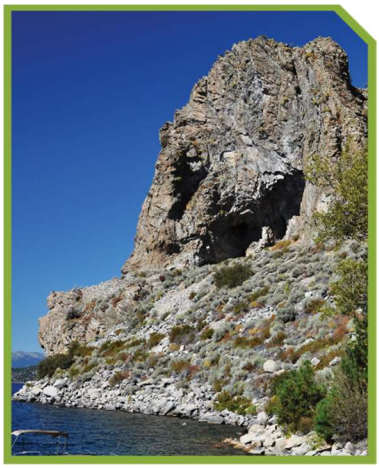
US 50 East Shore

Corridor Management Plan

Future Study Scenarios and Considerations



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ACRONYMS AND ABBREVIATIONS

&	And
#	Number
AADT	Annual Average Daily Traffic
CMP	Corridor Management Plan
hr	hour
Max	Maximum
Min.	Minimum
min	minutes
MPO	Metropolitan Planning Organization
NB	Northbound
NDOT	Nevada Department of Transportation
N/A	Not Applicable
Pass.	Passengers
RTP	Regional Transportation Plan
SB	Southbound
TRPA-MPO	Tahoe Regional Planning Agency – Metropolitan Planning Organization
TTD	Tahoe Transportation District
TWLTL	Two-Way-Left-Turn-Lane
US	United States
US 50	United States Route 50
USFS-LTBMU	United States Forest Service – Lake Tahoe Basin Management Unit

SECTION 1 | BACKGROUND

The US 50 East Shore Corridor Management Plan (CMP) will assess and evaluate needs along the 13-mile corridor within the Lake Tahoe Basin and be consistent with existing Tahoe Regional Planning Agency – Metropolitan Planning Organization (TRPA-MPO) plans, goals, objectives, as well as goals described in the Lake Tahoe Compact. The CMP will identify a mobility vision, objectives, performance measurements, and improvement strategies for the corridor, based on existing regional plans, stakeholder input, and sound technical assessment. In addition, the corridor vision will focus on recognizing regional economic development objectives, the unique seasonal and massive visitor-driven fluctuations in use, local planning and project development activities, and serving to guide the project development process. The study will examine potential multimodal solutions, local and regional transit services, and innovative transportation and mobility strategies. The CMP will be developed cooperatively with the TRPA-MPO, Tahoe Transportation District (TTD), United States Forest Service – Lake Tahoe Basin Management Unit (USFS-LTBMU), and the Nevada Department of Transportation (NDOT) among other local and state partners.

1.1 Study Area

The US 50 CMP corridor in Nevada begins at the crest of the Carson Range at Spooner Summit and extends south and west to Stateline Avenue, extending through Douglas County. The corridor encompasses the unincorporated communities of Stateline, Zephyr Cove, Round Hill Village, Skyland, Lakeridge, and Glenbrook along the eastern shore and links to the incorporated municipality of South Lake Tahoe, California. A map of the US 50 East Shore study area is illustrated in **Figure 1**.

Figure 1: US 50 East Shore Study Area

1.2 Document Purpose

The purpose of this document is to develop and describe transportation scenarios across modes. The scenarios are broad considerations of what may be feasible and how solutions to address transportation challenges in the US 50 CMP corridor could be approached. The scenarios are NOT alternatives but rather inform alternative development in the next phases of the US 50 CMP. These scenarios are not intended to accurately and completely depict US 50 CMP alternatives but are intended to spur thought around what may be feasible when developing specific alternatives later in the study process.

The TRPA *Linking Tahoe Regional Transportation Plan* (RTP) is the long-range transportation plan for the Lake Tahoe planning area. The RTP vision is for a transportation system that is interconnected, inter-regional, and sustainable, connecting people and places in ways that reduce reliance on the private automobile. The RTP recognizes the region has three distinct user types. To ensure the CMP successfully serves each of these types, it will refer to these user groups and their needs when developing scenarios. The user groups can be defined as follows:

Everyday Tahoe

Trips associated with the Everyday Tahoe user group include typical routine trips around everyday life such as commute trips, trips to/from work and/or school and running errands around town. These trips are usually short, less than two miles and, based on the TRPA RTP, account for 51-percent of all trips made within the Tahoe Region.

Discover Tahoe

Trips resulting from the Discover Tahoe user group reflect longer distance trips from residents and visitors alike to recreation destinations around the Tahoe Region. According to the TRPA RTP, the Discover Tahoe trips account for 38-percent made to, through and within Tahoe.

Visit Tahoe

Visit Tahoe user group trips are long-distance to/from the Tahoe area from the overall Northern California and Nevada region. This includes connecting airports such as the Reno-Tahoe International Airport. Visit Tahoe trips account for 11-percent of all Tahoe area trips according to the TRPA RTP.

The proportion of trips within the overall Lake Tahoe region by user group is illustrated in **Figure 2**. The resultant total mode share is shown in **Figure 3** and similarly represents mode share within the overall Lake Tahoe planning area, as noted in the RTP, and is considered to be representative for the mode share of travel within this corridor also.

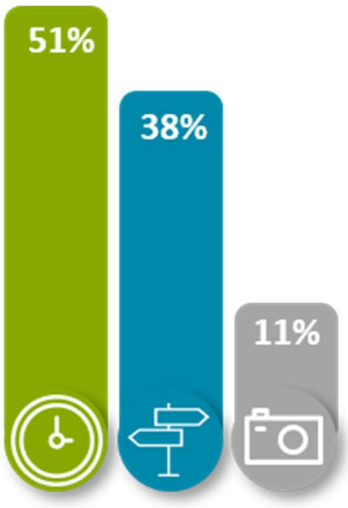


Figure 2: Travel Share by User
Source: TRPA RTP

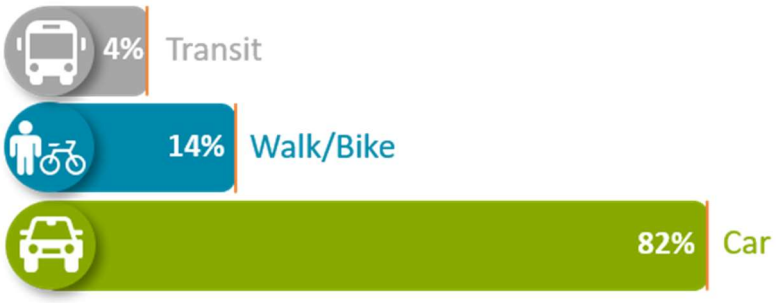


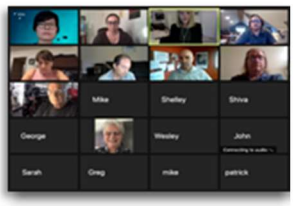
Figure 3: RTP Cumulative Tahoe Basin Mode Share

SECTION 2 | A FUTURE OF INCREASED DEMAND

Over the past decade, the demand for outdoor recreation has continued to increase, bringing more and more travelers to Tahoe. The US 50 corridor has a number of visitor attractions, outdoor recreation areas, and a large tourist bed base that attract both day and long-term visitors. These attractions include areas such as Nevada Beach, Round Hill Pines Resort, Zephyr Cove Resort, the Casino Core and Heavenly Village area. Below is a list of recent factors that have influenced an increase in trip generation for the US 50 corridor and will likely continue to do so into the future:

Northern Nevada's diversifying economy: This has brought an expanded employment base to the Reno/Carson area, less than an hour away from Lake Tahoe. California residents relocating to enjoy lower costs of living and a different pace of life has equated to more day users visiting Lake Tahoe. Development requirements and restrictions in the Tahoe Basin preclude much of this growth from spilling into Tahoe communities and the vast majority of growth occurs within a two-hour drive.

Climate Change: Warmer weather in Tahoe has allowed for more outdoor recreation during the shoulder seasons, potentially sustaining higher visitor levels for a longer period of time. Peak seasons for summer, the season with the highest visitation, have been extended while peak winter ski seasons have been shorter. As the seasonality characteristics of Tahoe change, the demand for warm weather outdoor recreation continues to increase.



The COVID 19 pandemic: Urban and suburban dwellers flocked to outdoor destinations to be active and break the monotony of indoor lockdowns. Destinations such as Lake Tahoe attracted swarms of visitors who, under normal times, may have stayed closer to home and opted for other forms of entertainment. Beyond visitation, many urban residents, after months of working from home, took advantage of remote work options to move out of cities to more rural and active destinations.

