

DRAFT

# U.S. 50 East Shore CORRIDOR MANAGEMENT PLAN

February 2024



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# ACKNOWLEDGMENTS

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# Executive Summary

Placeholder



# INTRODUCTION

The United States Route 50 (U.S. 50) East Shore Corridor Management Plan (CMP) is being led by the Nevada Department of Transportation (NDOT) and is partnering with the following eight agencies: Federal Highway Administration - NV Division (FHWA), Douglas County (DC), Nevada Division of State Parks (NDSP), Nevada Division of State Lands (NDSL), Tahoe Transportation District (TTD), Tahoe Regional Planning Agency (TRPA), United States Forest Service - Lake Tahoe Basin Management Unit (USFS-LTBMU), and Washoe Tribe (WT). The CMP focuses on the 13-mile stretch of U.S. 50 within Douglas County, Nevada along the East Shore of Lake Tahoe, from the crest of the Carson Range at Spooner Summit, extending south and west to the terminus at Stateline Avenue in Stateline, Nevada (**Figure 1**). The corridor is unique serving multiple functions: (a) an intrastate highway stretching from Sacramento, California to Ocean City, Maryland, (b) a regional connection to world-renowned Lake Tahoe recreation and employment destinations, and (c) as a local connection to the unincorporated communities of Stateline, Zephyr Cove, Round Hill Village, Skyland, Lakeridge, Glenbrook, and the incorporated municipality of South Lake Tahoe, California.

## A SAFETY CHALLENGE

Safety is a top priority for this CMP to ensure every user has safe access to their destination. With over one hundred motorist, pedestrian, and bicycle crashes occurring each year in the corridor and 80-percent of the corridor exceeding statewide average crash rates for comparative facilities, the highway is challenged to provide safe transportation for all users. High-speed crashes, residents rear-ended trying to turn into their neighborhood or driveway, visitors unofficially using the highway shoulders as a parking lot and sidewalk, and a lack of transit and bike paths continue to create safety challenges for visitors, residents, and commuters alike. An increase in safety will require slowing speed, addressing turn-movements and on-highway parking, and providing multimodal connectivity, while maintaining efficient access throughout the corridor.

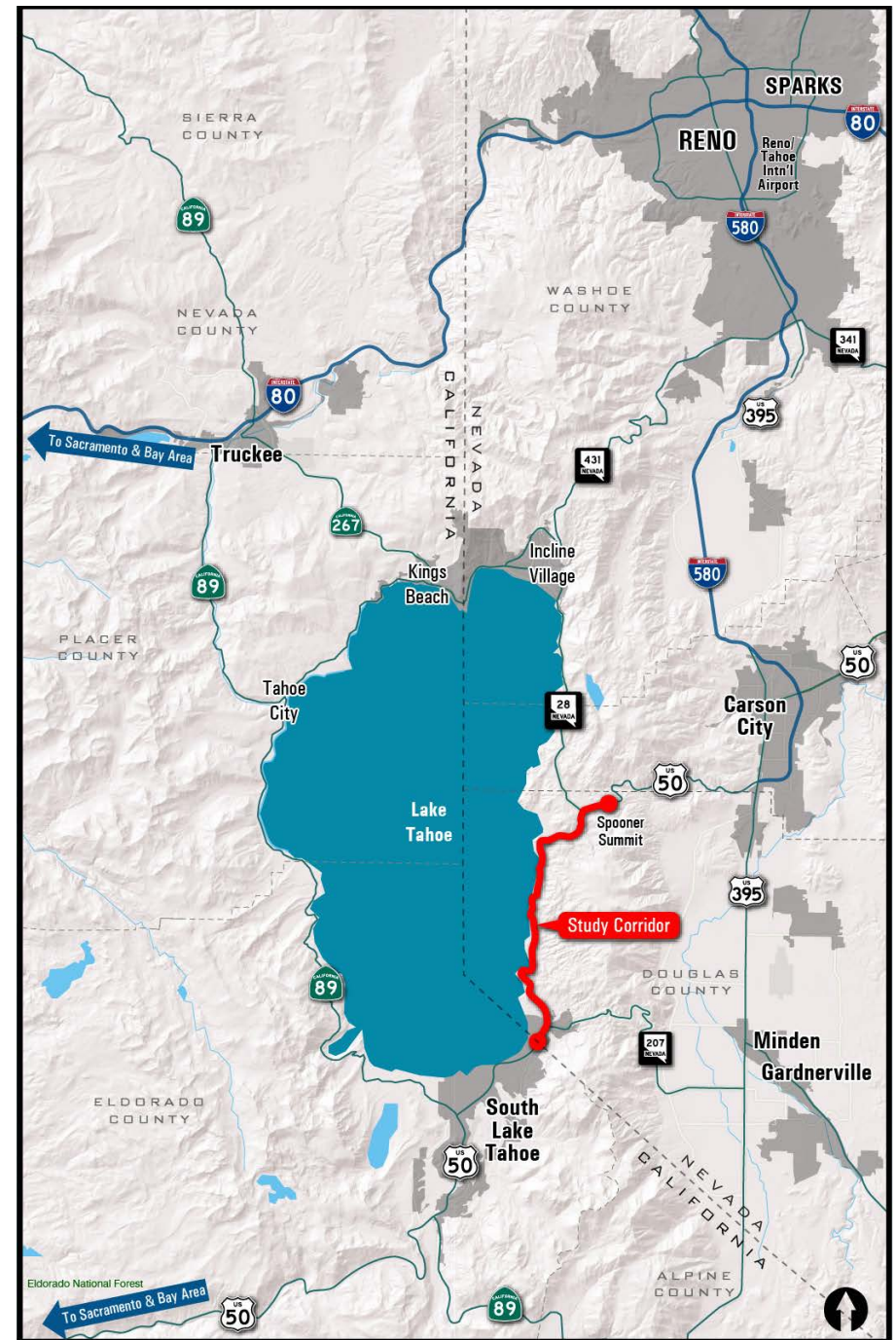


Figure 1: Study Area Vicinity Map



# THE CORRIDOR PLAN

The U.S. 50 East Shore Corridor Management Plan is an integrated, multimodal transportation study to balance mobility and safety enhancements with the unique range of other corridor interests through an ongoing collaboration among stakeholders.

Corridor planning is an organizing framework to support regional transportation policy, align partners, and accelerate project implementation. As outlined in the Linking Tahoe: Corridor Connection Plan (TTD, 2017) and the Lake Tahoe Regional Transportation Plan (TRPA, 2020), the Tahoe Basin is divided into six corridors based on their unique mix of common land use, transportation, and recreation issues and opportunities. This CMP focuses on the U.S. 50 East Shore corridor and is a result of a multi agency collaboration that evaluated challenges and solutions within the corridor, which is consistent with existing Tahoe Regional Planning Agency – Metropolitan Planning Organization (TRPA-MPO) plans, goals, and objectives, as well as goals described in the Lake Tahoe Compact and other guiding documents.

As a U.S. Highway, NDOT and FHWA guiding principles also play a vital role in developing the solutions proposed. The U.S. 50 East Shore CMP is the umbrella document for other plans and projects within the corridor, which establishes a coordinated vision, objectives, performance measures, and implementation strategies. The multimodal recommendations of the CMP are based on regional plans, public and stakeholder input, technical assessment, and maximizing funding opportunities. As projects move forward, the Corridor Management Team, which is comprised of the eight agencies noted above, will be the champion to drive progress while focusing on corridor adaptability, collaborating with stakeholders and the public through the design process, and considering long-term operations and maintenance of the entire corridor.



Figure 2: Study Area Limits



# THE PROJECT PARTNERS

A Project Charter (Volume 2) was developed among NDOT, TRPA, and the partner agencies including TTD, Douglas County, NDSP, NDSL, and the USFS-LTBMU to help guide the implementation of the CMP. These project partners have been involved throughout the development of the CMP and will form the Corridor Management Team going forward.





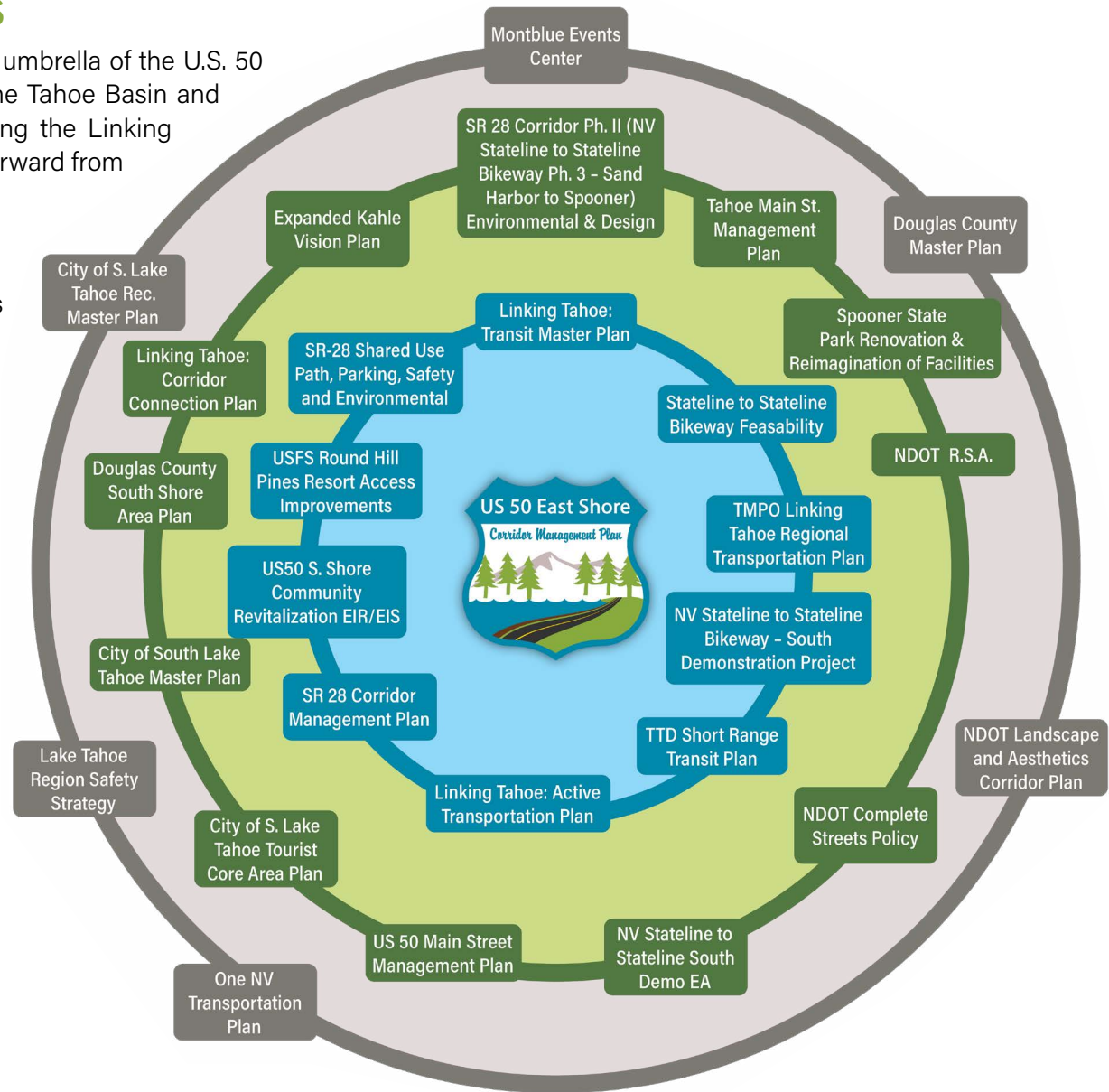
## GUIDING POLICIES, PLANS, AND PROJECTS

Numerous plans, studies, and projects are captured under the umbrella of the U.S. 50 East Shore CMP. The CMP builds upon decades of work in the Tahoe Basin and advances the goals established in this body of work, including the Linking Tahoe 25 Year Transportation Plan vision. Key themes carried forward from previous efforts in the U.S. 50 CMP include:

- Improving safety for all travelers
- Providing and maintaining access to recreation destinations
- Encouraging transit as an alternative to the personal automobile, particularly during peak visitation
- Expanding multimodal transportation options and opportunities
- Managing congestion and reducing overall Vehicle Miles Traveled
- Enhancing the Tahoe experience for visitors and residents alike
- Cultivating economic development throughout the Tahoe Basin
- Reducing environmental impacts

### The Linking Tahoe Regional Transportation Plan focuses on:

- **Transit:** 15-minute service town centers to recreation, 60-minute service neighborhoods to town centers, add inter-regional service
- **Technology:** Connecting people to information on how to travel around Tahoe, supporting electric vehicles
- **Trails:** Increasing trips by foot and bike by providing walking and biking routes.
- **Communities and Corridors:** Corridor planning to connect workers to jobs, visitors to recreation, and residents to town centers and recreation



**Figure 3: Relevant plans, policies, and projects**  
(Note, those closer to the center are more directly relevant)

\*The NDOT U.S. 50 3R Preservation Project in the Lake Tahoe Basin will rehabilitate the existing pavement through the CMP limits providing an initial opportunity for early action improvements identified in this CMP.



# U.S. 50 CMP EXISTING CONDITIONS

The U.S. 50 East Shore Corridor Management Plan (CMP) existing conditions serve a wide range of residents year round as well as tourists with peak trips during the summer and winter seasons. These provide a wide range of challenges which were analyzed utilizing an extensive array of data and

information regarding the study corridor. The following is a brief, info-graphic summary of a few of the key takeaways from this corridor. A full report can be reviewed in Volume 2.

## CHARACTERISTICS



U.S. 50 serves 7 million motorists annually with speed often exceeding the 45 MPH limit on this four-lane, mountainous and curving arterial with numerous driveways, making for challenging mobility conditions.

## RIGHT-OF-WAY



The base corridor right-of-way width is 80-feet, yet varies to over 400-feet in places. However, topography and adjacent development limit the ability to expand into much of the excess right-of-way.

## BICYCLE/PEDESTRIAN MOBILITY



The corridor has limited sidewalks and bike lanes, and the Tahoe East Shore Trail currently ends at Round Hill Pines Resort. Extending it north 10 miles to Spooner Summit either within the U.S. 50 right-of-way or parallel to it is a key challenge of this study.

## TRAFFIC CONDITION MONITORING



NDOT manages 5 dynamic message signs, 5 road weather sensors, 4 cameras, and the highway advisory radio. There are gaps in fiber optics and cellular limiting communications.

## OTHER CORRIDOR PLANS



The U.S. 50 East Shore CMP builds upon the work of over 21 previous plans and projects that align around several important goals.

## INTERSECTIONS



The majority of signalized and high-volume intersections operate at acceptable conditions. However, S.R. 28, and specifically the left turns, are problematic with long queues, resulting in dangerous behavior.

## PUBLIC TRANSIT



Transit is limited to local service within the City of South Lake Tahoe and Kingsbury and regional service connecting to the Carson Valley. Funding constraints make maintaining and expanding transit services a challenge.

## RECREATION



The largest recreation impacts to U.S. 50 operations occur at Zephyr Cove, where summertime roadside parking can extend almost 1 mile. Other locations of spillover parking include Nevada Beach, Round Hill Pines, Cave Rock State Park, Logan Shoals and Spooner Summit.

## PARKING



There are 1,200 existing parking spaces in/near recreation facilities with none meeting average peak demand. The challenge is to provide a multi-modal system, to manage that system for a good visitor experience, and protect Lake Tahoe's resources.



## What we know about the U.S. 50 Corridor:

- Broad range of land use: desolate recreation to developed recreation resorts, housing developments to housing spread out along the shoreline, and pockets of commercial to the casinos at Stateline.
- Land use attracts a mix of users, including residents, visitors, and commuters (primarily workers who cannot afford to live in Tahoe), as well as those passing through on the highway. **Linking Tahoe Plan: 2.6 million annual visitors in the corridor (2014). Internal corridor trips are highest during July from long-term visitors.**
- Public off-highway parking is primarily located in the Stateline and Kahle Drive areas within the parking garages with limited parking at recreation resorts. Shoulder parking is common around the recreation areas given the limited off-highway parking.
- Typical traffic volumes are much higher south of Elks Point Road where there is a concentration of uses approaching the urban core. North of Elks Point Road, typical traffic is more subdued, consisting of residential and commuter trips.
- Crashes in the corridor typically align with the concentration of driveways, intersections, areas of higher speeding, and sharp curves.
- There are no bicycle and pedestrian facilities north of Round Hill Pines Resort.

