking Safety Concern	1
19	Speed limit too high on west river street at 45 for the safety of drivers, bike riders or pedestrians. Suggest 35 mph from hwy 89 to mciver crossing and 25 mph we have witnessed one bicyclist get hit, one dog killed, and i worry every time my teen son rides his bike here. The residents of donner creek mobile home park also frequently walk/ride here.	Biking Safety Concern	2
20	This bridge is too narrow for bike lanes or sidewalks. No way around widening it to avoid dangerous situation for donner creek mobile home park residents as well as the numerous cyclists that frequently ride here. And, the 45 miles speed limit is way too high for current and future conditions as this area hopefully redevelops.	Walking Safety Concern	0
21	Paint "bicycles share lane" icon , on the pavement in roundabouts. I saw an ebike get hit in this roundabout on 8-5-21.	Biking Safety Concern	0
22	A pedestrian sign and speed limit of 25mph as approach top of legacy trail parking area. It's hard to safely approach the legacy trail and turn off of glenshire drive to get on the trail on a bike or enter parking area.	Biking Safety Concern	1
23	Please finish bike path to the stoplight intersection, as you ride behind raleys toward martis valley.	Biking Safety Concern	0
24	Paint "share with bikes" icon on pavement in roundabouts. It's the safest way for a bike to navigate a roundabout.	Biking Safety Concern	0
25	Heading w on keiser ave, then sw on e jibboom is very dangerous because some drivers going ne on e jibboon go straight through the intersection (staying on e jibboom). It's the top of a hill, so those heading w up keiser can't see them coming. If those heading up e jibboon are not bearing right to go e on keiser, they should stop.	Vehicle Safety Concern	1

ID	COMMENT	TYPE	LIKES
26	This is the sharpest curve on alder creek rd between rt 89 and tahoe donner. During the winter it is often icy, even if the rest of the road is clear and dry ... Because the curve is shaded by tall trees. Warning signs are needed for drivers going both directions.	Vehicle Safety Concern	0
27	Traffic speed is too fast on truckee way preventing a right or left turn, resulting in long wait times and traffic backups on glenshire dr	Vehicle Safety Concern	1
28	Turning left can be extremely challenging and causes backups. Additionally people turning left often pull up very far blocking the visibility of the person trying to turn right. Iâ€™ve also witnessed multiple times where people trying to turn left off of glenshire drive pull out and turn in front of other cars or vehicles in the left-hand turn lane on truckee way, which is dangerous and illegal. Sometimes the person turning left from truckee way will also wait and wave the person turning left off of glenshire drive through, again illegal and incredibly dangerous especially if there is on coming traffic going straight on truckee way.	Vehicle Safety Concern	0
29	A roundabout may ease a lot of traffic headaches here, not that iâ€™m a fan of all the roundabouts but it may help the flow of traffic.	Vehicle Safety Concern	0
30	Incredibly dangerous intersection; from the speed on hwy89 in either direction, residents slowing down in order to pull in (or out) of their neighborhoods, bicyclists trying to cross the highway to wildlife doing the same, this intersection has got to be one of the most dangerous in the area. Slower speed on the hwy until further north would seem to be the obvious fix.	Vehicle Safety Concern	2
31	Bike path from the legacy trail parking area needs to extend all the way to dorchester at a minimum	Biking Safety Concern	1
32	Isn't this where the legacy trail will come through? I know it's on the other side for most of w river st, but at some point it crosses the truckee river again. Just not sure where.	Walking Safety Concern	0
33	Need a round-about here.	Vehicle Safety Concern	1
34	Teens (and others!) On bikes have a difficult time crossing here. While more experienced cyclist can turn left like vehicles, teens need a safe crosswalk to cross. This is an essential crossing for teens and folks of all ages to commute to town.	Biking Safety Concern	0
35	This is a critical cycling connection from town to the pedestrian bridge access to the legacy trail at the end of e river st. Southbound syclist have an impossible time making a safe left turn onto e river. Even with the new bike path up old brockway, cyclists will still have strong preference for taking e river st to access the legacy trail via the pedestrian bridge because it will reduce overall hill climbing.	Biking Safety Concern	0
36	Highly recommend that some sort of bike warning signs be put up on glenshire dr. And northwoods where bikers are trying to cross the road to reach the multi-use trails.	Biking Safety Concern	0
37	Highly recommend that some sort of bike warning signs be put up on glenshire dr. And northwoods where bikers are trying to cross the road to reach the multi-use trails.	Biking Safety Concern	0

APPENDIX B

Document and Data Review Technical Memorandum

KITTELSON & ASSOCIATES
2510 J STREET, SUITE 200
SACRAMENTO, CA 95816
P 916.266.2190 F 916.266.2195

TECHNICAL MEMORANDUM

Truckee Local Road Safety Plan

Document and Data Review - Summary Memorandum

Date:	May 7, 2021	Project #: 25806
To:	Town of Truckee	
From:	Matt Braughton, RSP; Erin Ferguson, PE, RSP; Zachri Jensen, PE; and Mark Heisinger	

This document summarizes the review of data and documents that will influence the content of the Truckee Local Road Safety Plan (LRSP).

DATA COLLECTION

This section describes the data that Kittelson has obtained and organized as part of the Truckee LRSP. This data is stored in a spatial database for analysis and mapping purposes. After using the data for the data analysis, Kittelson will provide the Town of Truckee the comprehensive GIS-based database.

Crash Database

Kittelson obtained spatially located reported crashes from the Town of Truckee's crash database. The database included reported collisions within the Town of Truckee that occurred between 2009 and 2019 (the most recent 10 year of available data). The data includes the following attributes which will be used for the data analysis:

- Time, Date and Year
- Roadway (Primary and Secondary)
- Weather and Roadway Condition
- Driver Action
- Crash Type
- Crash Severity
- Bicycle or Pedestrian Related

The crash database was cleaned for the following circumstances:

- **Outside Jurisdiction Boundaries**: 3 total crashes occurred outside of the Town of Truckee or on private roadways (i.e., internal roadway system of apartment complex).
- **Occurred on Interstate 80**: 9 total crashes that occurred on I-80 were removed from the final database.
- **Occurred at Unclear Location:** 8 total crashes had incorrect spatial locations. Relocation of the crashes was not possible due to incomplete or inaccurate crash records.

The cleaned crash database resulted in 1,361 total crashes.

Roadway and Intersection Data

Kittelson obtained GIS-based roadway centerline data from the Town of Truckee as the base for creating the street network file for analysis. The roadway centerline data included the following attributes:

- Street Name
- Location
- Maintenance Responsibility
- Functional Classification
- Roadway Width
- Right-of-Way Width
- Speed Limit

Kittelson also received GIS-based data showing roadway markings in the Town of Truckee, including the following items:

- Crosswalks (International or Standard Types)
- Turn Arrows
- Stop Bars
- Bike Stencils

Kittelson created a spatial layer for analysis of intersections in the Town of Truckee. The intersection layer identifies locations with traffic signals or roundabouts.

Bicycle and Pedestrian Facility Data

Kittelson also obtained the following GIS data related to bicycle and pedestrian facilities from the Town of Truckee:

- Sidewalks
- Dirt Trails
- Class 1 Trails
- Bike Routes
- Bike Lanes

Other Data

Kittelson also obtained the following data from the Town of Truckee or LSC (provided on behalf of the Town of Truckee):

- TART Routes and Stops (GIS-based data)
- Traffic Count Data (from LSC)
    - Kittelson received 2018 and 2019 traffic count data for roadways and intersections in the Town of Truckee. This information was provided by LSC in Excel format. The following data was included:
        - Year 2018
            - 32 intersections
            - 12 roadway segments

        - Year 2019
            - 9 intersections (different locations than year 2018)
        - Truckee Transportation "Big Data" Review Memorandum
            - Provides review of StreetLight Data traffic volumes projections in the Town of Truckee.
- JAMAR Traffic Count and Speed Data (from Town of Truckee)
    - Kittelson received 2018, 2019, and 2020 traffic count and speed data in Town of Truckee. The information was provided by the Town of Truckee in JAMAR format for approximately 20 locations.
- Grant application data from the Town of Truckee, including successful, unsuccessful, and pending grant applications.

PLANNING DOCUMENTS

This section summarizes the following planning documents:

- 2020-2021 Annual Operating Budget and Five-Year Capital Improvement Project (CIP) Budget
- Town of Truckee 2025 General Plan (2006)
- Draft Truckee 2040: General Plan and Downtown Specific Plan (*in-progress*)
- Truckee Trails and Bikeway Master Plan
- Envision Donner Pass Road (DPR) Study
- Donner Pass Road Corridor Improvement Study
- HSIP Projects and Past HSIP Applications by the Town
- California Strategic Highway Safety Plan (SHSP)
- Other Caltrans, FHWA, and Countermeasure Guidance

Town of Truckee 2020-2021 Annual Operating Budget and Five-Year CIP

The most recent CIP was reviewed to identify projects in the Town of Truckee that address safety-related issues or might affect the safety characteristics of roadways. The CIP identifies the following roundabout and intersection projects:

- Northwoods Boulevard/Donner Pass Road Roundabout (Project C1608)
- I-80/Donner Pass Road/Coldstream Road Roundabout (Project C1712)
- Reimagine Bridge Street (Project C1805)

The CIP also identifies the following streetscape improvement and roadway improvement projects:

- 2020 Guardrail Upgrade Project (Project C1915)
- Envision DPR Corridor Improvement - Western Segment Phase 1 (Project C1407)
- West River Street Streetscape Improvement Project (Project C1703)
- Railyard Development Agreement Implementations (Project C1711)

- Jibboom & Bridge Streetscape Improvement Project (Project C1806)
- Church Street Extension/Trout Creek Restoration Reach 4 and 5 (Project C1804)
- Envision DPR - Western Segment Utility Undergrounding (Project C1815)
- DPR Corridor Improvement Study (Between Donner Memorial and East End Donner Lake) (Project C1823)
- Envision DPR - Eastern Segment Pedestrian Improvements (Project C1904)
- Envision DPR - Eastern Segment Utility Undergrounding (Project C1905)
- Envision DPR - Eastern Segment Improvement Plan (Project C2006)
- Downtown Railroad Pedestrian Crossing (Project C2106)
- Church Street Extension
- Pioneer Trail & Bridge Street Extension (C1503)
- Jibboom Street Sidewalk Feasibility Study and Improvement Project (C1824)

The Town of Truckee also maintains an online GIS-map inventory of CIP projects[1].

Town of Truckee 2025 General Plan (2006)

The 2025 General Plan provides direction on how to best fulfill its community vision and guidance on future development within the Town. The General Plan is currently being updated through the on-going Truckee 2040: General Plan and Downtown Specific Plan project. The sections of the plan that are related to roadway safety considerations are described below.

As part of the Circulation Element of the General Plan, the following Guiding Principles are identified (page 4-2):

- Provide a safe, comprehensive, and integrated system of trails and bikeways as a key component of the circulation system.
- Promote a safe and efficient transit system, including both bus and rail, to reduce congestion, improve the environment, and provide viable alternatives to the automobile.
- Provide for the safe and efficient movement of commercial goods through Truckee by road and rail.

The General Plan also identifies Goal CIR-10: “Provide a safe, comprehensive, and integrated system of facilities for pedestrians and cyclists and other non-motorized modes of transportation.” The General Plan identifies several policies and actions to meet this goal, primarily aimed at improving facilities for people walking and biking.

[1] https://townoftruckee.maps.arcgis.com/apps/Embed/index.html?webmap=ca7ec4f10e7246d08d4cd2d88f488986&extent=-120.2676,39.286,-120.1191,39.3827&zoom=true&scale=true&legendlayers=true&disable_scroll=false&theme=light

Draft Truckee 2040: General Plan and Downtown Specific Plan (*in-progress*)

The Truckee 2040 General Plan and Downtown Specific Plan is an in-progress update to the existing General Plan (created in 2006) and Downtown Specific Plan (created in 1997). The General Plan Update will reevaluate the existing General Plan and community vision. It will also address changes in State law that affect general plans. The Downtown Specific Update will reevaluate and update policies, projects, implementation plans, and regulation that guide the development of Downtown Truckee. Draft Truckee 2040 documents that were reviewed and findings related to roadway safety are listed below.

- Existing Conditions Report (February 2019)
    - Provides brief summary of crashes in the Town of Truckee from 2013-2017. Includes a crash heatmap and summary of crashes by severity and vehicle type.
    - Provides list of planned roundabouts, new travel lanes, paved shoulders, and other intersection improvements in Truckee. The intersections identified for future roundabout configurations are as follows:
        - Donner Pass Road / I-80 Westbound Ramp intersection (Coldstream Road interchange)
        - Donner Pass Road / I-80 Eastbound Ramp intersection (Coldstream Road interchange)
        - Donner Pass Road / Bridge Street intersection
        - W River Road / Bridge Street intersection
        - Truckee Way / I-80 Westbound Ramp intersection
        - Truckee Way / I-80 Eastbound Ramp intersection
        - Highway 267 / Highway 89 N / I-80 Eastbound Ramp intersection
        - Highway 89 N / I-80 Westbound Ramp intersection
        - Highway 267 / Brockway Road intersection
- General Plan Briefing (February 2019)
- Downtown Truckee Specific Plan Update – Downtown Opportunity Site Concepts (*April 2020 Workshop Presentation Slides)*
    - Provides overview of streetscape and development projects and studies in Downtown Truckee

The most recent documents and information regarding this plan can be found on the Truckee 2040 website[2].

Truckee Trails and Bikeway Master Plan (2015)

The Truckee Trails and Bikeway Master Plan provides a guide for future local, state, and federal roadway improvement projects, dirt trail projects, and identification of trail corridors. The purpose of

[2] https://www.truckee2040.com/

the plan is to implement the directly related goals, policies, and actions contained within the General Plan. The sections of the plan that are related to roadway safety are described below.

- Planning Goals and Policies related to safety:
    - Planning Goal 1 (Trail, Bikeway, and Walkway System): "*The trails and bikeway system should provide a full range of safe and convenient recreation and active transportation opportunities for multiple users."*
    - Planning Goal 3 (Design): *"The system design should adhere to a consistent design format to promote the development of a safe, recognizable and uniform system in keeping with the mountain character of Truckee"* and *"The bikeway system should be designed to minimize conflicts with vehicles and other users, utilizing the design standards and guidelines contained in the California Manual on Uniform Traffic Control Devices (CAMUTCD) and Caltrans' Highway Design Manual (HDM). Where appropriate, the Town should apply design guidance from best-practices documents such as the American Association of State Highway Transportation Officials' (AASHTO) Guide for the Development of Bicycle Facilities and the National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide."*
- The plan provides a map of existing and proposed trail and bikeway network facilities. The plan also identifies and prioritizes new sidewalks.

Envision Donner Pass Road Corridor Improvement Project – Western Segment Corridor Report (June 2018)

The Envision Donner Pass Road (DPR) Corridor Plan provides an assessment of existing conditions on the corridor and identifies potential corridor improvements to improve safety, circulation, multi-modal facilities and aesthetics. It includes an inventory of existing deficiencies and proposed improvements. The following proposed improvements along the corridor are:

- Roundabouts
    - Donner Pass Road / Northwoods Boulevard intersection (replace existing traffic signal)
        - *Included in CIP*
    - Donner Pass Road / I-80 Eastbound Ramp intersection (Coldstream Road interchange)
        - *Included in CIP*
    - Five other potential, future roundabouts were identified along the corridor, but are being reassessed based on public feedback and are not currently identified in the CIP.
- New Sidewalks and Crosswalks (Gap Closure)
- Sidewalk Widening and Replacement
- Center Medians

Donner Pass Road Corridor Improvement Study (November 2020)

The Town of Truckee authorized the Donner Pass Road Corridor Improvement study to evaluate transportation conditions along Donner Pass Road from Donner Memorial State Park to the East End of Donner Lake. The study evaluates parking conditions, traffic, pedestrian, and bike circulation, and safety along the corridor. The safety evaluation provides a breakdown of crashes by type and severity on the study corridor. Based on the evaluation, the study identifies potential recommendations to improve parking and bicycle and pedestrian safety along the corridor.

Based on the information presented in the study, the initial recommendation from the Town of Truckee staff was to prohibit parking along portions of the south side of the corridor and to initiate the design for a multipurpose trail along the roadway. However, based on public comment in the February 9th, 2021 Town Council Meeting, the Council directed staff to form a group of stakeholders to discuss alternative solutions.

Highway Safety Improvement Program (HSIP) Applications

The Town of Truckee had one recent HSIP grant application, the details are listed below:

- Project Description: Upgrade Guardrails
    - Date: 2018
    - Location: Five roadway segments throughout town (0.17 miles of roadway)
    - Status: **Successful** (project is in CIP)

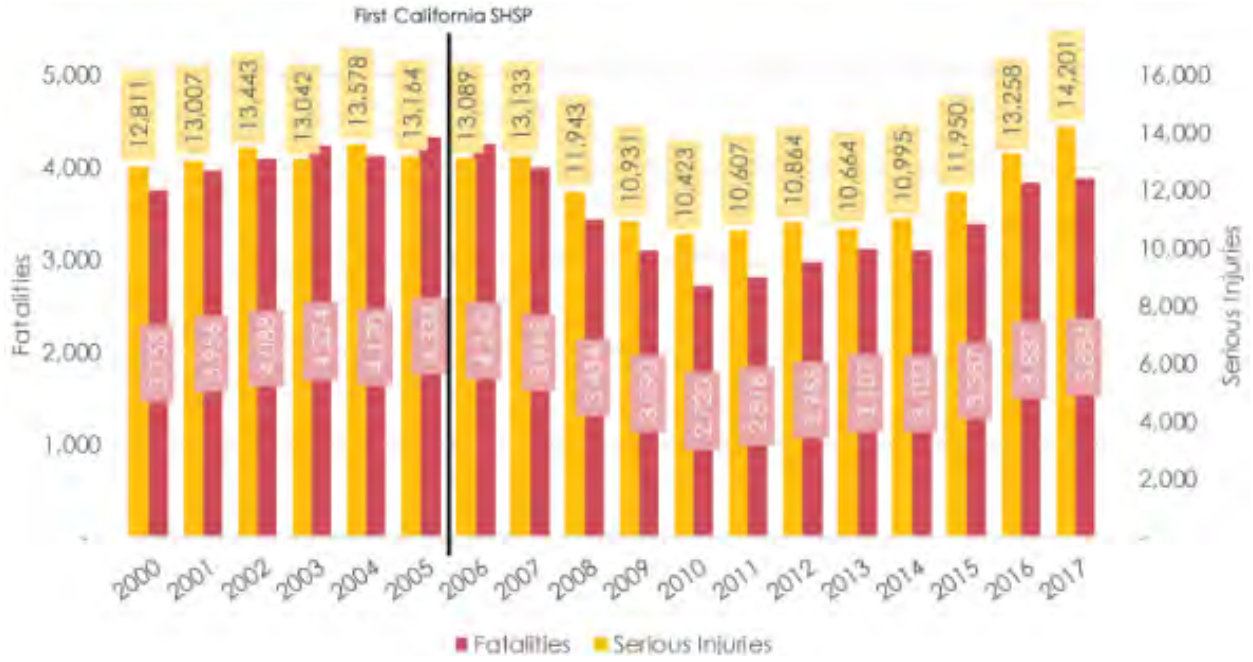
California Strategic Highway Safety Plan (2020)

The 2020-2024 Strategic Highway Safety Plan (SHSP) is a statewide, coordinated safety plan providing a comprehensive framework for reducing highway fatalities and severe injuries on public roads in California. It identifies key safety needs and guides investment decisions towards strategies and countermeasures with the most potential to save lives and prevent injuries.

The aspirational goal for the plan is to have zero fatalities and serious injuries on California public roads consistent with other Toward Zero Deaths (TZD) initiatives. The plan establishes steps for California to move closer to zero deaths. **Figure 1** shows historical data on fatalities and severe injuries between 2000 and 2017. The reported crashes decreased from the years 2006 to 2010, which may have been influenced by several behavioral and economic factors. The dashed black like indicates when California's first SHSP was adopted, in 2006.

The challenge areas or emphasis areas presented in the SHSP are based on in-depth analysis of California crash data and the large number of safety stakeholders. The challenge areas in the updated plan are shown in **Table 1**:

Figure 1: Fatalities and Severe Injuries, 2000-2017



Source: California Strategic Highway Safety Plan 2020-2024

Table 1: SHSP Challenge Areas, 2020-2024

Challenge Areas for SHSP 2020-2024		
Aggressive Driving	Emergency Response	Occupant Protection
Aging Drivers (>=65)	Emerging Technologies	Pedestrians
Bicyclists	Impaired Driving	Work Zones
Commercial Vehicles	Intersections	Young Drivers (15-20)
Distracted Driving	Lane Departures	
Driver Licensing	Motorcyclists	

Source: California Strategic Highway Safety Plan 2020-2024

The key points about traffic-related deaths and severe injuries include:

- Fatalities and severe injuries increased 15 percent and 19 percent respectively, from 2008 to 2017
- Fatalities decreased for the years 2008 to 2010, before increasing again at approximately four percent per year from 2010 to 2017

The SHSP also includes the policy actions involved in the multi-year efforts led by the Steering committee and/or technical expert members to develop the SHSP 2020-2024. The efforts included the following areas:

- Update of the SHSP (Began in 2018, and outreach activities completed in May 2019).
- Increase efforts to align SHSP with other Statewide Plans

  - Improving coordination and linkages among regional and statewide planning processes in California will facilitate a common approach to transportation safety planning. This will ultimately help in collectively working towards a common goal.
- Improve analysis of traffic safety data.
  - Improving the analysis on safety challenge areas, by quantitatively understanding fatalities and severe injuries and the contributing factors of traffic crashes.
- Increase federal, tribal, state, and local representatives' involvement.
  - Executive leadership directed that actions to increase communication between the SHSP and local agencies be strengthened. Increasing stakeholder engagement by conducting outreach events, webinar, and other events.

PROGRAMS AND GUIDANCE

This section discusses the guidance and resources at the statewide and national levels that will be helpful in the development of the Truckee LRSP.

Caltrans Highway Safety Improvement Program Guidance (2017)

The Highway Safety Improvement Program (HSIP) is a core federal-aid program under the Fixing America's Surface Transportation (FAST) Act that went into effect in December 2015. The purpose of the HSIP is to significantly reduce traffic fatalities and severe injuries on all public roads, including non-state-owned roads and roads on tribal land.

The HSIP requires a data-driven, performance-based and strategic approach to improving highway safety on all public roads. The HSIP consists of three primary components:

- Strategic Highway Safety Plan (described above);
- Program of Highway Safety Improvement Projects; and
- Railroad-Highway Grade Crossing Program.

Federal HSIP funds are apportioned by formula to the State of California and split 50/50 between state and local programs. The goal is reducing crashes while providing a safe, sustainable, integrated, and efficient transportation system. Accomplishing this involves systematically investigating high collision concentration locations to determine if measures can be taken to improve highway safety.

To be eligible for HSIP funds, highway safety improvement projects must:

- Address a SHSP priority;
- Be identified through the data-driven process; and
- Contribute to a reduction in fatalities and severe injuries.

There are five steps in the process of Highway Safety Improvement Projects selection:

1. Issue identification.

    - This can be done through systemic approach, spot location approach, and/or comprehensive approach incorporating human/driver behavior.
2. Allocating HSIP funding is to the highest benefit/cost ratio projects. Generally, the maximum federal reimbursement ratio for a HSIP project is 90%; however, there are low-cost proven safety countermeasures that qualify for 100% federal funding eligibility. The project costs for federal HSIP include:
    - Preliminary Engineering, Right of way Capital and Support, and Construction Engineering and Support.
3. The HSIP typically calls for projects at one to two-year intervals. The timing and size of the call is determined by the program apportionments, HSIP Federal Transportation Improvement Program (FTIP) capacity, and the delivery of the existing HSIP projects.
4. Evaluate proposed projects based on the benefit/cost ratio. Other project selection criteria include:
    - Funding set-asides, High Risk Rural Roads (HR3) eligible projects, and maximum federal HSIP funding per agency per cycle. The projects must also address a SHSP priority.
5. Caltrans HQ-Division of transportation programming sends the list of approved projects to the Metropolitan Planning Organizations (MPOs) for consideration. The MPOs amend the FTIP to include their projects.

Local Road Safety Plan Guidance

Caltrans

Caltrans provides guidance on the LRSP program on their website[3], including an overview of LRSPs and Strategic Highway Safety Plans (SHSP), links to useful FHWA resources, guidance on LRSP applications, and guidance on LRSP project implementation. Key findings from Caltrans regarding their guidance on the LRSP process is as follows:

- An LRSP provides local and rural road owners with an opportunity to identify, prioritize, and address unique highway safety needs in their jurisdictions while contributing to the success of the SHSP
- In the future HSIP Calls-for-Projects, an LRSP (or equivalent document) will be preferred or required for an agency to be eligible to apply for HSIP funds.
    - For HSIP Cycle 11 (around April 2022) and on: an LRSP (or its equivalent) will be required for an agency to be eligible to apply.

[3] https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvement-program/local-roadway-safety-plans

- After an LRSP application has been selected for funding, the local agency will proceed to implement their analysis/report-only project.

Federal Highway Administration

FHWA provides guidance on the development of LRSPs in the following documents (all of which are included in the Caltrans webpage referenced in the previous section):

- **Local and Rural Road Safety Briefing Sheets:** Provides high-level overview on the development of LRSPs. Identifies key steps in the process and provides case study. Recommends that local and road owners should attempt to answer the following questions through the development of an LRSP:
    - What is the purpose or goal?
    - Which agencies are critical to include during plan development?
    - How will safety problems be identified?
    - How will improvement strategies be identified? Prioritized? Implemented?
    - How will the plan be monitored and updated?
- **Developing Safety Plans: A Manual for Local Rural Road Owners:** Provides detailed guidance on the development of LRSPs, including the potential benefits of LRSPs, the process for developing LRSPs, common opportunities and challenges associated with LRSPs, and a series of case studies. Provides specific guidelines and instructions for engaging with local stakeholders, completing crash analysis, identifying strategies, and creating a draft plan.
- **Local Road Safety Plan Do-It-Yourself Website:** Provides videos, tools, and resources for the primary steps of the LRSP process, including identifying stakeholders, using safety data, choosing solutions, implementing solutions, and completing final steps.
- **Systemic Safety Project Selection Tool**: Provides a step-by-step process for conducting systemic safety analysis, considerations for implementation of spot safety improvements versus systemic safety improvements, and a mechanism for quantifying the benefits of safety improvements implemented through a systemic approach.

Countermeasure Guidance

This section discusses resources that should be used to assist with the identification of countermeasures for the Truckee LRSP.

Local Roadway Safety – A Manual for California's Local Road Owners (2020)

This document was created by Caltrans in conjunction with FHWA and the Safe Transportation Research and Education Center to provide focused roadway safety information to local agencies. Included in the document is information on countermeasure selection and a list of countermeasures. The list of countermeasures only includes those available in the Caltrans' HSIP calls for projects, and will be

required in the identification of treatments in the Truckee LRSP that are eligible for funding through HSIP grants.

The manual provides a summary list of countermeasures that are sorted into categories for signalized intersections, non-signalized intersections, and roadway segments. The list also includes the following information for each countermeasure:

- Applicable Crash Type (i.e., bicycle and pedestrian related)
- Crash Reduction Factor
- Expected Lifespan
- HSIP Funding Eligibility (90% or 100%)
- Level of Opportunity for Systemic Approach

The manual also includes detailed descriptions of each countermeasure, including guidance on "where to use" and "why it works", in the appendix.

Federal Highway Administration Proven Safety Countermeasures

FHWA had identified a list of encouraged countermeasures through their Proven Safety Countermeasures initiative. Information on the Proven Safety Countermeasures can be found on their website.[4] The list includes 20 different countermeasures that FHWA encourages transportation agencies to consider in order to move towards meeting local, State, and National safety goals. The website includes a summary sheet for each countermeasure, providing basic information on the countermeasure and countermeasure examples.

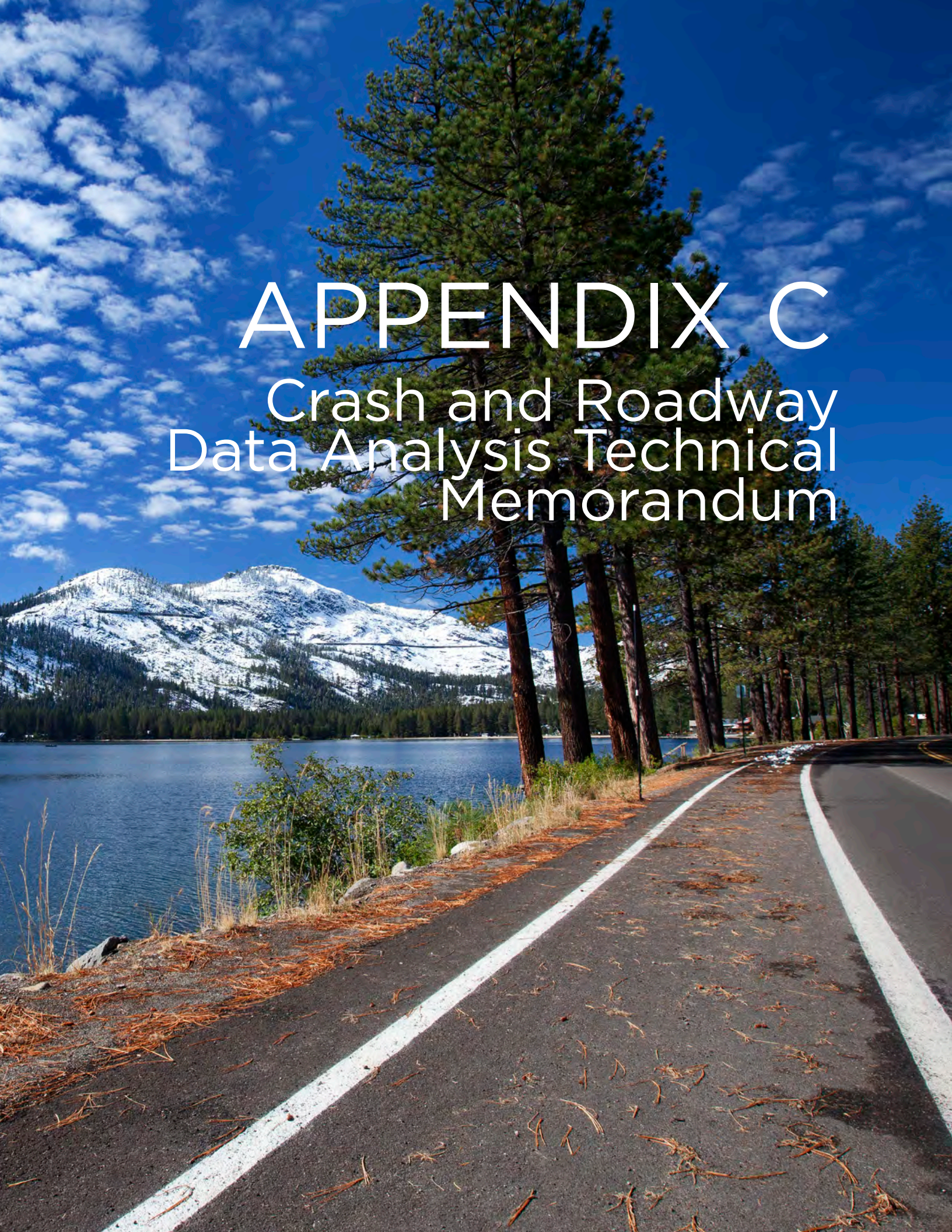
FHWA also maintains crash modification factor (CMF) clearinghouse[5] which provides a searchable database of CMFs. The clearinghouse includes information about the individual CMFs, including a star quality rating, which reflects the reliability of the CMFs. The CMF clearinghouse will serve as a potential supplemental source for the identification and anticipated effectiveness of countermeasures.