As a result of the factors mentioned above, some of the current and long-term challenges include:

- Shoulder seasons see less of a drop-off in activity with residents and visitors actively recreating at popular sites, not seasonally, but as weather and conditions permit. Tahoe will always be a seasonal destination; however, longer shoulder seasons make for more consistent visitation throughout the year as weather and conditions allow, resulting in more year-round activity.
- The increase in resident and visitor recreation creates parking demand that outstrips what is feasible to reasonably provide.
- Massive fluctuations in traffic volumes between peak daily visitation times, such as summer weekends and holidays, and typical weekday travel strain the transportation system.
- Overall peak traffic volumes would reasonably be expected to be above expectations, increasing the need for improvements and alternate modes faster than can be implemented.
- Increased tourism activity increases the need for service workers which typically commute in from nearby communities due to housing availability and affordability.
- Lack of bicycle, pedestrian, and transit options to and within the corridor aggravates an already strained transportation system.

SECTION 3 | CORRIDOR OPPORTUNITIES AND SCENARIOS

The opportunities and scenarios described in this section build upon a modal feasibility analysis and provide a range of future transportation outcomes. These scenarios could occur completely or in part depending on what the future holds, funding availability, and agency decisions. While there is a universe of opportunities for different transportation scenarios, after consulting with study partners, listening to public concerns, reviewing the *Linking Tahoe Regional Transportation Plan*, the *Linking Tahoe Corridor Connection Plan,* and the *Transit Master Plan*, as well as existing corridor conditions, three major scenarios were developed around the primary corridor improvements opportunities.

The primary corridor opportunities identified in Section 3.1 include: Reimagine US50 to Balance Needs and Safety, Expand Transit Service and Operations, Complete the Tahoe East Shore Trail, and Parking Relocation and Management Strategies. These opportunities can be implemented at varying levels as described under each of the three major scenarios. The scenarios identified in Section 3.2 include 1) Recreation Area Focus, which assumes a low transit investment with improvements focused around recreation areas; 2) Transit as a Priority, which assumes a medium transit investment with higher frequencies and improved highway access to residential areas; and 3) Multimodal Priority, which assumes a high transit investment, and highway improvements to support multimodal use. It is assumed that scenarios are a starting point and will meld together into various alternatives as the corridor management plan evolves.

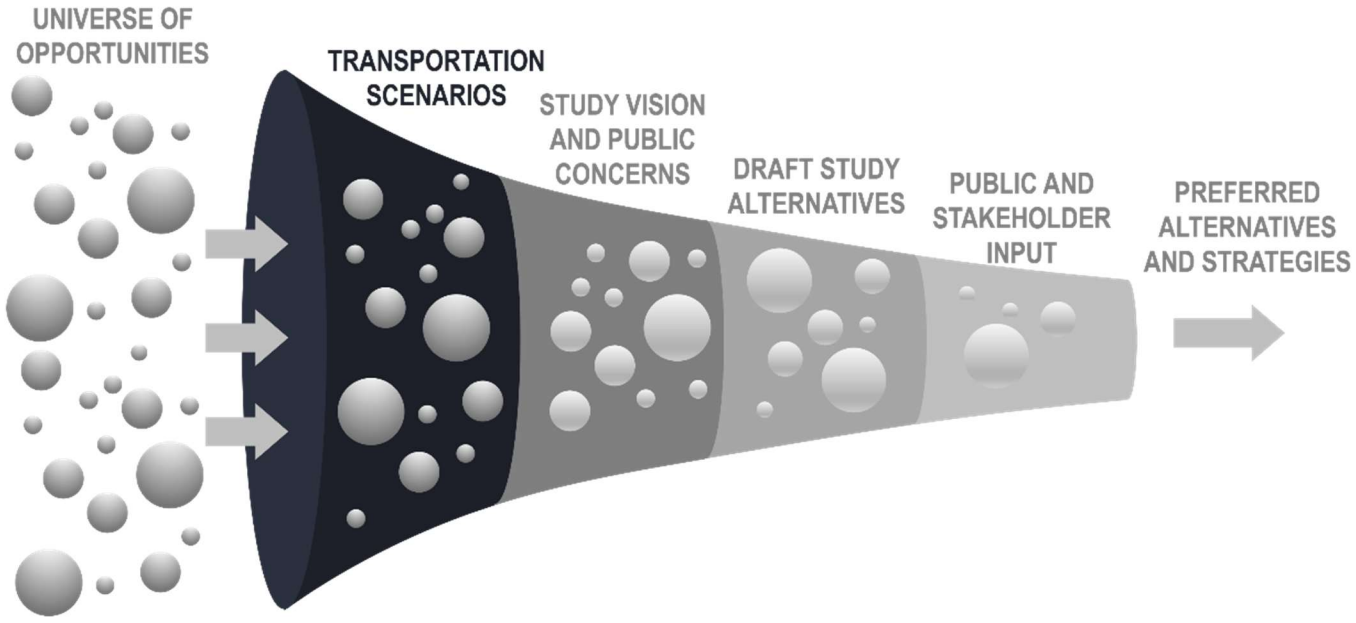


Figure 4: Scenario and Alternative Development Process

3.1 Key Corridor Opportunities

The primary opportunities for improving the corridor are based around **improving roadway safety and operations** and **expanding transportation choices**. These corridor improvements must serve a range of functions including primary access to the Tahoe East Shore and casino core, key access to east shore recreation, and the only access to neighborhoods, schools, and businesses. Roadway operations and safety improvements include looking at how the highway functions and where changes can be made to improve access to residential, commercial, and recreational areas while also looking at opportunities to incorporate pedestrian, bicycle, and transit improvements and parking management strategies in the corridor roadway footprint. Some strategies, like relocating parking to off-highway locations, provide multiple benefits, improve safety and highway operations, and also incentivize use of multimodal options. Other opportunities, such as the use of technology and demand management strategies could improve the corridor and will be addr roadway alternatives have been evaluated (**Figure 5**).

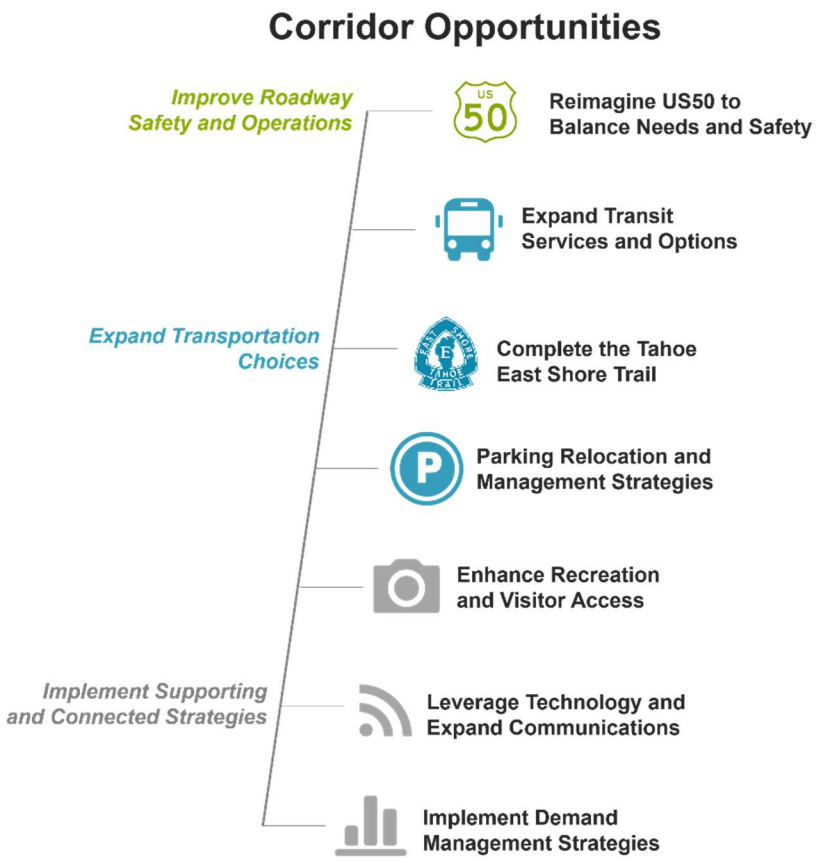


Figure 5: Corridor Opportunities Analyzed Herein (Colored)

The car is the dominant mode share for the US50 corridor, given the lack of transit and bike and pedestrian facilities, poor connectivity between multimodal options, and the inter-regional nature of the road. Regardless of the scenario, managing vehicular demand at recreation sites is an ever-important task as demand continues to exceed vehicle capacity during peak periods at many of the recreation areas within the corridor. Creating connected, reliable, and easy-to-use multimodal opportunities is key to addressing these demands. Parking management systems can distribute demand throughout the day at off-highway parking locations to improve overall capacity while also helping incentivize the use of other transportation choices. These strategies can support adaptive corridor management opportunities where existing capacity is used more efficiently to address dynamic needs and peak periods.