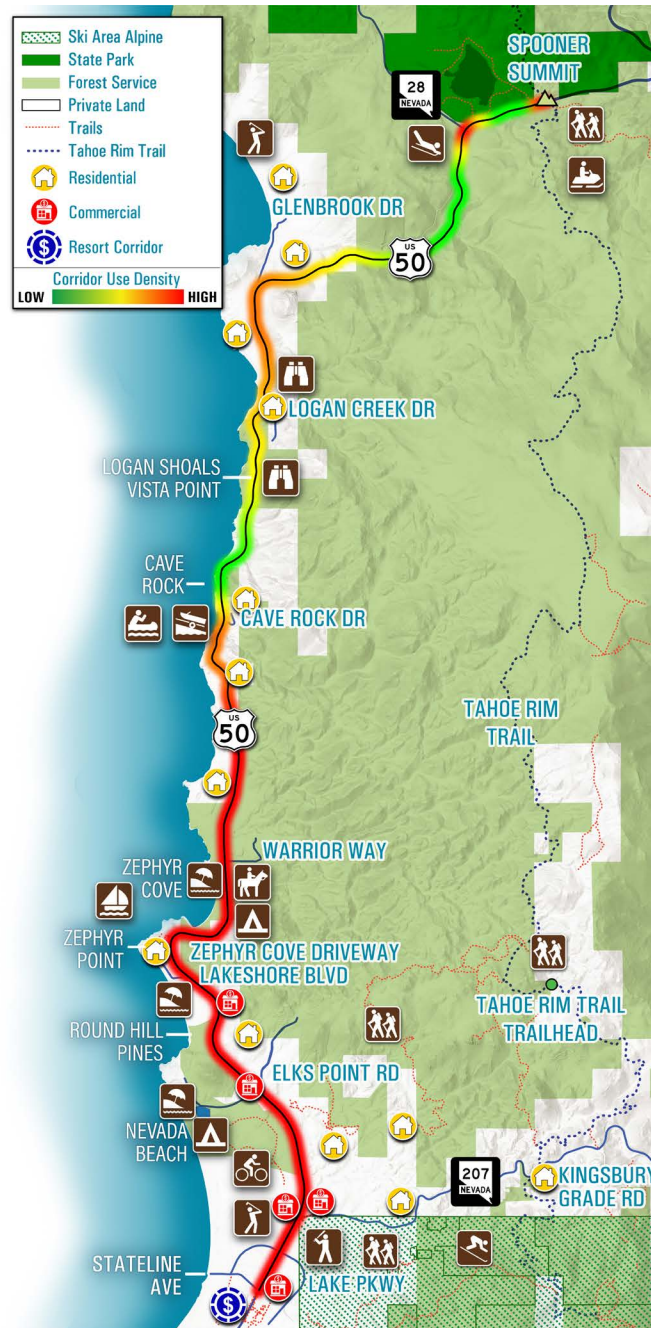


Figure 4: Land Ownership and Recreation Use



Figure 5: Existing Parking Locations

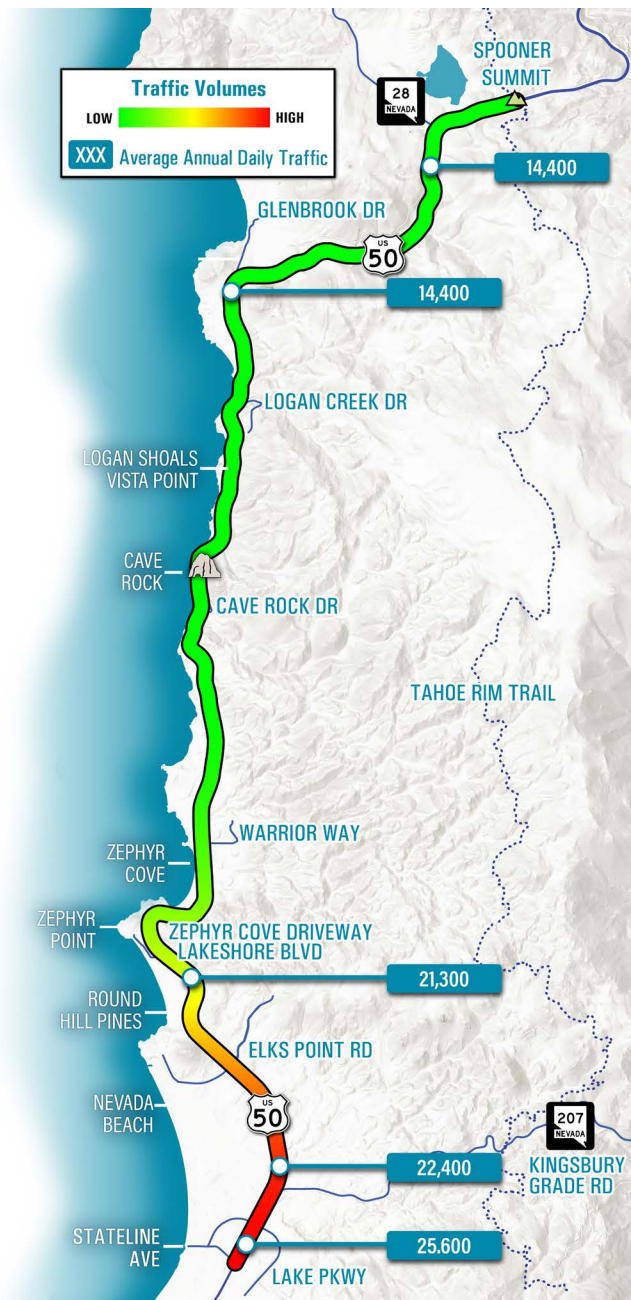


Figure 6: Average Annual Daily Traffic

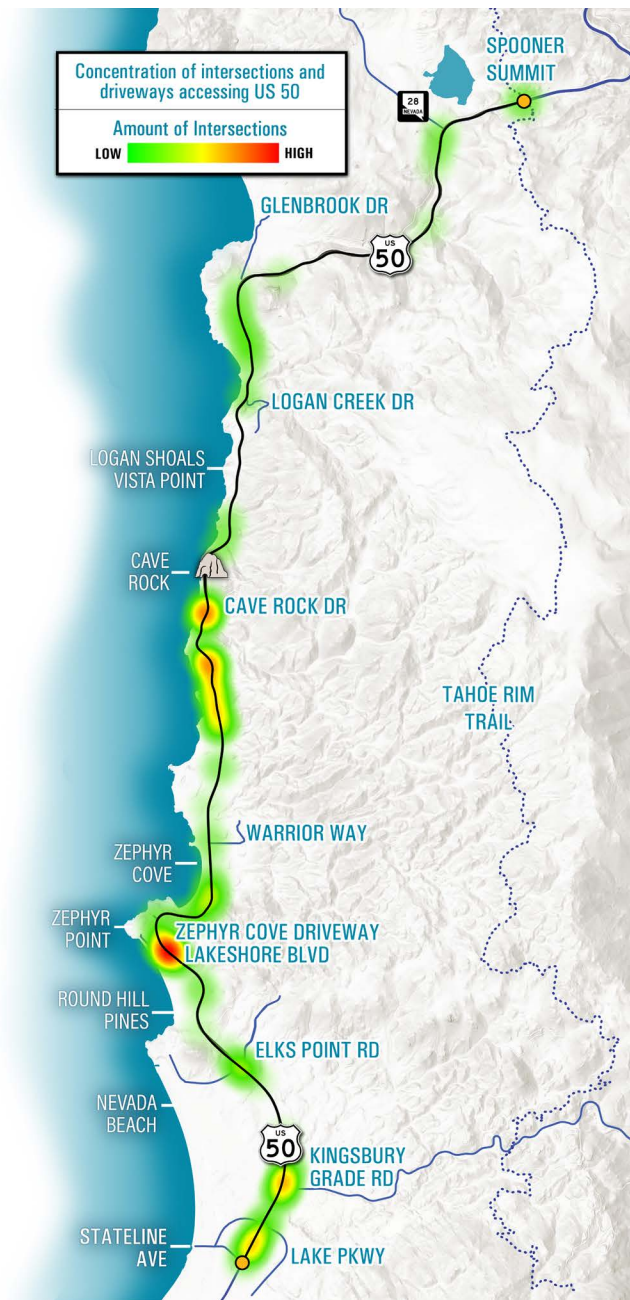


Figure 7: Concentration of intersections and driveways accessing U.S. 50



Figure 8: Concentration of Crash Incidents along the U.S. 50 Corridor



# U.S. 50 CRASH DATA SUMMARY

A summary of crash data was conducted for five years of NDOT data, spanning the period 2015 to 2019. Below are the key takeaways from that summary by corridor segment and intersection

## SEGMENT

1 Over 40% of crashes involved drivers going too fast with 57% of crashes involving a single vehicle.

2 Over 35% of crashes involved drivers going too fast. One fatality associated with alcohol.

3 Common factors include excessive speed, improper lane changes, and failure to stay within lanes. One impairment fatality.

4 Speed a factor in 1/3 of crashes. Most crashes occurred on "Deadman's Curve" near Zephyr Cove.

5 Over 10% of crashes were multi-modal in an area with no roadside bike/ped facilities. Inattention and impairment were notable.

6 Crashes due to inattention and multi-modal crashes may correlate to low light.

General crash characteristics include:

- 30% of crashes involved high speed
- 60% of crashes had clear weather
- 71% of crashes occurred in daylight



Figure 9: Crash Data Summary

## INTERSECTION

### S.R. 28

Over 40% of crashes were angle crashes, indicative of turning vehicles which coincides with leftturn delay identified in the traffic operations analysis.

### WARRIOR WAY

40% of crashes were angle crashes indicative of turning vehicles.

### ELKS POINT ROAD

Over 60% of crashes were rearend or sideswipe with driving too fast being the largest factor.

### KAHLE DRIVE

Bicycle and pedestrian crashes accounted for 22% of all crashes, likely associated with nearby parks and trailheads.

### KINGSBURY GRADE

Almost half of crashes were rearend, with driving too fast the largest factor.

### LAKE PARKWAY

73% of crashes were rear-end or angle, often due to distracted driving and failure to yield

# CHALLENGES

**Safety is the biggest challenge for the corridor**, which is largely caused by the diversity of users accessing the highway and is coupled with high speeds, blind curves, numerous driveways with limited visibility and no turn pockets, and no formal bike and pedestrian facilities. The corridor has become a difficult and dangerous stretch to traverse. The highway shoulders also turn into a de facto parking lot and pedestrian walkway adjacent to recreation areas during peak visitation periods. Typically, vehicles make abrupt turn movements into oncoming traffic, often with limited visibility. This activity often bleeds into and impacts the outside travel lanes.

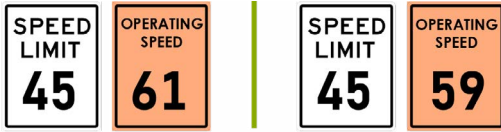
The U.S. 50 corridor is unique in that it provides access to residential areas, businesses, recreation, and those traveling the U.S. Highway system. It intermingles a variety of users who all have different perspectives on how the corridor should function. The residents' perspectives tend to focus on getting home and moving around the corridor safely with minimal impact from visitors. Business owners, commuters, and other travelers have their sights set on time and how quickly they can move through the corridor. Visitors experiencing Tahoe for the first time tend to stop in travel lanes to wait for coveted parking spaces to become available. Visitors make decisions on the fly due to a lack of information before arriving, which often exacerbates safety issues.

Lower traffic volumes in most of the corridor compared to a typical four-lane roadway encourages higher driving speeds<sup>1</sup> and there is a lack of access points meeting current standards, especially around areas with limited sight distance. Add in parking from the recreation areas spilling onto the highway and pedestrians and cyclists in the travel lane, and you get a major safety issue.



# SAFETY

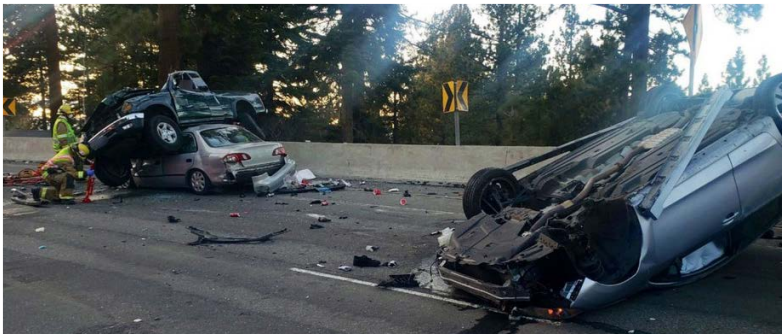
- **Speed** - NDOT speed studies conducted in 2022 confirm operating speeds are consistently above the speed limit.



East of Glenbrook      Glenbrook to Elks Pt.

- **Crash rates** – Between 2015 and 2019, the U.S. 50 East Shore Corridor saw a total of 605 crashes; seven resulted in fatalities, 172 involved other personnel injuries, and the remainder only damaged property. 80-percent of the corridor exceeds statewide average crash rates.
- **Turn movements/intersections** are a major concern for the corridor due to the lack of adequate acceleration and deceleration lanes, lack of left turn pockets, high speeds, and blind curves. **Only 6 turn lanes are meeting modern design standards to serve approximately 62 access points.** Due to historic development patterns and varied topography, there is no significant opportunity to consolidate access points within the corridor.
- **Shoulder Parking** created from recreation demand leaves cars impeding travel lanes, which forces bicyclists and pedestrians to use travel lanes as a sidewalk and results in cars pulling into high-speed traffic with limited sight distance.

*Many times, when turning in to Marla Bay, I have had to pump my brakes just to get drivers to realize I am turning. Without a turn lane, there have been many times when I have come close to being hit and cars dangerously move over at the last minute, only to be honked at by the car they nearly cut off.*



In addition to the safety challenges, the corridor also experiences challenges around recreation and the visitor experience, the environment, and technology. Each challenge and areas of concern is depicted in the following pages.

- **Lack of bicycle and pedestrian facilities.** With the exception of the Tahoe East Shore Trail between Kahle and Round Hill Pines Resort, there are no sidewalk, bicycle facilities, nor transit services north of Elks Point Road. Further, there are numerous gaps where they do exist. A lack of multimodal facilities encourages bicyclists and pedestrians to use the travel lanes or narrow shoulders for access.

**OVER 80% OF THE 13-MILE LONG CORRIDOR LACKS BIKE AND PED FACILITIES**



1 mile contains sidewalk  
(8% of the corridor)



2.5 miles include bike facilities  
(19% of the corridor)



1 mile of transit services  
(8% of the corridor)



*“I used to try to ride my bike on this corridor, but after multiple harrowing experiences, I refuse to use any other method other than driving.”*



*“I’ve lived here over 40 years and appreciate all the positive changes and growth, but I also see an extreme need for traffic control and safety.”*



## RECREATION/VISITOR EXPERIENCE

### • Recreation Travel Demand

- Demand for parking at recreation areas exceeds the current off-highway parking capacity, which results in unsafe highway shoulder parking
- Lack of multimodal access requires visitors and residents to drive their cars directly to their destination and walk within travel lanes
- Minimal opportunity for trailer parking
- Minimal opportunities for motorists to safely take photos of Lake Tahoe



*“The cars parking on 50 near Zephyr Cove is a death waiting to happen....I don't want to wait, lets fix it now.”*





- **Outdated Facilities**

- Facilities were originally designed decades ago when visitor numbers were much lower and automobiles were the primary mode of transportation to access these areas. These facilities are in need of updates to accommodate transit circulation, bicycle and pedestrian access, and new technology
- Existing recreation buildings and infrastructure create a challenge for improving access

- **Lack of formalized access for residents and visitors to public lands**

- Trail Access
- Winter Recreation
- Off-Highway Vehicles (OHV) & Equestrian
- Staging
- Vista Points
- Beaches
- Unmanaged Recreation



## ENVIRONMENT

- Social trails and erosion created from shoulder parking, which impacts water quality and creates ongoing roadway and resource maintenance issues
- Stormwater runoff and impacts on lake clarity
- Vehicle Miles Traveled (VMT) and air quality concerns
  - Lack of multimodal facilities and accommodations
- Physical constraints
  - Terrain limits right-of-way in certain areas
  - Cultural resources
  - Private property
- Scenic corridor
- Biological impacts from environmental degradation
- Climate change
  - Extended seasons and periods of visitation
  - Higher risk of forest fire
  - Impacts on lake clarity



## Lack of Technology

- Gaps in the communication network
- Limited ITS road communications
  - Limited ability to notify visitors of conditions ahead of time
- Current infrastructure limits new technology
  - Cellular phone coverage issues
  - Lack of fiber optic internet communications



## PLAN ORGANIZATION

The 13-mile corridor consists of six (6) separate segments with unique characteristics specific to each segment (**Figure 10**). The segments of the U.S. 50 East Shore CMP, and their accompanying characteristics, include:

- **Spooner to Glenbrook** – Higher speed section with few access points. Speed is a concern approaching Glenbrook. Recreation access and congestion are concerns around State Route 28 (S.R. 28) and Spooner Summit.
- **Glenbrook to Cave Rock** – Driveway and cross-street challenges with little recreation apart from Logan Shoals.
- **Cave Rock to Skyland** – Similar driveway and cross-street issues as the previous segment, yet more intense, with parking around Cave Rock State Park and pedestrian activity being a concern.
- **Skyland to Round Hill Pines Beach Resort** – The heart of the area with parking and other challenges along Zephyr Cove. Key next phase in the Stateline to Stateline bikeway. Priority segment to expand transit opportunities.
- **Round Hill Pines Beach Resort to Kingsbury Grade Road** – Transitions to the more urban areas of the corridor. Volumes increase as you approach Elks Point Road and commercial establishments. The change in land use limits the opportunities for lane reduction alternatives.
- **Kingsbury Grade Road to Stateline Avenue** – Experiences the highest volumes. Heavily impacted by the Loop Road and Main Street revitalization projects. Most of the segment has been through National Environmental Policy Act (NEPA) approvals as part of these projects.



Figure 10: Corridor Segments



# VISION & OPPORTUNITY

**Study Vision** – Provide all users a corridor from lake to rim that reflects its National Scenic Byway status and the unique qualities of the east shore of Lake Tahoe while promoting safety, defining connections to recreation areas, expanding transportation choices, improving water quality, and enhancing the enjoyment of Lake Tahoe.

**Study Goals** – The study vision is supported by six overarching study goals that guide study development and recommendations. Shown in **Figure 11**, these six goals are in alignment with decades of previous planning and policy and are further established in the study Charter, supported by signatory stakeholder agencies.



## Improve Safety, such as:

- Design for fewer crashes, zero fatalities
- Provide safer pedestrian, bicyclist, and motorist choices



## Expand Multi-Modal Transportation Choices, such as:

- Plan for implementation of a robust network of transit, bicycling, and walking options
- Encourage riding of transit, bicycling, and walking options
- Construct the missing links of the Tahoe Trail -- a walking/biking shared-use path



## Enhance the Visitor Experience, such as:

- Manage access to improve safety
- Enhance transportation choice to recreation destinations



## Protect Lake Tahoe, such as:

- Reduce erosion with dedicated parking, trails, and access
- Ensure water quality by reducing fine sediments that reach Lake Tahoe



## Promote Economic Vitality, such as:

- Encourage collaboration
- Establish public/private partnerships



## Promote and Enhance Agency Collaboration & Management:

- Establish a corridor management team who meet regularly
- Establish a problem resolution process between signatory agencies
- Recognize each responsible agency authority and responsibility while addressing solutions that cross any jurisdictional boundary leveraging resources and creating cooperative partnerships
- Improve community connectivity and access

**Figure 11:** Study Goals

## Objectives



### Roadway operations and safety improvements:

- Decrease the crash rate by reducing speeds, improving intersections, and providing safer turn movements where feasible
- Relocate shoulder parking to safe off-highway parking areas



### Expanding transportation choices:

- Expand transit options to serve recreation areas as well as enhance regional connectivity
- Close the gap in bike and pedestrian connectivity
- Expand the Tahoe East Shore Trail



### Other Opportunities:

- Use of technology and demand management strategies will improve the corridor by providing real-time information on parking availability, transit options, road conditions, delays, etc.

