SR 28 CORRIDOR PARKING MANAGEMENT PLAN

March 26, 2019

SR 28 Corridor
Parking Management Plan

Adopted by the Tahoe Transportation District
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Prepared for:

Tahoe Transportation DISTRICT
Connecting Our Communities

Danielle Hughes, Capital Projects Manager
Tahoe Transportation District
128 Market St., #3F
Stateline, NV 89448

Prepared By:

framework

1221 E. Pike Street, Suite 300
Seattle, WA 98122

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OVERVIEW 01

Project Context

The SR 28 Parking Management Plan (PMP) provides the context and implementation steps to develop an innovative and adaptable parking management system for the Nevada State Route 28 (SR 28) Corridor in the Lake Tahoe Basin.

The SR 28 Corridor, a National Scenic Byway that is part of "America's Most Beautiful Drive," extends from Crystal Bay to the intersection of SR 28 and U.S. 50 at Spooner Summit. As shown in ***Figure 1***, the SR 28 PMP project area extends along Tahoe's East Shore on the Nevada side of the Lake from Incline Village to U.S. 50 at Spooner Summit. The SR 28 Corridor is Tahoe's longest stretch of undeveloped shoreline, at 11 miles long, and is made up primarily of State and Federal public lands operated by Nevada Division of State Parks (NDSP) and the United States Forest Service Lake Tahoe Basin Management Unit (USFS-LTBMU). The SR 28 Corridor is home to some of Tahoe's most visited recreation areas, including Sand Harbor State Park, as well as numerous viewpoints, beaches and coves along the shoreline. It is the access point to the internationally acclaimed Flume Trail, the Incline Flume, the Tahoe Rim Trail and the Tahoe East Shore Trail, currently under construction. The only land access to these destinations is SR 28, which is a two-lane mountain highway.

Like many scenic recreational areas, the primary access to the SR 28 corridor is by vehicle. With a mix of formal off-highway parking such as at Sand Harbor and more informal shoulder parking along the highway, access to parking, is in many cases, illegal, unsafe and limited for people with disabilities.

With over 1 million visitors and 2.6 million vehicles entering the corridor annually, the demand during the peak summer season has created chaos as SR 28 and the parking and transportation systems become seasonally overloaded by recreational travel demand. This demand results in significant traffic congestion, emergency vehicles that are slowed or hindered in their response times, parking areas exceeding demand that cause people to make unsafe travel movements on the highway, and illegal roadside parking, with up to 2,000 visitors walking in travel lanes daily during the summer. This congestion diminishes the visitor's recreational experience, frustrates residents and through travelers who utilize SR 28, and threatens public safety and Tahoe's fragile natural resources.

To address these issues the Tahoe Transportation District (TTD) and 12 other partner agencies developed the 2013 SR 28 Corridor Management Plan (SR 28 CMP) to efficiently manage the high visitorship and congestion within the SR 28 Corridor. The SR 28 CMP identifies multiple solutions to addressing safety, access, and congestion issues. These multi-modal solutions include development of an off-highway shared use

Figure 1. Parking Management Plan Project Area

path system, expansion of transit services, relocating highway shoulder parking to new or expanded off-highway parking locations, and a parking demand management system. The SR 28 PMP is intended to further the goals of the CMP by expanding the public parking system and implementing an effective management program to reduce congestion, improve recreation access and the user experience, and expand mobility options.

Transit services began in 2012 (the East Shore Express) providing seasonal summer service between Incline Village and Sand Harbor State Park, with free parking at the park and ride lot with the purchase of a bus fare. Construction on the North Demonstration Project (East Shore Trail) shared use path began in August 2016. The path will extend from Incline Village to Sand Harbor and includes 90 new public parking stalls near Ponderosa Ranch Rd, and new transit stops at the parking area and at Hidden Beach. The 90 stall parking lot will open in the spring of 2019 as part of the pilot phase of the parking management system that will expand along the SR 28 Corridor as part of Phase 2, expected to begin in 2020.

Why Parking Management as a Solution?

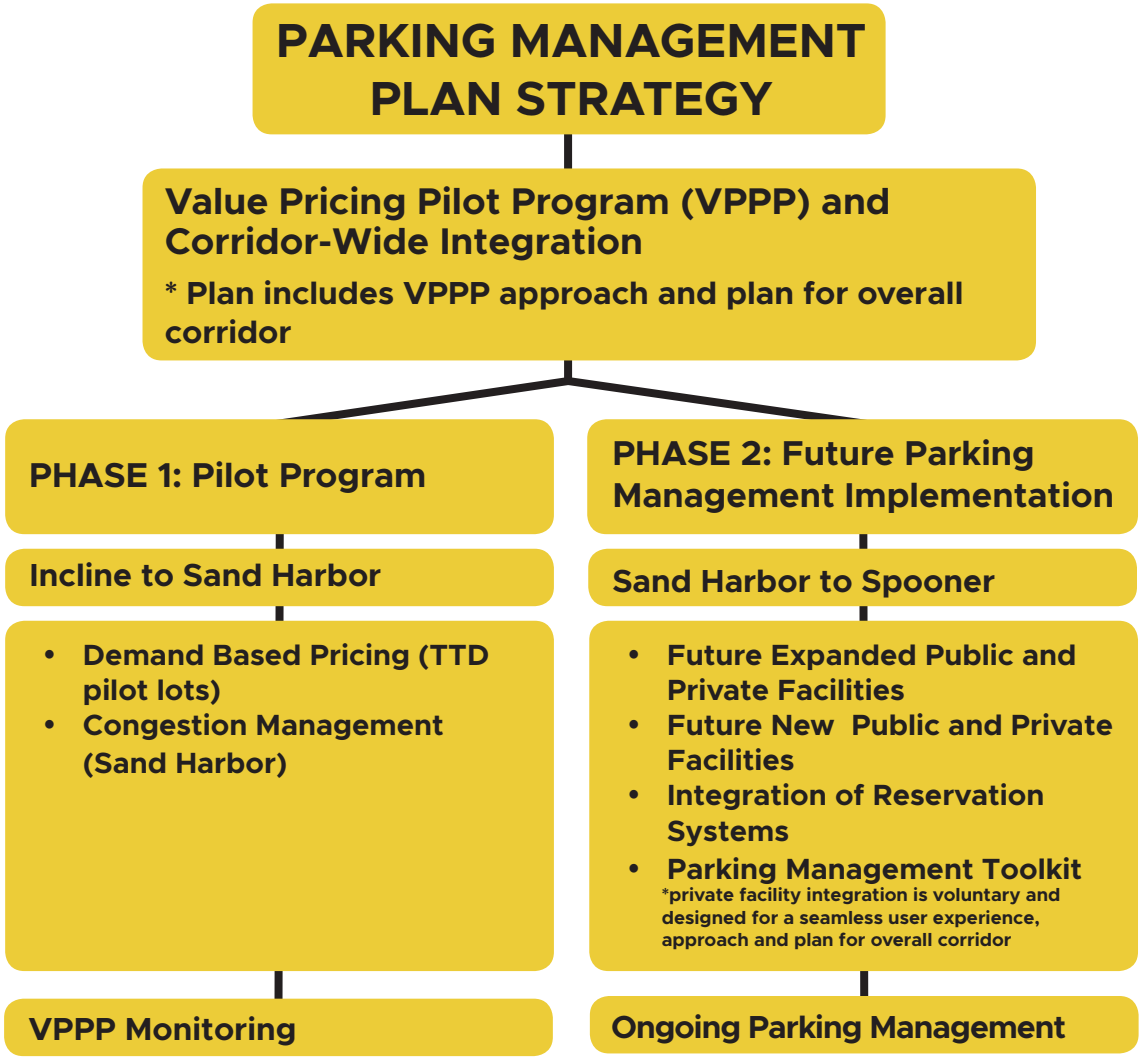
Recreation demand exceeds parking availability. If left unmanaged there will be continued chaos, safety issues, and a frustrating user experience. Parking management through demand based pricing provides greater opportunity to access recreation by efficiently using parking facilities and investing in multi-modal solutions within the SR 28 Corridor. Funding generated helps pay for management of the system and stays in the Basin. Revenue is invested into mobility enhancements, ongoing maintenance and environmental improvements of these facilities. Multi-modal connectivity along with parking management improves both resident and visitor recreation access.

Value Pricing Pilot Program

TTD received a federal grant through the Federal Highway Administration's (FHWA) Value Pricing Pilot Program (VPPP) to launch a pilot program parking demand management system for the SR 28 Corridor. The VPPP project is designed to explore and test new technologies to manage recreational travel demand effectively and create behavioral changes through ease of use, demand-based pricing, and information to get people out of their vehicles and create an exceptional, safe user experience within the corridor. It is anticipated that the system will be implemented to serve an initial pilot program, which includes 3 miles from Incline Village to Sand Harbor, before expanding to parking areas along the 11-mile shoreline and, potentially, the entire Tahoe basin.

Figure 2 shows the management and implementation of the two phases of parking management for the SR 28 corridor. Phase 1 is the pilot program described above, stretching from Tunnel Creek to Sand Harbor (highlighted in green in Figure 1). Phase 2 includes integration of the corridor-wide management system, consideration of private parking and reservation systems, and will add the Phase 2 area (highlighted in ***Figure 1***) to the overall management strategy. The VPPP Pilot in Phase 1 and corridor-wide management approach shown in Phase 2 of the SR 28 Corridor PMP follows the guiding principles, vision, goals and strategies discussed further in Section 2.

Figure 2. Plan Organization



Tahoe Transportation District, 2018; Framework, 2018

02 VISION, GUIDING PRINCIPLES, GOALS AND STRATEGIES

The project vision, goals, guiding principles, and strategies were used to shape the development of the SR 28 Corridor PMP to address current problems and achieve desired outcomes. The intent is for the approach developed for this plan to allow expansion throughout the basin through a flexible and unified transportation and parking management system.