[4] https://safety.fhwa.dot.gov/provencountermeasures/

[5] http://www.cmfclearinghouse.org/

SUMMARY

The data and documents summarized in this memorandum will be used to help the development of the Truckee LRSP. The spatial data obtained by Kittelson will be used to analyze crash patterns and trends on the roadway system and begin the process of identifying strategies to reduce crash risk. The local documents that were reviewed will be used to develop a plan that best meets the vision and goals of the Town of Truckee. The consultant team will also consider national and state safety evaluation practices and policies to implement an effective approach specific to the Town of Truckee.



APPENDIX C

Crash and Roadway Data Analysis Technical Memorandum

Kittelson & Associates, Inc.
2510 J Street, Suite 200
Sacramento, CA 95816

MEMORANDUM

Date:	April 4, 2022	Project # 25806.05
To:	Becky Bucar, PE, Engineering Manager Engineering Division Town of Truckee, CA	
From:	Kittelson & Associates, Inc.	
Project:	Town of Truckee Local Road Safety Plan	
Subject:	Task 5 Crash and Roadway Data Analysis Technical Memorandum	

Memorandum Overview

Kittelson & Associates, Inc. (Kittelson), LSC Transportation Consultants, Inc. (LSC), and the Town of Truckee (Town) are developing a Local Road Safety Plan for the Town. This work includes reviewing crash data to identify trends or patterns that could be addressed through systemic treatments or strategies. This work also includes identifying locations that have historically experienced a greater frequency and/or severity of crashes (i.e., high injury network). Ultimately, the LRSP will be a document that sets roadway safety goals and informs decisions the Town makes on roadway safety improvements. This memorandum documents the findings from the crash data analysis, high-injury network, strategies and countermeasures that could be used to improve roadway safety, and provides background data to inform the public outreach process. The Table of Contents below summarizes the contents of this memorandum.

Table of Contents

1. INTRODUCTION

This memorandum documents the safety data analysis conducted to identify crash patterns and trends, crash risk factors associated with increased crash frequency or severity, and priority locations for potential safety improvements. The information and findings in this memorandum will inform forthcoming countermeasure identification, project development, and goals for the Local Road Safety Plan (LRSP).

1.1. SUMMARY OF FINDINGS

The following presents a summary of findings based on the analysis in this memorandum. Separate findings are presented for crash data from the most recent 10-year (January 1, 2010 to December 31, 2019) and 5-year (January 1, 2015 to December 31, 2019) periods. The 10-year analysis is used to identify broader trends in crashes and roadway safety for the Town, whereas the more-recent 5-year analysis is used to inform more specific findings for the LRSP.

1.1.1. Crash Patterns and Trends

1.1.1.1. All Road Users

- Crash data was analyzed for 2010 through 2019 for all reported crashes in the Town of Truckee excluding those occurring on Interstate 80 mainline segments. In the 10 years of crash data analyzed, there were 1,250 total reported crashes in the Town of Truckee. Six crashes resulted in fatalities and 44 (4%) resulted in a severe injury.
- Among located crashes, 1,037 (83%) did not occur on the state highways.
- The four most frequent crash types overall include:
    - Rear End (21% of reported crashes);
    - Broadside (21% of reported crashes);
    - Hit Object (18% of reported crashes; and,
    - Sideswipe (18% of reported crashes).
- The three most frequent crash types among fatal and severe injury crashes include:
    - Hit Object (22% of reported fatal and severe injury crashes);
    - Broadside (16% of reported fatal and severe injury crashes); and
    - Head-On (14% of reported fatal and severe injury crashes).

- Unsafe speed was the most frequently cited collision factor among fatal and severe injury crashes with 10 (20%) of reported fatal and severe injury crashes. This violation is cited when vehicles are driving too fast for conditions and may include vehicles driving too fast under inclement weather or other roadway conditions.
- Among reported crashes, the share involving some level of alcohol was 16%. Among fatal crashes, the share involving some level of alcohol was 1%.
- The months with the highest number of reported crashes are:
    - January (153 reported crashes);
    - February (144 reported crashes);
    - December (134 reported crashes); and,
    - July (132 reported crashes).
- The weekday (Monday through Friday) hours with the highest frequency of reported crashes were 3-4pm and 5-6pm. The weekend (Saturday and Sunday) hours with the highest frequency of reported crashes were 5-6pm and 6-7pm.
- Clear weather was the most frequently cited weather condition with 66% of reported crashes. Of fatal and severe injury crashes, 85% occurred in clear weather conditions. Only 2% of fatal and severe injury crashes occurred during snowing conditions. Note that snow and ice can still be present on the roadways in clear weather.
- Dry roads were the most frequently cited road surface condition with 61% of reported crashes. Of fatal and severe injury crashes, 88% occurred on dry road surfaces. Six percent of fatal and severe injury crashes occurred on snowy or icy road surfaces.
- Crashes with dark lighting accounted for 27% of reported crashes but only 20% of fatal and severe injury crashes.

1.1.1.2. Bicycle and Pedestrian Crashes

- A total of 56 bicycle crashes were reported in the Town of Truckee between 2010 and 2019, of which 18 (32%) resulted in a fatality or a severe injury. A total of 27 reported crashes involved a pedestrian between 2010 and 2019, of which 7 (26%) resulted in a fatality or a severe injury.
- The majority of bicycle crashes (95%) and pedestrian crashes (96%) did not occur on the state highways.
- Bicycle crashes and pedestrian crashes are disproportionately severe relative to vehicular crashes:

- Of reported bicycle crashes, 5% resulted in a fatality and 27% resulted in a severe injury.
- Of reported pedestrian crashes, 4% resulted in a fatality and 22% resulted in a severe injury.

- Bicycles "with an unknown directional movement being hit by vehicles proceeding straight" as well as bicycles "proceeding straight being hit by vehicles making a left turn" comprised 21% and 20% of reported bicycle crashes (56 crashes) respectively. Of fatal and severe injury crashes, both these movements made up 28% (5 crashes) of fatal and severe injury bicycle crashes each.
- Pedestrians "in the road, including shoulder being hit by a vehicle proceeding straight" made up 30% (8 crashes) of reported pedestrian crashes (27 crashes). When looking at fatal and severe injury crashes, these movements made up 57% (4 crashes) of fatal and severe injury pedestrian crashes.
- Among the crashes where the bicyclist was identified as the party most at fault, the top two primary collision factors were "Other hazardous violation" and "DUI" (driving under the influence). Of the collisions where the vehicle was identified as the party most at fault, the top primary collision factor was "automobile right-of-way."
- Among the crashes where pedestrian was identified as the party most at fault, the top primary collision factor was "pedestrian violation." Where drivers were identified as the party most at fault, the top primary collision factor was "other improper driving."
- The year 2016 had the highest number of reported bicycle crashes (12) and tied with 2015 for the highest number of reported pedestrian-involved crashes (5).

1.1.1.3. Comparison with Statewide Averages

A comparison with statewide averages was conducted using the most recent statewide report - the 2017 Annual Report of Fatal and Injury Motor Vehicle Traffic Crashes prepared by the California Highway Patrol (CHP). A summary of this comparison with statewide crashes is provided below:

- Statewide, crash frequency is highest in October and November. In Truckee, winter months saw more crashes than October indicating drivers in Truckee are more likely to get in a collision during the snowy months.
- In 2017, the most common type of crash for fatal crashes was "broadside" which accounted for 1,210 (22%) fatal crashes out of the total 5,474 fatal crashes that occurred. In Truckee, "broadside" only accounted for 16% of fatal/severe injury crashes whereas the most common cause of fatal/severe injury crashes were caused by "hit object" which accounted for 22% of fatal/severe injury crashes.

- In 2017, the most common type of crash for injury crashes was "rear end" which accounted for 150,070 (41%) injury crashes out of the total 363,002 injury crashes that occurred. In Truckee, the most common types of crash for total crashes were both "rear end" and "broadside" which accounted for 21% of crashes each. The proportion of rear end crashes is much lower than the statewide averages.
- Between 2013 and 2017, a total of 5,436 (33.9%) fatal accidents occurred in California where alcohol was involved out of a total of 16,037 fatal accidents. In Truckee, 50% of the fatalities in Truckee in the last 10 years had alcohol involved. Overall, Truckee seems to have more alcohol related collisions when compared to the statewide averages.
- In Truckee, the top primary crash factor is "unsafe speed" which accounted for 20% of all crashes. This is consistent with the statewide averages. "Unsafe speed" and "driving or bicycling under the influence of drugs or alcohol" were the top primary collision factors in fatal and severe injury crashes in Truckee which is also consistent with statewide averages.
- In Truckee, pedestrian accidents made up 2.2% out of all crashes. 26% of all pedestrian accidents resulted in a fatality. Pedestrian accidents also made up 17% of all fatalities. Overall, the proportion of fatal and injury accidents involving pedestrians in Truckee is lower than statewide average. However, Truckee only had 6 total fatalities in the last 10 years of which 1 was a pedestrian.
- In Truckee, bicycle accidents made up 4% of all crashes but made up 50% of the fatalities. However, Truckee only had 6 total fatalities in the last 10 years of which 3 involved a bicyclist. Bicycle accidents accounted for 12.8% of injury accidents which is higher than the statewide average.

Additionally, the California Office of Traffic Safety (OTS) rankings for the most recent year available, 2018, were reviewed. These rankings compare similar sized cities safety performance to help identify emerging or on-going traffic safety focus areas. The Town of Truckee is grouped in Group E with 102 cities with populations between 10,001 and 25,000. A summary of relevant rankings for Truckee is provided below:

- Truckee's three highest (or "worst") rankings were for Bicyclist (#20), Speed Related (#21), and Alcohol-Involved (#29) crashes.
- The Town was in the top ("worst") half of similar jurisdictions for Motorcycle crashes (#30), Total Fatal and Injury crashes (#36), and the Composite ranking (#44).

1.1.2. Network Screening Findings

Kittelson developed crash severity scores for four analysis scenarios; all crashes, bicycle and pedestrian crashes only, winter crashes only, and summer crashes only. The findings will help the Town identify priority intersection and roadway segment locations for consideration in developing projects based on total reported crashes.

2. TOWNWIDE CRASH PATTERNS AND TRENDS

This section presents town-wide crash patterns and trends. This analysis focuses on identifying behavioral and roadway patterns associated with injury and fatal crash outcomes. By analyzing reported crashes together, systemic trends across locations can be identified. Findings from this analysis will help inform safety countermeasures selected in subsequent project tasks.

2.1. DATA SUMMARY

2.1.1. Crash Data

The database is comprised of the most recent ten years of reported crashes available on the Statewide Integrated Traffic Records System (SWITRS), representing January 1, 2010 through October 3, 2019.

2.2. ROADWAY CHARACTERISTIC AND LAND USE DATA

Truckee's roadway system (excluding Interstate 80) is largely comprised of two-lane roadways. Only SR 89 South provides four travel lanes and only for 2,400 feet between Donner Pass Road and the railroad undercrossing south of Deerfield Drive. In addition, portions of Donner Pass Road and Brockway Road have a three-lane cross-section with a center two-way left turn lane. Table 1 presents traffic volumes during the busiest season (summer), indicating the highest volumes on SR 267 (up to 21,910 total 2-way vehicles per day). The local roadway network is also notable due to the high number of roundabouts (nine at current count).

Table 1: Town of Truckee Summer Daily Traffic Volumes, 2018 Roadway Segment Two-Way Daily Traffic Volume

Roadway	Segment	Two-Way ADT
SR 267	Town limit to Brockway Road	21,910
SR 267	Brockway Road to I-80 interchange	21,610
Brockway Road	West River to Palisades Drive	17,500
Donner Pass Road	Northwoods Drive to SR 89 South	17,380
Northwoods Blvd	Just north of Bull Pine Trail	16,400
Donner Pass Road	West of Northwoods Drive to Northwoods Drive	15,820
Brockway Road	Just west of SR 267	14,510
Truckee Way	Pioneer Trail to SR 89 North	14,040
West River Street	Just east of McIver Crossing	13,750
Donner Pass Road	SR 89 South to I-80 central interchange	13,680

Roadway	Segment	Two-Way ADT
Brockway Road	Just east of Martis Valley Road	13,080
SR 89 South	Deerfield Drive to West River	12,930
Brockway Road	Palisades Drive to Martis Valley Road	12,270
Donner Pass Road	Cold Stream Road to I-80 westbound ramp	12,230
SR 89 North	I-80/SR 267 interchange to Truckee Way	12,190
SR 89 South	Just south of West River	12,090
Truckee Way	Glenshire Drive to I-80 eastern interchange	12,010
West River Street	Just west of Bridge Street	11,400
Truckee Way	Church Street to Glenshire Drive	11,300
Bridge Street	Just east of McIver Crossing	10,400
Donner Pass Road	Bridge Street to Truckee Way	9,980
Pioneer Trail	Just west of Truckee Way	9,700
Donner Pass Road	Spring Street to Bridge Street	9,460
SR 89 North	Prosser Dam Road/Alder Drive to Rainbow Drive	8,420
Deerfield Drive	Just west of SR 89 to SR 89	8,400
Glenshire Drive	Truckee Way to Olympic Boulevard	8,380
Palisades Drive	Brockway Road to Pine Cone Drive	7,930
Donner Pass Road	Just west of Cold Stream Road	7,650
Glenshire Drive	Just west of Dorchester Drive (West)	7,540
Martis Valley Road	Brockway Road to Old Mill Road	6,440
West River Street	Just east of SR 89	6,200
Donner Pass Road	Spring Street to McIver Crossing	6,000
Palisades Drive	Pine Cone Drive to Torrey Pine Road	4,560
Glenshire Drive	Just east of Martis Peak Road	3,370
Cold Stream Road	Donner Pass Road to Deerfield Drive	3,140
Donner Pass Road	Just east of South Shore Drive	2,890
SR 89 North	Alder Creek Road to north town limit	2,490
Donner Pass Road	Just east of South Shore Drive	1,880
Donner Lake Road	I-80 to McGlashan Drive	1,660
East River Street	Bridge Street to Commercial Zone	1,470

Source: Town of Truckee 2021.

At a broad level, Truckee land use can be considered to consist of several distinctly different areas: the historic downtown area is (with short blocks and limited roadway dimensions) with nearby residential areas, large residential subdivisions (notably Tahoe Donner, Glenshire, Prosser Lakeview and Sierra Meadows/Ponderosa Palisades), the Donner Lake area developed as a summer recreation area, the primary commercial corridor along Donner Pass Road (and SR 89 South) between downtown and Donner Lake, and the airport area where the Town Hall and Police station are located. There is also a growing commercial/public service activity center (near the airport) in the southeast area around SR 267 and Brockway Road.

3. TOWNWIDE CRASH ANALYSIS

3.1. ALL ROAD USERS

We first analyzed reported crashes across motor vehicles, pedestrians, and bicyclists. Trends and findings are presented based on the following:

- Crash Severity
- Crash Location
- Crash Type
- Primary Collision Factor
- Month
- Time of Day and Day of Week
- Weather Conditions
- Road Surface
- Lighting Conditions
- Alcohol and Drug Involvement
- Crashes by Year

Following this analysis, bicycle and pedestrian crashes are discussed separately.

3.1.1.1. Crash Severity

Crashes are classified by severity based on the most severe outcome associated with the crash, with the following reported severities (in descending order of severity): fatal, severe injury, other visible injury, complaint of pain injury and property damage only (PDO). Table 2 presents crashes by severity and by the road users involved (e.g., pedestrian bicyclist, motor vehicle).

- Among reported crashes, 50 (4%) resulted in either a severe injury or a fatality.
- The share of injuries and fatalities among pedestrian- and bicyclist-involved crashes is higher than among crashes overall
    - Pedestrians are involved of 2% of crashes and 7% of fatal and injury crashes.
    - Bicyclists are involved in 4% of crashes 13% of fatal and injury crashes

Table 2: Road Users Involved and Crash Severity, Town of Truckee 2010-2019

Road Users Involved in Crashes	Fatal (% of Column)		Severe Injury (% of Column)		Visible Injury (% of Column)		Complaint of Pain (% of Column)		Property Damage Only (% of Column)		Total (% of Column)	
Pedestrian	1	(17%)	6	(14%)	10	(7%)	10	(5%)	0	(0%)	27	(2%)
Bicycle Involved	3	(50%)	15	(34%)	27	(19%)	8	(4%)	3	(0%)	56	(4%)
Vehicle Only or Vehicle-Fixed	2	(33%)	23	(52%)	107	(74%)	183	(91%)	852	(100%)	1167	(93%)
Total Reported Crashes	6		44		144		201		855		1250	(100%)

Source: SWITRS, 2021.

3.1.1.2. Crash Location

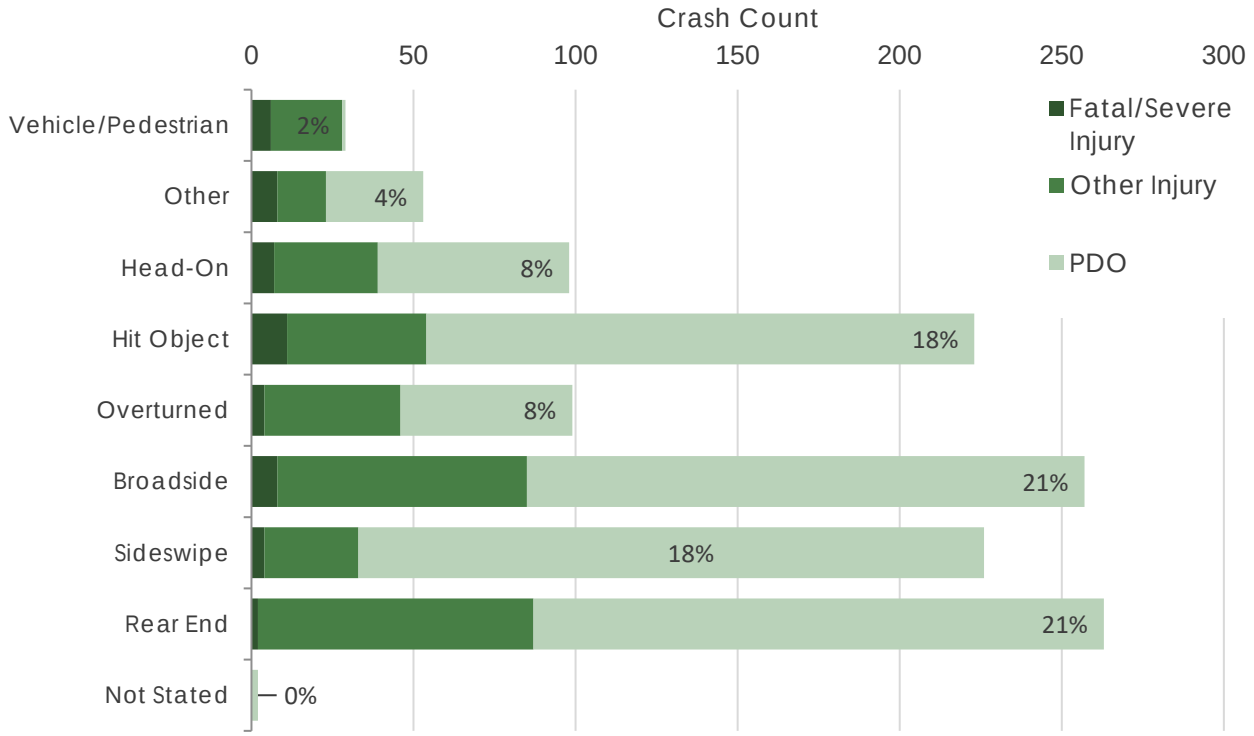
From located crashes, SWITRS identified the crashes as either Highway, Not State Highway, Intersection or Ramp (or collector).

- Of the crashes that were able to be located, 83% did not occur on the state highway, 8% occurred on the highway, 6% occurred at an intersection and 3% occurred on a ramp (or collector).
- The proportion of non-highway crashes among fatal and severe injury crashes (90%) is higher than the proportion of crashes that occurred among all severity levels (83%).

3.1.1.3. Crash Type

Figure 1 presents crashes by reported crash type and severity.

Figure 1: Reported Crashes by Type and Severity, Town of Truckee 2010-2019



Source: SWITRS, 2021.

As Figure 1 demonstrates, fatal and severe injury crash data differs from the number of total reported crashes by type.

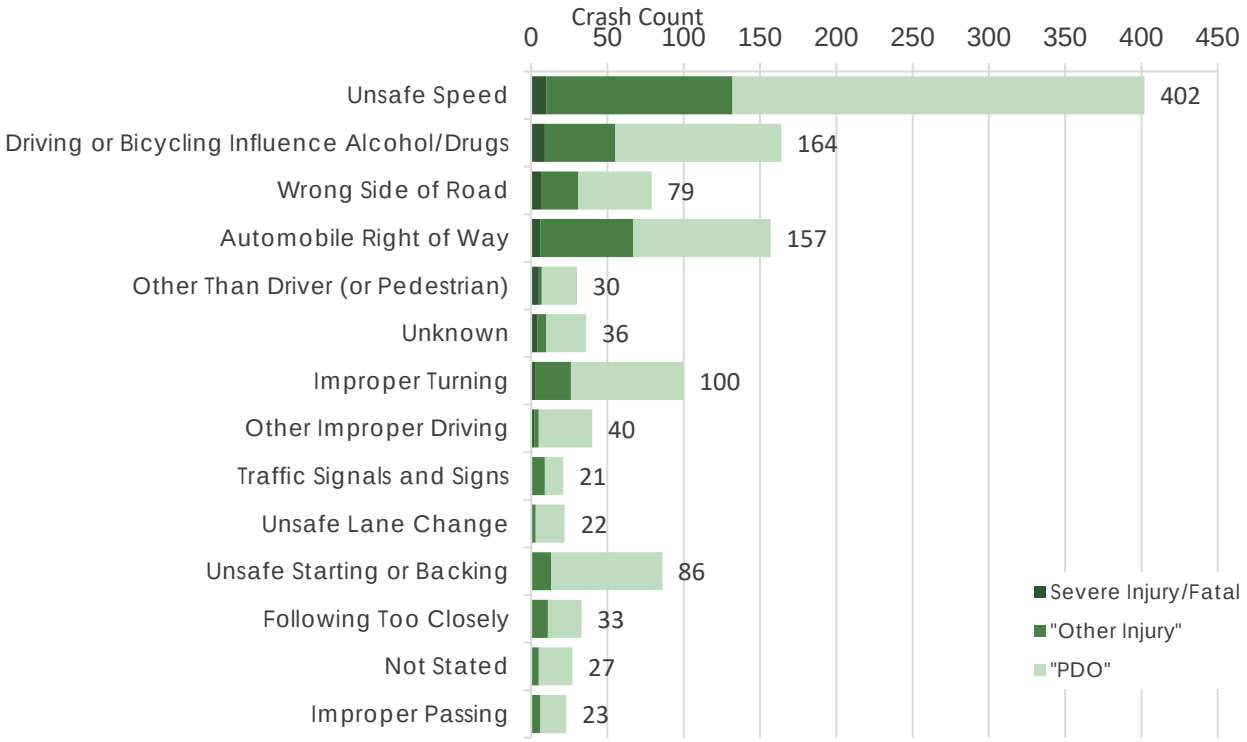
- The four most frequent crash types were:
  - Rear-end (21% of reported crashes);
  - Broadside (21% of reported crashes);
  - Hit Object (18% of reported crashes); and,
  - Sideswipe (18% of reported crashes).

- The three most frequent crash types for fatal and severe injury crashes were:
  - Hit Object (22% of reported fatal and severe injury crashes);
  - Broadside (16% of reported fatal and severe injury crashes); and,
  - Head-On (14% of reported fatal and severe injury crashes)

3.1.1.4. Primary Collision Factor

Figure 2 presents reported crashes with the top 14 most frequently cited primary collision factors. The figure is arranged in descending order based on frequency of fatal and severe injury crashes.

Figure 2: Crashes by Reported Primary Collision Factor, Town of Truckee 2010-2019



Source: SWITRS, 2021.

- Unsafe speed and driving/bicycling under the influence were the most frequently cited collision factors among fatal and severe crashes (with 10 and 9 crashes respectively).
- Unsafe speed was the most frequently cited collision factor overall (402 reported crashes).

3.1.1.5. Crashes by Month

Table 3 presents reported crashes showing bicycle, pedestrian, and vehicle crashes by month. On the right side of the table, fatalities by motor vehicle and month are shown.

Table 3: Total and Fatal Crashes by Motor Vehicle Type, Town of Truckee 2010-2019

	Total Crashes by Motor Vehicle Type			Fatalities by Motor Vehicle Type		
Month	**Bike Crash**	**Ped Crash**	**Auto Crash**	**Bike Crash**	**Ped Crash**	**Auto Crash**
January	0	0	153	0	0	0
February	0	4	128	0	0	0
March	0	5	90	0	0	0
April	1	2	54	0	1	0
May	4	3	46	0	0	1
June	8	0	50	0	0	0
July	17	3	52	2	0	1
August	14	2	42	0	0	0
September	9	1	45	0	0	0
October	1	2	58	0	0	0
November	2	1	82	1	0	0
December	0	4	118	0	0	0
Total	**56**	**27**	**918**	**3**	**1**	**2**

Source: SWITRS, 2021.

- Automobile crashes were highest in the winter months January, February, and December with over 100 crashes (153, 128 and 118 crashes)
- Bicycle crashes were highest in summer months - July and August (17 and 14 crashes)
- No fatalities occurred in the peak winter months of December through March (though winter conditions can also occur in other months). 3 out of the 6 fatalities occurred in July.

3.1.1.6. Time of Day and Day of Week

Table 4 presents reported crashes by time of day and day of week and Figure 3 presents the share of reported crashes by vehicle type and time of day.

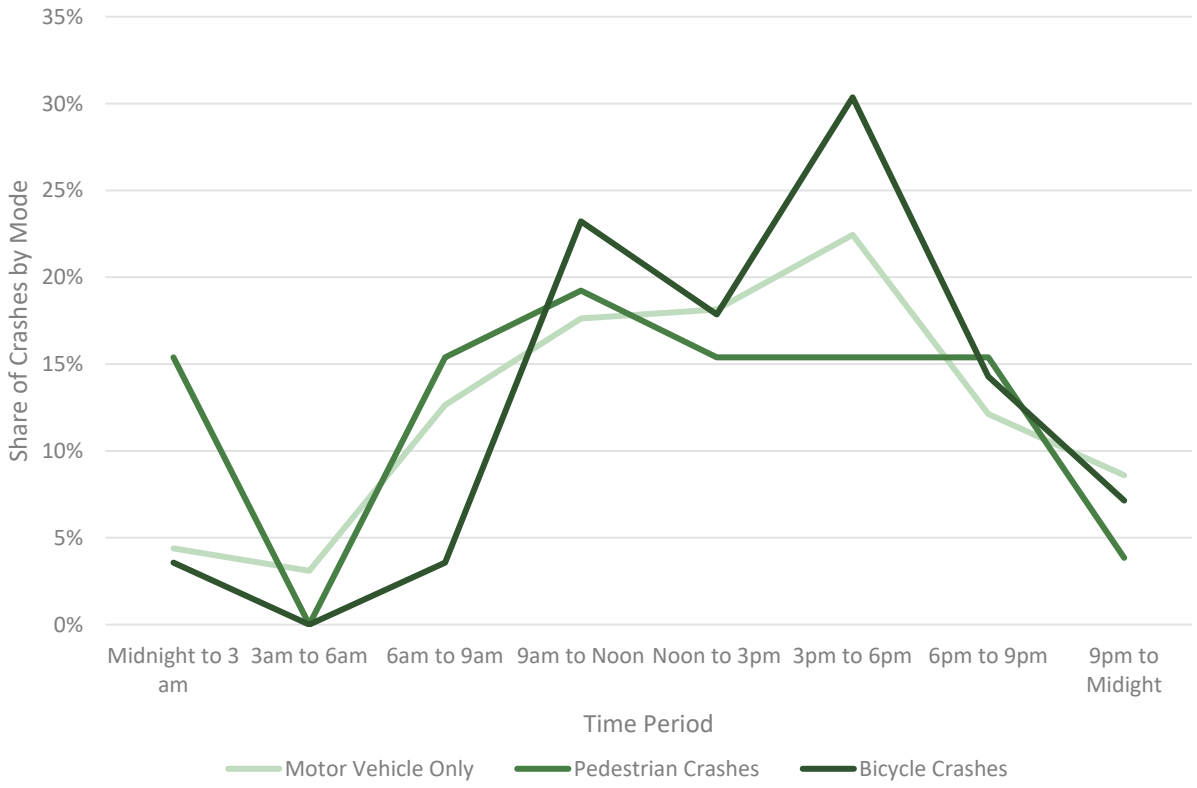
Table 4: Reported Crashes by Hour and Day of Week, Town of Truckee 2010-2019

Time of Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
12:00 AM - 1:00 AM	0	0	0	0	0	0	0
1:00 AM - 2:00 AM	4	2	3	6	5	1	9
2:00 AM - 3:00 AM	1	1	1	4	3	6	5
3:00 AM - 4:00 AM	0	1	0	1	0	3	1
4:00 AM - 5:00 AM	2	1	3	2	0	2	4
5:00 AM - 6:00 AM	2	2	4	1	2	4	1
6:00 AM - 7:00 AM	3	3	3	1	1	5	0
7:00 AM - 8:00 AM	5	12	18	11	8	10	3
8:00 AM - 9:00 AM	16	7	14	6	14	7	6
9:00 AM - 10:00 AM	9	12	11	14	18	12	8
10:00 AM - 11:00 AM	13	13	12	7	7	13	5
11:00 AM - 12:00 PM	17	11	14	8	6	7	6
12:00 PM - 1:00 PM	9	8	10	10	14	10	6
1:00 PM - 2:00 PM	17	13	8	13	11	4	13
2:00 PM - 3:00 PM	14	10	12	14	10	7	12
3:00 PM - 4:00 PM	16	13	17	14	13	13	9
4:00 PM - 5:00 PM	7	16	11	25	11	8	5
5:00 PM - 6:00 PM	10	21	13	16	18	14	12
6:00 PM - 7:00 PM	9	12	4	7	9	15	11
7:00 PM - 8:00 PM	2	5	4	9	6	4	11
8:00 PM - 9:00 PM	4	4	7	11	5	6	8
9:00 PM - 10:00 PM	7	3	3	6	9	5	7
10:00 PM - 11:00 PM	2	3	7	4	10	8	6
11:00 PM - 12:00 AM	5	4	1	3	7	3	2
Total	**174**	**177**	**180**	**193**	**187**	**167**	**150**

Source: SWITRS, 2021.