## Corridor Opportunities

### Improve Roadway Safety and Operations



Reimagine U.S. 50 to Balance Needs and Safety



Expand Transit Services and Options



Complete the Tahoe East Shore Trail



Parking Relocation and Management Strategies



Enhance Recreation and Visitor Access



### Implement Supporting and Connected Strategies

Leverage Technology and Expand Communications



Implement Demand Management Strategies

Figure 12: Corridor Opportunities



## PURPOSE & NEED

The purpose of the U.S. 50 East Shore CMP is to address the corridor’s safety, transportation, environment, recreation, scenic, and economic needs in a coordinated and balanced manner.

The U.S. 50 East Shore CMP is needed to engage the public and stakeholders, agencies operating in the corridor, and landowners to evaluate issues and challenges and develop solutions within the available highway right-of-way to avoid private property acquisition. Key needs within the corridor include:

- Improve Safety
- Enhance Recreation Access
- Support Transit
- Leverage Technology
- Extend the Tahoe Trail
- Protect Lake Tahoe
- Reinforce Commerce and Economic Development

## NATIONAL ROADWAY SAFETY STRATEGY

The U.S. Department of Transportation (U.S. DOT) has established a National Roadway Safety Strategy (NRSS). Safety is the U.S. DOT’s top priority, and this comprehensive approach is focused on significantly reducing serious injuries and fatalities as a first step towards the long-term goal of reaching zero fatalities on our nation’s roads. Reaching this goal has become more challenging in recent years. Roadway-related deaths in the U.S. were on the decline for decades, but the trend has reversed with an uptick in fatalities over the past few years. In 2021, the U.S. experienced 42,915 deaths on our nation’s roadways; a level not seen since 2005. In response to this increase in fatalities, the U.S. DOT centered the NRSS around five core elements that make up the Safe System Approach.

NDOT is in alignment with this national strategy and is committed to improving the safety of Nevada’s roadways through a Safe System Approach. This commitment is reflected in Nevada’s Strategic Highway Safety Plan and NDOT’s recently adopted Speed Management Action Plan (SMAP). The SMAP

establishes a proactive, comprehensive, and systemic approach to managing and reducing speeds on Nevada’s roads. Speed-related fatal crashes have been found to represent 31-percent of all fatal crashes in Nevada and speed-related crashes are more common on principal arterials such as U.S. 50.

The U.S. 50 CMP reflects the federal and state commitment to reduce fatalities and serious injuries on our roads through the advancement of Safe System Approaches. The U.S. 50 CMP provides a unique opportunity to address safer speeds and safer roads in conjunction with other needs in the corridor.



Figure 13: Safe System Approach (source: U.S. DOT)

The 42,915 American lives lost on U.S. roadways in 2021 is more than the almost 40,000 Americans killed in the entire Korean War.

Source: U.S. DOT



# THE CORRIDOR APPROACH

There is not sufficient highway right-of-way in all locations to fully accommodate every user's needs, including safety. To strike a balance within the corridor, strategies were developed and connected to the more challenging areas. These strategies were refined into alternatives and analyzed to determine the most appropriate solutions for addressing the corridor challenges and balancing the needs.

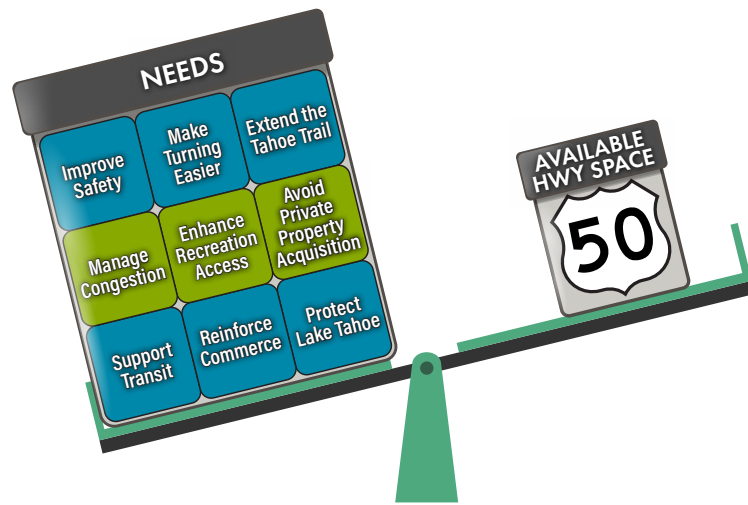


Figure 14: Corridor Needs vs. Available Hwy Space

## CONNECTING OPPORTUNITIES WITH CHALLENGES

To better understand safety issues and other challenges within the corridor and to determine the best opportunities to address these, the corridor was broken into two categories:

- **Unconstrained Sections:** Areas where needs can be addressed easily within the corridor as there is enough right-of-way and limited physical constraints and/or fewer needs.
- **Constrained Sections:** Areas with limited right-of-way and physical constraints creating a major unbalance of right-of-way needed to achieve the needs.

Constrained Sections are highlighted in green in **Figure 15** and were also areas identified to have a higher concentration of challenges.

- Limited right-of-way
- Numerous driveways and cross-streets, unprotected crosswalks
- Crashes associated with high speeds and turning
- High recreation demand (Cave Rock S.P.)
- Lack of multimodal connectivity

- Limited right-of-way
- Numerous driveways and cross-streets, bad sight distance, unprotected crosswalks
- Crashes associated with high speeds and turning
- Extreme recreation demand
- Lack of multimodal connectivity

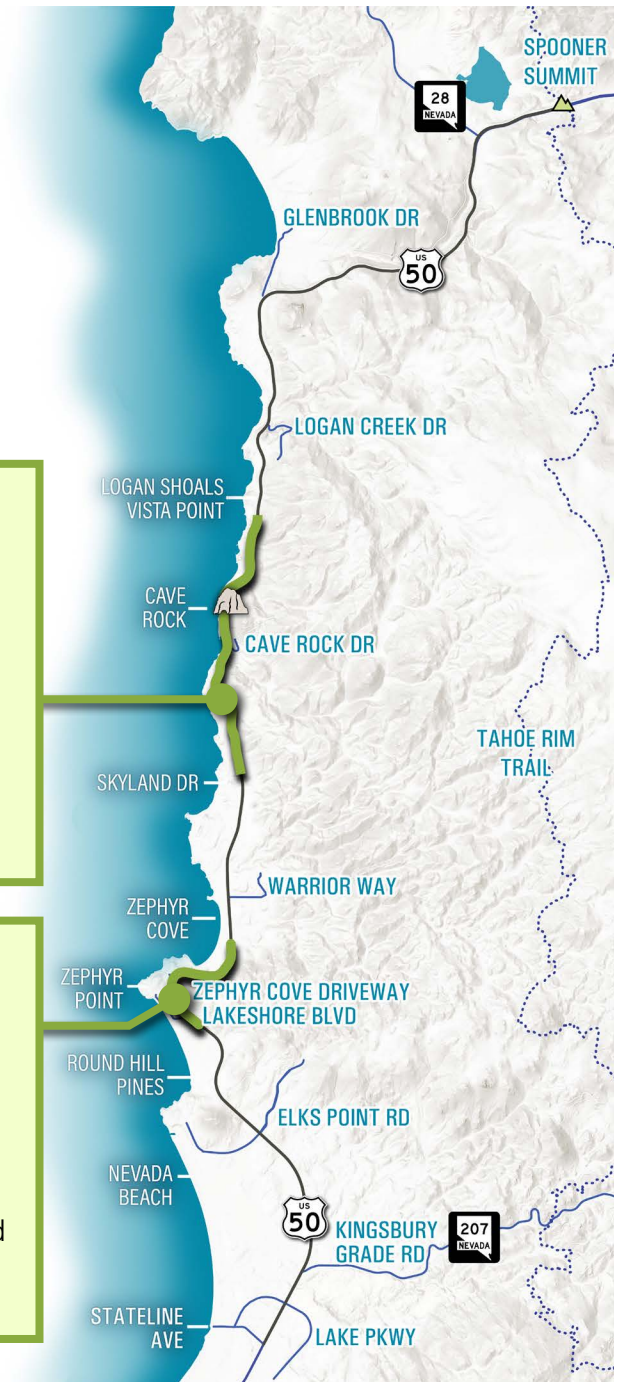


Figure 15: A map showing constrained sections





# PUBLIC OUTREACH

## SUMMARY OF PUBLIC INPUT EFFORTS

Users of U.S. 50 include residents, commuters, visitors/recreationists, local and regional commerce, and inter-state travelers. Efforts were made to collect input on the CMP from these user types. Three rounds of extensive collaboration between study representatives and the community directed the Corridor Management Plan process. The information provided has been thoroughly informed by public guidance through community canvassing, an online survey, and the input of a dedicated stakeholder group.

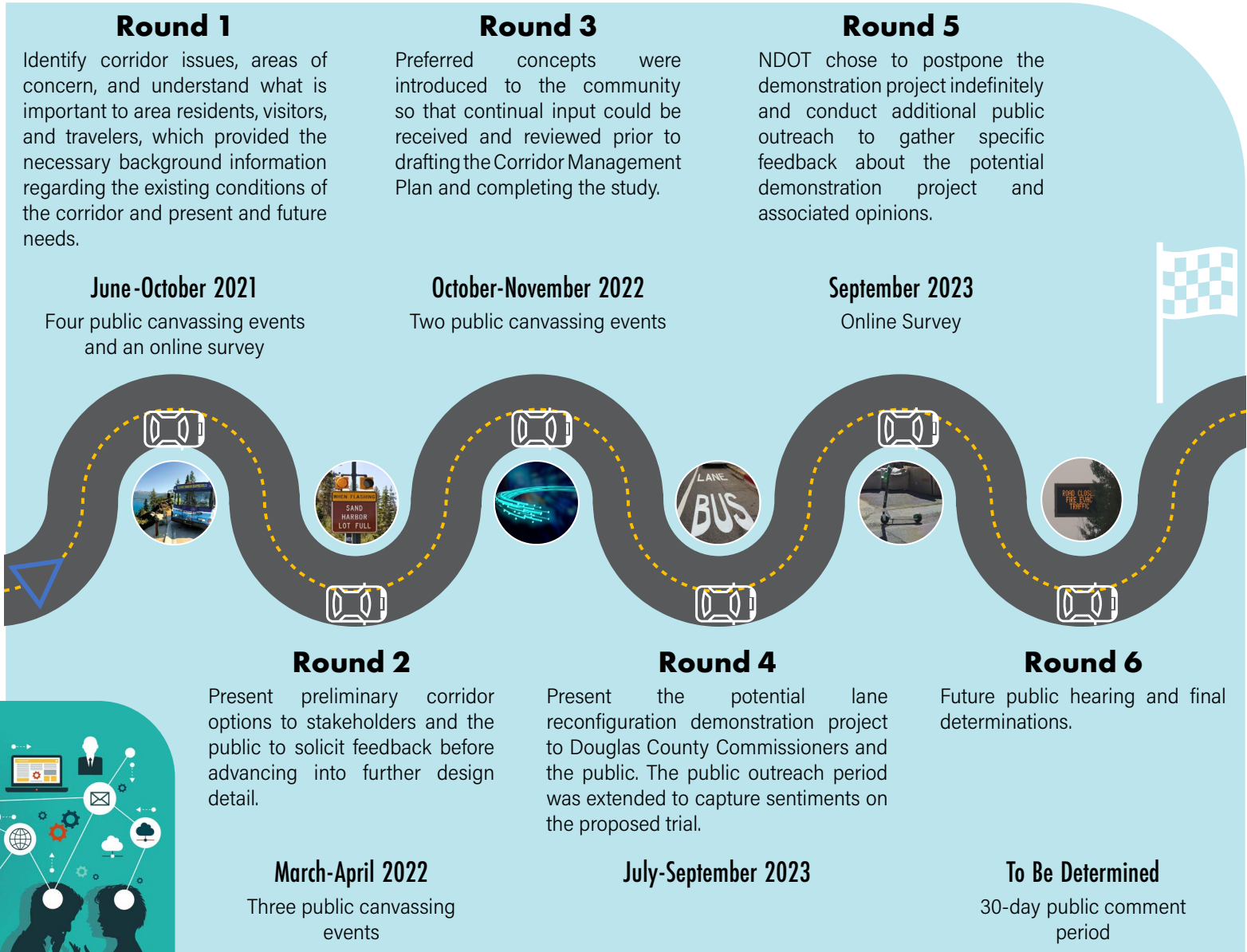


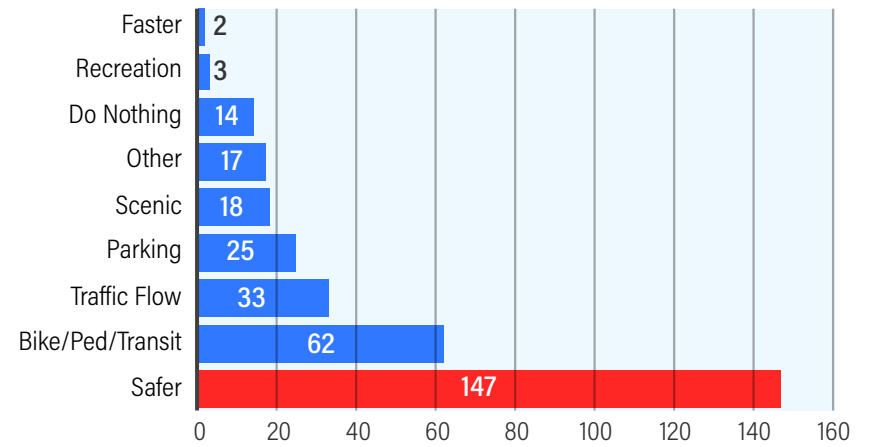
Figure 16: Public Outreach Summary

## PUBLIC VISIONING SURVEY

An online survey was hosted in conjunction with the first round of public canvassing. Notices of the survey were posted on NDOT's agency website and social media platforms, which include Facebook, Twitter, and Instagram. The survey was available from June 15 through July 16, 2021, with an additional two weeks added from July 26 through August 6 to address concerns received from the Cave Rock community. The survey totaled fifteen questions. The questions were targeted to understand user types and uses of the corridor, existing sentiments, challenges facing the corridor, and needed improvements. Between 211 and 254 responses were recorded for each question of the survey. 86.5-percent of respondents were residents, so an additional, recreation-focused survey was launched in the fall of 2021 that resulted in an additional eighty-nine, non-resident survey responses.

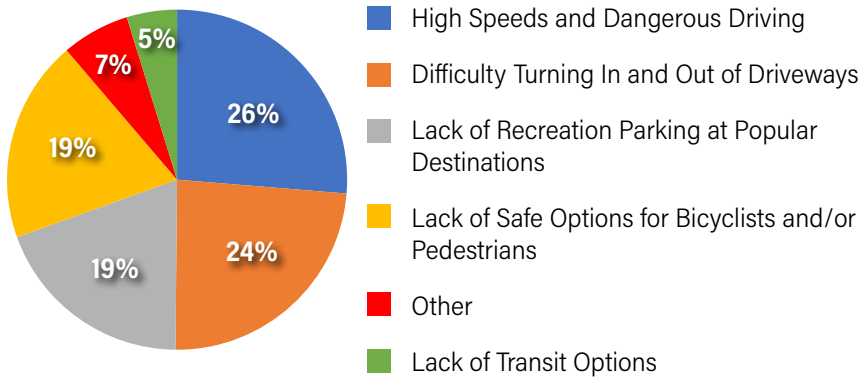
**When asked about a vision for the future of U.S. 50, challenges, and needed improvements, respondents consistently cited safety-related issues as being their most prevalent priority (Graphs 1-3).**

### "Which improvements do you feel are important for the corridor?"



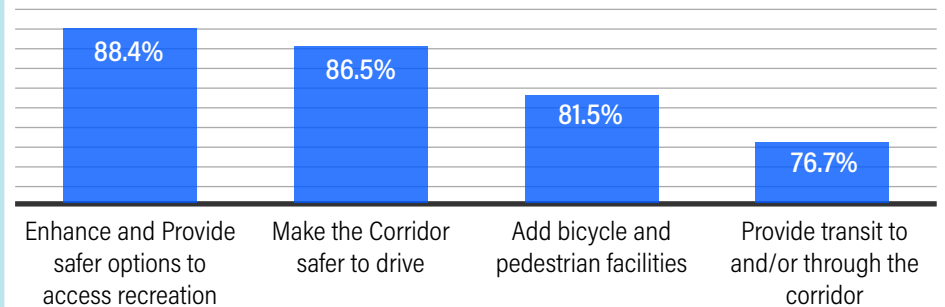
**Graph 1:** Response to "the future needs of U.S. 50" question from the online survey

### "What Do You Think Are The Biggest Challenges Facing This Corridor?"



**Graph 2:** Response to "the biggest challenges" question from the online survey

### "Thinking about the corridor as it is today, rank the following improvement types in order of importance"



**Graph 3:** Response to "improvement ranking" question from the online survey



## PUBLIC CANVASSING TOURS AND PUBLIC HEARING







For each stop on the public canvassing tour, study representatives were available for two-hour periods to answer questions and engage with participants. Informational flyers were available providing study information.

The meetings were noticed to the public via direct mailers sent to approximately 4,200 addresses located from the mountain ridge to the lakeshore within the study limits that were obtained from Douglas County. In addition to the mailers, notices were sent to partner agencies and posted to NDOT social media sites. For Round 1, NDOT also drafted a press release, and a formal presentation was made by consultant staff to the Douglas County Commission introducing the study and announcing the public canvassing tour.

Approximately 410 people attended the public canvassing tours, which resulted in over 748 comments logged from the maps, boards, comment sheets, emails, and other methods.