Vision

Parking in the Tahoe Basin is safe, predictable, easy to find, and connected to reliable alternative modes of transportation through a well managed, integrated parking system. It provides a positive experience for residents and visitors of all abilities accessing recreation areas, business districts, and other locations, while maintaining emergency access. Parking management enhances access and encourages the use of other travel modes through investments in transit, walking and biking, and technology to provide better information for people making travel decisions.

Guiding Principles

Park Tahoe is:

- Managed to reduce congestion
- Integrated with public and private facilities
- Predictable and adaptable
- A positive user experience for all
- Financially sustainable
- Supportive of other travel modes
- Enforceable
- A component of a larger transportation system with real-time information
- Designed to enhance access
- Safe and legal
- Supportive of the region's sustainability goals
- Consistent with the Regional Transportation Plan

Project Goals

GOAL 1

Manage parking to reduce congestion, provide safe parking, and encourage use of other travel modes

- Relocate shoulder parking to off-highway locations
- Provide more off-street parking options
- Use parking management guiding principles to manage parking demand
- Invest available revenues to improve mobility as part of a recreation and multi-modal system
- Provide corresponding transit access and service
- Enforce the parking system to minimize the effect on surrounding areas
- Support off-highway multi-use network

GOAL 2

Create an integrated parking system that is adaptable and financially sustainable

- Use parking fees to support management of the system
- Monitor the system and adapt to changing conditions (i.e., seasonal changes, changes over time)
- Define metrics to monitor system success
- Create a toolkit of parking strategies that can be tailored to specific facility types

GOAL 3

Improve the user experience and enhance access

- Improve predictability for accessing parking
- Develop a unified transportation application that addresses travel by various modes and integrates the transit, parking, and traffic systems with a common brand and marketing
- Provide wayfinding/real-time information
- Provide a variety of convenient payment options with user-friendly pay stations and mobile payment options

Parking Management Strategies

Parking management strategies have been developed to guide management of the parking program and for specific parking facilities. Facility specific strategies may vary by operator, season, event, day of the week, or time of day based on parking demand, other transportation options, and site accessibility.

STRATEGY 1

The parking management system should be a uniform, integrated system for the SR 28 Corridor, and revenues should cover the costs of managing the parking system.

STRATEGY 2

Technology should be used whenever feasible to support integration of parking and transportation systems, reduce management costs, reduce congestion, and improve the user experience.

STRATEGY 3

TTD and its partners should consider opportunities to integrate private parking facilities into the system to increase efficiency of existing parking resources through shared parking, develop common branding and marketing for the parking and transportation system and provide value added services to our community.

STRATEGY 4

Parking pricing should be used to manage parking demand, reduce congestion, change behavior, and encourage travel by other modes, while providing accessibility to all. Enhancing access for all users is the priority for parking management strategies and mobility investments

STRATEGY 5

Where feasible, the fee for parking should be unbundled from any recreation user fees.

STRATEGY 6

Consider opportunities for future integration of reservation systems where needed.

STRATEGY 7

The parking management program should minimize the effect of spillover parking on private properties and in residential neighborhoods that may require additional management through proper enforcement and signage.

STRATEGY 8

Placemaking elements should be incorporated into the design of parking and transportation facilities that reflect the culture and identity of the Tahoe Basin and surrounding context.

STRATEGY 9

Any program revenues that exceed the costs to manage the program should support mobility investments within the corridor or regional significant investments.

ELEMENTS OF THE VISION

✓ Support System Expansion Across Jurisdictions

The parking management system provides TTD the ability to quickly expand the technology system as new parking stalls come online or as other jurisdictions choose to join the program. New pay stations can be deployed as needed and can be programmed with the same customer interface. The system will allow for integration on non-vendor specific technologies, varying policies and rates at different pay stations or lots, and reservation integration, while still providing a cohesive experience. Data collected through the parking management system will be utilized to manage the recreation travel demand and multi-modal systems of the Lake Tahoe Basin.

This state-of-the-art technology allows the best user experience while addressing the overall goals of the program. A consistent look, feel and experience can be deployed throughout the system providing a cohesive program and customer confidence in the system. The payment platform encourages customer compliance while influencing behavior through rates and management approach. The data available via the management system will provide analytics to monitor program progress and success.

✓ Transportation/Parking App

As the overall parking and transportation management system expands throughout the Tahoe basin, new technologies can be introduced to support the goals of the program. This includes utilizing guidance applications to help customers find the best available parking and guide customers away from congestion or full parking areas.

The application based system will help customers navigate to parking and guide them through the payment process including turn by turn navigation and suggesting best parking options based on transaction data, various algorithms, and program management.

Having real time data for both management decisions and to improve the user experience provides many benefits. The ability for users to make a decision that is best for their travel plans adds to the enjoyment of their trip. Meanwhile, that data can assist with reducing congestion and vehicle miles traveled. During this entire process, data is being collected to support future policy decisions.

✓ Website

A web-based system similar to the application solution will be developed to provide a resource to those without smartphones. Important information can be shared with customers before they even leave their home. For example, traffic and parking information as well as parking availability and rates can be shared, thus influencing the customer's route and destination. Static information can also be available such as details on available permits or destination facts.

This opportunity to influence a customer while they are planning their route or trip is unique. A web presence will support the level of customer experience needed for a successful program and help reduce the number of cars on certain highways or heading to a parking area.

✓ Traffic, Transit and Emergency Management Integration

An integrated parking management, traffic, transit, and emergency notification system can improve performance of the corridor, while providing predictive insights, more connectivity and a better user experience for first responders, transportation and transit operations, and the public. The future system will provide a better understanding of all users in the Lake Tahoe Basin including travel movements and duration of stay, and emergency roadway issues such as closures or hazards caused by landslides, fires, toxic spills, avalanches, tree falls, and power outages. These systems will be considered for real-time detection and notification systems and reduction in secondary incidents. As wildland fire is the biggest risk in the Tahoe Basin, further benefits will include early notification of wildland fire to the system, and early warnings for proactive crash prevention and dynamic traffic flow optimization.

This solution can be expanded to allow payment for multiple forms of transportation in one place. Customers will find it easy to purchase their parking at a park and ride location, along with transit tickets, and other payment options all in one transaction.

✓ Integrate Public and Private Facilities

There are many solutions to address the goals of the parking management system that provide for a cohesive and flexible program that will support more informed decisions. The overall system will allow for expansions and partnerships across the basin. As a new location or partner is identified, the appropriate hardware and software can be selected that best matches the needs of that area. Then, those components can easily be added or 'plugged in' to the current system.

A new location or partner can utilize the cohesive look and feel of the system already installed across the area, but still customize features such as hours of operation, rates, management tools such as permits and reservations, and other policy information. The set up continues to allow for data exchange and system management through the parking management system.

✓ Enforcement

The active and regular enforcement of all facilities is key to ensuring policy compliance and a positive user experience.

Enforcement ensures that a parking system remains viable and equitable for all users. The goals of a successful enforcement program include:

- Providing friendly ambassador service to customers
- Ensuring easy pay for the parking systems and limiting confusion
- Providing safe and secure services by ensuring all vehicles are legally parked

The policies and procedures for the enforcement program will include:

- Personnel scheduling and routing
- Technology usage procedures
- Citation issuance procedures
- Reporting of safety and security issues
- Documentation of enforcement activities

Partnering agencies will consider appropriate technology to support the enforcement program. The selected technology with support a safe, effective, and efficient environment in which enforcement can occur. The following are technology platforms that will support the goals of the program.

- **Issuance technology.** A handheld mobile device and printer can be used to record an infraction and issue a physical ticket to a violator. The device is connected to a back-end service enforcement service in real time. Real time access provides for accurate transaction analysis ensuring that tickets are only issued for violations verified through transaction data. Also available are integrations for identification of repeat violators, stolen vehicles, permitted vehicles and more.
- **Citation Processing and Collection.** Partner with a public or private entity to process and collect citations. Citations must be collected to further compliance and financial stability of the overall program.
- **License Plate Recognition (LPR).** License plate reading cameras can mounted to vehicles or placed at the entrance to parking facilities. LPR technology is the latest in enforcement solutions allowing a single enforcement person to scan many vehicles in a short period. This technology increases accuracy of violation identification and decreases ongoing costs, although the initial investment can be significant.
- **Loop Detection Sensors.** Loop counting sensors and in ground loops detect the presence of a vehicle. The data can be integrated into the parking management system to alert visitors in advance via smart phone or signage of the number of space remaining within a parking lot.

✓ Visual Identity and Education

Coordinated parking management and mobility programs present opportunities to create a distinct and memorable system, build awareness, and educate the user of the system. Many regions are taking advantage of shared parking management and coordinated transportation programs to create a safe and easy user experience, manage congestion, and reduce vehicle miles traveled. A memorable system that reflects the qualities of the local community and surrounding area should be considered. There are several examples that organizations have successfully used to result in changes to how people choose to travel and park.

Figure 3 shows examples of visual identities for public parking systems including the recently started program in Truckee called park!Truckee focused on publicly owned parking facilities. Another example in the region is the City of Sacramento's SacPark system that includes on and off-street publicly owned facilities and many private facilities that the City manages.

Figure 4 shows the Park Tahoe logo that was created to brand the parking program and facilities. The logo was designed to be simple to be scalable for all elements of the system including apps, signage, websites, and other media. The logo design is also consistent with other regional branding.

Figure 3. Branding Examples

Figure 4. PARK TAHOE Logo Design

Source: TTD and the Abbi Agency, 2019

Figure 5 shows examples of education and outreach materials for parking and transportation systems. The example from King County Metro in Seattle uses local cultural references to Salmon and transit's environmental benefits to encourage people to use transit. Another example is from downtown Seattle's E-Park system that is a collection of privately owned off-street parking facilities that is branded and marketed as a unified parking system. The approach is intended to build awareness of affordable parking options and avoid driving around in search of parking to attract shoppers to downtown. The third example is from the Norwalk Parking Authority in Norwalk, Connecticut that developed an approach to educate the user on the program and improve the parking experience.