Each of the primary opportunities: Reimagine US50, Expand Transit, Complete the Tahoe East Shore Trail, and Parking Relocation and Management are addressed in greater detail below and on the following pages.

Reimagine US50 to Improve Safety and Access:

Expanding the existing paved US50 corridor is not feasible to accommodate safety and operational enhancements given constraints such as the existing development, topography, and the need to meet established environmental thresholds in the Lake Tahoe Basin. Therefore, safety and operational improvements must be accommodated within the existing developed US50 roadway corridor.

Note: The segment from Stateline to Kingsbury Grade (SR 207) was considered but not included in the analysis as it has improvements advancing through design for US50 South Shore Community Revitalization and Main Street Management projects, including multi-modal infrastructure on both sides of US 50.

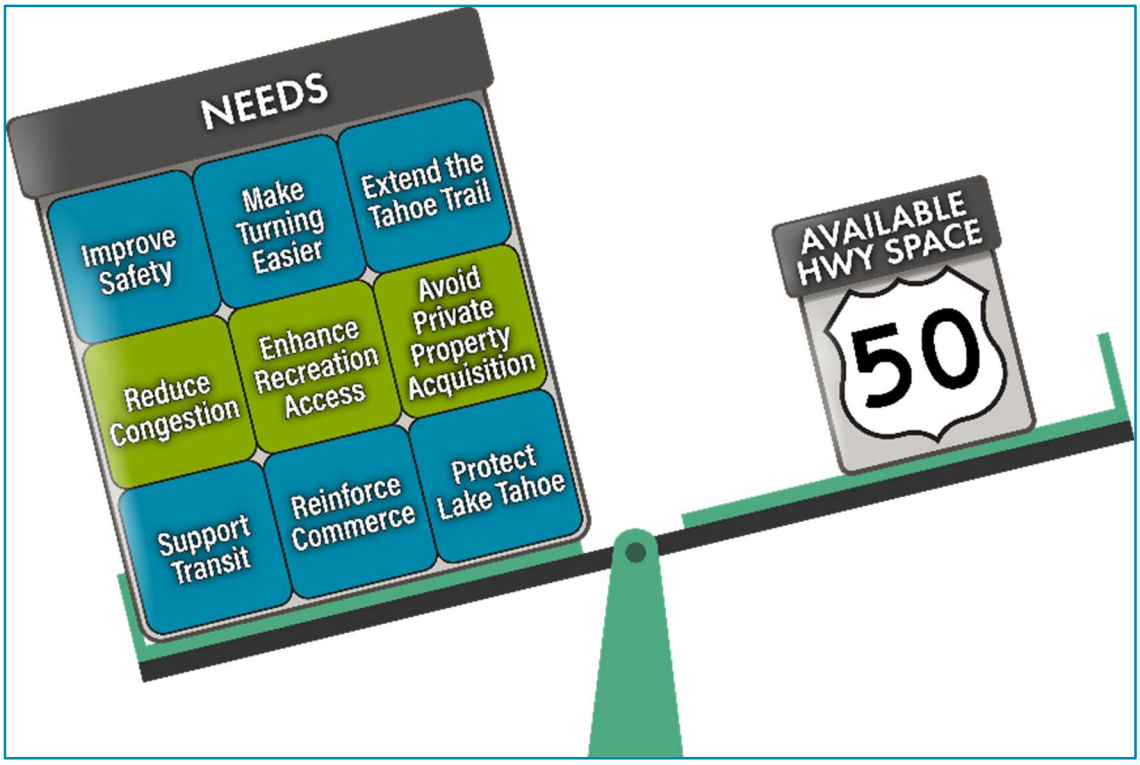


Figure 6: Balancing Needs Versus Available Space

Generally, the current four lane configuration, with a lack of dedicated turn pockets, and no bike and pedestrian facilities is outdated and only serves a single autocentric user group. Current national data sources show this type of configuration encourages higher speeds, has lead to a continual increase in crashes (including fatalities), and supports a higher demand of auto use versus multimodal use. Limited space available for transportation improvements coupled with a high demand for a variety of improvements, including but not limited to safer turn movements in/out of residential and recreation areas, adding bike and pedestrian facilities, and relocating on-highway parking will require a balanced approach. Balancing the highway space to maximize the benefits realized from space reallocation, as illustrated in **Figure 6,** will require looking at alternatives within the corridor and analyzing the performance of each.

Looking at the specific opportunities within this corridor, the space reallocation could be used for the following purposes by mode:

- **Vehicular Mode** – Incorporate turn lanes and acceleration/deceleration lanes to/from cross-streets and driveways, where additional space allows, a consistent concern among corridor residents.
- **Bicycle/Pedestrian Modes** – Accommodating the Tahoe East Shore Trail along the corridor is a priority that has been identified in multiple planning documents for decades in order to provide a safe facility for both bicyclists and pedestrians. Look at gaps in more direct bike and pedestrian links in the urban core areas such as Stateline to Kingsbury Grade and Kahle to Elks Point Road.
- **Transit** – Integrate transit-supportive infrastructure, like bus pullouts and transit stops, where appropriate, and help integrate transit with relocated parking that is moved from US50 to off-highway locations.

A conceptual traffic analysis of US 50 was completed to understand the feasibility to repurpose US50 to accommodate the opportunities described above. Planning-level analysis for potential roadway reconfigurations typically compares horizon-year vehicle volumes against Average Annual Daily Traffic (AADT) thresholds. This is a simple and effective

method, but it assumes an equal number of lanes in both directions. A planning-level analysis focused on lane capacities was used to consider opportunities with an unequal number of lanes in each direction, which could occur through permanent changes or through demand-driven adaptive lane management. The analysis used cellphone and navigation data to calculate current average daily traffic volumes to capture the influence the COVID-19 pandemic had on the roadway; both 2019 and 2020 were analyzed. The analysis results found that mid-day Saturdays from September through November 2020 provided the highest average use and are used to compare to volumes projected in the future year 2045. Future year analysis also considers the potential for an unequal number of lanes in each direction (e.g., two lanes north and one lane south). These volumes are shown in **Table 1**.

Table 1: US50 East Shore CMP Vehicle Scenarios

Segment	2020 SB	2020 NB	NDOT Min. Growth	2045 SB	2045 NB	Max Flow 1+TWLTL	Max Flow 1 Lane
Segment 1: Glenbrook	1224	1159	0.5%	1387	1313	1700	1500
Segment 2: Cave Rock	1180	1189	0.5%	1337	1347	1700	1500
Segment 3: Skyland	1127	1176	0.5%	1277	1332	1700	1500
Segment 4: Round Hill	1388	1271	0.5%	1572	1440	1700	1500
Segment 5: Kingsbury	1802	1811	0.5%	2041	2051	1700	1500

Future 2045 vehicle volumes were extracted from the TRPA travel demand model for the model years 2018 and 2045, and a ratio method calculation was applied to generate future 2045 volumes. The volumes between the two years (2018 and 2045) were found to have little to no growth, which is below the NDOT Traffic Operations Division's minimum required 0.5-percent annual growth rate. Therefore, future 2045 volumes were determined by applying the minimum 0.5-percent annual growth rate to the 2020 directional volumes. The resulting 2045 directional volumes are shown in **Table 1**.

To determine the potential for changes to vehicle lanes, whether permanent or adaptively, the projected future 2045 directional volumes are compared against AADT thresholds for one-lane and one-lane with a two-way-left-turn-lane (TWLTL) options. A one-lane threshold of 1,500 vehicles per hour is assumed while a threshold of 1,700 vehicles per hour is assumed for the one-lane with a TWLTL option to account for increases in efficiency when separating turning traffic. The 2045 northbound and southbound directional volumes are compared against these thresholds to determine potential feasibility as shown in **Figure 7**.