## PUBLIC OUTREACH KEY TAKEAWAYS

Feedback received during each round of public outreach greatly mirrored the goals developed for the study. Results of the surveys concluded that common issues and concerns were found involving the following topics:

-  Concerns with respect to safety, speed, and turning
-  Need for parking enforcement and/or restrictions
-  Concerns over concepts to reduce travel lanes
-  Consideration of public transit options to reduce traffic and congestion
-  Interest in improved bicycle and pedestrian facilities
-  Prioritize evacuations and emergency management

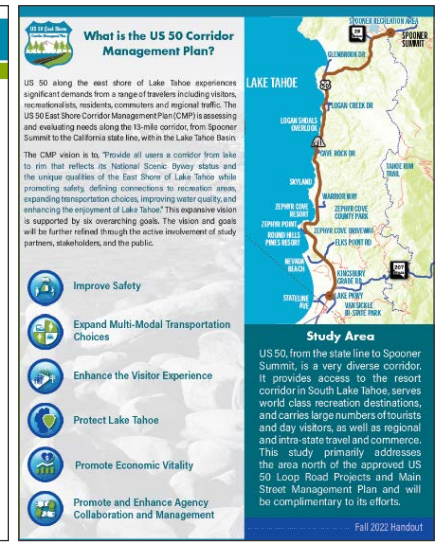
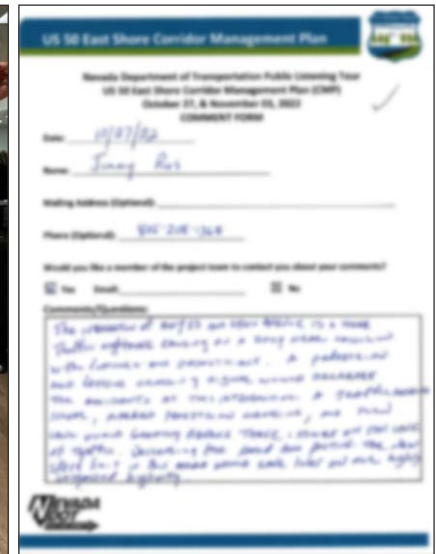




Figure 17: Public Outreach Tour and Materials



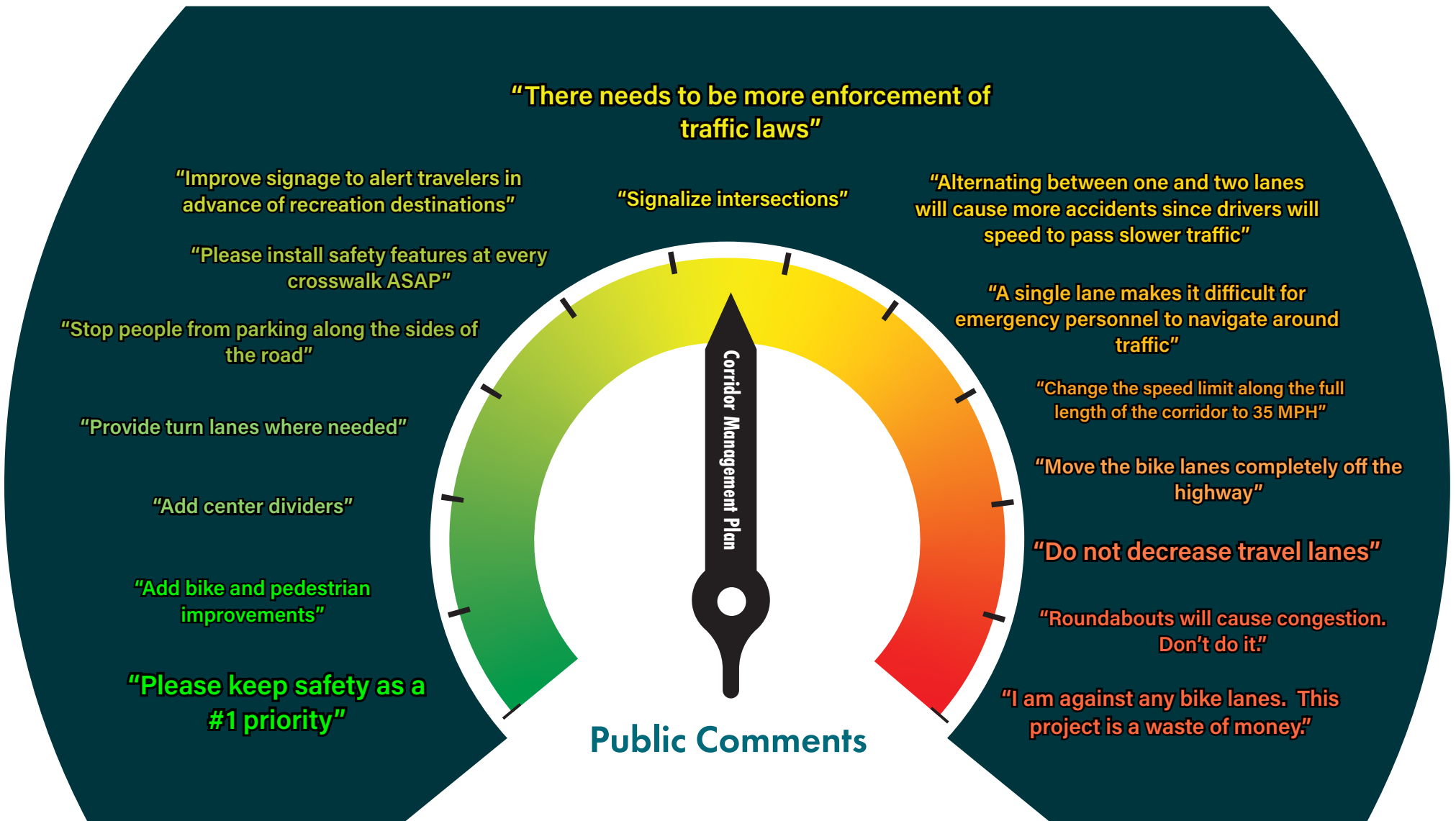


Figure 18: Example of the range of public comments received during the outreach portion of the study

Round

**1** **Community Vision U.S. 50** 2021

- 4 public workshops with 64 attendees.
- 225 written, verbal, and electronic comments received.
- 1 public outreach survey with 274 respondents.
- 1 public recreation survey with 90 respondents.

**4** **Extended Public Outreach Period** 2023

- 96 emails with 180 comments.

**2** **Backbone U.S. 50** 2022

- 3 public workshops with 170 attendees.
- 258 map comments.
- 63 comment cards with 148 comments.
- 33 emails with 90 comments received.

**5** **Public Survey #3** 2023

- 1,931 respondents with 3,066 comments.

**3** **Alternatives by Segment** 2022

- 2 public workshops with 160 attendees.
- 108 map comments.
- 78 comment cards with 104 comments.
- 67 emails and 3 voicemails with 90 comments received.

**6** **Public Meeting and Final Considerations** 2024

- To Be Determined.

Figure 19: Public Outreach Statistics



# RECOMMENDED SAFETY SOLUTION

## PROJECT PARAMETERS

To accomplish the purpose and need and focus solutions, the following set of project parameters were established:

- **Safety is the most important element of the plan**
- Private property impacts should be minimized to the extent possible
- All shoulder parking should be relocated to off-highway parking areas, which may include park-n-ride lots served by transit
- TRPA thresholds should be considered in every solution
- Emergency vehicle access/evacuations should be included
- The Tahoe Trail is a regional priority
- Transit is a key element in serving peak demands

## CRITICAL SAFETY AREAS

Critical Safety Areas were identified by focusing on hot spots including high-use recreation areas, intersection density, and high crash locations as shown in **Figure 20**. These Critical Safety Areas also tend to align with some of the more physically constrained areas in the corridor. This reflects the corridor's unique character and associated unique challenges.

The Critical Safety Areas represent those locations that require the most additional effort and continued study. Early action and specific safety recommendations have been identified, focused on the Critical Safety Areas. However, enhancements will be an ongoing evolution, requiring continued collaboration among the Corridor Management Team.

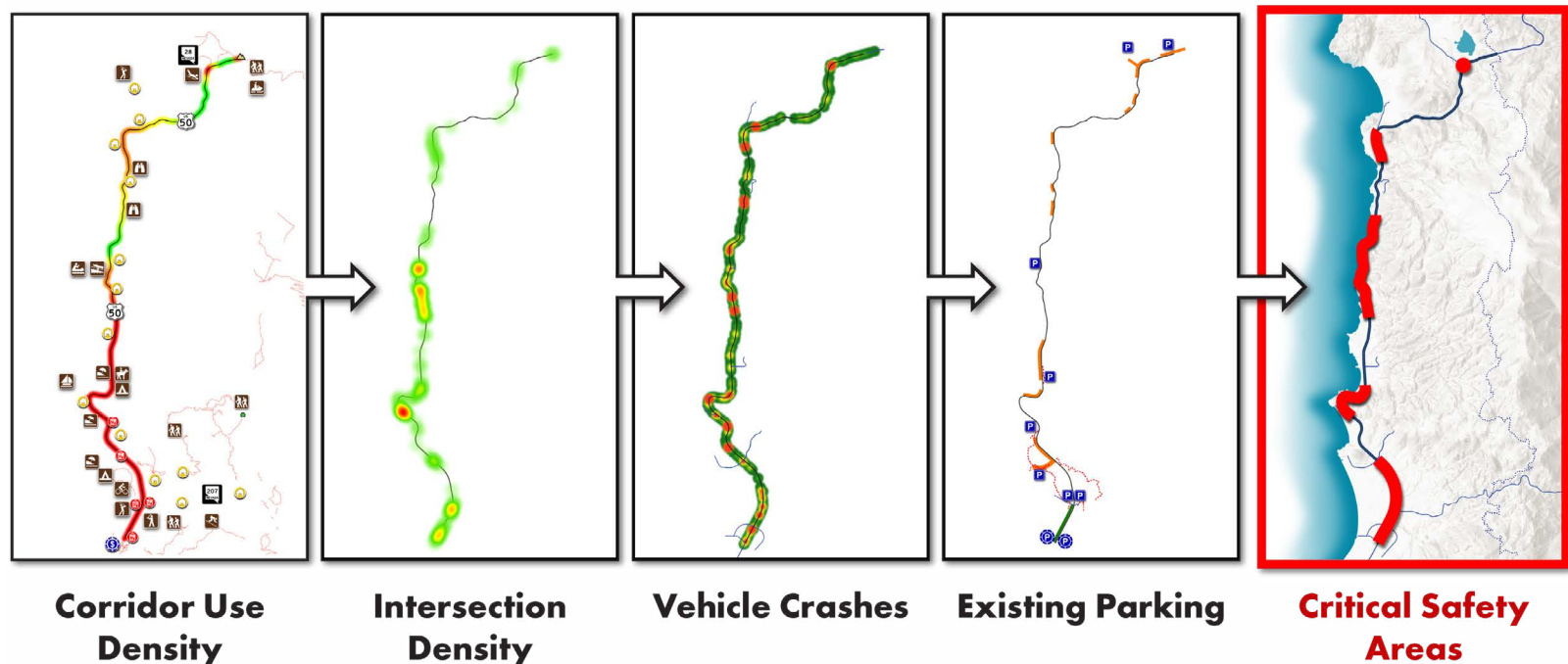


Figure 20: Critical Safety Areas

## CORRIDOR SOLUTIONS ADDRESSING THE CRITICAL SAFETY AREAS

Addressing safety in the corridor is a top priority for NDOT and the Corridor Management Team. Early action safety improvements have been identified that are implementable in the near future and don't require long lead times



### Early Action corridor roadway safety improvements include:

- ⌚ Add turn lanes where pavement and right-of-way widths permit.
- ⌚ Incorporate wide edge line striping.
- ⌚ Install edge-lit speed limit signs, in-pavement speed limit markings, and speed feedback signs.
- ⌚ Narrow lane widths (~11 feet wide) and increase separation of opposing directions of traffic.
- ⌚ Add transverse markings to wide shoulder locations (> 8-feet)
- ⌚ Develop and deploy additional signal timing plans.
- ⌚ Conduct Intersection Control Evaluation (ICE) of U.S. 50/S.R. 28
- ⌚ Improve signing to Cave Rock.
- ⌚ Continue to monitor and evaluate safety performance and opportunities in Critical Safety Areas.
- ⌚ Establish a multi-agency Safety and Operations Committee to coordinate ongoing safety evaluations and operations

such as a formal design and environmental processes. These early action improvements (< 5 years) are consistent with recommendations from the NDOT Speed Management Action Plan



### Critical Safety Area improvements include:

- ⚠ Off highway parking at Zephy Cove Resort
- ⚠ Add bicycle/pedestrian facilities on U.S. 50, from Elks Point Rd. to Lake Parkway
- ⚠ Advance Lake Parkway intersection improvements
- ⚠ Extend Tahoe East Shore Trail to Zephyr Cove Resort
- ⚠ Consider pedestrian underpasses at Zephyr Cove Resort
- ⚠ Right-turn lane extension at Kingsbury Grade to U.S. 50 northbound
- ⚠ Add RRFB to Lyons Ave. crosswalk <sup>2</sup>
- ⚠ Add RRFB to Tamarack Dr./Cedar Ridge Dr. crosswalk <sup>2</sup>
- ⚠ Improve existing RRFB at Lakeview Dr. <sup>2</sup>
- ⚠ Add dynamic curve warning systems
- ⚠ Interconnect signals and add dilemma zone protection
- ⚠ Install bike detection at signals
- ⚠ Improve cyclist detection and lighting at Cave Rock
- ⚠ Close sidewalk gap at Kahle Dr.
- ⚠ Improve existing northbound chain up area
- ⚠ Convert 4H Camp Rd. to right-turn only

These Early Action and Critical Safety Area improvements and recommendations are incorporated into the U.S. 50 CMP Implementation Matrix detailed later in this report.

<sup>2</sup> Pedestrian Hybrid Beacon may be considered pending peak pedestrian counts.



## Other alternatives considered and not advanced

Studying the corridor has been a continuous process for over 6 years. Researchers wanted to understand the unique safety issues and traveler characteristics of the corridor. The sensitivity of the solutions has been at the forefront of the process and drove the extensive public and stakeholder outreach process. While scenarios for highway lane reductions were developed as part of the process, these scenarios are not being advanced. It is important to document alternatives that were considered and not advanced, so future practitioners understand the background and history. To that end, other alternatives and strategies considered and not advanced are summarized in Table 1 below.

**Table 1:** Alternatives Considered and Not Advanced

Scenario/Alternative	Issue/Challenges
<b>Do Nothing</b>	<ul style="list-style-type: none"> <li>• Safety and transportation issues not addressed.</li> <li>• Does not meet any CMP goals.</li> </ul>
<b>Expansion Solution:</b> Add center turn lane throughout (5-lane configuration)	<ul style="list-style-type: none"> <li>• Major highway expansions impact private property, constrained topography, and existing retaining walls.</li> <li>• TRPA Regional Plan goals and policies do not support highway expansion</li> </ul>
<b>Lane Reductions:</b> 3-lane or other configuration with less than 4 travel lanes	<ul style="list-style-type: none"> <li>• Future peak traffic volumes south of Zephyr Point may not achieve NDOT level-of-service thresholds.</li> <li>• Negative public sentiment by some.</li> </ul>
<b>Reduce Speed Limits</b>	<ul style="list-style-type: none"> <li>• Existing speed limits currently exceeded by over 30%. Lower speed limits not likely to be followed. Strategies that change driver psychology likely more effective.</li> </ul>

The following sections further detail recommended solutions and strategies for achieving CMP goals.





# INTERSECTION/TURN MOVEMENT RECOMMENDATIONS

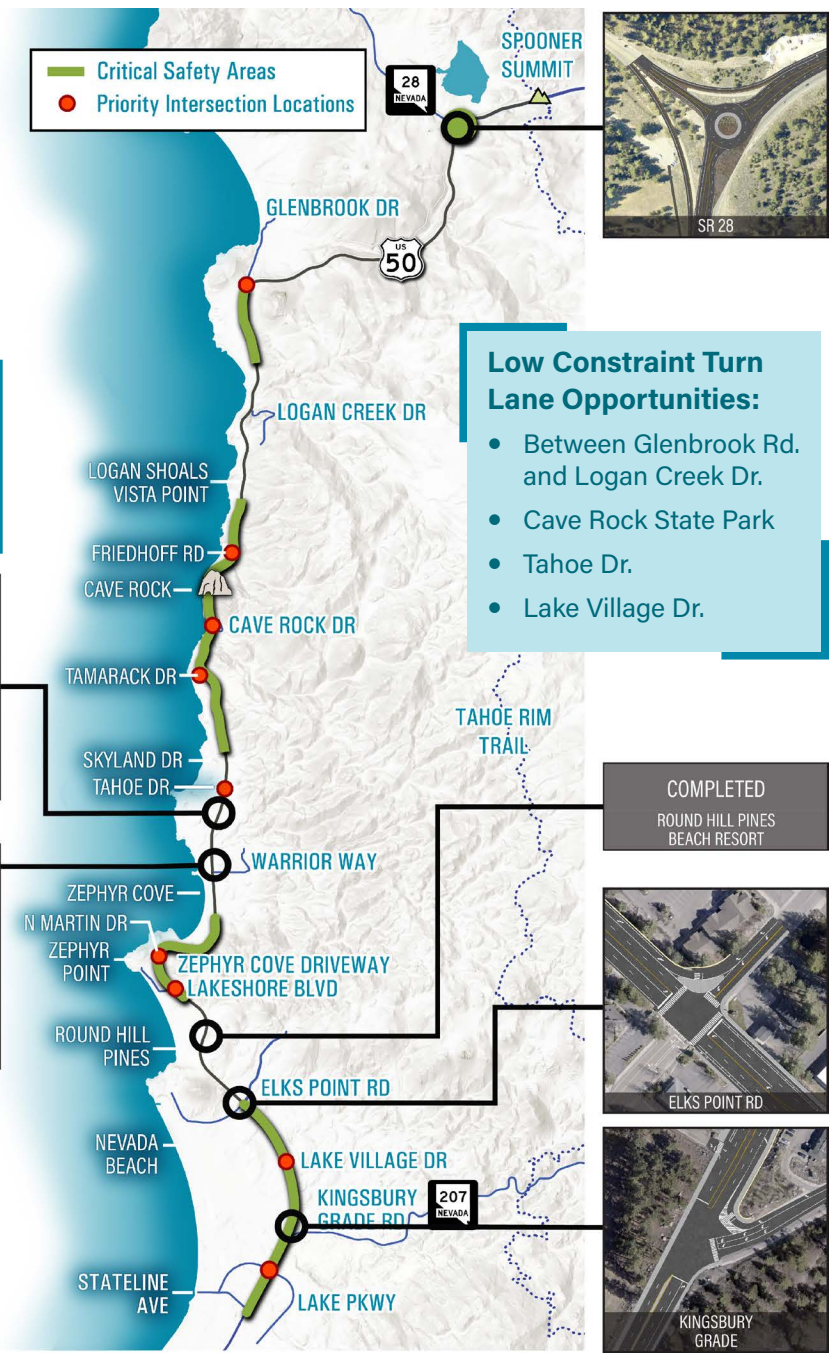
Giving residents safer turn movements into residential areas, slowing speeds, and improving flow, as well as improved pedestrian crossings have all been considered.