Figure 5. Parking and Transportation Marketing Examples

✓ Placemaking

Placemaking involves the planning, design, and management of public spaces to support active, fun, and engaging places that capitalize on local assets. Placemaking can include permanent design features and/or temporary activities often in underutilized public spaces, including parking lots. Parking lots and transit facilities serve as gateways to the SR 28 corridor and should reflect the special qualities of Lake Tahoe. Parking lots and transit facilities can be programmed with activities and other amenities to make the transit and parking experience more enjoyable and reinforce the sense of place and connection to the natural environment along the corridor. Parking facilities can also be used for events such as a farmers' markets or community events. Options for placemaking include:

- Public Art
- Activities and Programming
- Wayfinding and Signage
- Interpretive Signage
- Tourism Information
- Food Trucks

Figure 6 shows on the Tahoe East Shore Trail with identifiable wayfinding signs and a community/donor sponsored Bear Crossing. Placemaking efforts should reflect the local culture, identity, and scenic beauty of Tahoe and be coordinated between facilities for common aesthetic.

Figure 6. Placemaking Examples at Transportation Facilities

03 EXISTING CONDITIONS

Prior Planning Efforts

There have been three recent planning efforts that guided solutions and implementation for the challenges faced in the SR 28 Corridor. Those efforts include the SR 28 Corridor Management Plan, Linking Tahoe: Regional Transportation Plan, and Linking Tahoe: Corridor Connection Plan. The North Demonstration SR 28 Shared Use Path (now named the Tahoe East Shore Trail) is currently under construction. The project includes 3 miles of shared use path, off-highway parking, and a number of new visitor amenities. Future phases will extend the path and connect to the Stateline to Stateline Bikeway, eventually encircling both the California and Nevada sides of Lake Tahoe. Other highway and parking improvements and important elements of the regional plan will be implemented over time, and are necessary to change transportation behaviors and provide an exceptional user experience for all.

The following section summarizes the current condition related to parking management in the SR 28 Corridor. It covers the parking locations and inventory, agencies and oversight, existing system management, and parking demand and seasonal variation. This section utilizes past data collection and planning efforts to build the baseline condition for parking along SR 28.

SR 28 Corridor Existing Conditions Summary

The following are the key findings from a review of existing conditions and data related to the study area.

- There are currently 142 paved off-highway parking stalls with a demand of over 700 vehicles searching for parking during peak summer demand periods (LSC Traffic Engineers 2016).
- The peak demand for parking is in the summer from Memorial Day to Labor Day.
- Traffic congestion backs up at the Sand Harbor State Park entrance during the summer peak demand, often 1 to 3 miles long in both directions, due to a single fee booth collecting entrance fees. There are a total of 530 stalls at the main park and 75 at the boat ramp. Sand Harbor has the highest visitation of any Nevada State Park facility.
- Sand Harbor entrance traffic congestion hinders emergency vehicles and public through traffic on SR 28.
- Most parking is currently free for the nearly 1 million annual visitors within the SR 28 corridor other than access fees to recreational facilities such as Sand Harbor State Park.
- Parking is managed by several different public agencies and private property owners along the SR 28 corridor.
- The recent introduction of the East Shore Express provides transit service between Incline Village and Sand Harbor during the summer peak. Service runs from June 15 through Labor Day and is planned to serve the entire corridor in the future. East Shore Express ridership has grown over the past few years to 35,276 riders between July and September of 2018.
- According to the SR 28 CMP, there are an estimated 2,000 people walking in travel lanes on a daily basis during peak demand periods, with no shared use path connecting recreation areas to parking.

Off-Highway Parking Inventory

Off-highway parking is currently very limited along the corridor. ***Figure 7*** shows the location of existing off-highway parking facilities, and ***Figure 8*** shows the number of parking stalls by facility. By far the largest facility is at Sand Harbor State Park with 530 spaces, which fills up early during peak visitation periods. The parking management section addresses the planned expansion of the off-highway system and phase out of shoulder parking.

Figure 7. Route 28 Corridor Existing Parking Facilities

East Shore Trail, scheduled to open in Spring 2019

Figure 8. Existing Off-highway Parking Inventory

PARKING LOCATION	CURRENT INVENTORY, 2017
Incline Village Park and Ride	68
Tunnel Creek Café/Flume Trail (Private)	40
Rocky Point Vista	4
Memorial Point	27
Skinny Dipper Vista	4
Sand Harbor	605* (530 vehicle, 75 boat launch stalls)
Thunder Bird Vista 1	4
Thunder Bird Vista 2	4
Chimney Beach	21
Secret Harbor	31
Bliss Pond Vista	4
Spooner Meadow Vista 1	2
Spooner Meadow Vista 2	2
Spooner Lake State Park	95
South Corridor Park and Ride	+/- 50**

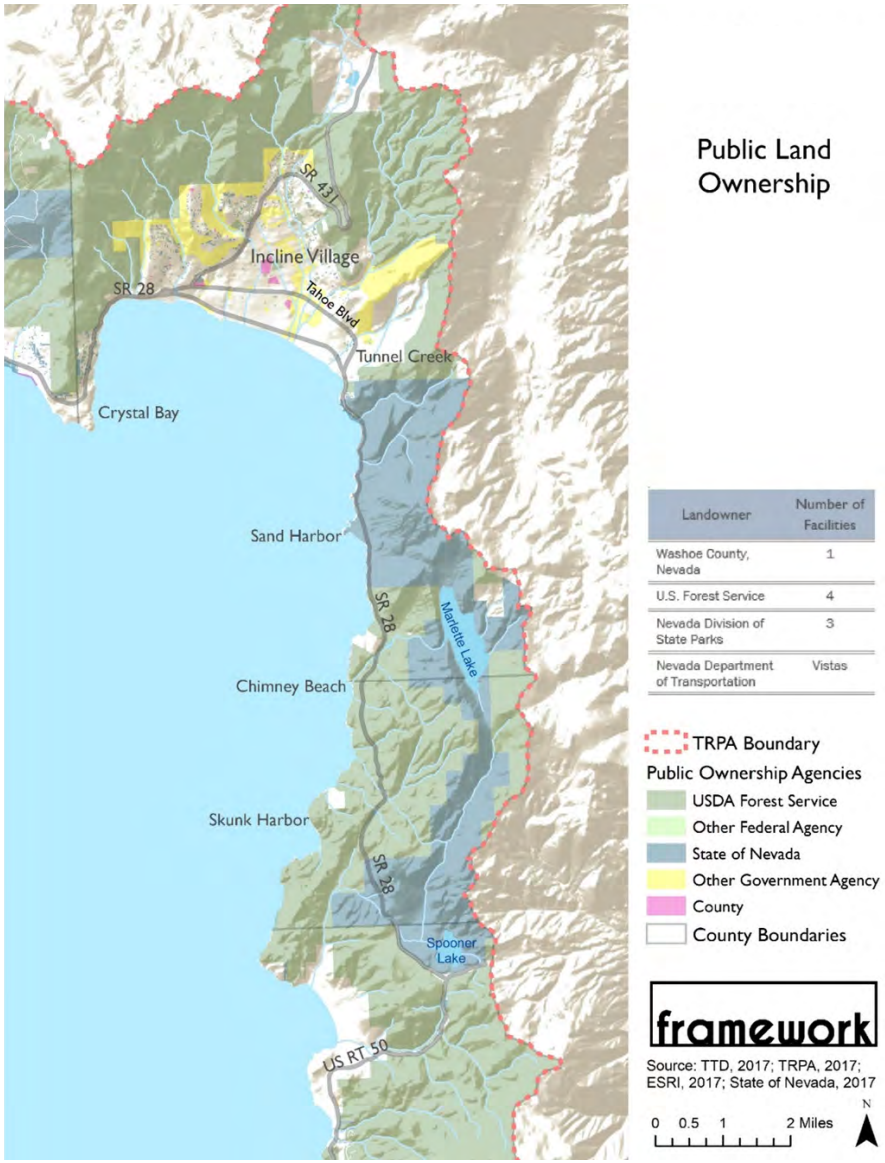
*Includes vehicle and boat trail parking Tahoe Transportation District, 2017

**SR 28 Corridor Master Plan Called for +/- 50 spaces, subject to change based on new analysis.

Agencies and Oversight

Four public agencies currently own and manage public parking facilities in the corridor (See ***Figure 9)***. There are also private landowners and managers in the area that provide off-street parking to users such as Tunnel Creek Café and Flume Trail Bike Rental. Figure 9 shows landownership in the corridor and the agencies that currently own and manage parking facilities, as well as the number of facilities they manage. It is a goal of this plan to develop coordinated parking management for public parking facilities along the SR 28 Corridor.

Figure 9. Project Area Landownership Map



In addition to the four agencies that own facilities within the corridor, there are several additional agencies that are involved in corridor management, enforcement, safety, maintenance, and future planning. ***Figure 10*** summarizes all stakeholder agencies and their roles.

Figure 10. Stakeholder Agency Roles in the SR 28 Corridor Parking Management Program

AGENCY	PARKING MANAGEMENT ROLE
Washoe County, Nevada*	▪ Parking facility manager, owns and maintains portion of new shared-use path
U.S. Forest Service*	▪ Parking facility owner and manager
Nevada Division of State Parks*	▪ Parking facility owner and manager
Nevada Department of Transportation*	▪ Maintains and operates highways, pullouts for emergency vehicles and vistas on corridor; responsible for regulatory signage on corridor.
Tahoe Transportation District	▪ Maintains and operates transit and mobility hubs along the corridor ▪ Leads coordinated implementation efforts on multi modal transportation projects within the Tahoe Basin.
Tahoe Regional Planning Agency	▪ Provides planning of transportation system improvements. Collects and shares data with the region. ▪ Distributes state, regional, and federal transportation funding for programs and projects as the Metropolitan Planning Organization
Carson City County	▪ Could potentially assist in management of off-highway parking within its jurisdiction
Douglas County	▪ Could potentially assist in management of off-highway parking within its jurisdiction
State of Nevada, Division of Land	▪ Landowner in the corridor and provides Tahoe Resource Team work
Federal Highway Administration	▪ Provides funding for projects within the corridor. ▪ Sets regulatory standards for the design, construction, and safety elements of projects ▪ Oversees VPPP Program
Nevada Highway Patrol	▪ Provides enforcement along Route 28
Washoe County Sheriff	▪ Substation Incline Village assists with enforcement along SR 28
Washoe Tribe of Nevada and California	▪ Landowner in the corridor
Incline Village General Improvement District	▪ Sewer, Water and Recreation facilities within the corridor
Washoe County Justice Court – Incline Village	▪ Administers parking and corridor related offenses
Tahoe Truckee Area Regional Transit	▪ Operates transit service primarily in Placer County, CA, with service extending to Incline Village, NV.