As can be seen in the figure, both northbound and southbound directional thresholds are not exceeded from Spooner Summit south to the Round Hill Pines Resort. From Round Hills Pines to Kingsbury Grade thresholds for both one-lane and one-lane with a TWLTL are exceeded.

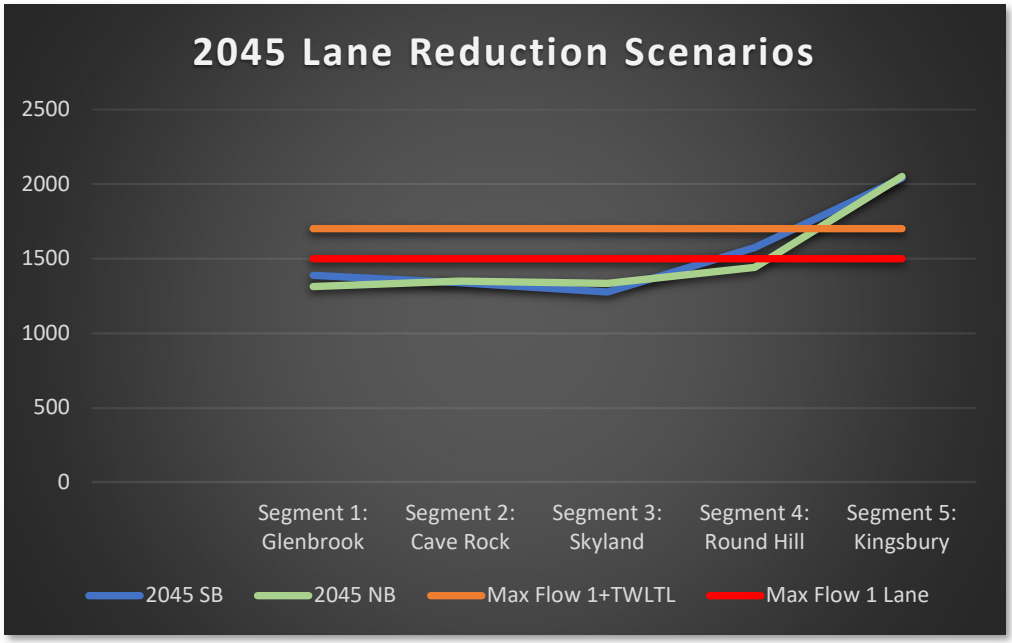


Figure 7: 2045 Reconfiguration Scenarios

From a volumetric standpoint, this provides approximately 11 miles of corridor where lane repurposing is feasible in both the northbound and southbound directions. Repurposing a vehicle lane provides space that could be used to improve the safety and performance of the roadway, improve access to residential, commercial, and recreational areas, and to build the Tahoe East Shore Trail.

Note: It is recognized that this feasibility analysis is a planning-level analysis based on general traffic capacity thresholds. A detailed traffic operations analysis is required to determine with a high degree of certainty how lane reduction alternatives would perform for this corridor and is beyond the scope of the current study. NDOT may or may not elect to conduct such an analysis and as is typical, may focus operational analyses to controlled intersections.

Based on the analysis, two potential roadway reconfigurations may be considered part of alternatives development: 1) a single lane reduction in one direction, or 2) a lane reduction in both directions coupled with a TWLTL. When considering the first option, a single lane reduction in one direction, a southbound direction lane is used in order to maintain two lanes northbound for emergency evacuation purposes: qualitative review of evacuation data from the Caldor Fire in August of 2021 suggests a single lane would perform adequately.

The two repurposing options were analyzed to determine their potential corridor safety improvement, the potential reduction in crashes, and the effect on travel time. This analysis does not include potential crash reduction from the implementation of turn lanes. Speed is also a major safety factor, and lane reductions are effective at reducing vehicle speeds. Vehicle speeds were estimated by coding each repurposing strategy into the NDOT Statewide Travel Demand Model (year 2040) between Glenbrook and Elks Point Road (logical segments within the model) and extracting the model's average speed and travel time to traverse the corridor from Spooner Summit to the California State Line. The results of these analyses are shown in **Figure 8**.

It is recognized that repurposing is but one roadway improvement strategy that can be considered. Other strategies such as narrowing lanes, adding shoulders, operational and intersection improvements, etc. are all feasible roadway improvements that will all also be considered in conjunction with potential repurposing. These options will be considered later in the study as part of alternatives development.

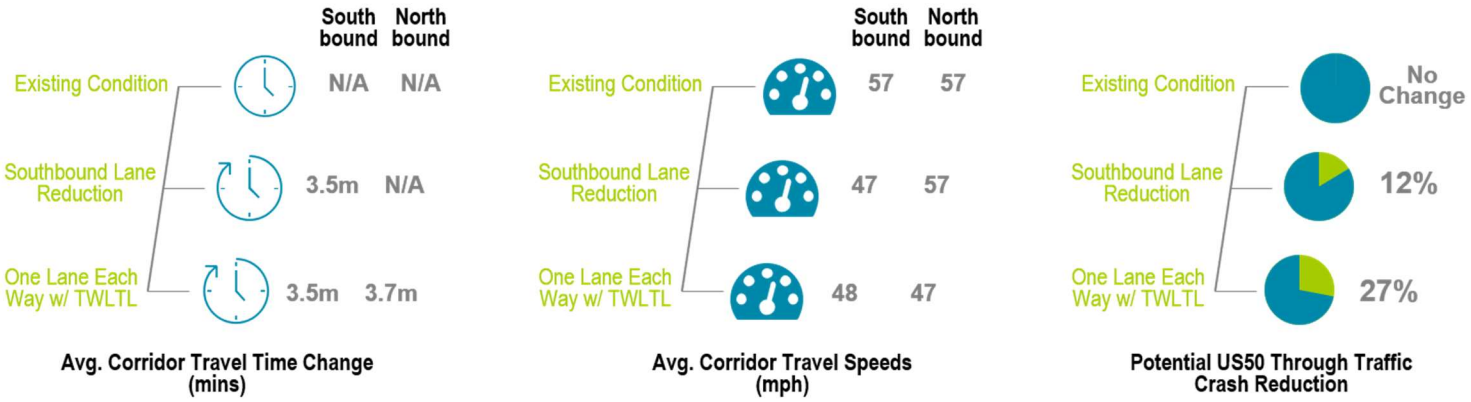


Figure 8: Reimagined US50 Potential Performance Metrics

Expand Transit Services and Options:

With strategies as far ranging as regional service, micro transit, shuttles, and water borne ferries/taxies, transit offers the most opportunity to consider a range of options. As such, a range of transit service scenarios were developed and analyzed. The transit scenarios incorporate strategies within each of the five service types outlined in the Tahoe Transportation District (TTD) *Linking Tahoe Transit Master Plan (2017)*. TTD is one of the few transit providers in the region, providing the majority of service for South Lake Tahoe and the US 50 Corridor. The plan outlines a vision for expanding frequent, convenient, and reliable service in the service area. The *Linking Tahoe Transit Master Plan* includes a range of investment scenarios; however, much has changed since 2017 with many routes having been eliminated or consolidated due to funding shortfalls. Therefore, relevant strategies were used to analyze transit feasibility options that apply to the US 50 corridor based on current transit operations across all service types and potential public-private transit services (**Figure 9**). Strategies can be mixed-and-matched. The five service types and associated strategies are outlined below and a look at how transit affects user groups shown in **Figure 10**.