## Proposed intersection improvements to enhance safety

- Safe ingress/egress for most residential areas will require dedicated turn lanes. These improvements will remove the safety issue of vehicles stopped in travel lanes waiting to turn, a consistent concern heard from residents. The addition of turn lanes will require further analysis given the limited right-of-way available and other constraints in most of these areas.
- Intersection improvements. Specifically roundabout concepts were considered at several locations; however, due to their large footprint, are only feasible at S.R. 28/U.S. 50 and Lake Parkway/U.S. 50 intersections. This evaluation was based on a conceptual traffic analysis. A formal Intersection Control Evaluation (ICE), which is a detailed traffic improvement analysis that considers various intersection control options, is recommended at S.R. 28. An ICE has already been completed at Lake Parkway. A roundabout at Zephyr Cove's south entrance could be considered in the future, requiring the USFS to relocate the existing building closer to the lake and focus on parking and access improvements closer to U.S. 50. Pedestrian traffic could be rerouted with an undercrossing.
- Corridor pedestrian crossings should be improved. Intersection improvements will include crosswalks and ADA improvements. Midblock crossings should include pedestrian-activated flashing beacons, advanced warnings, and potential refuge islands, specifically at Lyon's Avenue and Tamarack Drive to improve existing crossings. The existing crossing at Lakeview Drive is recommended for enhancements.
- Recent projects include:
  - The Round Hill Pines Resort Entrance is completed.
  - A new signal at U.S. 50 and Warrior Way is completed.

From Glenbrook to Elks Point Road, there are:

- 6 proper turn lanes
- 62 driveways and cross streets



**Figure 21:** Recommended Intersection Improvements  
*All concepts are conceptual and subject to change and further analysis.*



## PARKING RECOMMENDATIONS

To improve overall safety for residents and visitors along the corridor, especially during peak seasons, a micro-transit shuttle system and a coordinated, parking management system are proposed to serve residents and visitors in key areas. These improvements will provide a key role in safely connecting people to the scenic Tahoe landscape by providing shared-use path segments, sidewalks, and streetscape improvements. Area-specific improvements are detailed in the following pages.

- 1

Move to a "No Parking Zone" throughout the US 50 corridor to improve safety, congestion, and operations as destination access is provided for residents and visitors.
- 2

Potential proposed off-highway parking improvements related to existing shoulder parking should avoid adding new parking capacity but rather relocate, formalize, and manage the existing shoulder parking to improve safety, operations, and congestion.
- 3

Improved parking provides an opportunity implement dynamic parking information systems and parking management strategies.
- 4

Expanding transit options is critical to serving visitor demand and potential parking areas should incorporate supportive transit infrastructure.
- 5

Expanding transit options is critical to serving visitor demand and potential parking areas should incorporate supportive transit infrastructure.

Figure 22: Integrated Parking Vision

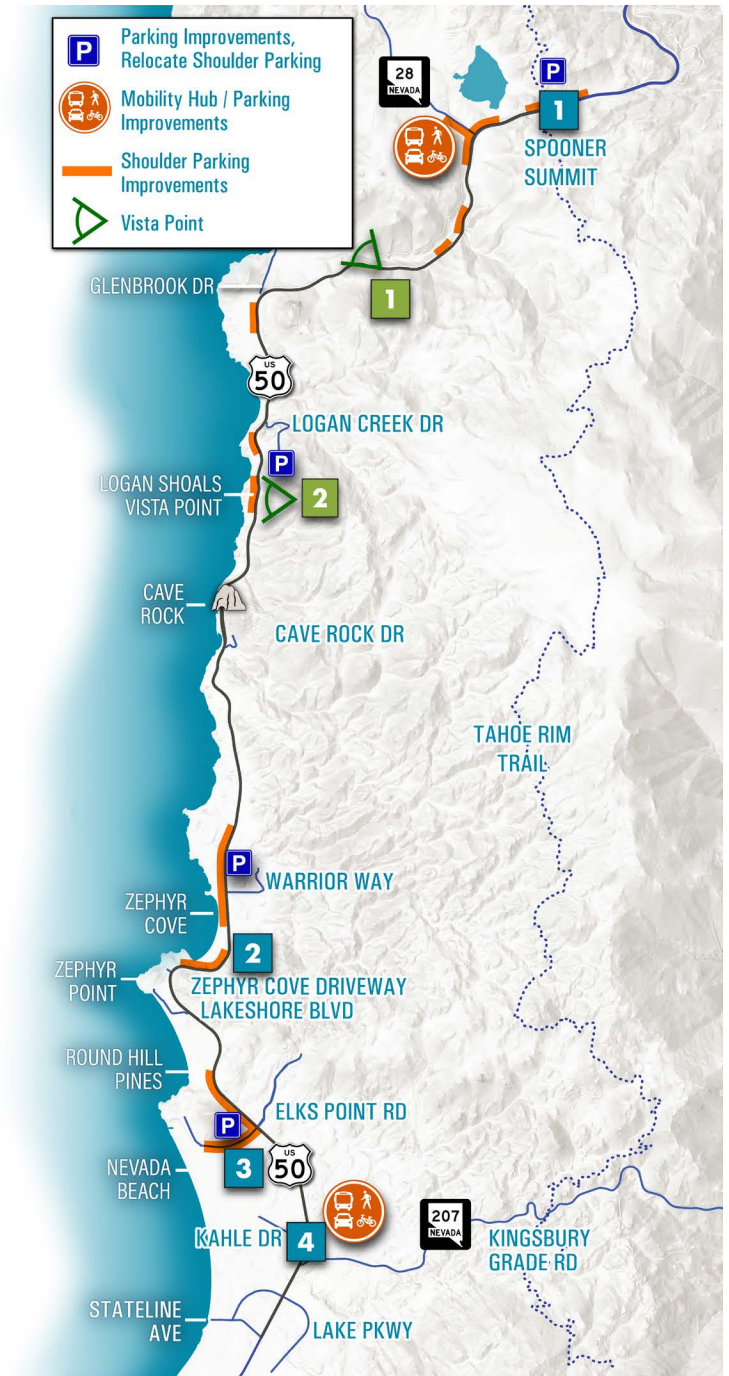


Figure 23: Recommended Parking Solutions

# 1 Spooner Summit Recreation Parking

Access to the renowned Tahoe Rim Trail is found just west of the summit towards Lake Tahoe. Designated parking to access the trail is found on both the north and south sides of the highway. Trailer parking is currently designated for the south side of the highway. Parking to access the popular trail often spills out along the highway. Pedestrians cross the highway to access the trail segment they wish to hike that day. Proposed enhancements to this area include:

- Connect trailheads to transit with adequate pull-outs.
- Expand the Tahoe Rim Trail parking on the northside of U.S. 50.
- Formalize equestrian parking on the northside of U.S. 50 and add additional trailer parking near the USFS Fire Station.
- Consider a pedestrian overcrossing to facilitate pedestrian movement on the Tahoe Rim Trail over the highway, acting as a gateway to the Basin.

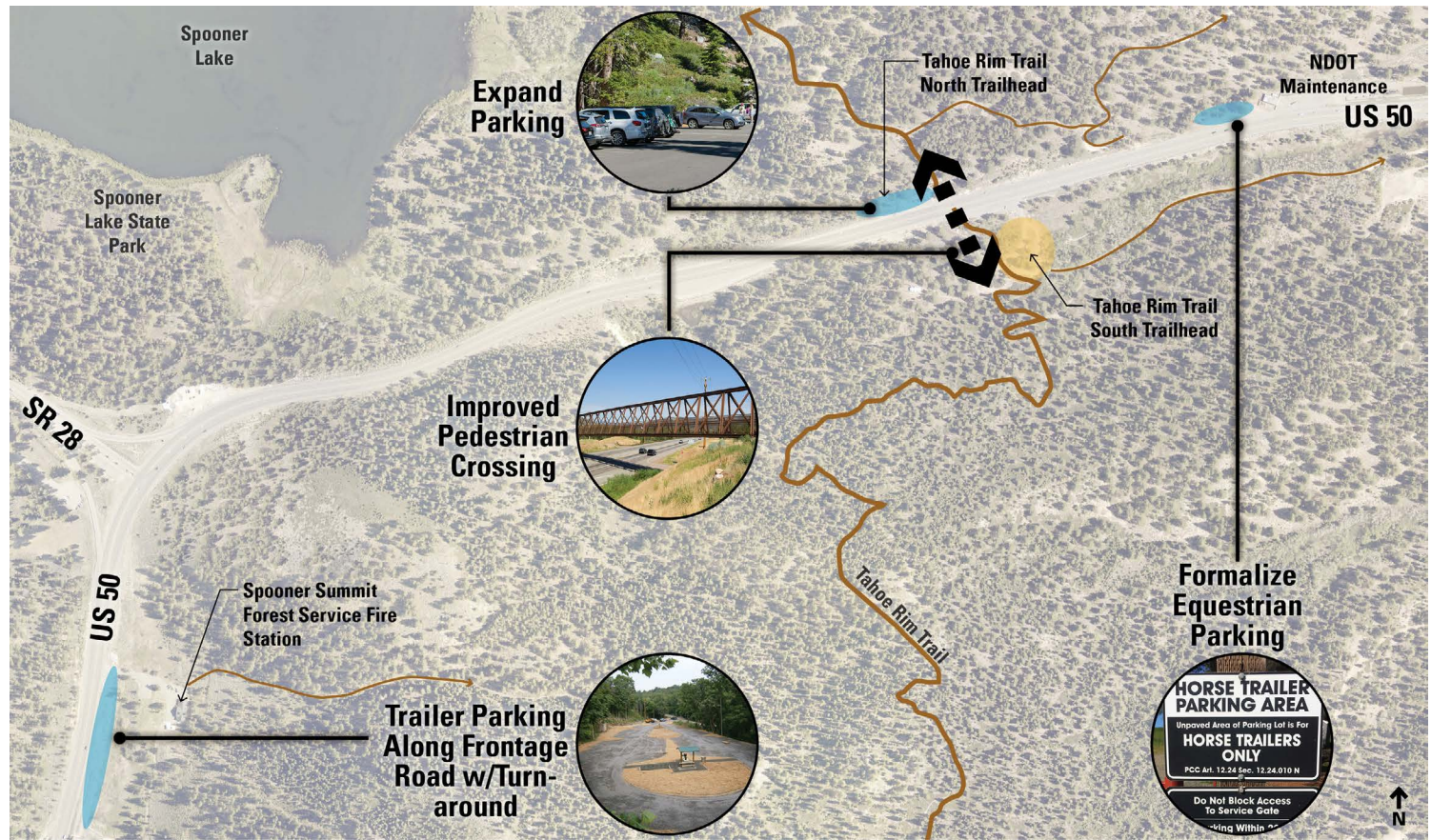
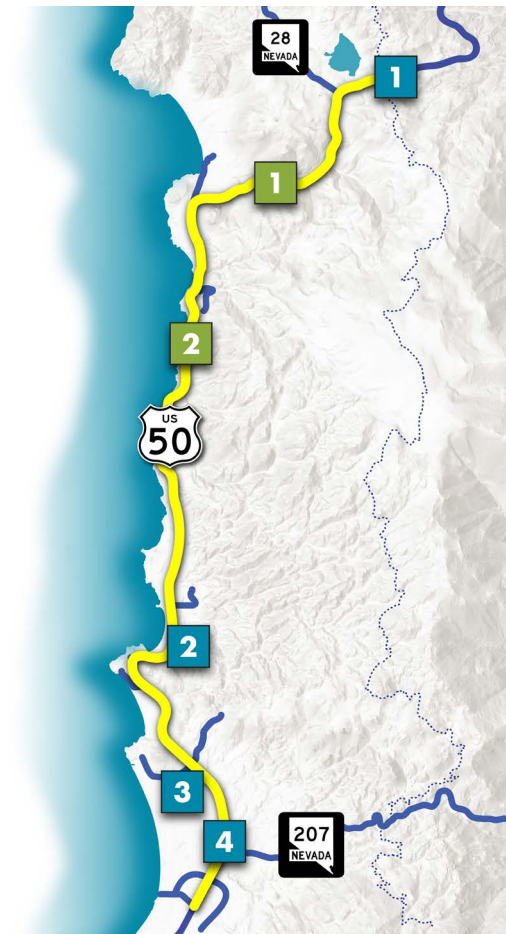


Figure 24: Spooner Summit Recommended Parking Solutions



## Zephyr Cove Roadside Parking

Shoulder parking for beach access during the summer lines both sides of U.S. 50 near Zephyr Cove Resort. Beachgoers walk along the highway with gear and children in tow. Car doors open into traffic and people often step into travel lanes to remove coolers, rafts, and other items from their vehicles. Relocating parking that occurs along the highway to an off-highway location is important to address safety while also reducing erosion. By analyzing current potential roadside parking, the capacity for  $\pm 223$  roadside parking spaces was determined to exist today.

To replace the roadside parking that may be restricted, potential off-highway parking areas were identified. The existing Zephyr Cove Resort parking lot could extend its off-highway parking to the north, paralleling U.S. 50, to create parking spaces on U.S. Forest Service land and off-highway parking spaces may be dedicated for recreational users north of Warrior Way and west of George Whittell High School on land owned by Douglas County. See below for a summary of recommended enhancements for future analysis:

- Relocate roadside parking to a new, off-highway facility. To address demands for recreation access, a combination of expanding the existing resort parking and providing a new, off-highway parking facility east of the highway is recommended.
- Utilize a portion of the Douglas County opportunity parcel for a future transit maintenance facility.
- Provide northbound and southbound transit pull-offs to service the resort area.
- Connect parking areas to recreation destinations by a shared-use path trail system that aligns with desire lines. Utilize fencing where needed to direct users to signalized or grade-separated crossings of U.S. 50.
- Connect the east side parking and facilities to the resort on the west side of U.S. 50 via undercrossing to avoid pedestrian conflicts at the highway. Utilize the planned signal at Warrior Way to provide safe pedestrian crossing in the meantime.
- Explore the opportunity to relocate Zephyr Cove Lodge closer to the lake to improve circulation and visitor experience

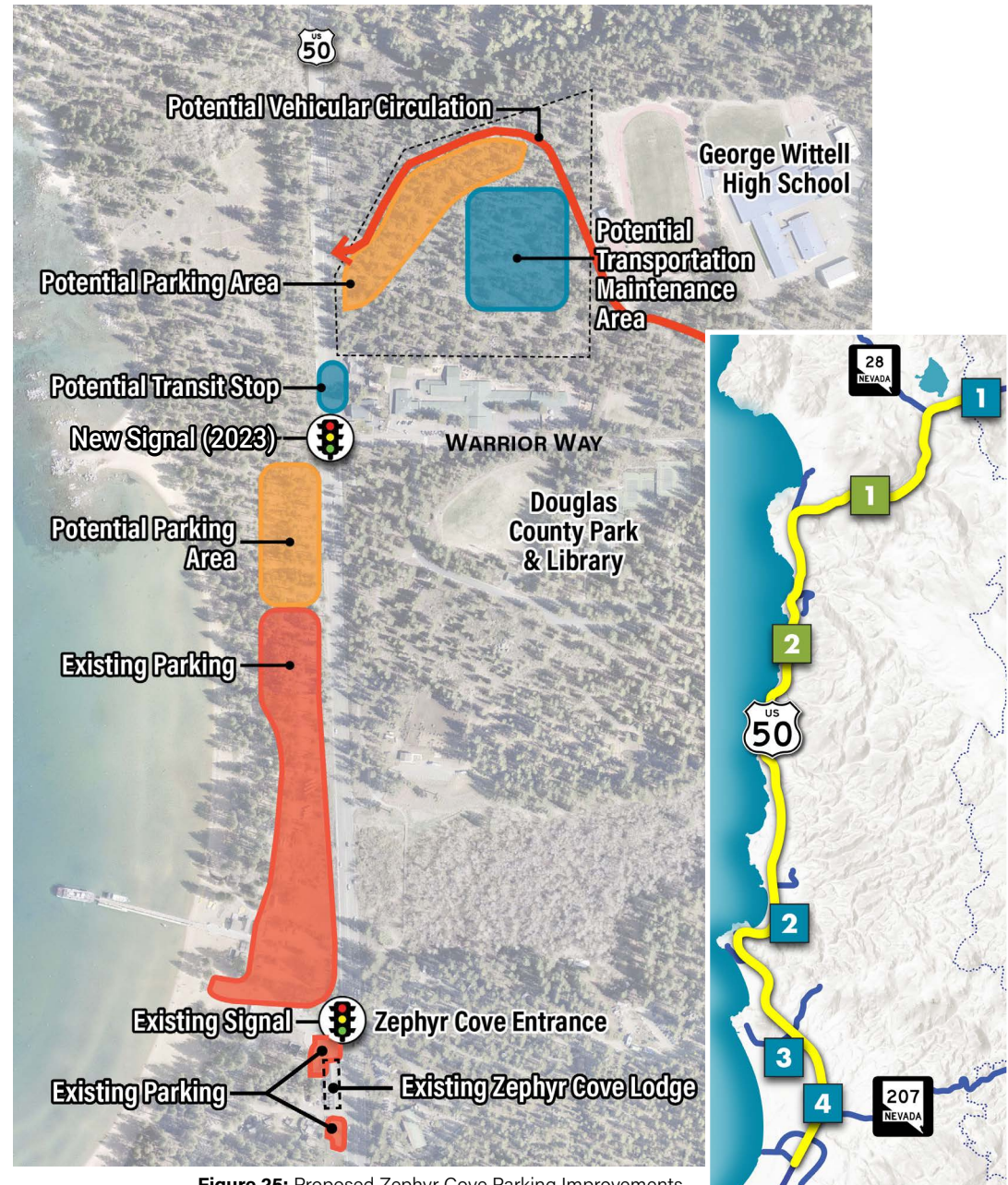
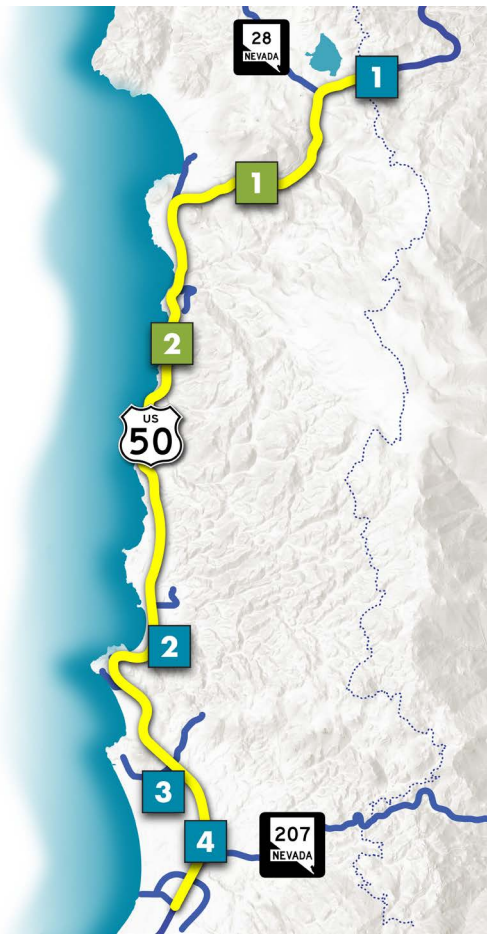