- The weekday (Monday through Friday) hours with the highest frequency of reported crashes were 3-4pm and 5-6pm.
- The weekend (Saturday and Sunday) hours with the highest frequency of reported crashes were 5-6pm and 6-7pm.
    - 42% of weekend crashes occurred between 5pm and 3am.

Figure 3: Share of Crashes by Vehicle Type and Time of Day, Town of Truckee 2010-2019



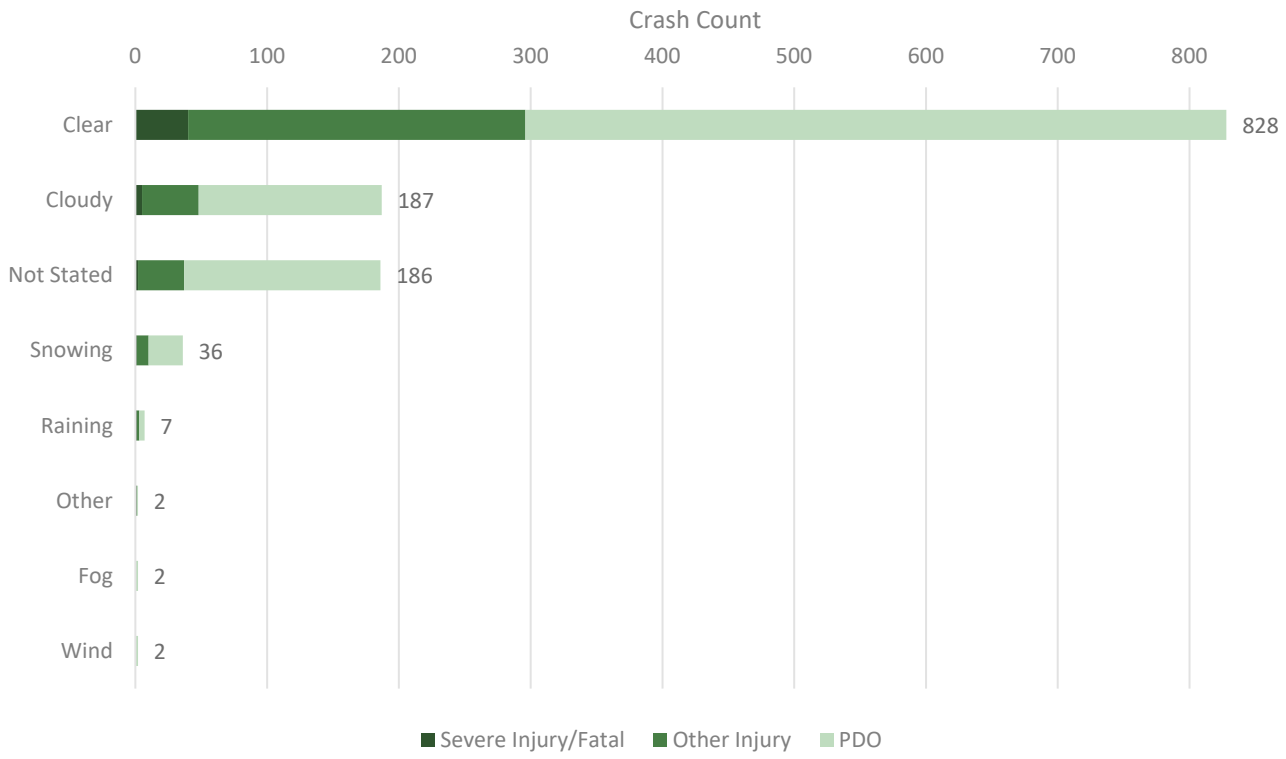
Source: SWITRS, 2021.

- Bicycle Crashes and motor vehicle only crashes peak between 3pm and 6pm
- Crashes involving pedestrians peak earlier (9am to Noon)

3.1.1.7. Weather

Figure 4 presents reported crashes by type of weather.

Figure 4: Reported Crashes by Weather and Severity, Town of Truckee, 2010-2019



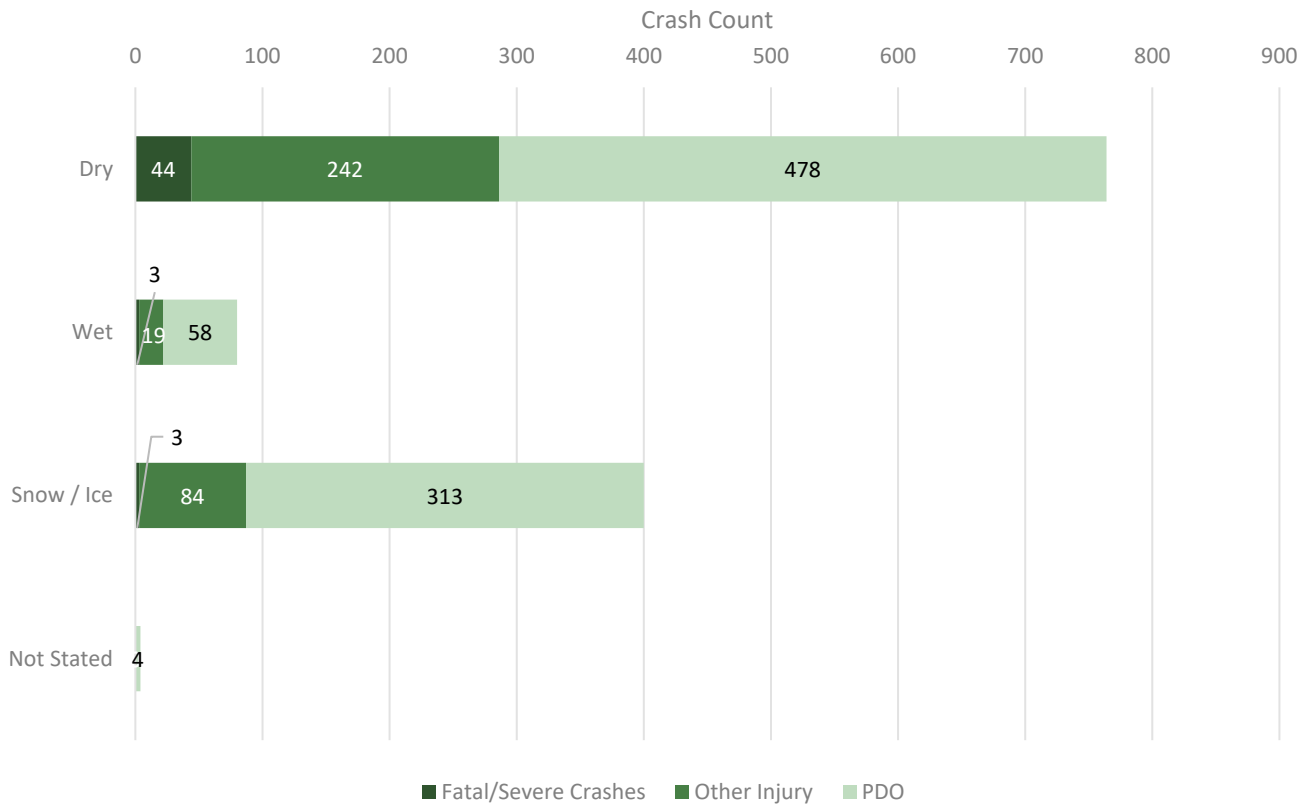
Source: SWITRS, 2021.

- Crashes that occurred in clear weather accounted for 66% of total reported crashes but accounted for 85% of fatal and severe injury crashes and 83% of other injury crashes.
- 1 fatal crash occurred when it was raining, and 1 fatal crash occurred when it was foggy.
- Despite Truckee's winter climate and setting, the number of crashes that occurred while it was snowing was modest (36).

3.1.1.8. Road Surface

Figure 5 presents reported crashes by road surface conditions.

Figure 5: Reported Crashes by Road Surface Conditions and Severity, Town of Truckee, 2010-2019



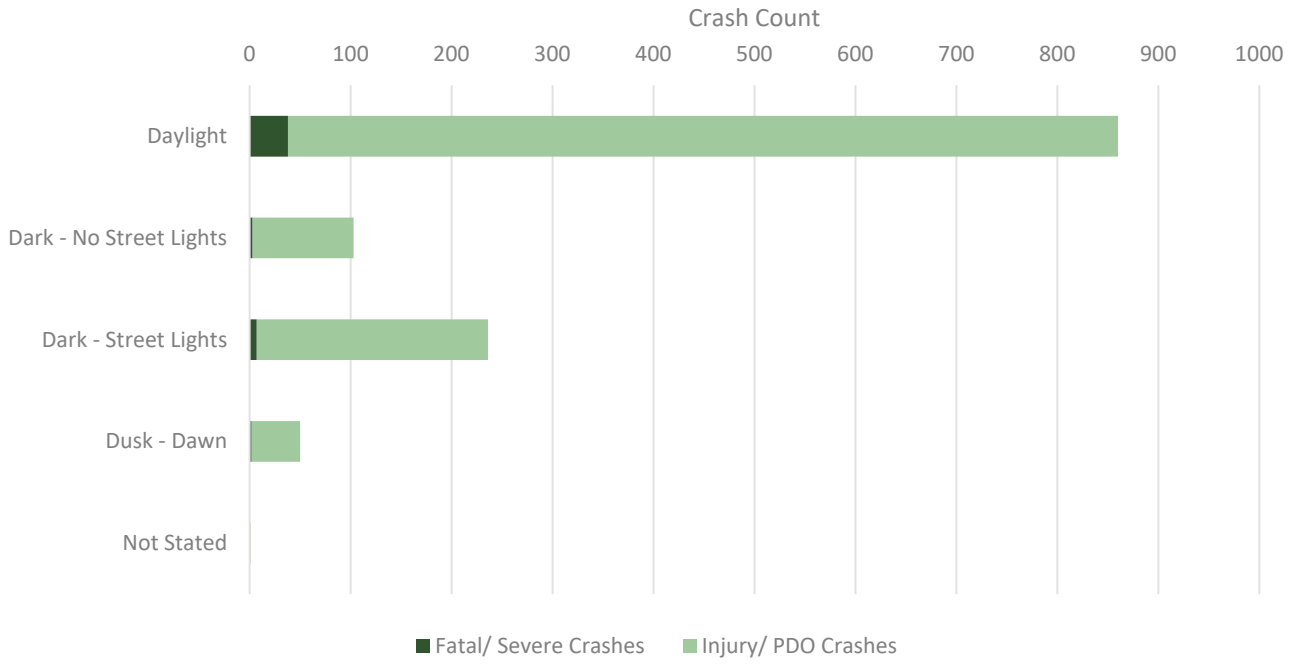
Source: SWITRS, 2021.

- Crashes that occurred on dry roads made up 61% of total reported crashes, but account for 88% of fatal and severe injury crashes.
- No fatalities occurred on snowy/icy roads, however three severe injuries occurred on snowy/icy roads.
- One fatality and two severe injuries occurred on wet roads.

3.1.1.9. Lighting

Figure 6 presents reported crashes by lighting conditions.

Figure 6: Reported Crashes by Lighting Conditions and Severity, Town of Truckee, 2010-2019



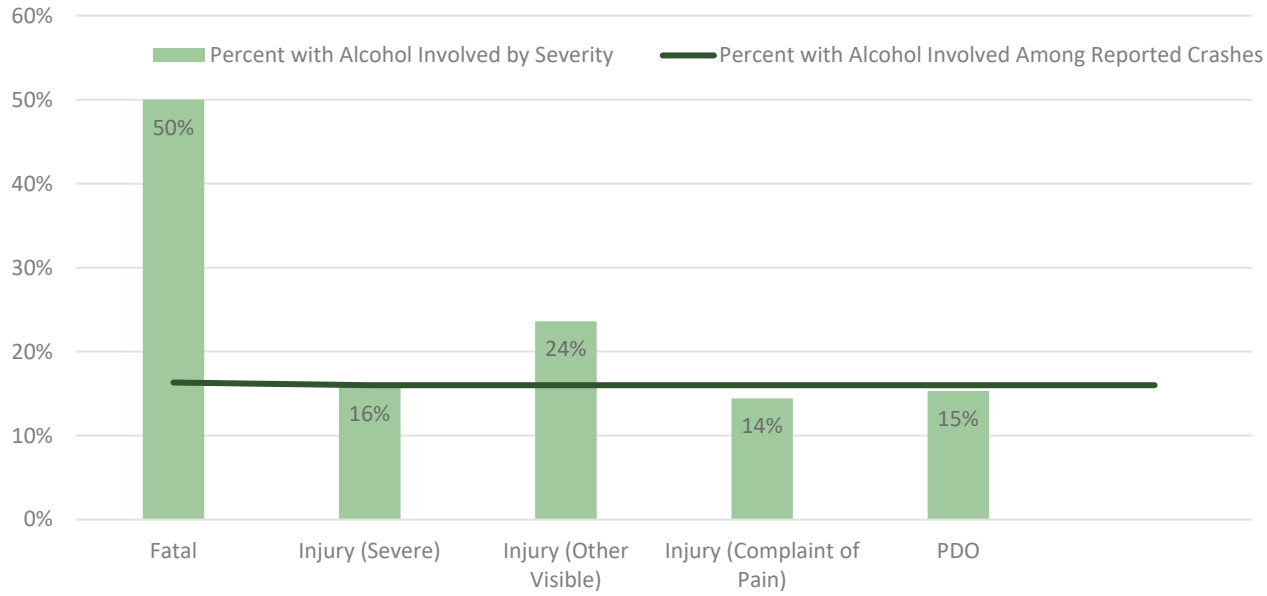
Source: SWITRS, 2021.

- Crashes that occurred in the dark make up 27% of total reported crashes and 20% of fatal and severe injury crashes.
- Crashes that occurred in the daylight account for 69% of total reported crashes and 76% of fatal and severe injury crashes.

3.1.1.10. Alcohol Involved

Figure 7 presents reported crashes by severity and the percent of crashes in which alcohol was involved.

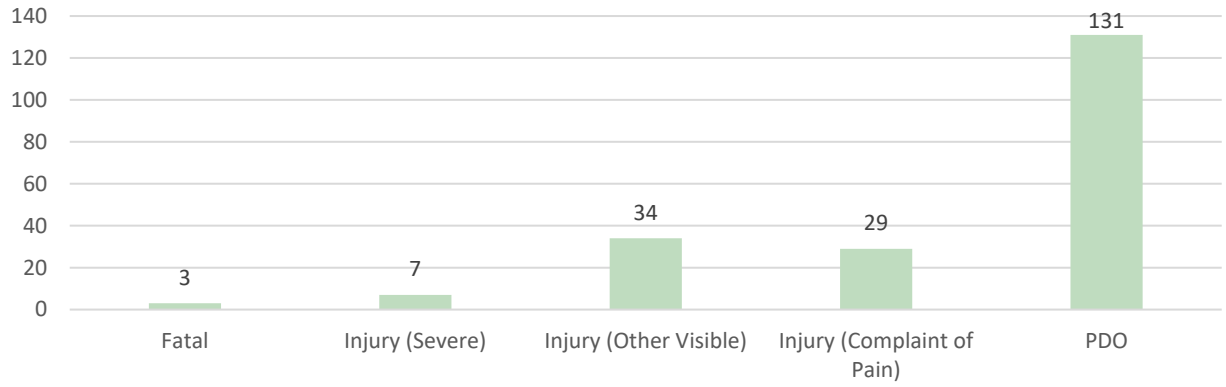
Figure 7: Reported Crashes by Severity and Percent with Alcohol Involved, Town of Truckee, 2010-2019



Source: SWITRS, 2021.

Among all reported crashes, the share involving some level of alcohol was 16%. However, among fatal crashes the share involving some level of alcohol was 50%. Total reported crashes involving alcohol by severity are shown in Figure 8.

Figure 8: Reported Crash Totals by Severity with Alcohol Involved, Town of Truckee, 2010-2019

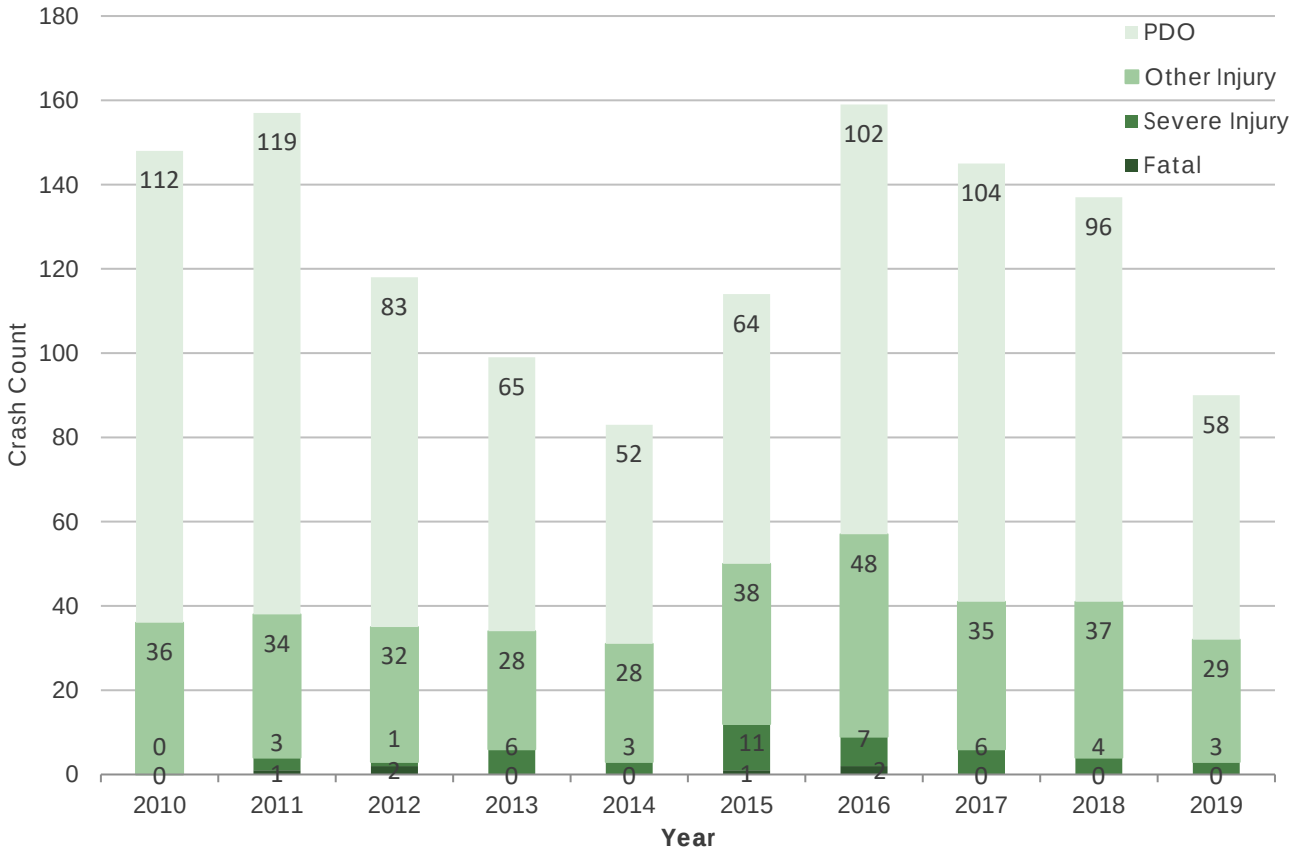


Source: SWITRS, 2021.

3.1.1.11. Crashes by Year

Figure 9 presents reported crashes by severity by year.

Figure 9: Reported Crashes by Severity by Year, Town of Truckee, 2010-2019



Source: SWITRS, 2021.

- The years 2012 and 2016 had the most fatalities with 2 fatalities each.
- Crashes occurring in 2015 made up about 9% of total crashes. The year 2015 accounted for the highest number of severe injuries with 11 (25% of all reported severe injury crashes). The year 2015 also had 1 of the 6 fatalities reported between 2010 and 2019.
- The year 2014 had the lowest number of reported total crashes with 83 crashes (7%)
- The year 2016 had the highest number of reported total crashes with 159 crashes (13%)

3.1.1.12. Summer vs. Winter Seasons

This memo provides additional information regarding the review of crash data in Truckee for 2010 through October 3, 2019. Specifically, this memo identifies the top crash types and primary collision factors in the summer and winter seasons. Winter months are defined by The Town of Truckee as the time period between November 1st and April 30th. Summer months are defined as the period between May 1st and October 31st. Table 5 presents the top four frequently cited crash types by winter and summer seasons. The table is arranged in descending order.

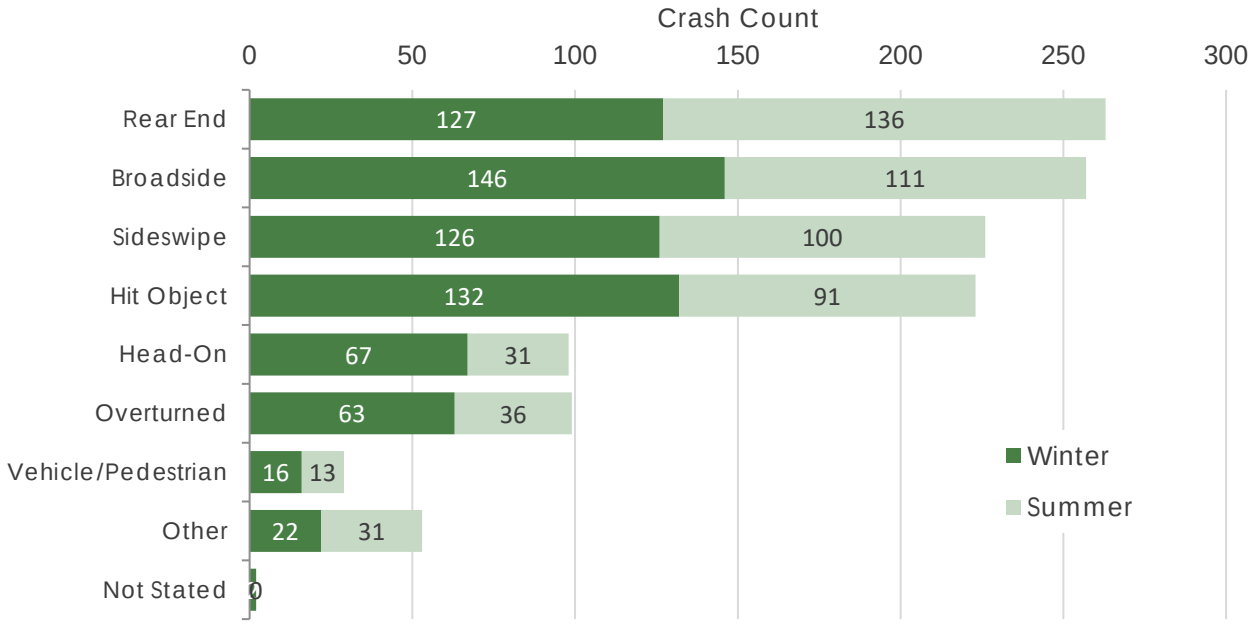
Table 5: Top Crash Types by Winter and Summer Seasons, Town of Truckee, 2010-2019

Crash Type	Winter Months		Crash Type	Summer Months	
Broadside	146	21%	Rear End	136	25%
Hit Object	132	19%	Broadside	111	20%
Rear End	127	18%	Sideswipe	100	18%
Sideswipe	126	18%	Hit Object	91	17%

- Among reported winter crashes, 146 (21%) resulted from a broadside
- Among reported summer crashes, 136 (25%) resulted from a rear end
- The top four crash types for both winter and summer are composed of the same four crash types

Figure 9 below shows all reported crashes by type and by season.

Figure 10: Crashes by Type and Season, Town of Truckee, 2010-2019



Source: SWITRS, 2021.

Table 6 presents the top three frequently cited primary collision factors by winter and summer seasons. The table is arranged in descending order.

Table 6: Top Primary Collision Factor by Winter and Summer Seasons, Town of Truckee, 2010-2019

Primary Collision Factor	Winter Months		Primary Collision Factor	Summer Months	
Unsafe Speed	292	42%	Unsafe Speed	110	20%
Driving or Bicycling Under the Influence of Alcohol or Drug	95	14%	Automobile Right of Way	84	15%
Automobile Right of Way	73	10%	Driving or Bicycling Under the Influence of Alcohol or Drug	69	13%

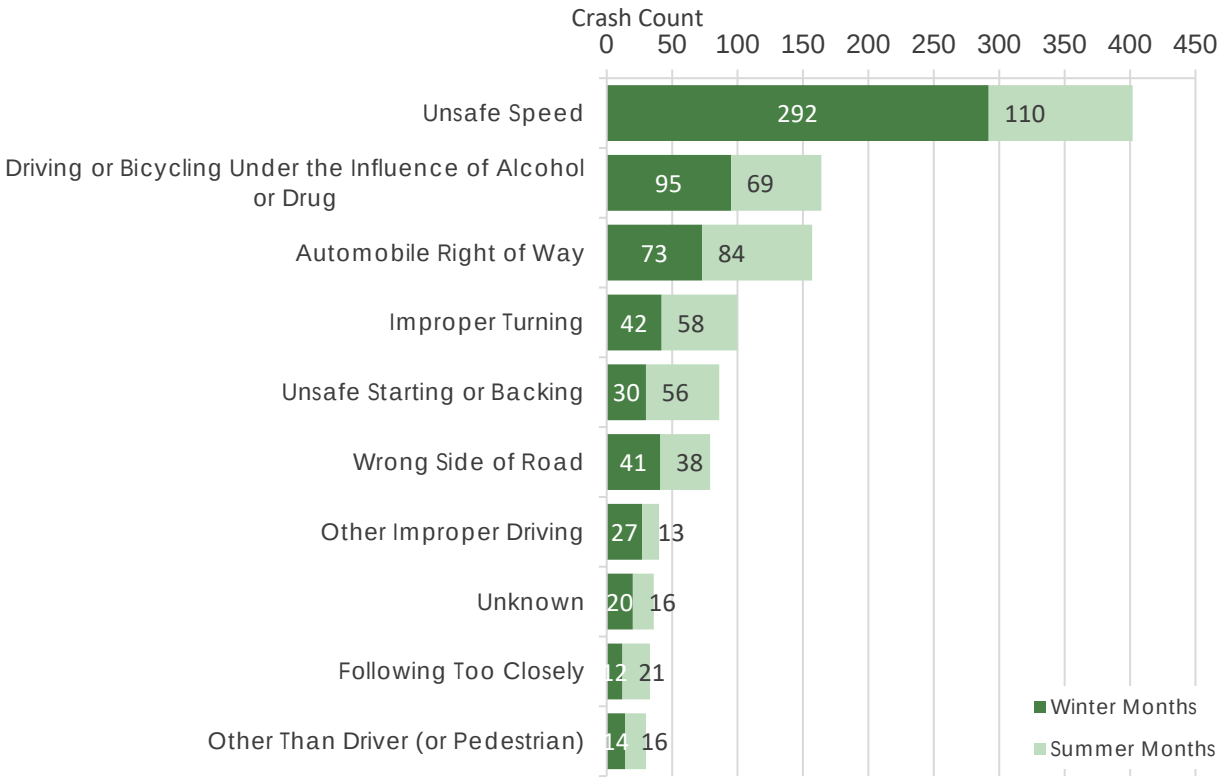
Source: SWITRS, 2021.

- Unsafe speed was the top primary collision factor for both winter (42%) and summer (20%) months
- Driving or Bicycling Under the Influence accounted for 14% of winter crashes and 13% of summer crashes

- Automobile Right of way accounted for 15% of summer crashes and 10% of winter crashes

Figure 11 shows the top 10 crashes by primary collision factor and season.

Figure 11: Crash Count by Primary Collision Factor and Season



Source: SWITRS, 2021.

3.2. BICYCLE AND PEDESTRIAN CRASHES

Trends and findings for bicycle and pedestrian crashes are presented based on the following:

- Movements Preceding Collision
- Primary Collision Factor
- Crash Location
- Lighting Conditions
- Trend by Year

3.2.1.1. Movements Preceding Crash

3.2.1.1.1. Bicyclist Crashes

Table 7 highlights the proportional distribution of severity between vehicle movement directions among reported crashes that involved a bicyclist.

To provide deeper insight into these crash dynamics, Table 7 provides the most frequent combinations of bicycle/vehicle trajectories and movements preceding collision. These results are sorted by the share of total bicyclist-involved crashes, although the most top five most frequent combinations for fatal and severe injury bicycle crashes are included in this table.