*In addition to other roles and responsibilities in the corridor, this agency owns parking facilities. See Figure 7.
Tahoe Transportation District, 2017

Parking Demand and Seasonal Variations

The Tahoe Basin is a tourism-oriented economy with variations in visitor types and seasons. Past planning efforts in the Basin have analyzed these different user groups and patterns in visitation numbers. Below is a summary of the Regional Transportation Plan's user group profile and visitor usage counts. The user groups and seasonal demand changes directly informed the demand-based pricing and parking management strategy.

REGIONAL TRANSPORTATION PLAN - USER GROUPS

The Regional Transportation Plan (RTP) defines three user groups within the Tahoe Basin: Everyday Tahoe, Discover Tahoe, and Visit Tahoe. These user groups overlap, with residents, commuters, and visitors often using the same facilities and creating a very high demand for limited parking during the summer. These user groups are described below:

- **Everyday Tahoe.** Residents and commuters doing everyday travel in the community centers and completing short-distance trips. This group accounts for 20% of daily trips. Linking Tahoe encourages residents and commuters to use multi-modal options for these trips and aims to have frequent and reliable transit services and connected shared-use paths.
- **Discover Tahoe.** Residents and visitors accessing recreation sites from neighborhoods and town centers and completing medium to long-distance trips. This group accounts for 55% of daily vehicle trips. Linking Tahoe aims to increase safety and manage congestion related to these trips through parking management, frequent transit, and increased safety measures.
- **Visit Tahoe.** Visitors and commuters entering and exiting the region and completing long-distance trips to and from the Basin. This group accounts for 25% of daily vehicle trips. Linking Tahoe aims for efficient and adaptively managed roadway systems that prioritize transit, park and ride lots, and frequent and reserve-able transit.

The RTP user groups helped guide the development of a demand sensitive fee structure for parking in the SR 28 Corridor. Because two of Linking Tahoe's primary user groups that account for the bulk of vehicle trips are subject to heavy seasonal variability, proposed parking fees are responsive to seasonal variations in parking demand. These two seasonal user groups account for roughly 80% of trips overall, and drive scheduling changes for transit in the peak- and off-season and create higher demand for access to recreational facilities, including off-road trails in the peak season.

TAHOE BASIN TRANSIT NETWORK

Expanding transit access and routes, including through expanded parking, is a key mobility strategy from the SR 28 CMP. The Tahoe Basin has several existing transit routes as shown in ***Figure 11***. The Tahoe Transportation District runs two routes of transit service – the East Shore Express, which connects Incline Village and the Route 28 corridor, and the South Shore Services, which connects the south shore between Carson City and the South Lake Tahoe area. In the SR 28 corridor, the East Shore Express runs during the summer season only (June 15 – Labor Day).

Figure 11. Tahoe Basin Transit Routes

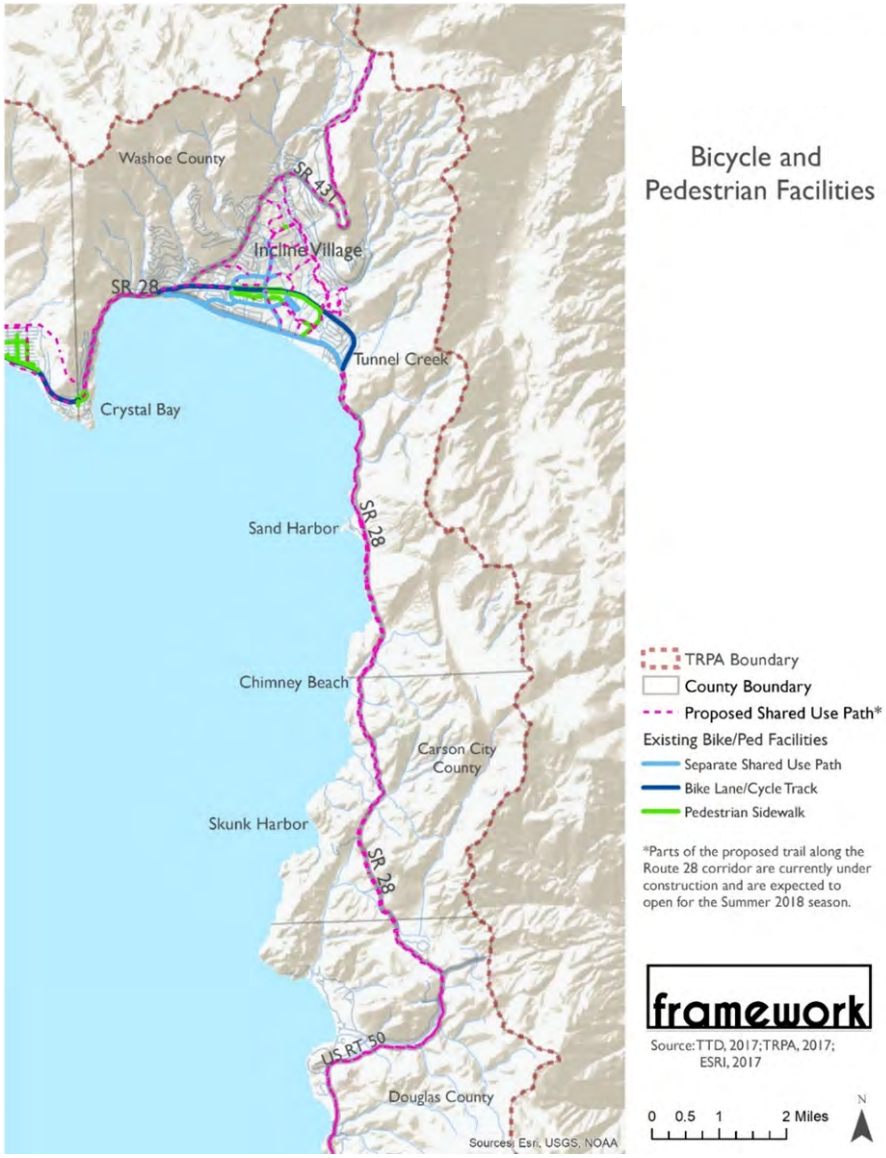
Tahoe Transportation District, 2017

Tahoe Truckee Area Regional Transit (TART) runs service between Truckee, Kings Beach, Incline Village, Tahoma, and Squaw Valley. All transit services run varying schedules according to the seasonal variation in demand for transit. The TART route in North Lake Tahoe runs from Incline Village, connecting the area to Tahoe City, Northstar, and Truckee.

Bicycle and Pedestrian Routes

Along with transit, expanding the bicycle and pedestrian network is a mobility strategy to reduce reliance on personal vehicles for access to the SR 28 Corridor. The existing and planned pedestrian and bicycle network is intended to connect users to the different recreation facilities, as well as with the opportunity to utilize transit, park and ride lots, and other forms of travel within the corridor. The current system contains a separated shared use path along certain areas of Incline Village, a bike lane on Tahoe Boulevard, and pedestrian sidewalks within some of the community centers. As illustrated in ***Figure 12***, the proposed shared use path will make many additional locations accessible by bikers and pedestrians. Parts of the new Tahoe East Shore Trail are already under construction and ready to open in the spring to season of 2019 along with 90 stalls in three parking lots named Bonanza, Tunnel Creek, and Ponderosa. The path will have connections to both park and ride facilities in Spooner Lake and Incline Village, as well as access to the scenic and recreation areas along the 11-mile corridor.

Figure 12. Bicycle and Pedestrian Facilities in the Route 28 Corridor



PARKING MANAGEMENT PROGRAM 04

Overview

The parking management plan addresses the overall program management strategies and approach to parking management for specific facilities on the corridor. This begins with the value pricing pilot program (Phase 1) and supports expansion of the parking management system (Phase 2). The effects of parking management strategies will be monitored and adjusted as necessary to meet the goals of the program. A key strategy is to use parking pricing to manage demand consistent with the goals of the VPPP.

Program Framework

Expand Off-Highway Parking

The approach to managing the chaos that occurs on the SR 28 Corridor parking will be relocated to off-highway locations. It is not expected that all seasonal peak demand will be met but instead the parking pricing will allow for better utilization of the available parking by encouraging turnover, which allows more people to enjoy the corridor. ***Figure 13*** shows the facilities with new or expanded parking by 2022 and ***Figure 14*** shows all existing and planned off-highway parking facilities by 2022. ***Figure 15*** shows the current and planned off-highway parking inventory that corresponds to the map in Figure 14. These are the facilities that are included in the PMP.

However, the facilities are managed by several different agencies and private entities and agreements will need to be developed for implementation of the shared parking management system described further below.

