Executive Summary

Lake Tahoe Region Safety Strategy

TAHOE REGIONAL PLANNING AGENCY | lake Tahoe

FINAL
February 2019

1.0 INTRODUCTION


Photo: M. Vollmer

The Lake Tahoe Region Safety Strategy[1] (Safety Strategy) identifies opportunities to reduce the likelihood and risk of crashes on Tahoe roads. The Safety Strategy was funded by grant funds from California Department of Transportation (Caltrans) and Nevada Department of Transportation (Nevada DOT).

From 2012 through 2016, there were approximately 2,672 reported crashes involving some combination of motor vehicles, pedestrians, and bicyclists. Approximately 32 percent or 856 of the reported crashes resulted in at least one injury and approximately 1 percent or 32 of the reported crashes resulted in at least one person killed. This Safety Strategy identifies crash patterns, treatments to address those patterns, and locations for engineering investments to reduce the risk of roadway crashes. The need to reduce traffic fatalities and injuries is a widely understood priority and need at the federal and state levels with increasing amounts of available funding dependent on local agencies' ability to track and show progress towards improving road safety. This Safety Strategy is a document for Tahoe regional partners to help them access state and federal construction funds and to guide and inform transportation projects to address priority locations and proactively incorporate treatments and roadway features known to reduce crash risk in project designs.

As part of the Safety Strategy development process, partners also drafted two memorandums of understanding that establish agreements between TRPA and its partners agencies to, when implementing and operating within the TRPA boundary:

(1) Develop transportation projects in a multimodal, context-sensitive manner, focusing on projects that meet the needs of people biking, walking, taking transit and driving by minimizing the risk of crash-related fatalities and injuries; and

(2) Collaborate to improve the quality of and access to crash data for the Tahoe Region.

These memorandums bring together agencies from across the Tahoe Region and, like the Tahoe watershed, establish the understanding and agreement that the Tahoe Region is uniquely different than

[1] This document serves as the Lake Tahoe Region Safety Strategy and the final Systemic Safety Analysis Report (SSAR) to satisfy Caltrans SSAR Program reporting requirements.

other geographic areas for which partner agencies may be responsible. Because of that unique difference and need to improve road safety in the Tahoe Region, partner agencies will sign the two memorandums of understanding as part of their commitment to reduce the number of people killed and injured in crashes on public roads within the Tahoe Region. This commitment does not supersede any participating agency's process or authorities for developing improvements on its facilities, but rather provides a commitment to collaborate when considering and developing safety improvements.

1.1 OVERVIEW OF SAFETY STRATEGY PROCESS

To jointly address shared roadway safety issues, Tahoe Region partners came together and are committed to continued collaboration and improvement of roadway safety at Lake Tahoe. The below organizations participated in the development of this Safety Strategy.

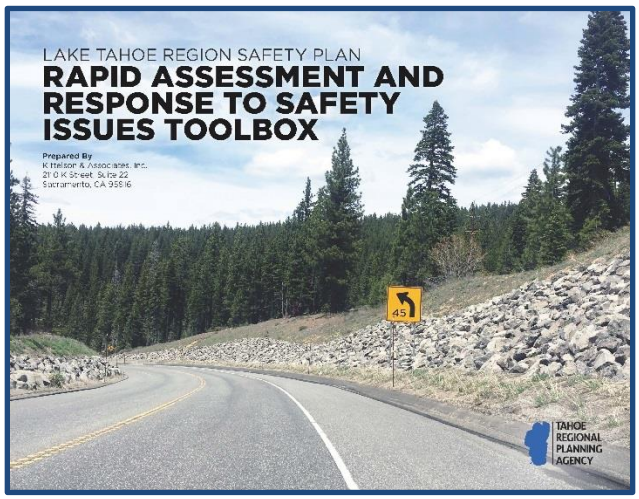
To facilitate this effort TRPA used the following process to develop the Safety Strategy:

- Created a Project Development Team (PDT) comprised of representatives from 15 partner agencies within the Tahoe Region.
- Hired a consulting team to lead the technical work for the Safety Strategy's content and facilitate meetings with the PDT. Kittelson & Associates, Inc. led the consultant work with support from Toole Design Group and Wood Rodgers, Inc. for the bicycle and pedestrian crash analysis and concept design development, respectively.
- Held eight PDT meetings over the course of the Safety Strategy's development, approximately a 12-month total schedule, to engage the PDT in meaningful dicussion and feedback regarding the technical work, core activities, and resulting deliverables.
- In addition to the eight PDT meetings, TRPA engaged individual agency stakeholders in one-on-one conference calls and in-person meetings to discuss and address their specific concerns related to the technical work, findings informing the Safety Strategy's content, and content of the memorandums of understanding developed to help implement recommendations from the technical work.

1.3 DRIVING DECISIONS: CONNECTION TO REGIONAL TRANSPORTATION PLAN, POLICY, PROJECTS, AND FEDERAL PERFORMANCE MEASURES

The Safety Strategy supports and is aligned with the direction of the Tahoe Region established by the 2017 Linking Tahoe: Regional Transportation Plan (RTP) and newly established federal performance measures. In the course of decision-making for the Region, the Safety Strategy, its attachments, and the memorandums of understanding:

- Act as a guide to implement the 2017 RTP goals and policies, especially those policies under Goal 3: Safety and Goal 4: Operations and Congestion Management.
- Provide recommendations for data-derived roadway safety investment projects to be included in future amendments and updates to the RTP, Active Transportation Plan (ATP), local jursisdiction area plans, and state led projects.
- Establish a consistent, mulitmodal, safety-concious, and context sensitive evaluation procedure for considering and developing transportation projects in the Tahoe Region prior to project design and permitting by TRPA.
- Provide an understanding of the overarching crash patterns and trends that should be considered when developing, constructing, and operating transportation infrastructure projects.



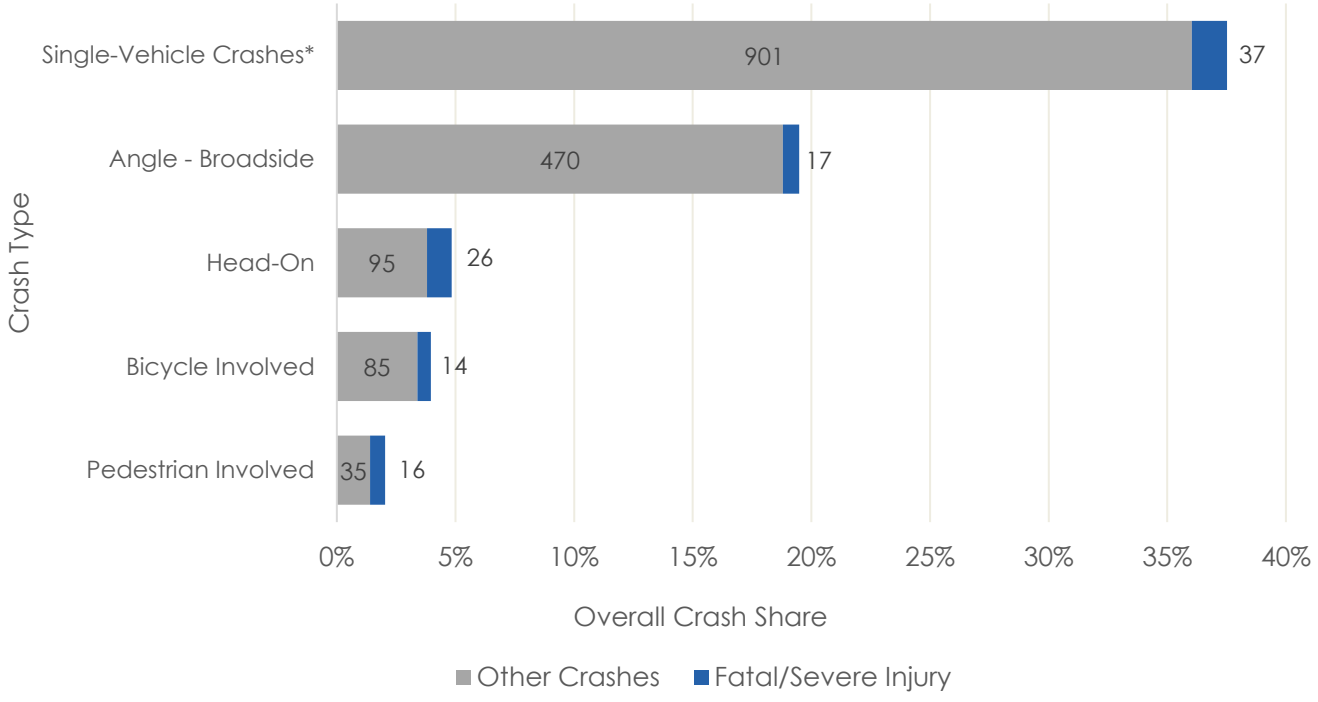
- Provides a toolbox of recommended and proven safety infrastructure countermeasures that are appropriate for Tahoe.
- Establishes a commitment from partners to improve the quality of crash data collected within the Tahoe Region and to create a regional data clearinghouse, via TRPA, to facilitate continuous updates to trend analysis and priority location identification as well as comply with federal performance measures that require regional reporting of traffic fatalities and severe injuries.

