



TAHOE  
REGIONAL  
PLANNING  
AGENCY



# LINKING TAHOE REGIONAL TRANSPORTATION PLAN

TAHOE REGIONAL PLANNING AGENCY ||

*Lake Tahoe*



FINAL  
April 2017



# Linking Tahoe: Regional Transportation Plan and Sustainable Communities Strategy

Horizon Year 2017-2040

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# Statements

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## Metropolitan Planning Organization Profile

The Tahoe Regional Planning Agency is the federally designated Metropolitan Planning Organization (MPO) for the Lake Tahoe Region which plans and funds transportation and transit improvements to support attainment of regional environmental thresholds. The MPO planning process is carried out by the transportation staff at TRPA and actions are taken by MPO Board, which consist of the full TRPA Governing Board plus an additional representative from the U.S. Forest Service.

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## Glossary: Acronyms and Definitions

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<b>100-year flood zone</b>	An area within which a flood can be expected to occur every 100 years on average
<b>AADT</b>	Annual Average Daily Traffic
<b>Active Transportation</b>	Transportation that does not rely entirely on a car to travel between origin and destination. This can include walking, biking, skateboarding, roller-skating, cross country skiing, using public transit, or driving to an intercept lot, parking, and then using another form of travel.
<b>ADA</b>	Americans with Disabilities Act
<b>ATP</b>	Active Transportation Plan
<b>ACIP</b>	Airport Capital Improvement Program
<b>ACS</b>	American Community Survey
<b>AMI</b>	Area Median Income
<b>ARB</b>	California Air Resources Board
<b>BEV</b>	Battery Electric Vehicle: a type of plug-in electric vehicle that is fully powered by the electric grid and the energy from the lithium-ion battery. BEVs can use Direct Current Fast Chargers, Level 1 Chargers, and Level 2 Chargers though different BEV models require plug adapters to gain compatibility with different chargers. The electric mile range is typically higher than PHEVs. Example BEV models include: Tesla, Chevy Bolt, Nissan Leaf, Ford Focus, Kia Soul, and Mercedes Benz B-Class.
<b>BID</b>	Business Improvement Districts: local funding mechanism for economic development and improvement via self-assessment by businesses
<b>BlueGO</b>	South Shore transit system
<b>CAFE</b>	Corporate Average Fuel Economy
<b>Caltrans</b>	California Department of Transportation
<b>CCTV</b>	Closed circuit television
<b>CDP</b>	Census-Designated Place
<b>CEQA</b>	California Environmental Quality Act
<b>CFR</b>	Code of Federal Regulation
<b>CIP</b>	Capital Improvement Program
<b>CMAQ</b>	Congestion Mitigation & Air Quality Program
<b>CMP</b>	Congestion Management Process
<b>CO</b>	Carbon Monoxide
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>CPI</b>	Consumer Price Index
<b>Complete Streets</b>	Streets built and managed to be comfortable and safe for all users and modes
<b>CTC</b>	California Tahoe Conservancy
<b>DCFC</b>	Direct Current Fast Charger: A type of electric vehicle supply equipment (PEV charger) that requires a dedicated circuit of 20-100 amperage, with a 480 volt service connection that allows for rapid charging of plug-in electric vehicles. The time to charge ranges from 50 to 70 miles of range per 20 minutes of charging. This is the fastest type of plug-in electric vehicle charger (examples: CHAdeMO, SAE Combo, and Tesla Super-

	Chargers), only compatible to battery electric vehicles. This charger requires special infrastructure and safety features and is more expensive to build than the Level 1 and 2 PEV chargers.
<b>DEM</b>	Division of Emergency Management
<b>DOT</b>	U.S. Department of Transportation
<b>DUE</b>	Dwelling Unit Equivalent
<b>EIP</b>	Environmental Improvement Program
<b>EMCC</b>	Emergency Management Community Council
<b>EMFAC2011 model</b>	Emissions estimation model used by the California Air Resources Board
<b>EVSE</b>	Electric Vehicle Supply Equipment: the charging equipment for plug-in electric vehicles. EVSE is typically differentiated by the maximum amount of power that can be delivered to the plug-in electric vehicle's battery.
<b>FAST Act</b>	Fixing America's Surface Transportation Act, the latest federal transportation bill, approved December 4, 2015.
<b>FAA</b>	Federal Aviation Administration
<b>Financial Constraint</b>	A demonstration that there will be sufficient funds to implement proposed improvements, and to operate and maintain the entire system, by comparing costs with available financial resources.
<b>FHWA</b>	Federal Highway Administration
<b>FTIP</b>	Federal Transportation Improvement Program
<b>GHG</b>	Greenhouse Gas
<b>HAR</b>	Highway Advisory Radio: provides real time highway information to travelers
<b>ICE</b>	Internal Combustion Engines: are vehicles that require gasoline to fuel operation of the engine (not electricity).
<b>ITS</b>	Intelligent Transportation Systems
<b>L1</b>	Level 1 alternating current: A type of electric vehicle supply equipment (PEV charger) that uses a standard plug with 120 volt and a three prong electrical outlet at 15-20 amperage. The time to charge ranges from two to five miles of range per one hour of charging. This typically provides residential or workplace charging and is considered to be the least expensive and slowest type of charger for plug-in electric vehicles due to low power delivery.
<b>L2</b>	Level 2 alternating current: A type of electric vehicle supply equipment (PEV charger) with 240 volt and alternating current split phase service that is less than or equal to 80 amperage. The time to charge ranges from 10 - 25 miles per one hour of charging. This typically provides residential, workplace, or opportunity electric vehicle charging and provides a faster charge than L1 electric vehicle supply equipment.
<b>LOS</b>	Level of Service: a measure of the quality of vehicle traffic flow at an intersection or on a road segment
<b>L RTP</b>	Long Range Transportation Plan
<b>LTBMU</b>	Lake Tahoe Basin Management Unit, United States Forest Service
<b>MPO</b>	Metropolitan Planning Organization
<b>MMLOS</b>	Multi-Modal Level of Service
<b>NDOT</b>	Nevada Department of Transportation

<b>OES</b>	Office of Emergency Services
<b>PBD</b>	Parking Benefit District: funding mechanism for local streetscape and transportation improvements from revenues generated by parking management strategies
<b>PDT</b>	Project Development Team
<b>PEV</b>	Plug-In Electric Vehicles: vehicles, including plug-in hybrid electric vehicles and battery electric vehicles, designed to plug into the electric grid to be powered by energy which charges a rechargeable lithium-ion battery. Electricity is used as transportation fuel for PEVs.
<b>PHEV</b>	Plug-In Hybrid Electric Vehicle: a type of plug-in electric vehicle that is powered by an internal combustion engine and an electric motor. PHEVs can use Level 1 Chargers and Level 2 Chargers though different models require plug adapters to gain compatibility with different chargers. The electric mile range is typically lower than the electric range in BEVs. Example PHEV models include: Chevy Volt, Honda Accord, Hyundai Sonata, Volvo XC90, and Mercedes C350.
<b>PPP</b>	Public Participation Plan
<b>PMADT</b>	Peak Month Average Daily Traffic
<b>RFTA</b>	Roaring Fork Transportation Authority
<b>RHNA</b>	Regional Housing Needs Assessment
<b>RSTP</b>	Regional Surface Transportation Program
<b>RTAC</b>	Regional Targets Advisory Committee
<b>RTIA</b>	Reno/Tahoe International Airport
<b>RTP</b>	Regional Transportation Plan
<b>RTPA</b>	Regional Transportation Planning Agency
<b>SACOG</b>	Sacramento Area Council of Governments
<b>SAFETEA-LU</b>	Safe Accountable, Flexible, Efficient, Transportation Equity Act; a Legacy for Users: 2005 Federal Transportation Investment bill
<b>SB 375</b>	California Senate Bill 375: requires MPOs to develop a Sustainable Communities Strategy to focus regional land use and transportation policies to reduce GHGs from cars and light trucks
<b>SCS</b>	Sustainable Communities Strategy: required by SB 375, a plan for integrating transportation investments with land use plans to help a region meet targets for reducing greenhouse gas emissions
<b>Secchi depth</b>	Depth at which the pattern on a circular disk lowered into a body of water is no longer visible; used to measure water clarity
<b>SEMS</b>	Standardized Emergency Management System
<b>SHOPP</b>	California State Highway Operation and Protection Program
<b>SLT</b>	South Lake Tahoe
<b>SNPLMA</b>	Southern Nevada Public Lands Management Act
<b>SRTS</b>	Safe Routes to School
<b>STIP</b>	State Transportation Improvement Program
<b>TAC</b>	Technical Advisory Committee: convened to review and provide input on the RTP
<b>TART</b>	Tahoe Truckee Area Regional Transit
<b>TCPUD</b>	Tahoe City Public Utility District

<b>TDM</b>	Transportation Demand Management
<b>TIF</b>	Tax-Increment Funds: a way to capture the value of an increase in property values from improvements or new development and use it to finance improvements
<b>TIP</b>	Transportation Improvement Program
<b>TMA</b>	Transportation Management Association
<b>TMDL</b>	Total Maximum Daily Load: Federally legislated maximum amount of certain pollutants in a body of water
<b>TMPO</b>	Tahoe Metropolitan Planning Organization
<b>TNC</b>	Transportation Network Company
<b>TOT</b>	Transient Occupancy Tax
<b>TransCAD/TranPlan</b>	Software for mapping and analyzing transportation data
<b>TRPA</b>	Tahoe Regional Planning Agency
<b>TSM</b>	Transportation System Management: measures such as dedicated turn lanes, signal synchronization, bicycle-activated signals, roundabouts
<b>TTC</b>	Tahoe Transportation Commission
<b>TTD</b>	Tahoe Transportation District
<b>U.S.</b>	United States
<b>VMТ</b>	Vehicle Miles Traveled
<b>VTG</b>	Vehicle Trip Generation





Lake Tahoe is situated at the heart of a Region of great natural beauty and exceptional environmental sensitivity that must be respected. These sensational natural attributes also support the Lake Tahoe Region's \$5 billion economy, which is driven largely by summer and winter tourism and outdoor recreation. The Region's population of 55,000 full-time residents is dwarfed by the 10 million vehicles who come to enjoy Lake Tahoe's crystal blue waters and surrounding alpine experience. The Region is also part of the rapidly growing Northern California and Nevada megalopolis, an area that extends from San Francisco to Sacramento and Reno and is home to more than 15 million people. Many of the residents in these metropolitan areas drive up to Lake Tahoe to enjoy its outdoor recreation opportunities, causing traffic congestion on the roadways that enter and exit the basin during peak times of visitation. With the lake as the predominant geographic feature at the Region's center and the Region's land area mostly in federal and state ownership, the transportation network is grounded in a predominantly 2-lane roadway system that rings the lake's shore and cannot be expanded to meet growing traffic demands. Meeting the transportation demands of Lake Tahoe residents and a growing recreation visitor population will require unique and dynamic solutions.

The Lake Tahoe Region's tourism-based economy poses significant challenges to managing an efficient transportation system. Due to high levels of visitation, the average daily population of the area is four times the permanent resident population, fluctuating by season and day of the week. In addition to being a popular destination for overnight visitors, Lake Tahoe serves as the outdoor playground for the neighboring metropolitan areas in Northern California and Nevada, resulting in a high number of drive-up day visits. Projected population growth in these metropolitan areas will likely add more users to Lake Tahoe's transportation system. By 2035, the population of these surrounding areas is expected to increase by four million people<sup>1</sup>. This will lead to increases in visitor trips to the Tahoe Region and increased demand on existing transportation infrastructure.



Photo: Aurora Photos / Rachid Dahnoun

As the Region's federally-designated metropolitan planning organization, the Tahoe Regional Planning Agency (TRPA) plays a critical role in identifying and solving Lake Tahoe's transportation challenges. TRPA's mission is to lead the cooperative effort to preserve, restore, and enhance the Lake Tahoe Region, while improving local communities and visitor's interactions with our irreplaceable environment. To carry out this mission, every four years TRPA prepares a regional transportation plan that outlines the overall vision for developing, operating, and maintaining the Lake Tahoe Region's transportation

<sup>1</sup> Trans-Sierra Transportation Coalition, 2015.

system. This 2017 Regional Transportation Plan offers strategies to jump start innovation through electric vehicle infrastructure, address the routine travel demands of residents and commuters, and the recreational travel demands of visitors that during peak periods stress and cause congestion on Lake Tahoe's transportation system.

**Strategies focus on projects and programs that dynamically meet the needs of all roadway users by:**

- 1 Offering better travel mode options
- 1 Creating incentives that spread out the times, places, and ways people travel to improve traffic flow
- 1 Providing environmentally innovative infrastructure
- 1 Improving safe and equitable access to the places people want to go
- 1 Prioritizing funding for projects that fulfill TRPA objectives in transit, active transportation, transportation demand management, and other programs and directly support identified TRPA transportation performance outcomes

## Transforming Tahoe Transportation

**A first-class transportation system that prioritizes bicycling, walking, and transit, and serves residents and visitors while contributing to the environmental and socioeconomic health of the Region**

The goal is for more people to arrive without a car and, once they are here, have other means of travel readily available for them to enjoy all the Region has to offer. To preserve the Lake Tahoe experience means addressing the peak periods of congested roadways. This traffic congestion at times makes Tahoe feel like a large city rather than the alpine mountain escape that is why people visit and live here and the foundation of the Region's healthy economy. The 2012 Regional Transportation Plan addressed transportation system needs in the Region's small community centers, emphasizing the planning and delivery of bikeable, walkable communities, and connections to transit through complete streets. This 2017 Regional Transportation Plan takes the next steps needed to build on that 2012 plan, focusing on providing frequent and prioritized multi-modal connections between town centers and neighborhoods and easy and convenient access to high demand recreation sites. With a seamless and efficient system operating within the Lake Tahoe Region, we can start planning for added modes of service to and from Lake Tahoe to aid in reducing reliance on the private automobile. Additionally, this plan promotes the use of electric and zero emission vehicles through infrastructure planning and incentive programming such as preferential parking. This work will encourage those who choose to travel by car to use less impactful vehicles. Partners are committed to planning, funding, and implementing a sustainable transportation system through coordinated land use and transportation strategies.



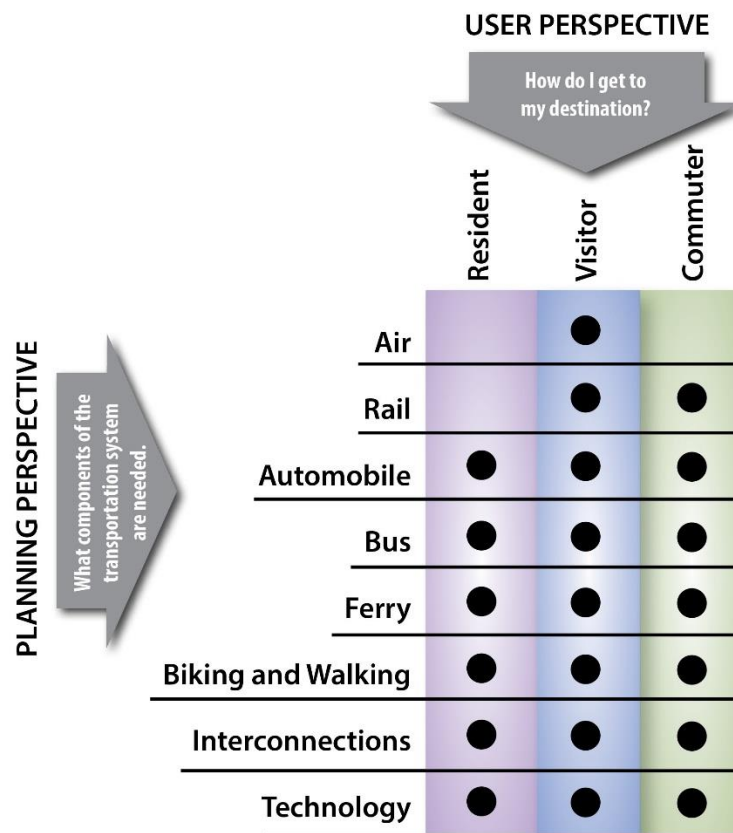
**Apache Avenue Pedestrian Safety and Connectivity Project Conceptual rendering. Designed by Fehr & Peers**

## The Long-Term Vision

Tahoe's system will be a model of how alpine mountain recreation destinations best serve residents, commuters, and it's many visitors. The system will be flexible and safe, provide predictable recreation access, preserve the environment, and encourage innovation. Visitors to the region from surrounding metropolitan areas will arrive by many available modes – air, rail, bus, and automobile, and once here will be able to easily afford and use an interconnected and seamless round the lake system of transit and trails to reach their desired destination.

In the future, Lake Tahoe residents, commuters, and visitors will be able ask their digital device the best way to reach a desired destination. The answer will provide real time options through intelligent transportation systems including congestion and travel time, the cost differential between parking a car versus cost of transit; availability of parking near the destination; capacity for carrying outdoor gear on transit; and the environmental impact of one option versus another in terms of GHG emissions. This plan envisions a future in which the user has real choices and can understand the real costs and impacts of making those choices.

Figure 1.1: User and Planner Perspectives

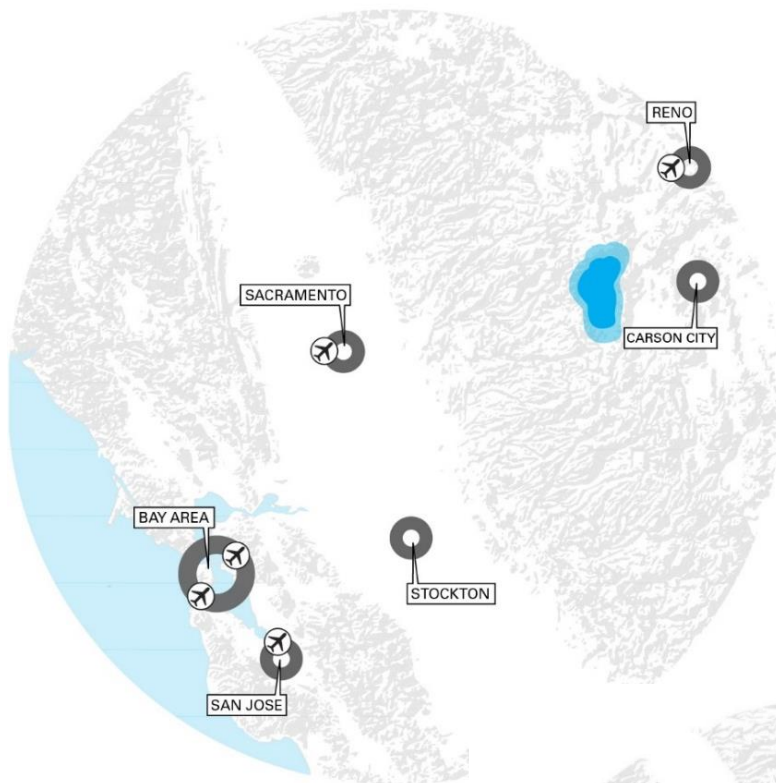


The transportation system user who decides to go to the grocery store from home at Lake Tahoe and the mountain biker who lives in the Bay Area and decides to visit for a weekend ride both want a system that allows them to reach their destination as quickly and conveniently as possible. The transportation planner envisions this same system as interconnected components: airports to rail lines, roadways and parking facilities, bus and ferry transit, biking and walking paths, all supported by technology like handheld devices that provide transportation options, and vehicles propelled by alternative fuels and drive themselves.



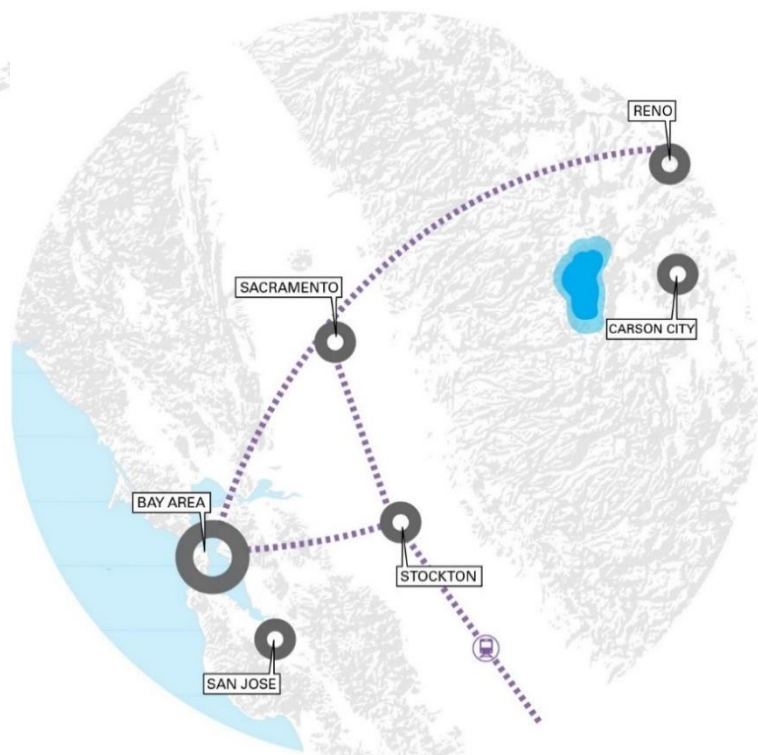
### The Envisioned Mega-Region System

Achieving Lake Tahoe's long-term transportation vision will take time, collaboration, dedication, and successful solutions for significant funding shortfalls. It will also take the concerted cooperation and agreement over time of many Lake Tahoe agencies, non-profits, and community groups working with surrounding regional partners to develop options for visitors and commuters. To serve this vision, integrated connections between neighboring metropolitan areas and Lake Tahoe must provide convenient, cost effective, and easy-to-use travel options, including air, rail, roadways, transit service and park and ride locations.



**Air:** The Tahoe Region is well-served by the Reno/Tahoe International Airport, Sacramento International Airport, Oakland International Airport, and San Francisco International Airport.

**Rail:** The heavy rail corridor, originally part of the Transcontinental Railroad, connects the major airports from northern California to Reno, Nevada. Adding increased passenger rail service in the Sacramento to Reno corridor is a long-term strategy in need of strong partnerships and additional funding.





### Automobile:

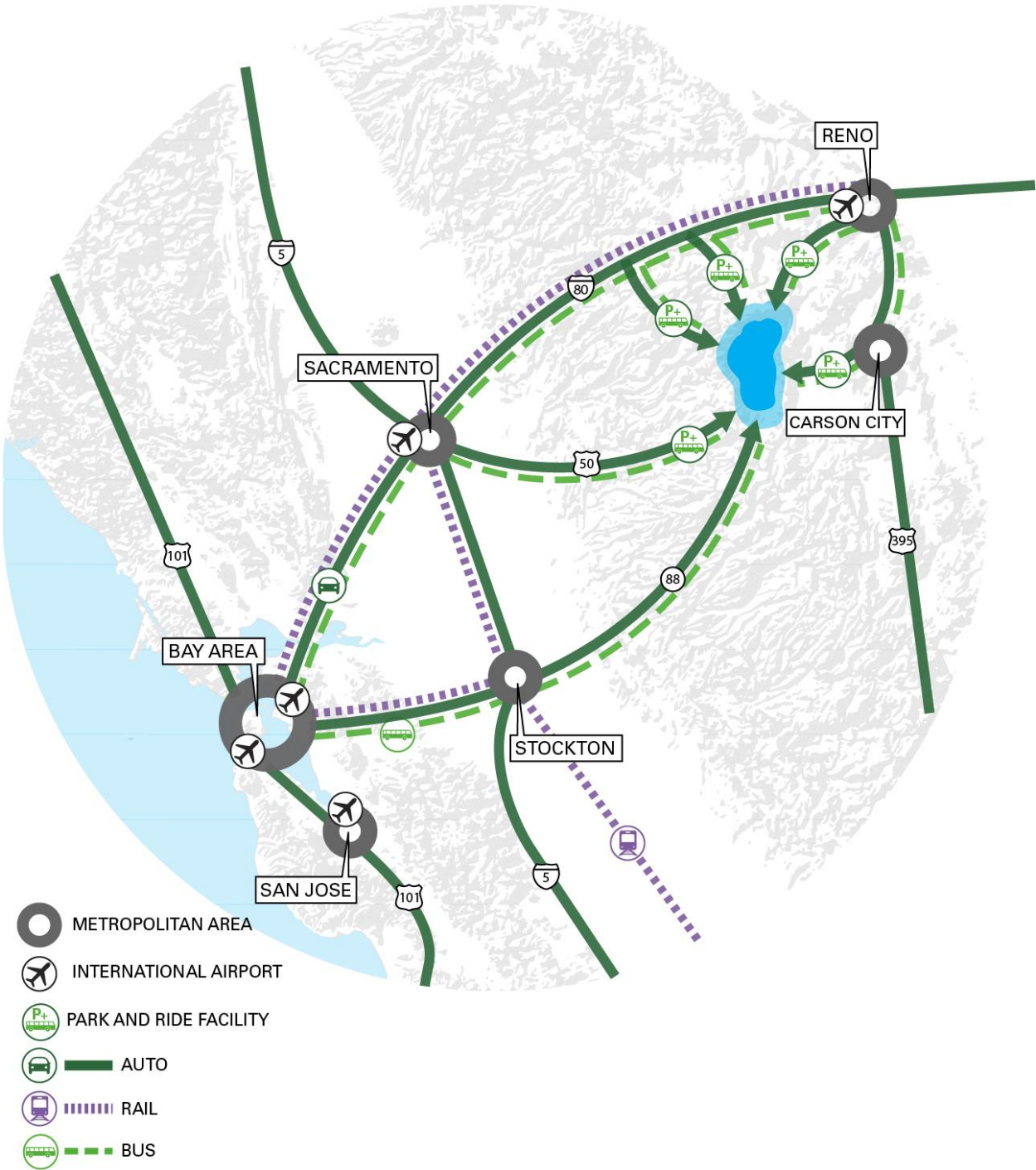
The automobile, once the only way to reach all parts of the Lake Tahoe Region, remains a major form of transportation. However, the automobile system is integrated into the overall transportation system with well-placed parking areas where travelers can transfer to rail or bus services to reach destinations in the Region where automobile access and parking is limited. Park and ride lots are long-term strategies in need of strong partnerships and additional funding.

**Bus:** A comprehensive and coordinated bus and shuttle transit system is provided by multiple entities, connecting Lake Tahoe to major airports and population centers outside of the Region. Enhanced inter-regional transit connections are already funded in part, but increased frequency and subsidized private services require better partnerships and increased funding.



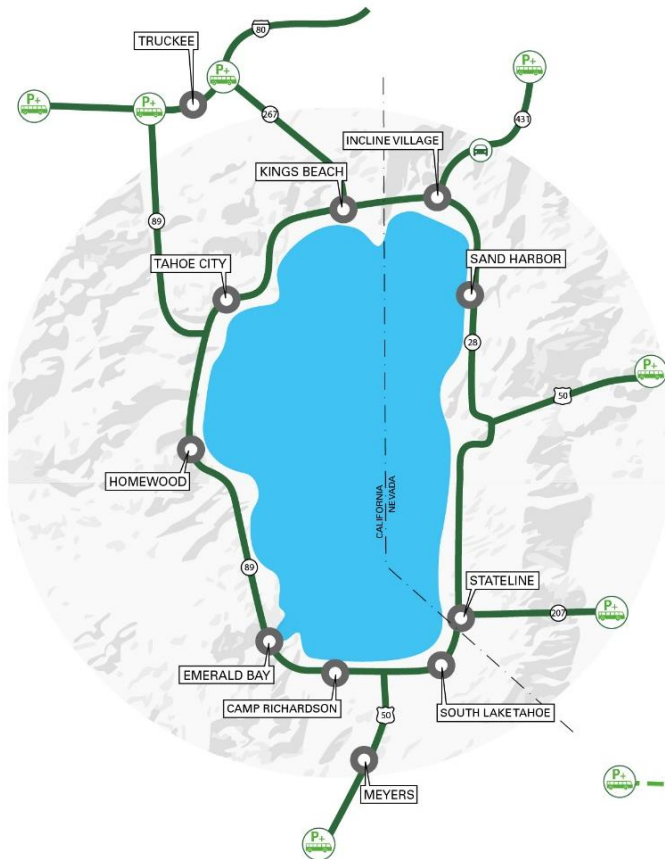


Figure 1.2: Envisioned Mega-Region System



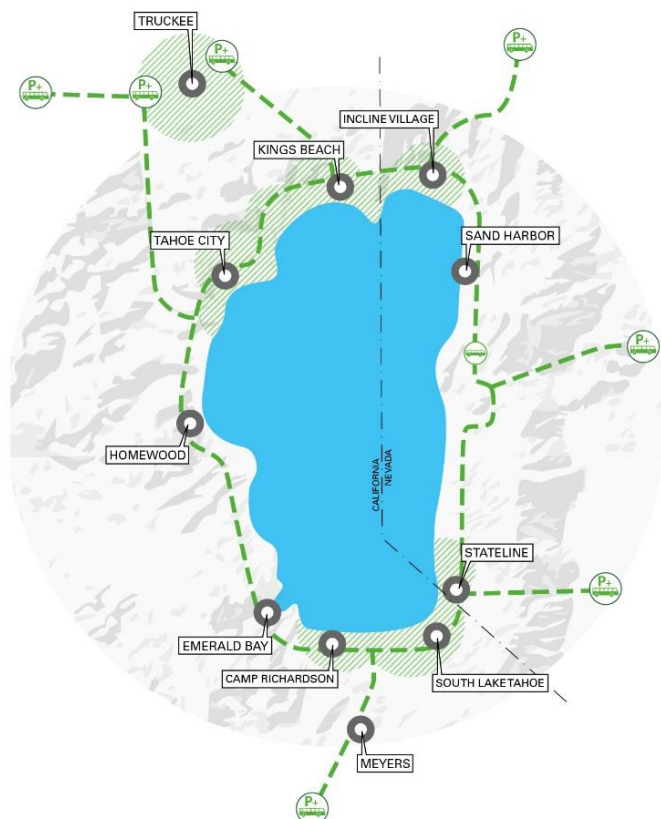
## The Envisioned Tahoe Region System

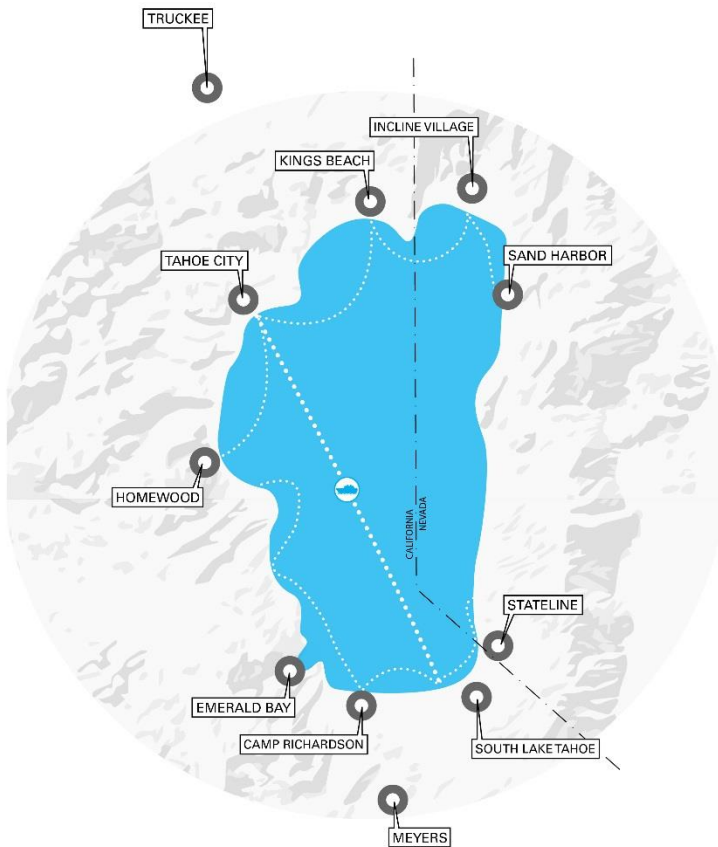
The Region's system of the future will be seamless and interconnected. More and better travel options to access recreation sites for residents and visitors are on the plan's funded project list. These projects will accomplish multiple goals, and make significant transit, trail, and technology improvements to Lake Tahoe's transportation system. Foreseeable funding provides incremental progress toward the achievement of Lake Tahoe's long-term transportation vision.



**Automobile:** Car travel remains a major form of transportation at Lake Tahoe. New park and ride lots at key entry and exit locations encourage residents, commuters, and visitors to transfer onto transit or biking and walk to reach their destinations at recreation sites and town centers. Technology is used to incentivize car-share and carpooling programs. Tahoe's roadways accommodate all users, treat stormwater runoff and are kept in a state of good repair.

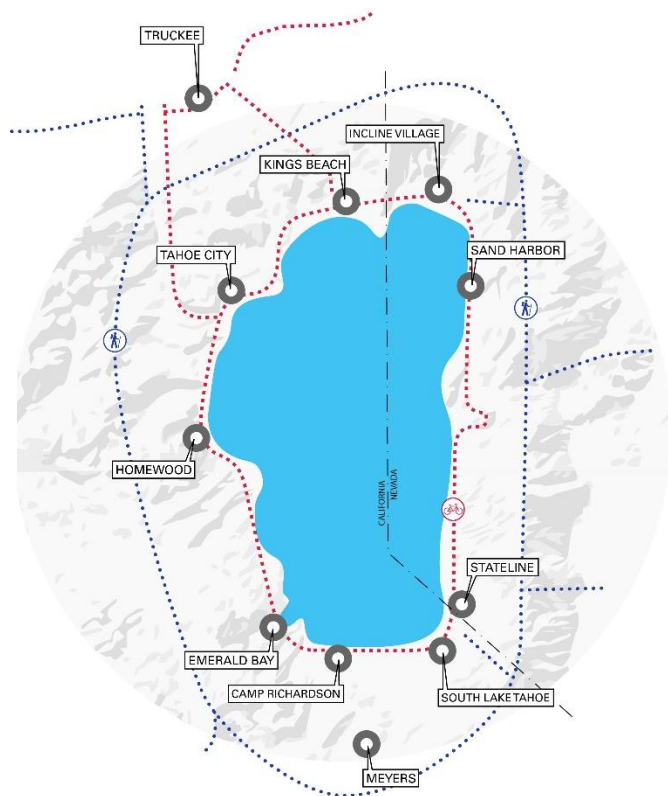
**Bus:** A comprehensive and coordinated bus and shuttle transit system will provide seamless around the lake service. Service has 30-minute frequency on major routes, is free-to-the-passenger, provides access to high-use recreation destinations, and connections with existing transit centers. Increased service with 15-minute frequencies and enhanced mobility hubs are an unfunded need.



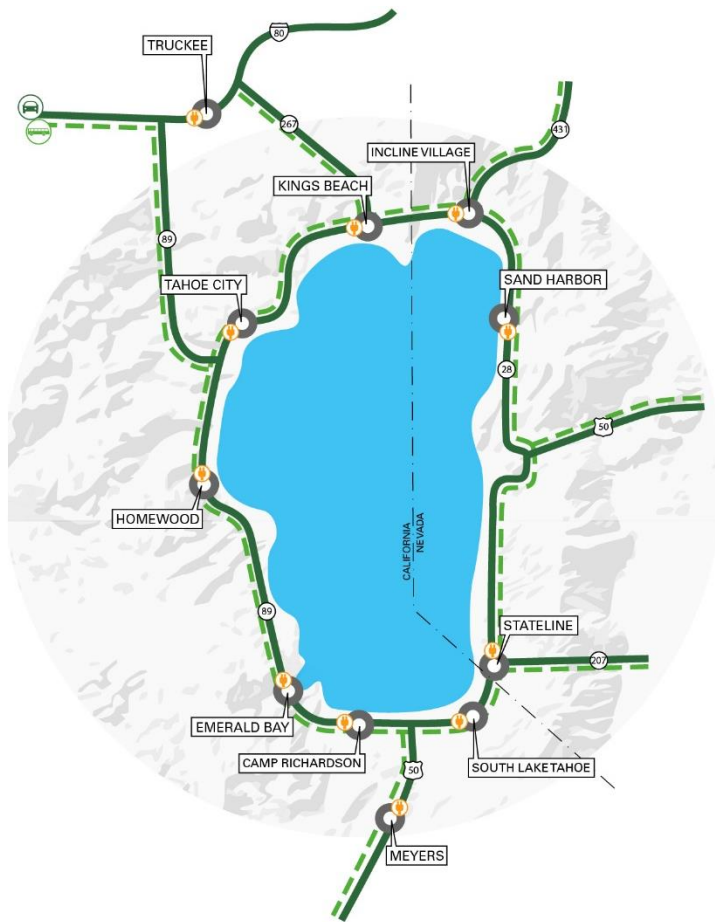


**Ferry:** The North and South shores of Lake Tahoe are connected by a cross-lake ferry serving residents, visitors and commuters who wish to transfer from automobiles and bus service, or who may have walked or ridden their bicycle. A South shore water taxi is included as part of this plan's funded scenario, with a North shore water taxi service remaining as an unfunded need.

**Biking and Walking:** Bicyclists can travel throughout the Region for either recreation or day-to-day transportation. They are served by connected bicycle paths and on-street bicycle lanes that access all areas around the Lake and connect to neighborhoods and key transfer points where there is automobile parking, bus or ferry service. Like bicyclists, pedestrians also can access all areas of the Lake Tahoe Region. For those wishing to recreate there are trails that connect from the shoreline to the famous Tahoe Rim Trail which receives roughly 400,000 annual users and the Pacific Crest Trail. Within developed areas pedestrians can easily travel between their residence, entertainment, and shopping locations, and to nearby jobs. To get to destinations that are further away, they can use their own bicycle or one from the bike share system, ride on bus or ferry service, or drive their own automobile or one from the auto-sharing program. Some critical trail gaps will require additional funding to complete the system.