Figure 13. New and Expanded Off-Highway Parking

Figure 14. Existing and Planned Off-Highway Parking

Figure 15. Existing and Planned Off-highway Parking Inventory

LOT	CURRENT INVENTORY	PLANNED INVENTORY (2018 - 2022)	TOTAL INVENTORY (2022)
Corridor Parking Facilities			
North Corridor Park N Ride	68	282	350
Tunnel Creek/Ponderosa	0	135	135
Hidden Beach	0	6	6
Chimney Beach	21	82	103
Secret Harbor	31	54	85
Skunk Harbor	0	23	23
South Corridor Park N Ride	50	200	250
Subtotal	**170**	**782**	**952**
Vista Facilities			
Rocky Point Vista	4	0	4
Skinny Dipper Vista	4	0	4
Sand Harbor Vista	0	8	8
Thunderbird Vista 1	4	0	4
Thunderbird Vista 2	4	0	4
Secret Harbor Vista	0	10	10
Bliss Pond Vista	4	0	4
Skunk Harbor Pray Meadow Vista	0	6	6
Spooner Meadow Vista 1	0	2	2
Spooner Meadow Vista 2	0	2	2
Subtotal	**20**	**28**	**48**
Public Facility Parking			
Sand Harbor	530	0	530
Sand Harbor Boat Launch	75	0	75
Memorial Point	10	0	10
Memorial Point Vista	17	0	17
Spooner Lake State Park	95	0	95
Subtotal	**727**	**0**	**727**
Private Partnerships			
Local Business Districts	68	0	68
Subtotal	**68**	**0**	**68**
TOTAL	**985**	**810**	**1,795**

Tahoe Transportation District, 2018; Framework, 2018

Demand-Based System Management

Parking in the project area is currently free other than user fees for specific facilities. Free parking increases the demand for parking, causes traffic congestion as people look for parking, and reduces incentives to travel to destinations by other modes. Demand-based system management uses pricing to influence travel behavior and reduce congestion, consistent with the goals of the VPPP, and can provide other public benefits. The fees for parking will be used to operate and manage the system, the facilities and to fund the multi-modal services support the public purpose to manage congestion, maintain infrastructure, reduce environmental impacts, and support the regional economy.

With demand-based pricing, parking will cost more at high demand times and less at low demand times. The price for parking may vary between facilities, seasons, day of the week, or hour of the day, and for holiday and special events during the pilot phase and as the system expands. Active parking management requires routine data collection to understand the effect of parking strategies and adjustment to meet desired outcomes. The metrics that will be used to monitor and manage the system are addressed in the following sections. Other management strategies such as time limits, permits, reservations, and validation may also be used along with pricing to manage parking at specific facilities or to address the effect of spillover parking on private facilities.

Shared Parking Management System

Parking systems are often fragmented including the management and accessibility of specific facility system information. For example, parking facilities are often restricted to a certain group of users such as customer parking for a business or access to a recreation destination. These accessibility issues create inefficiencies that lead to parking being underutilized and in some cases over-built. In addition, the fragmented nature of parking facilities also limits opportunities to make parking more accessible, reduce vehicle miles traveled, and improve the user experience through shared information. Increasingly agencies are optimizing parking management for both public and private facilities within one system which can be financially beneficial for all parties involved. Shared parking management may include active parking management, enforcement, revenue sharing, visualization and education, and the use of technology such as pay stations, mobile payment, and integrated transportation information to manage the system.

There are many different models for shared parking systems including those managed by public agencies, private parking operators, peer-to-peer networks, and community organizations. Public/private partnerships allow for the more efficient use of parking through coordinated management, to encourage other transportation modes, pool resources to manage the program, and effectively communicate to the public about parking and transportation options. The SR 28 Corridor has mostly public parking facilities managed by different agencies, but private facilities are part of the larger system and are more concentrated in other parts of the Tahoe Basin where the program may expand.

TTD is authorized under the bi-state compact to own, operate, and manage public and private parking systems, and to collect revenue from those systems, thus developing a shared parking management system for the SR 28 Corridor that could be expand throughout the Tahoe Basin through additional agreements are apart of the approach to develop a cohesive system basin-wide.

INVEST IN MOBILITY

Demand based pricing may create opportunities to invest revenues in the corridor where the revenue is generated to operate, maintain, and improve mobility and overall quality of life. Investing parking revenues within the corridor also connects the program to a broader set of local benefits such as an improved visitor experience that includes pedestrian and bicycle facilities, transit improvements, transit user incentives, and high-quality management of the parking and transportation system. This coordinated and financially sustainable approach to parking management and transportation planning should result in less traffic congestion, increased mobility options, and a better user experience for residents, businesses, and visitors.

The SR 28 Corridor experiences urban levels of congestion during peak times. Demand based pricing increases the efficiency of the parking system by encouraging higher turnover of parking stalls and enhancing access. A shared parking management system along the SR 28 corridor allows for a coordinated approach to parking management including shared parking, common messaging and education, and the use of integrated technology to improve the user experience and quality of the transportation experience within the corridor.

The six corridors identified in the Linking Tahoe: Corridor Connection Plan, including CA SR 89/298, NV US 50, CA/NV US 50 South Shore,Meyers/Y Corridor, and the SR 89 Recreational Corridor may require additional strategies to be incorporated into the overall parking management system to account for different land uses, management strategies, and ownership. A portion of the revenue generated within each corridor on public systems would be expected to be invested in mobility improvements within the corridor and for significant regional projects (See Figure 17). The shared parking management system would be developed through partnership between public agencies and private entities interested in participating in the program, with TTD serving as the lead agency responsible for management priorities.

Mobility investments may include traditional investments such as capital projects and transit improvements but may also include technology and other related investments that improve mobility and can assist people in making the best transportation choices and minimizing congestion.

AGENCY RESPONSIBILITY

Agency responsibilities associated with parking management may vary depending on the type of facility, rules and regulations, and agreements with TTD for parking management services. In general, the facility owner will be responsible for long-term maintenance and capital improvements for the parking facility and TTD may be responsible for parking management, technology, and contracting for enforcement.

TECHNOLOGY

Technology is changing how people choose to travel and park. It's creating more opportunities for shared parking management, better data for monitoring success, and more efficient ways to manage parking. Technologies include pay stations, smartphone apps, mobile payment options, and a variety of software to manage the program such as financial reporting. Technology informs the public about parking options, collects data for use in managing the program, and can help improve the user experience by providing easier payment options, more available parking, and less congestion through active management. A variety of technology and payment options will used to manage the parking system and will likely evolve over time as the system expands. However, it's important to consider the long-term use and integration of any technology investments during the pilot project and early stages of program implementation

PARKING AND FEE COLLECTION

Due to the presence of multiple agencies as landowners and facility operators, a system needs to be developed to ensure that the visitor experience is seamless, regardless of what facility they are using. The system should allow for the overall branding of the parking system to be consistent, while creating a back-end revenue collection and program administration system that works for all involved agencies.

Monitor the Parking Management System

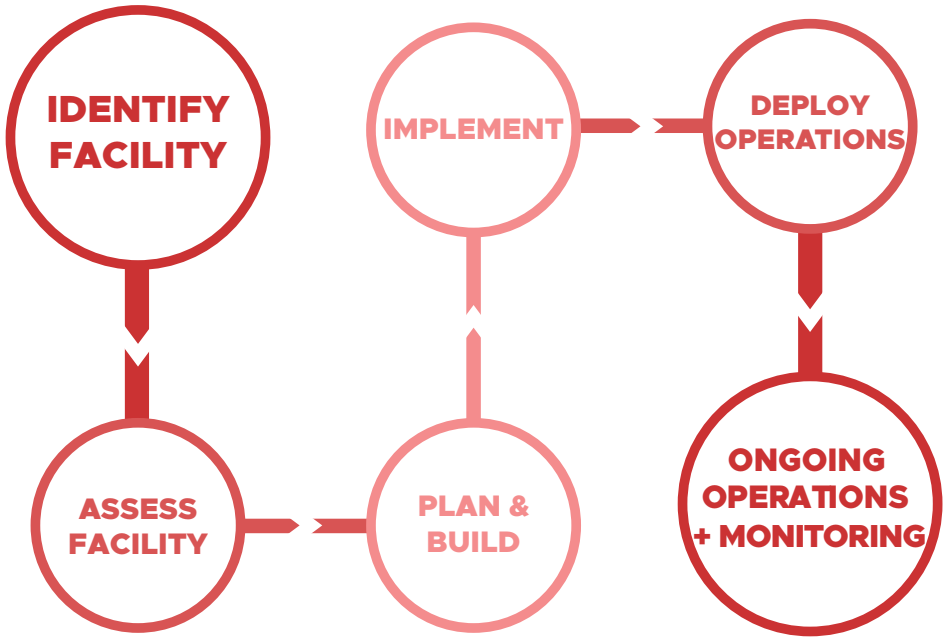
Parking management should be based on performance data to understand if parking management strategies are meeting the desired outcomes. Active parking management requires ongoing data collection to understand behavior and use changes overtime and adjust parking management strategies to manage demand. To improve performance adjustments may include increasing or decreasing parking rates, implementing graduated pricing, adding or changing time limits, and other strategies based on the monitoring results and intended used. Metrics such as occupancy, turnover, and duration as well as available data on traffic congestion, transit use, and bicycle and pedestrian counts, and other information can be used to guide corridor management and potential future improvements. TTD will monitor the shared parking system based on the metrics and targets identified in Chapter 5, Program Implementation and Monitoring.

Operations and Maintenance

Facility Implementation

TTD will benefit from a specific facility implementation plan. Although each facility may have different requirements, there are procedures to deliver the desired system infrastructure and operations. The following steps, highlighted in ***Figure 16***, will address the unique features of each facility, while preparing for a smooth implementation. The following outline details various stages of work for facility implementation and operations.

Figure 16. Future Facility Implementation Process



NUMBER AND LOCATION OF STATIONS

The Pilot Program will include 3 pay stations at the 90 stalls located at the Bonanza, Flume Trail and Ponderosa parking facilities and the mobile payment platform for all parking facilities included in the pilot program. Pay stations for new facilities can be determined using the table in ***Figure 17***, based on the number and configuration of on- or off-street parking stalls.