1.4 SAFETY ANALYSIS APPROACH AND FINDINGS

The findings and recommendations in this Safety Strategy are based on analyzing crash data from January 1, 2012 through January 31, 2016, roadway characteristics data, and traffic volume data. The California crash data was from the Statewide Integrated Traffic Records System (I-SWITRS) database and UC Berkeley Transportation Injury Mapping System (TIMS). The Nevada crash data was provided to TRPA directly from Nevada Department of Transportation. The roadway characteristics and traffic volume data were obtained from TRPA.

The team organized the crash, roadway, and traffic volume data in a single GIS-based database and analyzed it spatially to identify regionwide crash patterns and trends, the highest-risk corridors and intersections, specific risk factors associated with crashes and to assist in identifying Tahoe appropriate proven safety countermeasures. A severity weighting helped to identify the highest risk locations as the priority locations for which additional and more detailed work could occur such as identifying risk factors, countermeasures, and viable safety projects.

Top Five Crash Types in the Tahoe Region Contributing to Fatalities and Severe Injuries



***Single-vehicle crashes represent similar crash types coded uniquely in Nevada DOT ("non-collision") and California data ("hit object").**

Risk Factors Associated with Higher Risk for Pedestrian and Bicycle Crashes

- Mixed use and tourist designated areas
- Roadways with posted speed limits of 30 to 35 mph
- Roadways with more than three vehicle lanes
- Increases in motor vehicle volumes – most notably volumes above 20,000 Average Daily Travel

Multiple lanes, no bike lanes, limited and non-protected crossings; US 50 & Kahle Drive, NV
Photo: Kittelson

Three-leg stop-control intersection, undivided highway and minor street, no turn storage; North Upper Truckee & San Bernardino
Photo: Kittelson

Risk Factors Associated with Higher Risk for Motor Vehicle Crashes

- Roadways with two vehicle lanes
- Undivided roadways
- Roadways with posted speed limits of 45 mph or greater
- Three-legged minor street[2] stop controlled intersections with the highway as the major street
- Intersections lacking a turn lane pocket on approach

Sample of Recommended Countermeasures Identified for High-Risk Corridors and Intersections[3]

To Address Pedestrian and Bicycle Safety Issues:

- Crosswalk enhancements including: High visibility markings, pedestrian refuge islands, rectangular rapid flashing beacons or other flashing beacon treatment and curb extensions
- Pedestrian scale lighting for crosswalks and intersections

[2] A three-legged minor street intersection is a T-intersection where a lower volume street intersects with a higher volume street.
[3] See Section 9.0 and Section 10.0 for additional details and specifics.