**Technology:** In addition to an application that works on all personal digital devices and provides real-time information about the transportation options available, one can easily use electric vehicles because Lake Tahoe has plug-in electric vehicle stations conveniently located all around the Lake as well as at key marinas for electric boats. There are fueling stations for hydrogen fuel cell vehicles, self-driving automobiles, and an innovative auto-sharing program. Alternative fuels infrastructure planning is underway and partners are collaborating on creating and funding an online transportation trip planning tool and improved traveler information. Full buildout of the alternative fuel infrastructure will require robust public/private partnerships and additional funding.

### Interconnections:

Virtually every component of the transportation system is interconnected. Examples include rail to bus transit in Truckee, automobile to bus transit at parking and transit centers (Mobility Hubs) outside and inside the Region, bus to ferry service on the North and South shores, with all travel options connected to biking and hiking trails at trailheads.

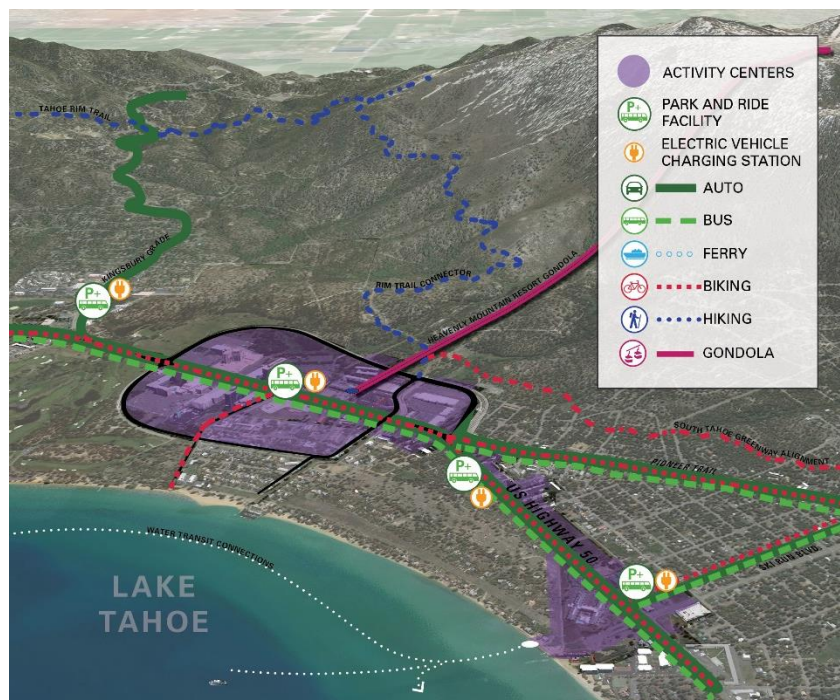
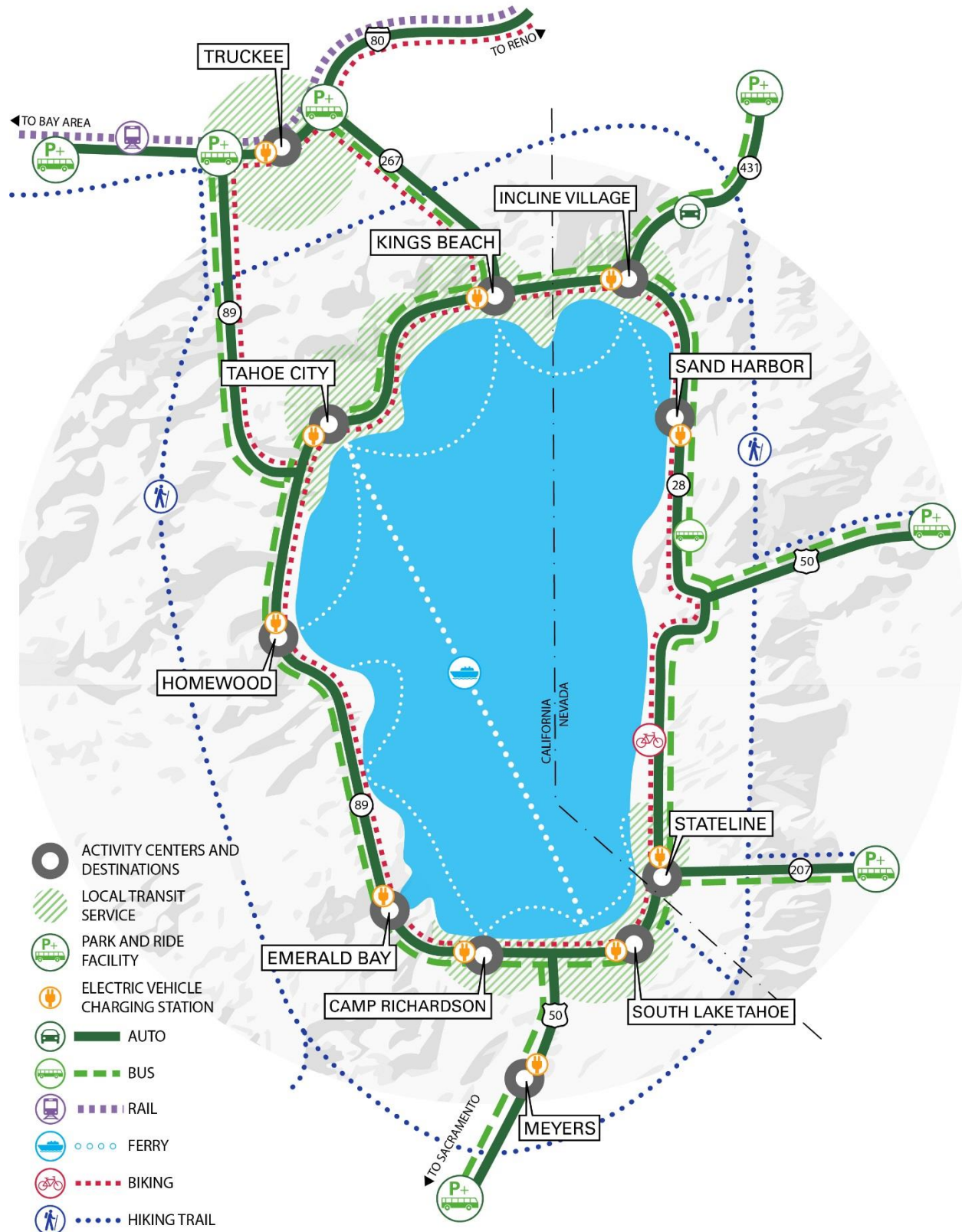


Figure 1.3: Envisioned Tahoe Region Transportation System





## Key Concepts

To achieve the Lake Tahoe Region's long-term vision of a well-connected, internal and external transportation system that meets the demands of all users, four key concepts coalesce and form the backbone of transportation planning and implementation. These concepts help synthesize the development of this plan, the design of local projects, the allocation of federal and state funding, and measuring ongoing system performance.

### Key Concept #1: Regional Goals

Regional goals and policies establish the organizing framework for transportation planning at Lake Tahoe and represent stakeholder feedback received through regional stakeholder meetings, public workshops and online input opportunities on draft transportation plan concepts, as well as input from previous regional transportation plans. The goals and policies also draw from detailed goals in the 2015 Intelligent Transportation Systems Strategic Plan and the 2016 Active Transportation Plan. These goals reflect the requirements of the TRPA Bi-State Compact, federal and state transportation planning requirements and plans such as the California Transportation Plan, and public input. The six regional transportation goals specify regional policies that guide project planners, implementers, and funders toward achieving each goal. In the following pages, example policies are provided.

Regional transportation plan policies are high-level and applicable at the regional level. Many are drawn from the more detailed plans that inform and support this regional transportation plan, including the 2016 Active Transportation Plan, the 2015 Intelligent Transportation Systems Strategic Plan, transit plans, corridor plans, and area plans. These supporting plans also include additional, more specific policies that TRPA and its partners will use when implementing projects. Chapter 3: The Plan, outlines the projects and programs that help the Region meet all six goals.



May 17, 2016 Regional Transportation Plan and Corridor Connection Plan Public Workshops  
Photo: TRPA



## GOAL 1: ENVIRONMENT

*Protect and enhance the environment, promote energy conservation, and reduce greenhouse gas emissions.*

A transportation system that promotes walking, biking, public transit use, and environmental innovation technologies can help preserve a healthy environment. The TRPA Bi-State Compact thresholds are intended to improve water quality by reducing fine sediment that can wash off roadways into Lake Tahoe and impact lake clarity. California's GHG reduction requirements aim to reduce vehicle miles traveled to improve air quality by reducing GHG emissions from automobiles. Multi-benefit corridor revitalization projects help reduce stormwater runoff, optimize traffic flow, and reduce vehicle dependence by providing active transportation facilities.

**Policy 1.4:** Facilitate the use of electric and zero emission vehicles and fleets by supporting deployment of vehicle charging infrastructure within the Region, and supporting incentives and education of residents, businesses, and visitors related to the use of electric and zero emission vehicles.



## GOAL 2: CONNECTIVITY

*Enhance and sustain the connectivity and accessibility of the Tahoe transportation system, across and between modes, communities, and neighboring regions, for people and goods.*

**Policy 2.15:** Accommodate the needs of all categories of travelers by designing and operating roads for safe, comfortable, and efficient travel for roadway users of all ages and abilities, such as pedestrians, bicyclists, transit riders, motorists, commercial vehicles, and emergency vehicles.

Providing a seamless transportation system means improving the individual elements of transit, trails, and technology while enhancing their integration. Increasing interconnections within and across modes, by closing gaps on paths, providing year-round access, and aligning transit schedules with transfers, encourages people to shift out of using their cars and into taking transit, bicycling, and walking.



## GOAL 3: SAFETY

*Increase safety and security for all users of Tahoe's transportation system.*

Residents, commuters, and visitors are more likely to bike, walk, and take transit if they feel safe. TRPA is setting safety targets pursuant to 2016 federal requirements and is integrating them into the performance measurement framework and the congestion management process accordingly (See chapter 5: Measuring Success). Infrastructure that achieves this goal could include pedestrian level lighting, redesign of high crash rate locations through left turn pockets and enhanced crosswalks, and security cameras.

**Policy 3.2:** Consider safety data and use proven safety design countermeasures for safety hotspots recommended from roadway safety audits, the active transportation plan, corridor plans, and other reliable sources when designing new or modifying existing travel corridors.



#### GOAL 4: OPERATIONS AND CONGESTION MANAGEMENT

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*Provide an efficient transportation network through coordinated operations, system management, technology, monitoring, and targeted investments.*

**Policy 4.1:** Identify opportunities to implement comprehensive transportation solutions that include technology, safety, and other supporting elements when developing infrastructure projects.

A well executed transportation management system incorporates monitoring data, real-time information, and dynamic operations that respond to seasonal congestion and periodic congestion. These projects and programs stabilize traffic flow to reduce idling and delays and maximize investment through holistic project delivery.



#### GOAL 5: ECONOMIC VITALITY & QUALITY OF LIFE

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*Support the economic vitality of the Tahoe Region to enable a diverse workforce, sustainable environment, and quality experience for both residents and visitors.*

The Tahoe Region's economy is built on the world-renowned recreational access enjoyed by residents and visitors. Attractive town centers, affordable housing, and a healthy environment encourage people to continue living in and visiting the Region. The transportation system supports these needs by encouraging people to leave their cars at their original destination through corridor revitalization projects that provide walkable, bikeable, and livable communities.

**Policy 5.1:** Encourage community revitalization and transit oriented development projects that comprehensively support regional and local transportation, housing, land use, environment, and other goals.



#### GOAL 6: SYSTEM PRESERVATION

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*Provide for the preservation of the existing transportation system through maintenance activities that support climate resiliency, water quality, and safety.*

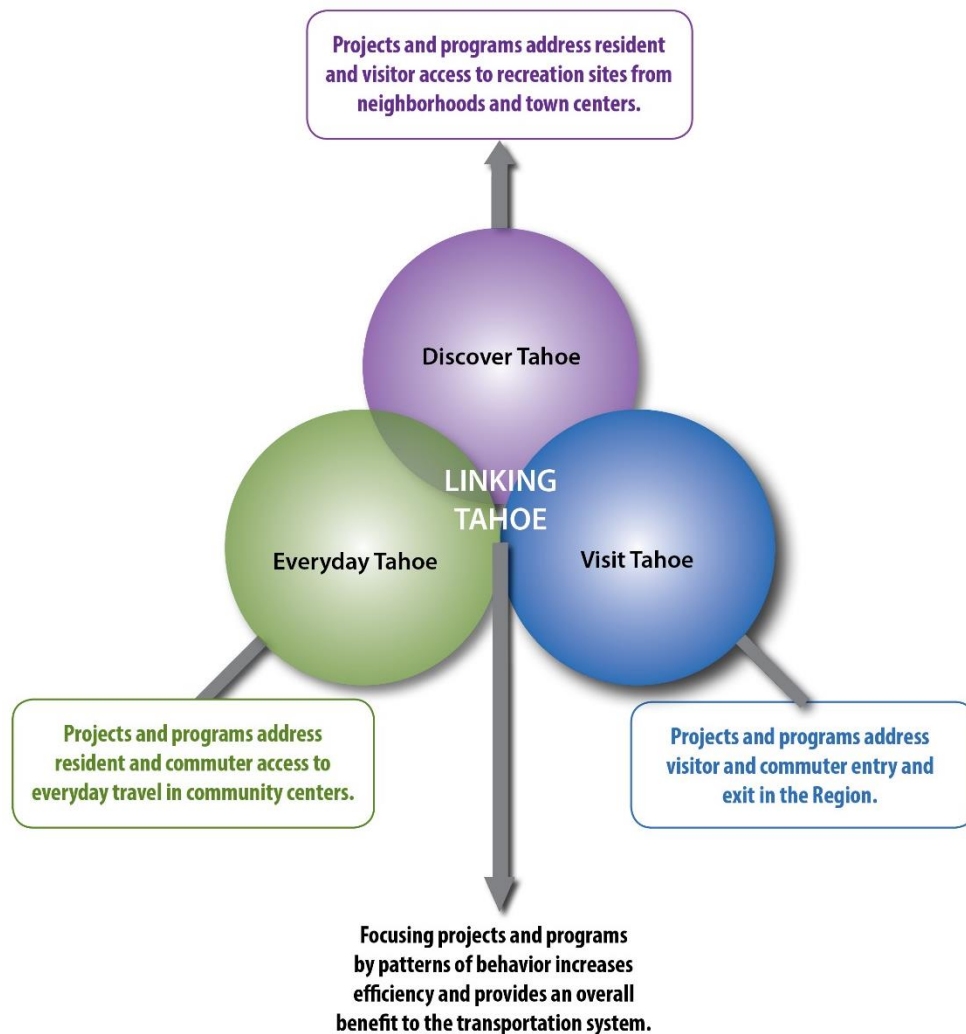
**Policy 6.1:** Preserve the condition of sidewalks and bicycle facilities and where feasible, maintain their year-round use.

Maintaining the existing transportation system to operate at it's highest level increases its overall efficiency. Keeping roadway pavement in safe condition, plowing paths for winter use, and planning for climate change resiliency makes initial investments last and reduces large and costly rehabilitation projects.

## Key Concept #2: Understanding Travel Behavior Patterns

Tahoe's transportation system serves the needs of three groups of users – residents, commuters, and visitors. Knowing “who” is using the system becomes especially relevant when addressing seasonal roadway congestion associated with times of peak visitation. The permanent resident population is relatively fixed at approximately 55,000 people, and accounts for roughly 55 percent of estimated daily vehicle trips in the Region. Commuters from outside the Region account for roughly 3 percent of daily vehicle trips, and visitors to Lake Tahoe account for nearly 42 percent of daily trips. Recognizing that residents, commuters, and visitors each use the system differently and sometimes similarly is the first step to understanding patterns of travel behavior at Lake Tahoe.

Figure 1.4: Lake Tahoe Travel Behavior Pattern Focus Areas



Travel behavior also separates into three predominant trends: **Everyday Tahoe**, the short-distance trips by residents and commuters in community centers and residential areas, accounting for 20 percent of daily vehicle trips; **Discover Tahoe**, the longer distance trips by residents and visitors to recreation areas, accounting for 55 percent of daily vehicle trips; and **Visit Tahoe**, the long distance trips to and from the Region, by visitors and commuters accounting for 25 percent of daily vehicle trips. These travel behavior patterns are used to plan and bundle projects, programs, and tailored incentive strategies to spread travel over different types of modes, times, and destinations.



### **Everyday Tahoe: Residential and Workforce Travel**

To encourage residents and commuters to use multi-modal options for short-distance travel in and around community centers, transit services should be frequent and reliable and work in conjunction with shared-use paths to connect to the locations where people need to go as part of their everyday activities.

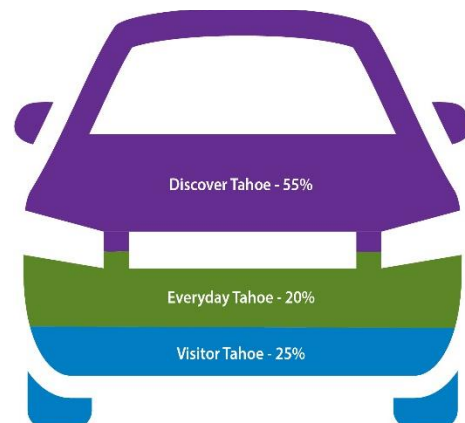
### **Discover Tahoe: Recreational Travel**

To manage congestion and increase safety at recreation areas, parking management systems coupled with frequent and free-to-the-user transit work together to incentivize people to use transit and increase safety by reducing illegal parking on roadway shoulders.

### **Visit Tahoe: Regional Entry and Exit Travel**

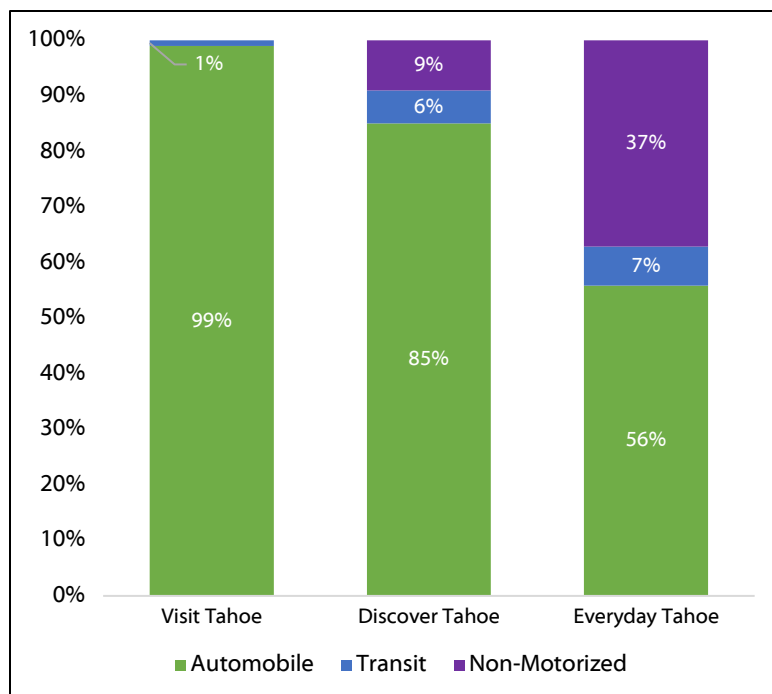
Strategies to ease congestion for people entering and exiting the Region include adaptively managing the roadway system to prioritize the passage of transit, offering park and ride lots with frequent and reservable transit, implementing dynamic signalization, and providing incentives that encourage the spread of travel times. These are strategies work together to provide transportation options that maximize the system's efficiency.

**Figure 1.5: Daily Trips by Travel Behavior**



Source: TRPA, 2016

**Figure 1.6: Travel Behavior Pattern Mode Splits**

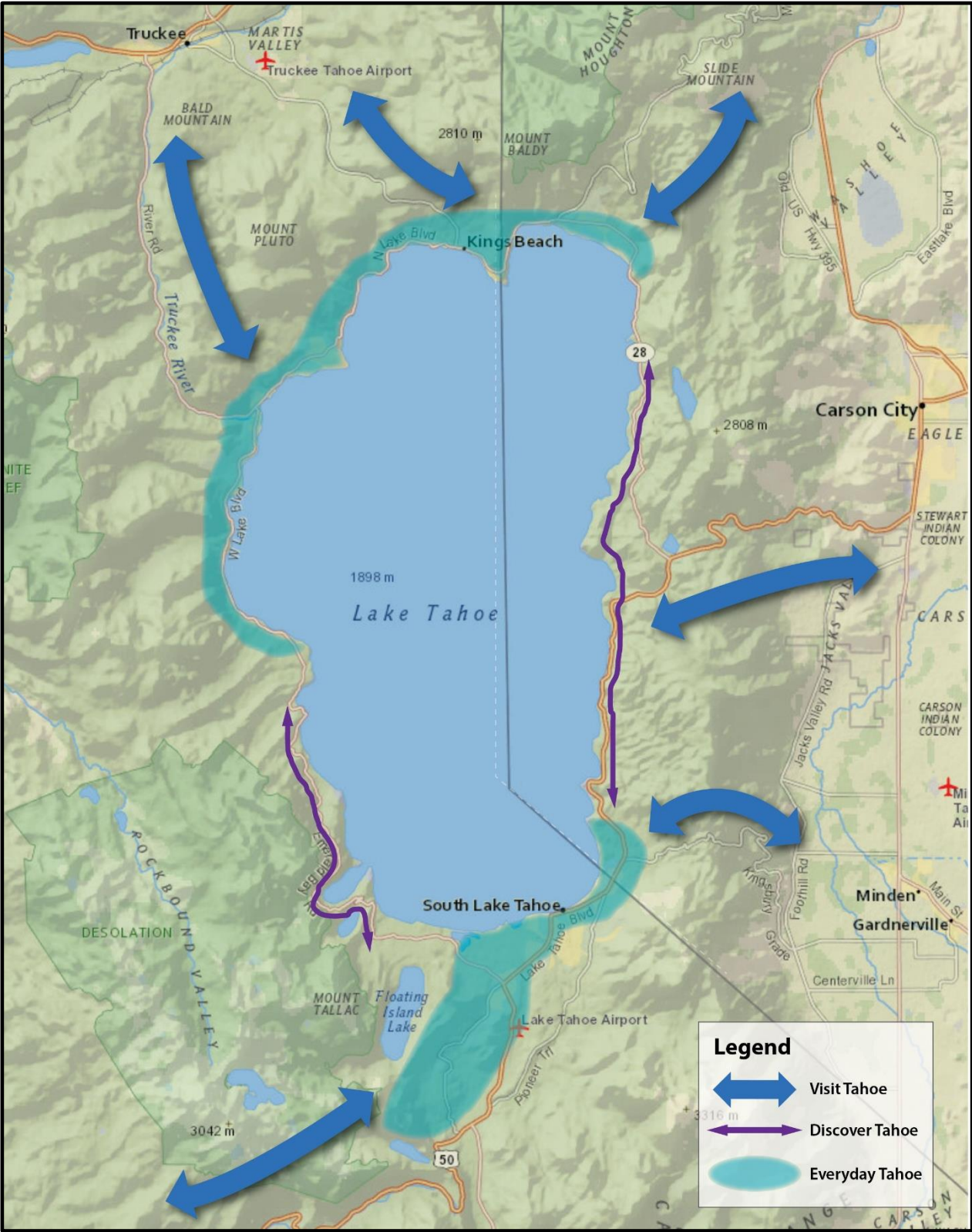


Solutions are well underway from the Everyday Tahoe travel emphasis of the 2012 Regional Transportation Plan. This 2017 plan places new and more focused emphasis on the Discover Tahoe travel behavior because it represents the largest percentage of daily vehicle trips. Figure 1.6 shows that projects and programs implemented over the past several years were effective at diversifying the way people travel for everyday, short-distance trips in community centers. The greatest opportunity to continue to shift more residents and visitors from automobile travel to walking, biking, and transit use is to apply new and updated strategies to the Discover Tahoe travel patterns. This can be done by

providing enhanced transit and trail access to high demand recreation destinations. The plan's policies, projects, and programs will provide travel options that increase safety, equitable access and manage congestion at recreation sites. By first creating a seamless in-region transportation system, by the next update in 2021, partners can direct more action emphasis to providing effective travel options for visitors entering and existing the Region.



Figure 1.7: Lake Tahoe Travel Behavior Patterns



### Key Concept #3: Planning for a Flexible System

The Lake Tahoe Region's transportation patterns are more variable than fixed, therefore rapidly responding to seasonal travel demands and maximizing system efficiency are critical. The Region experiences some common recurring daily commute patterns. However, Lake Tahoe's status as a world-renowned, year-round recreation destination and its snow-prone mountain location creates a travel environment with intense seasonal peaks and periodic events, such as chain controls and road closures that can queue or hold traffic for long periods of time. Lake Tahoe's roadway system becomes clogged only during periods of high seasonal use or during periodic events. With its regional geographic and regulatory constraints, this problem cannot be solved by building additional or bigger roads. Tahoe's strategy is to give people frequent, fun, and free-to-the-user options especially when the roadways are congested with heavy traffic. Transportation system services and programs can respond to these varying conditions with dynamic traffic and parking management, diverse seasonal public transit services, real-time travel information, and incentives to use public transit, mobility hubs, bicycling and walking trails, and zero-emission electric vehicles.

**Policy 4.2:** Collaborate with jurisdictions and DOT partners to develop adaptive management strategies for peak traffic periods at Basin entry/exit routes.

Figure 1.8: Dynamic Transportation System

#### Shoulder Season (A Tuesday in November)



#### Peak Season (4th of July Weekend)



#### Capacity Responds to Demand



**Supply:** Transportation Infrastructure

**Demand:** Number of People

## Key Concept #4: Leveraging Implementation

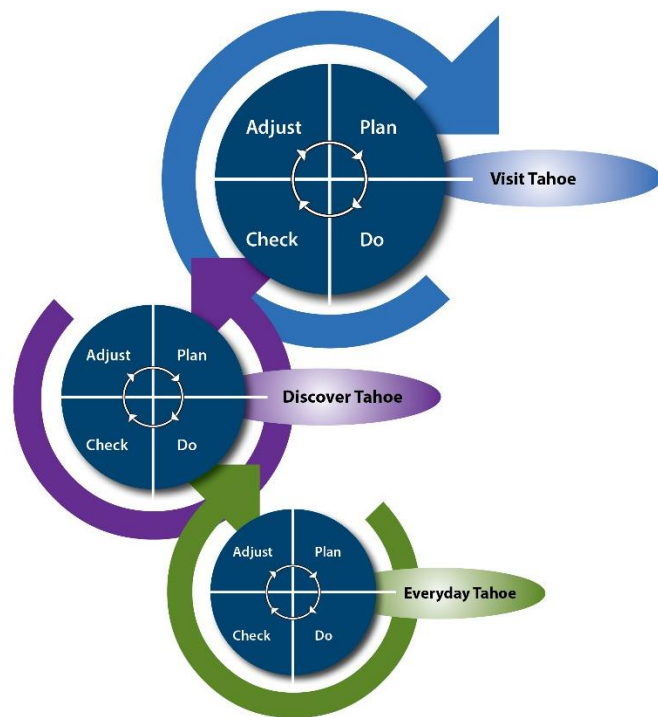
Integrating delivery of all necessary transportation system elements is a key to successful implementation. Detailed transportation corridor planning can maximize the delivery and effectiveness of projects by establishing partnerships and implementation alignment. The region's limited transportation funding can also be maximized by sequencing project implementation and bundling multi-modal infrastructure projects with incentive programs.

### Sequenced Implementation

The world class transportation system envisioned for Lake Tahoe cannot be built overnight or all at once. With the need to connect across multiple jurisdictions, it must be built area by area and incrementally to enhance the infrastructure and programs already in place. To implement the long-term transportation vision, TRPA and partners are utilizing this sequenced approach.

- **Everyday Tahoe:** In concert with the 2012 Tahoe Regional Plan, the 2012 Regional Transportation Plan focused on transportation improvements within town centers. The goals, policies, and projects that integrate land use and transportation strategies are the base to create walkable, bikeable communities.
- **Discover Tahoe:** This 2017 plan builds on the 2012 approach by prioritizing the planning and implementation of the transportation connections between town centers within the Region. Providing connections to and between town centers meets the greatest emerging need of connecting residents and visitors to recreation sites around Lake Tahoe.
- **Visit Tahoe:** Looking ahead to 2021, strengthening inter-regional transportation services provides the necessary system linkages to address recreation visitor travel from and to neighboring metropolitan areas, such as rail connections to airports and frequent bus service coupled with remote parking facilities.

Figure 1.9: Sequenced Approach



### Corridor Planning: The Bundled Approach

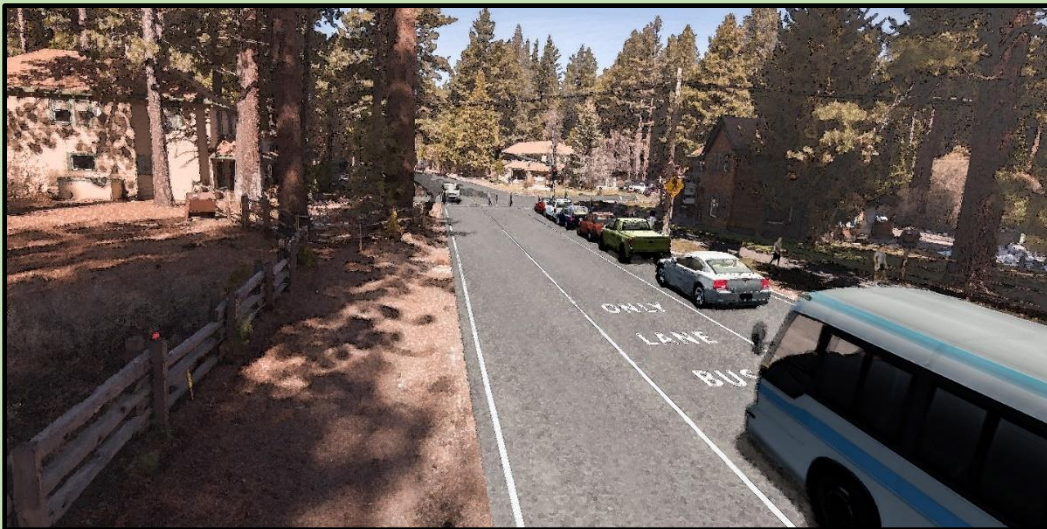
The implementation of the Regional Transportation Plan requires integrating a complex series of projects. These projects are being coordinated and grouped together by geographic area for cost savings. The Tahoe Transportation District (TTD), in partnership with TRPA and local, state, and federal agencies, is coordinating corridor planning focused on six distinct area corridors and the north and south entry corridors. Corridor planning identifies the primary role of the transportation system in specific areas, and tailors the demands and needs of visitors, residents, and commuters to those areas with infrastructure projects and programs to better meet all needs. Corridor planning also facilitates the bundling of multi-modal with environmental improvement projects from planning to implementation. This approach improves coordination with partners, enhances project benefits and creates cost savings. For more information, visit [www.linkingtahoe.com](http://www.linkingtahoe.com).



## Bundled Approach: State Route 89 Recreation Corridor

Bundling projects for implementation in a common corridor has proven success in saving time, cutting cost, and improving plans. One example is the State Route 89 Recreation Corridor Improvement Project. This U.S. Forest Service project will engage the TTD, Caltrans, California State Parks, private commercial entities, and advocacy groups such as the Tahoe Backcountry Alliance. Using detailed data collected for the corridor, multiple strategies can be considered and integrated. Possibilities include:

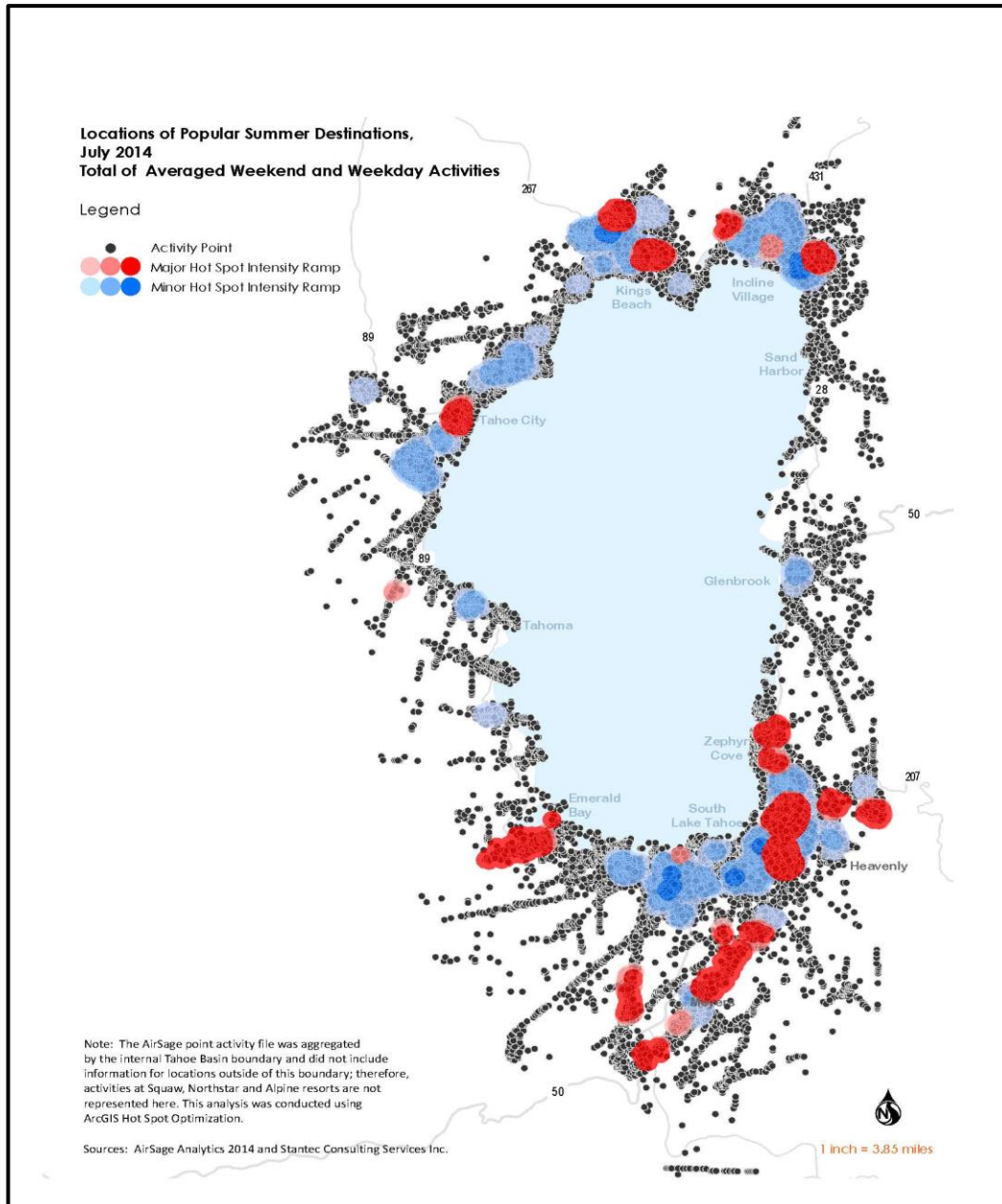
- More frequent transit service to Emerald Bay, as well as enhanced and expanded designated parking and restrictions on highway parking. This could improve visitor safety and access and more effectively manage congestion.
- A seamless fee system for existing and any new parking facilities; including necessary revenue retention for use in the corridor consistent with agency authorities.
- Improved wayfinding across jurisdictional boundaries to create a seamless visitor experience and enhance use of facilities and transportation services.
- Redesigned or repurposed facilities to enhance day-use activities.
- Adaptive traffic management on State Route 89 to prioritize transit movement through the corridor.
- Incentives for the use of multi-modal transportation from the bed base in the City of South Lake Tahoe and Stateline, NV., throughout the State Route 89 Recreation Corridor.
- Information and advertising to inform visitors of their transportation options and recreation site choices during peak visitation.



**SR 89 Transit Only Lane Conceptual Rendering**  
Designed by Fehr & Peers

Corridor planning is underway, with the State Route 28 Corridor Management Plan completed and bundled projects either under construction or undergoing environmental analysis. The draft Corridor Connection Plan, to be released in spring 2017, will include data to help partners understand the objectives for the transportation system in each corridor. New data reveals high summer and winter use locations, the number of annual vehicle trips within each corridor, and the number of parking spaces versus the number of users, all of which lead to better tailored projects to meet demand.

**Figure 1.10: Location of Popular Summer Destinations**



The following pages include a description of each corridor and newly available data that can be utilized to improve the functioning of transportation system for residents, commuters, and visitors. More detailed challenges, opportunities, and solutions will be outlined in the upcoming Corridor Connection Plan.

## California SR 89/28 Corridor

### Corridor Characteristics

The corridor begins at Sugar Pine Point State Park and extends north and east to the California/Nevada state line in Crystal Bay extending through both El Dorado and Placer Counties and encompassing two town centers, Tahoe City and Kings Beach.

The corridor represents 23 percent of the total in-basin acreage and about 17 percent of the Region's permanent residents. Sixty percent of the residential housing units are classified as seasonal. The corridor has the highest number of recreational sites as well as businesses in Tahoe, and serves **4.9 Million Visitors** annually making it the second highest visited corridor in Tahoe. There are 1,349 tourist accommodation units identified in the corridor. **6.7 Million Vehicles** enter the corridor annually, creating high demand for the **450 public parking spaces** available, or a 6,441:1 visitor to parking ratio.