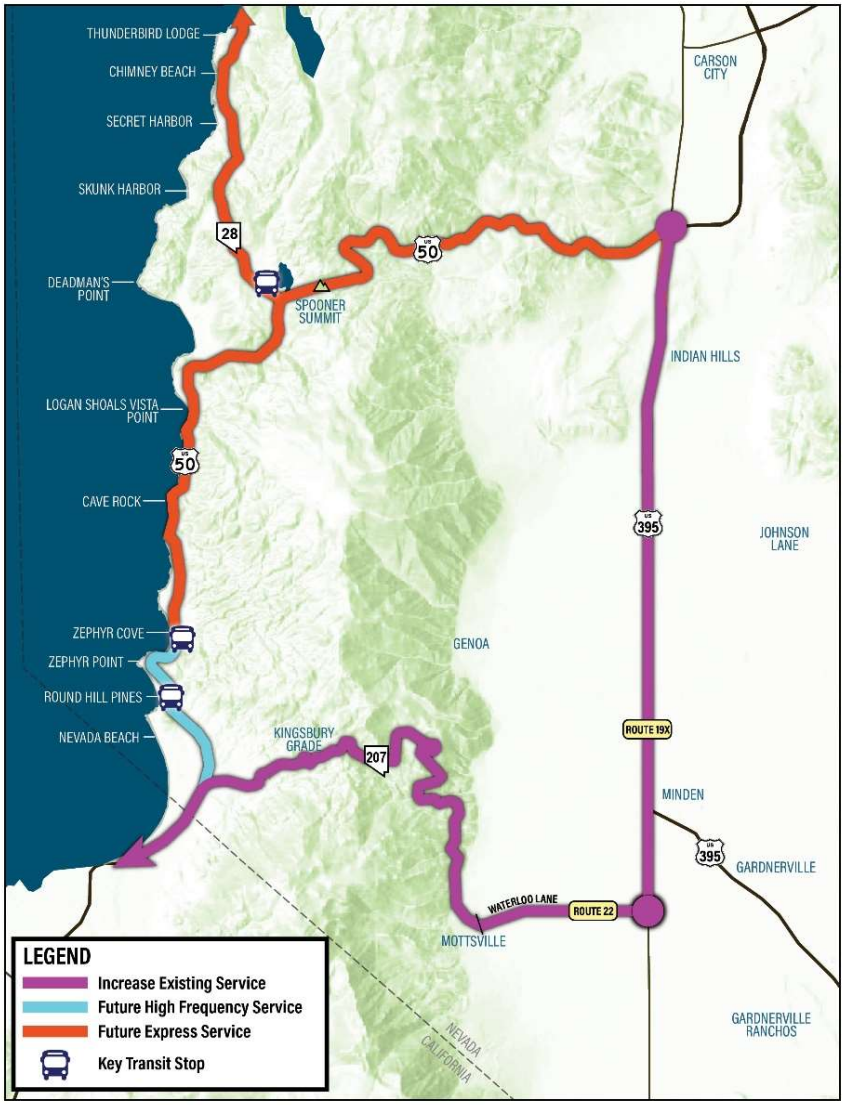


Figure 9: Transit Service Overview

Expand Transit Services and Options… Who Benefits?

Everyday Tahoe & Discover Tahoe: Better, more reliable connections to employment centers and recreational destinations, less reliance on private vehicles, less visitor traffic, and opportunities to avoid limited parking.

Visit & Discover Tahoe: Improved access to recreation through a continuous multi-use path and transit to popular destinations on the east shore.

Figure 10: Transit Benefits by User Group

Frequent Service – Urban core fixed route transit with frequencies of around 20 minutes or less.

Strategies:

- **Increase frequency and service hours on US50 routes 55/22** – Route 55 provides frequent local service from the South Y Transit Center to the Kingsbury Transit Center, with 15 stops in South Lake Tahoe. The service currently runs at a 60-minute frequency. The Stateline Transit Center and Kingsbury Transit Center stops service the study corridor. Route 22 provides both local and regional service from the Stateline and Kingsbury Transit Centers to Kingsbury and the Douglas County Community and Senior Center respectively. Route 22 consists of a total of seven stops, four total stops for local service, running at 60 to 120-minute frequencies, and five total stops for regional service, running at 120-minute frequencies during peak hours only. Transit scenarios include opportunities to increase the frequency and service hours on these established routes.

Frequent Service… Who Benefits?

Everyday Tahoe & Discover Tahoe: Increased access to local services and recreation, less visitor traffic on the roads

Visit Tahoe: Increased access to recreation, leave the car parked

- **Local Service** – Fixed routes serving neighborhoods and to urban cores with 30-to-60-minute frequencies.

Strategies:

- **Add service to Spooner Summit and Zephyr Cove** – Connecting the resort corridor (Stateline area) to major recreation destinations will encourage visitors to leave their car behind and use transit to access recreation. This will not only reduce congestion on the highways it will also reduce parking demand at recreation destinations -- improving safety as oftentimes, parking spills onto the highways.
- **TTD proposed ferry shuttle to Zephyr Cove** – Transit service by water provides another opportunity to move visitors around Tahoe without their car. Moving people by water provides a lot of benefits of not putting transit into the congestion on the highways making this a more reliable service. It also entices visitors to use transit as this is also viewed as an attraction for visitors to experience Lake Tahoe by boat.
- **Water taxi service to Round Hill Pines and Zephyr Cove** – Water taxi service, provided through private service to Round Hill Pines, provides an on-demand service to move users by water. Expanding this private service to more destinations on the east shore provides more travel choices and can build greater confidence in transit service.

Local Service… Who Benefits?

Everyday Tahoe & Discover Tahoe: Increased access to local services and recreation

Visit Tahoe: Increased access to recreation

- **Community Service** – Fixed or circulation service operating in a small zone, providing on-demand service to recreation hot spots and urban centers (5-to-30-minute frequencies).

Strategies:

- **Free fixed route from Round Hill Pines and Zephyr Cove to the tourist core (Stateline)** – Making transit free, frequent, and reliable between the visitor bed base and major recreation destinations along US 50 will entice visitors to leave their car behind helping to reduce both highway and parking congestion throughout the

corridor. Implementing this service could also provide benefits for local residents who would also have access to the service. Locating transit stops that can be convenient for both locals and visitors should be considered.

- **Increase frequency of existing ski shuttle (winter only)** – Providing free and frequent ski shuttles for winter use serves both visitors and locals. This greatly reduces the need for people to park at the ski resort helping to reduce congestion created by the recreation demand.

Community Service… Who Benefits?

Everyday Tahoe & Discover Tahoe: Increased access to recreation

Visit Tahoe: Increased access to recreation, leave the car parked

- **Microtransit** – On-demand, technology-enabled multi-passenger transport on dynamically generated routes.

Strategies:

- **On-demand Microtransit from Round Hill Pines and Zephyr Cove to/from resort corridor –** Visit Tahoe and Discover Tahoe users make most of their trips in Tahoe by car, contributing to congestion and parking demand. Frequent and convenient micro-transit service can reduce these users need to drive. Microtransit will also help create visitor confidence that if they arrive to Tahoe by transit they can move around freely.

Micro Transit Service… Who Benefits?

Everyday Tahoe & Visit Tahoe: Increased access to recreation, leave the car parked

- **Regional Service** – Fixed route express, or commuter routes connect the north and south shores of Lake Tahoe and to nearby cities: Reno/Sparks, Carson, Gardnerville/Minden.

Strategies:

- **Re-establish route 21x to Carson City –** Route 21x previously provided peak hour express commuter service with 6 daily trips (3 in the morning and 3 in the afternoon) between Carson City and the Stateline Transit Center. Based on 2015-2016 data, 21x served over 25,000 rides per year (service was eliminated in 2016 due to funding). Re-establishing this connection is key to providing transit service to many of the employees who work in corridor and the south shore but cannot afford to live in Tahoe. Weekly commuter service with increased service hours during peak visitation could serve employees and day visitors, and provide connection with future SR 28 transit service, connecting Carson City to the north shore and its recreation areas.
- **Increase route 22 to Minden/Gardnerville –** Route 22 provides limited service between Minden/Gardnerville and the Stateline Transit Center during peak commute hours only. Increasing this route during peak visitation could help reduce congestion created by recreation demand.
- **Increase route 19x to Minden/Carson –** Route 19X provides limited express commuter service between Carson City, Minden/Gardnerville and the Stateline Transit Center during the mid-day only. Increasing route 19x during peak visitation could help reduce congestion created by recreation demand.

Regional Service… Who Benefits?

Everyday Tahoe: Increased access to work for commuters

Discover Tahoe: Increased access to recreation

Visit Tahoe: Increased access to recreation

- **Day and resident user service from Sacramento, Stockton, Reno, Carson City, and airports combined with park-n-ride –** The majority of day visitors to Tahoe come from Sacramento or the Reno/Carson Valley areas. Adding new service aimed at day users and expanding existing services such as El Dorado Transit coupled with park-n-ride lots at key destinations outside of the Tahoe Basin will create an easy-to-use service. When paired with frequent, local, community, and microtransit strategies ensures visitors can move around Tahoe without a car once they arrive.