Table 7: Bicycle and Vehicle Movement Combinations, Town of Truckee, 2010-2019

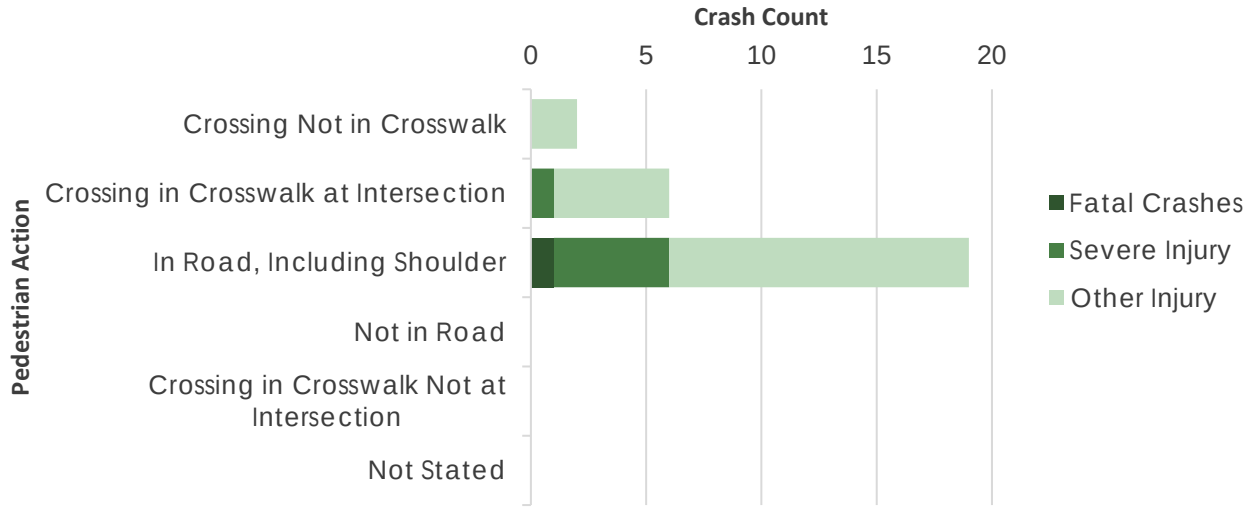
Relative Direction	Bicycle Movement	Vehicle Movement	Fatal or Severe Injury Crash Count		Total Crash Count	
Not Stated	N/A	Proceeding Straight	5	28%	12	21%
Same Direction	Proceeding Straight	Making Left Turn	5	28%	11	20%
Same Direction	Proceeding Straight	Proceeding Straight	1	6%	7	13%
Not Stated	N/A	Making Right Turn	1	6%	4	7%
Same Direction	Proceeding Straight	Entering Traffic	1	6%	3	5%
Same Direction	Proceeding Straight	Making Right Turn	1	6%	2	4%
Same Direction	Proceeding Straight	Stopped	1	6%	2	4%
Same Direction	Other Unsafe Turning	Other Unsafe Turning	1	6%	1	2%
Same Direction	Slowing/Stopping	Proceeding Straight	1	6%	1	2%
Not Stated	N/A	Ran Off Road	1	6%	1	2%
Same Direction	Entering Traffic	Passing Other Vehicle	0	0%	1	2%
Same Direction	Making Left Turn	Making Right Turn	0	0%	1	2%
Same Direction	Making Left Turn	Proceeding Straight	0	0%	1	2%
Same Direction	Making Right Turn	Proceeding Straight	0	0%	1	2%
Same Direction	Making U-Turn	Passing Other Vehicle	0	0%	1	2%
Same Direction	Passing Other Vehicle	Making Left Turn	0	0%	1	2%
Same Direction	Proceeding Straight	Other Unsafe Turning	0	0%	1	2%
Same Direction	Proceeding Straight	Passing Other Vehicle	0	0%	1	2%
Same Direction	Stopped	Proceeding Straight	0	0%	1	2%
Same Direction	Not Stated	Proceeding Straight	0	0%	1	2%
Not Stated	Not Stated	Making Left Turn	0	0%	1	2%
Not Stated	Proceeding Straight	Backing	0	0%	1	2%
Total			**18**	**100%**	**56**	**100%**

Source: SWITRS, 2021.

3.2.1.1.2. Pedestrian Crashes

Figure 12 highlights pedestrian-involved crashes by pedestrian action preceding a crash by severity.

Figure 12: Pedestrian Action Preceding Crash by Severity, Town of Truckee, 2010-2019



Source: SWITRS, 2021.

- Among fatal or severe injury pedestrian crashes, 22% occurred while a pedestrian was in the road (including the shoulder)
- No other categories had pedestrian fatalities. The only other category to have a pedestrian severe injury was while a pedestrian was crossing in the crosswalk at an intersection (4%)

To further contextualize these pedestrian actions, Table 8 shows the most frequent combinations of pedestrian action and vehicle movements preceding crash. This table is sorted by the total pedestrian-involved crash share.

Table 8: Pedestrian and Vehicle Movement Combinations, Town of Truckee, 2010-2019

Pedestrian Movement	Vehicle Movement	Fatal or Severe Injury Crash Count		Total Crash Count	
In Road, Including Shoulder	Proceeding Straight	4	57%	8	30%
In Road, Including Shoulder	Not Stated	1	14%	3	11%
In Road, Including Shoulder	Making Right Turn	1	14%	3	11%
Crossing in Crosswalk at Intersection	Making Left Turn	0	0%	3	11%
In Road, Including Shoulder	Backing	0	0%	3	11%
Crossing in Crosswalk at Intersection	Proceeding Straight	0	0%	2	7%
Crossing in Crosswalk at Intersection	Making Right Turn	1	14%	1	4%
In Road, Including Shoulder	Stopped	0	0%	1	4%
Crossing Not in Crosswalk	Proceeding Straight	0	0%	1	4%
Crossing Not in Crosswalk	Not Stated	0	0%	1	4%
In Road, Including Shoulder	Entering Traffic	0	0%	1	4%
Total		**7**	**100%**	**27**	**100%**

Source: SWITRS, 2021.

Based on this analysis, the most common movements resulting in pedestrian injury or death are:

- Pedestrians in the road (including the shoulder) being hit by a vehicle proceeding straight. This made up 8 (30%) of reported pedestrian crashes. It also makes up 3 (43%) of fatal or severe injury pedestrian crashes. The only reported fatality occurred under these conditions.
- Pedestrians in the road (including the shoulder being hit by a vehicle making a right turn. This made up 3 (11%) of reported pedestrian crashes and 1 severe injury pedestrian crash.
- Pedestrians crossing in the crosswalk at an intersection being hit by a vehicle making a left turn. This made up 3 (11%) of reported pedestrian crashes.
- Pedestrian in the road (including the shoulder) being hit by a vehicle backing up. This made up 3 (11%) of reported pedestrian crashes.

3.2.1.2. Primary Collision Factor

3.2.1.2.1. Bicyclist Crashes

Table 9 provides insight into the six most frequently reported primary collision factors associated with bicycle crashes in Truckee. The tables are broken down by parties at fault.

Table 9: Bicycle Crashes by Primary Collision Factor by Cited at Fault, Town of Truckee, 2010-2019

Primary Collision Factor	Bicyclist		Driver		Other		Unknown/Not Stated		Total Percent	
Wrong Side of Road	2	8%	0	0%	0	0%	0	0%	2	4%
Automobile Right of Way	2	8%	11	58%	0	0%	2	25%	15	27%
Traffic Signals and Signs	2	8%	0	0%	0	0%	0	0%	2	4%
DUI	4	16%	0	0%	0	0%	0	0%	4	7%
Improper Turning	0	0%	4	21%	0	0%	1	13%	5	9%
Other Hazardous Violation	14	56%	3	16%	1	25%	2	25%	20	36%
Unknown	1	4%	1	5%	3	75%	3	38%	8	14%
Total	**25**	**100%**	**19**	**100%**	**4**	**100%**	**8**	**100%**	**56**	**100%**

Source: SWITRS, 2021.

- Among the crashes where the bicyclist was identified as the party most at fault, the top two primary collision factors were “other hazardous violation” and bicyclist DUI.
- The top six primary collision factors included 48 (86%) of reported crashes that involved a bicyclist.

3.2.1.2.2. Pedestrian Crashes

Table 10 presents the primary collision factors most frequently associated with pedestrian crashes in Truckee. The tables are broken down by the party cited at fault.

Table 10: Pedestrian Crashes by Primary Collision Factor by Cited at Fault, Town of Truckee, 2010-2019

Primary Collision Factor	Pedestrian		Driver		Other		Unknown/Not Stated		Total Percent	
Other Improper Driving	1	20%	6	46%	2	67%	2	33%	11	41%
Pedestrian Violation	4	80%	1	8%	0	0%	0	0%	5	19%
Pedestrian Right of Way	0	0%	3	23%	1	33%	1	17%	5	19%
Driver DUI	0	0%	3	23%	0	0%	0	0%	3	11%
Unknown	0	0%	0	0%	0	0%	3	50%	3	11%
Total	**5**	**100%**	**13**	**100%**	**3**	**100%**	**6**	**100%**	**27**	**100%**

Source: SWITRS, 2021.

- Among the crashes where pedestrian was identified as the party most at fault, the top primary collision factor was pedestrian violation.
- Among total reported pedestrian crashes, the top primary collision factor was other improper driving consisting of 11 (41%) of crashes.

3.2.1.3. Crash Location

3.2.1.3.1. Bicyclist Crashes

A total of 56 crashes that involved a bicyclist occurred in the Town of Truckee between 2010 and 2019. Of these 53 did not occur on the State Highway and 1 crash occurred on a highway, an intersection, and ramp (or collector) each.

Table 11 highlights the distribution of bicycle crashes by location type.

Table 11: Bicycle Crashes by Location and Type of Severity, Town of Truckee, 2010-2019

Location Type	Fatal or Severe Injury		Other Injury or PDO		Grand Total	
Not State Highway	18	(100%)	35	(92%)	53	(95%)
Highway	0	(0%)	1	(3%)	1	(2%)
Intersection	0	(0%)	1	(3%)	1	(2%)
Ramp (or Collector)	0	(0%)	1	(3%)	1	(2%)
Total	**18**	**(100%)**	**38**	**(100%)**	**56**	**(100%)**

Source: SWITRS, 2021.

- Most of the bicycle crashes (95%) did not take place on a state highway.
- 100% of fatal or severe injury bicycle crashes did not take place on the state highway.

3.2.1.3.2. Pedestrian Crashes

Table 12 highlights the distribution of pedestrian crash locations by type.

Table 12: Pedestrian Crashes by Location and Type of Severity, Town of Truckee, 2010-2019

Location Type	Fatal or Severe Injury		Other Injury or PDO		Grand Total	
Not State Highway	7	100%	19	95%	26	96%
Highway	0	0%	1	5%	1	4%
Intersection	0	0%	0	0%	0	0%
Ramp (or Collector)	0	0%	0	0%	0	0%
Total	**7**	**100%**	**20**	**100%**	**27**	**100%**

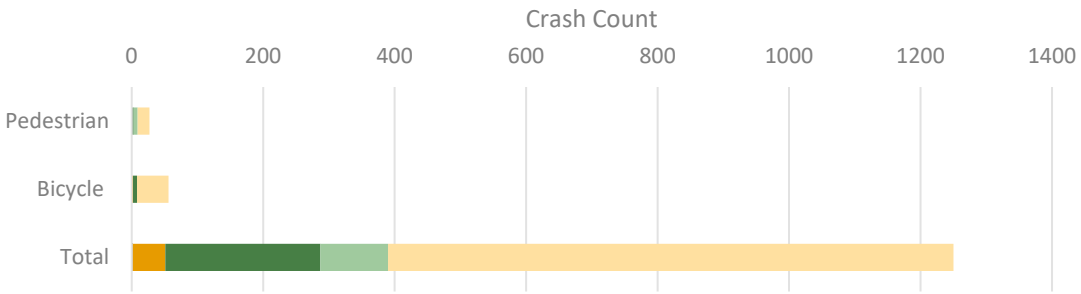
Source: SWITRS, 2021.

- Most of the pedestrian crashes (96%) did not take place on a state highway.
- 100% of fatal or severe injury pedestrian crashes did not take place on the state highway.

3.2.1.4. Lighting

Lighting is a consistently a concern for the safety of people walking and biking. Figure 13 depicts the distribution of pedestrian crashes, bicycle crashes and total crashes for various lighting conditions.

Figure 13: Pedestrian, Bicycle and Total Crashes by Lighting Conditions, Town of Truckee, 2010-2019



	Total	Bicycle	Pedestrian
Not Stated	1	0	0
Dusk - Dawn	50	2	0
Dark - No Street Lights	236	6	3
Dark - Street Lights	103	0	6
Daylight	860	48	18

Not Stated Dusk - Dawn Dark - No Street Lights Dark - Street Lights Daylight

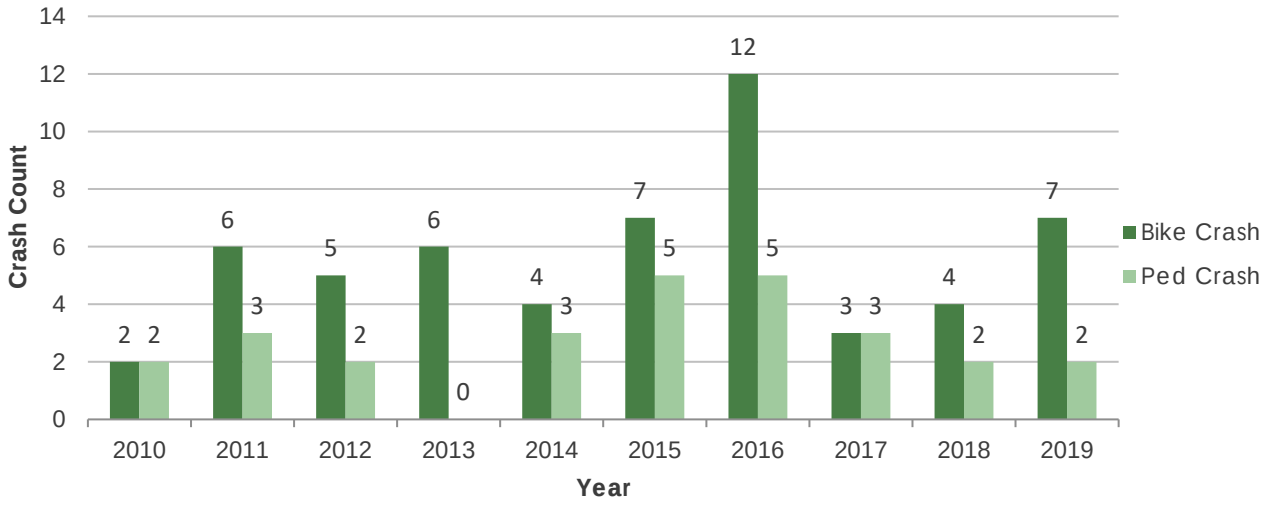
Source: SWITRS, 2021.

- Darkness was a factor for 17% of reported bicycle crashes, and 33% of reported pedestrian crashes.
- 27% of total reported crashes had darkness as a factor.

3.2.1.5. Trend by Year

Figure 14 highlights pedestrian-involved and bicyclist-involved crashes by year.

Figure 14: Pedestrian and Bicycle Crashes by Year, Town of Truckee, 2010-2019



Source: SWITRS, 2021.

- The years 2015 and 2016 had the highest number of reported pedestrian-involved crashes.
- The year 2013 had 0 reported pedestrian-involved crashes.
- The year 2016 had a higher-than-average number of reported bicyclist-involved crashes.
- There is no strong trend in the rate of bicycle or pedestrian crashes.

3.2.1.6. Conclusions

- Unsafe speed is a commonly cited primary collision factor for a high proportion of crashes in Truckee.
- Despite the sometimes-challenging winter weather conditions, snow and icy roads do not greatly impact serious crashes. However, during winter months, 67% of reported crashes occur on snowy/icy roads.
- Education for all road users around bicycling and/or improvements in facilities for bicyclists would likely benefit roadway safety for people biking.
- Traffic crashes were concentrated along Donner Pass Road, which is discussed in more detail in the next section.

3.2.2. Comparison with Statewide Averages

3.2.2.1. SWITRS Annual Report

It is useful to compare the Truckee crash data with statewide averages. The most recent statewide report available on the SWITRS website is the 2017 Annual Report of Fatal and Injury Motor Vehicle Traffic Crashes prepared by the California Highway Patrol (CHP). This report was completed based on motor vehicle traffic crash reports received from all reporting law enforcement agencies, Allied agencies, and from CHP field Area offices. A summary of statewide crashes are as follows.

- Statewide, crash frequency is highest in October and November. Between 2008 and 2017, the most fatal crashes occurred in 2017, the most fatal crashes occurred in November which saw 325 (9%) fatal crashes out of a total of 3,582 fatal crashes for the year. The year 2016 saw the most injury crashes with a total of 195,347 injury crashes. In 2016, the peak month was October which saw 17,724 (9%) injury crashes. The year 2016 also saw the most property damage only crashes with a total of 292,672 PDO crashes. In 2016, the peak month was October which saw 26,422 (9%) PDO crashes. ***In Truckee, winter months saw more crashes than October indicating drivers in Truckee are more likely to get in a collision during the snowy months.***
- In 2017, the most common type of crash for fatal crashes was "broadside" which accounted for 1,210 (22%) fatal crashes out of the total 5,474 fatal crashes that occurred. The most common movement preceding crash was "proceeding straight" which accounted for 3,173 (58%) of fatal crashes. ***In Truckee, "broadside" only accounted for 16% of fatal/severe injury crashes whereas the most common cause of fatal/severe injury crashes were caused by "hit object" which accounted for 22% of fatal/severe injury crashes.***
- In 2017, the most common type of crash for injury crashes was "rear end" which accounted for 150,070 (41%) injury crashes out of the total 363,002 injury crashes that occurred. The most common movement preceding crash was "proceeding straight" which accounted for 187,154 (52%) of injury crashes. ***In Truckee, the most common types of crash for total crashes were both "rear end" and "broadside" which accounted for 21% of crashes each. The proportion of rear end crashes is much lower than the statewide averages.***
- Between 2013 and 2017, a total of 5,436 (33.9%) fatal accidents occurred in California where alcohol was involved out of a total of 16,037 fatal accidents. In this same time period, a total of 88,041 (9.9%) injury accidents occurred in California where alcohol was involved out of a total 887,231 injury accidents. ***In Truckee, 50% of the fatalities in Truckee in the last 10 years had alcohol involved. However, since there are so few fatalities (6), this percentage may be misleading. For injury accidents, 16% of severe injury, 24% of other visible injury and, 14% of complaint of pain crashes had alcohol involved. Out of the total crashes,***

16% had alcohol involved in Truckee. Overall, Truckee seems to have more alcohol related collisions when compared to the statewide averages.

- Between 2013 and 2017, "driving or bicycling under the influence of alcohol or drugs" was the top primary crash factor for fatal crashes accounting for 3,193 (24.9%) out of a total of 12,837 fatal accidents. "Improper passing" was the cause of the second most primary crash factor for fatal crashes accounting for 3,070 (23.9%) followed by "unsafe speed" 2,509 (19.5%) and "pedestrian violation" 2,085 (16.2%) of fatal crashes. "Unsafe speed" was the top primary crash factor for injury crashes accounting for 232,785 (26.2%) out of a total of 887,231 injury accidents. "Automobile right-of-way" was the cause of the second most primary crash factor for injury crashes accounting for 140,988 (15.9%) followed by "improper turning" 126,443 (14.3%) of injury crashes. ***In Truckee, the top primary crash factor is "unsafe speed" which accounted for 20% of all crashes. This is consistent with the statewide averages. "Unsafe speed" and "driving or bicycling under the influence of drugs or alcohol" were the top primary collision factors in fatal and severe injury crashes in Truckee which is also consistent with statewide averages.***
- Between 2013 and 2017, a total of 4,267 (33.2%) fatal pedestrian accidents occurred statewide out of 12,837 fatal accidents and a total of 64,565 (7.3%) injury pedestrian accidents occurred out of the 887,231 injury accidents. Out of the pedestrian accidents, 6.2% of pedestrian accidents resulted in a fatality. ***In Truckee, pedestrian accidents made up 2.2% out of all crashes. 26% of all pedestrian accidents resulted in a fatality. Pedestrian accidents also made up 17% of all fatalities. Overall, the proportion of fatal and injury accidents involving pedestrians in Truckee is lower than statewide average. However, Truckee only had 6 total fatalities in the last 10 years of which 1 was a pedestrian.***
- Between 2013 and 2017, a total of 798 (6.2%) fatal bicycle accidents occurred out of all fatalities and a total of 61,634 (6.9%) injury bicycle accidents occurred out of all injury accidents in California. **In Truckee, bicycle accidents made up 4% of all crashes but made up 50% of the fatalities.** ***However, Truckee only had 6 total fatalities in the last 10 years of which 3 involved a bicyclist. Bicycle accidents accounted for 12.8% of injury accidents which is higher than the statewide average.***

3.2.2.2. OTS Crash Rankings

Additionally, the California Office of Traffic Safety (OTS) rankings for the most recent year available, 2018, were reviewed. These rankings compare similar sized cities safety performance to help identify emerging or on-going traffic safety focus areas. The Town of Truckee is grouped in Group E with 102 cities with populations between 10,001 and 25,000. The crash rankings using the Empirical Bayesian Ranking Method which weights different statistical categories including observed crash counts, population, and vehicle miles traveled. The resulting crash counts used for the rankings reflect unrecognized or unmeasurable influential factors for each jurisdiction as well as population and vehicle miles traveled to account for traffic exposure. SWITRS is the source for the crash data used

in the analysis, with population data from the California Department of Finance, and daily vehicle miles traveled (DVMT) from Caltrans. DVMT is an estimate of the total number of miles all vehicles traveled on the jurisdiction's streets on an average day during that year.

Table 13 shows the 2018 OTS Crash Rankings for the Town of Truckee. The first number in the ranking is the Town's ranking in that category, the second is the total number of cities in the Town's group. Number 1 in the rankings is the highest, or "worst", ranking. The composite ranking provides an aggregate of several other rankings to give an indication of overall traffic safety.

Table 13: Town of Truckee OTS 2018 Crash Rankings

Type of Crash	Victims Killed & Injured	OTS Ranking
Total Fatal and Injury	46	36/102
Alcohol Involved	7	29/102
Had Been Drinking Driver < 21	0	67/102
Had Been Drinking Driver 21 – 34	1	50/102
Motorcycles	3	30/102
Pedestrians	2	72/102
Pedestrians < 15	0	76/102
Pedestrians 65+	0	83/102
Bicyclists	5	20/102
Bicyclists < 15	0	75/102
Composite	23	44/102
Speed Related	11	21/102
Nighttime (9:00pm – 2:59am)	2	65/102
Hit and Run	2	57/102

Source: California Office of Traffic Safety, 2021.

A summary of relevant rankings for Truckee is provided below:

- Truckee's three highest (or "worst") rankings were for Bicyclist (#20), Speed Related (#21), and Alcohol-Involved (#29) crashes. These three crash types were responsible for 23 of the Town's 46 fatal and injury crashes in 2018.
- The Town was in the top ("worst") half of similar jurisdictions for Motorcycle crashes (#30), Total Fatal and Injury crashes (#36), and the Composite ranking (#44).
- For all other crash types, the Town ranked in the bottom half of similar jurisdictions.

4. NETWORK SCREENING ANALYSIS

This section describes the network screening and systemic evaluation of the Truckee roadway network.

4.1. DATA AND NETWORK SCREENING APPROACH

Kittelson identified the intersections and segments with the highest crash severity using the Equivalent Property Data Only (EPDO) network screening performance measure from the AASHTO *Highway Safety Manual (HSM)*. The EPDO calculation was performed for all public intersections and roadway segments. Private, emergency access, maintenance, and county roads were excluded from the analysis, as well as the Interstate 80 mainline. All at-grade Interstate 80 ramp terminals were included, and all grade-separated intersections were excluded. The EPDO performance measure is described below. Moving forward throughout this document, the EPDO performance measure is referred to as a *crash severity score*.

The crash severity score assigns weight to individual crashes based on the crash severity and location of the crash (Table 13). Weights, provided by the 2020 *Caltrans' Local Roadway Safety Manual*, are based on the cost of property-damage-only (PDO) crashes, assigning each crash with a score relative to a PDO crash.

Table 14: Crash Weights by Severity and Location Type

Location Type	Crash Weight by Severity				
	Fatal	Severe Injury	Other Visible Injury	Complaint of Pain	Property Damage Only
Signalized Intersection	119.55	119.55	10.70	6.08	1.00
Unsignalized Intersection	190.23	190.23	10.70	6.08	1.00
Roadway	164.66	164.66	10.70	6.08	1.00

Source: Adapted from crash costs by severity in Caltrans, *Local Roadway Safety: A Manual for California's Local Road Owners* (Version 1.5), 2020.

The weights prioritize fatal and severe injury crashes equally to recognize that a death versus a severe injury is often a function of the individual involved or of emergency response time. Therefore, both outcomes represent locations where the Town may want to prioritize improvements. Crash weights vary by location due to the relative costs associated with the crash severity at the location types. Specifically, unsignalized intersections have a higher cost for fatal and severe crashes because fatal and severe crashes at these locations tend to result in more injured

persons and more severely injured persons on average (e.g., a fatal crash at an unsignalized intersection on average results in more individuals killed and injured as part of the crash than a fatal crash at a signalized intersection).

4.1.1. Intersection Methodology

Kittelson first identified signalized and unsignalized intersections in the Town road network and then defined crashes as intersection or segment crashes. An intersection crash is defined as a crash that occurs within 250 feet of the intersection. These crashes were spatially joined and summarized in ArcGIS to show the total number of crashes by severity at each intersection. Where intersections were less than 500 feet from each other, crashes were assigned to the nearest of the two intersections. Crashes occurring more than 250 feet from any intersection were separated to be used in the segment analysis discussed below.

The crash severity score for the intersections was calculated by multiplying each crash severity total by the associated weight (by intersection type) and summing the results using the following formula:

> **Crash Severity Score** = Fatal weight * # of fatal crashes + severe injury weight * # of severe injury crashes + other visible injury weight * # of other visible injury crashes + complaint of pain injury weight * # of complaint of pain injury weight crashes + PDO crashes

Kittelson annualized the crash severity score by dividing the score by the years (5) of crash data analyzed.

4.1.2. Roadway Segment Methodology

After completing the intersection analysis, Kittelson used the crashes reported more than 250 feet from the nearest intersection to conduct a separate segment analysis. A Python script in ArcGIS allowed for splitting the Truckee street network into overlapping half-mile segments, incrementing the segments by one-tenth (1/10) of a mile. This methodology helps to identify portions of roadway with the greatest potential for safety improvements.

After splitting the network, the Python script spatially joined non-intersection crashes to each segment. Similar to the intersection methodology above, crashes were summarized by severity, and the totals were multiplied by the crash severity weights for roadway segments. The weighted crash severity scores of the crashes were totaled and annualized by the number of years of crash data (5) to generate an annualized crash severity score.

4.2. NETWORK SCREENING FINDINGS

Kittelson developed crash severity scores for four analysis scenarios; total reported crashes, bicycle and pedestrian crashes only, winter crashes only, and summer crashes only. The crash severity scores will help the Town identify priority locations for safety improvement projects.

4.2.1.1. Total Reported Crashes

This analysis scenario included total reported crashes from the last 5 years of data. For intersection locations, the crash severity scores ranged from zero (no reported crashes during the 5 years) to 80.37. For the half-mile roadway segments, the crash severity scores ranged from zero to 40.03. While there is current documentation of average crash severity scores across jurisdictions, based on Kittelson's prior safety analysis work, the range of crash severity scores is generally lower than other similar jurisdictions, indicating a lower average severity than other similar jurisdictions with whom Kittelson has worked. Figure 15 shows the results of the crash severity scoring by percentiles for intersection locations and roadway segments. Intersections or segments shown as not falling within one of the percentiles indicates that there were no reported crashes at that location.

4.2.1.2. Bicycle and Pedestrian Crashes

This analysis scenario only included crashes involving a bicyclist or pedestrian from the last 5 years of data. For intersection locations, the crash severity scores ranged from zero (no reported crashes during the 5 years) to 76.09. For the half-mile roadway segments, the crash severity scores ranged from zero to 35.07. Figure 16 shows the results of the crash severity scoring by percentiles for intersection locations and roadway segments. Intersections or segments shown as not falling within one of the percentiles indicates that there were no reported crashes at that location.

4.2.1.3. Summer-Month Crashes

This analysis scenario only included crashes occurring between May1 and October 31st from the last 5 years of data. For intersection locations, the crash severity scores ranged from zero (no reported crashes during the 5 years) to 80.37. For the half-mile roadway segments, the crash severity scores ranged from zero to 37.81. Figure 17 shows the results of the crash severity scoring by percentiles for intersection locations and roadway segments. Intersections or segments shown as not falling within one of the percentiles indicates that there were no reported crashes at that location.

4.2.1.4. Winter-Month Crashes

This analysis scenario only included crashes occurring between November 1 and April 30 from the last 5 years of data. For intersection locations, the crash severity scores ranged from zero (no reported crashes during the 5 years) to 80.37. For the half-mile roadway segments, the crash severity scores ranged from zero to 39.86. Figure 18 shows the results of the crash severity scoring by percentiles for intersection locations and roadway segments. Intersections or segments shown as not falling within one of the percentiles indicates that there were no reported crashes at that location.