Figure 17. Number of Required Pay Stations

NUMBER OF PAY STATIONS	NUMBER OF STALLS (ON-STREET PARALLEL)	NUMBER OF STALLS (ON-STREET, ANGLE)	NUMBER OF STALLS (PARKING LOT)
1	0 - 8 stalls	0 - 12 stalls	0
2	9 - 17 stalls	13 – 25 stalls	<36
3	18 – 26 stalls	26 – 38 stalls	37 – 67 stalls
4	27 – 35 stalls	39 – 51 stalls	68 – 98 stalls
5	36 – 44 stalls	52 – 63 stalls	99 – 129 stalls
6	45 – 53 stalls	64 – 76 stalls	130 – 160 stalls
+1	Additional pay station for every 8 stalls	Additional pay station for every 12 stalls	Additional pay station for every 30 stalls

Note: Due to layout and access, certain facilities may need a unique number of pay stations

Facility Maintenance

A defined maintenance and management plan ensures the highest levels of technology uptime, or time in operation, and customer compliance. There are three main components to Facility Maintenance:

- Pay Station and Infrastructure Maintenance
- Financial Maintenance
- Facility Enforcement

Pay Station and Facility Maintenance

Pay station maintenance includes two components. The first, preventative maintenance and ongoing maintenance, includes the following :

- 6-month rotation of planned maintenance
- Use of technology provider's preventative maintenance clean kit
- Visual inspection of interior and exterior of pay station
- Maintenance team assignments
- Documentation of completed work

The second component is reactive and ongoing maintenance, which will address:

- A daily schedule for reviewing open maintenance items
- Procedure for utilizing the technology provider's management system alerts and alarms
- Prioritization of maintenance levels
- Procedures for contacting technology provider's Help desk
- Procedures for parts and spares inventory
- Maintenance team assignments
- Documentation of completed work

Financial Maintenance

As the pay stations will collect funds for parking or other payments, proper accounting is required. Procedures for financial reconciliation of these funds includes:

- Initial report of funds collected at the pay station
- Reconciliation of funds deposited into the bank
- Required revenue reporting

The shared parking management system may be managed through a partnership between public agencies and private entities interested in participating in the program, with TTD serving as the lead agency responsible for overall management integration.

Technology

PAY STATIONS AND DATA COLLECTION

Pay stations like those shown in ***Figure 18*** will be installed as part of the new parking management program. All new pay stations will accept credit card payments through a user friendly interface with a full keyboard capability and a seven-inch color display will be used for system integration. The pay station interface is fully customizable, and will allow flexibility in the rates and strategies within each facility. The solar powered, multi-service kiosk has been installed around the country and includes such features as:

- Operating temperature range: -22F to 131F
- Full EMV (chip card) and payment card industry compliant credit card acceptance
- Thermal graphic multi-line printer
- Solar powered
- 4G data communication
- A bright and easy to read 7" thin film transistor liquid crystal display monitor with light emitting diode back lighting

MOBILE PAYMENTS

To enhance the user experience, a mobile payment system, will be tested through the Whoosh mobile payment platform starting with the pilot program. Mobile payment with the Whoosh! application is shown in ***Figure 19***. Customers may pay through the website or application available on both Android and Apple devices to process parking payments.

The system allows customers to store information on multiple vehicles and payment credit cards to easily pay for parking on their mobile device instead of going to the kiosk. Additional benefits include time extension, text reminders of expiration time, and electronic parking history. Successful utilization of the mobile system will be dependent on broadband availability that can be impacted during the peak demand thus additional communications may be needed to expand this mobile payment.

Figure 18. Parking pay station

All transactions completed in the Whoosh system are also stored in the Smartfolio management system to allow transaction data to be viewed and analyzed.

Figure 19. Mobile payment option for parking with the Whoosh! app

Phase 1 (Value Pricing Pilot Program)

The pilot program as part of Phase 1 includes the elements shown in ***Figure 20*** and is expected to be implemented in the spring of 2019.

Paid Parking and Demand-Based Pricing at Tunnel Creek

Implement paid parking and demand-based pricing at the 90 off-highway parking stalls in three adjacent lots, including 4 handicap stalls, that are currently under construction. The parking lots are named Bonanza, Flume Trail, and Ponderosa lots. The pilot program is expected to result in improved parking conditions by shifting on-highway parking to the new off-highway location, increased turnover and access to parking spaces, less congestion from those searching for parking, and parking demand shifted to times that typically have less demand.

Sand Harbor Congestion Management

Nevada State Parks is converting the traditional fee booth at the park entrance to pay stations. Due to the high demand for parking and access to Sand Harbor State Park vehicles queue southbound on SR 28 even before the park opens at 8am (See ***Figure***

Figure 20. Pilot Program Facilities

Framework, 2018; Google Earth, 2018

Figure 21. Sand Harbor Entrance and Traffic Queuing

Framework, 2018; Google Earth, 2018

21). The location of the fee both near SR 28 only allows for a few cars to queue on the Sand Harbor property resulting in significant backups and congestion on SR 28. The new pay stations planned by Nevada State Parks will eliminate on-highway vehicle queuing at Sand Harbor.

Manage Private Parking to Reduce Spillover

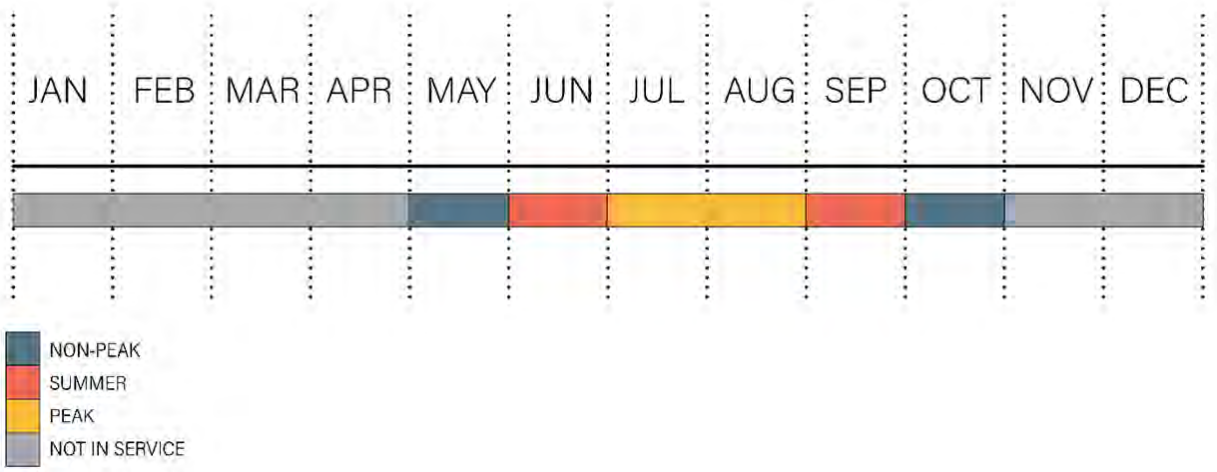
The shared parking system will have the capability to include parking management for private facilities. If desired, private facilities in the phase 1 section of the SR 28 corridor may become part of the shared parking system, which will minimize the effects of spillover parking from parking pricing at public facilities.

Pilot Program Pricing

For the pilot program at the new 90 stall parking facility various parking pricing scenarios with revenue and expenditure estimates were developed for evaluation. The pricing programs in these each scenario considered was developed to shift the user's behaviors, allow for accessibility by all user groups, and manage the peak demand to the extent practical.

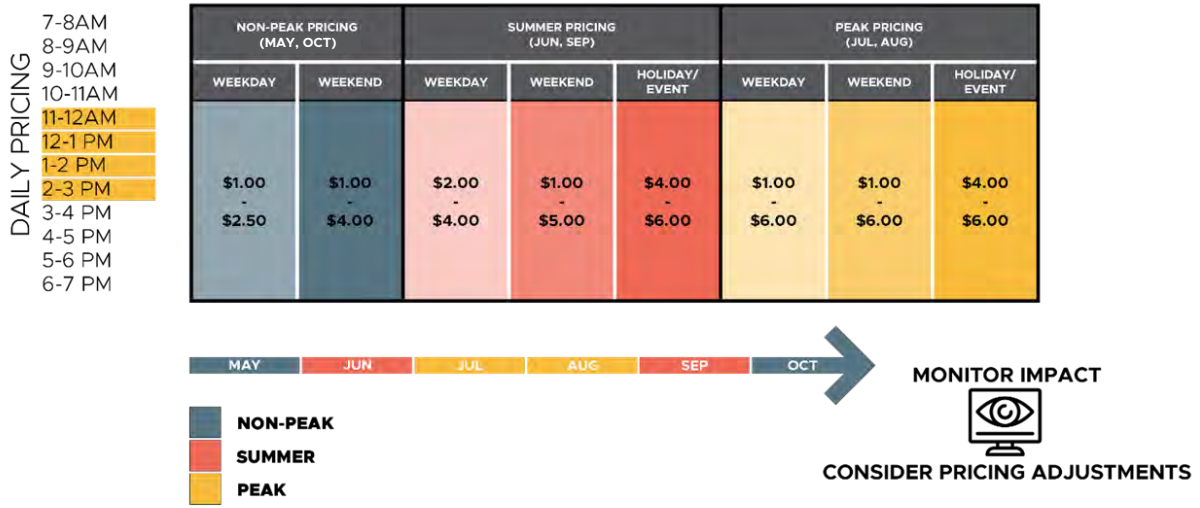
Figure 22 shows the seasonal pricing changes including non-peak in the spring and fall, summer pricing in June, and peak pricing from August through the Labor Day Holiday.

Figure 22. Pricing Periods



TTD, 2018: Framework, 2018

Figure 23. Demand-based Pricing



TTD, 2018; Framework, 2018
Note: Holiday/Event pricing applies to holidays such as Labor Day, July 4th, and for special events as defined by local agencies.

Figure 23 shows the overall demand-based pricing strategy across all evaluated pricing scenarios for the SR 28 corridor. Darker shades of each color mean higher prices and lighter shades of each color indicate lower prices. Higher prices correlate with times of estimated high-demand and lower prices during periods of lower-demand.