Figure 25: Proposed Zephyr Cove Parking Improvements



### 3 Nevada Beach Parking Enhancement

Nevada Beach is accessed by bike or by foot from the Lam Watah Nature Trail and by car through the entry station at the west end of Elks Point Road. In addition to the on-site parking available within the day-use area, users also park along Elks Point Road and walk to the beach and picnic areas. During peak visitation, parking for Nevada Beach can exceed the capacity of both the onsite lots and the informal roadside parking along Elks Point Road. Vehicles create congestion along U.S. 50 and park in nearby commercial areas. Improvements to this area that should be further analyzed are as follows:

- Reorganize the informal parallel parking along Elks Point Road into formalized angled parking.
- Develop a small traffic circle or roundabout near the west end of Elks Point Road to allow motorists space to turn around and not block through drivers.



Figure 26: Proposed Nevada Beach Parking Improvements

# 4

## Kahle Drive Recreation Connections

The U.S. 50 CMP builds on a number of prior community and stakeholder visioning and planning processes for the Kahle Drive/Lower Kingsbury area including, but not limited to, the South Shore Area Plan (2013), the TRPA Regional Transportation Plan (2020), the Kahle Drive Vision (2014) and Kahle Drive Expanded Vision (2019) projects, The Final Burke Creek-Rabe Meadow Complex Master Plan (2014), and the Douglas County Five-Year Transportation Plan (updated annually).

Gaps in the mobility and trail system show a need for trail connections from the Lakeview Trail east to the Kahle Community Center and parallel to U.S. 50 from Lake Parkway north to the Round Hill Village Shopping Center/Elks Point Road. Pedestrian connections are also needed along U.S. 50 between Lake Parkway and Kingsbury Grade. The Kahle Drive/U.S. 50 intersection has been identified as a priority for safety and mobility enhancements. Opportunities for improvements to this area that should be further analyzed are as follows:

- Link the lower Kingsbury area to Kahle Drive with an improved network of trails and sidewalks.
- Create a paved, off-highway shared-use path connecting residents and visitors from the casino core to the Lakeview Trail, creating linkages to Nevada Beach and east to Round Hill and Round Hill Pines Resort. Add sidewalks and buffered bike lanes along the length of U.S. Highway 50, from the intersection of Kingsbury Grade to Elks Point Road.
- Establish a connected, shared-use path system by connecting Kahle Community Park to the Lakeview Trail.
- Consider opportunities to improve connections with the advancement of the Barton Hospital Development.

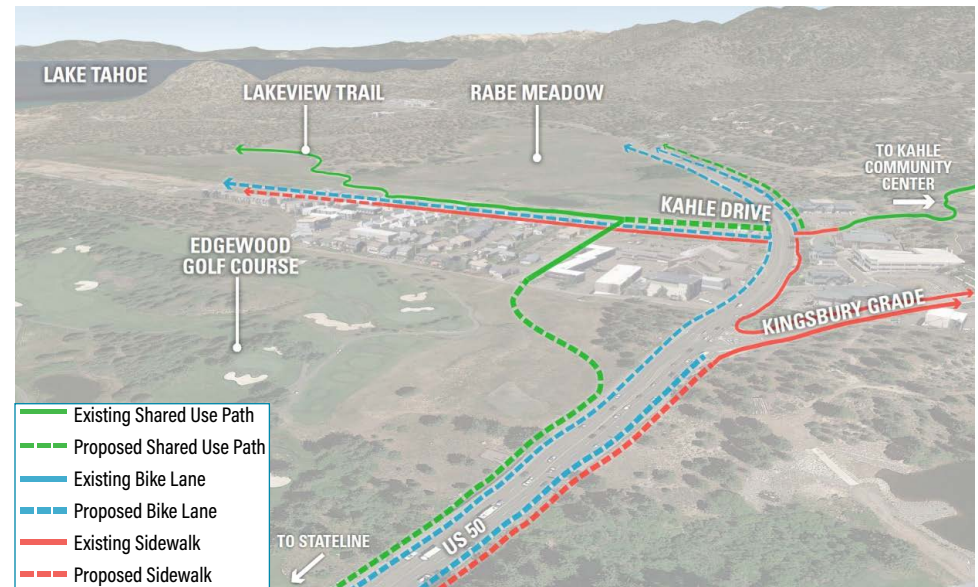
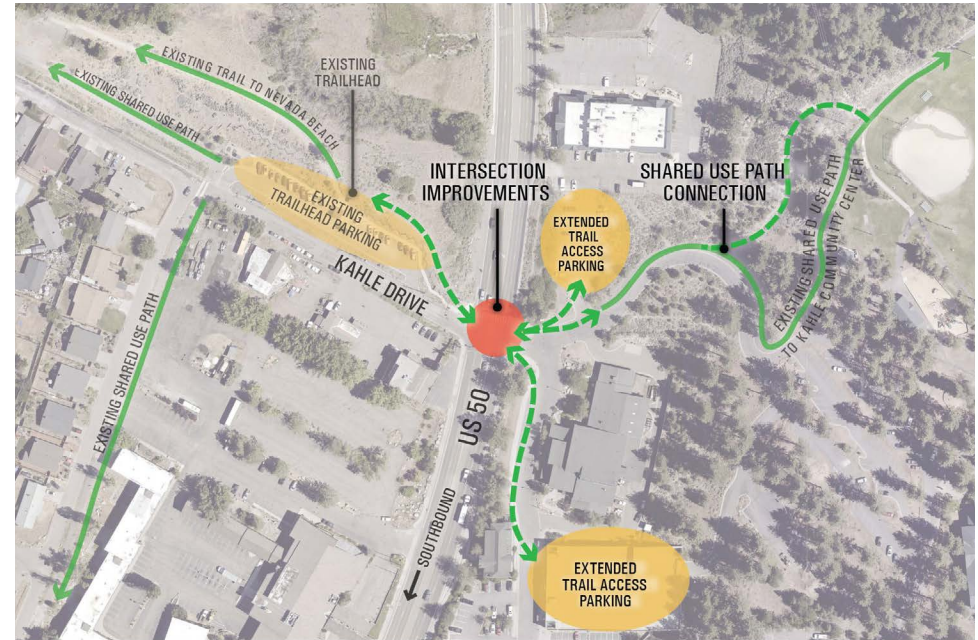


Figure 27: Proposed Kahle Drive Multimodal Improvements



## VISTA POINT RECOMMENDATIONS

Along with parking improvements, two popular vista points can be improved to enhance visitor safety along the corridor and help meet peak season demands.



### 1 "First Look" Vista Point

Four pull-outs exist along the south/westbound lane of U.S. 50 as it drops from Spooner summit into the Lake Tahoe Basin. As the highway bends toward the lake, the third pull-out offers travelers an opportunity to stop and take in their first glimpse of the Lake, which is framed by the Sierras and towering pines. Enhancements that should be further analyzed are as follows:

- Formalize pull-out with roadside signage, striped parking, striped buffer separation, interpretive signage, and fencing.

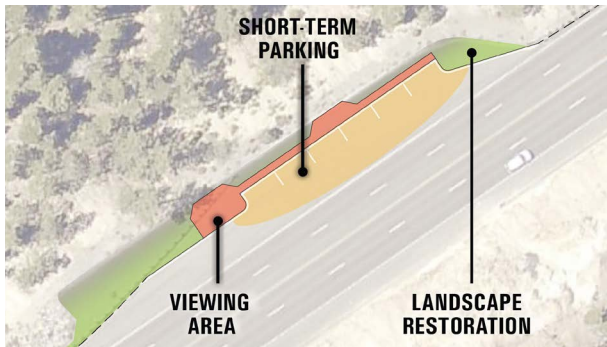


Figure 28: Proposed "First Look" Vista Point Improvements

### 2 Logan Shoals Vista Point

Located north of Cave Rock on USFS lands, this vista point has informal shoulder parking, restrooms, and a paved path to the overlook. It is used by motorists stopping to take a short walk, enjoy the view, or use the facilities for intimate wedding ceremonies with a total of eighteen guests. Parking is limited and can quickly fill on a busy day. Organizing the parking area and enhancing the trail connections can improve the overall function and flow of the site. Enhancements that should be further analyzed are as follows:

- Formalize pull-outs with striped parking, one-way entry/exit, signage, raised curb separation, shuttle/transit parking, and trail connection to restrooms. Incorporate a transit pull-off at the site.

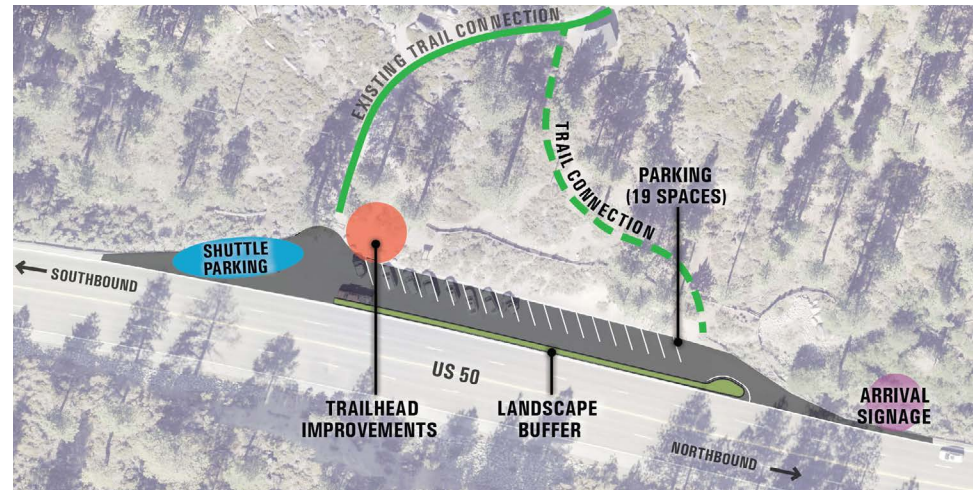


Figure 29: Proposed Logan Shoals Vista Improvements



## TAHOE TRAIL, BIKE, AND PEDESTRIAN CONNECTIVITY

The Tahoe Trail is a collaborative vision between the public and local, state, and federal agencies. The Tahoe Trail's design specifications will be further analyzed in future phases of the U.S. 50 CMP implementation. Once complete, the Tahoe Trail will allow users a continuous shared-use path around the entirety of Lake Tahoe. The Tahoe Trail is the artery for bike and pedestrian travel around Lake Tahoe, which connects residents to services, employment, and recreation and visitors to services and recreation. The U.S. 50 East Shore Corridor includes the Tahoe East Shore segment. Currently, a 2-mile segment of the Tahoe Trail extends from 4H Camp Road through Rabe Meadow to Nevada Beach and onto Round Hill Pines Resort. The gap between Stateline and 4H Camp Road as well as extending the Tahoe Trail north beyond Round Hill Pines Resort to Zephyr Cove are priorities for the Corridor Management Team.

The U.S. 50 East Shore Corridor has several physical constraints, which include private property, steep slopes, and cultural resources that prevent the construction of the entire Tahoe East Shore Trail separated from the highway. These constrained sections can be accommodated on-highway using a barrier-separated option as depicted in the "1" cross-section on the next page. Further analysis and design will be required given limited right of way space available as well as driveway and intersection crossings. Barrier options will vary based on future design and may range from decorative "K" rail similar to what is seen around Cave Rock, guardrail, curbing, or a striped separation as the path approaches driveways and intersections and line of sight becomes more of a factor. Bicyclists and pedestrians on the path in these areas will have a stop sign yielding to oncoming vehicles. This has been successfully implemented along the Tahoe West Shore Trail segments.

Off-highway sections will vary based on the location and will follow the alignment that best fits the recreation area it serves, or, in some cases, will follow the old Lincoln Highway where feasible. The area around Cave Rock has both cultural concerns as well as steep slopes and will require an extensive design process to determine the actual alignment through that segment.



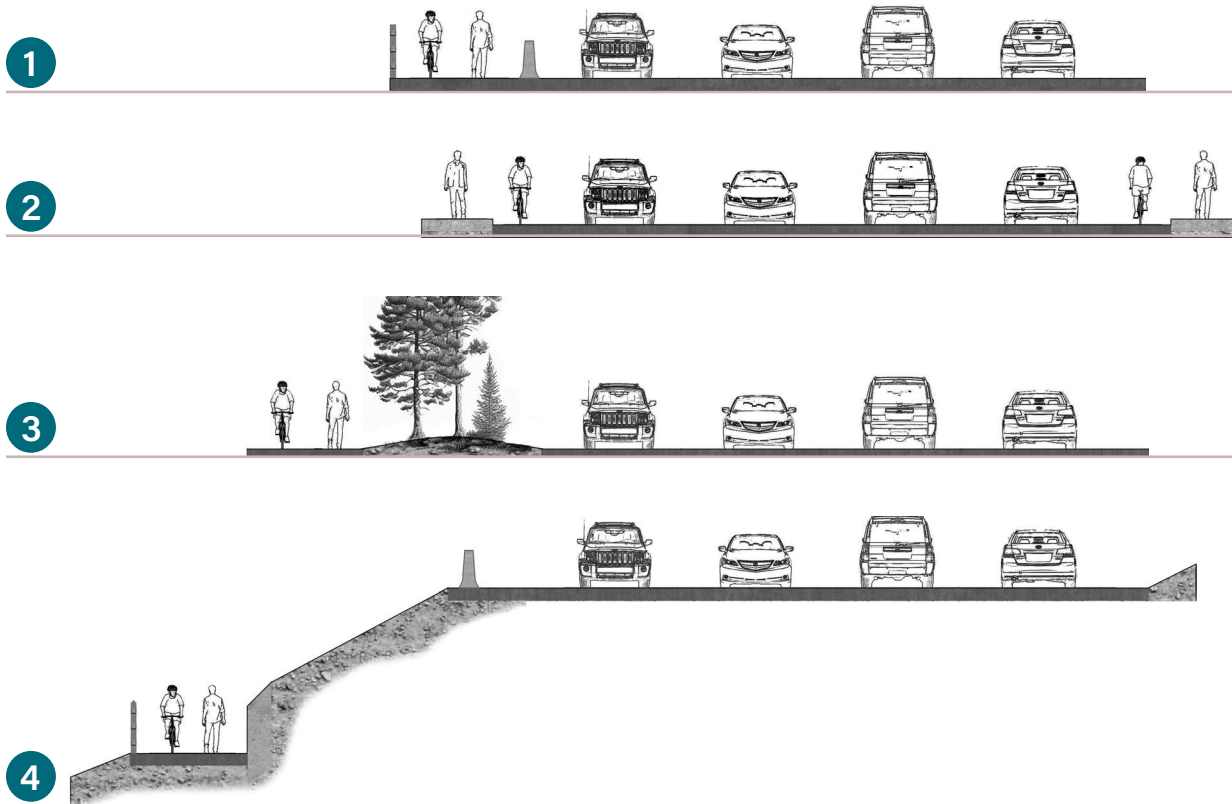
The Tahoe Trail provides opportunity for all users to access Lake Tahoe safely without their car, a key element for safety and long-term sustainability of Lake Tahoe.





The more urban portion of the corridor, Elks Point Road south to Lake Parkway, currently lacks a sidewalk. While there is an existing segment of the Tahoe Trail in this area, its primary focus is connecting the recreation areas, and it does not directly serve urban connectivity. There are several residential areas, commercial centers, employment, services, and the casino core that all generate high pedestrian activity. Currently, pedestrians are using dirt shoulders for access. The proposed solution to improve overall pedestrian and bicycle connectivity in this segment of the corridor is to add sidewalks on both sides of U.S. 50 along with bike lanes (section 2) and safe bike and pedestrian crossings.

**Figure 31** depicts a conceptual alignment for the Tahoe Trail along with conceptual cross sections identified in **Figure 30**. A more regional analysis of the Tahoe East Shore Trail was completed in 2011 by the Tahoe Regional Planning Agency and Tahoe Transportation District and referred to as the Nevada Stateline to Stateline Bikeway Project Feasibility Study Report.