Figure 15: Intersection and Roadway Segment Crash Severity Score Screening by Percentile (All Crashes)

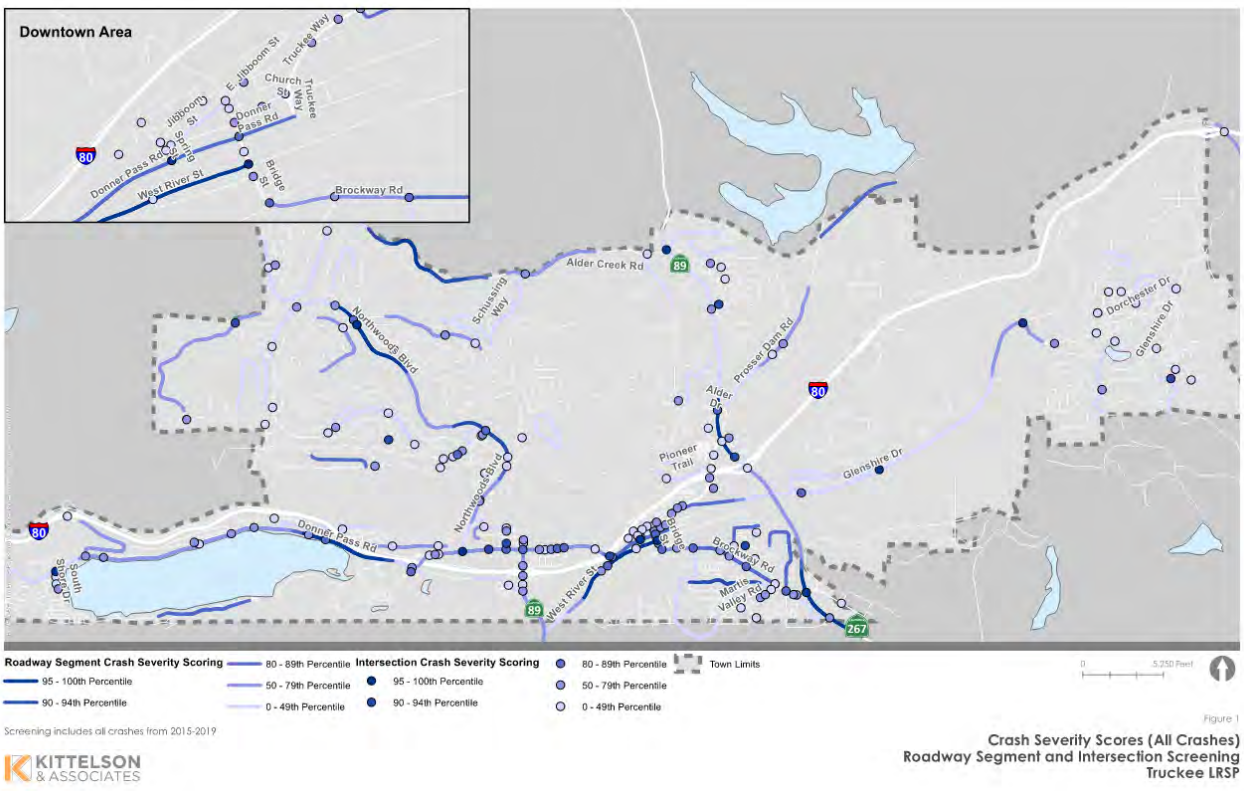


Figure 16: Intersection and Roadway Segment Crash Severity Score Screening by Percentile (Bicycle and Pedestrian) Crashes)

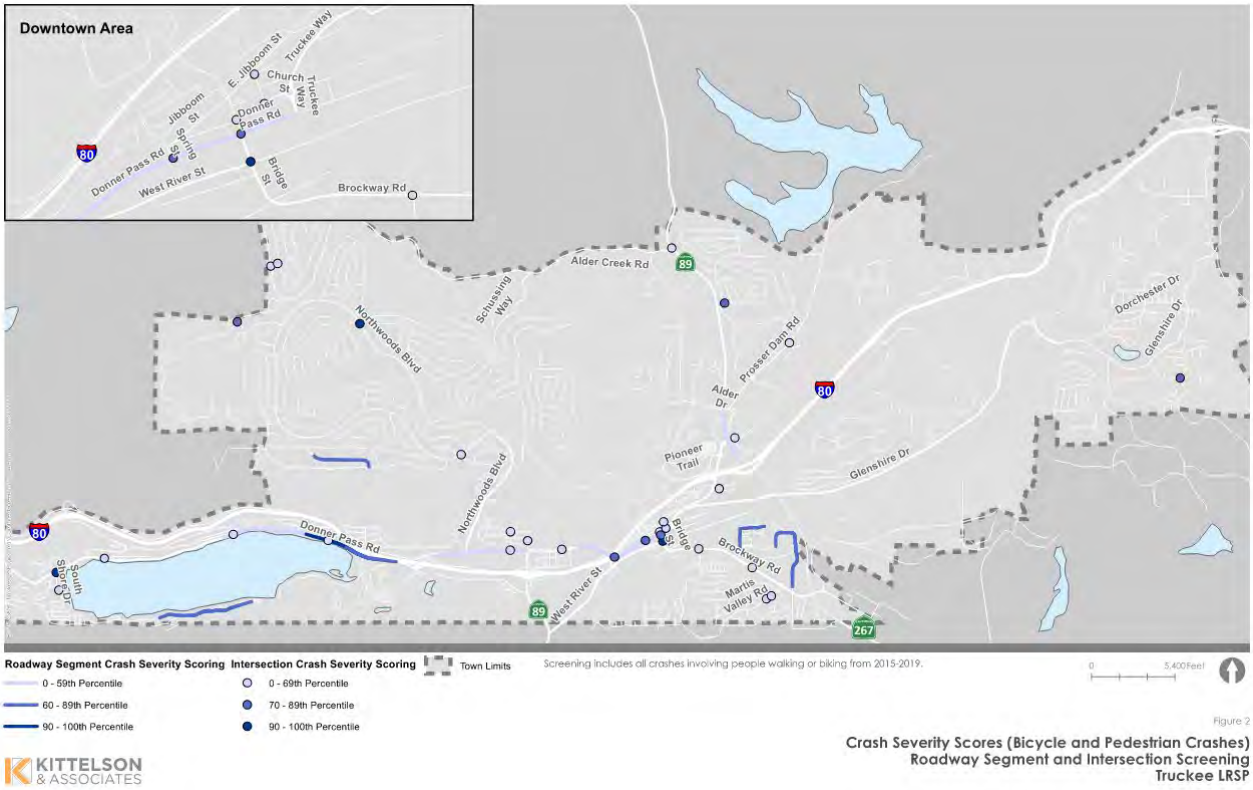


Figure 17: Intersection and Roadway Segment Crash Severity Score Screening by Percentile (Summer Month Crashes)

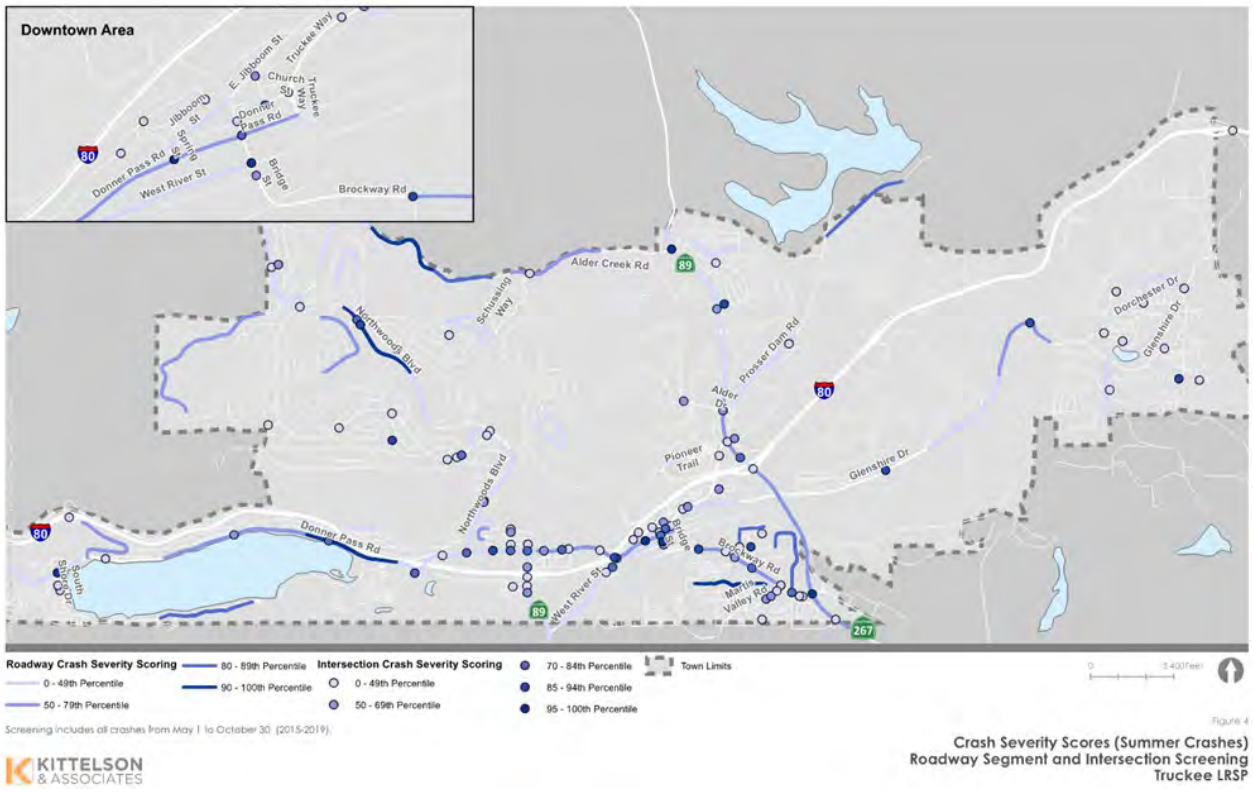
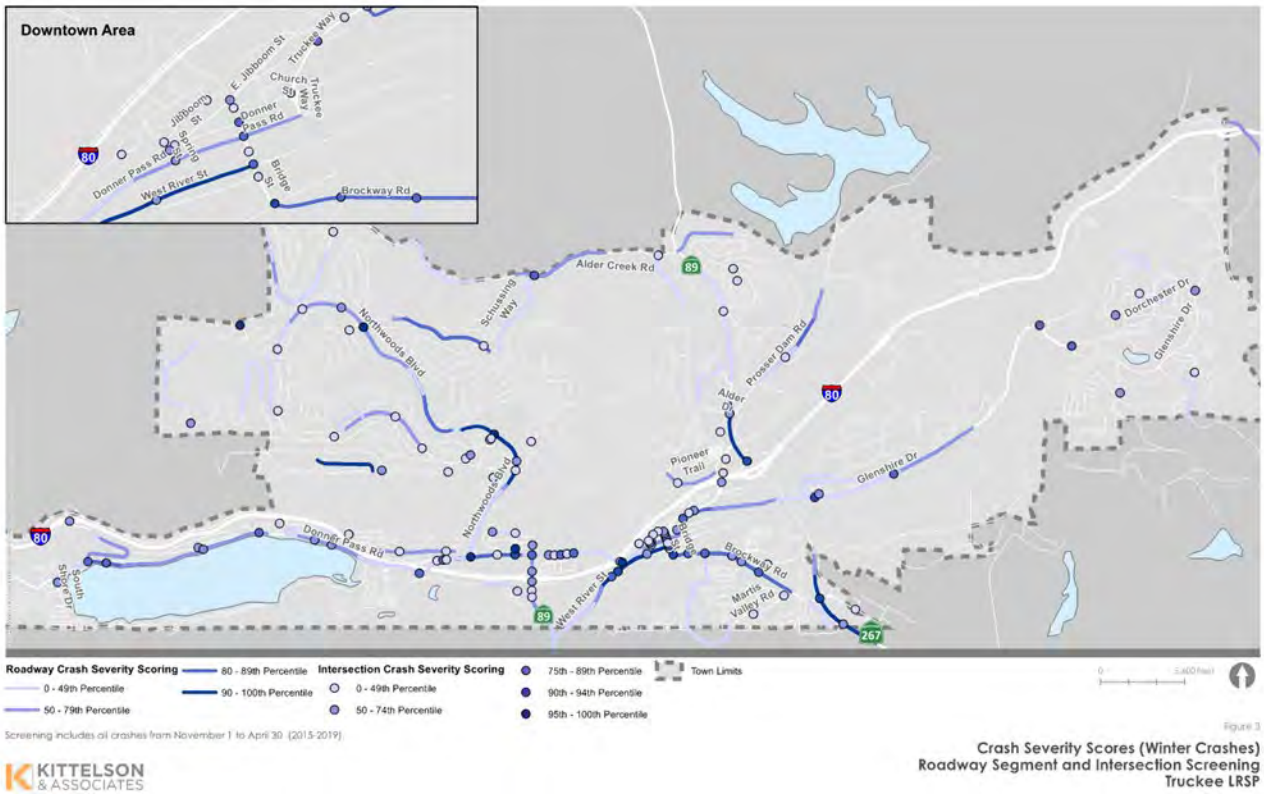


Figure 18: Intersection and Roadway Segment Crash Severity Score Screening by Percentile (Winter Month Crashes)



5. STRATEGIES AND COUNTERMEASURES

This section summarizes engineering and non-engineering countermeasure treatments that could be implemented by the Town of Truckee to reduce the frequency and risk of crashes throughout the Town. The section begins with a discussion of treatment groups for the most applicable engineering treatments based on a review of town-wide crash patterns and trends, as well as a review of characteristics at high priority intersections identified through the town-wide network screening evaluation. This is followed by a discussion of education, enforcement, emergency response, and innovation opportunities to partner with engineering countermeasures in working towards improving roadway safety performance across the Town. The recommended engineering countermeasures are summarized in Table 15

Table 15: Recommended Engineering Countermeasure Summary

Treatment	Crash Reduction Factor	Planning-Level Cost Range
Crosswalk Visibility Enhancements	25-35%	$1,000 - $10,000 per location
Rectangular Rapid Flashing Beacons (RRFBs)	35%	$15,000 per location
Pedestrian Hybrid Beacon (PHB)	55%	$150,000 - $250,000 per location
Pedestrian Refuge Island	45%	Up to $150,000 per island
Signalized Intersection Treatments	LPI: 60% No RTOR: 25%	LPI: $550 - $6,000 per location No RTOR: $200 - $6,000 per location
Sidewalk/Pathway Installation	65-89%	Dirt Trail: $200,000 per mile Paved Trail: $1.5 - $2.5 million per mile Sidewalk: $70 per linear foot
Bicycle Intersection Treatments		
Bike Lanes	35-45%	Bike Lanes: $16,000 per mile Buffered Bike Lanes: $20,000 per mile
Bike Lane Extension Through Intersections	39%	$200 - $5,000 per intersection
Bike Boxes	35%	$5,000 per bike box
Signalized Intersection Treatments		
Improve Signal Hardware, Striping, Timing, or Lighting	10-74%	$4,000 - $250,000 per location

Treatment	Crash Reduction Factor	Planning-Level Cost Range
Unsignalized Intersection Treatments		
Install or Upgrade Signing and Pavement Markings	15-25%	$500 - $5,000 per approach
Improve Sight Distance to Intersection	20%	$1,000 - $100,000 per approach
Install Roundabouts	12-78%	Costs vary significantly per site
Roadway Segment Treatments		
Segment Curve Treatments	Install or Upgrade Signs: 15-40% HFST: 17-68%	$4,000 - $20,000 per curve $35 per square yard
Delineation Treatments	Delineators: 15% Edge-Lines and Centerlines: 20%	$500 - $10,000 per curve $500 - $5,000 per direction
Median-Related Treatments	Raised Median: 20-75%	$100,000 per 100 feet
Speed Management	Speed Feedback Signs: 0-41%	$2,000 - $11,000 per display

Source: Kittelson, 2021.

5.1. ENGINEERING TREATMENTS

This section presents engineering safety treatments identified to address town-wide crash patterns and trends as documented in the "Town-wide Crash Patterns and Trends" section of this memorandum. The countermeasure treatments have been grouped into five treatment groups.

- Pedestrian Crossing Enhancements;
- Bicycle Intersection Treatments;
- Signalized Intersection Treatments;
- Unsignalized Intersection Treatments; and,
- Roadway Segment Treatments.

For each of these treatment groupings, the following presents priority countermeasures including a description of each, estimated effectiveness at improving roadway safety, and implementation considerations.

5.1.1. Pedestrian Crossing Enhancements

Pedestrian Crossing Enhancements was identified as a priority countermeasure for the Town because there is a significant percentage of pedestrian fatal and serious injury collisions (14%) among fatal and serious injury crashes in the Town. In addition, all pedestrian collisions resulted in a severity of complaint of pain or worse. The most common primary collision factor reported for pedestrian involved collisions is "in road (including shoulder) being hit by a vehicle proceeding straight" at 30%. These movements made up 57% of fatal or serious injury pedestrian collisions.

Pedestrian crossing enhancements seek to improve the visibility of pedestrians and awareness of drivers approaching a crossing location. The following five countermeasures were identified for the Town of Truckee:

1. Crosswalk Visibility Enhancements
2. Rectangular Rapid Flashing Beacons (RRFBs)
3. Pedestrian Hybrid Beacon (PHB)
4. Pedestrian Refuge Island
5. Signalized Intersection Treatments
6. Sidewalk/Pathway Installation

Each individual countermeasure is discussed below including a description of the treatment, purpose, application, considerations, possible systemic application, crash reduction factor, and relative planning-level cost. The information provided in the sections below is adapted from the Federal Highway Administration (FHWA) *Field Guide for Selecting Countermeasures at Uncontrolled Pedestrian Crossing Locations* (FHWA Field Guide, 2018) and National Cooperative Highway Research Program (NCHRP) *Guidance to Improve Pedestrian and Bicyclist Safety at Intersections* (NCHRP, 2020).

The crash reduction factor noted for each of the countermeasures in this memo is obtained from *Local Roadway Safety Manual* for California's Local Road Owners (LRSM, 2020), unless otherwise noted for countermeasures in the sections below.

5.1.1.1. Crosswalk Visibility Enhancements

- **Description:** This group of treatments include high-visibility crosswalk markings, improved nighttime lighting, advance or in-street warning signage, curb extensions, and parking restrictions. Figure 18 shows an example pedestrian crossing treatment and Figure 19 shows an example of curb extension.
- **Purpose:** The use of different crosswalk visibility enhancements in combination help indicate preferred locations for pedestrians to cross and increase the visibility of a crossing location. These treatments increase

both pedestrian and driver awareness and help reinforce drivers' requirement to yield the right-of-way to crossing pedestrians.

- **Application:** Per the FHWA Field Guide, adding advance Yield Here to Pedestrian sign and yield line should be considered for the following roadways with posted speeds greater than 35 miles per hour (and any combination of average daily traffic (ADT) or posted speed)

- **Considerations:** These treatments may be considered when any of the following factors are observed on site:
  - Drivers not yielding to pedestrians in crosswalks;
  - Inadequate conspicuity/visibility of crosswalk and/or crossing pedestrian;
  - Noted conflicts at crossing locations; or,
  - On-street parking restrictions and curb extensions should be considered for implementation with marked crossings to reduce the risk of pedestrian crashes at uncontrolled crossings.
- **Systemic Application:** Low-cost crosswalk visibility enhancements may easily be integrated into other ongoing maintenance or capital improvement projects. This could include integration into routine restriping or resurfacing activities. Maintenance during winter conditions is an important consideration given the likelihood of markings being ruined by weather events and snowplows. Markings would likely have to be redone on an annual basis, which could have high costs associated.
- **Crash Reduction Factor:** 25% - 35% depending on treatments selected.
- **Planning-Level Cost:** Varies - $1,000 – 10,000 depending on treatments selected.

Figure 19: Example Enhanced Pedestrian Crossing

Source: Town of Truckee

Figure 20: Example Curb Extension – Donner Pass Road

Source: Google Maps

5.1.1.2. Rectangular Rapid Flashing Beacons (RRFBs)

- **Description:** Rectangular rapid flashing beacons (RRFBs) are user-actuated amber Light Emitting Diodes (LEDs) that supplement warning signs to improve awareness and safety at unsignalized intersections or mid-block crosswalks. Figure 21 shows an example RRFB installation.
- **Purpose:** RRFBs have been shown to significantly increase driver yielding behavior at uncontrolled crosswalks, with motorist yielding rates ranging from 34% to over 90% (NCHRP, 2020). This treatment helps reduce pedestrian-vehicle conflicts, increase the visibility of pedestrian crossing locations, and reduces pedestrians trapped in the roadway.
- **Application:** Per the Town of Truckee guidance, RRFBs may be considered under the following roadway conditions:
  - ADT ≤ 15,000 + 2 lanes or one lane in each direction with a raised median + ≥ 40 mph posted speed limit
  - ADT 9,000 – 15,000 + one lane in each direction with or without median + ≥ 35 mph posted speed limit
- **Considerations:** This treatment may be considered when the following factors are observed on site:
  - Lack of pedestrian separation from traffic for long crossing distances;
  - Inadequate conspicuity/visibility of crosswalk and/or crossing pedestrian; or,
  - Noted conflicts at crossing locations.

  Truckee's practice is to install RRFBs in combination with curb extensions and/or pedestrian refuge islands, where appropriate.
- **Systemic Application:** RRFBs are mostly likely to be integrated as part of larger capital improvement projects or installed as their own capital improvements. This treatment may be better suited as a spot treatment or a treatment package in urban neighborhoods.
- **Crash Reduction Factor:** 35%
- **Planning-Level Cost:** $15,000 per location (for signs and solar-powered RRFBs).

Figure 21: Example of Enhanced Pedestrian Crossing with RRFB

Source: Washington County, Oregon, www.co.washington.or.us/lut/trafficsafety/drivingsafety/rrfb.cfm

5.1.1.3. Pedestrian Hybrid Beacon (PHB)

- **Description:** A Pedestrian Hybrid Beacon (PHB) is a hybrid beacon used to control traffic and reverts to all dark until a pedestrian activates it via a push button or other form of detection. When activated, the beacon displays a sequence of flashing and solid lights that indicate when vehicles must stop and when pedestrians should cross. Figure 22 shows an example of PHB.
- **Purpose:** PHBs provide active warning to drivers when a pedestrian is in the crosswalk. PHBs have been shown to significantly increase driver yielding behavior at uncontrolled crosswalks, with motorist yielding rates exceeding 90% (FHWA, 2014).
- **Application:** Per the Town of Truckee guidance, PHBs may be considered under the following roadway conditions:
  - ADT ≥ 9,000 + one lane in each direction with or without median + ≥ 35 mph posted speed limit
  - Any ADT + any number of lanes + ≥ 40 mph posted speed limit
  - 100 feet from intersection or driveway with a stop or yield control

  The California Manual on Uniform Traffic Control Devices (CA MUTCD) recommends consideration of PHBs at sites with a minimum of 20 pedestrian crossings per hour during the peak hour though site-specific considerations may warrant a PHB with a lower pedestrian crossing volume.
- **Considerations:** This treatment may be considered when the following factors are observed on site:

- Long pedestrian delay due to few available gaps in traffic;
- Drivers not yielding to pedestrians in crosswalks; or,
- Noted conflicts at crossing locations.

The Town may consider vehicle delay impacts and evaluate opportunities to coordinate PHB signal timing with nearby traffic signals, where appropriate.

- **Systemic Application:** PHBs are most likely installed as their own capital improvement projects and are usually installed in conjunction with a marked crosswalk and pedestrian countdown signals.
- **Crash Reduction Factor:** 55%
- **Planning-Level Cost:** Varies – $150,000 - $250,000 (includes fiber optic interconnect) depending on the type of signal and overall scope of the project.

Figure 22: Example of Pedestrian Hybrid Beacon

Source: NACTO

5.1.1.4. Pedestrian Refuge Island

- **Description:** A pedestrian refuge island is a median with a refuge area that is intended to help protect pedestrians who are crossing the roadway. This treatment is also referred to as a crossing island or pedestrian island. Figure 23 shows an example of the pedestrian refuge island.
- **Purpose:** Refuge island allows the pedestrians to focus on identifying adequate gap in traffic for one direction at a time. This treatment reduces the crossing distance for pedestrians and creates a place for

refuge to allow multiple-stage crossings. Refuge island positions pedestrians in the sightline of drivers approaching the intersection.

- **Application:** Per FHWA Field Guide, refuge islands may be considered under the following roadway conditions in Truckee:
  - Any ADT + 2 or 3 lanes (without a raised median) + any posted speed limit (note that low-speed roadways, i.e., speeds lower than 25 mph, may not warrant consideration of a refuge island)
- **Considerations:** This treatment may be considered when the following factors are observed on site:
  - Inadequate conspicuity/visibility of the crosswalk and/or crossing pedestrian;
  - Excessive vehicle speed; or,
  - Lack of pedestrian separation from traffic during long crossings.
- **Systemic Application:** Raised concrete medians are most likely installed as their own capital improvement projects and are usually installed in conjunction with a marked crosswalk and warning sign. Interim crossing islands can be implemented systemically using flexible delineators and temporary curbing.
- **Crash Reduction Factor:** 45%
- **Planning-Level Cost:** Up to $150,000 for refuge islands with paver crosswalks and landscaping similar to Donner Pass Road installations.

Figure 23: Example Pedestrian Refuge Island

Source: Google Maps

5.1.1.5. Signalized Intersection Pedestrian Treatments

- **Description:** This group of treatments include implementing leading pedestrian interval or prohibit right-turns on red which improve drivers' awareness of pedestrians at intersections. The detailed explanation for each of the strategies is below:
  - ***Leading Pedestrian Interval (LPI)***: LPIs provide pedestrians a head start when crossing at a signalized intersection. LPIs can be easily programmed into existing signals to give pedestrians the "Walk" signal a minimum of 3 to 7 seconds before motorists are given a green indication. With this head start, pedestrians can better establish their presence in the crosswalk before motorists have priority to turn left at the intersection. LPIs can be provided automatically with each phase or provided only when actuated (actively or passively). Figure 24 shows an example of this treatment.
  - ***No Right-Turn on Red (No RTOR):*** This treatment restricts motorists on turning right during the red light. In California, turning right on red is not a default condition of the existing laws. Drivers in California are advised of this restriction with the posting of "No Turn on Red" signs (static or dynamic), according to the sign specifications in California Manual on Uniform Traffic Control Devices (CA MUTCD). Dynamic signs can be used to restrict right turns during certain times of day or during certain signal phases.
- **Purpose:** LPIs increase visibility of crossing pedestrians and reduce conflicts between pedestrians and vehicles. This treatment increases the likelihood of motorists yielding to pedestrians. No RTOR eliminates conflicts between turning vehicles and pedestrians during a concurrent walk phase. Barnes Dance reduces conflicts between vehicles and pedestrians and improves pedestrian access and safety.
- **Application:** Per NCHRP guidance document, the following treatments may be considered for application under the following roadway contexts:
  - LPIs and No RTOR treatments may be considered at signalized intersections, specifically at intersections with medium to high motor vehicle turning volumes and pedestrian volumes.
- **Considerations:** These treatments may be considered when the following factors are observed on site:
  - LPIs may be considered at locations with particularly high elderly populations, high crash history, or at school crosswalks.
  - No RTOR treatment may be considered at intersections with exclusive pedestrian phase, and school crossings.
- **Systemic Application:** LPIs may be better suited as a systemic treatment in areas where there are existing pedestrian signals and high volumes of pedestrians and turning vehicles. No RTOR may be implemented as a systemic treatment, paired with a solution to address higher right-turn on green needs if warranted.

Barnes Dance may be better suited as a spot treatment or a treatment package in dense urban neighborhoods with high pedestrian activity.

- **Crash Reduction Factor:** LPI – 60%; No RTOR – 25% (NCDOT, 2021).
- **Planning-Level Cost:** LPIs - $550 - $6,000, including countdown timer, controller, signal head and software upgrade; No RTOR - $200 - $6,000 depending on the type of sign (electronic vs. others).

Figure 24: Example of Leading Pedestrian Interval

Source: PedBikeInfo

5.1.1.6. Sidewalk/Pathway Installation

- **Description:** Sidewalk or dedicated pathways for pedestrians provide a separated walking environment. Sidewalks on both sides of the street has been found to significantly reduce the frequency of "walking along the roadway" pedestrian crashes.
- **Purpose:** Sidewalks and paths provide people with space to travel within the public right-of-way that is separated from roadway vehicles.
- **Application:** Per LRSM guidance document, the following treatments may be considered for application under the following roadway contexts:
  - Pedestrian and bicycle collisions have occurred within the limits of the new walkway
  - An existing sidewalk is not being replaced with a wider one

- When an off-street multi-use path is proposed that is not adjacent to the roadway, engineering judgement to determine which crashes to apply must be documented

- **Considerations:** The expected effectiveness off this countermeasure must be assessed for each individual location. These projects can be most effectively applied in areas of high pedestrian volumes with a history of crashes involving pedestrians.

  The Town has an adopted Truckee Trails and Bikeways Master Plan (TTBMP) that identifies priorities for new Class I, II, and III trails as well as sidewalks. The decision to install any of these facilities should be consistent with the Trails and Bikeways Master Plan.

- **Systemic Application:** This treatment can be applied in areas noted as not having adequate or no sidewalks and a history of walking along roadway pedestrian crashes. In rural areas, asphalt curbs and/or separated walkways may be appropriate.

- **Crash Reduction Factor:** 65-89%

- **Planning-Level Cost:** Costs for sidewalks will vary depending upon factors such as width, materials, and existence of curb, gutter, and drainage. Asphalt curbs and walkways are less expensive but require more maintenance. Typical costs for sidewalk and paths are provided in

Table 16: Typical Unit Costs for Sidewalk/Pathway Projects

Project Type	Unit Cost
Dirt Trail	$200,000 per mile
Paved Trails	$1.5-2.5 million per mile
Sidewalk with Curb and Gutter	$70 per linear foot

Source: Town of Truckee, 2021.

Figure 25: Example of a Separated Pathway – Legacy Trail

Source: Kyle Railton

5.1.2. Bicycle Intersection Treatments

Bike-related treatments at intersections was identified as a priority countermeasure for the Town because the share of injuries and fatalities among bicycle crashes is higher than all reported crashes at 32% of all bicycle collisions. Among the collisions where the bicyclist was identified as the party most at fault, the top two primary collision factors were "other hazardous violation" and bicyclist DUI.

Bike-related treatments at intersections seek to improve the visibility of bicyclists, awareness of drivers approaching the intersections, and increased predictability of bicyclist location. The following three countermeasures were identified for the Town of Truckee:

1. Bike Lanes
2. Bike Lane Extension Through Intersections
3. Bike Boxes

Each individual countermeasure is discussed below including a description of the treatment, purpose, application, considerations, possible systemic application, crash reduction factor, and relative planning-level cost. The

information provided in the sections below is adapted from the Federal Highway Administration (FHWA) *Bicycle Safety Guide and Countermeasure Selected System* (FHWA BIKESAFE, 2021), NCHRP *Guidance to Improve Pedestrian and Bicyclist Safety at Intersections* (NCHRP, 2020), and National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide* (NACTO, 2011).