TART transit service operates at 60 minute year-round with exception of 30-minute service in the peak summer and winter seasons. TART's hub and a park and ride lot are located in Tahoe City at the existing Transit Center. There are 30 miles of shared-use path for biking and walking, and 17 miles still to be built.



Table 1.1: Trips made within the Corridor<sup>2</sup> (winter vs. summer during high visitation periods)

User Group	February, 2014			July, 2014			TART Daily Transit Trips (2015-16)
	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	
Resident Worker	13,145	183,898	28.9%	11,135	175,175	19.8%	421 (Less than 1% of daily trips made)
Home Based Worker	7,572	106,272	16.7%	6,040	94,070	10.1%	
Inbound – Outbound Commuters	6,241	86,488	13.6%	3,725	58,360	6.3%	
Short Term (day - use) Visitor	2,707	36,067	5.7%	3,500	51,575	5.6%	
Long Term (overnight) Visitor	17,035	222,685	35.0%	36,890	549,260	59.2%	
<b>TOTAL</b>	<b>46,700</b>	<b>635,410</b>	<b>100.0%</b>	<b>61,290</b>	<b>928,440</b>	<b>100.0%</b>	

<sup>2</sup> Map and analysis by Stantec Consulting



## Nevada SR 28 National Scenic Byway Corridor

### Corridor Characteristics

The corridor starts at the California/Nevada state line in Crystal Bay and extends east and south to the Douglas County line near the Spooner Lake Management Area, extending through parts of Washoe County and the Carson City rural spur. This corridor is also a winter recreation corridor, including access to Mt. Rose, however access and transit service to this area can be improved.

The corridor includes the communities of Crystal Bay and Incline Village and 11 miles of shoreline, the longest stretch of undeveloped shoreline in Tahoe. The land area in the corridor represents approximately 13 percent of the total in basin acreage and is home to 21 percent of the Region's resident population with 65 percent of the residential units owner occupied. **Three Million Visitors** and **4.5 Million Vehicles** enter the corridor annually and use **1,283 public parking spaces**, a 3,736:1 visitor to parking ratio.

TART transit service operates at 60 minute year-round with exception of 30-minute service in the peak summer and winter seasons. Seasonal transit service is provided by TTD's East Shore Express with 20-minute frequency from Incline Village to Sand Harbor, June-September. There are currently no park and ride facilities except for the temporary park and ride lot for the East Shore Express at the Old Incline Elementary School. Fifteen miles of bike and pedestrian paths are complete with another 21 miles remaining to be built. South of Incline Village along SR 28, three miles of the East Shore Tahoe Trail shared-use path to Sand Harbor are under construction. There are no pedestrian or bicycle facilities south of Sand Harbor to serve recreation facilities or between Crystal Bay and Incline Village.



Table 1.2: Trips made within the corridor<sup>3</sup> (winter vs summer during high visitation periods)

User Group	February, 2014			July, 2014			TART Daily Transit Trips (2015-16)
	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	
Resident Worker	10,303	144,955	29%	13,608	214,464	22%	92 (0.2% of daily trips made in Feb) W/TTD ESE X (X% daily trips made in July)
Home Based Worker	9,509	133,066	27%	11,329	178,167	18%	
Inbound – Outbound Commuters	2,209	31,357	6%	3,202	51,104	5%	
Short Term (day-use) Visitor	1,017	13,269	3%	2,658	38,960	4%	
Long Term (overnight) Visitor	12,757	169,006	34%	34,376	510,526	51%	
<b>TOTAL</b>	<b>35,795</b>	<b>491,653</b>	<b>100.0%</b>	<b>65,173</b>	<b>993,257</b>	<b>100.0%</b>	

<sup>3</sup> Map and analysis by Stantec Consulting

## Nevada US 50 East Shore Corridor

### Corridor Characteristics

The corridor begins at the US 50/SR 28 junction and extends south to Elks Point Rd, extending through Douglas County and encompasses the communities of Zephyr Cove, Round Hill, Glenbrook, Skyland, and Lakeridge among others along the eastern shore.

The corridor represents 9 percent of the total in basin acreage and is home to 5 percent of the Region's permanent residents. The corridor is dominated by residential use, with three recreational areas, the Zephyr Cove Resort, Round Hill Pines Resort, and Nevada Beach. The corridor has the second lowest visitation in Tahoe at **2.6 million visitors annually**, with limited tourist accommodation units. Annually **5.8 Million Vehicles** enter the corridor. There are **829 public parking spaces** or a 2,723:1 visitor to parking ratio, the third highest amount of parking spaces within the Region.

Public transit service does not currently exist within the corridor, except for Zephyr Cove Resort that operates a private shuttle for guests. In the past TTD has operated a commuter bus between the Stateline area and Carson City when funds are available. This is an important connection for commuters from Carson City to Lake Tahoe. The South Shore Tahoe Trail provides bicycle and pedestrian access to Round Hill from the Stateline area with another 12 miles remaining to be built.

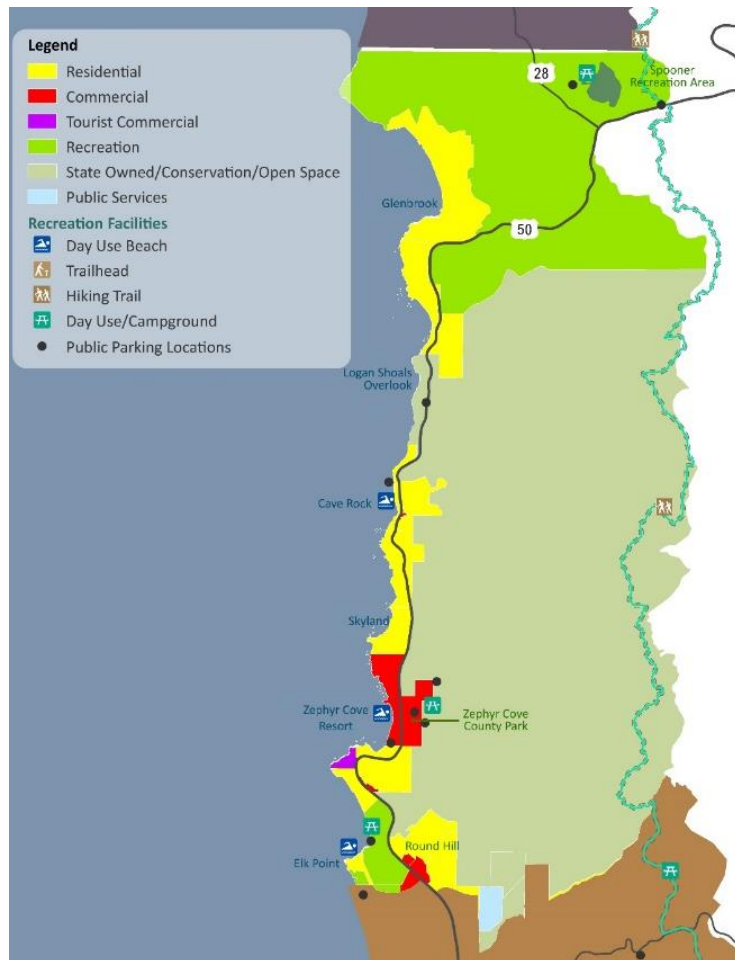


Table 1.3: Trips made within the Corridor<sup>4</sup> (winter vs summer during high visitation periods)

User Group	February, 2014			July, 2014			TTD Daily Transit Trips (2015-16)
	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	
Resident Worker	1,280	18,094	17%	1,549	24,351	8%	69
Home Based Worker	859	12,180	11%	786	12,639	4%	
Inbound – Outbound Commuters	838	12,185	11%	822	13,009	4%	
Short Term (day-use) Visitor	485	6,515	6%	1,223	17,835	6%	
Long Term (overnight) Visitor	4,599	59,574	55%	15,909	245,797	78%	
<b>TOTAL</b>	<b>8,061</b>	<b>108,548</b>	<b>100.0%</b>	<b>20,289</b>	<b>313,631</b>	<b>100.0%</b>	

Note: Route 21x used to run along east shore to Carson City and Back 25,388 riders 2015-16 (21X has been discontinued in 2016)

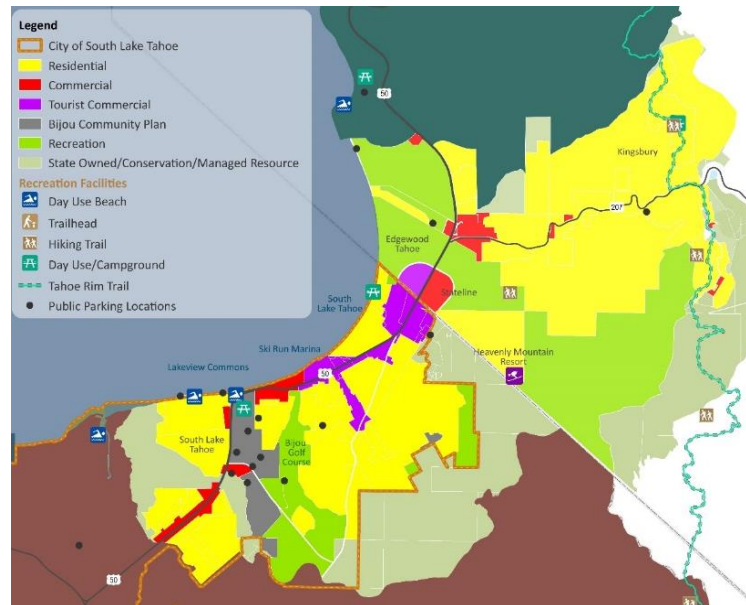
<sup>4</sup> Map and analysis by Stantec Consulting

## California/Nevada US 50 South Shore Corridor

### Corridor Characteristics

The corridor begins at Elks Point Rd. on the north and extends south to Trout Creek extending through Douglas County on the Nevada side and El Dorado County and the City of South Lake Tahoe on the California side. Throughout this corridor U.S. 50 is a 4-lane undivided highway with 20 signalized intersections within a 4.0-mile segment.

While the corridor's land area is only about 6 percent of the total in basin acreage, it is home to 29 percent of the Region's permanent residents. About 62 percent of the housing within the corridor is renter occupied and 30 percent is classified as seasonal. The corridor has the highest visitation in Tahoe at **nearly 8 million visitors annually**, and holds 80 percent of Tahoe's tourist accommodation units. **11.8 Million Vehicles** enter the corridor annually which is the highest visitor use in the Region. There are **576 public parking spaces** available, a 9,176:1 visitor to parking ratio - one of the lowest in the Region.



The corridor's primary transit hub is located in the Heavenly Village adjacent to U.S. 50, public parking facilities, pedestrian paths and bicycle lanes which unofficially connects the bottom of the Heavenly Gondola to the Tahoe Rim Trail. Partners are also developing an official trail system to connect the top of Heavenly Gondola to the Tahoe Rim Trail. However, additional planning and support for this connection is needed. TTD provides transit service year-round at 1 hour frequency and some seasonal routes during the winter months. The corridor has nearly 23 miles of paved bicycle lanes and shared use paths connecting neighborhoods to recreational sites, commercial and employment opportunities. An additional 13 miles of shared-use path remain to be built. Although great progress has been made in expanding the active transportation network, there are significant gaps and unserved areas which depress use of alternative modes and inhibit access to transit services. Heavy traffic and numerous driveways on U.S. 50 through the popular downtown core create high levels of pedestrian and vehicle conflicts, and congestion at peak times.

**Table 1.4: Trips made within the corridor<sup>5</sup> (winter vs summer during high visitation periods)**

User Group	February, 2014			July, 2014			TTD Daily Transit Trips (2015-16)
	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	
Resident Worker	30,260	424,529	22%	25,105	392,870	18%	1,157 (Less than 1% of daily trips made)
Home Based Worker	35,331	493,986	26%	25,123	391,473	17%	
Inbound – Outbound Commuters	5,131	71,289	4%	2,521	39,512	2%	
Short Term (day-use) Visitor	4,309	59,339	3%	4,567	65,889	3%	
Long Term (overnight) Visitor	65,273	858,938	45%	90,774	1,353,646	60%	
<b>TOTAL</b>	<b>140,304</b>	<b>1,908,081</b>	<b>100.0%</b>	<b>148,090</b>	<b>2,243,390</b>	<b>100.0%</b>	

<sup>5</sup> Map and analysis by Stantec Consulting

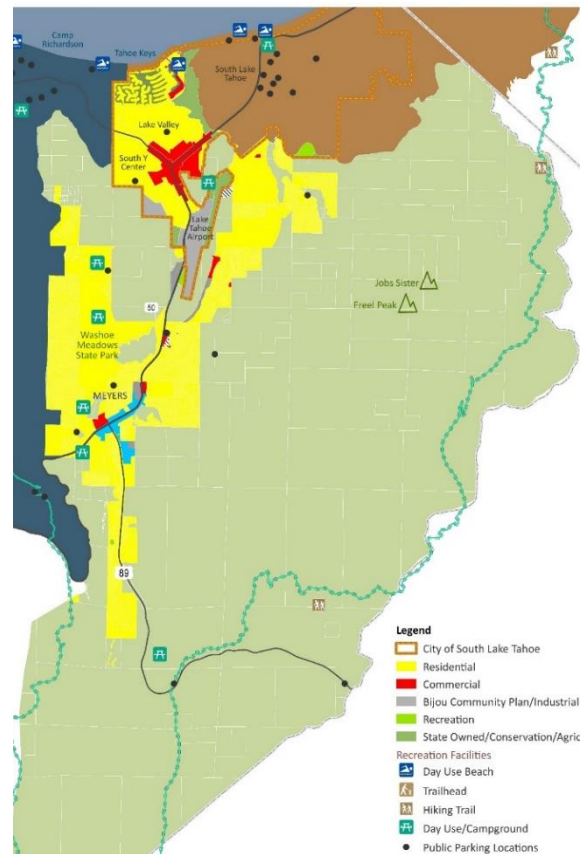
## Meyers/Y Corridor

### Corridor Characteristics

The corridor extends from Trout Creek in South Lake Tahoe on U.S. 50 on the north end to the western edge of South Lake Tahoe on SR 89. The corridor also includes approximately 4.8 miles of U.S. 50 south from Echo Summit entry to the “Y” intersection of U.S. 50 and SR 89 in South Lake Tahoe and 4.6 miles of Pioneer Trail from Trout Creek to U.S. 50. The corridor interconnects the communities of South Lake Tahoe and Meyers and functions as an entry/exit route through the area for visitors. This corridor is also a major winter recreation corridor, including access to Luther Pass, Freel peak, and Big Meadows, however access and transit service to these areas can be improved.

This corridor represents 25 percent of the total in-basin acreage as well as 25 percent of the Region’s total resident population. About 64 percent of the occupied housing is owner occupied; 34 percent of the occupied housing is rented. The corridor has the third highest visitation in Tahoe at **nearly 3.9 million visitors annually**. There are **184 public parking spaces** available, a 5,727:1 visitor to parking ratio, or the lowest ratio amount in the Region.

TTD operates two year-round transit routes with 1-hour frequency, and one seasonal route between the “Y” and the Stateline area. Transit service does not extend to Meyers. The seasonal Emerald Bay Trolley runs up the west shore of Lake Tahoe to Tahoe City and operates from June to October with varying days of service and frequency to match seasonal demand. The Meyers/Y Corridor has over 20 miles of completed shared-use path, and sidewalks total about 3 miles near the “Y”. An additional 13 miles remains to be built.



**Table 1.5: Trips made within the corridor<sup>6</sup> (winter vs summer during high visitation periods)**

User Group	February, 2014			July, 2014			TTD Daily Transit Trips (2015-16)
	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	
Resident Worker	15,003	213,503	27%	34,810	535,816	23%	882
Home Based Worker	20,396	286,795	36%	24,021	370,224	16%	
Inbound Outbound Commuters	3,549	48,884	6%	3,855	57,807	3%	
Short Term (day-use) Visitor	1,149	15,149	2%	4,102	60,383	3%	
Long Term (overnight) Visitor	18,556	238,205	30%	88,046	1,275,576	55%	
<b>TOTAL</b>	<b>58,653</b>	<b>802,536</b>	<b>100.0%</b>	<b>154,833</b>	<b>2,299,806</b>	<b>100.0%</b>	

<sup>6</sup> Map and analysis by Stantec Consulting



## SR 89 Recreational Corridor

### Corridor Characteristics

The corridor extends from the western edge of South Lake Tahoe at West Way to the Placer/El Dorado County line in Tahoma. The corridor connects the small communities and recreation areas of Tahoma, Meeks Bay, Emerald Bay, Spring Creek, and Camp Richardson, among other USFS recreation sites along the south and western shores. This corridor is also a major winter recreation corridor, including access to Jake's Peak and Mt. Tallac, however access and transit service to these areas can be improved.

This corridor contains about 24 percent of the total in-basin acreage but only about 2 percent of the Region's total resident population. The corridor has the lowest number of residential units, of which 80 percent are seasonal. Of those employed in the corridor 98 percent live outside of the corridor. The corridor sees **1.7 million visitors annually**. There are 2,132 public parking spaces available, an 836:1 visitor to parking ratio, with most of the parking concentrated within the USFS formalized recreation sites.

TTD operates a seasonal trolley between South Lake Tahoe, Emerald Bay, and the transfer center in Tahoe City from June to October with varying days of service and frequency to match seasonal demand. This route has few amenities or pull outs for transit vehicles. The only significant bicycle and pedestrian facility in this corridor is a shared-use path in the far southern portion that parallels SR 89 for 6 miles, running through Camp Richardson, serving the Pope and Baldwin Beach areas, and terminating at Spring Creek Road. A small section extends up Fallen Leaf Road to connect to the campground. An additional 7 miles remains to be built.



**Table 1.6: Trips made within the corridor<sup>7</sup> (winter vs summer during high visitation periods)**

User Group	February, 2014			July, 2014			TTD Daily Transit Trips (2015-16)
	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	
Resident Worker	1,958	27,281	26%	2,039	31,775	8%	61
Home Based Worker	1,949	26,965	26%	819	12,358	3%	
Inbound – Outbound Commuters	142	1,955	2%	665	10,411	2%	
Short Term (day-use) Visitor	141	1,901	2%	2,570	36,768	9%	
Long Term (overnight) Visitor	3,519	45,558	44%	22,021	331,695	78%	
<b>TOTAL</b>	<b>7,709</b>	<b>103,660</b>	<b>100.0%</b>	<b>28,114</b>	<b>423,007</b>	<b>100.0%</b>	

*Note: Includes only seasonal ridership on Route 30 7,482 and four months of service June-September.*

<sup>7</sup> Map and analysis by Stantec Consulting



## Implementing the Vision

This plan combines all the transportation system components into transit, trails, and technology which work together to ease congestion within the Region and at regional entry and exit points during peak periods.



**Transit:** Roadways must prioritize bus movement to increase convenience. This can be done through transit only zones and lanes, and traffic signal technology that allow buses to proceed before other traffic. Operators will use new sources of data to better understand the type of service, frequency, and routes needed based on time of year, time of day, and high use destinations. Rail and frequent bus services must be convenient, affordable, able to carry recreational equipment, and serve future mobility hubs that act as transit centers, park and ride locations, and provide active transportation connections.



**Trails:** The Lake Tahoe trail network must be completed and roadways retrofitted to accommodate all travel modes. The active transportation system must serve different comfort levels, be accessible year-round, and enhance safety and availability of crosswalks. Well-functioning, enhanced crosswalks such as pedestrian-activated beacons both increase safety for pedestrians and improve traffic flow in areas of high visitation.



**Technology:** Providing real-time travel information on smartphones, road signs, and the Internet will help inform the decisions of the traveling public, spreading the time and mode people use to travel. Real-time information can also provide important feedback to operators to dynamically manage services they provide, such as traffic signals, parking, and transit. Coordinated deployment of electric vehicle charging stations can also help preserve Tahoe's fragile environment through increased use of zero-emission electric vehicles.



Lake Tahoe Mergansers  
Photo: Tom Lotshaw



The Lake Tahoe Region is a uniquely complex transportation planning landscape. The Region includes two states, five counties, one city, one transportation district, multiple public land management agencies and public utility districts. Despite its patchwork of governments, the Lake Tahoe Region in many ways operates as a national park without the designation. Nearly 90 percent of the land within the Lake Tahoe Region is government owned and managed. The lake is the center of the Washoe Tribe's world both geographically and spiritually and is known as Dá áw. Lake Tahoe's famed water clarity is designated a national outstanding resource. These spectacular resources now attract approximately 10 million annual vehicles and house 55,000 year-round residents who support its \$5 billion recreation and tourism economy.

The lake's diminishing water quality due to rapid development following the 1960 winter Olympics at Squaw Valley led to the creation of TRPA. TRPA's land use development regulatory authority is far-reaching, specifying where development may occur with a focus on protecting, restoring, and sustaining environmentally sensitive areas such as streams, wetlands, and wildlife habitat. While the system works to prevent over development, federal, state, local, and private partners collaborate to deliver both environmental protection and economic vitality. A dynamic transportation system that responds to the demands of millions of annual users as residents, commuters and visitors is a foundation that serves both. This intricate planning framework is responding to visitation from other regions, synthesizing multiple needs from multiple partners and fulfilling various statutory requirements.

### Statutory Framework

The plan meets long-range transportation planning requirements at every level – regional, federal and state. TRPA operates at a regional level under the authority of the Bi-State Compact (Public Law 96-551) between the states of California and Nevada. Through this plan, TRPA satisfies requirements related to transportation planning under federal and state law:

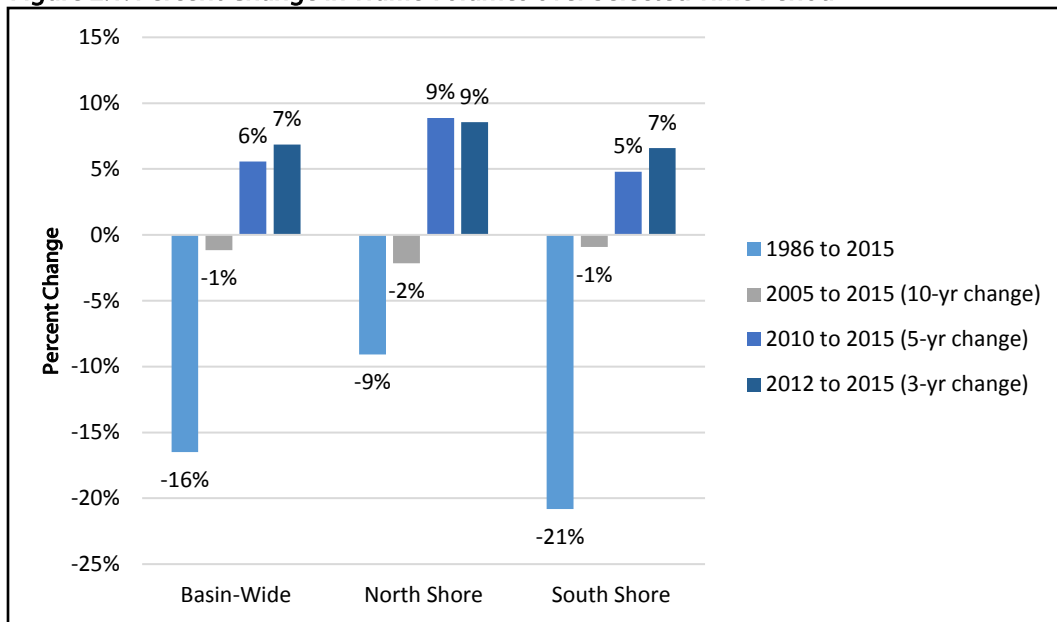
### Bi-State Compact

**TRPA, via the Tahoe Regional Planning Compact, is required to develop a long-range Regional Transportation Plan.** The Bi-State Compact states that TRPA's Regional Plan shall include a transportation plan and that the goal of transportation planning shall be:

- (A) To reduce dependency on the automobile by making more effective use of existing transportation modes and of public transit to move people and goods within the Region, and
- (B) To reduce to the extent feasible, air pollution that is caused by motor vehicles. Where increases in capacity are required, the agency shall give preference to providing such capacity through public transportation and public programs and projects related to transportation.

The Bi-State Compact also requires establishment of environmental threshold carrying capacities (thresholds) that measure the Region's performance on key environmental quality goals. TRPA is responsible for achieving these thresholds, which include performance indicators in the areas of air quality, water quality, soil conservation, vegetation, noise, recreation, scenic resources, fisheries, and wildlife. An efficient and connected transportation system has cross-cutting benefits to the environment and touches virtually every threshold.

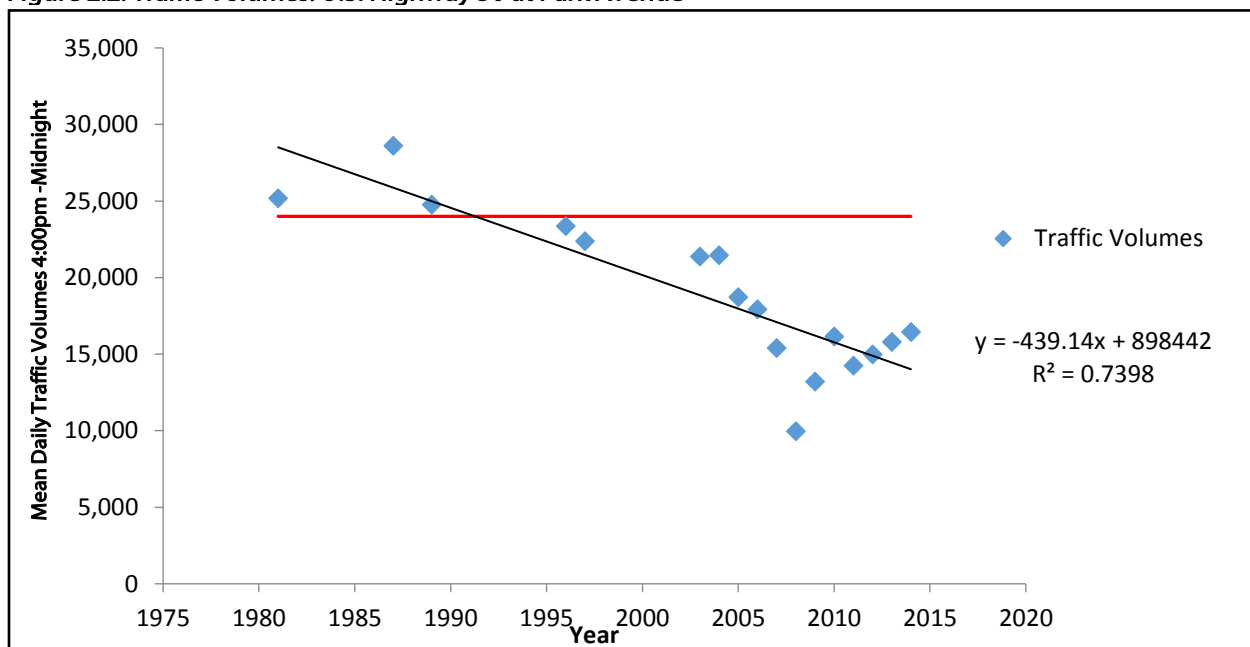
**Figure 2.1: Percent Change in Traffic Volumes over Selected Time Period**



Currently TRPA has two transportation related threshold indicators: total vehicle miles traveled (VMT) in the Region and traffic volumes on U.S. Highway 50 at Park Avenue<sup>1</sup>. VMT is discussed in depth in Chapter 5: Measuring Success. This plan in its implementation is a threshold attainment program that delivers increments of improvement to many threshold categories. The goals and policies in this 2017 plan are developed to achieve these multiple goals and to serve as the transportation element of the Tahoe Regional Plan - Goals and Policies.

**Policy 1.2:** Leverage transportation projects to benefit multiple environmental thresholds through integration with the Environmental Improvement Program.

**Figure 2.2: Traffic Volumes: U.S. Highway 50 at Park Avenue**



<sup>1</sup> California Department of Transportation, 2014.

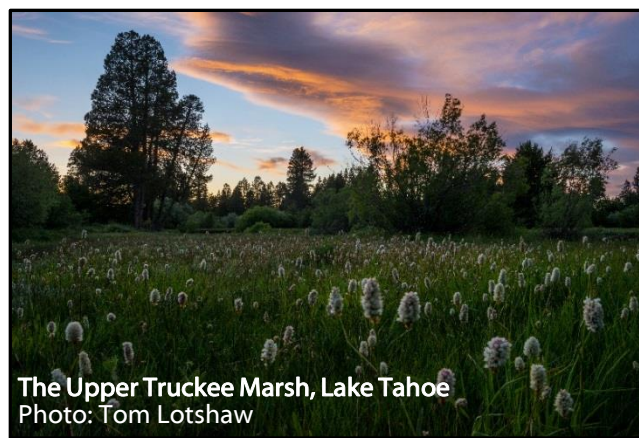


**Policy 1.9:** Develop and implement a cooperative continuous, and comprehensive Congestion Management Process to adaptively manage congestion within the Region's multi-modal transportation system.

As a federally designated Metropolitan Planning Organization (MPO), this plan meets transportation planning requirements under federal law, including the development of a Long Range Transportation Plan and Transportation Improvement Program. Federal transportation law promotes comprehensive planning and public

participation, improved connections between nodes, meeting the needs of travelers and freight, flexibility in targeting funds for transportation improvements, strengthening federal, state, and public-private partnerships, encouraging the use of new technology, and cost-effective management of the transportation system. The law also requires that all regional planning be consistent with Title VI of the Civil Rights Act of 1964, located on TRPA's website here: <http://www.trpa.org/document/title-vi-program/>. The law also requires consistency with the

Americans with Disabilities Act of 1990. Additionally, as part of Fixing America's Surface Transportation Act (FAST Act) compliance which designates TRPA as a transportation management agency serving a population greater than 200,000, the agency must develop and incorporate a congestion management process into its planning, monitoring, and project funding allocations. The congestion management process will build upon the existing performance-based planning framework that guides project investment by directing funding and project design to meet regional objectives. The congestion management process is described in more detail in Chapter 5: Measuring Success.



## State, California

As an MPO in California, the 2017 plan is the Regional Transportation Plan under California state law and includes the Region's Sustainable Communities Strategy required by California's Senate Bill 375 (SB 375). SB 375 established requirements to reduce GHG emissions in the transportation sector and include in the regional transportation plan a Sustainable Communities Strategy describing the land-use scenarios and transportation investments that allow the Tahoe Region to meet its mobile source GHG emissions reduction targets. The California Air Resources Board (CARB) sets targets for GHG emissions reductions from cars and light trucks for each metropolitan planning region in the state. The targets designated for the Tahoe Region are 7 percent reduction by 2020 and 5 percent reduction by 2035 from 2005 GHG emission levels. The projects and programs in this plan meet these reductions with an estimated 8.8 percent reduction in 2020 and a 5 percent reduction in 2035. As part of this 2017 plan the targets are being reanalyzed and a new set of GHG reduction targets will be recommended to CARB. The required SB375 elements are included in this chapter, under the Sustainable Communities Strategy section.

**Policy 1.3:** Mitigate the regional and cumulative traffic impacts of new, expanded, or revised developments or land uses by prioritizing projects and programs that enhance non-automobile travel modes.

**Table 2.1: SB 375 Greenhouse Gas Reduction Target Compliance**

SB 375 GHG Targets for Tahoe Region		2017 Regional Transportation Plan Reductions	Does it meet requirements?
By 2020	7 percent	8.8 percent	Yes
By 2035	5 percent	5 percent	Yes



## Lake Tahoe Total Maximum Daily Load Program

The 2017 Plan includes roadway maintenance and operations, and water quality projects that contribute to the Lake Tahoe Total Maximum Daily Load Program. Section 303(d) of the Clean Water Act requires states to compile a list of impaired water bodies that do not meet water quality standards. The Clean Water Act also requires states to establish total maximum daily loads (TMDL) for the primary pollutants impacting these waters. Lake Tahoe is a federally designated Outstanding Natural Resource, but has also been designated an impaired water body. The primary pollutants causing its degradation are phosphorus, nitrogen, and sediment. The TMDL Implementation Plan establishes strategies for reducing these pollutant loads for Lake Tahoe to meet a deep-water transparency standard of 97.4 feet, as measured by a Secchi disk. Since fine sediment from roadway runoff in the urban upland and atmospheric nitrogen deposition from vehicle emissions are contributors to pollutant loading, this plan has an important role to play in achieving the TMDL. TRPA's transportation plan includes strategies to reduce fine sediment loading and the amount of nitrogen entering the atmosphere from mobile sources. Proper management, such as using best available road traction materials, is expected to reduce the basin-wide nitrogen load by at least 1 percent within 15 years.<sup>2</sup> Transportation projects leverage water quality improvements by including stormwater and drainage controls into on and off roadway projects. Integrated transportation and land-use strategies, such as parking management and compact development, will also reduce the need for extensive coverage in town centers and help reduce runoff from urban areas.

## Partnering and Collaboration

TRPA's primary role is to plan for the Region and strengthen partnerships with neighboring governmental agencies and private partners. TRPA not only carries out the goals and policies of state and regional plans, directs funding to projects that help meet regional goals assessed through performance measures, but also convenes a diversity of partners to address various challenges facing the Region. The 2017 Regional Transportation Plan, updated every four years, is the blueprint for the long-term regional transportation vision. It takes into account the expectation of increased visitation with an increased focus on strategies to address seasonal congestion and recreational access. The plan responds to these challenges by providing attractive transportation options and incentives designed to spread out when, how, and where people travel. Additionally, TRPA and partners assess which investments will best meet performance goals, while also considering funding limitations to guide strategic investment.



Meyers Road Safety Audit  
Photo: Morgan Beryl

This plan also supports projects and programs in adjacent regions that directly connect or indirectly serve the Lake Tahoe Region. For example, the North Lake Tahoe-Truckee Resort Triangle includes two main entry points to Lake Tahoe and encompasses North Lake Tahoe, Squaw Valley/Alpine Meadows, Northstar, and the Town of Truckee. The joint coordination, planning and development of transit, trails, and adaptive traffic management are essential in this high-use recreation area. The Truckee North Tahoe Transportation Management Association (TNT/TMA) provides a forum for collaboration among the public and private sectors to improve mobility in the Resort Triangle and beyond, including connections to Reno/Sparks and the Truckee Meadows. Other adjacent communities and regions are collaborating to improve access to and from Lake Tahoe, along highway corridors and in the backcountry. Examples include Carson City's plan to construct a single-track trail that will connect users from Carson to the Tahoe Rim Trail near Spooner Summit, and Douglas County's Pony Express Trail intended to connect the Carson Valley with Lake Tahoe in an area near Kingsbury Grade. These projects will provide additional non-highway access to recreation and increase safety by providing separated active transportation options for access to Lake Tahoe from neighboring communities.

<sup>2</sup> Water Quality Control Plan Amendments, Total Maximum Daily Load for Sediment and Nutrients in Lake Tahoe, approved by Lahontan Regional Board on November 16, 2010; approved by State Water Resources Control Board on April 19, 2011; approved by US EPA on August 17, 2011; and Final Lake Tahoe Total Maximum Daily Load, dated August 2011, approved by US EPA on August 17, 2011.

## Supporting Plans

Modal plans and corridor plans provide in-depth analysis and recommend many of the projects, programs, and policies found in this plan. The 2016 Active Transportation Plan, the 2014 Intelligent Transportation Systems Strategic Plan, and the Short and Long Range Transit Plans inform the four strategic areas of transit, trails, technology, and transportation system management. To more comprehensively address safety, and ready local jurisdictions for safety project funding, TRPA will lead the development of the Lake Tahoe Region Safety Plan supported by Caltrans' Systemic Safety Analysis Report Program and Nevada Department of Transportation's Safety Program. Corridor plans also provide further project and program specificity to meet the travel needs of residents, visitors, and commuters. Area Plans developed by local jurisdictions provide an opportunity to coalesce regional and local land use and transportation policies and strategies at a community scale.

Figure 2.3: Transportation Planning Framework



## Partners Roles and Responsibilities

As regions surrounding Lake Tahoe are expected to grow we can expect increased visitation to Lake Tahoe. To address the anticipated tourism travel, strategies that alleviate clogged roads during peak periods will require partnerships with surrounding area government agencies and transportation districts. Coordination is already underway to identify solutions and prepare to implement more frequent and convenient connections between Lake Tahoe and northern California and Nevada cities including Truckee, Reno, Sacramento, Bay Area, Stockton, and Auburn. Concepts for new rail and transit services with transit centers that incorporate park and ride lots are being developed and are included on the plan's unconstrained, unfunded project list. Through continued work with the Trans-Sierra Transportation Coalition these strategies will be refined and poised for inclusion and implementation through the 2021 RTP.

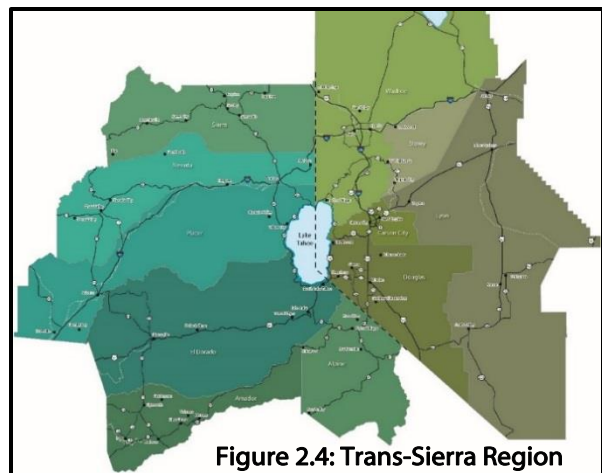
**Policy 2.3:** Establish regional partnerships with surrounding metropolitan areas to expand transit to and from Lake Tahoe.