The preferred pricing program was selected because it is anticipated it will be more effective at supporting the goals of the program and shifting demand to non-peak times while supporting other transportation modes The preferred pricing program includes a base price of $1.00 per hour in the early morning and later afternoon during non-peak periods before Memorial Day and after Labor Day, and has the most hourly price changes to shift demand to times of less demand. Pricing at other times of day varies from $2.00 to $6.00, with higher pricing midday, on weekends and during peak periods based on anticipated demand. Special pricing for holidays such as July 4th and Labor Day weekends, and during special events will be used on a case-by-case basis where higher parking demand is expected during the peak.

Figure 24 shows hour to hour pricing fluctuations based on seasonal periods with expected peak and non-peak demand. Darker shading represents times of day in which demand for parking is generally highest, between 11:00am and 3:00pm. Average stay prices at times with high (midday) and low (morning and evening) demand is based on an average stay of 4 hours across the parking system.

This pricing program has expenditures of approximately $230,000 including parking management system contingency, operations, maintenance and monitoring. This program includes the purchase of a license plate reader unit, which is an efficient tool to use as the system expands, but is not required the first year of enforcement on the 90 parking stalls at the Bonzanza, Flume Trail, and Ponderosa lots. All revenues will be placed in a SR28 Corridor account and revenues that exceed expenses for operations and maintenance of the parking management system will be allocated to the Tahoe East Shore Trail, parking, and other multi- modal systems.

Figure 24. Pricing Program by Hour and Period (Non-Peak, Summer, Peak)

	Non Peak Weekdays	Non Peak Weekends	Summer Pricing (weekday)	Summer Pricing (weekend)	Peak Pricing (weekday)	Peak Pricing (weekend)	Holiday/Event Pricing
7am - 8am	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00	$4.00
8am - 9am	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00	$4.00
9am - 10am	$2.00	$2.50	$3.50	$4.50	$4.50	$5.00	$6.00
10am - 11am	$2.00	$3.50	$4.00	$5.00	$5.00	$5.50	$6.00
11am - 12pm	$2.00	$3.50	$4.50	$5.00	$5.50	$6.00	$6.00
12pm - 1pm	$2.50	$4.00	$4.50	$5.00	$5.50	$6.00	$6.00
1pm - 2pm	$2.50	$4.00	$4.50	$5.00	$5.50	$6.00	$6.00
2pm - 3pm	$2.50	$4.00	$4.50	$5.00	$5.50	$6.00	$6.00
3pm - 4pm	$2.00	$3.50	$4.00	$5.00	$5.00	$5.50	$6.00
4pm - 5pm	$2.00	$2.50	$3.00	$4.00	$4.50	$5.00	$6.00
5pm - 6pm	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00	$4.00
6pm - 7pm	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00	$4.00
AVG MIDDAY STAY	$9.50	$15.50	$18.00	$20.00	$22.00	$24.00	$24.00
AVG MORNING/EVENING STAY	$6.00	$8.00	$9.50	$11.50	$11.50	$12.50	$20.00

*Non-Peak (Spring and Fall); Summer Pricing (May 24-June14 and August 17-September 2); Peak Pricing June 15 - August 16
*Holiday/Event pricing includes Memorial Day, July 4th, and Labor Day weekends
Framework, 2018

Implementation and Monitoring

The transition from free parking managed by each individual owner to an integrated shared parking system is a long-term effort that will begin with the pilot program and evolve over time as opportunities arise and conditions change. However, the implementation strategy is intended to support the development of a basin-wide shared parking program with both public and private facilities. More detailed plans that address management policies, operations, maintenance, and revenue estimates will be required as new facilities are enrolled in the shared parking program.

Strategies, Timeline, and Responsible Agencies

The actions described in ***Figure 25*** are short- (0-3 years), mid- (3-5 years), and long-term (5+ years) steps towards implementing this plan, several long-term actions will be implemented with a phased approach, particularly where capital investment is required. Some actions are ongoing, with execution currently underway.

Figure 25. Implementation Actions, Responsible Agencies and Timeframe

CATEGORY	ACTION	OVERVIEW	TIMEFRAME	AGENCY RESPONSIBLE
PARKING MANAGEMENT	Implement a paid parking pilot program including the 90 stalls at the Bonanza, Flume Trail, and Ponderosa lots; Collect data to monitor the success of the pilot program and to ensure parking management is achieving desired outcomes.	Paid parking will help manage parking demand, enhance access, and provide revenue to support parking and transportation management.	Short-term	TTD (lead) and Washoe County
	Develop a shared parking management program for the SR 28 Corridor including, enforcement, visual identity, education and public outreach. Design the program to be expanded throughout the entire Tahoe basin	Shared parking typically results in greater efficiency and a better user experience by combining resources for parking management and making parking more available to a wide range of users.	Short-term	TTD (lead), Other public agencies with parking, Private parking facility owners.
	Use strategies from the parking management VPPP pilot project and toolkit to manage parking demand to reduce traffic congestion, environmental impacts, to improve the user experience and enhance access to recreation destinations. Monitor the effects of parking management strategies and make any adjustments to meet the goals of the program and to achieve the metrics identified in the next section.	A wide range of strategies are available to manage parking including pricing, time limits, permits, reservations, and other strategies. The approach to parking management will depend on the specific type of facility, parking demand, parking users, and other factors. In addition, parking strategies will likely need to be modified overtime as conditions change.	Ongoing	TTD, TRPA, NDOT, USFS, Nevada State Parks, and Washoe County
	Relocate shoulder parking to off-highway locations in phases as off-highway parking is developed and other transportation options are available	Shoulder parking is unsafe and in some cases illegal. Shoulder parking will be relocated and along with more transportation options will maintain and enhance access.	Long-term with phasing	TTD (lead), Nevada State Department of Transportation, National Forest Service
	Work with agencies and jurisdictions to reduce regulatory barriers that preclude or interfere with shared parking management.	Parking required as a part of a development or land use may be restricted by local regulations from being available for general public parking even if some of the parking is not being used. Local policies and regulations may need to be updated to allow shared public parking and active parking management.	Short-term	TTD, TRPA

CATEGORY	ACTION	OVERVIEW	TIMEFRAME	AGENCY RESPONSIBLE
TRANSIT	Secure long-term park and ride parking in Incline Village and at Spooner Summit with service along SR 28	Park and ride parking currently provides the primary way to access transit service to destinations on SR 28. The loss of park and ride parking would significantly reduce access to transit service and would likely increase demand for limited parking along SR 28.	Short-term	TTD
MULTI-MODAL	Complete the Tahoe East Shore Trail along the entire SR 28 corridor	The first phase of the bikeway from Incline Village to Sand Harbor will be completed soon. Design and environmental review is underway for the rest of the SR 28 corridor.	Long-term with phasing	TTD, NDOT, USFS, TRPA
	Work with Transportation Network Companies (TNC's) such as Uber and Lyft to coordinate service and access to destinations and transit stops	TNC's are currently operating in the basin and have the potential to increase access to destinations and transit without the need for parking. Increased access to recreation sites may negatively affect those sites by exceeding their carrying capacity. TTD and other agencies should coordinate service with TNC's to ensure that their operations are consistent with transportation and parking management goals.	Ongoing; Short-term	TTD, Local Cities and Counties

CATEGORY	ACTION	OVERVIEW	TIMEFRAME	AGENCY RESPONSIBLE
ENFORCEMENT	Develop coordinated enforcement strategies to effectively manage parking on public and private facilities.	Public and private parking are currently owned and operated by different entities with either no enforcement or limited enforcement. Designating a single agency or organization to manage and enforce these facilities as part of a unified system may require updating local policies and laws.	Short-term	TTD in coordination with WCSO, NHP, NDSP
	Develop a parking enforcement for payment by license plate rather than space using License Plate Readers (LPR) and other technologies to increase efficiency such as tickets-by-mail, pay by plate, and sensors.	Traditional parking management is labor and time intensive. Technological advances have increased the efficiency of enforcement by reducing staff needs while improving speed and accuracy.	Mid-term	TTD in coordination with WCSO, NHP, NDSP
VISUAL IDENTITY AND EDUCATION	Develop a visual identity and education plan for the shared parking system. Consider opportunities to improve the identity and education for parking and mobility options along SR 28 and the Tahoe Basin.	Visual identity and education is used to increase awareness about parking and mobility options, improve the user experience, and support the overall shared parking system.	Short-term	TTD in coordination with Visitor Authorities & Chambers
PUBLIC OUTREACH	Conduct public outreach on the parking management plan to increase awareness and understanding of the parking program and solicit input from the public. Continue to conduct public outreach as the plan is implemented and expanded.	It's important to communicate to the public any major changes in parking management and pricing that may affect users and the benefits and outcomes of improve parking management and provide opportunities for input and feedback from the public.	Short-term, Ongoing	TTD, TRPA, other public agencies
TECHNOLOGY	Work with partner agencies to develop a mobility app, including parking, to provide real time information and transportation options within the Tahoe basin.	Technology can be used to modifying people's transportation choices by providing mobility options including traffic data, parking and payment options, transit options, and other resources to improve the user experience and reduce congestion.	Mid-term	TTD, NDOT, TART, TRPA other public agencies

Framework, 2018

Monitoring Metrics, Indicators and Measures of Success

As new tools are implemented to improve parking management along SR 28, there are several metrics and success indicators that can be used to monitor successful implementation strategies. ***Figure 26*** shows the specific parking metrics that will be tracked as part of the program monitoring. In addition to the parking metrics additional indicators should be tracked to assess the success of the corridor including parking management (See ***Figure 27***).