Based on the Transit Strategies described in the previous pages, three overall transit scenarios (**Table 2)** are considered with each scenario representing different levels of transit services resulting in various mode share opportunities: Scenario 1 (1-percent), Scenario 2 (4-percent), and Scenario 3 (9-percent). The **Table 2** analysis quantifies feasible ridership for each scenario which would result in fewer vehicular trips in the corridor. The strategies that make up these scenarios will be further analyzed and flushed out in the alternatives analysis phase of the CMP.

Table 2: US50 East Shore CMP Transit Scenarios

Strategies by Service Type	Scenario 1			Scenario 2			Scenario 3		
Frequent Service									
Transit Strategies	**Frequency (min)**	**Pass./Hr**	**Daily Load**	**Frequency (min)**	**Pass./Hr**	**Daily Load**	**Frequency (min)**	**Pass./Hr**	**Daily Load**
1. Increase frequency and service hours on US50 routes 55/22	60	50	400	30	100	800	15	200	1600
Local Service									
Transit Strategies	**Frequency (min)**	**Pass./Hr**	**Daily Load**	**Frequency (min)**	**Pass./Hr**	**Daily Load**	**Frequency (min)**	**Pass./Hr**	**Daily Load**
1. Add service to Spooner Summit and Zephyr Cove	N/A			60	50	400	30	100	800
2. Water taxi service to Round Hill Pines and Zephyr Cove	N/A			40	18	144	20	36	288
3. TTD proposed ferry service to Round Hill Pines and Zephyr Cove	N/A			90	8	64	45	16	128
Community Service									
Transit Strategies	**Frequency (min)**	**Pass./Hr**	**Daily Load**	**Frequency (min)**	**Pass./Hr**	**Daily Load**	**Frequency (min)**	**Pass./Hr**	**Daily Load**
1.Free fixed route from Round Hill Pines and Zephyr Cove to resort corridor (Stateline)	N/A			60	30	240	20	90	720
2. Increase frequency of existing ski shuttle (winter only)	60	30	240	30	60	480	20	90	720
Microtransit									
Transit Strategies	**Frequency (min)**	**Pass./Hr**	**Daily Load**	**Frequency (min)**	**Pass./Hr**	**Daily Load**	**Frequency (min)**	**Pass./Hr**	**Daily Load**
1. On-demand microtransit from Round Hill Pines and Zephyr Cove to/from resort corridor	N/A			60	6	48	20	18	144
Regional Service									
Transit Strategies	**Frequency (min)**	**Pass./Hr**	**Daily Load**	**Frequency (min)**	**Pass./Hr**	**Daily Load**	**Frequency (min)**	**Pass./Hr**	**Daily Load**
1. Re-establish route 21x to Carson City	N/A			90	33	267	60	50	400
2. Increase route 22 to Minden/Gardnerville	60	25	200	45	33	267	30	50	400
3. Increase route 19x to Minden/Carson	120	12.5	100	90	17	133	60	25	200
4. Day user service from Sacramento, Stockton, Reno, Carson, and airports combined with park-n-ride	1440	4	100	240	63	500	120	125	1000
Total Daily Summer Loads (Full)			1040			2863			5680
Total Daily Summer Loads (80% Capacity)			832			2290			4544
Equivalent Trips Removed			396			1091			2164

Notes: 1) Passengers per hour refers to total potential capacity. 2) Daily load refers to maximum possible daily load.

Complete the Tahoe East Shore Trail: For the pedestrian and bicycle modes, the *Nevada Stateline-to-Stateline Bikeway Feasibility Study (2011)* analyzed feasibility and use of the Tahoe Trail in this corridor. The study defined the opportunity for a separated, paved pedestrian and bicycle path circling Lake Tahoe. It forms the basis for alternatives considered in this plan and informs alternative development in the next phase of the plan, when the potential path alignment will be determined.

Figure 11: US50 Corridor Tahoe East Shore Trail Overview

Since the study was completed, segments of the Tahoe Trail have been constructed from Incline Village to Sand Harbor and from Round Hill Pines to South Lake Tahoe, and the Sand Harbor to Spooner Summit section, has recently received environmental approval and is advancing into design, the final step before construction. An overview of the existing and proposed Tahoe East Shore Trail in the corridor is shown in **Figure 11**.

These successes have provided several lessons learned:

- Where demand is high, transit, trails, and parking management must work together to provide transportation options when demand exceeds capacity
- The Tahoe Trail will have different users along different segments.
- Bicycle and pedestrian facilities are important to meet regional environmental and vehicle miles traveled goals and thresholds
- Gaps to connecting trails and sidewalks must also be completed to enhance access for recreation areas, neighborhoods, and commercial centers.

- Expanding technologies, such as electric bikes and scooters are increasing the range of non-auto travel the average user can make - and these technologies are gaining acceptance for use in National Forest lands.
- The Tahoe Trail is key to improving recreation access management.

Tahoe East Shore Trail… Who Benefits?

Everyday Tahoe, Discover Tahoe, & Visit Tahoe
Increased access to recreation without the car

The remaining segments of the Tahoe East Shore Trail within the study corridor will be further detailed as part of the alternative development process.

Parking Relocation and Management Strategies: On-highway shoulder parking is one of the largest safety issues in the corridor and is typically concentrated around recreation areas as recreation demand exceeds on-highway parking capacity at these areas. Off-highway parking areas connected with transit and the Tahoe Trail creates opportunity for balancing parking capacity at the recreation areas while also providing alternative ways for visitors and residents to access recreation when parking areas are full (**Figure 12**). Management strategies play a key role in helping manage parking and ensuring the on-highway parking does not continue. These strategies include:

- Balance among recreation area access, on-site parking, off-highway parking nodes, and multimodal connectivity – i.e. parking for the off-peak with transit helping during peaks.
- Once alternatives to on-highway parking are implemented, enforcement and education are key to ensuring residents and visitors understand how to access the recreation areas safely.
- Parking management and integration of technology – incentivize visitors to use parking during off-peak and the use of multimodal options, advance notice of parking capacity, and advertise multimodal option
- Look for opportunities for shared parking to maximize benefits with minimal disturbance.

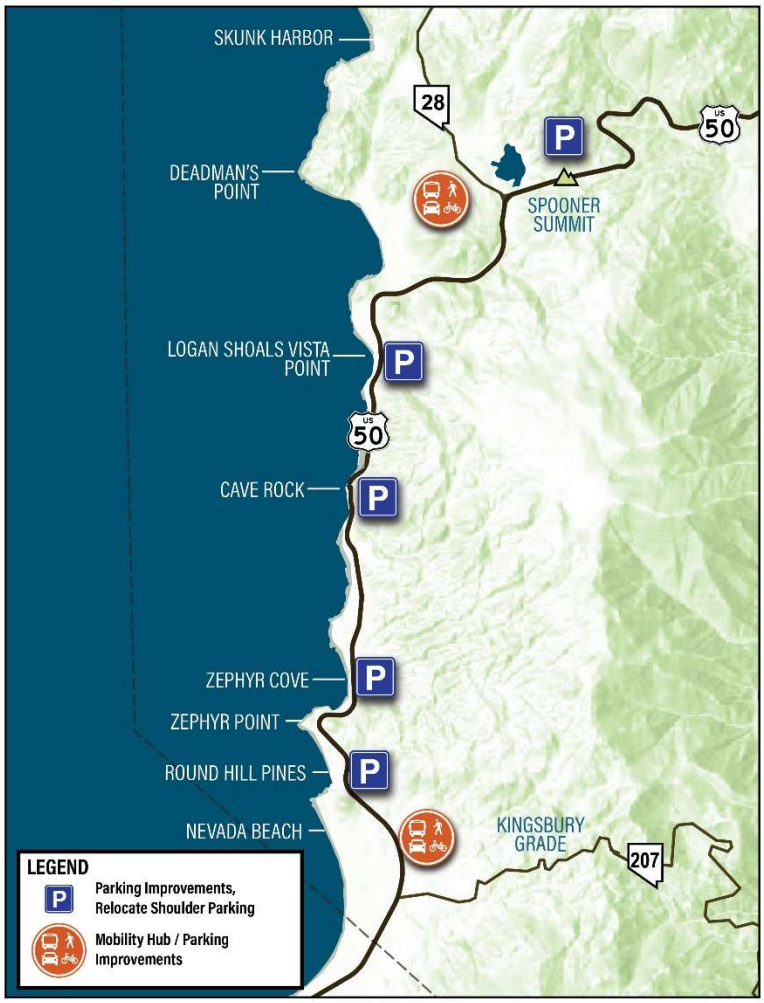


Figure 12: Parking Management Opportunities

Relocate Shoulder Parking… Who Benefits?