TRPA supports the implementation of regional transportation plan policies by working with the partners to incorporate active transportation and transit services into projects. The primary responsibility for construction and maintenance of the transportation network lies with local jurisdictions, public utility districts, state transportation agencies, regional transportation districts, and public lands agencies. Private partners also play an important role by providing easements, constructing and maintaining paths, and offering transportation services for their employees and customers. Input from the public, advocacy groups, and other associations is also an essential part of project and program delivery. In addition to the core planning partners listed below, TRPA collaborates with several public agencies, local advocacy groups, and a large number of private stakeholders. See Appendix C for a full list of partners consulted and citations to documents describing consultation procedures.

**Policy 2.13:** Incorporate programs and policies of the active transportation plan into regional and local land use plans and regulatory processes.

### Trans-Sierra and Mega-Region Partners

The Trans-Sierra Transportation Coalition is a group of 11 California and Nevada counties, federal and state agencies, stakeholders, and citizens from Northern California and Northern Nevada committed to ensuring that the transportation system in the greater Trans-Sierra Region supports economic vitality and preserves an excellent quality of life. Mega-Region partners currently collaborating with the Tahoe Region include but are not limited to Washoe Regional Transportation Commission, Carson City Metropolitan Planning Organization and Sacramento Area Council of Governments.



**Figure 2.4: Trans-Sierra Region**

### Washoe Tribe of California and Nevada:

The Washoe Tribe of Nevada and California is an important partner as Lake Tahoe is the traditional center of the Washoe world. The tribe owns and manages land in the Region, such as Meeks Bay Resort and Marina and Cave Rock on the East Shore of the lake that serves as a transportation gateway. The Washoe are the original inhabitants of the Lake Tahoe Region. Transportation planning staff meet one-on-one with the Washoe Tribe to share information and updates on transportation projects and issues. Tribal staff actively participated on the project development team for the Corridor Connection Plan and the 2017 Regional Transportation Plan. The Tribe also serves on project development teams for specific projects, such as the Nevada Stateline to Stateline Bikeway. The Tribe is a voting member of the TTC and the APC, which are the advisory bodies to TRPA/TMPO.

## Local Governments

This plan reflects collaboration with Washoe, Douglas, Placer, and El Dorado counties, Carson City, and the City of South Lake Tahoe to align transportation policies and deliver capital improvement programs. Additionally, Placer County, Town of Truckee and Washoe Regional Transportation Commission jointly fund Tahoe Truckee Area Regional Transit on the North shore and these services and funding mechanisms are included on the project lists and within the reasonably foreseeable revenue sources. As regional partners continue to broaden their work beyond traditional boundaries, coordination with the Town of Truckee is vital.

## Tahoe Transportation District

The TTD was established in Article IX<sup>3</sup> of the 1980 Tahoe Regional Planning Compact (Public Law 96-551) as a special purpose district to implement and deliver safe, environmentally positive transportation programs and projects, including transit operations, and corridor revitalization capital improvements that include active transportation, transit, and roadway facilities. The TTD Board of Directors is comprised of representatives from the five counties within the Region, the City of South Lake Tahoe, and private sector members from the South Shore TMA and Truckee-North Tahoe TMA, and an at-large member representing a public or private transportation system in the Lake Tahoe Region. Caltrans and NDOT have non-voting seats on the board. TTD's monthly meetings are open to the public. TTD and TRPA work closely to coordinate investments in transportation infrastructure and transit services.

## Tahoe Transportation Commission

The Tahoe Transportation Commission (TTC) serves as the formal advisory body to the TRPA Governing Board in its capacity as the metropolitan planning organization. TRPA established the TTC to vet transportation plans, programs, and projects prior to making recommendations to the Governing Board. The commission provides an opportunity for coordinated technical review and public involvement on transportation-related issues and its members have had direct and ongoing input in the development of this plan.

## Transportation Management Associations (TMAs)

The Tahoe Region has two transportation management associations, the Truckee-North Tahoe TMA, serving the North Lake Tahoe-Truckee Resort Triangle, and the South Shore TMA, serving the greater

**Policy 4.10:** Actively support Transportation Management Associations (TMAs) in the Tahoe Region.

South Shore area. The TMAs are community-based, nonprofit organizations designed to foster public outreach, receive community input on transportation issues, and encourage and facilitate the public-private partnerships necessary to implement transportation projects.

## State Departments of Transportation

State highways act as the Region's main streets and major arterial roadways. Caltrans and NDOT maintain and improve these roadways to provide efficient movement of goods, safe travel for all roadway users, and water quality projects to reduce runoff into Lake Tahoe. Each state department of transportation is actively involved at Lake Tahoe through project implementation and participation on the TTC and various other project development teams. This plan coordinates with both state's long range transportation planning documents and complete street plans and will influence any future plans such as Nevada's "One Nevada Plan."

## Federal Partners

TRPA has an important relationship with federal land management agencies due to the large amount of public lands under federal management in the Region. TRPA works closely with the U.S. Forest Service Lake Tahoe Basin Management Unit to provide coordinated access to its lands. TRPA also works with the Federal Highway Administration on road safety audits, design, and transportation system delivery in the Region that improve access to federal lands and benefit residents and visitors.

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<sup>3</sup> Article IX, was revised in 1997 by the States of California and Nevada.

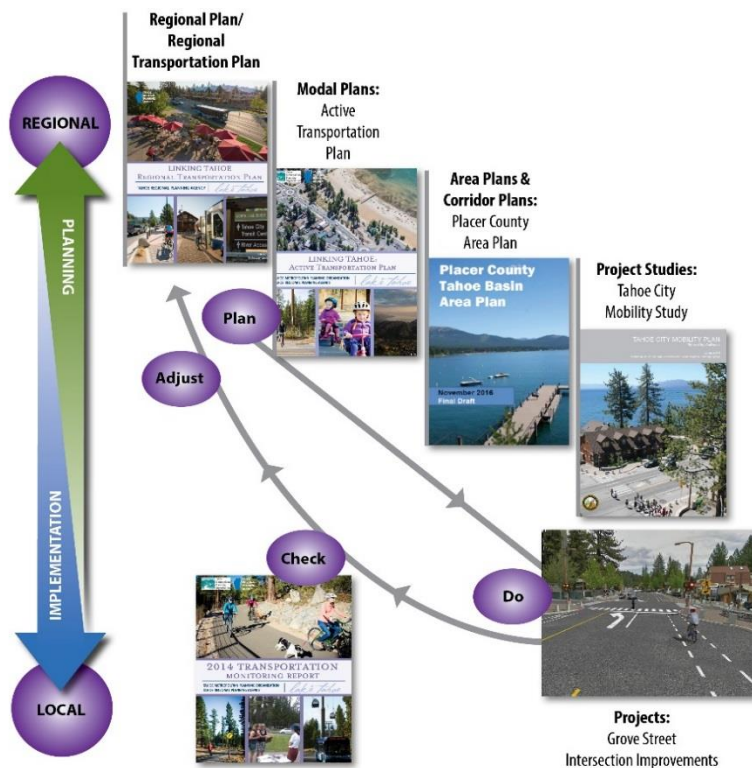


## Connections Between Planning and Project Delivery

Seeing planning through to project delivery includes partner collaboration at all scales. Some partners have greater responsibility during certain phases depending on the type of plan, and scale of project. However, all projects must be consistent with the goals, policies, and project lists found in the regional transportation plan and associated modal plans. Therefore, strong stakeholder involvement during the planning process is essential to ensure local projects are recognized at the appropriate plan level. Regional plans, like the regional transportation plan, is a high-level concept document that guides project and program design through policies, includes lists of expected upcoming projects and identifies foreseeable revenues to support implementation. At the next level of planning, modal plans, like the Active Transportation Plan, though still regional, go into more depth by not only providing bicycle and pedestrian specific policies and a prioritized project list, but also acts as a toolbox for project design. At the next level of specificity, Area and corridor plans provided by local jurisdictions and the TTD are community specific, and include more detailed policies and projects at the local level. To ready projects for delivery, detailed studies like the Tahoe City Mobility Study and the South Tahoe Middle School Area Connectivity Plan funded through TRPA's On Our Way Grant Program, consider vehicle and active transportation use numbers, right-of-way and engineering standard constraints, and prolific public feedback. From these types of detailed studies, projects such as the pedestrian activated beacon at Grove Street in Tahoe City, which seeks to enhance safety and improve traffic flow on SR 28, are developed and are construction ready once funding becomes available. As projects are delivered, partners monitor effectiveness of the transportation improvement and identify if additional adjustments are needed. Following the "Plan, Do, Check, Adjust" model, monitored information provides feedback to all levels of planning, and affects updated policies and designs for future projects.

**Policy 2.17:** Coordinate and include in area plans, where applicable, intermodal transportation facilities ("Mobility Hubs") that serve centers and other major areas of activity while encouraging the consolidation of off-street parking within mixed-use areas.

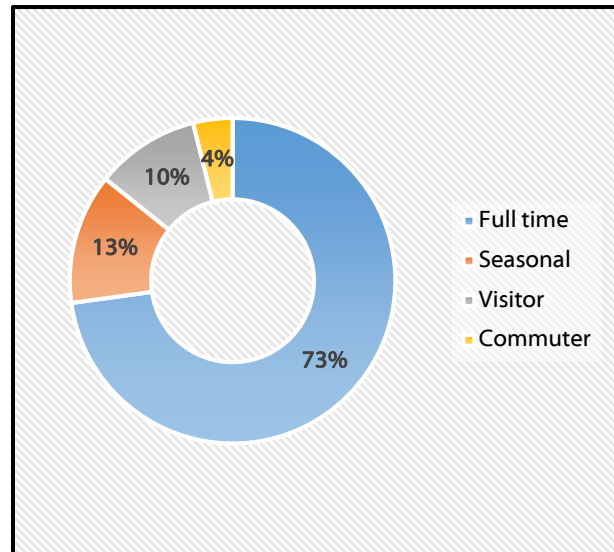
Figure 2.5: Connections Between Planning and Project Delivery



## Public Participation

TRPA actively engages with partners and the public both within and outside of the Lake Tahoe Region. Residents and visitors shape the vision, goals, and projects in this plan. Outreach is ongoing and includes gathering input from stakeholder groups, seeking public review of draft documents, and extensive data collection including surveys, door-to-door interactions, online information, and workshops. The multiple plans that support this 2017 Regional Transportation Plan also included frequent interactions with the public. TRPA involves the public, stakeholder groups, community-based organizations, federal, state, local agencies, tribal governments, and local elected officials early in the planning process. To ensure input from a large and broad range of residents and visitors, TRPA followed the guidance of the 2016 Lake Tahoe Public Participation Plan, developed in accordance with federal requirements and California Government Code 65080. More detailed description of TRPA's interagency consultation, and public outreach can be found in Appendix C: Public Participation, Consultation, and Cooperation. The investments proposed in this plan aim to better connect jobs, services, and recreational opportunities for all residents, workers, and visitors regardless of age, race, income, national origin, or physical ability. The proposals in this plan support social and environmental justice and TRPA's Title VI Plan adopted in May 2015. Extensive outreach to disadvantaged groups is part of TRPA's Public Participation Plan and TRPA has worked to increase outreach to and communication with traditionally under-represented and under-served populations. Proposed projects analyze impacts on these communities.

Figure 2.6: Survey Respondents by Residency







### Multiple themes and goals generated from the public are integrated into Linking Tahoe.

- Increasing quality-of-life and environmental benefit through reducing the high numbers of cars arriving and leaving the Region at the same time
- Improving access to recreation areas, including maintaining access for backcountry sports during the wintertime
- Implementing beach or recreation shuttles
- Increasing bicycle carrying capacity on transit
- Better advertising, wayfinding signage, and web or mobile based information for transit and active transportation services and facilities
- Increasing safety for people walking, riding bicycles, and driving, with specific needs called out at locations in Kings Beach and Zephyr Cove
- Providing bus shelters and amenities in areas with high use by residents and visitors
- Increasing electric vehicle charging infrastructure and electric vehicle use in the Region, including transit vehicles

Over the last four years, TRPA has continued to expand public outreach activities. Early in the update process of this 2017 plan, TRPA established new outreach techniques to foster greater understanding and input. TRPA also received a grant from the Federal Highway Administration to work with the Community Transportation Association of America to enhance outreach techniques. Outreach focused on gaining the public's feedback on prioritization of goals to help establish a performance-based project assessment tool. In total, over 800 people were engaged through qualitative and quantitative methods specifically for feedback on the 2017 Regional Transportation Plan.

### New Websites and Interactive Tools

Various websites and interactive tools have been launched to make it easier for the public to find transportation information.

-  [www.linkingtahoe.com](http://www.linkingtahoe.com) is a partnership between TRPA and TTD to provide links to regional-level transportation plans and projects, all of which are considered part of the 2017 Regional Transportation Plan. This website also provides information on public input opportunities and the public can also sign up for the monthly newsletter.
-  <http://www.trpa.org/RegionalTransportationPlan> is an interactive website specifically developed for the Regional Transportation Plan. A similar format site was developed for the 2016 Active Transportation Plan at <http://www.trpa.org/ActiveTransportationPlan>. These sites are highly visual and user friendly and provide key information while also providing access to resources for users to learn more.
-  [www.Laketahoeinfo.org](http://www.Laketahoeinfo.org) is an interactive site that provides user friendly information via dashboards, detailed demographic data sets, monitoring and performance data, and the regional Environmental Improvement Program Project Tracker that includes all transportation projects on the constrained and unconstrained list.
-  [www.TahoeTruckeeTransit.com](http://www.TahoeTruckeeTransit.com) is a Placer County and Town of Truckee joint website managed by the Truckee North Tahoe Transportation Management Association that provides information for the TART system. The website includes fixed route schedules, transit directory, airport shuttle information, and access to "nextbus" which tells users exact bus time arrival.

### Monthly Newsletter

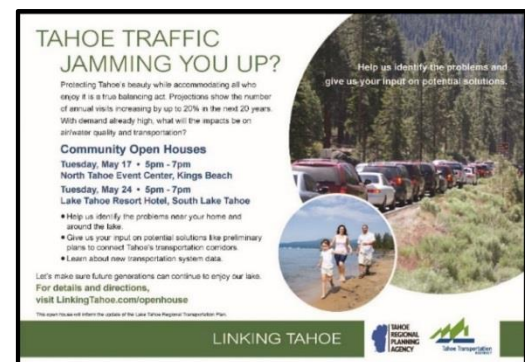
TRPA established a monthly electronic newsletter in 2014, now with 950 subscribers. The newsletter keeps people informed about projects and input opportunities.

### Tahoe Talks

The Tahoe Talks series initiated in fall 2014 is a monthly lunchtime forum of community members and industry experts who present and discuss ideas on transportation, the environment, and the economy.

### Association Meetings

One recommendation that came out of the stakeholder outreach assistance provided by Community Transportation Association of America was to begin regularly attending meetings of traditionally underserved groups in the Region. TRPA regularly gives presentations, and solicits feedback at existing association meetings as a key strategy, and regularly participates in standing meetings, such as chamber of commerce and transportation management association meetings. In response to the recommendation, TRPA now also regularly engages with new groups. More detail on groups can be found in Appendix C.



Community Open House Advertisement

### Community Open Houses

TRPA held two community open houses to gather feedback specifically on the concepts and projects presented in this plan. The open houses were held on May 17, 2016 at the North Tahoe Event Center in Kings Beach, California, and on May 24 at Lake Tahoe Resort Hotel in South Lake Tahoe, California. At total of over 100 people attended both events.

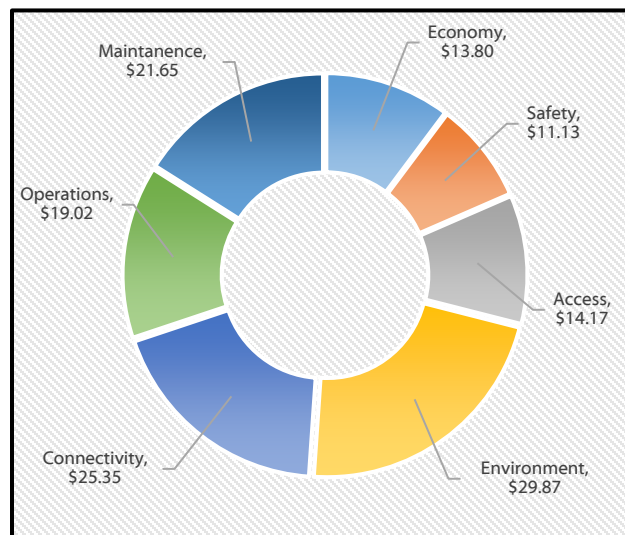
### Spanish Language Outreach

For both the 2016 Active Transportation Plan and the 2017 Regional Transportation Plan, TRPA targeted outreach to the Latino community. On the South shore, TRPA attended Cafecitos meetings, a Spanish-language parent-teacher group. On the North shore, TRPA completed door-to-door surveys. Over 100 of each survey was collected in Spanish for both the 2016 Active Transportation Plan survey and the 2017 Regional Transportation Plan survey.

### Online Opportunities & Surveys

TRPA released three surveys to gather planning input for this 2017 plan. In total, TRPA received over 1,400 survey responses from the 2015 Active Transportation Plan survey, the 2016 Tahoe-Truckee Plug-In Electric Vehicle Infrastructure Readiness Plan survey and the regional transportation plan specific survey.

Figure 2.7: Average of Dollar Amount Community Would Spend by Project Type



### Informational Meetings

California SB 375 specifies that metropolitan planning organizations must conduct informational meetings for members of each county board of supervisors and city councils as part of the outreach for the sustainable communities strategy. TRPA held these meetings on January 27, 2016 at the TRPA Governing Board meeting in Kings Beach, Placer County, California, and on April 8, 2016, at the Tahoe Transportation Commission meeting in South Lake Tahoe, El Dorado County, California. TRPA noticed both informational meetings through the county clerk's offices in Placer County, El Dorado County, and the City of South Lake Tahoe. In addition to these formal informational meetings, TRPA staff makes frequent presentations to both the TRPA Governing Board and the Tahoe Transportation Commission.

### Stakeholder Consultation

TRPA and TTD invited a broad array of agencies and groups to be part of a project development team for the Corridor Connection Plan and the Regional Transportation Plan. Representatives were from local jurisdictions, neighboring regions such as Washoe Regional Transportation Commission and the Carson Area Metropolitan Planning Organization, state and federal agencies such as California and Nevada State Parks, Caltrans, NDOT, the U.S. Forest Service, and the Federal Highway Administration.





## Sustainable Communities Strategy

This plan underscores the importance of making land use decisions in concert with transportation decisions because TRPA has the regulatory authority most MPOs don't. California's legislature recognized the land use - transportation connection in 2008 when it passed SB 375, the Sustainable Communities and Climate Protection Act. This law requires metropolitan planning organizations to focus regional land use and transportation policies on reducing GHG emissions from cars and light trucks. SB 375 calls for each metropolitan planning organization to develop a sustainable communities strategy that identifies the transportation, land use, and housing strategies needed to meet regional GHG emission targets. The Tahoe Region has a long history of integrated land-use and transportation planning, and continues to be committed to concentrating development in town centers and removing incompatible uses from environmentally sensitive lands, all with the goal of reducing vehicle miles traveled, increasing public health and quality of life, providing affordable housing, and protecting the environment.



Harrison Avenue, South Lake Tahoe  
Photo: Aurora Photos / Rachid Dahnoun

## Land Use Patterns, Forecasts, and Housing Needs

The Tahoe Region presents very limited opportunities for growth with roughly 90 percent of the land within the basin publicly owned and preserved and environmentally sensitive lands protected from development through TRPA Regional Plan policies and Code of Ordinances. Development is limited to high capability land and the redevelopment of aging commercial and housing stock is encouraged and incentivized. Four significant programs control growth and coordinate redevelopment with transportation in the Region.

1. The 1980 Regional Plan established a growth control system that prohibits new subdivisions of land, meters growth by local jurisdiction, and allocates and caps other forms of land use. The Region is almost at complete build out, with 46,000 of 50,000 available parcels already developed. By 2035, the Region is expected to reach full buildout.
2. This growth management process was strengthened with the adoption of the 2012 Regional Plan. Through updating the Region's existing Transfer of Development Rights program, incentives that include bonus units and enhanced transfer ratios help shift existing development on sensitive land or outside communities toward more compact development within existing small town centers around the lake. An online marketplace was developed to assist in making transfers easier to use and find, located at <http://www.trpa.org/permitting/transfer-development-rights/tdr-marketplace/>. The goal is to concentrate development near transit and trails, encouraging people to walk, bike, or take transit rather than use their car to get to their destinations while restoring sensitive lands that improve habitat and lake health. Other elements of the 2012 Regional Plan support a compact land use pattern and works in tandem with a walkable, bikeable transportation system. They include moving from a single zoning framework to encouraging mixed use development that includes affordable housing for varied income levels.

**Policy 2.9:** Develop formal guidelines or standards for incorporating transit amenities in new development or redevelopment, as conditions of project approval.

3. The 2012 Regional Plan looks to public and private entities to implement the plan's policies. Local jurisdictions are encouraged to generate area plans. Area plans allow local government to develop detailed policies, design guidelines, and projects tailored to the local needs and characteristics of each community while still conforming to the 2012 Regional Plan land use element goals and policies. Since 2012, many area plans have been adopted or are under development.

**Policy 4.7:** Regional transportation plan updates shall review projected travel into and within adopted area plans and effectiveness of mobility strategies.

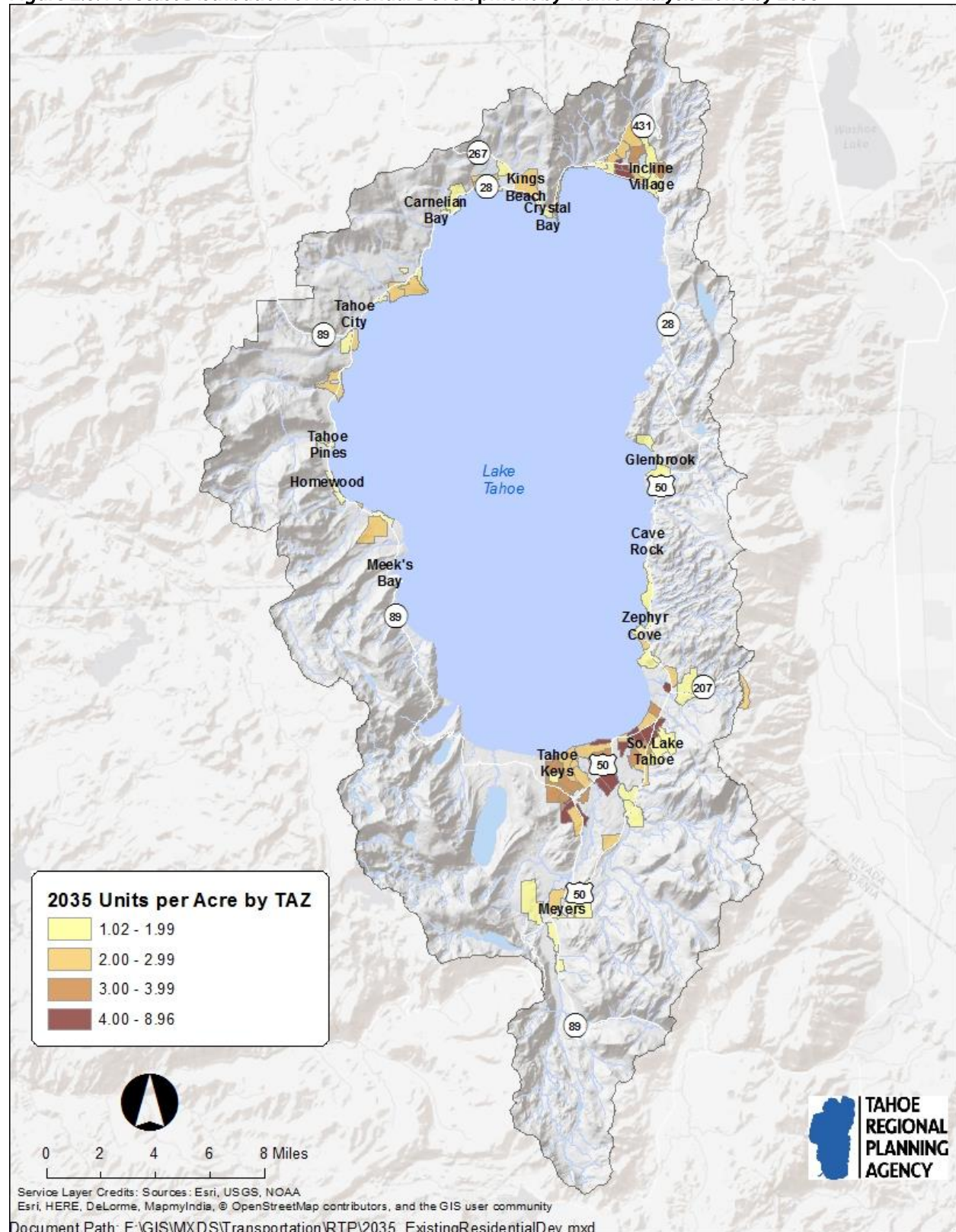
**Table 2.2: Regional Area Plan Development**

JURISDICTION	PLAN NAME	ADOPTION PHASE
Douglas County	South Shore Area Plan	Adopted
City of South Lake Tahoe	Tourist Core Area Plan	Adopted
City of South Lake Tahoe	Tahoe Valley Area Plan	Adopted
Placer County	Tahoe Basin Area Plan	Adopted
El Dorado County	Meyers Area Plan	Adoption expected in 2017
Washoe County	Washoe County Area Plan	In Development
Douglas County	Tahoe Douglas Area Plan	In Development

4. TRPA's Transfer of Development Rights strategic initiative gives partners the opportunity to identify barriers to environmentally beneficial redevelopment and a chance to evaluate the effectiveness of the system in implementing the Regional Plan, managing growth, supporting environmentally beneficial redevelopment, and accelerating sensitive land restoration. System improvements to better incentivize compact, mixed-use development in town centers may be proposed and codified from the initiative recommendations.



Figure 2.8: Forecast Distribution of Residential Development by Traffic Analysis Zone by 2035







Local governments play a vital role in the supply and affordability of housing. California's housing element law mandates local governments meet existing and projected housing needs of all economic segments of the community including for "low" and "very low" income households<sup>4</sup>. California jurisdictions must adopt housing element updates that demonstrate accommodation of an eight-year projection of housing need, called the Regional Housing Needs Assessment. For portions of El Dorado and Placer counties at Lake Tahoe, the projection of housing need is set by the Sacramento Area Council of Governments

(SACOG), in consultation with TRPA. SB 375 requires that the land use plan in the Sustainable Communities Strategy accommodate and not prevent jurisdictions from meeting the regional housing needs requirements. SACOG approved the 2013-2021 Regional Housing Needs Assessment for the California side of the Tahoe Basin in December 2011. Regional Housing Needs Assessments are approved every eight years.

The regional housing needs requirements for Tahoe's California jurisdictions are shown in Table 2.3. The table demonstrates the Lake Tahoe Sustainable Communities Strategy is expected to provide more than the required total housing units, as well as providing sufficient bonus units so local jurisdictions can provide housing units that are affordable to households defined as "low" or "very low" income. To meet the "low" or "very low" requirement, the TRPA Regional Plan included 1,474 residential bonus units, or permissions to build multi-family, affordable, or moderate-income housing in town centers over the life of the plan. All jurisdictions have an equal opportunity to utilize the bonus units. To incentivize construction of affordable housing, the TRPA Regional Plan sets aside a certain number of bonus units specifically for use in affordable housing projects.

**Table 2.3: Regional Housing Needs Assessment (RHNA) Requirements (CA Only)**

Jurisdiction	Total Housing Units RHNA Requirement	Total Housing Units Lake Tahoe SCS allocation <sup>5</sup>	Very Low + Low Income RHNA Requirement	Very Low + Low Income Lake Tahoe SCS allocation
Placer County (Tahoe portion)	328	534	154	n/a
El Dorado County (Tahoe portion)	480	831	225	n/a
City of South Lake Tahoe	336	394	92	n/a
<b>Total</b>	<b>1,144</b>	<b>1,759</b>	<b>471</b>	<b>1474<sup>6</sup></b>

Although a sufficient quantity of bonus units are available to be constructed as affordable housing, market viability can have a significant impact on the likelihood that units are actually constructed as affordable housing. While TRPA can show that it is meeting the housing needs as identified by SACOG, studies indicate that there remain significant barriers to constructing workforce and affordable housing. TRPA is committed to working with local governments, agencies and non-profits around the lake to address Tahoe's regional housing needs. Planners, developers, local jurisdictions, and affordable housing advocates must maintain an ongoing dialogue to monitor the effectiveness of incentives to support a diversity of housing types and create or modify development policies if needed.

<sup>4</sup> Defined as households with household incomes less than 80% or 50%, respectively, of the area median income.

<sup>5</sup> The SCS overall allocation is based on the ratio of development rights remaining in each jurisdiction times the number of allocations that will be available over the 8-year period (under the TRPA Regional Plan this would be 130 allocations x 8 years = 1,040 allocations), plus bonus units. Ratios are: City of South Lake Tahoe= 9% of total; El Dorado County=51%; Placer=23%. Bonus units available for each jurisdiction for the purposes of this table are calculated as the total number of bonus units available over the entire life of the plan, divided evenly between the five jurisdictions (295 units per jurisdiction). Each jurisdiction has an equal opportunity to obtain bonus units, however, and is not limited to 295 units.

<sup>6</sup> 874 remaining bonus units from the 1987 plan plus 600 new bonus units.



## Meeting Travel Demand, Environmental Goals and Resource Protection

Although growth is capped and development metered within the Tahoe Region, population growth is occurring outside the regional boundaries. Forecasts of four million people or more in Northern California and Northern Nevada over the next 20 years are likely to increase the currently estimated 10 million vehicles entering the Tahoe Region annually. Consistent with long standing regional policy, the Tahoe Region will not meet this increased demand from recreational travel by expanding roadways and adding additional vehicle lanes. Instead, the strategic focus for more effectively managing congestion during high recreation seasons and during periodic events is on improving roadway efficiency through partnerships and strategies that enhance transit, trails, technology, and transportation system management. A key element of the Lake Tahoe Sustainable Communities Strategy is demonstrating that the transportation and land use strategies proposed in this plan allow the Region to meet multiple environmental goals, including air and water quality standards established in accordance with the Bi-State Compact, state GHG emissions reduction targets set under SB 375, and federal water quality goals such as the Total Maximum Daily Load under the Federal Clean Water Act.

**Policy 5.2:** Provide multimodal access to recreation sites. Encourage collaboration between public lands managers, departments of transportation, transit providers, and other regional partners to improve year-round access to dispersed recreation activities. Strategies could include active transportation end-of-trip facilities, transit services, parking management programs, and incentives to use multi-modal transport.



Photo: Aurora Photos / Rachid Dahnoun

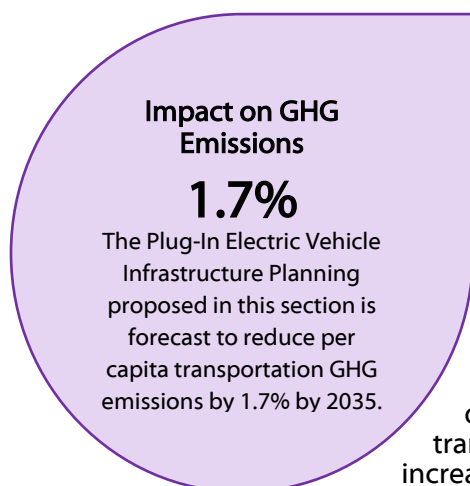
## Greenhouse Gas Emission Reductions

Tahoe's challenge rests in providing a transportation system that can accommodate increasing levels of visitation while reducing impacts to the environment. To meet GHG reduction targets and preserve the overall Lake Tahoe environment, this plan builds off 2012's focus on creating walkable, bikeable communities to include improved connectivity between these activity centers, neighborhoods, and recreation destinations to better serve high visitation levels. Strategies emphasize frequent, free-to-the-user transit, closing gaps in the active transportation network, and coupling these infrastructure and operations projects with incentive programs such as parking system management, targeted advertising, and enhancing the employer trip reduction ordinance to reduce commute car trips.



Entry and Exit Travel at Pioneer Trail and U.S. 50  
Photo: Aurora Photos / Rachid Dahnoun

The Tahoe Region is required to meet GHG reduction targets of 7 percent by 2020 and 5 percent by 2035 based off 2005 emission levels. The projects and programs in this plan meet these reductions with an estimated 8.8 percent reduction in 2020 and a 5 percent reduction in 2035.



Through an aggressive set of strategies including transit, active transportation, parking management, zero emission electric vehicles and incentive programs, the Tahoe regional transportation model estimates meeting CARB mandated GHG reduction targets. The model is calibrated with ongoing traffic counts, resident and visitor surveys, and population projections to anticipate future travel patterns and volume. Appendix D: Methodology for Estimating Vehicle Miles Traveled and Greenhouse Gas Reductions in the 2017 Regional Transportation Plan explains how the model works and the assumptions made to assess compliance with GHG reduction targets. Additionally, this plan's expanded environmental checklist includes a robust discussion on the differences between analysis of the 2012 and 2017 regional transportation plan including the updated EMFAC2014 model, increased vehicle miles travelled projections, and increased reductions through electric vehicles.

**Table 2.4: 2016 RTP/SCS Mobile-Source Greenhouse Gas Emissions for California Portion of Basin<sup>7</sup>**

2005		2020		2035	
Daily VMT <sup>2</sup>	1,041,890	Daily VMT	1,038,998	Daily VMT	1,149,601
Population <sup>2</sup>	41,377	Population	43,341	Population	45,166
VMT/capita/day	25.18	VMT/capita/day	23.97	VMT/capita/day	25.45
GHG Emissions (tons/day) <sup>3</sup>	445	GHG Emissions (tons/day) <sup>3</sup>	428	GHG Emissions (tons/day) <sup>3</sup>	461
GHG Emissions/Capita (pounds/person/day)	21.52	GHG Emissions/Capita (pounds/person/day)	19.75	GHG Emissions/Capita (pounds/person/day)	20.41
		% change GHG/capita from 2005	-8.2	% change GHG/capita from 2005	-5.2
		Adjusted % change GHG/capita from 2005 <sup>4</sup>	-8.8	Adjusted % change GHG/capita from 2005 <sup>4</sup>	-5.0
		SB 375 Target	-7	SB 375 Target	-5
		SB 375 Target Met?	Yes	SB 375 Target Met?	Yes

<sup>7</sup> Information on this table can be found in the 2017 RTP Environmental Document



## DENVER BUSTANG:

### A Model for Reducing GHG Emissions Through Recreation Travel by Transit

Bustang is an interregional bus service operated by Colorado Department of Transportation (CDOT). Bustang uses Denver as a hub and has routes North to Fort Collins, South to Colorado Springs, and West to Glenwood Springs. The bus service provides riders access to ski resorts and other outdoor recreation destinations year-round. This service aids in alleviating congestion on Colorado's major corridors and provides a safe and convenient mode of transportation for commuters and outdoor enthusiasts alike. The Bustang has ample storage space for skis, snowboards, and other luggage in stowage compartments overhead and under the bus. Each bus is also equipped to hold two bikes on exterior bike racks. Each bus can transport 51 passengers and offers free Wi-Fi, USB outlets, power outlets, wheelchair access, and a restroom on board. The north and south lines are geared towards aiding commuters that work in Denver and live outside of the Denver metro area. The north line has six daily departures and the south line has seven daily departures Monday through Friday. The west line has two daily departures seven days a week and is mainly used by residents in the Denver metro area visiting ski resorts or hiking and biking destinations in the mountains.

The Bustang service began in July 2015 and has exceeded expectations in regards to ridership, revenue, and fare box recovery. The first year Bustang ridership was forecasted at 87,376 people but the actual ridership through the first year was 102,577 people, 17 percent higher than forecasted. CDOT estimated the revenue from fares would be \$647,817 and cover 30 percent of the operation costs. The actual fare revenue was 57 percent higher at \$1,014,781, covering 38 percent of the operation costs in its first year of service. Start-up costs were \$10 million with an expected \$3 million annual cost for operating the fleet and facilities. Each bus cost CDOT about \$538,000, which is comparable to the standard public transit bus price. Lastly, Bustang exceeded its fare box recovery rate by eight percent. These positive results have lead CDOT to expand the bus lines, increase frequency, and provide additional bus services, such as scheduled rides to Mile High Stadium on Denver Broncos gamedays and weekend trips between Denver and Colorado State University in Fort Collins.



27<sup>th</sup> St. Bustang station in Glenwood Springs  
Photo: Will Grandbois of Post Independent

## Clean Air Act Compliance

Under the federal Clean Air Act, TRPA and the U.S. Department of Transportation must determine that this regional transportation plan conforms to the State Implementation Plan for air quality. Conformity means that transportation activities will neither create nor worsen air quality violations or delay the attainment of air quality standards. The conformity analysis, which focuses only on carbon monoxide, was developed and reviewed according to TRPA's Transportation Conformity Interagency Consultation Process that includes representatives from Caltrans, NDOT, Federal Highway Administration, US Environmental Protection Agency, and TRPA. The required air quality conformity analysis and a description is included in Appendix E: 2017 Transportation Conformity.

## Clean Water Act Compliance through Lake Tahoe Total Maximum Daily Load

The Clean Water Act requires states to compile a list of impaired water bodies that do not meet water quality standards and requires establishment of a Total Maximum Daily Load (TMDL) to reduce the primary pollutants affecting these waters. As an impaired water body, the primary pollutants causing Lake Tahoe's degradation are phosphorus, nitrogen, and fine sediment particles. The TMDL establishes strategies for reducing these pollutant loads so that Lake Tahoe can meet a deep-water transparency standard of 97.4 feet, as measured by a Secchi disk. There are two sets of strategies that affect transportation projects: reducing roadway runoff from the urban uplands and reducing atmospheric nitrogen deposition from vehicle emissions.