The crash reduction factor noted for each of the countermeasures in this memo is obtained from *Local Roadway Safety Manual* for California's Local Road Owners (LRSM, 2020), unless otherwise noted for countermeasures in the sections below.

5.1.2.1. Bike Lanes

- **Description:** This treatment designates a portion of roadway for the preferential or exclusive use of bicyclists through striping, signage, and pavement markings. Bike lanes typically run in the same direction of traffic, though they may be configured in the contra-flow direction on low-traffic corridors for the connectivity of a particular bicycle route. Different types of bike lanes are as follows:
  - ***Conventional Bike Lanes:*** These bike lanes designate an exclusive space for bicyclists using pavement markings and signage. These are located adjacent to motor vehicle travel lanes and flow in the same direction as motor vehicle traffic.
  - ***Buffered Bike Lanes:*** These bike lanes are conventional bike lanes paired with a designated buffer space separating the bike lane from motor vehicle travel lanes and/or parking lane. Figure 26 shows an example of buffered bike lane at intersection approach.
  - ***Contra-Flow Bike Lanes:*** These bike lanes allow bicyclists to ride in the opposite direction of motor vehicle traffic. They convert a one-way street into a two-way street: one direction for motor vehicles and bikes, and other for bikes only.
- **Purpose:** The use of bike lanes helps bicyclists to ride at their preferred speed without interference from prevailing traffic conditions and facilitates predictable behavior and movements between motorists and bicyclists.
- **Application:** Per the NACTO Guide, the following treatments may be considered for application under the following roadway contexts:
  - Conventional Bike Lanes: ADT ≥ 3,000 + ≥ 25 mph posted speed limit + high transit vehicle volumes
  - Buffered Bike Lanes: ADT ≥ 3,000 + ≥ 35 mph posted speed limit
  - Contra-Flow Bike Lanes: On streets where bicyclists are already riding the wrong way, and on low-speed and low volume streets

- **Considerations:** These treatments may be considered when any of the following factors are observed on site:
  - Presence of sidewalk or wrong-way riding behavior by bicyclists;
  - Limited connectivity and access to bicyclists; or,
  - Presence of right or left-turning conflicts between bicyclists and motor vehicles.

  Buffered bike lanes opportunities will be considered when the TTBMP is updated as these facilities would require additional roadway widening and striping to install.
- **Systemic Application:** Low-cost bike lane installations may easily be integrated into other ongoing maintenance or capital improvement projects, provided it involves striping the roadway and minor signing. This could include integration into routine restriping or resurfacing activities. It is important to consider that physical separation and maintenance may be difficult in winter conditions given snowy weather events and consequent plowing. The Town may consider not plowing bike lanes in winter, investing in a special snow plow, or making use of buffered lanes rather than paint depending on location. Buffers would also be most applicable in non-winter conditions but may be more affordable than re-striping on an annual basis. Projects that require roadway widening, right-of-way acquisition and environmental impacts are most likely addressed as capital improvement projects given the increased cost and complexity of these improvements.
- **Crash Reduction Factor:** 35% - 45% depending on treatments selected.
- **Planning-Level Cost:** Bike lanes typically cost approximately $16,000 per mile for restriping only. Buffered bike lanes are approximately $20,000 per mile (accounting for the additional striping). Overall implementation costs will vary based on the implementation approach and design elements included.

Figure 26: Example of Buffered Bike Lane at Intersection Approach

Source: Kittelson & Associates, Inc.

5.1.2.2. Bike Lane Extension Through Intersections

- **Description:** Bicycle pavement markings through intersections indicate the intended path of bicyclists through an intersection or across a driveway or ramp. They guide bicyclists on a safe and direct path through the intersection and provide clear boundary between paths of bicyclists and motorists. Figure 27 shows an example of bike lane extension through signalized or unsignalized intersections.
- **Purpose:** The use of bicycle pavement markings helps raise awareness for both bicyclists and motorists to potential conflict areas. This treatment reinforces that the through bicyclists have priority over turning motor vehicles.
- **Application:** Per the NACTO Guide, bicycle pavement markings may be considered for application for the following roadway context:
  - At particularly wide or complex signalized intersections, where the bicycle path may be unclear.
- **Considerations:** This treatment may be considered when any of the following factors are observed on site:
  - Presence of right or left-turning conflicts between bicyclists and motor vehicles as determined by crash analysis or field reviews; or,
  - Locations with bicycle lanes or separated bike lanes where it is desired to delineate the bicycle crossing.

Since the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority where this treatment is considered.

- **Systemic Application:** Bicycle pavement markings are mostly likely to be integrated as part of larger capital improvement projects along major bike-routes. It is important to consider that maintenance of paint may be difficult in winter conditions given snowy weather events and consequent plowing. Paint would likely need to be redone on an annual basis.
- **Crash Reduction Factor:** 39% (ODOT, 2021).
- **Planning-Level Cost:** Varies - $200 - $5,000 per intersection depending on surface area of markings, materials used, and the color of markings.

Figure 27: Example of Bike Lane Extension Through Intersection

Source: Kittelson and Associates, Inc.

5.1.2.3. Bike Boxes

- **Description:** A Bike Box is a designated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase. Figure 28 shows an example of Bike Box at an intersection.
- **Purpose:** The use of bike boxes increases visibility of bicyclists and helps prevent 'right-hook' (or left-hook) conflicts with turning vehicles at the start of the green indication. In addition to increasing the visibility and predictability of bicyclists, bike boxes provide priority for bicyclists by allowing them to come to the front of the queue.
- **Application:** Per the NACTO Guide, bike boxes may be considered for application under the following roadway context:
  - At signalized intersections with high volumes of bicyclists and/or motor vehicles, especially those with frequent bicyclist left-turns and/or motorist right-turns.
- **Considerations:** This treatment may be considered when any of the following factors are observed on site:
  - Presence of right or left-turning conflicts between bicyclists and motor vehicles;
  - Desire to better accommodate left turning bicycle traffic; or,
  - A situation where dominant motor vehicle traffic turns right (e.g., onto a ramp) and bicycle traffic goes straight, at the intersection.

- **Systemic Application:** Bike Boxes are mostly likely to be integrated as part of larger capital improvement projects along major bike-routes. This treatment may be better suited as a treatment package in urban neighborhoods. It is also important to consider that maintenance of paint may be difficult in winter conditions given snowy weather events and consequent plowing. Paint would likely need to be redone on an annual basis.
- **Crash Reduction Factor**: 35% (ODOT, 2021).
- **Planning-Level Cost:** $5,000 per box, including green thermoplastic, pavement markings and signage.

Figure 28: Example of Bike Box

Source: NACTO

5.1.3. Signalized Intersection Treatments

Treatments at signalized intersections seek to improve the visibility of the intersection, reduce the potential for conflicting movements within the intersection, and reduce the number of conflict points within the influence area of the intersection. Improving signal hardware and timing was identified for signalized intersections in Truckee.

The countermeasure discussed below includes a description of the treatment, purpose, application, considerations, possible systemic application, crash reduction factor, and relative planning-level cost. The information provided in the section below is adapted from FHWA Safety documentation, the *Caltrans Local Roadway Safety: A Manual for California's Local Road Owners* (LRSM) (2020), and current research. The crash reduction factor noted in this memo is obtained from the LRSM.

5.1.3.1. Improve Signal Hardware, Striping, Timing, or Lighting

- **Description:** These treatments include both hardware and timing improvements to signals to improve the visibility of the intersection or help drivers negotiate the intersection. Treatments may include the following:
  - ***Additional or Upgraded Signal Heads:*** Signal heads may be added to the signal to provide additional clarity on movements where a signal head communicates movements for multiple travel lanes. Additionally, signal heads may be upgraded to add larger signal heads (i.e., increasing the signal head size from 8 inches to 12 inches), new LED lighting, visors, signal back plates, or retro-reflective tape outlining the back plates to increase the visibility of the intersection of the intersection. Figure 29 shows a signal with retroreflective marking.
  - ***Conversion from Pedestal-Mounted to Mast Arm:*** When signals are currently mounted on pedestals in the median or outside shoulder, conversion of the pedestal-mounted intersections to mast arms can improve visibility of the traffic signals.
  - ***Signal Timing Improvements:*** Signal timing improvements may include the adjustment of clearance intervals, phasing adjustments, eliminating or restricting certain movements, or coordinating signals along a corridor to reduce the potential for conflicting movements.
  - ***Improved Intersection Lighting:*** Lighting may be improved at the intersection or at its approaches to make drivers' more aware of the surroundings at an intersection, enhance drivers' available sight distances, and improve the visibility of non-motorists at an intersection. In commercial areas or in downtown areas where there is more pedestrian activity, pedestrian scale lighting may be placed over sidewalks to help pedestrians navigate the intersection safely.
- **Purpose:** Signal hardware, striping, timing, and lighting improvements improve the visibility of the intersection signs and signals while also helping approaching drivers perceive the upcoming intersection. These treatments can also improve awareness of and clarify or restrict movements to avoid potential conflicts within the intersection.
- **Application:** These treatments may be considered at any signalized intersection, but the following may be considered for specific treatments:
  - Conversion to mast arms may be considered where mast arms have the potential to increase visibility of the intersection and signal heads for one or more approach(es).
  - Signal timing improvements may be considered where crash patterns indicate conflicts between movements associated with different signal phases or there are opportunities to rephase the signal to separate conflicting movements.

- Signal hardware upgrades may be considered where crash patterns indicate visibility of the intersection or signal heads may benefit from enhancements.
- Striping and marker through the intersections may be considered where intersection footprints are large or skewed, or when multiple turn lanes are present for a movement to provide a clear path of travel for the movement.
- Intersection lighting improvements may be considered at intersections that have a disproportionate number of night-time crashes and do not currently provide lighting at the intersection or at its approaches.

- **Considerations:** These treatments may be considered when high frequencies of angle, broadside, rear-end, night-time or other conflicting movement crashes are occurring at a signalized intersection.
- **Systemic Application:** Signal hardware, striping, signal timing and lighting improvements are low-cost and best suited to systemic applications. These improvements can easily be packaged together for multiple sites as a low-cost capital improvement or integrated into other ongoing projects to integrate safety treatments. Conversion to mast arms is more costly and are more suited to a combined capital improvement project or site-by-site implementation.
- **Crash Reduction Factor:** 10% - 74% depending on treatments selected.
- **Planning-Level Cost:** Varies - $4,000 – $250,000 depending on treatments selected and existing roadway configuration with signal timing, striping, lighting, and low-cost hardware representing the low-end of the cost range and replacement and/or conversion to mast arms at the high-end.

Figure 29: Signal with Retroreflective Marking

Source: FHWA

Figure 30: Example of Pavement Markers Delineating Turning Path of Travel

Source: Google Maps

5.1.4. Unsignalized Intersection Treatments

Treatments at unsignalized intersections seek to improve the visibility of the intersection and reduce the potential for conflicting movements within the intersection. The following three countermeasures were identified for the Town of Truckee:

1. Install or Upgrade Signing and Pavement Markings
2. Improve Sight Distance to Intersection
3. Install Roundabouts[1]

Each individual countermeasure is discussed below including a description of the treatment, purpose, application, considerations, possible systemic application, crash reduction factor, and relative planning-level cost. The crash reduction factor noted for each of the countermeasures in this memo is obtained from the LRSM, unless otherwise noted for countermeasures in the sections below.

5.1.4.1. Install or Upgrade Signing and Pavement Markings

- **Description:** This treatment consists of adding or upgrading signing and pavement markings at and on the approach to an unsignalized intersection. This can include advance intersection warning signs, STOP AHEAD pavement markings, transverse rumble strips on the approach, stop bars, and upgraded warning or control signs. Figure 31 shows an example of larger or additional signs installation near the intersection.
- **Purpose:** Adding or upgrading signing and pavement markings for an uncontrolled intersection can help increase the visibility of the intersection for approaching drivers as well as reducing potential conflicts by clarifying the footprint of the intersection.
- **Application:** These treatments may be considered at any unsignalized intersection, especially intersections with higher speed, curved, or skewed approaches, or locations with other visibility limitations. Given winter conditions in Truckee, it is advisable to implement more signs than markings, which are easier to maintain in snowy conditions.
- **Considerations:** These treatments may be considered when high frequencies of crashes are related to visibility of the intersection, or the intersection footprint is not clearly delineated by striping or pavement markings.

[1] Note that roundabouts may installed as a replacement for a traffic signal as well.

- **Systemic Application:** New or upgraded signs and pavements markings are low-cost treatments that can be implemented systemically and integrated into ongoing maintenance and capital improvement projects.
- **Crash Reduction Factor:** 15-25% depending on the treatments applied.
- **Planning-Level Cost:** $500 - $5,000 per approach depending on the combination of signing and striping implemented.

Figure 31: Example of Larger or Additional Signs

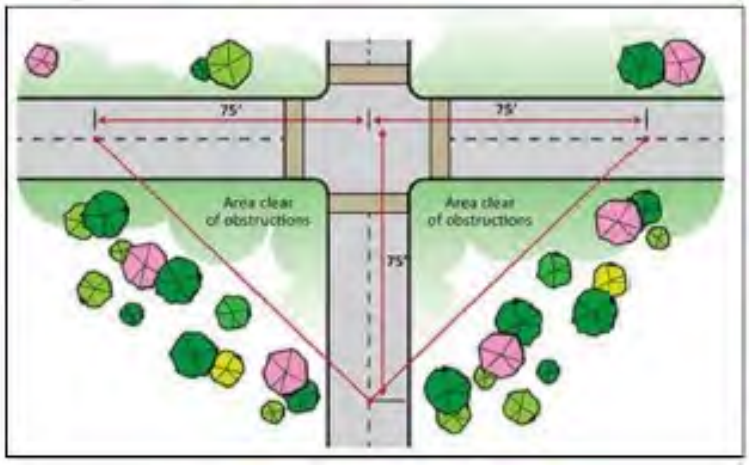
Source: South Carolina DOT

5.1.4.2. Improve Sight Distance to Intersection

- **Description:** This treatment consists of clearing vegetation, roadside objects, on-street parking, fences, buildings, snow, or other objects in the right-of-way. Figure 32 shows an example of a sight triangle to remain clear of obstructions to provide sufficient line of sight.
- **Purpose:** Clearing obstructions within the vicinity of the intersection improves sight distance at the intersection by providing clear sight triangles on the approach or adjacent to the intersection.
- **Application:** These treatments may be considered at any unsignalized intersection where intersection sight distance is limited by on-street parking or other obstacles.
- **Considerations:** These treatments may be considered when high frequencies of crashes are related to conflicting movements that may be impacted by limited visibility at the intersection. However, sight distance improvements should be balanced with other concerns (such as the loss of on-street parking) to balance competing needs.

- **Systemic Application:** Some obstructions and on-street parking may be removed from the right-of-way at low cost and implemented systemically. Some obstructions such as earthen berms or buildings may require separate capital improvements to implement. In Truckee, snow piles can be a significant obstruction to visibility, as shown in Figure 33: Snow Pile at a Truckee Intersection below. IT is recommended that improved snow management is implemented in areas where snow piles high near intersections.
- **Crash Reduction Factor**: 20%
- **Planning-Level Cost:** $1,000 - $100,000 per approach, depending on the extent and type of obstruction.

Figure 32: Example of Sight Triangle



Source: Chester County Planning Commission

Figure 33: Snow Pile at a Truckee Intersection

Source: Google Earth

5.1.4.3. Install Roundabouts

- **Description:** This treatment consists of installing a roundabout as traffic control at an intersection. A roundabout is a type of circular intersection without traffic signals or stop signs, where drivers travel counterclockwise around a center island. When entering the roundabout, drivers yield to existing traffic, then enter the intersection and exit in their desired direction. Figure 34 shows an example of a roundabout. While this treatment is presented for converting an unsignalized intersection to a roundabout, note that roundabouts may also be installed as a replacement for traffic signals. However, the crash reduction factors presented below only reflect the crash reduction expected for converting from a stop-controlled intersection to a roundabout due to the different operating characteristics versus a signalized intersection.
- **Purpose:** Roundabouts are designed to eliminate left turns by requiring traffic to exit to the right of the circle. Roundabouts are installed to manage vehicular speeds through the intersection, improve safety at intersections by eliminating broadside and head-on crashes, and help traffic flow more efficiently. Additionally, given the conflict points at a roundabout, these treatments tend to reduce the average severity of crashes at the intersection as well.
- **Application:** This treatment may be considered at any intersection with a high frequency of reported crashes, traffic delays, complex geometry (more than four approach roads), frequent left-turns, and/or relatively balanced traffic flows.
- **Considerations:** Roundabouts work well for intersections with low-to-moderate traffic speeds, and lower traffic volumes. Per the NCHRP 672: Roundabout Informational Guide, the typical daily service volumes for four-legged roundabouts are as follows:
  - Up to 15,000 veh/day for a mini-roundabout with desirable entry design speed of 15-20 mph,
  - Up to 25,000 veh/day for a single-lane roundabout with desirable entry design speed of 20-25 mph, and,
  - 25,000 – 45,000 veh/day for a multi-lane roundabout (2-lane entry) with desirable entry design speed of 25-30 mph.
- **Systemic Application:** Due to the need to design roundabouts for the context of each location, this treatment is best implemented as part of a site-specific capital improvement.
- **Crash Reduction Factor**: 12% - 78% (depending on roundabout configuration and total entering volumes)
- **Planning-Level Cost:** Costs vary significantly depending on the size, site conditions, and right-of-way acquisition. The most recent selected bid for a single lane roundabout at Donner Pass Road and Cold Stream Drive was $5 million.

Figure 34: Example of a Truckee Roundabout - Stockrest

Source: Town of Truckee

5.1.5. Roadway Segment Treatments

Roadway segment treatments seek to improve the visibility of the roadway, improve pavement friction, enhance delineation along curves, and manage traffic speeds along the roadway. The following four countermeasure categories were identified for the Town of Truckee:

1. Segment Curve Treatments
2. Delineation Treatments
3. Median Related Treatments
4. Speed Management

Each countermeasure category is discussed below including a description of the treatment, purpose, application, considerations, possible systemic application, crash reduction factor, and relative planning-level cost. The crash reduction factor noted for each of the countermeasures in this memo is obtained from the Caltrans LRSM, unless otherwise noted for countermeasures in the sections below.

5.1.5.1. Segment Curve Treatments

Segment curve treatments were identified based on a review of the highest-scoring segments from the SSAR's network screening results. Treatments to address curves at these locations can be used to systemically address roadway safety at curves throughout the Town. Treatments at curves seek to improve the visibility of the approach

curve and guide road users safely through the curve. The following two countermeasures were identified for the Town of Truckee:

1. Install or Upgrade Signs for Horizontal Curves
2. Install High-Friction Surface Treatments (HFST)

5.1.5.1.1. Install or Upgrade Signs for Horizontal Curves

- **Description:** This treatment consists of adding new or upgrading existing advisory signs along or on the approach to horizontal curves. This may consist of chevron signs, curve warning signs (including flashing warning beacons), or other advisory signs. Figure 35 shows an example of curve advance warning sign.
- **Purpose:** New or upgraded advisory signs provide drivers with advance warning of the approaching curve and can help them navigate safely through the curve.
- **Application:** These treatments may be considered at any horizontal curve where visibility of the approaching curve is limited or providing guidance through the curve via chevron signs may provide safety benefits.
- **Considerations:** These treatments may be considered when high frequencies of run-off-road crashes related to a horizontal curve are identified. Signing should be in accordance with California MUTCD requirements and may be implemented in phases, as needed. Flashing beacons may be most beneficial if operated only during winter to add novelty and improve driver compliance when conditions are more hazardous.
- **Systemic Application:** Due to the low cost of new or upgraded signs, curve treatments may easily be implemented systemically or integrated with ongoing maintenance or capital improvement projects.
- **Crash Reduction Factor:** 15-40% depending on the treatment(s) selected.
- **Planning-Level Cost:** $4,000 - $20,000 per curve depending on the treatment(s) selected.

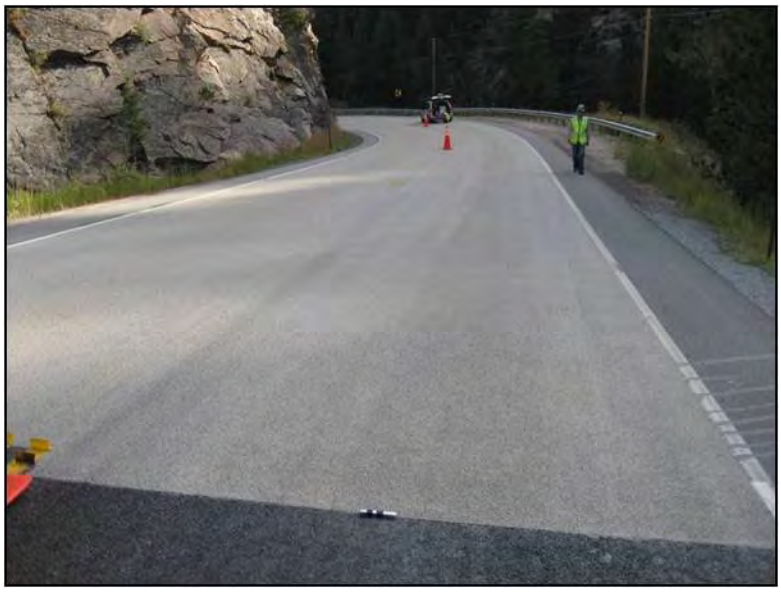
Figure 35: Example of Curve Advance Warning Sign

Source: Google Maps

5.1.5.1.2. Install High-Friction Surface Treatments (HFST)

- **Description:** This treatment involves the application of very high-quality aggregate to the pavement using a polymer binder to restore and/or maintain pavement friction. Figure 36 shows an example treatment application.
- **Purpose:** Higher pavement friction helps drivers maintain better control in both dry and wet driving conditions.
- **Application:** These treatments may be considered along horizontal curves or intersection approaches where vehicles frequently brake, and pavement surfaces become prematurely polished, thereby reducing the available pavement friction. This friction reduction may contribute to vehicles losing control or skidding when they speed or turn abruptly.
- **Considerations:** These treatments may be considered when high frequencies of run-off-road crashes related to a horizontal curve are identified or frequent hard-braking related crashes occur on intersection approaches. HFST withholds winter conditions well, and the effect from snow plows is minimal. HFST has been placed in many areas with heavy snow and plowing, including Alaska.
- **Systemic Application:** These treatments can be relatively low cost and can be implemented in a short timeframe. They are also ongoing maintenance or capital improvement projects.
- **Crash Reduction Factor**: 17-68%.
- **Planning-Level Cost:** $35 per square yard.

Figure 36: Example High-Friction Surface Treatment Application



Source: Utah Department of Transportation

5.1.5.2. Delineation Treatments

Delineation treatments seek to improve the visibility of the roadway and provide visual information about changes in the roadway environment. These treatments are particularly helpful where visibility can become poor due to rain, fog, or dark conditions. The following two countermeasures were identified for the Town of Truckee:

1. Install Delineators, Reflectors and/or Object Markers
2. Install Edge-Lines and Centerlines

5.1.5.2.1. Install Delineators, Reflectors or Object Markers

- **Description:** This treatment consists of adding delineators, reflectors, or object markers on the approach and through a horizontal curve. Figure 37 shows an example of delineators on curved roadway.
- **Purpose:** Delineators, reflectors, and object markers provide drivers with a visual cue of the approaching horizontal curve and help drivers navigate safely through the curve.
- **Application:** These treatments may be considered at any horizontal curve where visibility of the approaching curve is limited or providing guidance through the curve via delineation may provide safety benefits.

- **Considerations:** These treatments may be considered when high frequencies of run-off-road crashes related to a horizontal curve are identified. It is recommended that delineation is placed selectively given winter weather conditions. The weight of snow as well as snow plows can knock this treatment down relatively easily.

  Snow poles are in place year-round in Truckee and may act as delineators in certain situations.

- **Systemic Application:** Due to the low cost of delineators or reflectors, these treatments may easily be implemented systemically or integrated with ongoing maintenance or capital improvement projects.
- **Crash Reduction Factor:** 15% depending on the treatment(s) selected.
- **Planning-Level Cost:** $500 - $10,000 per curve depending on the treatment(s) selected.

Figure 37: Example Delineators on Curved Roadway

Source: FHWA

5.1.5.2.2. Install Edge-Lines and Centerlines

- **Description:** This treatment consists of installing or modifying edge-lines or centerlines through a horizontal curve. Figure 38 shows an example of this treatment.
- **Purpose:** New or modified edge-lines or centerlines help clarify and increase the visibility of the edge of the roadway and lane boundaries.
- **Application:** These treatments help drivers who may depart the roadway or travel lane correct their driving path and delineate the appropriate path of travel through the curve.
- **Considerations:** These treatments may be considered when high frequencies of run-off-road crashes related to a horizontal curve are identified and the roadway is not defined through edge-lines or

centerlines (or may benefit from adjustments to the existing striping). Adjustments may be considered when roadways have wide travel lanes that may contribute to higher speeds on the approach to a curve.

- **Systemic Application:** Striping is a low-cost implementation that can easily be implemented systemically or integrated with ongoing maintenance or capital improvement projects. Striping plans for each curve will need to be developed to account for the individual roadway cross section for each curve. It is recommended that this treatment is done on an annual basis given the impact of winter weather conditions and plowing on striping.
- **Crash Reduction Factor:** 20% depending on the treatment(s) selected.
- **Planning-Level Cost:** $500 - $5,000 per each direction of travel depending on the extent of the striping needed.

Figure 38: Example of Road with Edge-lines and Centerlines

Source: FHWA

5.1.5.3. Median Related Treatments

Median treatments for roadways represent one of the most effective means to regulate access and improve safety by restricting certain movements. These treatments reallocate the existing roadway cross-section to incorporate a buffer between the opposing travel lanes, reinforces the limits of the travel lane, and physically restrict or control certain movements. The following three countermeasures were identified for the Town of Truckee:

1. Install Raised Median

5.1.5.3.1. Install Raised Median

- **Description:** This treatment consists of adding new raised medians on roadways to control and restrict left-turn and U-turn movements on the roadways except at few designated locations. Figure 39 shows an

example of this treatment. An example of this treatment is the raised median constructed recently along Deerfield Drive.

- **Purpose:** Adding raised medians can help reduce conflicts by restricting access-related movements to the roadway. The raised medians prohibit left-turns into and out of driveways that may be located along the roadway and within the influence area of an intersection. In addition to preventing left-turns at minor driveways, the raised median reduces friction in the traffic stream by separating opposing traffic.
- **Application:** These treatments may be considered on roadways with high frequencies of head-on crashes, left-turning vehicle crashes, and other access-related crashes that may be affected by both the number of vehicles that cross the centerline and by the speed of oncoming vehicles.
- **Considerations:** These treatments may be considered on roadways after ensuring that there is enough space for wider sidewalks, and bike lanes after installing the median. The landscaping in medians should not obstruct the visibility between pedestrians and approaching vehicles. The safety benefits of restricting movements should be balanced with restrictions to business access and its associated impacts on commercial and retail areas.
- **Systemic Application:** Providing raised medians on roadway can be implemented in combination with other ongoing corridor capital improvements.
- **Crash Reduction Factor**: 20-75%
- **Planning-Level Cost:** Approximately $100,000 per 100 feet of the roadway, depending on design, site conditions, and whether the median can be added as part of a utility improvement or other capital improvement project.

Figure 39: Example of Raised Median

Source: FHWA

5.1.5.4. Speed Management

Speed management was identified as a priority countermeasure for the Town because unsafe speed was the most frequently cited collision factor accounting for 32% of the total reported crashes. This treatment seeks to lower the vehicular speeds on the roadway, thereby reducing speeding related crashes. Speed management should be addressed comprehensively to encompass all the factors that may influence travel speeds, including road user/driver behavior, roadway design, surrounding land use context, traffic, roadway conditions, posted speed limits, and enforcement. The following two countermeasures were identified for the Town of Truckee:

1. Install Dynamic Speed Feedback Signs

5.1.5.4.1. Install Dynamic Speed Feedback Signs

- **Description:** This treatment consists of installing dynamic or variable speed feedback signs on the roadway. Figure 40 shows an example of this treatment.
- **Purpose:** Speed feedback signs provide drivers with feedback about their speed in relationship to the posted speed limit.
- **Application:** These treatments provide a message to drivers exceeding a certain speed threshold (or posted speed limit). The intent of these treatments is to get drivers attention and provide them with a visual warning that they may be traveling over the recommended speed on the roadway.
- **Considerations:** These treatments may be considered on roadways that have higher incidence of crashes due to excessive speeds, and on relatively sharp curves.
- **Systemic Application:** This treatment is a relatively low-cost implementation that can easily be implemented systemically or integrated with capital improvement projects.
- **Crash Reduction Factor**: 0-41%.
- **Planning-Level Cost:** $2,000 - $11,000 per display, depending on whether it is solar powered or AC.

Figure 40: Example of Dynamic Speed Warning Sign

Source: Kittelson and Associates, Inc.

5.2. EDUCATION STRATEGIES

Education strategies are focused on teaching roadway safety principles to roadway users. These strategies can be developed to include interactive activities, comprehensive teaching notes, and information on road safety messages and concepts that can be taught at school or in the off-school activities. The following six education-related strategies were identified for the Town of Truckee.

1. Road Safety Education to Children
2. Speed Monitoring Awareness Radar Trailer
3. Conspicuity Enhancements and Education
4. Vulnerable Road User Education
5. High-Visibility Cell Phone and Text Messaging Media Campaign
6. Second-Home Owner and Visitor Education

5.2.1. Road Safety Education to Children

Road safety education to children includes strategies such as safe routes to school, walking school bus, and bicycle trains that promote road safety to all users, particularly for pedestrians and bicyclists. A 'safe routes to school' program encourages and enables children to walk and bike to school. This can improve their health, well-being, and safety. This also results in less traffic congestion and emissions caused by school-related travel. Walking school buses and bicycle trains encourage groups of children walking or biking to school, with one or more adults. The walking school buses, and bicycle trains have been put into practice by some of the schools in Sacramento, California; Chapel Hill, North Carolina; and Duluth, Georgia (SRTS Guide, 2021). These strategies or practices have

shown communities and families that walking, and biking can be a viable and safe transportation option, and thus can be incorporated into their own daily travel patterns.