Example: Vehicle Speed Feedback Sign

- A painted stop bar on approach to signalized intersections
- Designated bike lanes or other dedicated space for bicyclists to close gaps in the bicycle network
- Vehicle speed feedback signs to manage motor vehicle speeds
- Enhanced marked crosswalks to connect trip generators on opposite sides of a roadway

To Address Motor Vehicle Safety Issues:

- Vehicle speed feedback signs to manage vehicle speeds
- Chevron signs on horizontal curves
- High friction surface treatment on horizontal curves and downhill grades
- Edgeline and centerline rumble strips
- Enhanced roadside delineation

Recommended Projects to Improve Roadway Safety

Thirty locations and potential countermeasures were identified as recommended projects. Eight locations were advanced for more detailed consideration including concept development and planning-level cost

Example: Pioneer Trail and Edna Street Concept

estimates. The following are the eight locations for which concepts and planning-level cost estimates were developed. Benefit/cost ratios were calculated for the six California locations using the Caltrans Highway Saftey Improvement Program (HSIP) Analyzer Tool from the HSIP Cycle 9 call for projects.[4]

Projects in California:

- Pioneer Trail/Edna Street Intersection: Owned and operated by City of South Lake Tahoe
- Tamarack Avenue/Blackwood Road Intersection: Owned and operated by City of South Lake Tahoe
- Emerald Bay Road (US50/SR89) between F Street and 13th Street: Owned and operated by Caltrans and located in City of South Lake Tahoe
- North Upper Truckee Road/San Bernardino Avenue: Owned and operated by El Dorado County
- US 50 between Old Meyers Grade Road and Echo Summit: Owned and operated by Caltrans and located in El Dorado County
- SR 267 between Brockway Summit and approximately 500 feet east of the Brockway Summit Trailhead: Owned and operated by Caltrans and located in Placer County

Projects in Nevada:

- US 50/Kahle Drive Intersection and Corridor: Owned and operated by Nevada Department of Transportation and located in Douglas County
- US 50/Lakeway Parkway Intersection and Corridor: Owned and operated by Nevada Department of Transportation and located in Douglas County