**Figure 30:** Recommended Tahoe Trail Sections



**Figure 31:** Recommended Tahoe Trail Solutions





## Technology, Communications, and Parking Management

### Opportunities

Managing safety, traffic flow, and recreation demand in the corridor is no easy task and will take agency coordination, leveraging technology, and improving communication to make it happen. Technology is always changing and will continue to shape transportation in the future. Accommodating and adapting to modern technology and determining its impacts will be an ongoing challenge, but it will provide many benefits such as giving visitors and residents more options and information to travel the corridor safely. As corridor projects move forward through implementation, technology and communications should be further explored and incorporated to help improve corridor adaptability and better manage the demand.

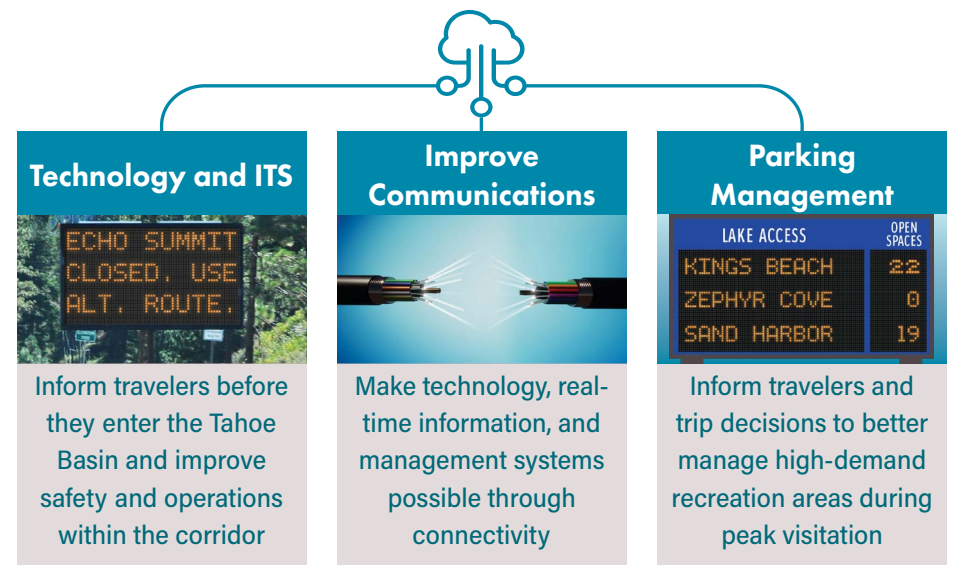
Receiving real-time information can allow users to make decisions before they become part of the challenge. Land managers can also use the same real-time information to actively manage the demand. Technology and communications paired together with new multimodal options can allow people to plan their trips, better understand what options are available and when, and give them confidence in taking reliable transit instead of their vehicle.

Parking management systems also play a vital role in helping to incentivize visitors to use recreation during off-peak hours while also feeding real-time information on availability and encouraging the use of transit and the Tahoe Trail when parking areas are full. Advance notice will help promote the shift from vehicle to multimodal opportunity.

### Leverage Technology and Intelligent Transportation System (ITS) Opportunities

Several options for leveraging technology and ITS to help manage and improve safety in the corridor have been identified and include the following recommendations:

- Improvements to traffic signal operations and communications, including fiber connectivity and multimodal operations such as bicycle detection
- ITS to support crash reduction
  - Dynamic curve warning signs
  - Speed limit sign enhancements



- Cave Rock Tunnel cyclist safety and system improvements
- Dilemma Zone Detection at signalized intersections
- Parking Management Systems
  - Parking kiosks with demand-based pricing and enforcement
  - Parking payment apps, QR codes, and text and pay
  - Visitor pre- and during trip information – web/app based
  - Electronic enforcement tools
  - Reservation systems for major destinations such as Zephyr Cove Resort, Round Hill Pines Beach, and Nevada Beach
- Visitor enhancements
  - Real-time transit and parking information (e.g., on-site, DMS boards, and web/app links)
  - Micromobility options and amenities
  - Stations for bike repair, raft/paddle board inflation, and smart device charging at parking, transit, and information hubs
- Electric vehicle accommodations
  - Charging stations at key locations – cars, autonomous vehicles, and micromobility devices

## Improve Communications

As technology increases in the corridor, communication infrastructure will need to be enhanced concurrently to support overall operability. Currently, there are no wireline communications in place for ITS. All communications are wireless and are primarily cellular, except NDOT's use of the 800 MHz radio system to address Road and Weather Information Systems (RWIS) stations. There are three key opportunities to improve communications for ITS in the corridor:

- The upcoming U.S. 50 pavement preservation project will be placing conduits for future fiber-optic communications. Locations for power connectivity and communication cabinets should be considered. Also, spurs should be added to accommodate future connections to devices that require fiber communications such as parking nodes.
- The NMLRS radio system upgrade is planned to be implemented to assist the U.S. 50 corridor sometime in 2023. The new system will support additional data capacity and it may be a useful asset to aid ITS improvements in the less developed areas along the corridor.
- Consider leasing excess right-of-way or surplus parcels to cellular providers to improve coverage and reliability.

## Implement Parking Management

Parking management for the U.S. 50 corridor is planned to coincide with efforts already underway for the U.S. 50 South Shore Community Revitalization Project in the Stateline Area, as well as the S.R. 28 Value Pricing Pilot Program. Integration of parking management systems in the Tahoe Basin is key to ensuring a seamless and safe experience for visitors. Connecting the parking management system to other technology and delivering information to visitors in advance is also part of Tahoe's larger, regional vision for parking management.

The vision for a parking management system incorporates the following key functions and features:

- Be available pre-trip so that users can plan their trip before they leave. Functions and features may include:
  - Information on locations and costs to park

- Information on times of day when parking is most and least available
  - Link to real-time parking availability information
  - Potential reservation and pre-payment systems
  - . . .Information on transit access to recreation areas and paying for transit in advance
  - Enabling registration for discounted parking for select users such as residents and seniors
- Provide driver information on parking availability by parking lot location as they enter the Lake Tahoe Basin:
    - Providing dynamic signs that post the availability of parking in major day-use parking lots in real-time
    - . . . . .Including distance to the parking lot from the sign location
  - Supporting visitors at the parking lot and on their return to parking:
    - Providing user-friendly cashless payment systems on-site
    - Enabling visitors to use their mobile device to add time and pay for the additional time for parking beyond what was originally planned and paid for while they are at their recreation destination (e.g., from the beach or trail)
    - Providing information on transit arrival and stops – and providing this information for the return trip to the parking lot
    - Demand-based pricing to help manage parking lot occupancy
  - Demand-based pricing:
    - Parking costs will be based on location and real-time demand
    - Incentivize users to come during non-peak hours or use multimodal options



## Environmental Improvements (Lake Tahoe EIP)

In 1982, TRPA adopted environmental threshold categories that set environmental standards for the Lake Tahoe Basin. There are nine threshold areas: Air Quality, Water Quality, Soil Conservation, Vegetation, Fisheries, Wildlife, Scenic Resources, Noise, and Recreation. The recommendations of the U.S. 50 East Shore CMP have been developed following regional policies and thresholds. As the CMP is implemented, future projects will be evaluated based on these thresholds and should incorporate project elements or partner with already planned environmental improvement projects to meet the threshold standards.

This CMP does not include an environmental analysis but does provide the framework for corridor wide solutions that will require further analysis under TRPA and National Environmental Policy Act. The CMP also provides the framework for agency coordination to encourage that projects be analyzed cumulatively opposed to drafting separate environmental documents.

Climate change is impacting the Lake Tahoe Basin, and, as a result, TRPA has recently adopted the Tahoe Climate Resilience Action Strategy. Strategies this CMP is helping address include:



### Build Sustainable Recreation and Transportation Systems

- Improve recreation and transportation facilities to accommodate change in seasons and visitor patterns
- Expand equitable access – Bike paths, transit, and accessibility



### Upgrade Infrastructure and Protect Vulnerable Communities

- Technology and communication improvements
- Electric vehicle accommodations
- Emergency planning



### Advance Science, Stewardship, and Accountability

- Adaptive Corridor Management
- Monitoring

**Table 2:** TRPA Environmental Thresholds

TRPA THRESHOLD	OPPORTUNITY FOR IMPROVEMENT
Air Quality	<ul style="list-style-type: none"> <li>• Tahoe Trail and Expanded Transit Service reduce congestion and VMT</li> <li>• Off-highway parking and parking management reduce congestion</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>• Reduced erosion through relocation of shoulder parked cars to off-highway locations</li> <li>• Water quality improvements should be coordinated with transportation projects where appropriate</li> </ul>
Soil Conservation	<ul style="list-style-type: none"> <li>• Relocation of shoulder parking to off-highway locations will reduce erosion and allow for restoration of disturbed areas including social trails.</li> </ul>
Scenic Resources	<ul style="list-style-type: none"> <li>• Improved scenic quality through relocation of shoulder parked cars to off-highway locations</li> <li>• Improved vista points</li> </ul>
Wildlife	<ul style="list-style-type: none"> <li>• Wildlife preservation projects should be coordinated with transportation projects where appropriate</li> </ul>
Fisheries	<ul style="list-style-type: none"> <li>• Stream preservation projects should be coordinated with transportation projects where appropriate</li> </ul>
Vegetation Preservation	<ul style="list-style-type: none"> <li>• Vegetation preservation projects should be coordinated with transportation projects where appropriate</li> </ul>
Recreation	<ul style="list-style-type: none"> <li>• Tahoe trail and expanded transit will improve access to recreation and improve overall visitor experience.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Improving multimodal access will help reduce noise caused by automobile traffic along U.S. 50</li> </ul>

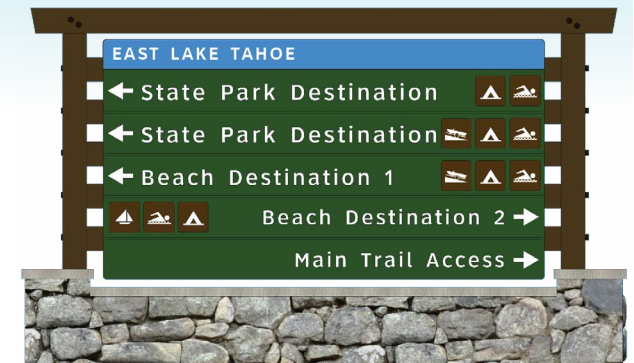
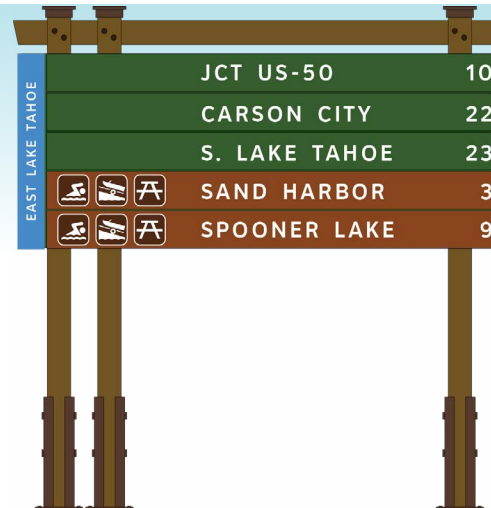


## Signage

Wayfinding signage enhances the scenic quality of the corridor and serves an important role in notifying visitors of where they are and how to use the corridor and its recreation facilities. A signage master plan was completed for the S.R. 28 Corridor (S.R. 28 National Scenic Byway Signage Master Plan), which would carry forward to this corridor to ensure consistency along the entire eastern shore of Lake Tahoe.

### Purpose/Intent of the Signage Master Plan:

1. Create consistency in wayfinding signage for Tahoe East Shore.
2. Improve Highway Safety by making wayfinding easier for motorists and recreation users to avoid unnecessary travel looking for recreational and parking areas.
3. Create a sense of place and a unique identity for the U.S. 50 Corridor.
4. Create interpretive opportunities along the Tahoe Trail.
5. Provide clarity to trail users regarding stewardship of resources and trail connectivity.
6. Provide a design manual for easy implementation



# CORRIDOR IMPLEMENTATION AND LONG-TERM MANAGEMENT

The opportunities and solutions identified throughout this U.S. 50 CMP will take time to fully implement. The needs and concepts must be considered alongside other needs throughout the state. Funding must be secured, portions will require rigorous environmental reviews, and the Corridor Management Team partnership will be key to deliver many of the more intensive concepts. All these factors influence when certain concepts may be able to advance into construction projects.

NDOT has plans to rehabilitate the pavement along the entire corridor, which is currently planned for 2024 (State TIP ID DO20210002). The project is anticipated to occur over two phases. The first phase addresses the pavement condition only. The second phase, likely occurring in the future after the first phase, will incorporate additional improvements such as ADA enhancements, sidewalk connectivity, etc. This two-phased NDOT pavement improvement project provides a potential opportunity to incorporate and address several of the U.S. 50 CMP recommendations.

An overall Implementation Matrix has been developed and is shown on the following pages. Early action improvements are shown as “Phase 0.” Phase 1 of the Implementation Matrix is intended to align with the second phase of the NDOT pavement preservation project. The following phases are beyond the timeframe of the pavement preservation project with anticipated horizons noted.

## CORRIDOR MANAGEMENT TEAM

Managing changes for U.S. 50, a corridor that crosses federal, state, and local jurisdictions, requires partnering agencies to continue engaging the community and working together to implement projects, resolve issues as they arise, further leverage resources and develop funding sources to implement projects, as well as to jointly operate and maintain facilities and programs along the corridor.

The U.S. 50 CMP provides the opportunity to promote long-term agency collaboration by expanding the S.R. 28 Corridor Management Team (CMT)

approach. The public operating agencies working within the U.S. 50 corridor also work within the S.R. 28 corridor and are familiar with the CMT systems approach. Because agencies are limited in staffing and resources, it is recommended that the existing S.R. 28 CMT Interlocal Agreement amongst the agencies be amended to include the U.S. 50 corridor, thus capturing all of Nevada’s east shore under one collaborative team. The CMT consists of public landowner agencies who, from time to time, call in the expertise of other agencies or non-profits. The CMT meets regularly as needed, to discuss emerging issues, review and implement corridor projects, partner on grant applications, and resolve operating issues along the corridors. No single agency can address the many issues that are a by-product of high-use and high-demand corridors. Prior planning efforts have stagnated due to the lack of a management structure that would bring all parties together to resolve shared issues. It is not the intent to have this management team direct individual agency goals or budgets but to establish a partnership that collaboratively addresses their shared issues.

Within the CMT framework, it is recommended that a multi-agency Safety and Operations Committee be established to coordinate ongoing safety evaluations and coordinate operations. The safety challenges facing this corridor are unique and evolving. Continuous collaboration as new data becomes available is critical to ensuring the U.S. 50 CMP vision and goals are achieved in the face of dynamic conditions. Further, the Safety and Operations Committee can also coordinate operations. For example, temporary lane closures can have a significant impact on traffic depending on timing and location. The Safety and Operations Committee can ensure these activities are coordinated with a broader perspective versus traditional approvals. For reference, an operations and maintenance (O&M) roles and responsibilities overview chart can be found in Volume 2.

## MANAGEMENT STRATEGIES

*Adaptive Corridor Management.*

The TRPA 2020 Regional Transportation Plan references adaptive corridor management as a strategy to help address peak demands within the Tahoe Basin. The CMT should apply an ongoing adaptive management philosophy as they work together to implement CMP recommendations and other



strategies in the future. Adaptive management is a decision-making approach that allows for adjustments in response to new information, lessons learned from past implementation efforts and monitoring, as well as changes in corridor context while maintaining the goals of the CMP.

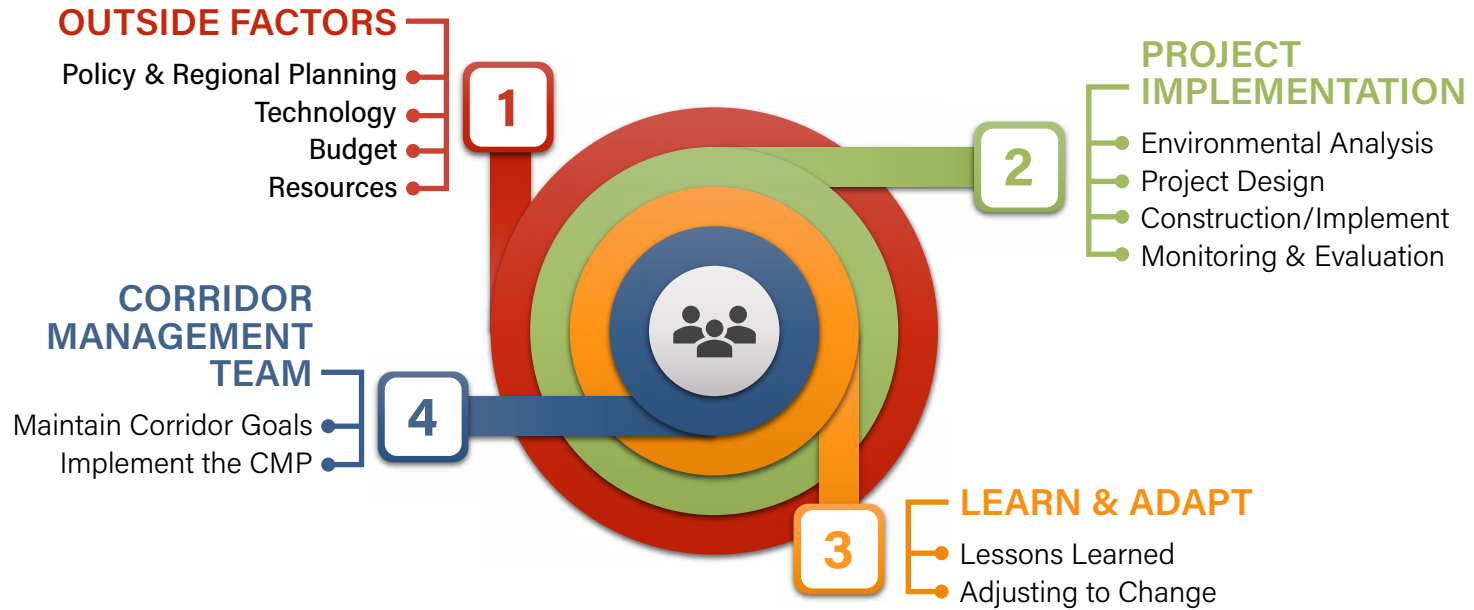


Figure 33: Management Strategies

## Transportation Demand Management

The TRPA 2020 Regional Transportation Plan references transportation demand management (TDM) as an important strategy to help address congestion during peak periods by changing travel patterns and times and is an example of an adaptive corridor management approach. The CMP solutions support TRPA's TDM strategies by:

- Providing travel information through ITS to encourage visits during non-peak times
- Expand transit and multi-modal opportunities to allow travelers to leave their cars at home or at least out of busy recreation destinations and focus transit to allow workers to easily commute to/from work
- Incentivize travel and visitation times through parking management, value pricing, and reservation systems
- Supportive infrastructure like electric chargers and pumps for bikes so

visitors do not feel like they must have their cars with them to recreate

- Encourage employers to develop trip reduction programs, leveraging the Commute Tahoe employer portal, and expand carpool opportunities
- Marketing TDM strategies and opportunities to maximize their effectiveness





## FUNDING

There are multiple funding options through federal, state, and local sources. Table X provides several programs available through the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). Many of these programs are administrated through NDOT. These programs should be reviewed annually with the Corridor Management Team to align each phase with the appropriate funding opportunities. The Implementation Matrix in the following section provides a phased approach for project delivery. These projects and phases could change depending on funding availability.