Reducing roadway runoff is the responsibility of local jurisdictions and state departments of transportation. Each of these entities in the Tahoe Region are implementing load reduction plans and projects to meet their assigned pollutant load reduction allocations, such as Caltrans' upcoming water quality project from the South Tahoe "Y" to Trout Creek. This plan supports the coordination of funding sources and other local projects to facilitate completion of these water quality improvements. The TMDL program relies on the regional transportation plan to manage the loading of nitrogen to the atmosphere from mobile sources. The TMDL anticipates that this plan will result in a basin-wide nitrogen load reduction of at least 1 percent within 15 years<sup>8</sup> by 2025, primarily through enhanced operations and maintenance and roadway treatment projects. Based on the proposed strategies to reduce vehicle miles traveled and the anticipated improvements in vehicle emissions technology documented in California's EMFAC 2014 model, TRPA expects the reduction to be significantly greater than the 1 percent target.

## Protecting Natural Resources

Protecting the health of Lake Tahoe and the surrounding natural resource areas includes discouraging development in open space, flood zones, and natural habitats where rare, threatened, or endangered species live. This is a fundamental responsibility of the Region's public agencies together with private partners. The first public lands in the Lake Tahoe Basin were established in 1899 as the Lake Tahoe Forest Reserve totaling 37,000 acres. Congress passed the Santini-Burton Act in 1980 to protect the environmental quality of the Lake Tahoe Basin that was jeopardized by over-development of sensitive lands. Along with state land acquisitions, roughly 90 percent of the land in the Tahoe Basin is now

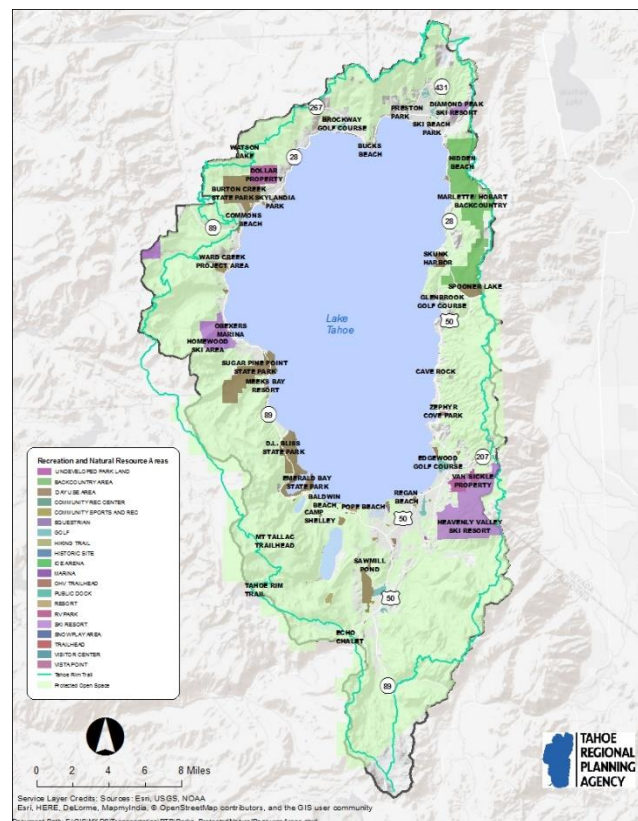


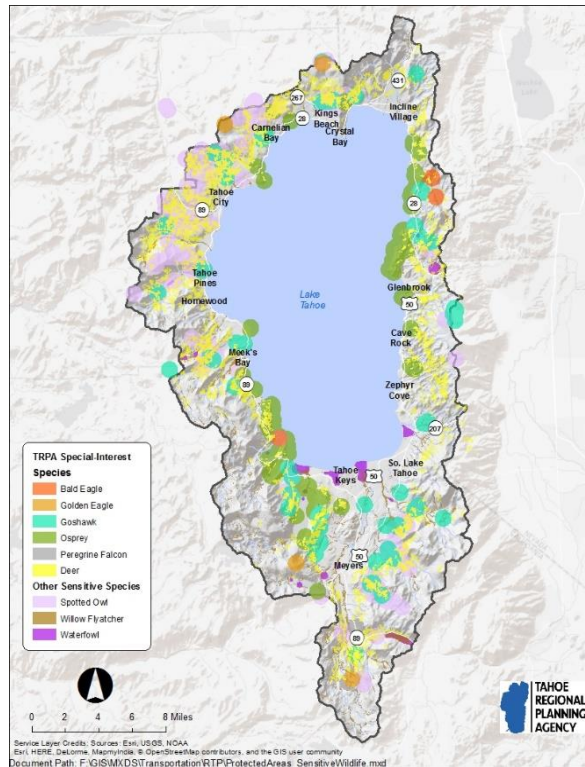
Figure 2.9: Parks and Protected Natural Resource Areas

<sup>8</sup> California Regional Water Quality Control Board & Nevada Division of Environmental Protection, 2010.



publicly owned. As new research becomes available to calculate the value of open space toward carbon sequestration as presently being done in Sonoma County, that information will be used to influence transportation and land use policies as communities strive to meet GHG reduction targets<sup>9</sup>.

**Figure 2.10: Protected Areas for Endangered, Threatened, or Sensitive Wildlife**



In accordance with the requirements of SB 375, TRPA identifies protected parkland, open space, natural resource areas, and floodzones. SB 375 also requires the Region to identify farmland and mineral resource areas, however the Tahoe Region does not have these types of land uses. Natural habitat and rare, threatened, or endangered species are protected in the Lake Tahoe Region by the federal Endangered Species Act, the California Endangered Species Act, and the TRPA Code of Ordinances. The TRPA Code of Ordinances also sets rules regarding development in the 100-year flood zone.

TRPA circulated the 2017 RTP/SCS and environmental analysis to the California Department of Fish and Wildlife, the responsible agency for implementation of the State Wildlife Action Plan. The Lake Tahoe Region falls within the Sierra Nevada Conservation Unit as identified in the State Wildlife Action Plan. Because site specific design and locations have not been identified for projects included in the 2017 RTP/SCS, the presence of the focal species listed in the 2017 RTP/SCS is not known. However, agencies that are permitting individual projects would be required to consult with California Fish and Wildlife to ensure site design would avoid or mitigate any impacts to sensitive species, including those listed in the State Wildlife Action Plan.

The State Wildlife Action plan identifies key pressures on conservation targets in the Sierra Nevada. These include climate change; fire and fire suppression; housing and urban areas; invasive plants and animals; livestock, farming and ranching; recreational activities; renewable energy; and roads and railroads. The 2017 RTP/SCS include transportation policies, programs and projects to reduce reliance on the automobile, increase efficiency of the transportation system, and the use of alternative fuel which will reduce greenhouse gas emission. Road and recreation projects contained in the plan will include storm water retention and filtration improvements to protection to the Region's waterbodies. All projects would be required to comply with TRPA's best management practices for construction that include management of invasive species. Implementation of the plan will ultimately result in improved environmental conditions in the Region and would not interfere with land conservation strategies contained in the State Wildlife Action Plan.

### Climate Change Resiliency

Climate change and extreme weather events present significant and growing risks to the safety, reliability, effectiveness, and sustainability of transportation infrastructure and operations. While this plan proactively identifies strategies to reduce per capita GHG emissions as part of the statewide effort to slow climate change, many impacts of climate change are already occurring and Lake Tahoe communities need to be prepared. Higher temperatures, changes in seasonal precipitation, the intensity of rain events, and extreme weather can degrade roadway surfaces and subsurfaces, damage culverts, and disrupt traffic. As temperatures increase, Tahoe's winter season may shorten and the percent of precipitation that falls as rain rather than snow is likely to increase<sup>10</sup>. These events

<sup>9</sup> Sonoma County, 2016.

<sup>10</sup> UC Davis, 2016.

can result in shorter replacement cycles and higher maintenance costs for transportation infrastructure. Preparing for climate change and extreme weather events is an important element of protecting the integrity of the transportation system and the investment of taxpayer dollars.

In the Tahoe Region, highways and bridges may be the most vulnerable infrastructure type, and are most likely to be affected by flooding or increased rain events. Increased rain-on-snow may lead to more frequent and extreme flooding. The Federal Highway Administration has developed a climate adaptation sensitivity matrix<sup>11</sup> that identifies specific impacts to different types of transportation infrastructure. TRPA has reviewed the impacts of precipitation-driven inland flooding on roads and bridges. Partners should begin to protect transportation infrastructure from extreme weather conditions by accounting for the potential impacts when building new facilities or maintaining existing facilities. During the permitting process implementers should evaluate the costs, benefits and potential barriers to planning for climate change when designing and maintaining projects.

**Policy 6.4:** Consider the increased vulnerability and risk to transportation infrastructure from climate stressors, such as increased precipitation, flooding, and drought when designing new infrastructure and repairing or maintaining existing infrastructure.

### Identified Environmental Mitigation

TRPA identified some impacts in the 2017 RTP/SCS environmental document, primarily related to construction of new development and impacts of new development on travel delays. Project level mitigation will be implemented through TRPA's best construction practices, while Region-wide impacts would be addressed by implementation of non-motorized improvements to reduce congestion, roadway system management requirements as well as programs to monitor traffic conditions through established performance measures.

## Planning Context Informs Decisions

As the Lake Tahoe Region transitions into an era of climate change and expected population growth in neighboring areas, the Region needs a continued emphasis on strengthening policies and programs that shift development into town centers and provide the transit, biking, and walking infrastructure needed to help residents and visitors reach popular destinations quickly and easily with minimal environmental impact. This plan builds on 2012's past accomplishments by introducing trails, transit, and technology concepts that have the capacity to transform the way people travel to, through, and around the Lake Tahoe Region.



**Homewood Path Ribbon Cutting**  
Photo: Tahoe City Public Utility District

These efforts seek to reduce peak congestion, preserve the environment, and improve the overall travel experience. Since the 2012 Regional Transportation Plan, local and state partners have been constructing projects, utilizing new technology, analyzing current conditions, and collaborating to help meet regional goals.

<sup>11</sup> FHWA, 2015.

## Transit Service

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TTD and TART have rebranded and upgraded their fleets, expanded services and frequency, added real-time transit information, and built transit shelters and a new Transit Center just outside of Tahoe City. TART completed the TART Systems Plan Update, ridership surveys and is implementing portion of the systems update plan. Many bus shelters have been constructed including in Sunnyside and in the Dollar Hill Area. TTD has increased the number of “Spare the Air Days” on which transit service is provided free of charge to passengers, reducing costs for regular users and encouraging new users to try and commit to using the system.

## Trails: Active Transportation Network

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Class-I shared-use paths are being constructed across the Region. The California Tahoe Conservancy has built the first phase of the South Tahoe Greenway Shared-Use Trail and secured funding to complete a second phase of the project. TTD has constructed the southern sections of the Nevada Stateline to Stateline Bikeway and broke ground on the northern section from Incline Village to Sand Harbor, in partnership with NDOT. Placer County and Tahoe City Public Utility District are closing gaps in the shared-use path network on the West and North shores with the Homewood and Dollar Creek connections, creating over 22 miles of fully connected, separated path. El Dorado County completed two important trail segments that link the Sawmill trail and Lake Tahoe Boulevard, connecting the Meyers community, South Tahoe High School, and numerous recreation areas. Overall, more than 25 miles of the bikeway around the lake has been constructed, with an additional six miles planned in the near term through the projects noted above. Shared-use paths are being maintained for year-round use to provide access and increase safety in Placer, Washoe, El Dorado counties and the City of South Lake Tahoe.

## Technology

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### Data Collection and Analysis

Data helps inform agency staff and decision makers, supports successful grant applications, and is a vital public education tool. For instance, Placer and Washoe counties have recently performed supply, demand, and pricing parking studies which will assist in implementing a parking management system. New tools to analyze roadway congestion and performance provide an opportunity to identify traffic bottlenecks. Transit rider surveys help determine the need for additional services and operating hours. TRPA and its local partners have instituted the Bicycle and Pedestrian Monitoring Protocol, which is now collecting year-round active transportation data. TRPA provides a multitude of regional data sets and is moving towards becoming the regional data clearinghouse through [www.laketahoeinfo.org](http://www.laketahoeinfo.org).

### Real-Time Information

Over the last few years, intelligent transportation systems have seen significant advancements and deployments in the areas of data collection, data sharing, mobile solutions, and traffic monitoring capabilities. Caltrans has installed and upgraded changeable message signs along the U.S. Highway 50 corridor, utilizing bluetooth sensors to display travel times to and from Tahoe. The Tahoe Prosperity Center has completed an analysis of broadband and cellular coverage, capacity, and speed in the Region which impacts real-time traveler information applications, and is partnering with agencies and private companies to increase service. As part of the State Route 28 Corridor Management Plan, TTD is developing a parking management system that will provide real-time information to people looking for available parking spaces.



## Transportation System Management

### Corridor Revitalization Projects

Placer County's Kings Beach Commercial Core Project began construction in 2015 and is scheduled to be completed in spring 2017. This project reconfigured 1.1 miles of state Route 28 and included a reduction of travel lanes, the addition of sidewalks and landscaping, roundabout intersection improvements, and stormwater modifications. These "complete streets" design elements all work together to enhance economic vitality in Kings Beach, increase bicycle and pedestrian safety and access, and motivate resident and visitors to walk, bike, or use transit.



### Water Quality Improvements

Roadway water quality projects and enhanced operations and maintenance around the Region are reducing stormwater runoff and substantially decreasing the impact of the transportation system on the lake's clarity. Many of these projects have contributed multiple benefits with formalized parking, active transportation infrastructure, and beautified highway corridors. Since 2012, transportation agencies have retrofitted 73 miles of paved roadways with water quality improvements.

### New and Enhanced Partnerships

From getting projects on the ground to sharing data and strategies with local jurisdictions and neighboring metropolitan areas, strong agency and citizen-led partnerships are imperative. TRPA is focused on bringing partners together to learn, leverage resources, and support each other's efforts. The 2015 Transforming Tahoe Transportation Workshop was a first step in providing education, offering networking opportunities, and scaling up our challenges and opportunities from local level to the regional, state, and federal levels. TRPA and TTD are continuing this work through the Trans-Sierra Coalition and partnerships with SACOG and Washoe Regional Transportation Commission among others to better connect the Lake Tahoe Region to surrounding areas. The Region's advocacy groups and many associations continue to help look for innovative ways to improve Tahoe's transportation system and provide the services community members desire, such as transit access to Meyers, improved intersection and mid-block crossings, and community education programs like Tahoe Talks.







Imagine Lake Tahoe on a wintery blue sky day or a warm summer weekend leading up to the fourth of July. This can bring visions of skiing down powdery slopes, or biking to the beach with friends and family. Seasonal peaks and weekends also bring images of vehicle clogged roads when trying to cross town to get to Heavenly Village, the grocery store, or your favorite beach spot on the East shore. Decades ago, the transportation system was designed as a rural, two lane roadway. The Lake Tahoe Region is now home to 55,000-year-round residents and receives an estimated 10 million vehicles annually on its two-lane network. To protect the sensitive environment, expanding capacity by widening roads stopped in the 1980's. Nonetheless, this original transportation network and accompanying development pattern was designed to favor the car. Accomplishing the long-term vision means severing the connection of favorable weather and year-round recreational activities with stand still traffic on our major roadways within and leading to the Region.



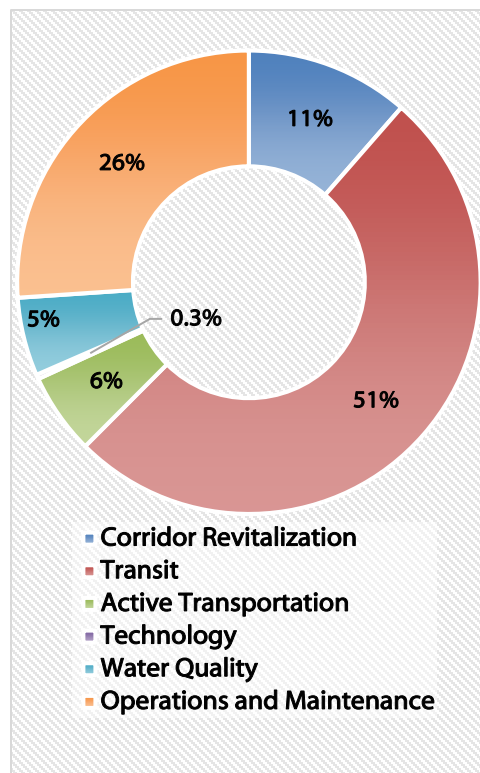
**Policy 1.8:** Strongly encourage traffic calming and noise reduction strategies when planning transportation improvements.

Traffic congestion at Lake Tahoe is cyclical, occurring at peak times and locations. In some locations at certain times it may continue. Town centers for instance are being designed to calm traffic and act as gateways that attract people to stop, shop, eat, and visit. Coupling traffic calming with safe and convenient walking and bicycling infrastructure provides options to use active modes and avoid traveling by car when roadways and parking are at capacity. The building blocks of the transformative changes needed to shift

more people to multi-modal options rests in efficiently managing roadways while enhancing transit, trails, technology, and transportation system management. These enhancement projects will strategically target the patterns of travel behavior for residents, commuters, and visitors, to manage congestion by spreading out when and where people decide to travel while incentivizing people to use transit, walk and bike in busy areas.

Building off the 2012 plan’s emphasis on creating walkable and bikeable town centers, this plan proposes services and programs that target increasing electric vehicle use, and extending walking, biking, and taking transit to recreation sites from neighborhoods and town centers. By seamlessly connecting the destinations within the Region, partners are cementing the framework needed to offer travel to the Region without need for the car, by ensuring they can move around the lake by other means once they are here. This chapter lays out the transit, trails, technology, and transportation system management strategies that include projects and supporting programs that will be delivered over the next 20-years. This plan sets the blueprint for a 20-year horizon, however regional transportation plans are updated on a four-year cycle. The plan specifies the need for some projects, such as 15-minute transit frequency and adaptive roadway management of the Region’s entry roads, but they can only be implemented once additional funds are identified. If increasing regional revenues and agency commitments can be identified over the next four years, these and projects like them may be included in the funded project list of the 2021 regional transportation plan update.

**Figure 3.1:**  
**Percentage of Total Cost by Category**



### Projects and Programs Meet Regional Goals

The Bi-State Compact and California legislation mandates the Region to reduce reliance on the private automobile to decrease vehicle miles travelled and associated GHG emissions, and protect water clarity among other responsibilities. Through planning for frequent and free-to-the-user transit, robust connections to recreation sites, and closing gaps on the active transportation network, this plan meets these mandates. These services and incentivization programs also help meet regional goals which are the organizing framework of this plan and the performance measurement framework. Many of the projects and programs presented are multi-benefit and meet all or many of the regional goals. This chapter describes the proposed system under the four categories of transit, trails, technology, and transportation system management and identifies which goals are the primary focus for the projects under these categories.



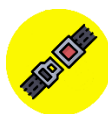
#### GOAL 1: ENVIRONMENT

Protect and enhance the environment, promote energy conservation, and reduce greenhouse gas emissions.



#### GOAL 2: CONNECTIVITY

Enhance and sustain the connectivity and accessibility of the Tahoe transportation system, across and between modes, communities, and neighboring regions, for people and goods.



#### GOAL 3: SAFETY

Increase safety and security for all users of Tahoe’s transportation system.



#### GOAL 4: OPERATIONS AND CONGESTION MANAGEMENT

Provide an efficient transportation network through coordinated operations, system management, technology, monitoring, and targeted investments.



#### GOAL 5: ECONOMIC VITALITY & QUALITY OF LIFE

Support the economic vitality of the Tahoe Region to enable a diverse workforce, sustainable environment, and quality experience for both residents and visitors.



#### GOAL 6: SYSTEM PRESERVATION

Provide for the preservation of the existing transportation system through maintenance activities that support climate resiliency, water quality, and safety.

### Infrastructure Projects Supported by Incentive Programs

**Policy 4.3:** Promote awareness of travel options and conditions through advertising and real-time travel information.

Management strategies help distribute people across different travel types across time with multiple strategies working together to support each other. Visitors, residents, and commuters will be engaged through targeted outreach and

education to support the success of management strategies that shift travel patterns to walking, biking, and transit, or car use that reduces environmental impact through alternatives fuels and encourages travel at non-peak times when there is more capacity on roadways and at recreation sites. The coupling of infrastructure planning with management strategies is particularly important in the Tahoe Region, which has recreational visitation traffic patterns with high peaks during the winter and summer seasons. Spreading out these peaks is one way to maintain visitation levels while managing congestion or providing ways for people to avoid it. These types of strategies accomplish more than merely addressing high seasonal peak traffic. A more efficient, safe, and connected transportation system will reduce daily commute times, reduce environmental impacts, enhance security and emergency response time, and provide improved access to Lake Tahoe's world-renowned recreation. Planning projects and programs that influence and change patterns of behavior is a key concept of this plan<sup>1</sup>.

#### Discover Tahoe - Recreational Travel:

Access to many high-use recreation sites and other popular points of interest are limited by parking availability and inadequate transit services. This creates roadway congestion, unsafe conditions for all users, and environmental degradation when people park vehicles on unpaved roadway shoulders. Projects and programs in the Discover Tahoe focus area will inform travel decisions and incentivize the use of transit and electric vehicles. They provide online or smartphone real-time information, parking management systems, convenient and easy transit, and charging infrastructure and parking incentives for electric vehicles.



<sup>1</sup> See Chapter 1: Regional Goals and Key Concepts



## Visit Tahoe - Regional Entry and Exit Travel:



Although an estimated 10 million cars enter the Region annually, congestion is not always the result. Peaks in travel are experienced at specific locations during holiday weekends, for special events, and on high snowfall days. These peaks add vehicle miles traveled, GHG emissions, and congestion and cause frustration for visitors and residents who may be delayed when trying to reach a destination. The Visit Tahoe focus area includes strategies that encourage people to enter and exit the Region at non-peak times through easily accessible real-time information, financial incentives provided through partnerships with lodging, ski resorts, shop owners, and restaurants, and through partnerships with transportation network companies. These strategies are coupled with convenient transit options offering recreational amenities.

## Everyday Tahoe - Residential and Workforce Travel:

The Everyday Tahoe focus area outlines strategies to encourage walking, biking, transit use, and electric vehicle use by residents and commuters. These strategies focus on commutes to work or school and routine short trips, often less than two miles in length. Because they follow a similar pattern every day, they are the easiest trips to make using transit, biking, or walking. Employer trip reduction programs, coordinating transit stops near school locations, and education and encouragement programs such as the Lake Tahoe Bike Challenge and Bike to School week are among the Everyday Tahoe options.

Each travel category benefits from tailored strategies that spread different types of travel over different times. Many strategies overlap and benefit the overall transportation system. For example, effective parking management can influence recreation or work destination travel choices. Reducing the amount of parking required for new development projects, such as for affordable housing, can redirect financial resources towards supplying more transit amenities to residents such as shuttles, transit passes, and secure indoor bicycle parking. Specific strategies are linked to each focus area. The Placer County Tahoe Basin Area Plan is an example of how these types of policies are put into place. Table 3.1 shows many of the same strategies can be utilized in more than one focus area to benefit the efficiency of the overall transportation system. Strategy details are outlined chapter under their most relevant category, either transit, trails, technology or transportation system management.

**Policy 1.5:** Require major employers of 100 employees or more to implement vehicle trip reduction programs.





**Table 3.1: Transportation Demand Strategies**

STRATEGIES	EVERYDAY TAHOE	VISIT TAHOE	DISCOVER TAHOE
Adaptive Roadway Management	✓	✓	✓
Education & Encouragement	✓	✓	✓
Employer Trip Reduction	✓		
First and Last Mile Amenities	✓	✓	✓
Free-to-the-User Transit	✓		✓
In-Person Traffic Management		✓	✓
Mobility Hubs		✓	✓
Parking Management	✓	✓	✓
Partnerships with Transportation Network Companies (TNCs)	✓	✓	✓
Real-Time Transit Information	✓	✓	✓
Rewards for Electric Vehicle Use	✓	✓	✓
Roadway Asset Management	✓		✓
Roadway Traveler Information	✓	✓	✓
Transit Priority Access	✓		✓
Transit Schedule Coordination	✓	✓	✓



## Transit

The transit system will serve all three user types and their associated travel patterns with community, local, regional, and inter-regional services. Community routes connect residents from locations within walking distance to their homes to work and other routine activities. Local routes are on state highways that connect commuters, residents, and visitors from one end of town to another. Regional services work in tandem with local services and link the North and South shores connecting all user groups to their recreational or work destinations. Inter-regional services are visitor oriented and provide frequent and convenient options for entering and exiting the Region by bus or rail.

### The two transit operators at Lake Tahoe are:



[www.TahoeTruckeeTransit.com](http://www.TahoeTruckeeTransit.com)



[www.tahoetransportation.org](http://www.tahoetransportation.org)

Cost-effective and efficient transit systems often rely on grid like land use patterns. In general, Lake Tahoe's development pattern does not fit this description. Regional and local round the lake services that connect residents, commuters, and visitors to town centers and many of the Region's recreational sites on state highways can provide linear, frequent service at relatively low cost and are included on the plan's constrained project list. In limited instances, neighborhood community services connect residents, commuters and visitors staying at vacation home rentals are included on the constrained project list at 30-minute frequencies. Inter-regional bus connections that encourage visitors to use transit to enter and exit the Region are also included with more services to Sacramento and Reno on the constrained project list. Added inter-regional service that include mobility hubs, frequent bus service, and commuter rail connections will be available when funding is identified.

## Transit Goals, Policies, and Plans

Regional transit policies appear in many of the regional goals, with the most targeted transit policies in Goal 4: Operations and Congestion Management, Goal 5, Economic Vitality and Quality of Life, and Goal 2, Connectivity. Improved transit operations and increased ridership also have an enormous positive environmental impact by reducing vehicle miles travelled and GHG emissions.



### Connectivity



### Operations & Congestion Management



### Economic Vitality & Quality of Life

Two transit operators, Tahoe Transportation District (TTD) in the south and Placer County and the Town of Truckee who jointly operate TART in the north, provide local bus services at Lake Tahoe. Short-range transit plans and Coordinated Human Services Transportation Plan outline routes, centers, and services of the existing system; analyze trends such as ridership, revenue, and unmet customer needs; and recommend five-year system upgrades. A Long-Range Transit Plan that outlines a 20-year regional transit vision is expected to be released in 2017. Corridor plans and area plans add transit connection details such as transit center and bus stop locations.

## Existing Transit System

The two regional transit providers, TTD and TART, work together to provide year-round and seasonal services on the North, East, South and West Shores. They also provide commute services to nearby areas such as Truckee to the North, and Carson valley to the East. Washoe Regional Transportation Commission, the Town of Truckee, State Departments of Transportation, and private entities such as ski-resorts also partner with transit providers to offer transit service through cost sharing agreements, formula funding allotments, and private shuttles and taxi services.

**Policy 2.11:** Coordinate public and private transit service, where feasible, to reduce costs of service and avoid service duplication.

### Regional, Local, and Community Services

Typical transit routes offer hourly service, with 30-minute service offered for heavily used routes and during peak periods of visitation in the summer months. Hours of operation vary depending on route, with some routes beginning as early as 5:15 a.m. and ending as late as 2:00 a.m. TART connects the North and West shores of Tahoe to the Town of Truckee year-round. TART also runs a free night shuttle service during summer. TTD provides year-round service throughout the South Shore and connects to the neighboring communities of Gardnerville and Minden. The TTD also connects parts of the West and East shores during the summer with the Emerald Bay Trolley and the East Shore Express. Some local buses also provide connections to trailheads, such as at Spooner Summit. Though many parts of the Lake are served with transit, year-around connections from North to South do not exist.



Crystal Bay, NV Bus Stop Shelter

### Inter-Regional Services

Amtrak and Greyhound provide connections to Lake Tahoe from surrounding areas of California and Nevada, including Sacramento, San Francisco, Sparks, and Reno. These services run three times daily from the Bay Area/Sacramento to and from the Town of Truckee and one time daily to and from Lake Tahoe's South Shore. Trips may require transfers to regional rail or bus service to reach the destination. Charter services are available by commercial companies. Shuttles to the Reno/Tahoe airport from both the North and South shores are available. The North Lake Tahoe Express is managed by the Truckee-North Tahoe Transportation Management Association and the South Tahoe Express is a public/private partnership between the South Tahoe Alliance of Resorts and Amador Stage Lines.

### On-Demand and Recreational Shuttles

TART and TTD supply on-demand services to qualified individuals with special needs who are unable to independently use the fixed-route transit system. Location-specific shuttle service is provided by private companies and public/private partnerships. Though some transit stops are located at recreation destinations, upgrades to transit service and facilities to recreation sites, including connections to the Tahoe Rim Trail can be improved. Major ski resorts, which are large trip generators in the Lake Tahoe Region, also provide shuttle services. These include Homewood Mountain Resort, Squaw Valley/Alpine Meadows, Northstar California, Diamond Peak Ski Area, Sierra-At-Tahoe, and Heavenly Mountain Resort. Some private shuttle companies focus on the needs of the recreational hiker and biker by providing point-to-point pick-up and drop-off. Private providers include Flume Trail Bikes and Over the Edge Tahoe. Since beginning shuttle service in 2015, Over the Edge Tahoe has shuttled an estimated 790 people to Spooner Summit, Dagget Pass, Stage Coach Lodge, and Luther Pass.

**Policy 2.7:** Provide specialized public transportation services for individuals with disabilities through subsidized fare programs for transit, taxi, demand response, and accessible van services.

[illegible]



## Proposed Transit Services

Increasing services at areas of known congestion and visitation “hot spots” is a key objective of the plan. Over the long-term, both transit systems will provide free-to-the-user transit and the crosslake ferry will open for service. Over the next four years, many of the needed service enhancements will begin. On the North Shore, TART projects will increase frequency to 30-minute intervals on all mainline services including routes on SR 89, SR 28, and SR 267. TART will also expand summer, winter and evening service dates and times on most routes, including routes to Truckee. TART will partner with the Town of Truckee to provide more cost-effective paratransit services. On the South Shore, TTD will increase frequency on its U.S. 50 route, extend service to Meyers and Zephyr Cove and increase service frequency and connectivity to the Lake Tahoe Community College. Additionally, TTD will add recreational transit service to Emerald Bay, and Echo Summit. To support these increased operations, TTD will enhance administrative facilities, transit stops and infrastructure operations at the Lake Tahoe Community College, Emerald Bay, and along the East shore. TTD will also work with private entities to enhance transit services to the Region from Sacramento and Reno. All transit improvements will provide enhanced services to residents, commuters, and visitors.

**Policy 2.4:** Improve the existing transit system for the user making it frequent, fun, and free in targeted locations. Consider and use increased frequency, preferential signal controls, priority travel lanes, expanded service areas, and extended service hours



Photo: Jan Colyer

### Residents

Year-round 30-minute service on all main local routes will be offered by TTD and TART. Enhanced on-demand services that decrease waiting times and reduce costs through inter-jurisdictional partnerships.

### Commuters

South shore transit service will extend from the City of South Lake Tahoe to Meyers and will better connect with the Lake Tahoe Community College. North shore transit service will expand frequency, seasonal, and evening service to Truckee.

### Visitors

Recreational service will be provided to Echo Pass, Emerald Bay, and Zephyr Cove, connecting all the way to Incline Village. Inter-regional services will better connect with Sacramento and Reno.

Attractive transit caters to the needs of users, by providing frequent service, reservations, door-to-door service, and the ability to bring dogs, bikes, and recreation equipment.

These projects are described in detail within the respective transit plans which can be found online at:

<http://www.trpa.org/transportation/library/>

Each project can be found online at:

<https://eip.laketahoeinfo.org/Project/TransportationList>.

The complete constrained project list is Appendix B: Project List and Revenue Narrative.

**Lake Tahoe Transit Master Plan**  
Long term transit network

Legend:

- Express (Red line with train icon)
- Local (Yellow line with bus icon)
- Shuttle (Blue line with bus icon)
- Ferry (Blue line with boat icon)
- Ski Shuttle (Red line with ski lift icon)
- Ferry terminal (Blue circle with boat icon)
- Parking (P in a circle)

Logos: Tahoe Regional Planning Agency, Stantec, and a circular logo with a stylized 'S'.

## Incentive Programs

Merely offering transit may not assure ridership. The plan's incentives encourage people to make the choice to shift from individual automobiles to transit or active transportation use.

### Transit Schedule Coordination

Transit coordination makes service more convenient to the rider. Projects will knit together schedules and transfer points and link visitors from their hotel room to the trailhead. Consistent and reliable coordinated transfer times, a guarantee of not being stranded by transit delays, and a single ticket for the entire trip helps remove transfer anxiety for riders. TTD and TART are improving transit coordination through the Long-Range Transit Plan.

**Policy 2.5:** Integrate transit services across the Region. Develop and use unified fare payment systems, information portals, and shared transfers.

### Real-Time Transit Information

People are more willing to ride the bus if they know when it will arrive. Real-time arrival information at transit stops, online, and on smartphones can increase ridership. Both TART and TTD have

**Policy 4.5:** Support the use of emerging technologies, such as the development and use of mobile device applications, to navigate the active transportation network and facilitate ridesharing, efficient parking, transit use, and transportation network companies.

deployed automatic vehicle location systems that allow passengers to find the exact location and will soon include real-time arrival of buses. Real-time information not only benefits passengers, but also helps operators monitor performance by identifying inefficiencies in routes, schedules, and maintenance.

### Free-To-The-User Transit

The elimination of transit fares has proven success at increasing ridership. Over the last few years, TTD has implemented "Spare the Air Days" during peak visitation times and demonstrated dramatic ridership increases by eliminating fares. Both TTD and TART will institute free-to-the-user transit by 2020.

**Interim step:**  
Offering commute hour service that is free-to-the-user.

### Parking Management

The price and availability of parking has a significant impact by shaping how people decide to travel. Where parking is free, disorganized, or un-enforced, as it is along the Region's state highways which provides access to many of Tahoe's most popular recreation areas, roadsides can become crowded



Existing Conditions at Emerald Bay  
Photo: Aurora Photos / Rachid Dahnoun

with parked cars. This uncontrolled parking leads to issues with roadside erosion and public safety. Where parking is perceived as free and unlimited people are less likely to use transit to access those areas or pay for parking in a safer more organized location. Successful parking management strategies help disperse where and when people travel.

Parking strategies are dependent on the location and use of an area. For recreational areas, strategies could include combinations of no time limit parking lots with higher prices, limited and short-term roadway parking with medium prices, and free shuttle service. Through corridor planning, TTD and land management partners are exploring parking



strategies that support improved access to recreation areas. These include a pilot project to test parking pricing along Tahoe's East Shore<sup>2</sup>. This project will also explore using technology to let travelers know about the availability and price of parking in the area via smart phones, online, or changeable message signs.

In developed areas, parking regulations, such as minimum parking requirements, can shape where and how development occurs. Through local area plans, each local jurisdiction develops parking management strategies specific to their communities. Some of the plans, such as the Placer County Area Plan, create shared parking lots in town centers, which can reduce private lots that remain empty when parking is in high demand. Jurisdictions also allow reduced parking requirements for mixed-use development in town centers, where people are much more likely to be able to walk or bike from their hotel or home to retail, restaurants, and other destinations. During peak times, dynamic pricing structures and enforced time limit parking could also encourage the use of transit and active transportation.

#### Parking management strategies include:

- 🚗 Price
- 🚗 Time limit
- 🚗 Location
- 🚗 Reservation ability
- 🚗 Real-time information
- 🚗 Intermodal Connectivity



**Bus and Bike Only Lane, Boston, MA**  
Photo: Morgan Beryl

#### Transit Priority Access

Making transit faster, cheaper, and more convenient is key to increasing ridership and reducing vehicle miles traveled. One method to achieve this is by creating roadway restrictions in targeted locations that only allow transit, bike, emergency, and local traffic during peak periods. These types of projects dramatically reduce vehicle miles traveled and GHG emissions, needing first broad coordination among partner agencies. Transit signal priority which allows buses to start moving before cars at signalized intersections is on the constrained list and is a first step. Adaptive management strategies that hold cars to let buses pass or provide transit only lanes will occur later with additional project funding and partner consultation.

#### Mobility Hubs

Encouraging visitors to use transit to enter and exit the Region depends in part on access being convenient and reliable. One strategy is to partner with surrounding transportation agencies to provide intercept parking lots paired with frequent transit into

the Region. Parking lots and transit services that provide amenities will be more successful. Lots located at airports, train stops, or at secure in town locations with parking spots guaranteed by reservation, frequent and reservable bus service that can carry recreation equipment are all important incentives. For in region locations, lots with opportunities to rent recreation equipment or bicycles at discounted prices are an added incentive. These needs could be served by the construction and operation of Mobility Hubs planned and funded by robust partnerships between agencies and private entities. Seventeen mobility hubs are planned within and outside the Region, which will require identified new funding sources to realize.

#### Incentives could also include:

- 🚗 Onsite & discounted recreation equipment
- 🚗 Shared-ride services
- 🚗 Parking space reservations
- 🚗 Real-time parking availability and congestion-based pricing information

<sup>2</sup> Constrained project list: "Parking Lot Information and Guidance System Integration/Parking Lot Detection System."