Figure 26. Parking Metrics

MONITORING METRIC	DESCRIPTION	MEASURE OF SUCCESS
TURNOVER AND DURATION	Turnover and duration by lot and basin-wide provide an indication of how well the system is working based on the management goals. If the system has set time limits on parking, this measure indicates whether behavior is matching the restriction.	▪ Turnover measures the average frequency of vehicle turnover per space. This can be calculated for a particular stall, lot, or recreation areas, all the way up to basin-wide turnover. ▪ Duration measures the average time that a vehicle is staying. This measure can also be calculated for a variety of geographic areas. ▪ Target: Parking turnover of between 2 and 3 times per day during peak season.
OCCUPANCY	Occupancy for each lot provides an indication of how well-used the system is and what the demand is (under the current management conditions). Occupancy is generally measured hourly across a variety of user days (weekdays, weekends, different seasons) in order to understand demand across the week and year.	▪ Occupancy is measured on an hourly basis and can be calculated for a particular lot, recreation area, corridor, or basin-wide. ▪ An occupancy of 85% or above indicates that a change in management or supply should be considered to mitigate congestion. If occupancies drop below 85% in an area that has an understood demand challenge, it is also an indication that management changes are needed (for example that prices are too high or the prioritized user group is not aligned). ▪ Target: 100% occupied during peak periods given longer parking stays to support recreation use. Reduce traffic congestion associated with searching for parking.
ENFORCEMENT	Enforcement is a challenging but important aspect of managing the parking system. In particular, as changes are implemented enforcement is an essential part of changing behaviors and then maintaining those behaviors.	▪ Enforcement can be measured by tracking the number of citations issued by category (shoulder parking versus paid parking, etc.). ▪ Although increased enforcement provides added revenues, ideally enforcement will lead to compliance and a system that is operating better. ▪ Target: Violation rate should be between 5% and 9% for all vehicles parked.

MONITORING METRIC	DESCRIPTION	MEASURE OF SUCCESS
REVENUE FOR TRANSPORTATION & PARKING MANAGEMENT	Revenue sources that fund operations, maintenance expenditures and investments in the parking and transportation system.	▪ Transportation funding sources can vary in their predictability, consistency, and source. Tracking funding opportunities is important to planning for operations and priority investments. ▪ Maintaining integrated corridor and basin-wide parking and transportation plans helps advance an identified vision and can make the region more competitive for grant-funding as well as local and regional support for projects. ▪ Target: Revenues should support management of the parking and mobility program to reduce traffic congestion and improve mobility.
CUSTOMER TRANSACTION DATA	Transaction data from the parking technology system will allow TTD to compare trends between different seasons, days, and times of day. The transaction data will not replace the need to collect data in the field for occupancy, turnover, and duration.	▪ Targets not applicable ▪ Review data monthly

Figure 27. Corridor Indicators

INDICATOR	DESCRIPTION	MEASURE OF SUCCESS
VEHICLES MILES TRAVELED (VMT) PER VISITOR	VMT per parking stall would provide metrics on the distance traveled to reach the recreation destination.	▪ Average VMT per stall could be calculated for specific facilities, areas, corridors, or basin-wide. ▪ Goals for average VMT can be set. For example, if the region had a vision to get more local trips on transit, biking, or using park and rides then average VMT should track higher over time since you would have less short-distance trips ending in on-site recreation parking. ▪ Target: Reduction in VMT per visitor.
TRAFFIC CONGESTION	Tracking traffic congestion will provide a baseline for congestion, and the ability to track whether congestion is increasing or decreasing and locations of congestion in order to target solutions.	▪ Traffic congestion in the past has been generated by backups related to shoulder parking and wait times at recreation destinations. ▪ As parking management solutions are implemented, it is expected that traffic congestion from parking travel will be reduced. ▪ Monitoring Metric: Track traffic congestion in the corridor over time as the plan is implemented to understand the effects of the parking and mobility program on congestion using TRPA's congestion index by intersection. ▪ Target: Reduce traffic congestion associated with people looking for parking.

BIKE/PED COUNTS	Bicycle and pedestrian counts will help shed light on how many people are accessing the recreation areas by alternative modes.	▪ It is expected that as the Tahoe East Shore Trail is opened and expanded, more users will access recreation areas by foot and by bicycle. ▪ Tracking foot and bicycle traffic will provide a count of visitors to specific destinations and show how use of the facilities changes as parking management tools are implemented. ▪ Monitoring: Use TRPA's monitoring data for bicycle and pedestrian counts, an year-round counts at locations not monitored by TRPA to understand changes in visitor and use levels at recreation sites along the corridor to manage to the carrying capacity for each site.
MODE SHARE	Mode share data provides a profile of what percentage of users are traveling to their destination by different modes.	▪ Measuring travel modes at certain facilities will provide data on how people are getting to the facilities and how the patterns are changing over time. ▪ Target: Increase non-vehicle mode share for the "Discover Tahoe" user group from 15% to 30%.
USER EXPERIENCE	User experience measures provide qualitative data on how well implementation of parking tool is going from the user perspective.	▪ Qualitative data on user-experience can be collected through intercept surveys and online surveys. This data can provide a baseline of how well things are going, and over time can provide data on if the experience is getting better or worse. ▪ For things that are not going well, user experience surveys can help target areas of improvement. ▪ Monitoring: Conduct intercept surveys to understand the user experience at parking facilities as the plan is implemented at specific locations.
TRANSIT RIDERSHIP	Transit ridership data indicates usage levels of transit, boardings and alightings by location, and counts by time of day and week.	▪ Ridership data indicates what stations are being more heavily used than others, where additional investments in parking may be needed. ▪ This data tracks patterns in ridership within the corridor and basin throughout the week, seasons, and year. ▪ Target: Double the existing transit mode share in the corridor for all user groups.
SAFETY STATISTICS	Safety is tracked through data on the nature and location of accidents.	▪ Accidents by locations identify problem areas, which can lead to targeted solutions and safety improvement measures. ▪ Accidents can be categorized by vehicle-to-vehicle, vehicle-to-pedestrian, vehicle-to-bicycle, and others to provide an extra level of detail. Data on collisions can be used to monitor road safety and track hotspots that may represent dangerous road conditions. ▪ Target: Adopt the Vision Zero target of 0 traffic fatalities in the corridor.

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TOOLKIT OF PARKING STRATEGIES

The primary management strategy for the pilot program is demand-based pricing. However, a variety of management strategies are available that can be implemented in the short, medium, or long-term based on the results of the pilot and monitoring program.

As the parking system expands, these strategies can be applied to different facilities along the SR 28 Corridor based on ownership, parking users, demand for parking, location, size, and other factors. The matrix of strategies shown in ***Figure 28*** includes an assessment of how particular strategies support the project vision, goals, and guiding principles.

Figure 28. Toolkit of Parking Strategies Matrix

MANAGEMENT TOOL	DESCRIPTION	CONSIDERATIONS FOR IMPLEMENTATION
DEMAND-BASED PRICING	Rates are adjusted based on demand for parking. Demand-pricing changes can be seasonal, daily, hourly, or instantaneous.	▪ The Tahoe Basin experiences drastic changes in visitation between different seasons and different days of the week (weekends versus weekdays). ▪ The high traffic areas in the winter peak season are often different than the high traffic areas during the summer peak.
TIME LIMITED PARKING	Limiting parking (whether free or paid parking) to a specific amount of time in order to ensure that the parking is being used by the right users. For example, a main street wants turnover so parking limits are shorter, while employee-targeted parking would have longer time periods.	▪ The Tahoe Basin community would have to consider what an appropriate time limitation for recreational visitors is at different locations. ▪ If implemented, time restrictions at a beach lot, where visitors and families are likely to be spending at least half a day, would likely be longer than time restrictions at areas where activities generally coincide with shorter stays.
GRADUATED PRICING	Rates increase above the base rate after a certain period of time, but there are no time limits.	▪ Given the demand for longer stays at recreation sites in the corridor the use of graduated pricing would provide flexibility for those willing to pay a higher rate and not be subject to strict time limits given that recreational activities can be unpredictable.
RESERVATION SYSTEM	A system that allows visitors to pre-reserve and pay for a space for a specific time slot before they are.	▪ This system provides users with predict-ability as they know they will have a space available to them when they arrive. ▪ Technology allows for easy integration of a reservation system. ▪ For those less apt to use a website or app to pay for parking online, and who prefer to pay by cash or pay by card on-site, may be at a disadvantage under this system.

MANAGEMENT TOOL	DESCRIPTION	CONSIDERATIONS FOR IMPLEMENTATION
PERMIT SYSTEM	A permit system would allow those with a permit to park in certain areas in the Basin either at all times or at designated times. Permits could be sold daily, weekly, monthly, or annually.	▪ A system could be set up so that permit-holders can park in specific recreation areas for free (or for the price of a permit) at either all times or specific times. ▪ This system could allow users an option to pay once and then visit different locations around the lake (either in that same day, season, year, etc.).
RESTRICTED PARKING ZONES	Restricted parking zones are formed in order to prioritize a certain user group for long-term parking in a specific zone. Usually these zones are implemented in residential areas where there is outside demand for parking. Permitted users within the zone are exempt from restrictions placed on other parkers, such as a two hour time limit.	▪ There may be residential areas through-out the Basin that begin to see an in-creased demand for parking as paid parking, shoulder parking enforcement, and increased transit opportunities are implemented. ▪ For phase one, areas of Incline Village near Tunnel Creek and/or the transit center may begin to see vehicles parking in residential areas in order to evade paid parking, or because the designated parking areas are full.
CARPOOL PRICING	In areas with paid parking, carpool pricing can be provided at a discounted cost in order to provide a benefit for those choosing to ride together. Carpool pricing could also be used for certain types of permit systems.	▪ Carpools in the recreation setting would most likely be generated from day trips coming up from the regional cities, such as Reno and Sacramento. ▪ Enforcement of carpools can be difficult.
RESTRICTED PARKING AREAS (SHOULDER PARKING)	Designating certain areas as restricted to parking at all times.	▪ Along Route 28, and other areas of the Tahoe Basin, restricting parking on shoulder areas will be an important implementation measure to achieving basin-wide safety, environmental, and management goals. ▪ This management tool requires consistent enforcement to ensure that behaviors change.

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