1.5 NEXT STEPS

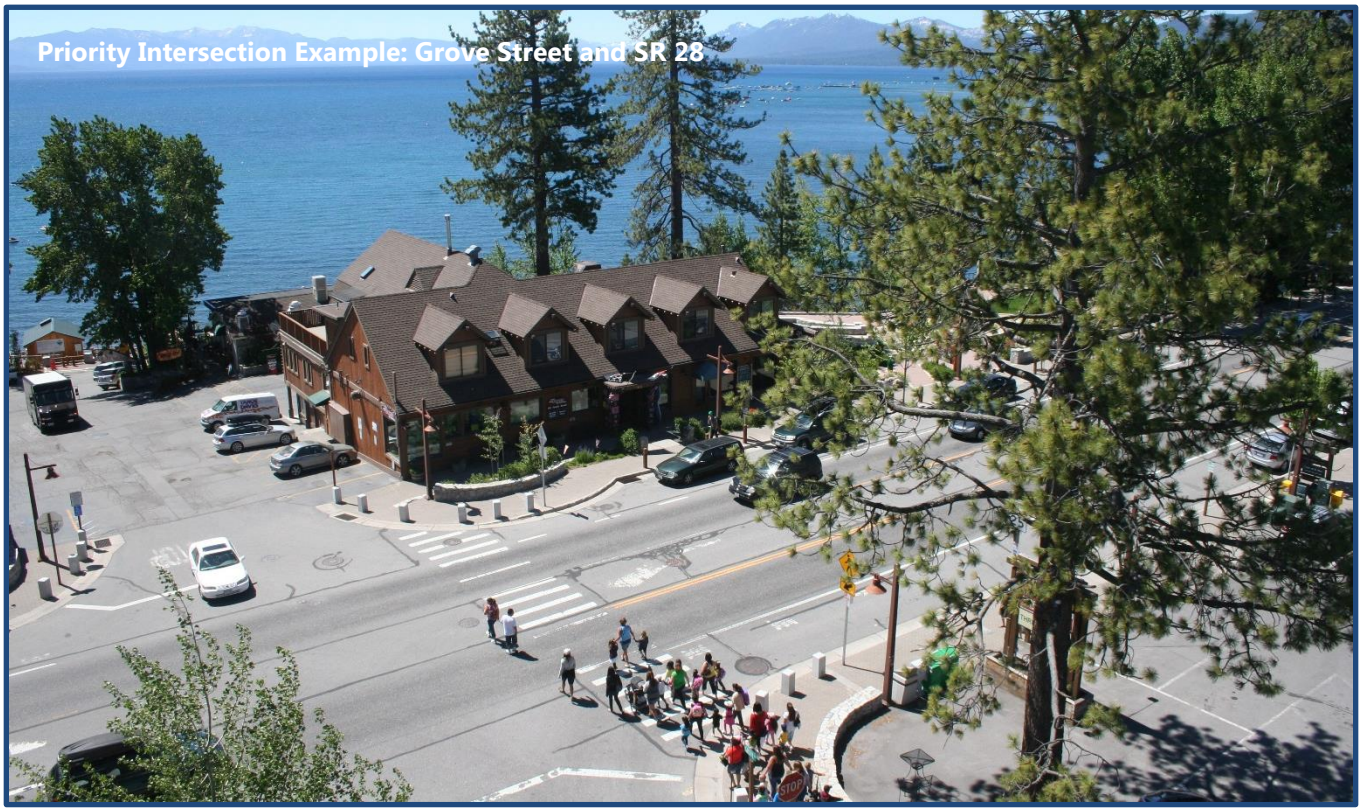
Moving forward, the Safety Strategy will serve as a technical document to be used by TRPA and regional partner agencies within the Tahoe Region. The intent is to inform project design to ensure safety is prioritized, add new projects to appropriate plans to ensure funding eligibility for identified safety improvement locations, implement effective countermeasures, improve crash data quality and access, meet requirements for federally required performance measures, and implement the project evaluation approach to assess and develop transportation projects in the Tahoe Region. Specific recommendations include:

- Implement the high priority projects. Based on the analysis done for the Safety Strategy, these represent the locations in the Tahoe Region with most potential to benefit from engineering countermeasures. This will require inter- and intra-agency coordination.
- Partner with Caltrans and Nevada Department of Transportation to implement enhanced pedestrian crossings across state facilities, including constructing pedestrian refuge islands and other proven safety countermeasures.

[4] Section 10.0 discusses these projects in greater detail.

- Apply the project evaluation approach described in the Performance Evaluation memorandum of understanding to inform transportation project development in the Tahoe Region. This will help create transportation infrastructure that is appropriately sized, thereby reducing the risk for people walking and biking while also helping to reduce the potential for higher than desired vehicle speeds in the off-peak travel periods and motor vehicle related crashes.
- Apply the Rapid Assessment and Response to Safety Issues Toolbox as part of regional and local agency efforts to respond to safety concerns raised by community members and those that are found via safety analysis.
- Work together to improve the quality of and access to crash data across the Tahoe Region consistent with the Data Improvement memorandum of understanding.
- Establish a coordinated emergency and evacuation reponse plan across the jurisdictional boundaries within the Tahoe Region to improve public transparency and identify and find solutions to existing gaps or challenges.
- Re-evaluate Tahoe Region safety performance in three to five years to gauge the impact of the actions taken as a result of this Safety Strategy.

To further enable putting the Safety Strategy into action, partners will sign two memorandums of understanding that outline next steps to continue to improve safety on Lake Tahoe roadways. Additionally, TRPA will update its policies and ordinances as appropriate to ensure safety informs project decision making. Local jurisdictions may need to update their policies and permitting processes to ensure consistency with TRPA.



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