### One Nevada Transportation Plan

The One Nevada Transportation Plan (One Nevada) is the state's long-range transportation plan, which equips NDOT with the strategic direction to meet Nevada's current and future transportation needs. The One Nevada is built on a foundation of six goal areas, reflecting the priorities of Nevada's residents. One Nevada moves ideas through the project development cycle from big picture needs to implementable projects. NDOT's State Transportation Improvement Program (STIP) defines the projects that will be funded over the next four years.

NDOT must make choices and evaluate the tradeoffs between spending in one area versus another. One Nevada has resulted in a data-driven and transparent process for NDOT to identify and fund projects that achieve their six priority goals. CMP recommendations should be considered as part of this process.



Figure 34: One Nevada Six Priority Goals

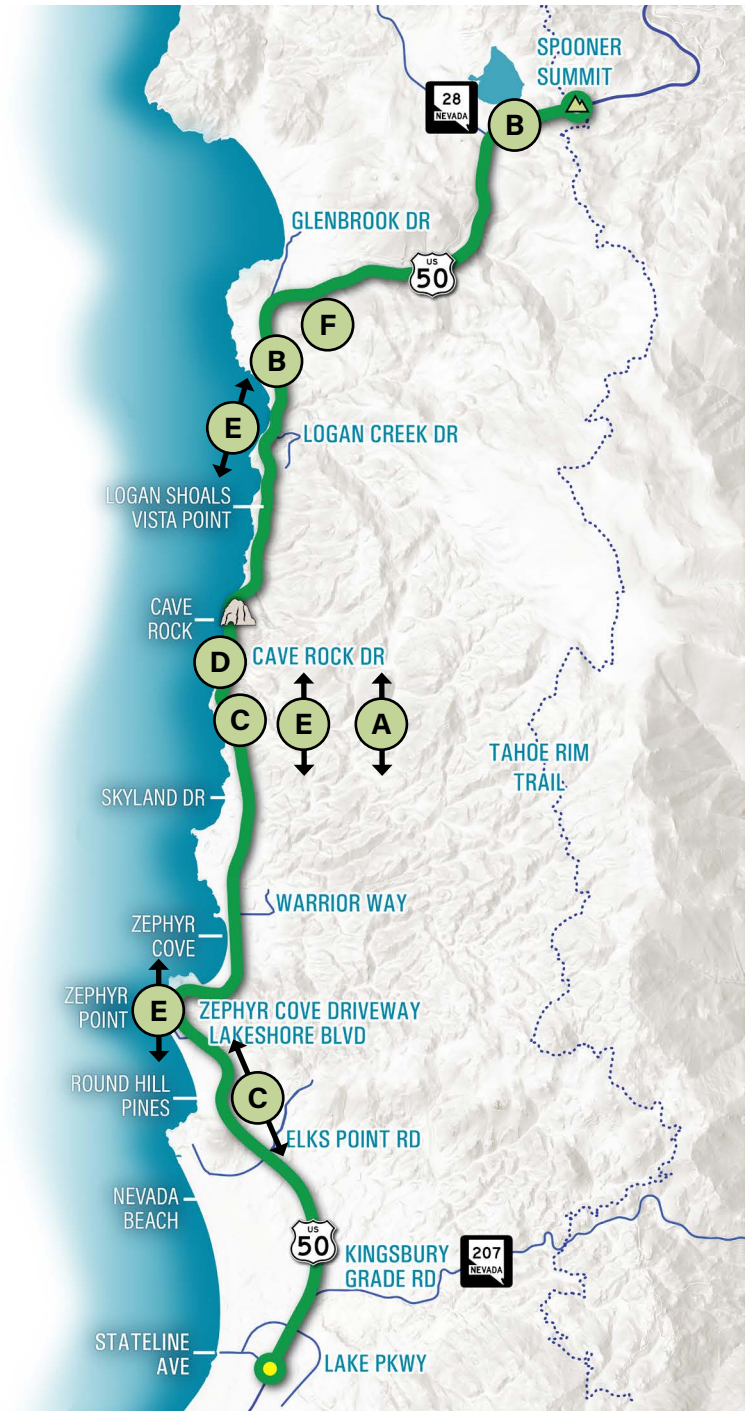
Table 3: Potential Funding Sources

Potential Funding Sources	Highway	Bike/ Ped	Transit	Supporting Strategies*
<b>Federal</b>				
National Highway Performance Program	✓			
Highway Safety Improvements Program	✓	✓		✓
Surface Transportation Block Grant	✓	✓		✓
Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	✓	✓	✓	✓
Nationally Significant Freight and Highway Projects (INFRA)	✓	✓	✓	✓
Charging and Fueling Infrastructure				✓
Safe Street and Roads for All	✓	✓		✓
Multimodal Project Discretionary		✓	✓	
Reconnecting Communities Program and Neighborhood Access and Equity	✓	✓		✓
Federal Lands Access Program (FLAP)	✓	✓	✓	✓
Nationally Significant Federal Lands and Tribal Projects	✓	✓	✓	✓
Federal Lands Transportation Program (USFS)	✓	✓	✓	✓
Transportation Alternatives Program (TA)		✓		✓
Capital Investment Grants - 5309			✓	
Bus and Bus Facilities - 5339			✓	
Congestion Mitigation and Air Quality (CMAQ) Improvement Program		✓	✓	
<b>State</b>				
State Gas Tax	✓	✓	✓	✓
General Funds	✓	✓	✓	✓
State Question 1		✓		✓
<b>Local</b>				
Tahoe Fund		✓		✓
Tahoe Environmental Improvement Program	✓	✓	✓	✓
Private Partnership Contributions		✓	✓	✓
County Funds	✓	✓	✓	✓

\*Parking Management, ITS and Communications, Technology, Environmental Improvements, etc.

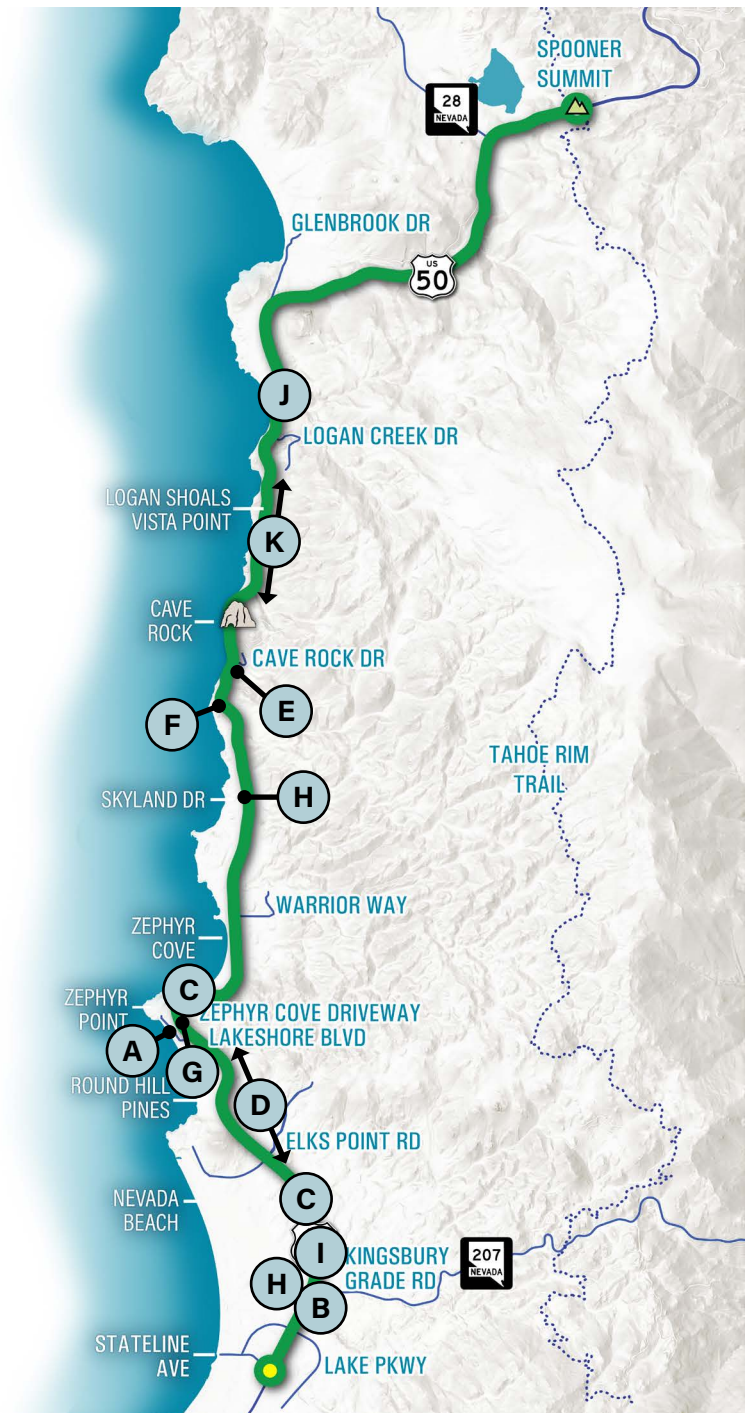
# U.S. 50 CMP: IMPLEMENTATION MATRIX

Phase 0 (1-2 years) Early Action				
Map Marker	Alt. Description	Ballpark Cost Estimate	Land Ownership	Lead/Other Agencies
A	Early-action pavement striping and markings (e.g. narrow lanes)	N/A	NDOT	
B	Conduct S.R. 28/U.S. 50 ICE Analysis	\$50,000	NDOT	
C	Develop and deploy additional signal timing plans	\$250,000	NDOT	
D	Improve Signing to Cave Rock State Park	\$5,000	NDOT	NDSP
E	Add turn lanes where feasible	N/A	NDOT	
F	Evaluate gateway opportunities	\$15,000	NDOT	



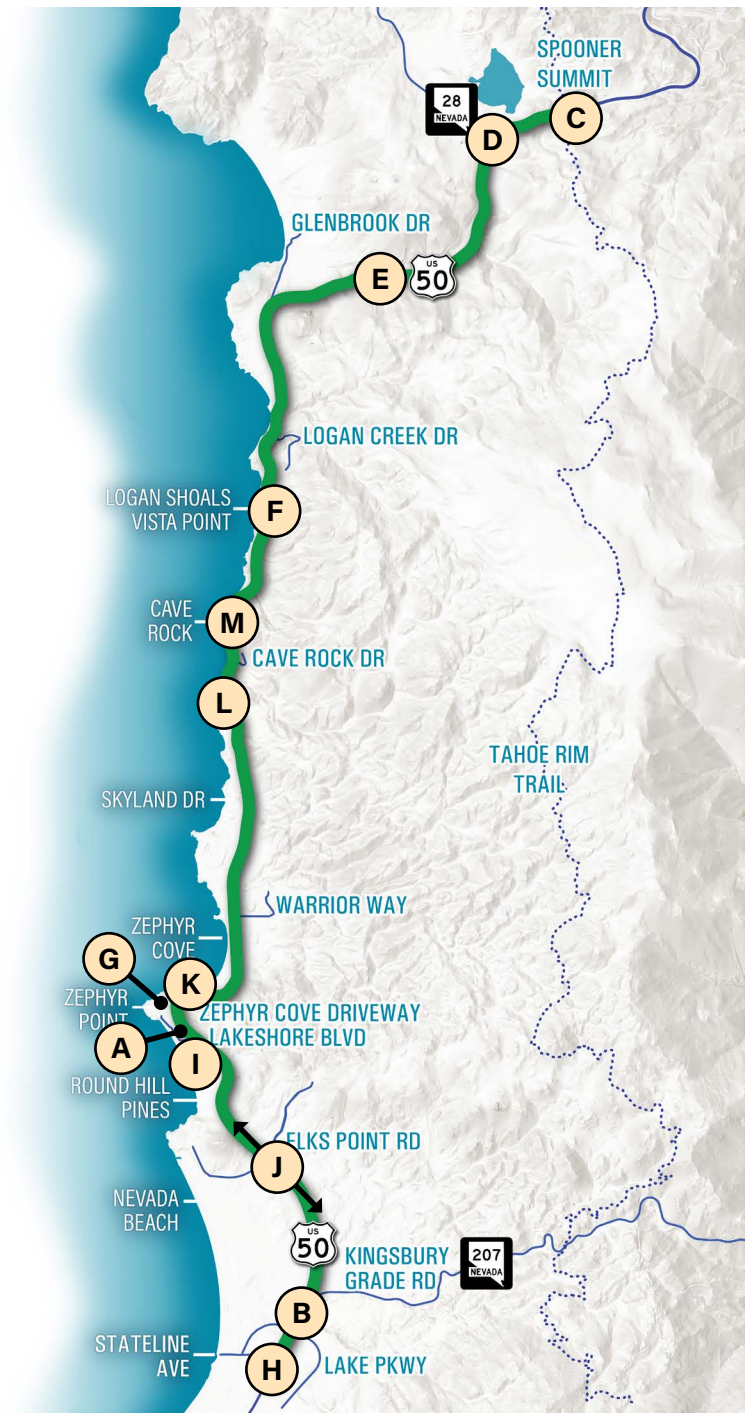
Phase 1 (2-5 Years) Short-Term

Map Marker	Alt. Description	Ballpark Cost Estimate	Land Ownership	Lead/Other Agencies
A	Tahoe East Shore Trail Alignment Study: Round Hill Pines to Zephyr Cove Resort	\$100,000	NDOT	USFS
B	Tahoe East Shore Trail: 4-H Camp Road to Lake Parkway	\$1,400,000	NDOT	DC
C	Multimodal facilities and turn lanes: Elks Pt. Rd. to Kingsbury Grade	\$3,500,000	NDOT	
D	Install bike detection at signals	\$150,000	NDOT	Carson City
E	RRFB at Lyons Ave.	\$50,000	NDOT	
F	RRFB at Tamarack Dr/Cedar Ridge Dr.	\$50,000	NDOT	
G	Improve RRFB at Lakeview Dr.	\$50,000	NDOT	
H	Close sidewalk gap at Kahle Dr.	\$15,000	DC	NDOT
I	Right turn only at 4H Camp Rd.	\$50,000	NDOT	DC
J	Improve existing chain up area	\$60,000	NDOT	
K	Install edge lit speed limit signs, markings, and speed feedback signs	\$85,000	NDOT	



Phase 2 (5-10 Years) Mid-Term

Map Marker	Alt. Description	Ballpark Cost Estimate	Land Ownership	Lead/Other Agencies
<b>A</b>	Tahoe East Shore Trail: Round Hill Pines to Zephyr Cove Resort Environmental/Design	\$1,000,000	NDOT	USFS
<b>B</b>	Multimodal Facilities: Kingsbury Grade to Lake Pkwy.	\$4,000,000	NDOT	
<b>C</b>	Revised parking at Spooner Summit	\$800,000	USFS	NDOT
<b>D</b>	S.R. 28 intersection improvements	\$6,000,000	NDOT	
<b>E</b>	U.S. 50 formal vista point	\$3,500,000	NDOT	
<b>F</b>	Turn lanes to/from Logan Shoals and parking improvements	\$1,500,000	NDOT	USFS
<b>G</b>	Off highway parking at Zephyr Cove Resort	\$6,000,000	DC	USFS, NDOT
<b>H</b>	Lake Parkway Intersection Improvements	\$5,500,000	NDOT	
<b>I</b>	Interconnect traffic signals	\$300,000	NDOT	Carson City
<b>J</b>	Install dilemma zone protection	\$250,000	NDOT	Carson City
<b>K</b>	Install dynamic curve warning system	\$200,000	NDOT	
<b>L</b>	Install dynamic curve warning system	\$200,000	NDOT	
<b>M</b>	Install improved cyclist detection and lighting	\$100,000	NDOT	
<b>N</b>	Install dynamic Parking Full signs (2)	\$150,000	NDOT	USFS



Phase 3 (10+ Years) Long-Term

Map Marker	Alt. Description	Ballpark Cost Estimate	Land Ownership	Lead/Other Agencies
<b>A</b>	Tahoe East Shore Trail: Zephyr Cove Resort to S.R. 28 Feasibility and Environmental	\$10,200,000	NDOT	USFS, NDSP
<b>B</b>	Pedestrian underpass at N. Zephyr Creek	\$5,000,000	NDOT	USFS, DC
<b>C</b>	Pedestrian underpass at campground	\$6,000,000	NDOT	USFS
<b>D</b>	Revised parking along Elks Point Rd. and Roundabout at NV Beach Terminus	\$4,000,000	NDOT	USFS, DC
<b>E</b>	Right turn lane extension at Kingbury Grade to U.S. 50 NB	\$500,000	NDOT	
<b>F</b>	U.S. 50 Park-n-Ride out of Basin	\$550,000	NDSL	NDOT
<b>G</b>	SR 207 Park-n-Ride out of Basin	\$100,000	NDOT	
<b>H</b>	Improve/expand Spooner Summit parking	\$750,000	NDOT	NDSP
<b>I</b>	Kingsbury-Lake Parkway evacuation connection	\$1,020,000	Private	NDOT