Figure 3.4: Complete Transit Vision

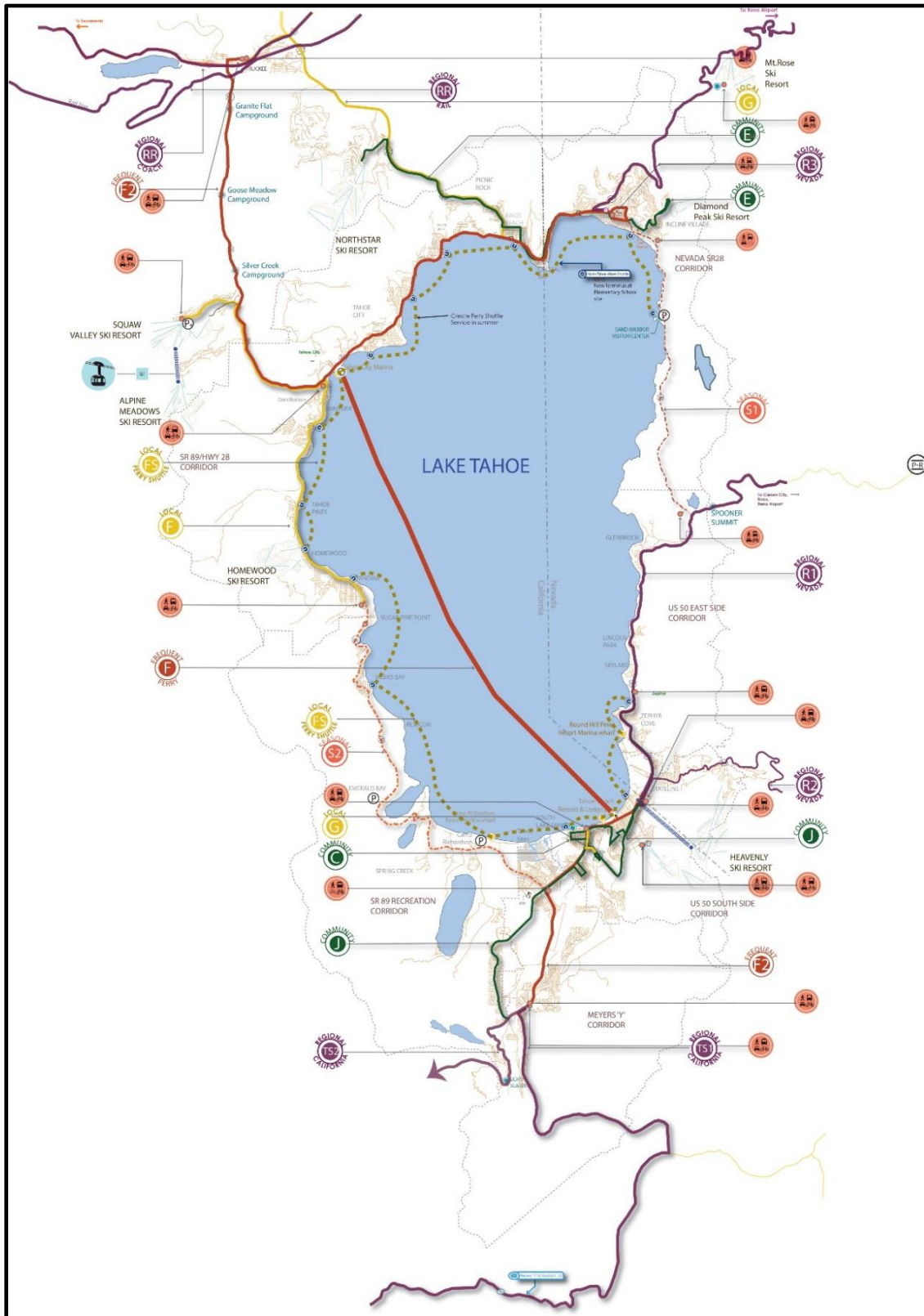


Table 3.2 illustrates differences between existing transit services and transportation enhancements realized with reasonable available funding (constrained list) and service enhancements possible beyond the foreseeable revenue sources for this 2017 plan (unconstrained list).

**Table 3.2: Transit Services: Existing, Constrained and Unconstrained**

Service Type	Existing	Constrained List	Unconstrained List
<b>Community</b>	One-hour service in neighborhoods	30-minute service in neighborhoods	15-minute service in neighborhoods
<b>Local</b>	One hour service on all routes	30-minute service on select routes	15-minute service on select routes
<b>Regional</b>	No year-round North to South shore regional connections	Hourly year-round regional connections	30-minute frequency year-round connections
<b>Regional</b>	No crosslake ferry, limited South shore watertaxi service	Crosslake ferry, complimentary South Shore watertaxi service	Crosslake ferry, complimentary regional watertaxi service
<b>Regional - Recreation</b>	Limited Emerald Bay Trolley service and 20-minute East Shore service from Incline to Sand Harbor.	30-minute and expanded season service to Emerald Bay, 20-minute East Shore Express, and new service to Echo Summit	No additional enhancements planned at this time
<b>Regional - Recreation</b>	No Service from Zephyr Cove to Incline	Hourly and limited season service from Zephyr Cove to Spooner Summit	30- minute service form Zephyr Cove to Incline.
<b>Inter-Regional</b>	Three times daily to Truckee from San Francisco and one time daily to South Lake Tahoe from Sacramento	Two-hour service from Reno to Tahoe City and additional weekend services from Sacramento to South Lake Tahoe	Increased frequency on all inter-regional routes, and enhanced connections from Reno/ Sparks to South Lake Tahoe through subsidies
<b>Inter-Regional</b>	Limited rail service to Truckee/ Reno	Limited rail service to Truckee/ Reno	Frequent Commuter rail service to Truckee/Reno
<b>Infrastructure</b>	Three Transit Centers	No additional transit centers	17 transit centers or mobility hubs within and outside the Region
<b>Program: Transfer Information</b>	Transfer points are not coordinated or well-advertised	Improved scheduled transfer coordination between TTD and TART along East and West shores	Online Transportation Trip Planning Tool
<b>Program: Cost per ride</b>	\$2 per ride	Free-to-the-user on TTD and TART services	No additional enhancements necessary
<b>Program: Adaptive Roadway Management</b>	No priority access	Transit signal priority on California signals implementation	Transit signal priority on Nevada signals, and adaptive roadway management on U.S. 50, SR 89, and SR 267
<b>Program: real-Time Information</b>	Real-time online transit location	Real-time bus arrival on smart phones and CMS signs	Information kiosks at activity centers
<b>Program: Recreation Equipment</b>	No recreation equipment carrying capacity on buses	No recreation equipment carrying capacity on buses	Ability to carry recreation equipment
<b>Program: Parking Management</b>	No parking management systems	Parking management systems in SR 89 Corridor and SR 28 Corridors	Parking management systems throughout the Region



## Trails

The active transportation network is a complex system of shared-use paths, sidewalks, bicycle lanes, bicycle boulevards, crosswalks, ADA facilities and more. Not only does the network need to serve residents, commuters, and visitors, but also people who have varying levels of comfort using active transportation as a method of travel, those who have no other forms of travel, and individuals with special needs such as wheelchair users. For bicyclists, there are those who are experienced and confident. This type of bicyclist is comfortable riding on the roadway with traffic, with or without a bicycle lane. They can be commuters or recreational cyclists. Casual cyclists are less confident, preferring to ride on the roadway only if bicycle lanes and other enhancements such as bike boxes at intersections are present or will opt to use a separated shared-use path if it does not take them too far off their direct route. The third category, interested but concerned bicyclists, are typically families or inexperienced riders. If they do ride, they typically will only go places where they can use separated shared-use path the entire way.



Bicycling and walking attracts people for both transportation and recreation. Residents and visitors use separated shared-use paths and our roadway network to enjoy the Tahoe landscape and gain access to beaches or to train and compete in races. Commuters use the network to get to work, school, and to visit friends. A successful active transportation network is about creating an equitable roadway system that addresses the needs of all users. The plan includes many short-term projects that will close gaps and increase safety on the existing network, and will provide residents, visitors, and commuters many of the facilities they need to recreate and travel to their destinations. For projects not yet undergoing design, the plan conserves \$10 million dollars that are located in the Active Transportation Plan and may become construction ready before the 2021 Regional Transportation Plan. To complete the largest gaps in the network, the areas connecting Crystal Bay to Incline Village and Spooner Summit to Stateline Nevada which traverse geographically challenging areas and multiple jurisdictions, will require largescale investment, coordinated partnerships, and funding not yet identified.

### Designing for all users of the transportation system means:

- 1 Right sizing roadways to include vehicle lanes, left turn pockets, and bicycle lanes.
- 1 Optimizing signalized intersections so bicyclists and pedestrians are detected and have a leading head start before cars begin to move
- 1 Appropriately distancing crosswalk opportunities so people can access their neighborhoods, commercial centers, and jobs without to cross without appropriate infrastructure
- 1 Providing shared-use paths that take children the entire way to school from home
- 1 Adhering to ADA requirements so wheelchair users, visually disabled and the hearing impaired can get to their destinations safely.
- 1 Providing year-round access through snow-removal, annual maintenance, and detours during construction.



## Trails Goals, Policies, and Plans

No matter why people use active transportation or the type of user they are, connectivity, safety, and system preservation are the key elements that encourage consistent and increased active transportation. Regional policies for active transportation are Goal 4, Connectivity, Goal 5, Safety and Goal 6, System Preservation. Additionally, increasing the number of people who choose to ride their bike or walk to their destinations greatly enhances economic vitality and quality of life, and preserves the environment by reducing vehicle miles traveled and GHG emissions.



Connectivity



Safety



System Preservation

**Policy 2.12:** Develop and maintain an Active Transportation Plan as part of the regional transportation plan. Include policies, a project list of existing and proposed bicycle and pedestrian facilities, and strategies for implementation in the Active Transportation Plan.

All levels of government plan active transportation infrastructure, though for projects to receive federal or state construction funding they must be included in the regional Active Transportation Plan and Regional Transportation Plan. Community and advocacy groups are important partners in planning, designing, and educating about the active transportation network, as shown in the construction grant award success of the AI Tahoe

Safety and Mobility Enhancement Project. TRPA's 2016 Active Transportation Plan (ATP) outlines a comprehensive, region-wide bicycle and pedestrian system that includes all locally supported projects and community identified areas of needed improvement. The ATP does not offer specific project design or exact alignments; however, it does provide a suite of tools to support implementing agencies while designing and constructing projects. The ATP prioritizes projects that close gaps in connectivity, have high estimated use, reach desired destinations, increase safety, connect to other modes of transportation, are cost-effective, and increase economic vitality. Identified high-priority projects are focused on Class-I paths, corridor revitalization, and complete street projects such as the City of South Lake Tahoe's South Tahoe Greenbelt and the Nevada Stateline to Stateline Bikeway.



Kings Beach, CA  
Photo: Aurora Photos / Rachid Dahnoun



**Policy 3.1:** Coordinate the collection and analysis of safety data, identify areas of concern, and propose safety-related improvements that support state and federal safety programs and performance measures.

Bicycle and Pedestrian Road Safety Audits (RSAs) are also vital planning studies that identify safety concerns within roadway corridors that can be addressed through enhanced design, lowering vehicle speeds, adding infrastructure, and formalizing partnerships. Since 2012, the Tahoe Region has received technical assistance from the Federal Highway Administration to complete three RSA's located in Tahoe City, the town of Meyers, and the City of South Lake Tahoe<sup>3</sup>.

**Tahoe relevant critical emphasis areas:**

Intersections  
Pedestrians  
Bicycling  
Aging Road Users  
Data

Starting in summer 2017, partners will develop a Lake Tahoe Region Safety Plan which will use best available data to identify areas of concern for all roadway users and recommend re-designs and improvements that will improve safety. Both California and Nevada recently updated their Strategic Highway Safety Plans and have identified critical emphasis areas. The Lake Tahoe Region Safety Plan will address these emphasis areas and position identified projects for funding.

## Existing Trails Network

State, local, and regional agencies such as departments of transportation, local jurisdictions, public utility districts, school districts, and transportation districts, build and maintain the active transportation network. In total, the current network includes roughly 50 miles of shared-use path, 44 miles of bicycle lanes, 23 miles of sidewalks, and four enhanced crosswalks that include a pedestrian active beacon or rapid flashing beacon. The USFS also operates and maintains 350 miles of National Forest System Trails and 250 miles of National Forest System Roads. Partners work together to ensure consistency in design standards, and to coordinate maintenance plans such as snow removal procedures. Snow removal on shared-use paths is becoming increasingly common at Lake Tahoe, with the City of South Lake Tahoe, El Dorado County, the Tahoe City Public Utility District, and Placer County all removing snow on select facilities. Additionally, year-round bicycle and pedestrian monitoring is performed throughout the Region.

**Policy 2.14:** Construct, upgrade, and maintain pedestrian and bicycle facilities consistent with the active transportation plan.

## Off Roadway Infrastructure - Separated Paths and Sidewalks



Meyers Bikeway, Sawmill Rd.  
Photo: Mike Vollmer

These facilities provide pedestrians, bicyclists, skateboarders, and special need users with safe, designated areas to travel and recreate. The Region has over 70 miles in separated class-I shared-use paths and sidewalks. These routes are well-connected in some areas and have gaps in others. Caltrans and local jurisdictions have constructed sidewalks along the state highway system through town centers and more are planned. Local jurisdictions are connecting Class-I shared-use paths around the lake, providing links across communities and to neighboring areas. Examples include the connection from the City of South Lake

<sup>3</sup> To be completed in Spring 2017

Tahoe to Meyers via the Sawmill bike path, and the 25 miles already built of an eventual 72-mile “Tahoe Trail” paved path that will loop the entire lake. Separated shared-use paths are the public’s preferred infrastructure type for active transportation, providing a dual benefit as a travel route and recreational opportunity.

### On-Street Infrastructure – Bike Lanes and Bike Routes

Bicyclists who are comfortable sharing the roadway with vehicles and want to take the most direct route to their destination can use a comprehensive on-roadway bicycle infrastructure system. Much

**Policy 2.18:** In roadway improvements, construct, upgrade, and maintain active transportation and transit facilities along major travel routes. In constrained locations, all design options should be considered, including but not limited to restriping, roadway realignment, signalization, and purchase of right of way.

of the state highway system has dedicated bike lanes where space allows. In more constrained areas, shoulders are provided. In some locations, such as the ascent to Emerald Bay or along the East Shore of U.S. Highway 50, bicyclists may need to use the full vehicle lane for safety because shoulder space is unavailable. On local, low-volume and low-speed roads, bike routes help keep the on- and off-street systems connected. Examples include Eloise Avenue in the City of South Lake Tahoe and Sequoia Avenue in Sunnyside on the West Shore. Bike routes include signage and painted markings on the roadway to indicate to all users that the roadway is a shared space.

### Connecting Off-Street to On-Street – Crosswalks and Roundabouts

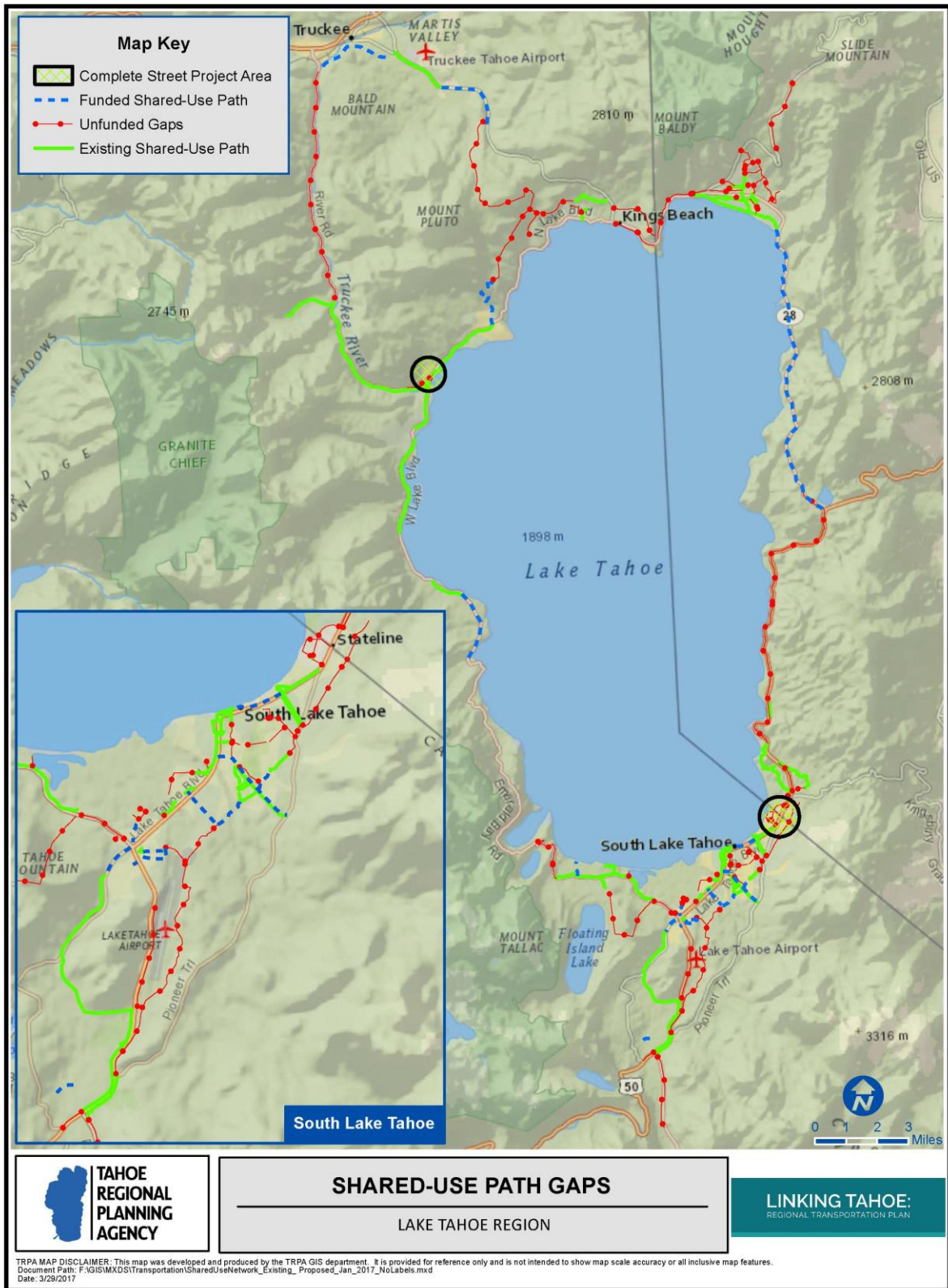
Accessibility to destinations can be severely hindered by the inability to safely cross the street. These gaps in connectivity can discourage people from biking or walking for transportation. Some Lake Tahoe communities have well-spaced crossing opportunities, such as Tahoe City, the newly updated roadway in Kings Beach, and the enhanced crosswalks constructed in Incline Village. Locations in City of South Lake Tahoe, Tahoma, Meyers, and Douglas County lack crosswalk opportunities, encouraging people to cross in areas without crosswalks and bike in the wrong direction. Roundabouts are another infrastructure design that provide crossing opportunities to vulnerable roadway users while simultaneously lowering the speed of vehicle traffic, increasing safety for all travelers. Roundabouts have been installed in Kings Beach, just outside of Incline Village, and may soon be constructed in Tahoe City and Meyers.

**Policy 3.5:** Design projects to maximize visibility at vehicular, bicycle, and pedestrian conflict points. Consider increased safety signage, site distance, and other design features, as appropriate.





Figure 3.5: Shared-Use Path Gaps



## Proposed Trails Network

This plan will deliver active transportation projects that connect residents and commuters to schools and jobs, provide visitors recreational access, and enhance commercial centers. Most of the projects on the constrained list already have secured funding. Corridor Revitalization projects include complete streets design and

additional active transportation investments through a comprehensive “bundled approach” to project construction. The constrained project list identifies eleven active transportation projects. Five projects in the City of South Lake Tahoe include shared-use paths, sidewalks, and intersection improvements. The City’s projects target high volume pedestrian areas, school districts, and revitalization near the South Tahoe “Y”. El Dorado County will connect Tahoe Mountain residents to Meyers and the magnet elementary school on a shared-use path, bicycle routes, and bridge to protect environmentally sensitive land. NDOT will complete the first section of the East Shore Tahoe Trail from Sand Harbor to Incline Village. The Tahoe Transportation District will continue to plan and build the East Shore Tahoe Trail from San Harbor to Spooner Summit. The California Tahoe Conservancy will build out the first two phases of the South Tahoe Greenway, increasing neighborhood access from Sierra Tract to Lake Tahoe Community College. Placer County will continue their recreational investments on the Resort Triangle by building the North Tahoe Regional Trail. The USFS will increase beach access and reduce vehicle and active transportation conflicts by building a shared-use path from SR 89 to Baldwin Beach.

**Policy 2.19:** Encourage jurisdiction partners to develop and plan coordinated wayfinding signage for awareness of alternative transportation modes including transit (TART/BlueGO), pedestrian, and bicycle facilities.



### Residents

Shared-use paths on the South Shore on U.S. Highway 50, Al Tahoe Boulevard, Lake Tahoe Boulevard, and San Bernardino will close gaps in the network providing safer, more convenient access to neighborhoods, jobs, schools, and commercial centers.

### Commuters

Sidewalks and lighting on Pioneer Trail will increase safety for the many pedestrians who work in the Casino Core and travel home at late hours.

### Visitors

The East Shore Tahoe Trail will connect Incline village to Spooner Summit providing beach access and gorgeous mountain views.

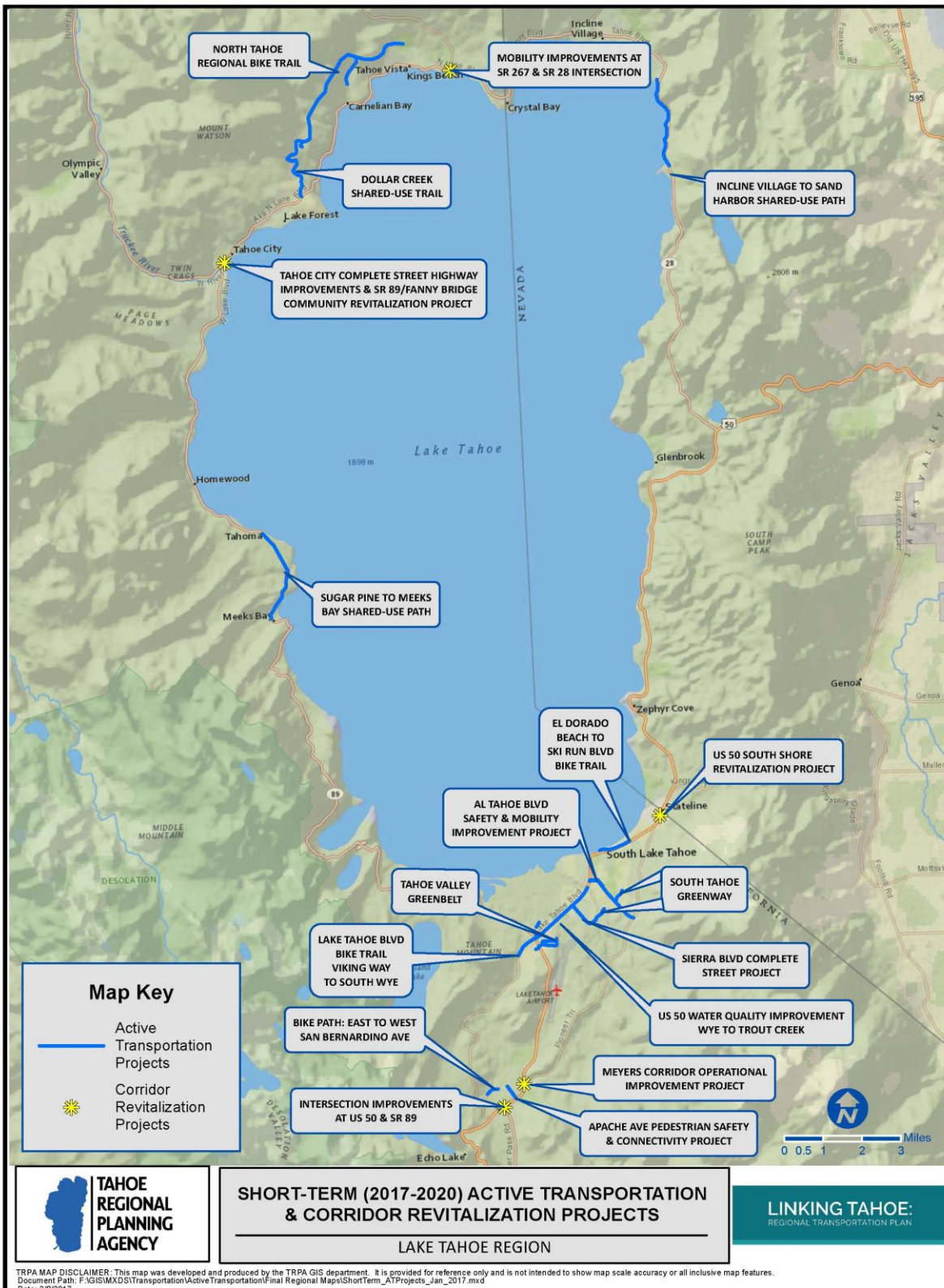
Active  
Transportation  
provides health  
benefits for people  
and is gentle on  
the environment.

These projects are described in detail within the 2016 ATP and each project can be found online at <https://eip.laketahoeinfo.org/Project/TransportationList>.

The complete constrained project list is Appendix B: Project List and Revenue Narrative.



Figure 3.6: Short Term (2017-2020) Active Transportation and Corridor Revitalization Projects



## Incentive Programs

Better, more consistent use of Tahoe's extensive network of shared-use paths can be achieved with effective incentives offered through education, employer programs, and readily available supporting amenities.

### Employer Trip Reduction

Employer managed programs can encourage employees to make different transportation choices to and from work by providing financial incentives and enhanced convenience. The employer trip reduction ordinance<sup>4</sup>, specifies employer investment in programs to reduce employee vehicle trips. Businesses can provide information to employees about transportation options or promote trip reduction plans including rideshare, offering an employee shuttle, or transit pass subsidies. Employers can also help educate employees by providing transportation option information during the employee onboarding process. New employees may be an optimal group to target as they have not yet established a regular commute routine. Now with advances in technology and other upgrades in Lake Tahoe's transportation system, more trip reductions can be gained by working closely with employers on additional strategies.

#### Some examples of commute benefit package strategies:

- Providing free or discounted transit passes
- Guaranteed ride home services
- Bicycle fleet
- Bonuses for using alternative transportation
- Free bicycle tune-ups

### Education & Encouragement

Awareness programming encourages residents, commuters, and visitors to use active transportation. Successful programs derive from joint effort among state departments of transportation, local jurisdictions, law enforcement, advocacy groups, and local organizations. Campaigns that include encouragement, education and awareness, evaluation, and enforcement all work together to increase active transportation, improve safety, and gather valuable community feedback. Existing programs include the Lake Tahoe Bike Challenge, Safe Routes to School

**Policy 3.3:** Coordinate safety awareness programs that encourage law abiding behavior by all travelers.

education series, and Bike Safe Lake Tahoe media campaign. Online and smartphone maps also help inform new users about the network, provide an avenue for feedback on needed improvements, and can help partners understand commute patterns. The Lake Tahoe Bicycle Coalition recently released Tahoe's first interactive bicycle map at <http://map.tahoebike.org/>.

### First and Last Mile Amenities

People are more likely to ride a bike to a destination or the bus stop if they know certain amenities are in place. Secure bicycle parking provides riders protection from bike theft. The ability to bring your bike on transit helps commuters get to the bus stop and to their destination quicker. For residents who do not have a bike, or visitors who are unable to bring their bike, bikeshare systems allow inexpensive access for short trips.

Table 3.3 illustrates differences between existing active transportation facilities, and the additional mileage that will be realized with this plan's reasonably available funding (constrained list) and the planned mileage possible beyond the foreseeable revenue sources for this 2017 plan (unconstrained list).

**Table 3.3: Active Transportation Infrastructure: Existing, Constrained, and Unconstrained**

Infrastructure Type	Existing	Constrained List	Unconstrained List
Separated Shared Use Paths	49.85 miles	25.71 miles	57.07 miles
Bicycle Lanes	44.24 miles	21.20 miles	25.09 miles
Bike Routes	8.88 miles	0 miles	25.79 miles
Sidewalks	23.55 miles	0.46 miles	2.14 miles
Total	126.52 miles	47.37 miles	110.09 miles

<sup>4</sup> Section 65.5 of the TRPA Code of Ordinances



## Technology

Technological innovation and planning for the future is a pillar of this plan. Technology projects are often complements to infrastructure projects, can be stand-alone investments, or support future projects through advanced data collection and monitoring techniques. Residents, commuters, and visitors use varying types of technological services to inform travel decisions including time of travel, type of mode, and use of electric or zero-emission vehicles. Agencies use technology to monitor effectiveness of existing services, keep the traveling public safe during intense weather conditions, preserve the environment by using state-of-the-art maintenance equipment, and plan for the future by building electric vehicle infrastructure and planning for autonomous vehicles. With a relatively fixed roadway system, technology aids in maximizing efficiency.

Technology is constantly changing and becoming more sophisticated. Lake Tahoe partners continue to expand their use of technological advancements to serve residents, commuters, and visitors through technology additions to transit, trails, and transportation system management projects. Improving the basic fiber optic infrastructure throughout the Region is needed to increase utilization of advanced technologies. Technological projects specifically called out in this plan will improve real-time information accessibility, optimize signalization, increase data collection and transparency, proliferate electric vehicles in personal and public fleets, and improve transit safety and security. Additional technological improvements, such as weather variable speed signs, a region-wide transportation trip planning tool, and information kiosks at activity centers are possible only with new sources of funding (unconstrained list).

### Technological improvements serve residents, commuters, visitors, and public agencies:

- Infrastructure that encourages the use of electric and zero-emission vehicles
- Enhanced crosswalks to provide safety for bicyclists, pedestrians, and users with special needs while stabilizing vehicle traffic flow by controlling crossings
- Smartphone and online tools such as interactive maps and real-time information on bus arrival, bus location, trail locations, bicycle parking locations and parking availability
- Optimized signalized intersections that improve traffic flow to respond to peak period and location specific congestion
- Online data and analysis portals to increase transparency of how the transportation system functions and progress toward meeting regional goals
- Robust monitoring of traffic and active transportation volumes to help identify high use locations
- Changeable message signs at strategic street and bus stop locations to provide equitability accessible safety and travel time information
- Night sky friendly lighting features that protect scenic quality and increase safety for bicyclist, pedestrians, and users with special needs
- State-of-the-art equipment preserves the environment by reducing stormwater runoff, decreasing GHG emissions, and efficiently maintaining roadways



## Technology Goals, Policies, and Plans



### Environment



### Safety



### Operations & Congestion Management



### System Preservation

coordination, signal queue-jump for buses, bikes, and pedestrians, bicycle signal detection, emergency response signal override, and pedestrian hybrid beacons. Technology also preserves the environment through using best available technologies in equipment, construction, and vehicle type.




Communication improvements, optimizing intersection functionality, and increasing electric and zero-emission vehicle use help meet the regional goals of environment, safety, operations and congestion management, and system preservation. The “dig once” policy under Goal 6, System Preservation addresses communication and supports the Tahoe Prosperity Center’s “Connected Tahoe Project” by requiring project implementers to include community supporting conduit where appropriate. Optimizing intersections, addresses congestion management and safety by improving traffic flow, movement predictability, and accessibility. Examples of intersection improvements include signal timing and

**Policy 6.3:** Make “dig once” the basin-wide standard, requiring public and private roadway projects to accommodate the installation of conduit to support community needs. (e.g: fiber optic,

Regional partners collaborate on a variety of work groups and publish plans to ensure technological advancements are included in existing and future projects. To utilize emerging technologies efficiently and effectively, the Tahoe Prosperity Center’s “Connected Tahoe Project” seeks to expand high-speed internet service throughout the Region. The Sacramento Area Council of Governments (SACOG) convenes an Intelligent Transportation System (ITS) Committee which is a forum for technical staff to share information, coordinate on project planning and implementation, and provide advice and input to SACOG on ITS funding advocacy efforts. NDOT’s Operation Management Group, which comprises eight agencies, meets monthly to identify and deploy

### Autonomous Vehicles are on the Way

*Some experts predict that by 2035, 25 percent of vehicles on the road could have autonomous features, with full market saturation of autonomous vehicles by 2050.*

-  **Transportation Network Companies** may dominate the automated vehicle market, dramatically declining private vehicle ownership. Conversely, research also suggests **private ownership** of autonomous vehicles may become the norm. Single person private vehicle trips may proliferate and increase commutes or leisure travel. Additionally, vehicle trips with no-person occupancy may begin and could increase congestion.
-  **Parking and roadway capacity** need may be substantially reduced as more people use shared rides or subscription services. **Dynamic pricing policies** that assign costs to parking and driving could help support this shift.
-  **Public transit** could change drastically with the possibility of automated buses and an adaptive route system. Operating at less cost and more efficiently while increasing accessibility to underserved areas could increase ridership.

operations technologies. Nevada also recently applied to the United States Department of Transportation to fund autonomous vehicle planning. TRPA's 2015 Tahoe Basin Intelligent Transportation Systems Strategic Plan identifies technological advancements, is a tool that encourages inter-agency cooperation, and prioritizes recommended projects by cost efficiency and maximum benefit to roadway users.

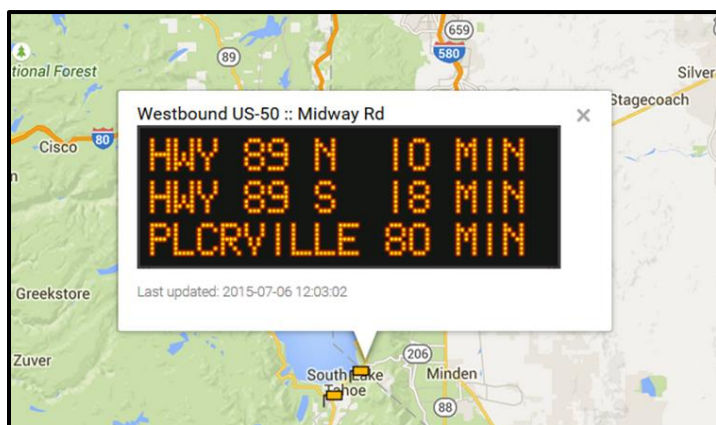
Finally, a partnership between TRPA and Truckee-Donner Public Utility District supported by the California Energy Commission will publish a Plug-In Electric Vehicle Readiness Plan in Spring of 2017. The goal is to establish the Tahoe-Truckee Region as a plug-in electric vehicle (PEV) destination, gateway, and leader in mass deployment supported by robust education and engagement, a convenient network of charging infrastructure, streamlined charger installation, and standardization of policies. Improved access to charging infrastructure will enable PEV owners to travel more miles using electricity<sup>5</sup>. The readiness plan is expected to accelerate the deployment of charging infrastructure and adoption of PEVs by residents and visitors contributing to the Region's overall reduction in GHG emissions per capita.

## Existing Technology Systems

The Tahoe Region implements technology improvements to benefit residents, commuters, visitors and public agencies. Recent improvements include: increasing transportation safety and security with real-time travel information, online interactive maps, and enhanced data collection and transparency. Alternative fuel readiness planning is also underway, which identifies existing and needed infrastructure updates to increase electric and zero-emission vehicle fleets.

### Real-Time Travel Information

Alerts on traffic congestion, safety hazards, emergencies, construction detours, and routine maintenance are easily communicated by real-time information technologies that use road sensors and cameras to display traffic information. Pre-travel online forums such as California 511 and Nevada 511 offer statewide road alerts, controls, incidents, and construction information. Weather



Caltrans 511 website: <http://quickmap.dot.ca.gov>

and natural disaster conditions such as air quality and wildfire locations are also available online through AirNow, Calfire, and the U.S. Forest Service's InciWeb. Changeable message signs installed on U.S. Highway 50, SR 89, and SR 207 display safety and travel time information. TART and TTD use online and mobile applications to provide exact bus location, arrival times, and to manage fleet operations. Highway advisory radios provide a synchronized notification system accessible on AM radio stations. Flashing roadway lights notify motorists to tune in to the radio for alerts.

### Data Collection

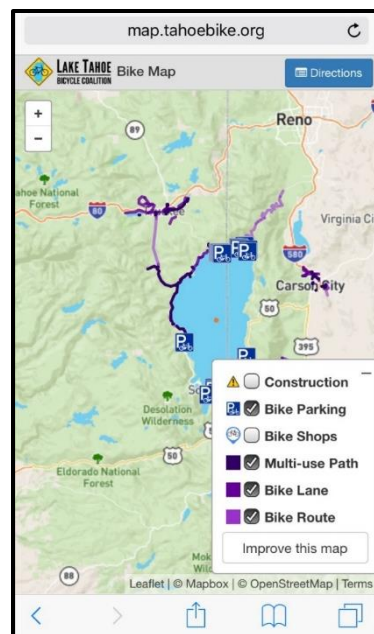
Technologies used to provide real-time travel information to the public also assist agencies in data collection. Logged information is used to create user trends, improve system functionality, and apply for construction funding. Remote sensors, cameras, loop detectors, and passive infrared counters installed on roadways and bike trails are just some of the tools Tahoe and State agencies are using to understand demand and road conditions. More recently partners are utilizing anonymous mobile phone data. This data is filling gaps in our understanding of annual visitation

<sup>5</sup> Research shows 90% more charging events per week compared to unplanned deployment of PEV charging infrastructure. Idaho National Laboratory, 2015.

and high use recreation destinations. TRPA provides a multitude of regional data sets and provides a regional data clearinghouse through [www.laketahoeinfo.org](http://www.laketahoeinfo.org).