Everyday Tahoe & Discover Tahoe: Safer access to recreation

3.2 Corridor Improvement Scenarios

Three scenarios were developed to manage transportation and mobility improvements in the corridor that integrate the corridor opportunities. These scenarios are not intended to suggest binary choices but rather the range of outcomes that could be realized based on the level of implementation of strategies. Each scenarios describes the resultant impact on vehicular, bicycle (bike)/pedestrian (ped) and transit modes, as well as parking. While not a transportation mode, parking is intrinsically tied to mode choice and is a key supporting strategy that will be considered during alternative development. The scenarios could be blended to develop alternatives in the next phase of this CMP.

The scenarios are evaluated qualitatively with some quantitative data in order to understand their potential for improving the corridor. As the CMP planning process continues, alternatives will be developed based on the opportunities and scenarios. These alternatives will be quantitatively evaluated more deeply, tested against policy decisions, reviewed for likely funding opportunities, and evaluated for cost/benefit. Below are a range of opportunities and scenarios that should be considered as alternatives are developed later in the study.

1) Recreation Area Focus Scenario:

Transit continues to lack funding and service remains limited in most of the corridor, with modest increases in frequency of existing transit routes (only serving segments 5 and 6) , and through private shuttles provided by concessionaires for only their visitor's use. Highway improvements and lane repurposing are focused around recreation area entrances, major intersections, and constrained locations along the corridor, and at safety hot spots. Off-highway parking areas are expanded to the extent feasible around recreation areas. The Tahoe Trail provides connectivity between residential areas, visitor bed base and recreation areas. While this helps recreational areas deal with peak demand periods, it leaves gaps in multimodal connectivity.

- ✓ **Focus on safety improvements at major intersections and lane repurposing along constrained sections**
- ✓ **Address safety hot spots, and community access near recreation areas**

- ✓ **Complete Tahoe East Shore Trail**

- ✓ **Expand Transit:** Low Transit Investment Scenario
  - Increase frequency on existing routes
  - Private shuttle service to recreation areas

Scenario 1… Who Benefits?

Everyday Tahoe: Safer turn movements into residential at limited locations. Safer access to recreation areas. Increased transit service.

Discover Tahoe, Visit Tahoe: Increased access to safer recreation locations with less dependence on the car

- ✓ **Relocate Shoulder Parking to Off-Highway Locations:** Relocate shoulder parking by expanding off-highway parking at a maximum capacity assuming minimal transit service. Implement parking fee system.

2) Transit as a Priority Scenario: Focus on transit improvements at recreation areas and trailheads, key residential locations, and commute options out of the basin. Parking lot expansion at Zephyr Cove to better manage on-highway parking removal and support transit, and improvements to promote park-n-ride areas. Highway improvements and reconfigurations are focused around recreation area entrances and major intersections along the corridor, and at safety hot spots. While this approach drastically improves transit, gaps remain in the bicycle and pedestrian network, specifically lacking first-and-last mile connections.

- ✓ **Focus on access improvements to neighborhoods through roadway improvements and lane repurposing**
- ✓ **Address safety hot spots, and community access near recreation areas**
- ✓ **Complete Tahoe East Shore Trail**
- ✓ **Expand Transit:** Medium Transit Investment Scenario
  - Increase frequency
  - New service with focus on serving recreation and residential areas and regional transit services

Scenario 2… Who Benefits?

Everyday Tahoe: Safer turn movements into residential at select locations. Safer access to recreation. Increased transit service.

Discover Tahoe, Visit Tahoe: Increased access to safer recreation with some options to avoid the car

- ✓ **Relocate Shoulder Parking to Off-Highway Locations:** Relocate shouldering parking by expanding off-highway parking based on shoulder season demand with transit covering peak periods. Implement parking fee system.

3) Multimodal Priority Scenario: Corridor improvements will be focused around multimodal connectivity with higher frequency service to recreation areas, and the commercial core. Highway lane repurposing will support the Tahoe Trail and transit circulation while improving access to residential areas. Regional transit service will also be expanded.

- ✓ **Focus on multimodal access**
- ✓ **Lane repurposing to accommodate improved safety at intersections and driveways**
- ✓ **Address safety hot spots and community access near recreation areas**
- ✓ **Fully Complete Tahoe East Shore Trail**
- ✓ **Connect other trails and sidewalks to the Tahoe East Shore Trail**

Scenario 3… Who Benefits?

Everyday Tahoe: Safer turn movements into residential throughout. Safer access to recreation. Robust transit options.

Discover Tahoe, Visit Tahoe: Maximum access to safer recreation with a range of options to avoid the car

- ✓ **Expand Transit:** High Transit Investment Scenario
  - Increase frequency
  - New services expanded throughout the corridor including new water services
  - Expanded regional connectivity

- ✓ **Relocate Shoulder Parking to Off-Highway Locations:** Relocate shouldering parking by expanding off-highway parking and providing more frequent transit services. Off-highway parking is provided at lower capacity as transit is providing the majority of the access. Focus on park-n-ride lots (mobility hubs) at corridor bookends. Implement parking fee system with higher rates for parking at recreation areas, include reservation systems.

Mode Share by Scenario

Mode share for each of the scenarios is qualitatively illustrated in **Figure 13**. These potential outcomes help inform alternative development and selection during the US 50 CMP and suggest that investments across all modes are likely to experience demand regardless of foreseeable future outcomes. Basically, an all-of-the-above approach to mobility investments is warranted.

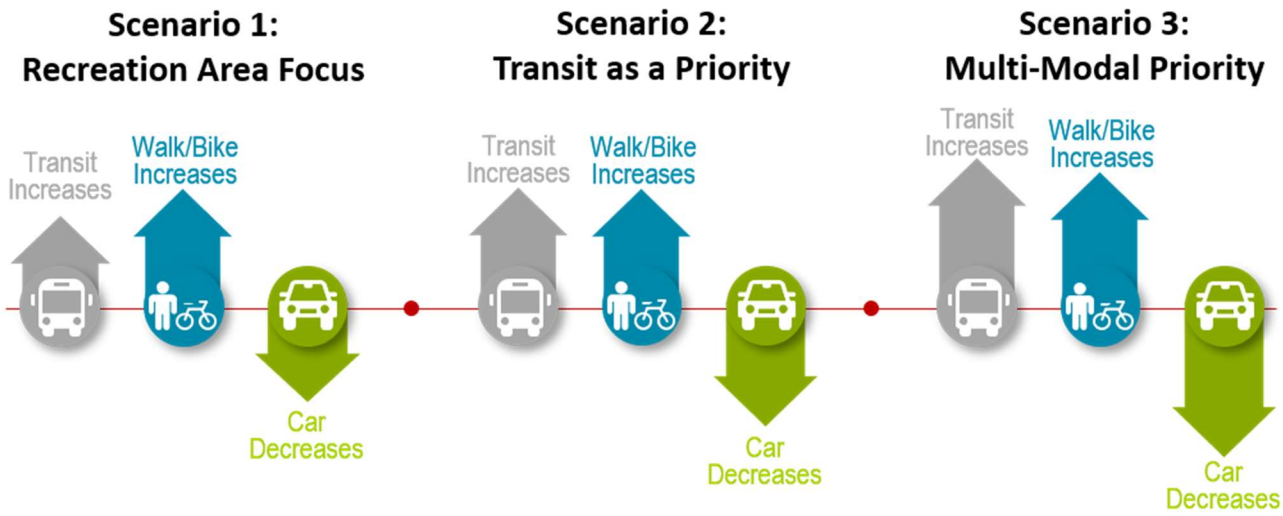


Figure 13: Qualitative Impact of Scenarios on Mode Share

3.3 Comparison to Study Goals

A total of six US50 East Shore CMP goals have been developed to help guide the study and support the study vision. A cross-check of the scenarios from Section 3.2 against these goals helps inform the development of scenarios and selection of an alternative in the CMP. A qualitative comparison of the scenarios against the study goals is provided in **Table 3**.