5.2.2. Speed Monitoring Awareness Radar Trailer

The speed trailer is an educational device that helps drivers become more aware of their speed in relation to the posted speed. This awareness tool can also help residents survey the traffic speeds in their own neighborhood. This trailer is usually deployed in a street or neighborhood for a few days so the residents can monitor the speeds on their own streets and become aware of their own driving behaviors.

5.2.3. Conspicuity Enhancements and Education

The purpose of enhancing conspicuity for pedestrians is to increase the opportunity for drivers to see and avoid pedestrians, particularly when it is dark. Over 70% of national pedestrian fatalities occur in the dark, and pedestrians who are more visible are less likely to be struck. Educating pedestrians to wear reflective clothing and walk in well-lit areas can be implemented as targeted campaigns. The use of high visibility clothing and protective gear enhances safety. There is some limited evidence to suggest that a program aimed at increasing conspicuous and protective clothing could be successful.

5.2.4. Vulnerable Road User Education

The road safety education regarding vulnerable road users like pedestrians, bicyclists, and motorists includes strategies involving education from police officer. If the driver encroaches into the bike lane or fails to yield to the pedestrian at the crossing, the police officer pulls the driver over and hands them a flyer that has the information for drivers to adapt their behavior towards all road users; this can be in addition to a citation.

5.2.5. High-Visibility Cell Phone and Text Messaging Media Campaign

The High Visibility Enforcement model combines dedicated law enforcement with paid and earned media supporting the enforcement activity. Paid media includes advertisements on TV, radio, online, and via billboards, while earned media includes things like press events and news releases covering the efforts. Both types of media support enforcement activity by helping to ensure the public is aware of the enforcement activity, and to create the impression that violators will be caught.

5.3. ENFORCEMENT STRATEGIES

The enforcement strategies will focus on best practices for improving roadway and community safety. Research has found that most enforcement strategies have limited long-term impacts for changing road user behavior. Therefore, the most effective enforcement strategies tend to be those that can be done transparently, consistently, and in coordination with education or outreach campaigns such as enforcement in school zones during school hours.

Even when engineering countermeasures are implemented, road users failing to adhere to traffic laws can result in crashes of varying severity. Police enforcement can increase driver awareness and consequently reduce traffic crashes. Potential enforcement strategies to address crash patterns and trends in Truckee are presented below. However, enforcement strategies should be undertaken with due caution to avoid inequitable enforcement activities and evaluated to determine the strategy's impact. The following considerations can help lead to more successful outcomes for roadway safety enforcement strategies:

- Police officers should be trained properly beforehand.
- Campaigns should be tailored to suit the needs of different neighborhoods and demographics and should be designed and carried out to avoid targeting disadvantaged communities.
- Enforcement should be conducted with the help of staff support and awareness of the courts.
- Enforcement operations should begin with warnings and flyers before moving on to issuing citations.

Crash data can help identify priority intersections and/or road segments and the times of the day when the crashes have occurred. This information can inform and guide the type of enforcement strategy to be selected at the most appropriate locations and time periods. Town staff can also help monitor the impact of the enforcement strategy by coordinating with the Truckee Police Department to obtain and analyze enforcement records to help evaluate effectiveness and equity considerations.

5.3.1. Progressive Ticketing

Progressive ticketing is a method for introducing ticketing through a three-staged process. Issuing tickets is the strongest strategy of an enforcement program and it is usually reserved for changing unsafe behaviors that other strategies failed to change or that pose a real threat to the safety of road users. There are three main steps of an effective progressive ticketing program:

1. Educating - Establish community awareness of the problem. The public needs to understand that drivers are speeding and the consequences of this speeding for road safety. Raising awareness about the problem will change some behaviors and create public support for the enforcement efforts to follow.

2. Warning - Announce what action will be taken and why. Give the public time to change behaviors before ticketing starts. Fliers, signs, newspaper stories and official warnings from officers can all serve as reminders.
3. Ticketing – After the "warning" period, hold a press conference announcing when and where the police operations will occur. If offenders continue their unsafe behaviors, officers issue tickets.

5.3.2. Speed Enforcement in School Zones

Strict enforcement of speed laws in school zones is one law enforcement tool that can improve the safety for children walking and bicycling to school as well as drivers. A 'zero tolerance' policy for speeders in school zones and even an increase in fines for drivers who violate the posted school zone speed limit are potential approaches.

5.4. EMERGENCY RESPONSE STRATEGIES

Emergency response is critical in reducing the severity of injuries sustained from collisions. Effective emergency response allows for high quality medical care at the scene and during transport to a trauma center. It is integral to helping the Town reduce fatal and severe injury collisions.

The effectiveness of emergency response is tied closely to the time it takes for a person injured in a collision to received prompt medical care. Research indicates that there is a "golden hour;" total pre-hospital time over 60 minutes is associated with a rise in patient mortality[2]. To receive prompt, high-quality medical attention a victim with severe injuries needs to be quickly transported to a high-level trauma center.

There are several components of effective emergency response that allow for efficient transport of injured people, including detection of a collision site, collection of details pertaining to severity and injuries, dispatching the right responders, pre-arrival instructions, determining the fastest path for responders to access the collision, and the safe and rapid transportation of patients to appropriate trauma centers. Currently, technological developments are being applied to improve emergency response. Drones and roadway video are being explored to better understand the details of collisions in real-time in order to send proper care as soon as possible. This can also maximize resources utilized for care at the collision[3].

In addition to technology, there are strategies that the Town can use to improve emergency response time. These strategies are listed below.

[2] Samplais, et al. Impact of on-site care, prehospital time, and level of in-hospital care on survival in severely injured patients, 1993.

[3] Caltrans Strategic Highway Safety Plan (SHSP), 2021.

5.4.1. Partner with Local Hospitals or Outreach Groups

Partnering with local hospitals or outreach groups can help provide bystander training courses to the public (i.e., train members of the public to respond to emergencies since they are sometimes the first on the scene at a collision and may be the only one for some time in rural areas). Opportunities for this strategy include:

- Partner with hospitals offering public education courses
- Promote the Community Emergency Response Team (CERT) program, which trains community members in first responder skills
- Work with local groups, such as fire departments, to be trainers themselves and then offer training more frequently in their local community
- Partner with local trauma centers which are required to provide injury prevention programs
- Consider a collaborative media campaign to inform and educate motorists on how to help emergency vehicles move faster by slowing down and moving over

5.4.2. Work with Stakeholders

The Town can work with stakeholders such as emergency service groups to:

- Maximize efficiency with urban and rural response times through evidence-based techniques
- Build advanced education EMS personnel capacity in rural areas
- Identify reasons for delay in transport for both ground Emergency Medical Services (EMS) (using registry data and EMS records)
- Identify equipment upgrades, training, or enhancements that would improve patient outcomes
- Identify barriers, if any, to rapid transfer of patients from lower-acuity hospitals to nearby trauma centers

5.4.3. Work with the Town 911 Team

The Town can also improve emergency response time by working with the local 911 team. Priorities in doing so include:

- Involving them in appropriate project planning and design review to identify opportunities to improve EMS access and location identification
- Involve them in enforcement and EMS grant opportunities

- Develop and purchase a system that allows local 911 dispatchers to quickly input reported road issues and send the information to the appropriate agency

5.5. INNOVATIVE APPROACHES

This section notes innovative approaches to improve roadway safety by accelerating road safety understanding and technology, thereby helping transition to more sustainable and safer transportation systems. Each of the previous sections (engineering, enforcement, education, and emergency response) will integrate information and recommendations about how to leverage emerging technologies to enhance roadway safety. Emerging technologies can impact each of these other strategies by streamlining crash reporting for enforcement, providing automated data enforcement, implementing dynamic engineering treatments (e.g., operational under specific weather conditions) and leveraging social media for education programs.

Technologies that are applicable to roadway safety at the vehicle level can be broken into five categories. While some of the categories listed below are applicable and actionable for the Town of Truckee, others are generally out of jurisdictional control and are informational in nature. These categories are discussed below.

5.5.1. Alerting Drivers at Risk

One of the main ways to use emerging technologies to limit collisions is to alert drivers when they are at risk, whether due to their own behavior or the behavior of others. This includes technologies that monitor speed, indicate blind spots, alert driver to actions of other vehicles, alert driver to maintenance needs, and more. Visual and/or audio alerts, depending on the urgency of a given situation, can quickly change the behavior of the driver. Such technologies are being integrated into the national vehicle fleet. According to the National Highway Traffic Safety Administration (NHTSA), it can take as long as 30 years for a new feature to be integrated into the entire vehicle fleet[3].

5.5.2. Protecting the Vehicle Occupants

Protecting the vehicle occupants includes physical, in-vehicle protections in the case of a collision. These protections range from seatbelts to vehicle structure, both of which are being continuously developed. In the case that a collision is unavoidable, physical protections can help reduce crash severity and protect lives.

5.5.3. Communicating with Drivers and the Environment

Communication with drivers and the environment is critical for safety and is a constantly developing field. Communication can come in the form of vehicle-to-driver (blind spot detection), environment-to-driver (signals),

vehicle-to-vehicle, and vehicle-to-environment (the latter two methods will likely become more relevant as the fleet of autonomous vehicles develops further).

5.5.4. Vehicle Performing as Designed

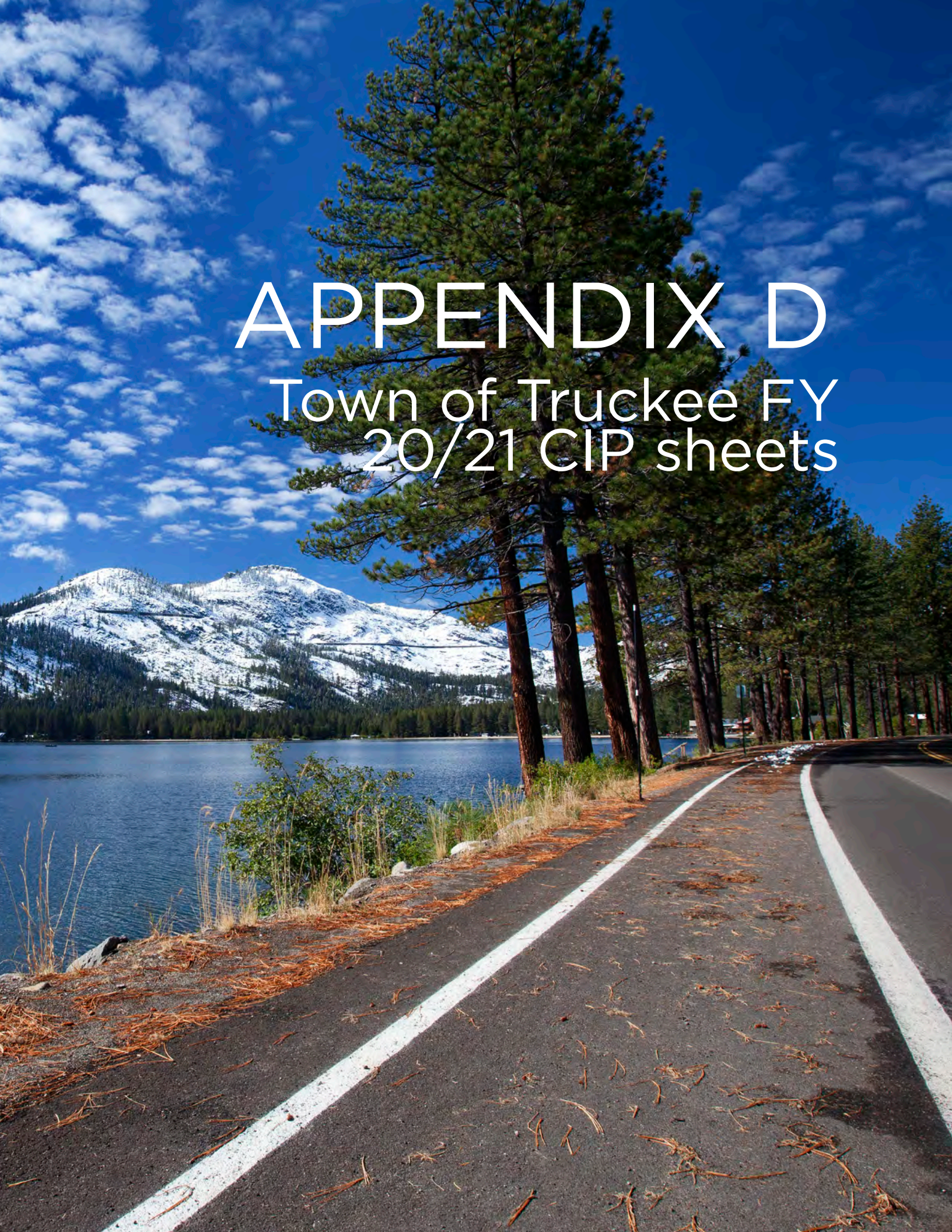
Another way to use technology to increase roadway safety is to ensure the vehicle fleet is performing as designed. This includes vehicle upkeep, maintenance, and record keeping. Although the Town may have a limited ability to enforce these activities, it may consider producing media campaigns encouraging maintenance, provide programs to alleviate maintenance costs, and partner with local organizations, mechanics, and auto shops to promote upkeep.

5.5.5. Mobile Technology and Applications

Many of the currently emerging technologies applicable to roadway safety come in the form of mobile applications. Many of these are used to support Transportation Network Companies (TNCs) such as Uber or Lyft in providing rideshare, bike share, and scooter rental services, which collectively may have significant impacts in reducing impaired driving collisions. Several county sheriffs have partnered with TNCs, particularly during holidays, to reduce the number of impaired drivers on the road. There are also applications that work to restrict drivers' use of mobile devices while driving. Some of these are apps in and of themselves, while others are integrated into existing apps. Encouraging the use of such apps may be useful for the Town.

6. NEXT STEPS

The findings presented above will be discussed, reviewed, and confirmed with Town of Truckee staff. The findings will be used to develop countermeasure profiles for the most relevant safety treatments for the Town based on common crash patterns and trends. This analysis will also be used to determine the locations and projects most likely to provide the greatest potential for crash reduction.



APPENDIX D

Town of Truckee FY 20/21 CIP sheets

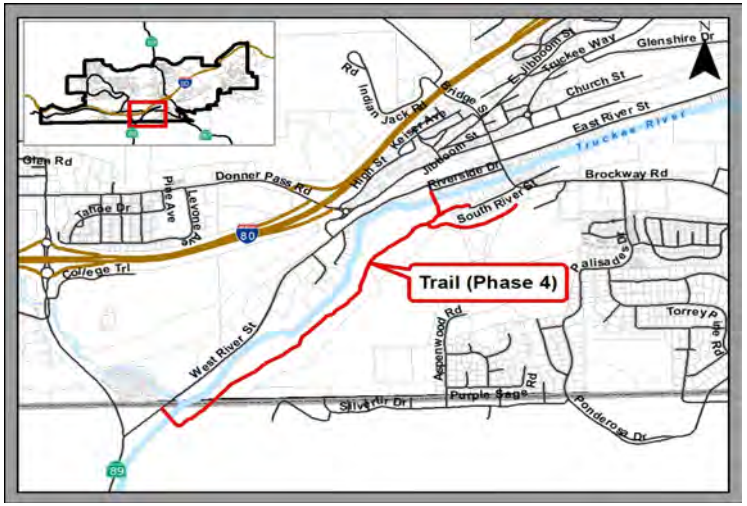
Truckee River Legacy Trail Phase 4 — C0702

PROJECT CATEGORY: Bicycle Path & Trail Projects

RESPONSIBLE DEPARTMENT: Public Works - Engineering

PROJECT BEGIN DATE: FY 15/16 **ESTIMATED COMPLETION:** 23/24

COUNCIL PRIORITY: Infrastructure, Community Connectivity



PROJECT DESCRIPTION:

Perform environmental analysis, engineering and construction of Phase 4 of the Truckee River Trail. Construction timing will be largely dependent on land owner cooperation and right-of-way acquisition. Measure R Sales Tax (Trails) Fund dollars will provide a majority of the funding for the design of this project as well as some construction costs. Intergovernmental amounts are from Placer County. Truckee Donner Land Trust (TDLT) is in escrow for the Truckee Springs Property and has committed to funding for trailhead parking, the extension of South River Street to the parking area, a small bridge at the end of South River Street, and a bridge between the Truckee Springs Property and Old County Corp Yard. The Town is committing to funding 25% of the bridge to the Old County Corp Yard, currently estimated at $2.5 million. This is in addition to the Open Space Designation ($500,000) the Town committed (Truckee Springs Property Acquisition CIP).

REASON FOR OR BENEFITS OF PROJECT:

Trail provides transportation route and recreational facility.

OPERATIONAL COST IMPACTS:

Ongoing trail maintenance expense once trail is constructed.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Measure R Sales Tax Fund	$ 916,938	$ 636,969	$ 433,000	$ 1,080,610	$ 1,240,000	$ 250,000	$ -	$ -	$ -	$ 3,920,548
Intergovernmental Contributions	$ 35,922	$ 42,000	$ 42,000	$ 148,000	$ 2,375,000	$ -	$ -	$ -	$ -	$ 2,600,922
Unfunded	$ -	$ -	$ -	$ -	$ 2,000,000	$ 2,000,000	$ -	$ -	$ -	$ 4,000,000
Trails & Open Space (In-Lieu Fee)	$ -	$ 3,031	$ 3,031	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,031
Trails Amenities Contributions	$ -	$ -	$ -	$ 6,390	$ -	$ -	$ -	$ -	$ -	$ 6,390
Private Contributions	$ -	$ 500,000	$ 362,000	$ 500,000	$ 2,175,000	$ -	$ -	$ -	$ -	$ 3,037,000
TOTAL:	**$ 952,860**	**$ 1,182,000**	**$ 840,031**	**$ 1,735,000**	**$ 7,790,000**	**$ 2,250,000**	**$ -**	**$ -**	**$ -**	**$ 13,567,891**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Design	$ 952,860	$ 532,000	$ 600,031	$ 400,000	$ -	$ -	$ -	$ -	$ -	$ 1,952,891
Construction	$ -	$ -	$ -	$ 685,000	$ 4,990,000	$ 2,250,000	$ -	$ -	$ -	$ 7,925,000
Acquisition	$ -	$ 150,000	$ -	$ 150,000	$ -	$ -	$ -	$ -	$ -	$ 150,000
Truckee Springs Bridge Construction	$ -	$ 500,000	$ 240,000	$ 500,000	$ 2,000,000	$ -	$ -	$ -	$ -	$ 2,740,000
Truckee Springs Trailhead	$ -	$ -	$ -	$ -	$ 800,000	$ -	$ -	$ -	$ -	$ 800,000
TOTAL:	**$ 952,860**	**$ 1,182,000**	**$ 840,031**	**$ 1,735,000**	**$ 7,790,000**	**$ 2,250,000**	**$ -**	**$ -**	**$ -**	**$ 13,567,891**

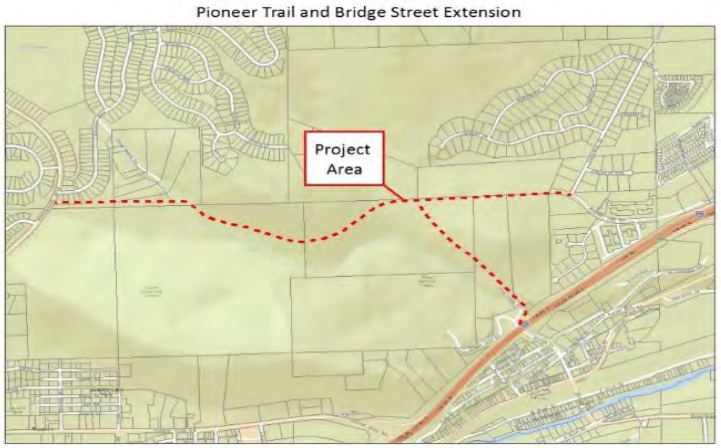
Pioneer Trail and Bridge Street Extension C1503

PROJECT CATEGORY: Roadway & Water Quality Improvement Projects

RESPONSIBLE DEPARTMENT: Public Works - Engineering

PROJECT BEGIN DATE: FY 20/21 **ESTIMATED COMPLETION:** FY 24/25

COUNCIL PRIORITY: Town Infrastructure



PROJECT DESCRIPTION:
Construction of a new access road linking Tahoe Donner to SR 89 north/SR 267 via an extension of Pioneer Trail as well as a connection to Downtown Truckee via a Bridge Street extension using the Trout Creek I-80 underpass.

REASON FOR OR BENEFITS OF PROJECT:
Provide a third access to and from Tahoe Donner, reduce congestion on Donner Pass Road and support development. Project is identified by the General Plan.

OPERATIONAL COST IMPACTS
Once built it will add approximately 3-4 miles of roadway to the Town maintained roads. Average annual cost for maintenance and replacement would be $150,000 - $200,000 per year.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Tahoe Donner TSSA Fund	$ -	$ 150,000	$ 75,000	$ 400,000	$ 325,000	$ -	$ -	$ -	$ -	$ 800,000
Traffic Impact Fees Fund	$ 14,963	$ 150,000	$ 75,000	$ 400,000	$ 325,000	$ -	$ -	$ -	$ -	$ 814,963
Unfunded	$ -	$ -	$ -	$ -	$ -	$ 20,000,000	$ 20,000,000	$ -	$ -	$ 40,000,000
TOTAL:	**$ 14,963**	**$ 300,000**	**$ 150,000**	**$ 800,000**	**$ 650,000**	**$ 20,000,000**	**$ 20,000,000**	**$ -**	**$ -**	**$ 41,614,963**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Design	$ 14,963	$ 300,000	150000	$ 800,000	$ 650,000	$ -	$ -	$ -	$ -	$ 1,614,963
Construction*	$ -	$ -	$ -	$ -	$ -	$ 20,000,000	$ 20,000,000	$ -	$ -	$ 40,000,000
TOTAL:	**$ 14,963**	**$ 300,000**	**$ 150,000**	**$ 800,000**	**$ 650,000**	**$ 20,000,000**	**$ 20,000,000**	**$ -**	**$ -**	**$ 41,614,963**

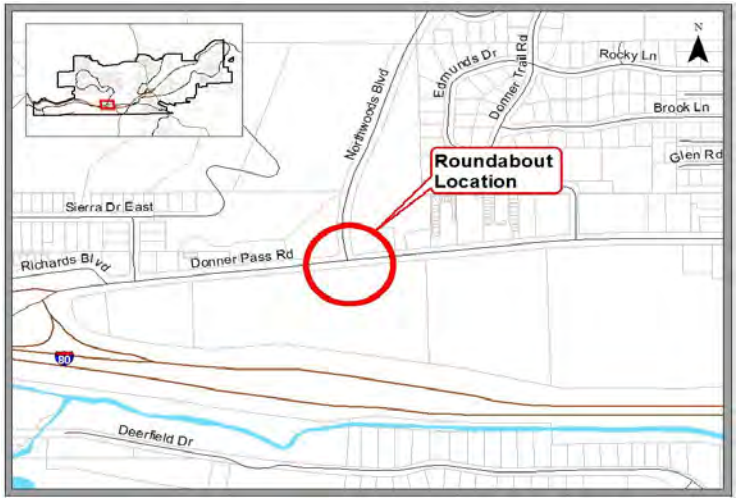
Northwoods Boulevard/Donner Pass Road Roundabout — C1608

PROJECT CATEGORY: Roundabout & Intersection Projects

RESPONSIBLE DEPARTMENT: Public Works - Engineering

PROJECT BEGIN DATE: FY 16/17 **ESTIMATED COMPLETION:** FY 22/23

COUNCIL PRIORITY: Town Infrastructure



PROJECT DESCRIPTION:
Design and construction of a roundabout at the intersection of Donner Pass Road and Northwoods Boulevard. Additional expense incurred in FY18/19 for land acquired from private property owner and TTUSD.

REASON FOR OR BENEFITS OF PROJECT:
Project will provide an overall increase in level of service to this intersection.

OPERATIONAL COST IMPACTS:
Anticipated annual maintenance cost of $10,000 for landscaping and lighting.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
General Fund	$ 571,566	$ 23,750	$ 23,750	$ -	$ -	$ -	$ -	$ -	$ -	$ 595,316
Private Contributions	$ 200	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 200
Unfunded	$ -	$ 995,000	$ -	$ -	$ 996,250	$ 3,560,000	$ -	$ -	$ -	$ 4,556,250
TOTAL:	**$ 571,766**	**$ 1,018,750**	**$ 23,750**	**$ -**	**$ 996,250**	**$ 3,560,000**	**$ -**	**$ -**	**$ -**	**$ 5,151,766**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Right-of-Way Acquisition	$ 556,818	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 556,818
Planning & Design	$ 14,948	$ 253,750	$ 23,750	$ -	$ 256,250	$ -	$ -	$ -	$ -	$ 294,948
Construction Management	$ -	$ 25,000	$ -	$ -	$ -	$ 60,000	$ -	$ -	$ -	$ 60,000
Construction	$ -	$ 740,000	$ -	$ -	$ 740,000	$ 3,500,000	$ -	$ -	$ -	$ 4,240,000
TOTAL:	**$ 571,766**	**$ 1,018,750**	**$ 23,750**	**$ -**	**$ 996,250**	**$ 3,560,000**	**$ -**	**$ -**	**$ -**	**$ 5,151,766**

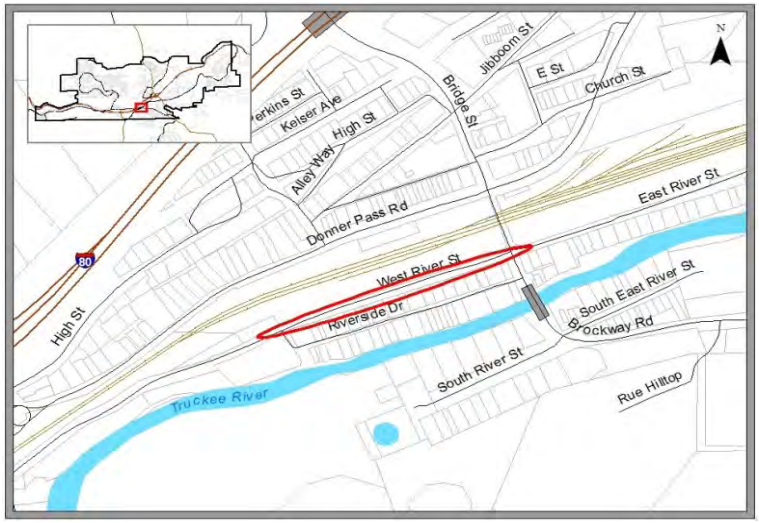
West River Street Streetscape Improvement Project — C1703

PROJECT CATEGORY: Streetscape Improvement Projects

RESPONSIBLE DEPARTMENT: Public Works - Engineering

PROJECT BEGIN DATE: FY 18/19 **ESTIMATED COMPLETION:** FY 23/24

COUNCIL PRIORITY: Infrastructure, Community Connectivity



PROJECT DESCRIPTION:

Design and construction of streetscape improvements (curb, gutter, sidewalk, landscaping, utility undergrounding, parking improvements) on West River Street from Bridge Street to Mill Street/Riverside Drive intersection. The Project has five components including: undergrounding utilities; Jax Diner parking lot improvements; north side sidewalk; south side sidewalk; and Mill Street parking lot. Construction includes one pedestrian median island. Acquisition of parking lot areas is budgeted in C1706 Town Property Acquisitions.

REASON FOR OR BENEFITS OF PROJECT:

Improving the roadway/streetscape connections in downtown.

OPERATIONAL COST IMPACTS:

Ongoing sidewalk and crossing maintenance expense once constructed. Current Council policy would require the formation of a Community Facilities Maintenance District to fund ongoing maintenance.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
General Fund	$ 207,771	$ 100,000	$ 100,000	$ 200,000	$ 1,800,000	$ 2,500,000	$ -	$ -	$ -	$ 4,807,771
AHSC Grant	$ -	$ -	$ -	$ -	$ 500,000	$ -	$ -	$ -	$ -	$ 500,000
Streetscape Designation	$ 143,254	$ 300,000	$ 200,000	$ 350,000	$ 1,250,000	$ -	$ -	$ -	$ -	$ 1,943,254
TOTAL:	**$ 351,025**	**$ 400,000**	**$ 300,000**	**$ 550,000**	**$ 3,550,000**	**$ 2,500,000**	**$ -**	**$ -**	**$ -**	**$ 7,251,025**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Planning & Design	$ 351,025	$ 400,000	$ 300,000	$ 350,000	$ -	$ -	$ -	$ -	$ -	$ 1,001,025
Construction	$ -	$ -	$ -	$ 200,000	$ 3,550,000	$ 2,500,000	$ -	$ -	$ -	$ 6,250,000
TOTAL:	**$ 351,025**	**$ 400,000**	**$ 300,000**	**$ 550,000**	**$ 3,550,000**	**$ 2,500,000**	**$ -**	**$ -**	**$ -**	**$ 7,251,025**

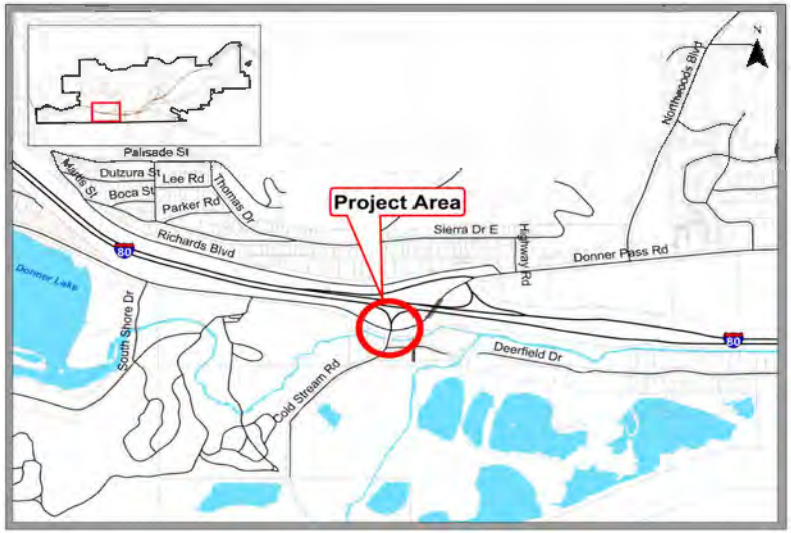
I-80/Donner Pass Road/Coldstream Road Roundabout C1712

PROJECT CATEGORY: Roundabout & Intersection Projects

RESPONSIBLE DEPARTMENT: Public Works - Engineering

PROJECT BEGIN DATE: FY 16/17 **ESTIMATED COMPLETION:** FY 21/22

COUNCIL PRIORITY: Town Infrastructure



PROJECT DESCRIPTION:

Design and construction of a single-lane roundabout at the intersection of Interstate 80/Donner Pass Road/Coldstream Road. The Developer will act as a conduit in securing Affordable Housing Sustainable Communities (AHSC) grant funding in the amount of $1.3 million for the project. Developer will also finance construction costs up to $3,060,000, and the Town will reimburse the costs using AB1600 Traffic Impact Fees (at a minimum of 15% of the total costs per year until repaid).