### Online Interactive Maps

Lake Tahoe partners use geographic information systems for public facing interactive maps. TRPA provides a mapping tool (<http://gis.trpa.org/bikemap/>) displaying active transportation infrastructure and a 75-foot buffer zone. This tool is used by people interested in building or redeveloping properties and triggers additional requirements if a project is within the 75-foot zone of an existing or proposed active transportation project. The Lake Tahoe Bicycle Coalition developed an interactive bike route map at [www.tahoebike.org/map](http://www.tahoebike.org/map), partially funded by TRPA's On Our Way grant program. The map helps residents and visitors decide which route to take, and crowd-sources information on needed infrastructure upgrades. The map is mobile-friendly and can be printed for offline use.



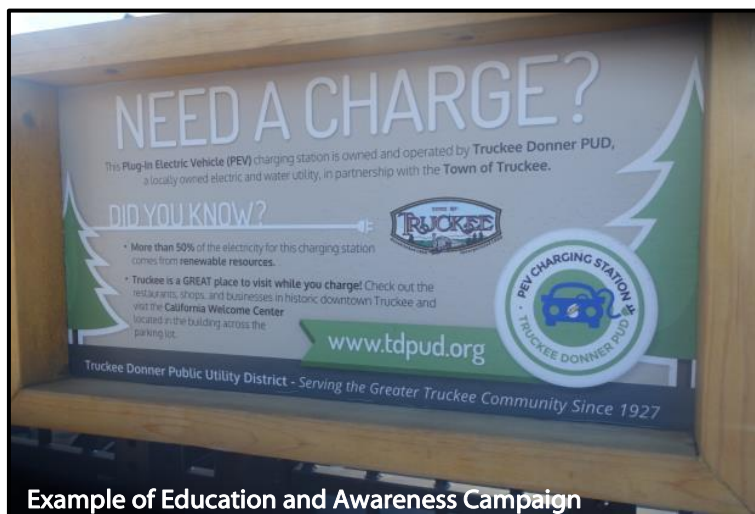
**Interactive Bike Map:**  
[www.tahoebike.org/map](http://www.tahoebike.org/map)

### Safety

Technologies that improve safety for all roadway users are being adopted. The Cave Rock safety project installed sensors that detect bicyclists entering the tunnel and alert vehicles to their presence. Closed circuit television cameras are installed on transit buses and transit centers to increase security, and are used for construction and traffic flow monitoring in Kings Beach. To encourage better driver behavior, NDOT and Caltrans have installed variable speed signs which flash driver speeds over the enforceable limit on U.S. 50, State Route 89, State Route 267 and State Route 28.

### Alternative Fuels Infrastructure

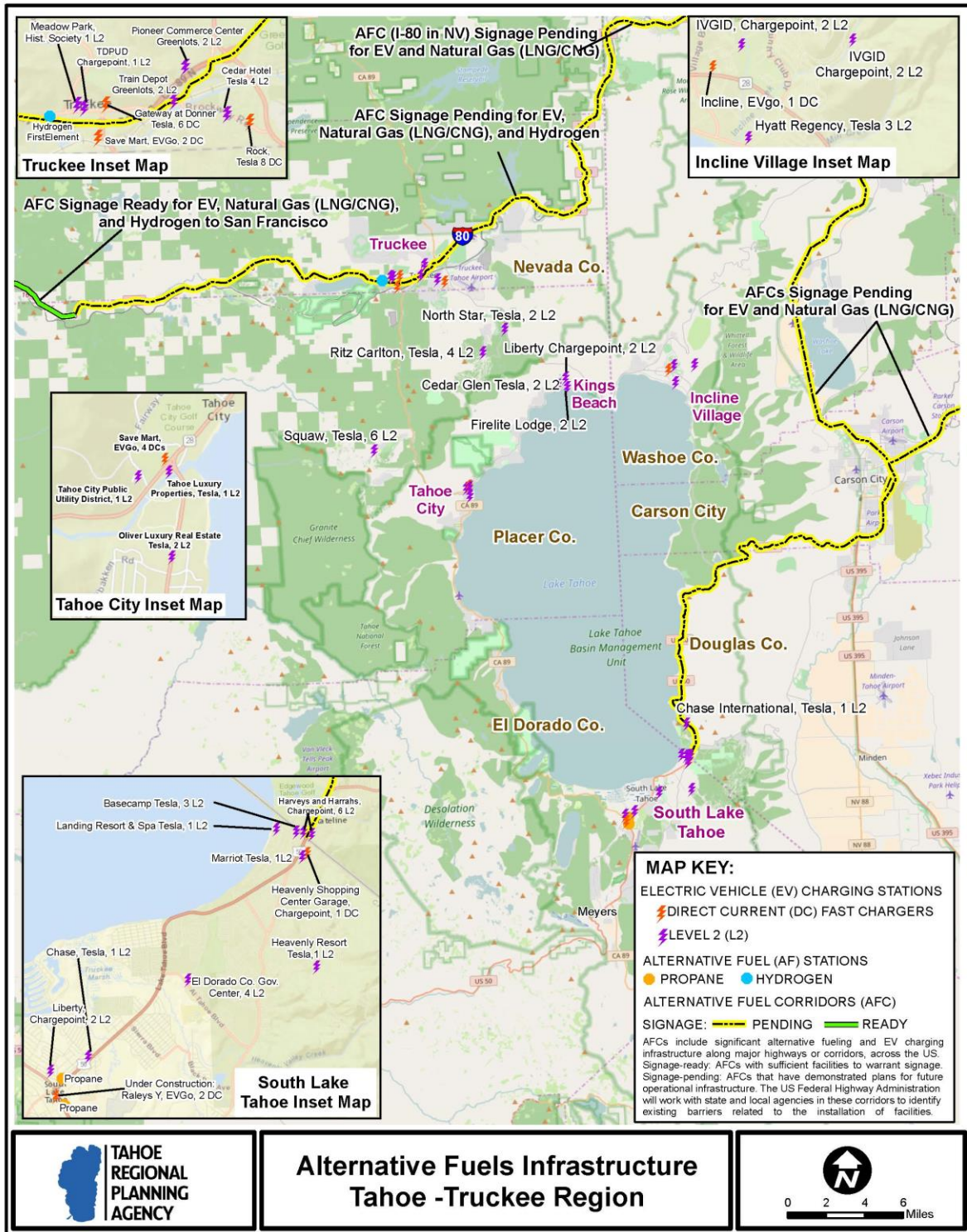
The rapid deployment of alternative fuels infrastructure will increase use of electric and zero emission vehicles. The FHWA has established a national network of alternative fueling and charging infrastructure corridors for electric, natural gas, hydrogen, and propane fuel vehicles across the nation. These corridors are designated as signage-ready if they have sufficient facilities or signage-pending if they have demonstrated plans. Work conducted for the PEV Readiness Plan illustrates that Interstate 80 and U.S. Highway 50 are designated signage-pending alternative fuel corridors for PEVs and natural gas and hydrogen fueling for the CA side of I-80. Alternative fuels infrastructure is growing steadily in the Region particularly for electric vehicles. However, many of the electric vehicle stations lack public access and few are located at workplaces. A total of 32 non-residential charging locations are operational, with one additional station underway in the City of South Lake Tahoe. At these stations, around 80 different charger plugs are provided, offering varying levels of accessibility and power delivery. Publicly accessible direct current fast chargers provide convenient, rapid delivery of power in less than an hour. The majority of fast chargers are located in Truckee with a few located in Tahoe City, the City of South Lake Tahoe, and Incline Village. Partners are working to fill in infrastructure gaps to enhance accessibility of alternative fuel infrastructure and encourage the use of zero emission vehicles.



**Example of Education and Awareness Campaign**



Figure 3.7: Alternative Fuels Infrastructure in Tahoe-Truckee Region



TRPA MAP DISCLAIMER: This map was developed and produced by the TRPA GIS department. It is provided for reference only and is not intended to show map scale accuracy or all inclusive map features. The material on this map was compiled using the most current data available, but the data is dynamic and accuracy cannot be guaranteed. EV and AF Station info is from the US Department of Energy Alternative Fuels Data Center Station Locator. Document Path: F:\GIS\MXDS\PlugElectVeh\AltFuelsRegionalMap.mxd

## Proposed Technological Improvements

This plan will continue to deliver technological improvements that provide real-time information using smartphone applications on bus arrival, road conditions, and parking availability and dynamic pricing to residents, commuters, and visitors. Signals along the South shore will be optimized to better address peak demand visitation and provide safe and equitable access to bicyclists, pedestrians, and those with special needs. Transit signal priority will also be introduced on the South shore to make transit a more convenient and attractive option for commuters and visitors. Changeable message signs and traffic monitoring equipment will become more common on the Nevada side of the Region to enhance safety, manage congestion, and understand travel demand. Maintenance equipment will be upgraded to preserve the environment and enhance efficiency of maintenance activities. Alternative fuel infrastructure and public fleets will begin rapid deployment through implementation of the Plug-in Electric Vehicle Readiness Plan. Partners will collaborate to identify subsidy programs for partnerships with ridesharing companies to fill gaps where transit or active transportation cannot accommodate traveler needs. Additional technology projects such as weather variable speeds signs, a region-wide transportation trip planning tool, and information kiosks at activity centers are desired but require newly identified funding.

**Policy 2.6:** Consider waterborne transportation systems using best available technology to minimize air and water quality impacts in coordination with other modal options, as an alternative to automobile travel within the Region.



Example of information kiosks at activity centers. Portland, Oregon.

These projects and more are described in detail within the [Tahoe Basin Intelligent Transportation Systems Strategic Plan](#).

More detailed project information can be found online at:

<https://eip.laketahoeinfo.org/Project/TransportationList>.

The complete constrained project list is Appendix B: Project List and Revenue Narrative.

### Residents

Deployment of electric public fleets will increase health by improving air quality. Charging infrastructure will encourage electric and zero-emission vehicle ownership.

### Commuters

Smartphone, online and changeable message signs at transit stops will provide real-time bus arrival information, encouraging increased ridership.

### Visitors

Online and smartphone parking availability and dynamic pricing information will assist visitors to determine which recreation destinations to visit, at what time and will shift people to taking transit.

### The Dig Once Policy

- 1 Conduit is installed when digging occurs for projects, allowing easy upgrades to communication lines, increasing broad-band coverage.
- 1 Provides opportunities for synchronization and connection of traffic signals, improving traffic flow.
- 1 Parking management systems also benefit by encouraging installation of real-time information systems during routine maintenance or new construction.
- 1 Challenges to delivering the Dig Once Policy include finding appropriate funding sources.



## Incentive Programs:

Travel behavior may be influenced for different reasons by different people, some by economics and others by convenience or quality of experience.

### Rewards for Using Electric Vehicles or Travel Alternatives

To encourage the use of travel alternatives, some users may respond to economic incentives such as providing resident and visitors guaranteed and free entrance to beaches and recreational sites, reduced-priced tours at local museums, and discounts on lodging, dining, and retail shopping for riding transit or using electric vehicles. Increasing PEV charging and zero emission vehicle (ZEV) infrastructure, offering ZEV tax credits for purchases, and lower or no parking fees are rewards that could encourage use of ZEVs. A coordinated approach for incentivizing electric vehicle use is identified in the Tahoe-Truckee Plug-In Electric Vehicle Readiness Plan.



Tahoe Fund Director, Amy Berry on electric bicycle

### Roadway Traveler Information

Providing real-time roadway condition information including current traffic levels, accidents, weather conditions, construction activities, and chain requirements help travelers make informed choices. The goal of this strategy is to provide travelers with timely, accurate, and equitably accessible information about travel delays and conditions. Providing information kiosks at activity centers, travel time dissemination, and increasing cellular coverage address these communication needs. One form of travel time dissemination is the use of visual displays, such as live video of current conditions at strategic locations, like the base of ski resorts or in hotel lobbies. Changeable message signs do and will continue to communicate information to travelers. Additional strategies are on the unconstrained project list and require newly identified funds.

### Partnerships with Transportation Network Companies

With the introduction of transportation network companies, visitors and commuters have new transportation options. Companies like Waze, Lyft, and Uber<sup>6</sup> now offer carpool functions that connect commuters to share the cost of a ride. These systems use smartphone applications to schedule and charge fees for trips which can be competitive with public transportation costs. These services also improve convenience by solving the “last mile gap” problem. Often, visitors and commuters are discouraged from taking transit because it does not deliver them close enough to

their destination. Capitalizing on the availability of these services can switch vehicle commute trips to carpooling or increase commuting by bike, walk, or transit, as commuters will have the security of knowing that they can call on a TNC in the case of bad weather or a missed transit connection<sup>7</sup>.

Especially interesting as a possible model are the partnerships between Ford Motor Company and the private company Chariot. Using 15-seat Ford Transit vans, Chariot, which was recently

#### Ways to Partner with TNCs:

- ❖ Subsidized rates during peak travel times where TNCs provide a shuttle-like service
- ❖ Subsidy to pay for cost of adding the ability to carry recreation equipment on private vehicles for recreation shuttling
- ❖ Encourage a limited boat-share system where personal motor boats are used for commute trips rather than a personal car.

<sup>6</sup> Lyft and Uber are currently operating in Lake Tahoe.

<sup>7</sup> Brustein, 2016.



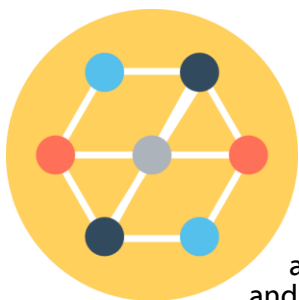
acquired by Ford, provides rides for up to 14 people who are requesting a ride along a common route. Advances in technology allow the creation of these routes through crowdsourcing by aggregating desired pick-up and destination data from user interactions with the mobile-app and determining which routes to serve once interest reaches a tipping point.<sup>8</sup> In the Tahoe Region, this type of system could work well for residents and visitors in remote neighborhoods that are not well-served by public transit mainlines. Squaw / Alpine ski resorts are already piloting similar programs.

Table 3.4 illustrates differences between existing and additional technology infrastructure, realized by this plan's reasonably available funding (constrained list) and the planned technologies possible beyond the foreseeable revenue sources for this 2017 plan (unconstrained list).

**Table 3.4: Technology Infrastructure: Existing, Constrained, and Unconstrained**

Technology Infrastructure	Existing	Constrained List	Unconstrained List
Real-time parking information applications	None existing	Smartphone and online parking availability and fee information for SR 28 Corridor	Region-wide parking availability and fee information
Real-time travel information on changeable message signs	Signs located on SR 89, SR 207 and US 50	Additional signage on SR 28	No additional enhancements planned at this time
Real-time transit arrival information	Online bus locator systems and limited bus arrival information	Smartphone and online bus arrival information region-wide	No additional enhancements planned at this time
Signal coordination	South shore signal coordinated in certain areas	Corridor wide signalization that is optimized by traffic patterns and for multi-modal users.	No additional enhancements planned at this time
Transit signal priority	None existing	Transit signal priority on California signals	Transit signal priority on Nevada signals
Electric and zero emission vehicle infrastructure	Some public electric vehicle fleets and 32 charging stations	Increased electric vehicle public fleet and vehicle charging stations	Appropriate and supporting build out of public fleet infrastructure
Weather variable speed signs	None Existing	None planned	Deployed region-wide
Transportation Trip Planning Tool	None Existing	Coordination among partnering agencies underway	Region-wide transportation trip planning tool
Incentive Program: PEV and ZEV	None Existing	Priority electric vehicle parking	Guaranteed and free entrance to beaches and recreational sites, reduced-priced tours at local museums, and discounts on lodging, dining, and retail shopping
Incentive Program: Partnerships with TNCs	TNCs operating independently at Lake Tahoe	Public/private partnerships with TNCs	No additional enhancements planned at this time

<sup>8</sup> Etherington, 2016.



## Transportation System Management

Transportation system management (TSM) ties all the parts of the system together by considering ongoing operations and maintenance, goods movement, aviation, emergency response and evacuation, transportation security, and the overall functioning and interaction between transit, trails, and technology. A seamless transportation system that provides dynamic and safe services to residents, commuters, visitors, as well as agency operators, truck drivers, and emergency personnel relies on long-term, high-level planning. TSM is truly about coordination – among agencies, modes, users, and priorities. Corridor revitalization projects, which redesign large areas often including intersections, roadway stretches, parking facilities, and adjacent buildings, are perfect examples of projects planned with TSM in mind. These projects take a comprehensive approach to planning, design, and desired outcomes. Corridor revitalization projects improve traffic flow, goods movement, safety, connectivity, economic vitality and quality of life, and preserve the environment by leveraging transportation projects with water quality improvements. Good TSM practices coordinate public/private partnerships to reduce cost by not duplicating services or by enforcing pre-planning and implementation requirements for traffic control during seasonal events. This plan includes TSM projects under the Corridor Revitalization, Technology, Operations and Maintenance sections of the constrained and unconstrained project list.

This plan's constrained project list focuses on three aspects related to TSM - preserving the environment using equipment upgrades planning for resiliency, improving emergency response times using signal preemption, and improving traffic flow and safety by reducing conflicts through corridor revitalization projects. This plan will increase public health and safety and more effectively manage congestion for residents, commuters, and visitors. Adaptive roadway management is a keystone strategy of TSM, but will not be realized without new funding sources. Adaptive roadway management includes operating a roadway system in an atypical way, such as reversing the direction of travel on a roadway when increased evacuation capacity is required. Another example is prioritizing roadway access for transit and active transportation during peak times at peak locations to manage congestion and encourage less impactful travel methods. Adaptive roadway management on U.S. Highway 50, SR 89, and SR 267 would significantly improve entry and exit congestion during high peak visitation seasons and visitation at high-use recreation destinations.

**Policy 6.2:** Maintain and preserve pavement condition to a level that supports the safety of the traveling public and protects water quality.

## Transportation System Management Goals, Policies, and Plans



### System Preservation



### Operations & Congestion Management



### Economic Vitality & Quality of Life

This 2017 regional transportation plan focuses TSM policies within the goals of system preservation, operations and congestion management, and economic vitality and quality of life. Maintenance, operation, transportation security and emergency response are major components of TSM that help to meet these three regional goals. Additionally, effective TSM enhances the environment

by managing congestion, reducing idling and vehicle miles travel traveled, and replacing older maintenance equipment with state-of-the-art equipment that reduces stormwater runoff and GHG emissions during operation. As an overarching theme, TSM is included in everyday activities, long-term planning documents, and project designs. State asset management plans, aviation master plans, and event and construction traffic control plans all include TSM strategies.

## Existing Transportation System Management Strategies

TSM on Lake Tahoe's road and highway corridors is delivered with corridor revitalization projects, aviation services, goods movement, transportation resilience and security, and ongoing operations, maintenance, and rehabilitation projects.

### Roads, Highways, and Corridor Revitalization

There are 110 miles of state and federal highways in the Tahoe Region. These routes, managed by Caltrans and NDOT, form the backbone of the Region's transportation system. The major state facilities that circle and link to Lake Tahoe include U.S. Highway 50, California State Routes 267 and 89, and Nevada State Routes 28 and 431. These roads connect town centers around Lake Tahoe and are the principal links to surrounding regions serving as entry and exit corridors. In addition to their important role as regional connectors, these roads serve as the main streets of Lake Tahoe's communities. Intersecting and supplementing these regional roadways are 619 miles of local streets. These local routes include a range of facility types, from urban arterial streets and roadways with sidewalks and bicycle facilities to rural county roads.

The 2012 Regional Transportation Plan outlined three major corridor revitalization projects which retrofit Tahoe's highway corridors to better act as town center main streets. The Kings Beach Commercial Core Project which realigned SR 28 and expanded pedestrian access with wide sidewalks and increased crossing opportunities is near completion. The State Route 89/ Fanny Bridge Community Revitalization Project broke ground in fall 2016 and the U.S. 50 South Shore Community Revitalization Project will release the draft environmental analysis in 2017. These revitalization projects alter the way our roadways function, and provide amenities to residents, commuters, and visitors by adding sidewalks, landscaping, bike lanes, art, and redevelopment opportunities that are truly transformational.

### Aviation

Most visitors from out-of-state or outside the U.S. fly to Reno, Sacramento, or the Bay Area and then travel by car or bus to the Tahoe Region. There are several private airport shuttles from North and South Lake Tahoe to the Reno-Tahoe airport, which contribute to making air travel to the Region more attractive and help reduce traffic congestion and vehicle emissions.



Passenger air service to the Tahoe Region is mostly through the Reno-Tahoe International Airport, followed by Sacramento International Airport. In 2015, 3.43 million passengers in total passed through the Reno-Tahoe airport, representing an increase of nearly 4 percent compared with 2014. The rise in passenger traffic can be attributed to new non-stop service, including the resumption of international service, new airlines, and increased seat capacity.<sup>9</sup> The South Lake Tahoe Airport benefits the Region economically through transport of goods and supports public health through emergency infrastructure. The airport serves general aviation activities including emergency services, private flights, and air taxi operations. Until 2001, the airport also offered commercial service. Based on trends in the airline industry and the character and location of the airport, there is low potential for a commercial airline entering the South Lake Tahoe Airport without significant subsidies. Based on the improving economy, continued marketing efforts of the South

**Policy 1.7:** Coordinate with the City of South Lake Tahoe to update and maintain an Airport Master Plan and limit aviation facilities within the Tahoe Region to existing facilities.

Lake Tahoe community, and the forecasted growth of the aviation industry, general aviation operations at Lake Tahoe Airport are projected to increase by 17.9 percent through 2023.<sup>10</sup>

<sup>9</sup> Reno -Tahoe International Airport (personal communication, 2016).

<sup>10</sup>City of South Lake Tahoe, 2015



### Goods Movement

The movement of goods into and out of the Lake Tahoe Region is essential to its economic well-being. Trucks using federal and state highways account for the vast majority of goods movement and the Tahoe Region is considered the final destination for goods. The closest freight rail depot is in Truckee and is served by the Burlington Northern and Santa Fe Railway. Reno-Tahoe International Airport also moves goods in and out of the Region, with air cargo comprising about 21 percent of the total landed weight. In 2015, the Reno-Tahoe airport handled 138.5 million pounds of air cargo, an increase of over 7 percent from 2014. This rise in air cargo weight can be attributed to a growing and diversifying regional economy.<sup>11</sup>

Due to relatively low goods movement volume on the Lake Tahoe Region's roadways there are no projects planned to enhance specifically the movement of goods. However, project design takes truck movement needs into account and provides improvements as part of existing projects when necessary. Additionally, because most of the Region's goods are delivered by truck, projects that improve roadway access in general will benefit trucks moving goods. Examples include Caltrans's U.S. Highway 50 water quality improvement project from the "Y" to Trout Creek which will add better turning access onto Sierra Boulevard from U.S. Highway 50. The U.S. 50 South Shore Community Revitalization Project and SR 89 / Fanny Bridge Community Revitalization Project will redirect truck traffic out of town centers, increasing safety by allowing drivers to avoid high levels of pedestrian and bicycle traffic and get to their destinations more efficiently.

### Operations, Maintenance, and Rehabilitation

Asset management is a critical part of maintaining and operating the transportation system in the harsh Lake Tahoe climate. This plan tracks operation and maintenance costs and includes foreseeable operations and maintenance funding on the constrained list. The unconstrained list illustrates the additional amount of funding needed by local and state agencies to provide a higher quality of operation and maintenance service. At Lake Tahoe, local jurisdictions and implementing agencies spend over 25 percent of available transportation funding to maintain the system. Activities include striping, repaving, curb repair, snow removal, landscaping, sweeping, upgrading equipment, and more. Operations and maintenance spans the categories of transit, trails, and technology and are both annual reoccurring activities, or may occur only when an asset has reached the end of its life cycle. Benefit assessment districts help support much needed maintenance of sidewalks, lights, and other aesthetic elements of streetscapes through agreements with property owners who directly benefit from infrastructure. Placer County is seeing success with benefit assessment districts in Kings Beach and is looking to continue this type of agreement in Tahoe City.



West Shore shared-use path snow removal  
Photo: Tahoe City Public Utility District

### Transportation Security

Partners plan for transportation security and emergency relief in the face of individual and large-scale disaster through project design and operations and management. The South Lake Tahoe Airport is a vital emergency service center that provides services such as air ambulance and firefighting amenities. Technology is a primary element in providing transportation security. Examples include transit station surveillance cameras that reduce the risk of theft or harassment to

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<sup>11</sup>Reno-Tahoe International Airport (personal communication, 2016).

people using transit and signal preemption for emergency providers to enable quick response to incidents. Additionally, the Lake Tahoe Sustainability Action Plan provides suggestions for the public and private sectors to address climate change and resilience which impact overall transportation infrastructure security.

Wide-scale evacuation plans for the Lake Tahoe Region are necessary to address possible large-scale security incidents and natural disasters such as fires, earthquakes, and tsunamis. Effective coordination and communication among different operating agencies in the Region is essential to safely evacuate and stabilize the community. City, counties, state departments of transportation, public safety agencies, and local organizations such as the Lake Tahoe Community College have incident command systems in place to allow law enforcement and safety responses to occur quickly, while at the same time permitting the transportation system to handle public response. Regional public safety agencies must be prepared to provide clear and concise information to the public about the situation and what actions they should take.

**Policy 3.4:** Support emergency preparedness and response planning, including the development of regional evacuation plans, and encourage appropriate agencies to use traffic incident management performance measures.



The immediate organizational response to security incidents and disasters is the responsibility of law enforcement and public safety agencies. TRPA provides support by focusing on communication technologies, providing funding for new strategies and projects that can help prevent events, and provides a centralized online location of information on transportation system conditions. At the state level, California has developed the Standardized Emergency Management System<sup>12</sup> as the framework for emergency procedures to be used in response to disasters by the state and all levels of government. Nevada has

the Division of Emergency Management<sup>13</sup> to assist and coordinate during large-scale events. Each county and the City of South Lake Tahoe have an Operational Area Emergency Operations Plan.

**Placer County:** The Office of Emergency Services<sup>14</sup> provides emergency management services countywide, in cooperation with local cities and special districts, such as fire and law enforcement agencies. During an active incident, such as a fire or flood requiring emergency sheltering, the office helps to facilitate the resources necessary for first responders to protect the community.

**Washoe County:** The Washoe County Emergency Management Program<sup>15</sup> assists local agencies and communities in preparing for emergencies through training, development of plans and procedures, addition of equipment, and other measures which may reasonably be taken to enhance emergency preparedness.

**South Lake Tahoe area:** In 2006, the Emergency Management Community Council<sup>16</sup> was established for the South Lake Tahoe area. The council consists of numerous emergency responders, including El Dorado, Douglas, and Alpine counties.

<sup>12</sup> California: <http://www.caloes.ca.gov/cal-oes-divisions/planning-preparedness/standardized-emergency-management-system>

<sup>13</sup> Nevada: <http://dem.nv.gov/>

<sup>14</sup> Placer County: <https://www.placer.ca.gov/departments/ceo/emergency>

<sup>15</sup> Washoe County: [https://www.washoecounty.us/em/files/PDFs/Washoe\\_Singles.pdf](https://www.washoecounty.us/em/files/PDFs/Washoe_Singles.pdf)

<sup>16</sup> South Lake Tahoe: <http://www.southtahoeemergencyguide.com/uploads/public/documents/pdfs/EmergencyBookVol1.pdf>

## Proposed Transportation System Management Strategies

This plan will deliver projects that increase efficiency of goods movement by redesigning intersections like Sierra Boulevard and U.S. Highway 50, and by implementation of large scale projects like the Tahoe City Downtown Access Improvement Project, the SR 89 / Fanny Bridge Community Revitalization Project, and the U.S. Highway 50 South Shore Community Revitalization Project. These projects will also increase safety for pedestrians and bicyclists, while creating gathering places for residents and visitors. Intersection improvements at U.S. Highway 50 and SR 89, SR 28 and SR 267, and U.S. 50 and Pioneer Trail will improve traffic flow for visitors, residents, and commuters during high peak seasons, and improve connectivity and safety for active transportation users. Additional corridor improvements on SR 89 and SR 28 will improve accessibility to all users with enhanced crosswalks, increased wayfinding, and parking opportunities. NDOT will also deliver the U.S. Highway 50 Safety and Complete Street project which will provide traffic calming, safe left turns, bicycle and pedestrians facilities, enhanced transit stops, and parking management systems.

This plan provides the necessary funding to continue regular ongoing maintenance and operations, and includes additional equipment upgrades that will preserve the environment through the purchase of high efficiency sweepers and sander trucks by the

**Policy 4.8:** Prohibit the construction of roadways to freeway design standards in the Tahoe Region. Establish Tahoe specific traffic design volume for project development and analysis.

City of South Lake Tahoe and El Dorado County. Snow removal operations are also increasing region-wide, with the City of South Lake Tahoe, El Dorado County, Placer County, and Tahoe City Public Utility District (TCPUD) all removing snow on select, high use shared-use paths. Many shared-use path and bicycle routes will also be reconditioned, including South Lake Tahoe's Eloise Avenue, TCPUD's Truckee River Trail, and Douglas County's Round Hill path.



**West Shore shared-use path snow removal**  
Photo: Tahoe City Public Utility District

### Residents

Regional emergency response coordination and resiliency planning that addresses impacts of climate change and wildfire risk will increase safety and health for the year-round population.

### Commuters

Upgraded maintenance equipment will provide safer travel conditions for commuters while preserving the environment through up-to-date technologies that more quickly clear roads, reduce GHG emissions and stormwater runoff.

### Visitors

Corridor revitalization projects will provide multi-modal options for visitors to access lodging, commercial services, and recreation sites while reducing conflicts and improving traffic flow in town centers. Congestion will be managed with intersection improvements on entry and exit roadway corridors.

These projects and more are described in detail and can be found online at <https://eip.laketahoeinfo.org/Project/TransportationList>.

The complete constrained project list is Appendix B: Project List and Revenue Narrative.



## Incentive Programs

### In-Person Traffic Management

Sometimes people provide more effective traffic management than technical tools. A variety of traffic management programs have been established in response to seasonal traffic. This includes chain controls, cone controls, and flaggers. The Truckee and North Lake Tahoe areas use traffic management very effectively to control vehicles leaving ski resorts and special events. These strategies can be considered in other areas heavily affected by peak visitor traffic, particularly at recreation sites.

**Policy 4.9:** Require the development of traffic management plans for major temporary seasonal activities, including the coordination of simultaneously occurring events.

### Adaptive Roadway Management

Because the Lake Tahoe roadway system is fixed with no capacity expansion plans, strategies will optimize the system's operating efficiencies during peak and off peak times. Targeted operational changes depending on the time of year, location, and time of day are key. Managing corridor access through lane prioritization, limiting vehicles at peak times at peak destinations, signalization, parking limitations, and dynamic travel lane direction are all strategies that can be used to serve Lake Tahoe traffic patterns most efficiently. As an example, in the fall and spring shoulder seasons intersection signal phases could prioritize neighborhood streets where they meet state highways at certain times of day, such as during school pick-up. Effective signalization management programs are updated on a continual basis and are adjusted based on monitored signal performance.

Managing corridor access through lane prioritization, signalization, parking limitations, and travel lane direction are all strategies that can be used to serve Lake Tahoe traffic patterns most efficiently.

Optimizing signals on the South shore is on this plan's constrained project list. However, adaptively managing the Region's entry and exit roadways, U.S. 50, SR 89, and SR 267, cannot be realized without new funding sources, and agency collaboration and buy-in (unconstrained project list).

### Roadway Asset Management

Maintenance of the Region's roadways supports smooth and safe traffic flow while protecting water quality. Improving the efficiency and effectiveness of snow removal operations and addressing roadway dilapidation is a recurring, high priority need. Several projects on the constrained project list will improve the efficiency of dispatching maintenance crews and increase the effectiveness of the maintenance they provide. The 2016 Active Transportation Plan and the FHWA, in their 2016 report, *Incorporating On-Road Bicycle Networks into Resurfacing Projects*, also encourages roadway redesign during routine maintenance and using tools for low-maintenance infrastructure, such as removable pedestrian refuge islands.

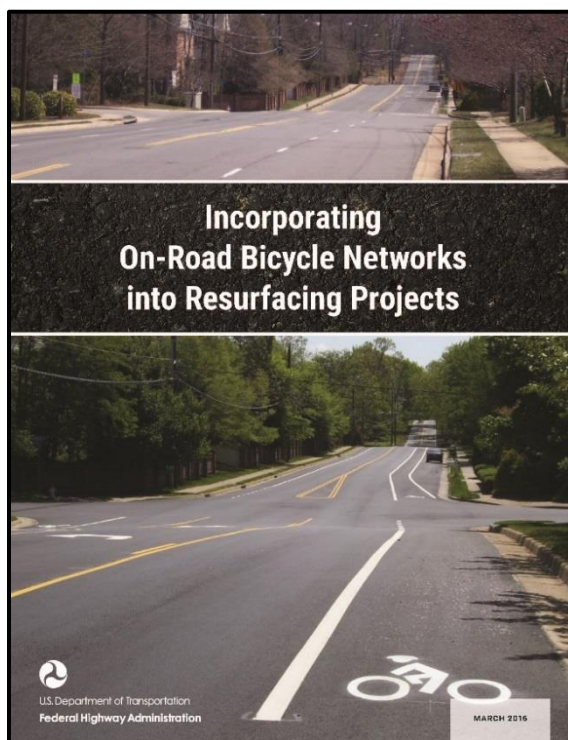


Table 3.5 summarizes differences between existing and additional transportation system management strategies realized with reasonably available funding (constrained list) and the planned strategies possible beyond the foreseeable revenue sources for this 2017 plan (unconstrained list).

**Table 3.5: Transportation System Management: Existing, Constrained and Unconstrained**

Strategies	Existing	Constrained List	Unconstrained List
<b>Operations and maintenance</b>	On-going at an average level of service	Higher level of service through new equipment and additional snow removal on shared-use paths	Enhanced services including roadway and path / sidewalk rehabilitation and additional snow removal services
<b>Intersection function</b>	Traditional intersection functioning	Multiple optimized intersections through re-design to roundabouts and enhanced signals	Increased intersection improvements
<b>Signal coordination</b>	South shore signals are coordinated in certain areas	Corridor wide signalization that is optimized by traffic patterns and for multi-modal users.	Nevada side signal coordination
<b>Emergency Signal pre-emption</b>	Limited on Nevada roadways	South Shore signals	Signals Region-wide
<b>Transportation Security</b>	Wide-spread agency coordination	Increased resiliency planning during project design	Increased resiliency planning during project design
<b>Program: Adaptive Roadway Management</b>	North Shore travel lane reversal during peak periods	Initiate agency coordination and evaluation, no projects proposed at this time	Adaptive roadway management on U.S. Highway 50, SR 89, and SR 267
<b>Corridor Revitalization</b>	King Beach Commercial Core almost complete and SR 28 Corridor under construction	17 Corridor Revitalization projects	Additional enhancements to be planned through corridor planning process



In most other regions, the transportation system is financially supported primarily by its residents through fares and property taxes. Local businesses support the system through in-lieu fees, contributions to local shuttle services, and by participating in other public/private partnerships. The federal and state governments provide planning and construction funding by formulas that are calculated based on residential populations and discretionary competitive grant programs. Resort destinations, like Lake Tahoe, with high visitation and demand, require more complex financial structures and transportation services.

Similar to places like Park City, Utah and Aspen, Colorado, Lake Tahoe's daily population balloons during peak seasons and holiday weekends. Additionally, the Lake Tahoe Region's roughly 55 percent second home ownership and the growing populations in neighboring metropolitan areas continue to increase day visitation and increase pressure on a transportation system designed originally for a small, summer season only residential population. Depending on the local government tax structure, visitors can support the transportation system with transit occupancy taxes paid for hotel visits or sales taxes if the local government allots some of those funds towards transportation initiatives. At Lake Tahoe, each jurisdiction contributes dedicated transportation monies from varied mechanisms. But current funding is not enough to support the system to adequately respond to the Region's influx of annual visitation. Citizens and public agencies must grapple with the question of what transportation costs should be paid by residents, businesses, second-home owners, and the millions of people who drive up to Lake Tahoe each year. Current funding projections illustrate that we cannot accomplish our long-term vision and ultimately meet our regional goals with existing funding streams. Governmental agencies and the public need to consider a variety of local, regional, and inter-regional funding opportunities to diversify the ways we fund the transportation system.

### Funding the Vision

The Lake Tahoe Region saw federal funding increase with the recent passage of the FAST Act, which now recognizes the Region functions as an urbanized area with an effective population base of 210,000. This change in status accounts for a portion of the average daily visitor population at Lake Tahoe and changes the Region's funding formulas accordingly. The changed population assumption increased overall transportation funding to \$3.4 million per year and includes additional planning requirements for TRPA. The States too are being asked to recognize the new population base in certain state formula funding allocations. These funding increases make it possible to deliver additional transit services, continue to close gaps in the active transportation network, and improve corridors such as the state Route 89 Recreation Corridor. But even these funding increases do not address seasonal and peak period traffic congestion. Responding fully to the impacts of expected population growth in major metropolitan areas surrounding the Lake Tahoe Region and increased annual visitation from those areas will need new sources of funds above the levels identified by the constrained project list in the 2017 Regional Transportation Plan.



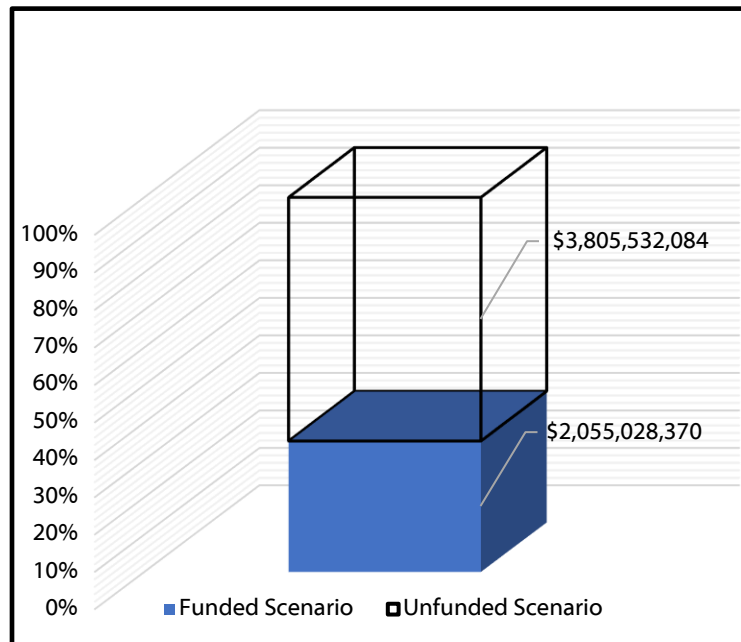
**Policy 5.3:** Collaborate with local, state, regional, federal, and private partners to develop a regional revenue source to fund Lake Tahoe transportation and water quality projects.