Table 3: Scenarios to Study Goals Comparison

	Improve Safety	Protect Lake Tahoe	Enhance the Visitor Experience	Expand Multimodal Transportation Choices	Promote Economic Vitality	Promote and Enhance Agency Collaboration and Management
Scenario 1: Recreation Area Focus	Improvements focused on intersections and spot locations only	Vehicle impacts persist given limited transit alternatives	Tahoe Trail a benefit, yet limited options to access recreation	Additional mode choices with limited transit opportunities	New infrastructure supports increased demand	Collaboration around parking management and the Tahoe Trail
Scenario 2: Transit as a Priority	Improvements focused on access points and spot locations only	Vehicle impacts lessen given medium transit investment	Tahoe Trail a benefit, with new options to access recreation	Additional mode choices with medium transit opportunities	New infrastructure supports increased demand	Collaboration around parking management, transit and the Tahoe Trail
Scenario 3: Multimodal Priority	Improvements focused on overall corridor safety	Vehicle impacts lessen given high transit investment	Tahoe Trail a benefit, with several options to access recreation	Robust mode choice with high transit opportunities	New infrastructure best supports increased demand	Collaboration around parking management, transit and the Tahoe Trail

SECTION 4 | CONCLUSION

The corridor opportunities and scenarios, combined with the corridor vision and goals, and public input, provide an overall framework for further discussion with stakeholders and the public to arrive at alternative recommendations for the CMP. The recommendations will be further analyzed by stakeholders and through a public review process as shown in **Figure 14**.

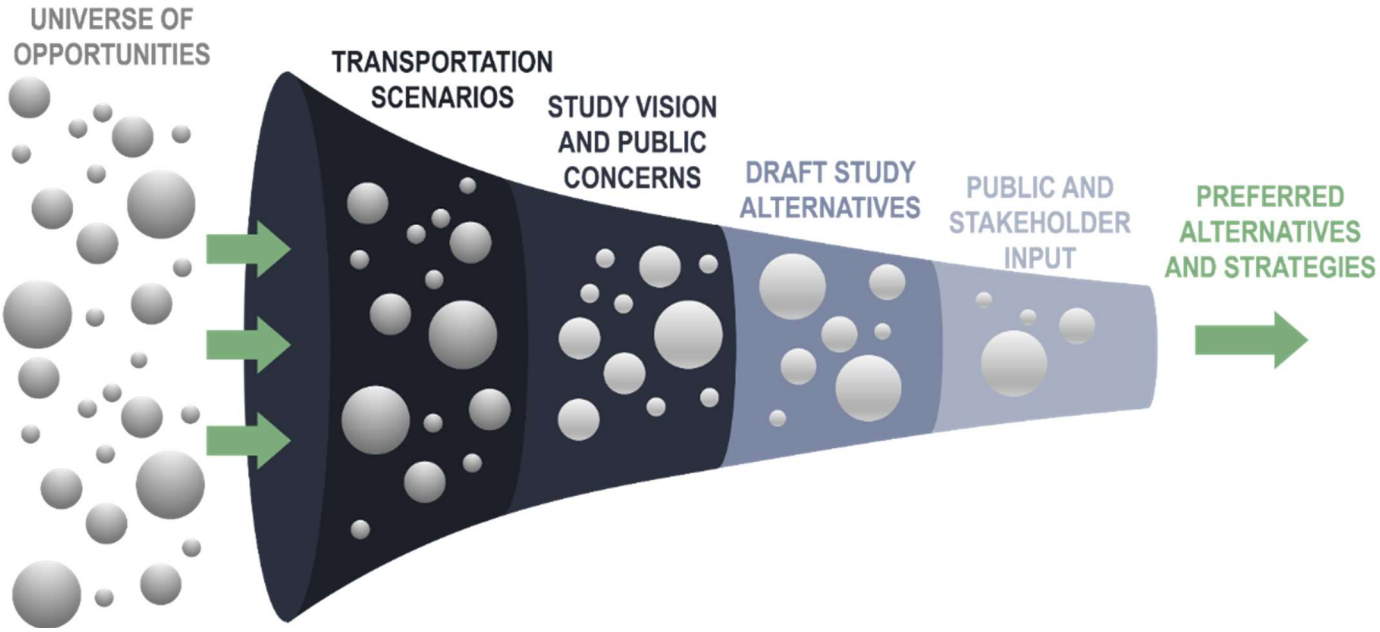


Figure 14: Alternatives and Corridor Management Development Process

As part of identifying corridor opportunities and gathering input through the initial public and stakeholder workshops, initial concepts to help create balance of need versus space have been developed. Lane repurposing have been a hot topic for all user groups and will remain a hot topic as striking a balance between need versus space continues to be looked at through the alternatives analysis phase of the corridor management plan. The maps included on the following page depict where achieving balance within the current highway configuration becomes a challenge, which accounts for 4.5 miles or approximately 35-percent of the corridor. Looking at lane repurposing in these general areas, illustrated in **Figure 15**, will continue to be further refined through the alternatives analysis and brought back to the public and stakeholders for further input.

- Excessive downhill speeds
- High crash and fatality location
- Change in land use
- Incorporate Tahoe Trail

- Limited right-of-way
- Numerous driveways and cross-streets
- Crashes associated with high speeds and turning
- High recreation demand (Cave Rock S.P.)
- Incorporate Tahoe Trail

- Limited right-of-way
- Numerous driveways and cross-streets, bad sight distance
- Crashes associated with high speeds and turning
- Extreme recreation demand
- Incorporate Tahoe Trail

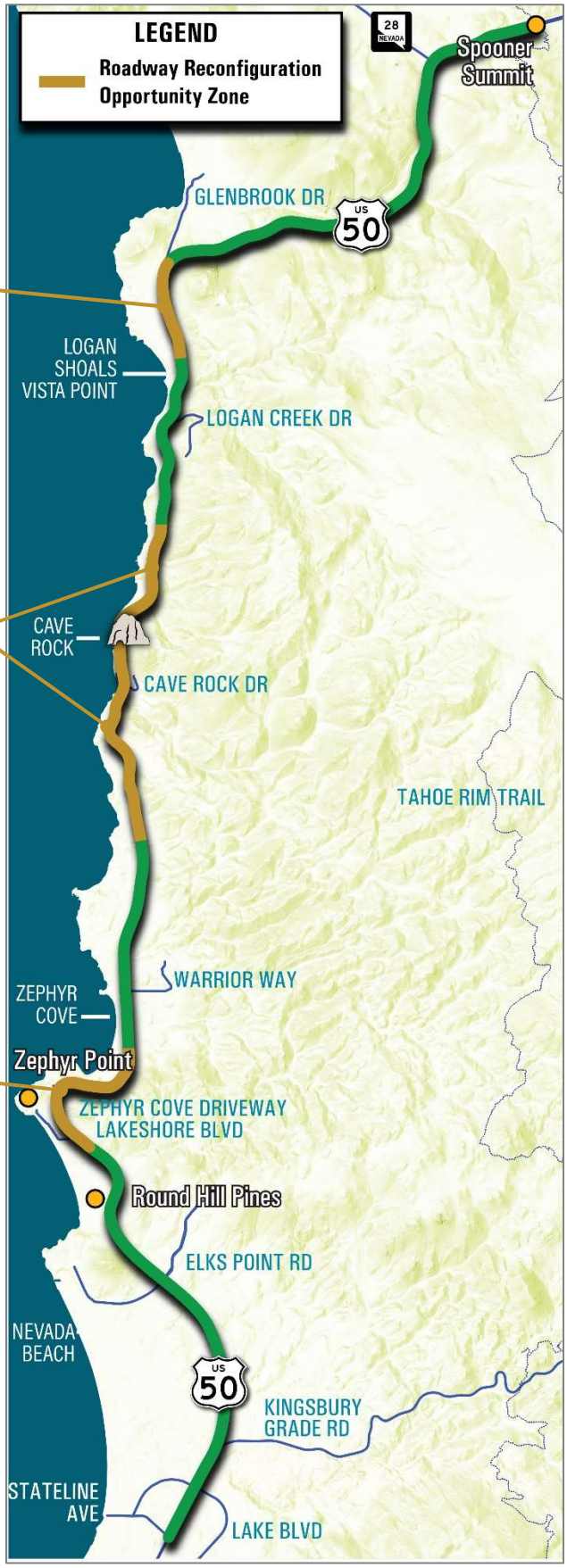


Figure 15: Roadway Reconfiguration Opportunity Zones

APPENDIX A – Travel Demand Model 2018 and 2045 Forecasts

Appendix A contains maps illustrating AADT volumes by segment from the TRPA travel demand model for the years 2018 and 2045

2018 Forecast AADT Volumes

2045 Forecast AADT Volumes