REASON FOR OR BENEFITS OF PROJECT:

Project will provide an overall improvement to the level of service at this intersection.

OPERATIONAL COST IMPACTS:

Anticipated annual maintenance cost of $10,000 for landscaping, lighting, and sidewalk snow removal.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Traffic Impact Fees Fund	$ 294,405	$ 261,876	$ 261,876	$ -	$ 659,578	$ 659,578	$ 659,578	$ 659,578	$ 1,758,878	$ 4,953,471
Developer Funding	$ -	$ 2,180,000	$ 200,000	$ 5,497,190	$ (659,578)	$ (659,578)	$ (659,578)	$ (659,578)	$ (1,758,878)	$ 1,300,000
TOTAL:	**$ 294,405**	**$ 2,441,876**	**$ 461,876**	**$ 5,497,190**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 6,253,471**

** Affordable Housing and Sustainable Community Grant Funds (AHSC Program Funds)*

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Design & Permitting	$ 294,405	$ 261,876	$ 261,876	$ -	$ -	$ -	$ -	$ -	$ -	$ 556,281
Construction	$ -	$ 2,180,000	$ 200,000	$ 5,497,190	$ -	$ -	$ -	$ -	$ -	$ 5,697,190
TOTAL:	**$ 294,405**	**$ 2,441,876**	**$ 461,876**	**$ 5,497,190**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 6,253,471**

TRACKING OF LOAN FROM DEVELOPER	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26
Balance of Loan from Developer	$ -	$ -	$ -	$ 4,397,190	$ 3,737,612	$ 3,078,034	$ 2,418,456	$ 1,758,878	$ -
Traffic Impact Fees Fund	$ -	$ -	$ -	$ -	$ (659,578)	$ (659,578)	$ (659,578)	$ (659,578)	$ (1,758,878)

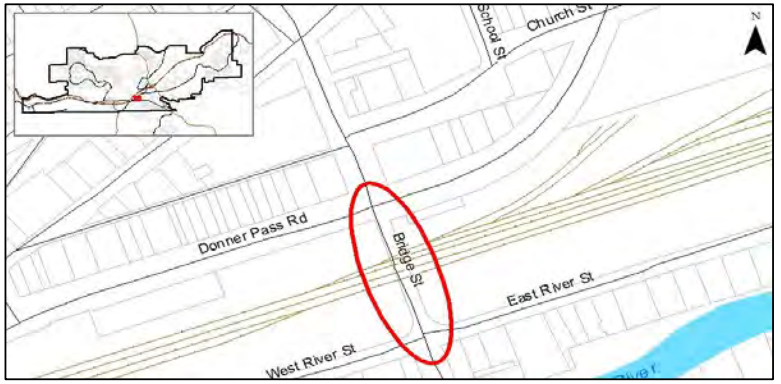
Reimagine Bridge Street — C1805

PROJECT CATEGORY: Roundabout & Intersection Projects

RESPONSIBLE DEPARTMENT: Public Works - Engineering

PROJECT BEGIN DATE: FY 17/18 **ESTIMATED COMPLETION:** 22/23

COUNCIL PRIORITY: Infrastructure, Community Connectivity



PROJECT DESCRIPTION:

Evaluation, design and construction of improvements to the Bridge Street/Donner Pass Road and Bridge Street/West River Street intersections. Improvements are anticipated to include traffic signals, sidewalks, crosswalks, pre-emption infrastructure, and railroad gates. Project goals consider traffic capacity, pedestrian/bicycle facilities, safety, aesthetics, and ability to implement a Union Pacific Railroad "Quiet Zone". $375,000 is the estimated additional cost for the quiet zone.

REASON FOR OR BENEFITS OF PROJECT:

Traffic capacity and pedestrian improvements.

OPERATIONAL COST IMPACTS:

Anticipated annual maintenance cost of $10,000 for landscaping, lighting, and sidewalk snow removal.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Traffic Impact Fees Fund	$ 526,282	$ 600,000	$ 450,000	$ 1,950,000	$ 4,100,000	$ -	$ -	$ -	$ -	$ 7,026,282
General Fund	$ -	$ -	$ -	$ -	$ 375,000	$ -	$ -	$ -	$ -	$ 375,000
TOTAL:	**$ 526,282**	**$ 600,000**	**$ 450,000**	**$ 1,950,000**	**$ 4,475,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 7,401,282**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Planning & Design	$ 526,282	$ 500,000	$ 450,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 976,282
Acquisition	$ -	$ 100,000	$ -	$ 100,000	$ -	$ -	$ -	$ -	$ -	$ 100,000
Construction	$ -	$ -	$ -	$ 1,850,000	$ 4,475,000	$ -	$ -	$ -	$ -	$ 6,325,000
TOTAL:	**$ 526,282**	**$ 600,000**	**$ 450,000**	**$ 1,950,000**	**$ 4,475,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 7,401,282**

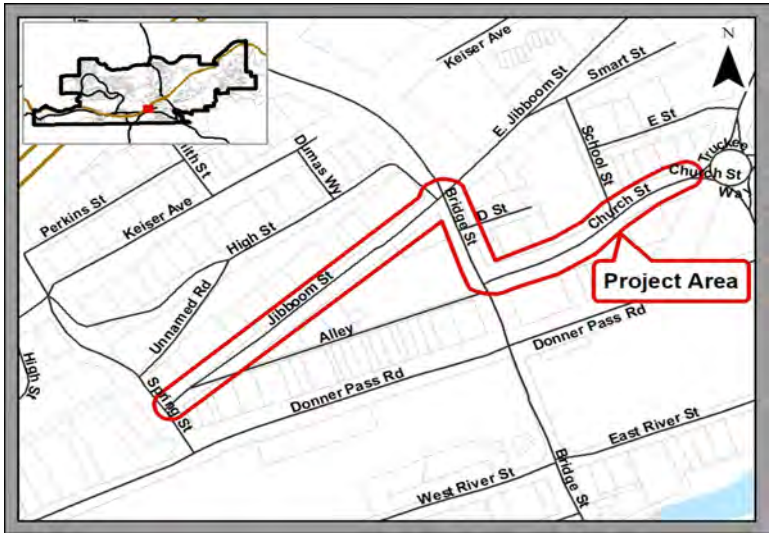
Jibboom, Bridge, and Church Streetscape Improvements — C1806

PROJECT CATEGORY: Streetscape Improvement Projects

RESPONSIBLE DEPARTMENT: Public Works - Engineering

PROJECT BEGIN DATE: FY 22/23 **ESTIMATED COMPLETION:** FY 23/24

COUNCIL PRIORITY: Infrastructure, Community Connectivity



PROJECT DESCRIPTION:

Design and construction of streetscape improvements (curb, gutter, sidewalk, landscaping, utility undergrounding, parking improvements) on Jibboom Street (between Spring Street and Bridge Street), Bridge Street (between Church Street to the north side of Jibboom Street at the Trout Creek Pocket Park), and Church Street (between Donner Pass Road and Bridge Street).

REASON FOR OR BENEFITS OF PROJECT:

Improving the roadway and streetscape connections in downtown.

OPERATIONAL COST IMPACTS:

Ongoing sidewalk and crossing maintenance expense once constructed. Current Council policy would require the formation of a Community Facilities District to fund ongoing maintenance.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
General Fund	$ -	$ -	$ -	$ -	$ 200,000	$ 300,000	$ 300,000	$ -	$ -	$ 800,000
Unfunded	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,500,000	$ -	$ 5,500,000
TOTAL:	**$ -**	**$ -**	**$ -**	**$ -**	**$ 200,000**	**$ 300,000**	**$ 300,000**	**$ 5,500,000**	**$ -**	**$ 6,300,000**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Planning & Design	$ -	$ -	$ -	$ -	$ 200,000	$ 300,000	$ 300,000	$ -	$ -	$ 800,000
Construction*	$ -	$ -	$ -	$ -	$ -	.	$ -	$ 5,500,000	$ -	$ 5,500,000
TOTAL:	**$ -**	**$ -**	**$ -**	**$ -**	**$ 200,000**	**$ 300,000**	**$ 300,000**	**$ 5,500,000**	**$ -**	**$ 6,300,000**

*Concept cost estimate without the benefit of any design or project development.

DPR Corridor Improvement Study (Between Donner Memorial and East End Donner Lake) C1823

PROJECT CATEGORY: Streetscape Improvement Projects

RESPONSIBLE DEPARTMENT: Public Works - Engineering

PROJECT BEGIN DATE: FY 18/19 **ESTIMATED COMPLETION:** FY22/23

COUNCIL PRIORITY: Infrastructure, Community Connectivity

PROJECT DESCRIPTION:

A Draft parking demand analysis and parking improvement feasibility study was prepared for parking improvements along Donner Pass Road adjacent to the Tahoe Donner Beach Club Marina and Donner Memorial State Park. Project includes a short term improvement to place boulders and signage to restrict on-street parking to parallel parking as well as design and construction of formal parallel parking and sidewalk.

REASON FOR OR BENEFITS OF PROJECT:

Currently parking occurs along Donner Pass Road adjacent to the Tahoe Donner Beach Club and Donner Memorial State Park. During busy summer days, the parking results in traffic congestion and inhibits flow of vehicles, pedestrians, and bicyclists. Parking improvements would provide direct benefit to the residents of the Tahoe Donner Town Special Service Area (TSSA 1) and will be open to the general public.

OPERATIONAL COST IMPACTS:

None identified at this time but additional costs may occur depending on improvement.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
General Fund	$ -	$ -	$ 25,000	$ 15,000	$ -	$ -	$ -	$ -	$ -	$ 40,000
Tahoe Donner TSSA Fund	$ 28,747	$ 115,000	$ 20,000	$ 15,000	$ -	$ -	$ -	$ -	$ -	$ 63,747
Measure R Sales Tax Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Measure V Sales Tax Fund	$ -	$ -	$ 25,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 25,000
Unfunded	$ -	$ -	$ -	$ -	$ 250,000	$ 1,750,000	$ -	$ -	$ -	$ 2,000,000
TOTAL:	**$ 28,747**	**$ 115,000**	**$ 70,000**	**$ 30,000**	**$ 250,000**	**$ 1,750,000**	**$ -**	**$ -**	**$ -**	**$ 2,128,747**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Planning	$ 28,747	$ 15,000	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 48,747
Design	$ -	$ 100,000	$ -	$ 30,000	$ 250,000	$ -	$ -	$ -	$ -	$ 280,000
Construction*	$ -	$ -	$ 50,000	$ -	$ -	$ 1,750,000	$ -	$ -	$ -	$ 1,800,000
TOTAL:	**$ 28,747**	**$ 115,000**	**$ 70,000**	**$ 30,000**	**$ 250,000**	**$ 1,750,000**	**$ -**	**$ -**	**$ -**	**$ 2,128,747**

*Concept cost estimate without the benefit of any design or project development.

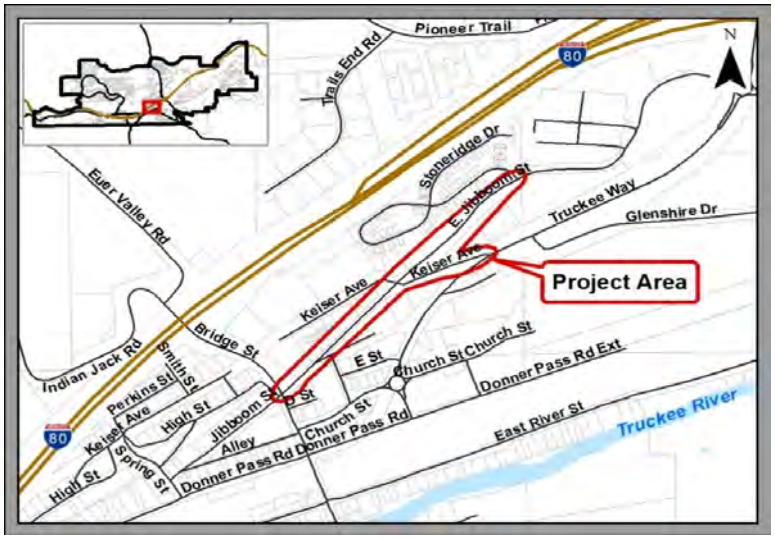
Jibboom Street Sidewalk Feasibility Study and Improvement Project — C1824

PROJECT CATEGORY: Studies & Plan Updates

RESPONSIBLE DEPARTMENT: Public Works - Engineering

PROJECT BEGIN DATE: FY 19/20 **ESTIMATED COMPLETION:** FY 23/24

COUNCIL PRIORITY: Infrastructure, Community Connectivity



PROJECT DESCRIPTION:

Prepare a study to evaluate potential pedestrian/bicycle improvements on Jibboom Street between Bridge Street and the Stoneridge Development, including several alternatives such as widening, the conversion to a one-way street, and improvements to the Keiser Avenue/Jibboom Street intersection.

REASON FOR OR BENEFITS OF PROJECT:

With the addition of the new Coburn Crossing development east of the Stoneridge Development and the associated extension of Jibboom Street to the Truckee Way/Stockrest Springs intersection, vehicle, pedestrian and bicycle activity is expected to increase along Jibboom Street east of Bridge Street. Project will evaluate potential improvements. Improvements would potentially improve vehicle, pedestrian, and bicycle infrastructure, circulation and safety.

OPERATIONAL COST IMPACTS:

None identified at this time but additional costs may occur depending on improvement.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
General Fund	$ -	$ 50,000	$ 100,000	$ 167,125	$ 75,000	$ -	$ -	$ -	$ -	$ 342,125
Unfunded	$ -	$ -	$ -	$ -	$ 300,000	$ 700,000	$ -	$ -	$ -	$ 1,000,000
TOTAL:	**$ -**	**$ 50,000**	**$ 100,000**	**$ 167,125**	**$ 375,000**	**$ 700,000**	**$ -**	**$ -**	**$ -**	**$ 1,342,125**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Study Preparation	$ -	$ 50,000	$ 100,000	$ 92,125	$ -	$ -	$ -	$ -	$ -	$ 192,125
Engineering	$ -	$ -	$ -	$ 75,000	$ 75,000	$ -	$ -	$ -	$ -	$ 150,000
Construction*	$ -	$ -	$ -	$ -	$ 300,000	$ 700,000	$ -	$ -	$ -	$ 1,000,000
TOTAL:	**$ -**	**$ 50,000**	**$ 100,000**	**$ 167,125**	**$ 375,000**	**$ 700,000**	**$ -**	**$ -**	**$ -**	**$ 1,342,125**

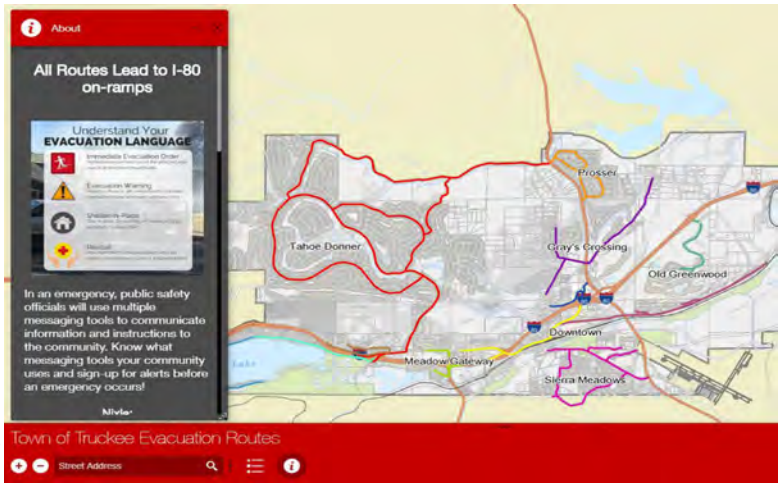
Emergency Evacuation Planning — C1913

PROJECT CATEGORY: Studies & Plan Updates

RESPONSIBLE DEPARTMENT: Public Safety - Support Services

PROJECT BEGIN DATE: FY 19/20 **ESTIMATED COMPLETION:** Ongoing

COUNCIL PRIORITY: Wildfire Mitigation



PROJECT DESCRIPTION:

Emergency evacuation planning, including an evaluation of evacuation routes and estimated time to evacuate residential areas under various scenarios such as time of year and time of day.

REASON FOR OR BENEFITS OF PROJECT:

This study will inform the Police Department and other local and regional agencies involved in emergency services to develop evacuation plans and to enhance our Emergency Operations Plan that was last updated in 2011. Once updated, the plan will be revised every 5 years.

OPERATIONAL COST IMPACTS:

The operational cost impacts will be determined based on the outcomes of the study.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
General Fund	$ -	$ 100,000	$ 30,000	$ 100,000	$ -	$ -	$ -	$ -	$ 100,000	$ 230,000
Glenshire TSSA Fund	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tahoe Donner TSSA Fund	$ -	$ 30,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL:	**$ -**	**$ 150,000**	**$ 30,000**	**$ 100,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 100,000**	**$ 230,000**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Plan Study	$ -	$ 150,000	$ 30,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 30,000
Emergency Operations Plan		$ -	$ -	$ 100,000	$ -	$ -	$ -	$ -	$ 100,000	$ 200,000
										$ -
TOTAL:	**$ -**	**$ 150,000**	**$ 30,000**	**$ 100,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 100,000**	**$ 230,000**

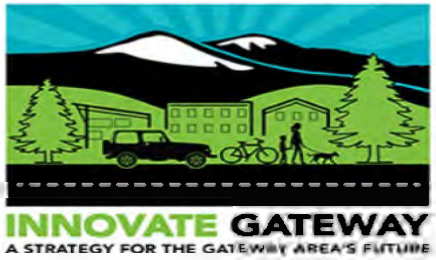
Innovate Gateway — C1917

PROJECT CATEGORY: Studies & Plan Updates

RESPONSIBLE DEPARTMENT: Community Development - Planning

PROJECT BEGIN DATE: FY 20/21 **ESTIMATED COMPLETION:** FY 21/22

COUNCIL PRIORITY: Infrastructure, Community Connectivity



PROJECT DESCRIPTION:

The Town was awarded a $250,000 Sustainable Communities Grant from Caltrans to create an integrated land use, urban design and sustainable transportation plan for Donner Pass Road (DPR) from I-80/Coldstream Road to the McIver Roundabout in historic downtown Truckee. This plan, titled "Innovate Gateway," will include complete streets, smart mobility and multi-modal transportation supporting the development of new affordable housing. The purpose is to evaluate and update adjacent land uses to complement the Town's recent complete streets and sustainable transportation project, "Envision DPR," to create development proformas and incentives to encourage redevelopment, and to develop a complete streets conceptual design plan for the eastern segment of DPR from SR 89 to McIver Crossing. This plan will inform the General Plan Update currently underway and is primarily being developed by an urban design consulting firm.

REASON FOR OR BENEFITS OF PROJECT:

This grant provide an opportunity to take a close look at a 2-mile segment of Donner Pass Road that carries a significant amount of traffic, but has not seen the same level of investment as other parts of Truckee. The goal is to create an integrated land use plan that focuses on a complete streets concept with integrated higher density housing and links to jobs and services. Because this section of town has many underutilized sites and lacks more current mixed-use development, this plan creates an opportunity to inform policy decisions about how to incentivize reinvestment into this corridor.

OPERATIONAL COST IMPACTS

Staff time will be required to assistant the consultant in preparing the plan along with community engagement. A portion of staff's time is covered under the grant administration. The required Town match is 11.47%, paid out of the General Fund.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
General Fund	$ 565	$ 24,661	$ 21,610	$ 6,500	$ -	$ -	$ -	$ -	$ -	$ 28,675
Sustainable Communities Grant	$ 4,359	$ 190,340	$ 175,000	$ 41,966	$ -	$ -	$ -	$ -	$ -	$ 221,325
TOTAL:	**$ 4,924**	**$ 215,000**	**$ 196,610**	**$ 48,466**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 250,000**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Consultant	$ 4,359	$ 175,000	$ 175,000	$ 41,966	$ -	$ -	$ -	$ -	$ -	$ 221,325
Staff Administration	$ 565	$ 40,000	$ 21,610	$ 6,500	$ -	$ -	$ -	$ -	$ -	$ 28,675
TOTAL:	**$ 4,924**	**$ 215,000**	**$ 196,610**	**$ 48,466**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 250,000**

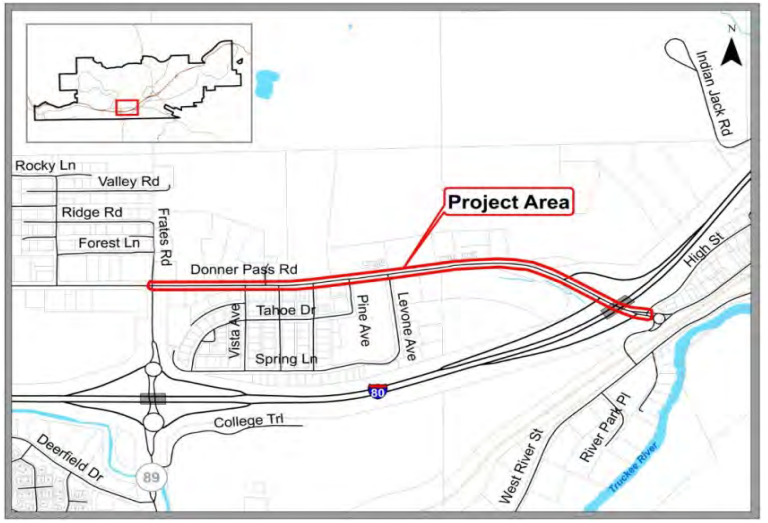
Envision DPR - Eastern Segment Improvements — C2006

PROJECT CATEGORY: Streetscape Improvement Projects

RESPONSIBLE DEPARTMENT: Public Works - Engineering

PROJECT BEGIN DATE: FY 21/22 **ESTIMATED COMPLETION:** FY 25/26

COUNCIL PRIORITY: Infrastructure, Community Connectivity



PROJECT DESCRIPTION:

Planning, design, and construction of streetscape and utility undergrounding improvements on Donner Pass Road between Frates Lane and the McIver roundabout. This project would include a public outreach process to inform a conceptual corridor plan, similar to the western segment efforts.

REASON FOR OR BENEFITS OF PROJECT:

Safety and aesthetic improvements of Donner Pass Road corridor.

OPERATIONAL COST IMPACTS:

Ongoing sidewalk and crossing maintenance expense once constructed. Current Council policy would require the formation of a community facilities maintenance district to fund ongoing maintenance.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
General Fund	$ -	$ -	$ -	$ 150,000	$ 150,000	$ 900,000	$ -	$ -	$ -	$ 1,200,000
Utility Reimbursement	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,500,000	$ -	$ -	$ 1,500,000
Unfunded	$ -	$ -	$ -	$ -	$ -	$ 2,400,000	$ 2,700,000	$ 5,000,000	$ -	$ 10,100,000
TOTAL:	**$ -**	**$ -**	**$ -**	**$ 150,000**	**$ 150,000**	**$ 3,300,000**	**$ 4,200,000**	**$ 5,000,000**	**$ -**	**$ 12,800,000**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Planning & Environmental Review	$ -	$ -	$ -	$ 150,000	$ 150,000		$ -	$ -	$ -	$ 300,000
TDPUD Conduit Acquisition	$ -	$ -	$ -	$ -	$ -	$ 550,000	$ -	$ -	$ -	$ 550,000
Pedestrian Imp. and Utility Design	$ -	$ -	$ -	$ -	$ -	$ 900,000	$ -	$ -	$ -	$ 900,000
Utility Undergrounding Construction	$ -	$ -	$ -	$ -	$ -	$ 1,850,000	$ 2,700,000	$ -	$ -	$ 4,550,000
Pedestrian Imp. Construction	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,500,000	$ 5,000,000	$ -	$ 6,500,000
TOTAL:	**$ -**	**$ -**	**$ -**	**$ 150,000**	**$ 150,000**	**$ 3,300,000**	**$ 4,200,000**	**$ 5,000,000**	**$ -**	**$ 12,800,000**

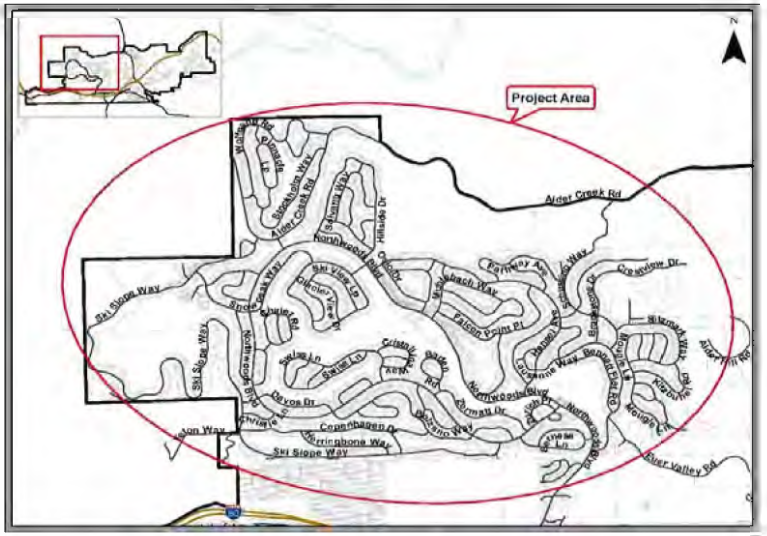
Tahoe Donner Roadways Brushing and Chipping Project — C2008

PROJECT CATEGORY: Miscellaneous Projects

RESPONSIBLE DEPARTMENT: Public Works - Roads & Snow

PROJECT BEGIN DATE: FY 20/21 **ESTIMATED COMPLETION:** FY 20/21

COUNCIL PRIORITY: Wildfire Mitigation



PROJECT DESCRIPTION:
Project would consist of vegetation removal and chipping along roadways in Tahoe Donner using Truckee Special Service Area #1 (Tahoe Donner) Funds.

REASON FOR OR BENEFITS OF PROJECT:
The removal of vegetation along the roadways will improve defensible space, visibility of signs, maintenance of clear zones, and winter road maintenance/snow removal.

OPERATIONAL COST IMPACTS
None.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Tahoe Donner TSSA Fund	$ 418,856	$ 1,150,000	$ 800,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,218,856
TOTAL:	**$ 418,856**	**$ 1,150,000**	**$ 800,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,218,856**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Construction	$ 418,856	$ 1,150,000	$ 800,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,218,856
TOTAL:	**$ 418,856**	**$ 1,150,000**	**$ 800,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,218,856**

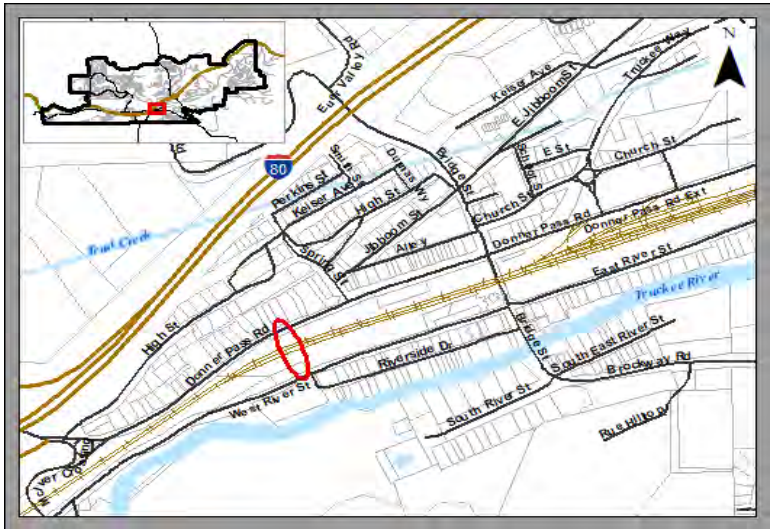
Downtown Railroad Pedestrian Crossing — C2106

PROJECT CATEGORY: Streetscape Improvement Projects

RESPONSIBLE DEPARTMENT: Public Works - Engineering

PROJECT BEGIN DATE: FY 21/22 **ESTIMATED COMPLETION:** FY 24/25

COUNCIL PRIORITY: Infrastructure, Community Connectivity



PROJECT DESCRIPTION:
Design and construction of a pedestrian railroad undercrossing or overcrossing, connecting West River Street to Donner Pass Road west of Spring Street. Project includes an initial feasibility analysis.

REASON FOR OR BENEFITS OF PROJECT:
Improving pedestrian and bicycle connections in downtown.

OPERATIONAL COST IMPACTS:
Ongoing maintenance expense once constructed.

FUNDING SOURCES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
General Fund	$ -	$ -	$ -	$ -	$ -	$ 250,000	$ 750,000	$ -	$ -	$ 1,000,000
Unfunded	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,000,000	$ -	$ 8,000,000
TOTAL:	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 250,000**	**$ 750,000**	**$ 8,000,000**	**$ -**	**$ 9,000,000**

EXPENDITURES	CUMULATIVE TOTAL THRU FY 19/20	FY 20/21 AMENDED BUDGET	FY 20/21 ESTIMATED ACTUAL	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	ESTIMATED AFTER FY 25/26	TOTAL
Planning & Design	$ -	$ -	$ -	$ -	$ -	$ 250,000	$ 750,000	$ -	$ -	$ 1,000,000
Construction*	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,000,000	$ -	$ 8,000,000
TOTAL:	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 250,000**	**$ 750,000**	**$ 8,000,000**	**$ -**	**$ 9,000,000**

*Concept cost estimate without the benefit of any design or project development.