This 2017 plan is a blueprint for a regional transportation system that also begins to address inter-regional travel demand. To achieve the long-term vision, TRPA and partners will need to collaborate to identify and source dedicated regional revenue sources to meet the larger need of comprehensive bus and rail service coupled with park and ride lots that will provide options to private vehicle use. This policy debate has been ongoing since the 1990s without resolution. Now with a clearer understanding of the size of the demand, the time is ripe to

engage the matter of regional funding. While we move forward to build seamless transit and active transportation systems within the Lake Tahoe Region, over the next four years TRPA and partners have the opportunity to identify new funding streams and be poised in 2021 to fully support the build out of the transportation system's long-term vision. This is necessary to ensure the preservation of the environment, residential quality of life, and quality experience for the millions of people who travel to the Lake Tahoe Region.

A 23-year funding forecast has been developed from funding sources that are reasonably foreseeable during the life of the plan. The forecast is intended to reflect historically available funding levels given variability in federal, state, and local funding priorities and resources. An estimated \$2 billion in revenue is anticipated over the 23-year forecast period. The total amount of funding needed to deliver the constrained and unconstrained projects, operations, and programs for the life of this plan is just over \$5.8 billion. That leaves the Region with an \$3.8 billion funding shortfall over the next several decades to implement the fully envisioned system.

**Figure 4.1: Total Funding Needed**



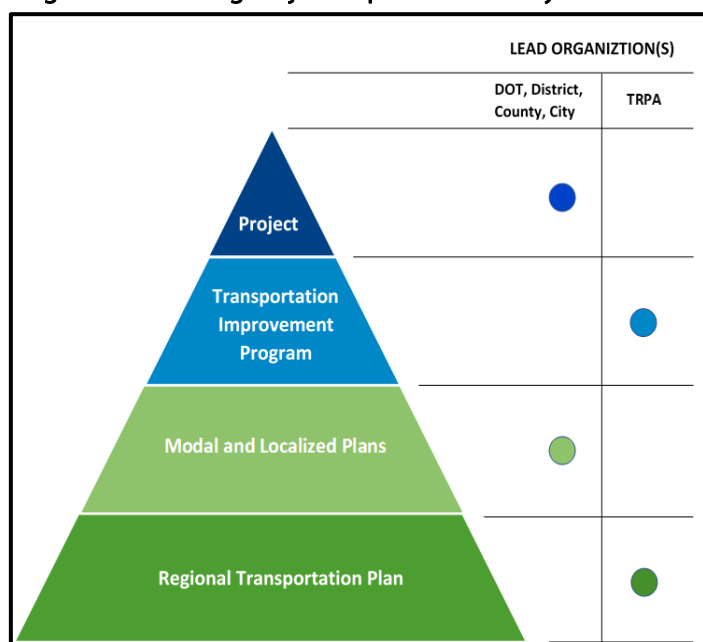
About \$530 million is estimated to be available over the first four-year period of the plan (2017-2021). Approximately \$740 million is estimated to be available between 2021-2031, which is the medium-term planning horizon. The projects on the constrained list match the foreseeably available revenue sources with approximately \$100,000 remaining.

### Funding Project Implementation

The Regional Transportation Plan is the foundation for all other transportation plans in the Region such as modal plans, and the federal transportation improvement program which allocates funding for projects. This plan includes goals and high-level policies focused on better managing congestion and reducing reliance on the automobile. The plan's goals and policies (Appendix A) also serve as the Transportation Element of the Lake Tahoe Regional Plan.

Modal and localized plans, as well as project specific studies fit within the policy framework set forth in the regional transportation plan. Modal plans cover topics like active transportation, intelligent

**Figure 4.2: Funding Project Implementation Pyramid**



transportation systems<sup>1</sup>, plug-in electric vehicles, and transit services provided by the Tahoe Transportation District and Tahoe Truckee Area Regional Transit. Localized plans include the Tahoe Region corridor plans and jurisdictional area plans that include transportation policies, projects, and programs such as transit service levels, parking management and funding commitments.

The Transportation Improvement Program (TIP) includes all projects that are scheduled to receive federal and state funding. It is included in the broader Lake Tahoe Environmental Improvement Program which is intended to implement the Lake Tahoe Regional Plan. The TIP must be consistent with the regional transportation plan and is updated bi-annually.

Projects improve the overall transportation system. Improvements may be new shared-use paths, intersection realignments like roundabouts, or new transit facilities and fleets. These projects are the responsibility of the state departments of transportation (DOT), transit districts, counties or the city. Some projects are multi-modal such as a complete street project that includes sidewalks to improve pedestrian access, bicycle lanes, and a roundabout to stabilize traffic flow and increase safety for vulnerable users. To receive certain types of funding, these projects must be in the TIP, and they must be in a modal or localized plan that is consistent with the regional transportation plan.



Photo: Aurora Photos / Rachid Dahnoun

<sup>1</sup> Cell phone applications, real time messaging along roadways, etc.

## Funded, Constrained Vision

The funded, constrained strategies move the Region closer to a seamless, around the lake transit system that is frequent, free-to-the-user, and connects residents and visitors to recreation sites and town centers. About 26 miles of additional shared-use paths will be delivered in the short term between 2017-2021 to close gaps in the active transportation network. Intersection improvements will be delivered in multiple corridors around the lake, improving traffic flow, safety, and connectivity for bicyclists and pedestrians. Parking management systems coupled with transit amenities and incentive programs will begin to take shape starting with the SR 89 Recreation Corridor and Nevada SR 28 Corridor. Technological improvements will increase real-time information access and optimize multi-modal signal coordination along the South Shore. Water quality projects that protect Lake Tahoe by reducing stormwater runoff will be completed along the South, West, and East shores. While these projects and programs are funded with reasonably foreseeable sources, the availability of these funds will require a concerted and vigilant commitment by agency partners, and will take ongoing communication with the public, active pursuit of grant funding, and political leadership to move voter-approved initiatives onto the ballot for renewal.

**Policy 2.2:** Provide frequent transit service to major summer and winter recreational areas.

## Foreseeable Revenue Sources

The funding sources that support the constrained project list come from federal, state, local, and public/private partnerships. A brief description of each funding category is included here. Additional detail is available in Appendix B: Project List and Revenue Narrative. Figure 4. illustrates the percentage of funding that comes from federal, state, and local sources.

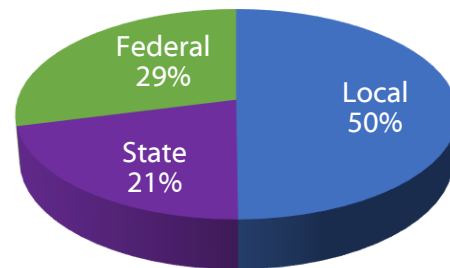
### Federal Funding

The plan accounts for just under \$600 million in federal funds that are expected to be available over its 20-year life. Major federal funding sources include the Surface Transportation Block Grant Program, Congestion Mitigation & Air Quality Program, the Federal Lands Access Program, Federal Transit Administration grants, Federal Aviation Administration Airport Improvement Program, and others. The Federal Transportation Improvement Program (FTIP) is a comprehensive four-year program consisting of transportation projects for highway, transit, and active transportation that receive federal funds, require a federal action, or are regionally significant. Federal legislation requires projects to be included in the regional transportation plan prior to being programmed in the FTIP. This plan is consistent with the current FTIP and includes additional projects for programming in future FTIPs. Once a project has federal funding secured, the project progresses from the regional transportation plan to the FTIP. While projects may be shown on the plan's project list when funding is not yet secured, projects on the FTIP must have secure guaranteed funding.

### State Funding

Approximately \$430 million in funding from the states of California and Nevada are projected over the life of the plan. Expected California and Nevada revenue sources include State Transit Assistance and Local Transportation Fund, California State Highway Operation and Protection Program (SHOPP), the State Transportation Improvement Program (STIP), and Nevada State Funds generated from the state gasoline tax. The first four years of the constrained funding scenario include revenue

**Figure 4.3: Forecast Revenue Percentages by Source**





forecasts consistent with the STIP fund estimate. At the state level, transportation revenues are linked to gasoline taxes that have been outstripped by inflation, rising construction costs, and improved fuel economy of vehicles.

## Local Funding

Local jurisdictions and agencies at Lake Tahoe are projected to provide just over \$1 billion in local revenue to pay for transportation investment strategies, including stormwater retrofits and operation and maintenance. Forecasted local revenue sources that are already established include: transit farebox revenues<sup>2</sup>; transient occupancy taxes (TOT); rental car impact mitigation funds; a parcel tax approved by South Lake Tahoe and El Dorado County voters to pay for dedicated maintenance of bicycle and pedestrian facilities; and a five-cent increase to the gasoline tax approved by Douglas County Commissioners in December 2015. All revenue generated from the Douglas County tax is required to be deposited into a regional street and highway fund and used solely for regional road construction, maintenance, and improvement. Possible uses for the tax revenue include the U.S. Highway 50/South Shore Community Revitalization Project, general county road maintenance, and other future road construction projects within Douglas County.<sup>3</sup>

### Case Study: Financing Transportation in Park City, Utah

Park City uses transient room, resort, sales, and franchise taxes as well as fees from business licenses, water service, recreation, planning, engineering and building services to fund its many visitor and community attractions.

Sales tax is 7.95 percent, divvied into multiple pots and used for specific services:

- 0.1% funds recreation, arts, and parks
- 0.3% funds mass transit services
- 1.6 % funds the Capital Improvement Program



In November 2016, Placer County and the City of South Lake Tahoe pursued new funding through local sales tax measures, however these measures failed. Clark and Washoe counties in Nevada passed legislation to index gasoline taxes to inflation, which has led to additional revenues for transportation projects in the State of Nevada. Similar legislation in Douglas County was voted down by residents in November 2016. Local jurisdictions have developed or are in the process of developing stormwater pollutant load reduction programs that respond to the Lake Tahoe Total Daily Maximum Load program. While some reasonably foreseeable funding has been identified for these projects, many of the projects do not have identified funding sources.

<sup>2</sup> Farebox revenues will be eliminated as the Region delivers free-to-the-user transit

<sup>3</sup> Douglas County, 2015

### Environmental Improvement Program

The Environmental Improvement Program (EIP) is a restoration program unique to the Lake Tahoe Region. It was conceived in association with the 1997 Presidential Forum at Lake Tahoe, when former President Bill Clinton, Vice President Al Gore, and others convened to focus efforts on protecting the lake for future generations. The EIP is designed to help restore Lake Tahoe's water clarity and environment and encompasses hundreds of capital improvement, research, and operation and maintenance projects. Projects cover the areas of watershed protection, air quality and transportation, forest stewardship, recreation, and scenic resources. Many of the projects are geared toward helping meet the local commitment to the Lake Tahoe Total Maximum Daily Load program.

This plan lists environmental improvement projects and associated revenue sources related to roadway stormwater treatment and transportation. Since 1997, approximately \$2 billion has been invested across multiple program areas by the federal government, the states of California and Nevada, local governments, and the private sector to implement the EIP. In August 2016, former President Barack Obama renewed the federal priority of Tahoe's conservation at the annual Tahoe environmental summit and announced new federal funding for additional conservation measures at Lake Tahoe, including \$230,000 for projects to reduce stormwater pollution and \$27 million for projects to remove hazardous fuels from thousands of acres of forest around the lake.<sup>4</sup> These funds are made possible through the Southern Nevada Public Lands Management Act. In December 2016, Congress passed the Lake Tahoe Restoration Act, authorizing up to \$415 million in federal funding over seven years for continued federal investment in the EIP.



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<sup>4</sup> Lotshaw, 2016.

## Unfunded, Unconstrained Vision

The 2017 Regional Transportation Plan is the blueprint for Lake Tahoe's long-term transportation vision. The combination of the constrained and unconstrained project lists illustrates that complete vision. If the Region can tap into additional and innovative funding sources in combination with citizen and public agency commitment to adaptively manage our roadways and incentivize travelers to spread the times they travel and mode they use to travel, Tahoe's transportation system can truly be transformed. Mobility hubs and transit centers would be built within the Region and in neighboring areas to act as park and ride lots. Hubs would be coupled with frequent transit that carries recreation equipment, luggage, and could allow dogs, with services reservable online. Both inter-regional and in-basin transit could be prioritized through adaptive roadway management including transit only lanes or signalization that holds vehicle traffic while allowing buses to pass to the front of the line.



**SR 89 Recreation Corridor Improvement Project Conceptual Rendering**  
Design by Fehr and Peers

Visitors and commuters could take trains from San Francisco to Reno, with stops in Truckee that connect by bus to Lake Tahoe. Local free-to-the-user bus services would have frequent routes that run every 15-minutes. Expanded and more frequent community routes would serve residents and commuters. Dynamic parking management systems would be prevalent throughout the Lake Tahoe Region with technological enhancements that provide real-time information to travelers before they've chosen their travel mode. Speed signs could be variable based on weather conditions and a basin-wide transportation trip planning tool could be launched to provide holistic transportation system information and options to users. Electric vehicle charging stations could be located in parking areas with specialized parking incentives. Roadways could be routinely cared for, eliminating worsening potholes that further degrade quality of travel, traffic flow, and safety. The Tahoe Trail, a shared-use path around Lake Tahoe, could be completed, providing residents, commuters, and visitors safe and enjoyable active transportation options region-wide. Delivery of these types of projects and programs can reduce congestion for visitors entering and exiting the Lake Tahoe Region, increase safety on local roadways, preserve the environment by reducing GHG emissions and stormwater runoff, make the Region a leader in environmental innovation, and spearhead an economically vibrant region.



## Case Study: Maroon Bells Scenic Area, Colorado

From mid-June to early October, the Maroon Bells Scenic Area, home to the Maroon Bells which are the most photographed peaks in North America, is only accessible by transit, with a few exceptions. The Roaring Fork Transportation Authority (RFTA) operates the Maroon Bells transit system and served over 80,000 people in 2015, a 30 percent increase from 2014. Located 10 miles from Aspen, Colorado, this bus tour is about 15 minutes one-way between Aspen Highlands and the Maroon Bells Scenic Area. A toll booth on Maroon Creek Road through which all visitors must pass to gain access enforces personal vehicle restrictions. The toll booth is staffed from 7 a.m. to 7 p.m. every day.



**Maroon Bells Scenic Area Welcome Station**  
Photo: USFS White River Nation Forest Website

### Visitors cannot drive to the Scenic Area unless they fall under the following exceptions:

- 🚗 Vehicles can enter with a \$10 fee between 7 a.m. – 8 a.m. and 5 p.m. – 7 p.m., when the bus is not running
- 🚗 Vehicles with a handicap placard or license plate
- 🚗 Vehicles with 11 people or more with a \$3 fee per person
- 🚗 Vehicles with children under age 2 that require a restraining child seat, but not a booster seat
- 🚗 Visitors camping at Silver Bar, Silver Bell & Silver Queen Campgrounds
- 🚗 Horse trailers
- 🚗 When the road to the Maroon Bells opens in mid-May until mid-June when the buses start running
- 🚗 When the bus service ends in early October until Maroon Creek Road closes due to weather



RFTA bus stop at Maroon Bells Scenic Area  
Photo: RFTA

## Potential Revenues

State and federal funding sources are reliant on limited term legislation and can be uncertain due to short authorization periods authorized by Congress or state legislatures. Therefore, Lake Tahoe partners are considering new sources of locally and regionally generated funding, including looking beyond jurisdictional boundaries to new Trans-Sierra and mega-regional funding partnerships. These methods create diverse funding streams that benefit all stakeholders, leverage funding, and equitably share the burden for funding the Region's transportation vision. Broad partnerships have the potential to generate more revenue with less burden on individual residents, visitors, and local jurisdictions while helping to accelerate the implementation of critically-important projects and programs.

**Policy 2.1:** Coordinate with Federal, state, and local government as well as private sector partners to identify and secure adequate transit service funding that provides a viable and reliable transportation alternative to the private automobile for all categories of travelers in the Region.

There are a few unique challenges that the Tahoe Region faces when considering new sources of local and regional funds, particularly those that must be decided by ballot measure. Both the Region's complex combination of jurisdictions, including five counties and one city in two states and its relatively small local population in comparison to the number of visitors entering the Region annually makes passing local or regional funding measures difficult. Not only is it challenging to obtain the concurrence of multiple jurisdictions, but the funding mechanism may be seen as an undue burden on year-round residents or the visitor population. Nevertheless, Tahoe partners must



**Bijou Bike Park Opening Day**  
Photo: Mike Vollmer

find ways to turn the challenges of Tahoe's multi-jurisdictional nature into opportunities for building strong support for a transportation investment strategy that will not only improve mobility and environmental threshold attainment, but will also lead to economic development opportunities. A revenue generation and transportation investment strategy can help create its own stability by creating jobs and an attractive, exciting place to visit. Below are some financing concepts that may warrant consideration by a broad stakeholder collaboration.

### Local "Self-Help" Funding

As federal and state transportation funding continues to decline, many communities across the country are making the necessary choices to become self-help jurisdictions through various local ballot measures that are tied to a supported multi-year transportation investment program. Local jurisdictions at Lake Tahoe, such as the City of South Lake Tahoe and Placer County, have started to pursue new sources of transportation funding. Most recently, voter-approved sales tax measures have been tried but have not been successful to date. The City of South Lake Tahoe passed a voter initiative in November 2016 that increases the transient occupancy tax paid by visitors to the Region. This increase will fund recreational improvements and is estimated to accrue roughly \$2 million annually. Local self-help funding is needed to match federal and state funds, but also require voter approval for initiation and renewal. These types of sources can levy relatively large amounts of funding, but are insufficient as the sole source that the Lake Tahoe Region relies on to achieve its long-term transportation vision.

### Regional Dynamic Pricing Strategies

Generating revenue in ways that charge users of a system in proportion to their impacts on the system is a strategy being implemented world-wide. Dynamic pricing strategies generate revenue to fund transportation improvements while also shifting users to travel at non-peak times or to use different travel modes. This reduces impacts to the environment and improves residential quality of life and visitor experiences. One example is dynamic parking pricing, where people choosing to drive their car to a popular recreation destination are charged a higher rate to park at that location during a busy time, such as 10 a.m. on a Saturday in July, versus a less busy time, such as 10 a.m. on a Thursday in July. During certain times, when demand for that area is low, drivers might not be charged anything to park. This concept could also be used to direct people to other recreation sites that may have open parking capacity. Dynamic pricing strategies are becoming more common and are applied to parking, dedicated travel lanes on a highway, or various access points. The success of any regional or area-wide version of this strategy depends on a partnership of agencies and organizations collaborating to tackle legislative barriers, determine its fair administration, and garner public support to move the strategy towards implementation.

### Trans-Sierra and Mega-Regional Funding

The Trans-Sierra Transportation Coalition is a concept that hinges on the idea that the Lake Tahoe Region serves and benefits the extended population of 15 million residents from the Bay Area to Reno who travel far beyond traditional planning boundaries. By acting as a larger partnership, the coalition can develop a package of transportation investments that benefit the larger Trans-Sierra

**Policy 5.4:** Collaborate with regional and inter-regional partners to establish efficient transportation connections within the Trans-Sierra Region including to and from Tahoe and surrounding metropolitan areas.

Region. This inter-regional coalition can create opportunities that no single region acting alone can achieve. Opportunities include building needed voter and state, regional, and federal legislative support for a comprehensive multi-region funding package. The funding package would support a full suite of road, rail, transit, aviation, and bicycle and pedestrian improvements throughout the heavily-visited Trans-Sierra Region.

## Funding Tomorrow's Vision Today

The transformation that Lake Tahoe deserves and communities around the lake demand will require dedication, collaboration, and difficult political decisions. Creating new sources of funding to pay for high-priority projects, services, and programs is vital. While continued progress can be made under the funded, constrained scenario outlined in this 2017 Regional Transportation Plan, realizing the next level of implementation will require creativity and innovation by citizens and local, regional, and mega-regional agency partners. This work must start now in preparation for the next update to the regional transportation plan in 2021.

**Policy 4.0:** Prioritize regional and local investments that fulfill TRPA objectives in transit, active transportation, transportation demand management, and other programs and directly support identified TRPA transportation performance outcomes.

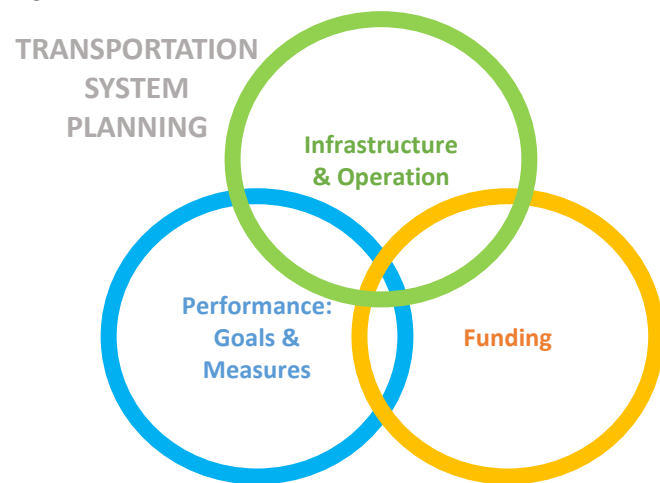
Over the next four years, implementation partners will work to deliver constrained projects and solidify the internal transit, trails, technology, and transportation system management framework. Prioritization of funding for projects that are vital for better managing congestion and reducing reliance on the automobile, including free-to-the-user transit, transit frequency and location increases, closing gaps on shared-use paths, providing equitable access to real-time information, adaptive roadway management, and transportation demand management programs will be the key to implementation. Concurrently, elected officials, planning agencies, state governments, and private partners coming together to establish regional, Trans-Sierra and mega-regional funding mechanisms is the next strategic step to achieve the long-term needs of the system.





TRPA has been at the forefront of environmental stewardship through data-driven decision making since its inception. TRPA approaches transportation system planning through (1) Infrastructure and operations, including the network of roadways, trails, and transit services; (2) Performance, including monitoring and reporting on transportation performance relative to established federal, state, and regional goals; and (3) Funding, where strategic investment of limited funds guides successful achievement of goals. The 2017 Regional Transportation Plan is a performance-based plan that provides investment recommendations using an established performance measurement framework.

The performance measurement framework supports our understanding of the system's operating effectiveness and helps to identify the projects and programs that will most effectively lead to the achievement of regional goals. This chapter provides an overview of the performance measurement framework, discusses how the system is monitored using collected data, specified measures, and regional tools, and concludes with a description of how measures inform policy making and strategic transportation investments.



TRPA has carried out performance-based planning at the regional scale for many years, most notably through the Region's periodic threshold evaluation reports, but also through extensive monitoring and biennial regional transportation monitoring reports. The 2012 federal transportation bill, Moving Ahead for Progress Act (MAP-21), introduced new requirements for metropolitan planning organizations to use performance-based planning as part of regional transportation plans. This requirement was reinforced and strengthened in the recent 2016 FAST Act. This plan incorporates the new requirements, including the development of a congestion management process.

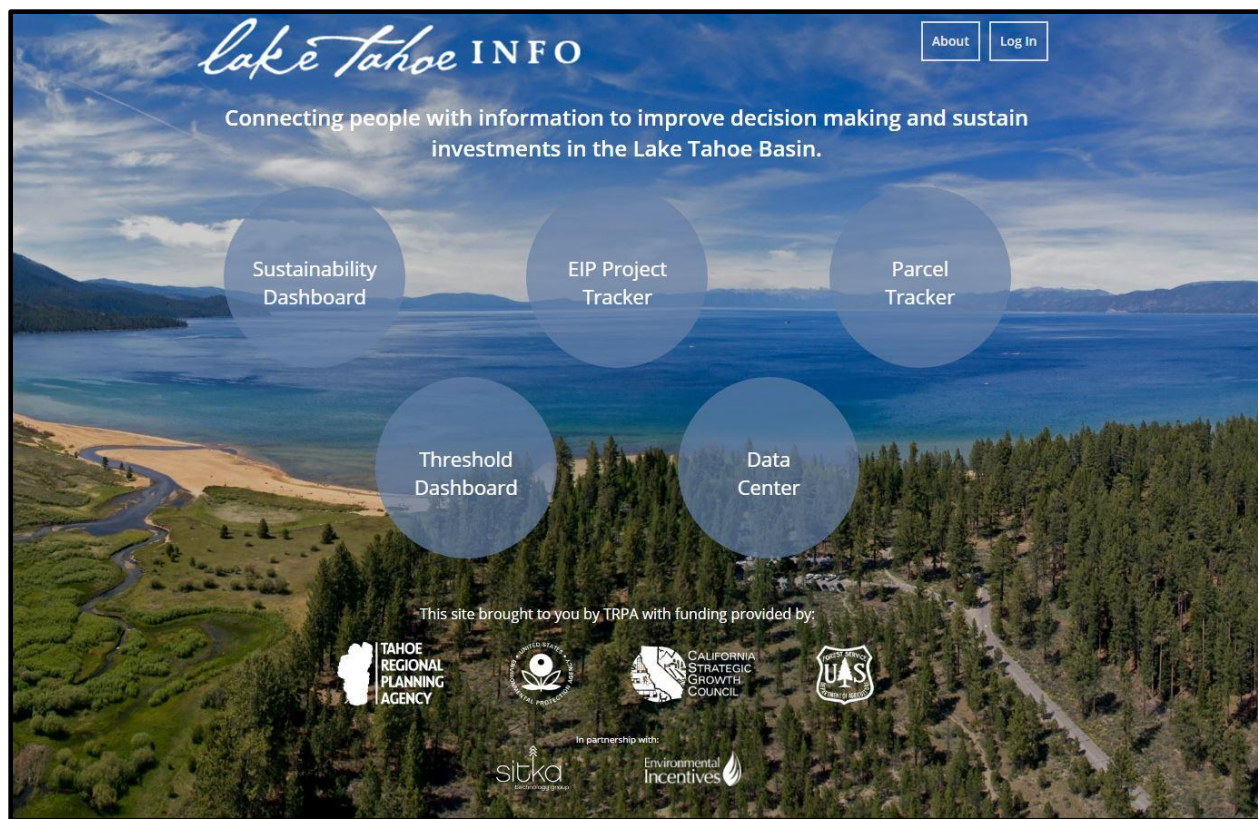
### Performance Measurement Framework

The performance measurement framework comprises three types of Performance Measures: (1) *Performance Indicators* to assess the current state of the transportation system; (2) *Performance Metrics* to analyze expected effectiveness of proposed projects at meeting the goals identified in Chapter 1: Regional Goals and Key Concepts; and, (3) Principal *demographic, socioeconomic, and other data* that influence demand and use of Tahoe's transportation system. Performance indicators, metrics, and socio-demographic data are collectively referred to as *Performance Measures*.

Performance measures are routinely assessed for efficacy and refined to ensure that TRPA continues to monitor and analyze the right data to inform successful decision making. A summary table arranged by each regional transportation plan goal is contained within Appendix G: Performance Measures. Existing transportation performance measures are currently under review as part of a larger initiative to update regional measurement systems to the best, most informative metrics. Until that initiative is complete, this plan carries forward the existing framework of transportation measures.

**Policy 4.12:** Maintain monitoring programs for all modes that assess the effectiveness of the long-term implementation of local and regional mobility strategies on a publicly accessible reporting platform (e.g. [www.laketahoeinfo.org](http://www.laketahoeinfo.org) website).

[LakeTahoeInfo.org](http://LakeTahoeInfo.org) is an internet-based information exchange for the Lake Tahoe Region. A “Transportation Dashboard” is planned and, when released in 2017, will be available at the LakeTahoeInfo.org website, including the full suite of the Agency’s transportation performance measures and trend data. The available data, the measures, and the public reporting platform, will continue to advance over time.



## Monitoring Our System

Planning at every scale provides stakeholders and the public with information to understand progress toward goals. Specific data are collected per prescribed data collection and monitoring protocols which make it reproducible, consistent, and reliable for analysis and informed decision making. The interrelationships between the performance measurement framework, the data collection processes, and regional tools are discussed in the sections that follow.



## Data Collection: Partnerships and Protocols

TRPA and its partners monitor conditions, collect data, and evaluate them to inform transportation policy and programs.

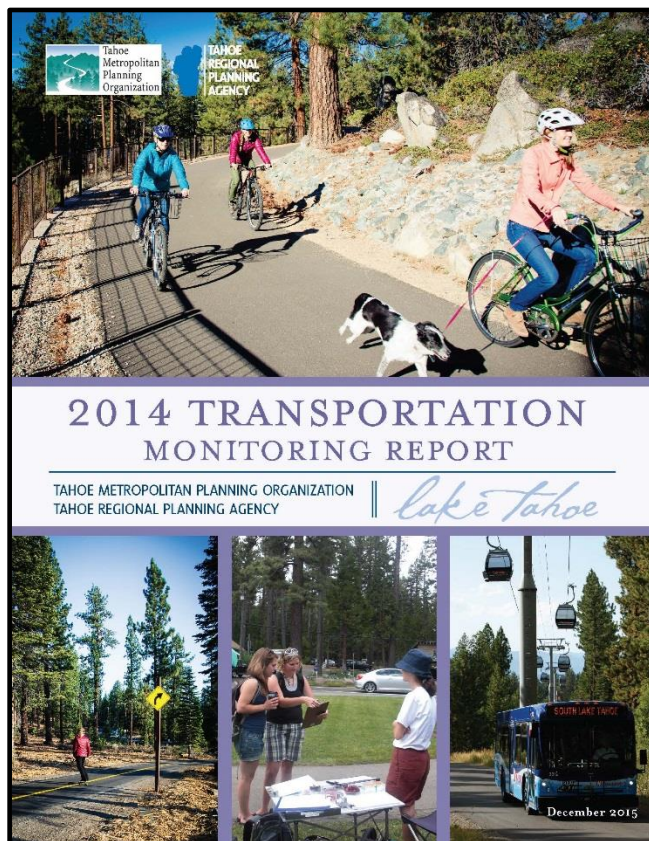
### Partnerships

Partnerships drive the Region's performance measurement framework and propel advancements. Data collected by partners informs agency staff and decision makers, supports successful grant applications, and is a critical public education tool. Two recent examples of successful collaborative data collection include:

- ❖ Placer<sup>1</sup> and Washoe<sup>2</sup> counties recently performed supply, demand, and pricing parking studies to assist in implementation of a parking management system.
- ❖ TTD, TRPA, and TART, in corridor and transit planning are using new technologies to better understand travel trends. Consistent transit rider surveys are helping determine the need for additional services and operating hours.

### Regional Transportation Monitoring Reports

Biennial regional transportation monitoring reports bring together the results of continuous performance measure monitoring since the early 1970s – from regional traffic counts and travel mode choice, to demographic and air quality trends – so that the Region's transportation system and demand management strategies can be evaluated to inform policy-making and strategic investment. These reports, too, will soon be available on the LakeTahoeInfo.org website and can also be found at <http://www.trpa.org/transportation/library/>.



### Monitoring Protocols

In addition to the regional transportation monitoring reports, which contain regional-scale, multi-modal performance measures, TRPA and its local partners have instituted the Bicycle and Pedestrian Monitoring Protocol, which guides collection of year-round active transportation data. The result of the Bicycle and Pedestrian Monitoring Protocol is a biennial bicycle and pedestrian monitoring report which supplements the regional transportation monitoring report. The bicycle and pedestrian monitoring report contains more granular performance measures than the regional transportation monitoring report, such as daily and/or peak period bicycle volumes on a specific trail, for example. In 2017, TRPA staff will be developing a Transit Monitoring Protocol similar to the Bicycle and Pedestrian Monitoring Protocol, to complement finalization of the 2017 Long Range Transit Plan currently under development by TTD (expected Spring 2017).

<sup>1</sup> TRPA, 2016.

<sup>2</sup> TRPA, 2014.



These modal data collection and monitoring protocols provide standardization and guidance for partners to consistently collect the fine-grained modal data necessary to support the performance measurement framework. These protocols yield robust data that facilitate direct “apples to apples” comparison and trending over time, meet federal, state, and local requirements, and drive achievement of regional goals.

**Policy 4.11:** Establish a uniform method of data collection for resident and visitor travel behavior.

## Tools

Tools, techniques, and methods are continually assessed and refined to assist the Agency in understanding whether regional goals are being met and whether strategies are effective. Notably, the Lake Tahoe Transportation Model and the congestion management process currently under development, are both tools that continue to be examined and expanded to be more useful and robust.

### Lake Tahoe Transportation Model

The Lake Tahoe Transportation Model is a powerful analytic tool for understanding travel behavior and congestion into and around the Region. The state-of-the-art activity-based travel demand model was developed using the TransCAD platform. It is an enhancement over the more common four-step trip-based models because it considers non-home-based travel and linked characteristics of a household’s travel patterns in addition to planned future land uses and transportation system investment. The travel patterns of distinct groups are modeled including year-round residents, seasonal residents, external workers (commuters), day-use visitors, and overnight visitors. Separate algorithms are included within the model to simulate each group’s population, demographics, socioeconomic characteristics, and travel preferences. The model aggregates the travel behavior of each travel group (known as “tour types”), estimates the expected travel mode distribution (auto, transit, walk, bike), and produces traffic projections for intersections and roadways on a peak summer day, and for peak periods during that day. Since these estimates are based on regional data, they are useful for understanding region-wide impacts.



**Tahoe City**

Photo: Aurora Photos / Rachid Dahnoun

The Tahoe Region is subject to an adopted threshold standard for reduction in regional VMT and must also show compliance with GHG reduction targets set by CARB (SB 375). The integrated land use policies from the Lake Tahoe Regional Plan and the transportation strategies and policies from this plan must demonstrate achievement of these standards. The Lake Tahoe Transportation Model, using both physical activity counts and modeled data, estimates regional daily VMT and the regional impacts of land use and transportation project implementation. These outputs are the best available data

and methods to determine compliance with required standards. Additional information about the Lake Tahoe Transportation Model is in Appendix D: Methodology for Estimating Vehicle Miles Traveled and Greenhouse Gas Reductions in the 2017 Regional Transportation Plan.

## Congestion Management Process

TRPA is in the process of establishing and implementing a congestion management process (CMP) that builds upon existing tools, and meets federal requirements and the unique needs of the Lake Tahoe Region. The CMP will serve as a principal component of the performance measurement framework, providing a systematic process for monitoring, measuring, and diagnosing the causes of current and future congestion on the Region's multi-modal transportation system; evaluating and recommending alternative strategies to manage current and future regional congestion; and monitoring and evaluating the performance of strategies implemented to manage congestion. TRPA's CMP will respond to federal transportation legislation (23 CFR 450.320) requiring development and implementation of a formal CMP that provides for the safe and effective management and operation of the multi-modal transportation system through performance monitoring and the application of travel demand reduction and operational management strategies.

Congestion can be generally defined as a condition where the volume of users of a transportation facility approaches or exceeds the capacity of that facility. Vehicular congestion is characterized by reduced traffic speeds, increased travel times and delay, and, in some cases, increased crashes. This condition can lead to uncertainty, frustration, and dissatisfaction by residents, commuters, and visitors. Secondary impacts of congestion include decreased productivity, increased GHG emissions, and increased costs to users. High traffic volumes causing roadway congestion are also symptomatic of growth within the Region and outside. Therefore, the plan seeks to manage congestion but cannot totally eradicate it. Managing congestion means prioritizing projects and funding to the most impactful congestion problems and hot spots. TRPA has historically administered transportation funding utilizing a competitive grant process. Outputs from CMP monitoring and evaluation will now also be considered to direct the performance-based funding to projects of maximum effectiveness at meeting regional goals. The process of evaluating system-wide and project-level performance, and applying those results to project selection is a key function of the CMP, and fulfills federal requirements for congestion management planning. The CMP will be integrated into the regional transportation planning process in the following ways:

- 🔦 The regional transportation plan provides congestion management objectives (the Goals in Chapter 1) and performance measures;
- 🔦 Through the CMP, the regional transportation plan will include an evaluation and prioritization of transportation projects and strategies structured around advancing these identified objectives and measures;
- 🔦 System-level performance information, an output of the CMP's continuous data monitoring and evaluation, will be reported as part of the Agency's performance measurement framework on <https://laketahoeinfo.org/> and used to identify corridors, segments, or intersections for further analysis and strategic investment;
- 🔦 The regional transportation plan goals and policies guide and encourage alternative congestion management strategies. Specific projects will be recommended in CMP assessments, which will then be incorporated into the regional transportation plan's fiscally constrained project list and will ultimately be reflected in project design.
- 🔦 The CMP will provide system-level and expected project-level performance information for use by TRPA in evaluating projects nominated for inclusion in the FTIP;
- 🔦 The CMP will provide system- and project-level performance information for project sponsors, which may influence project proposals recommended for the FTIP; and,
- 🔦 The CMP will provide information about, and recommendations for, alternative congestion management strategies eligible for federal funds.

The CMP will be developed, established, and implemented in 2017 in accordance with FAST Act requirements for the Tahoe Region. Its development will require a working group and stakeholder engagement, and may consider technology and tools to facilitate transition from vehicular capacity measures such as Level of Service (LOS) to more contemporary, multi-modal performance-driven measures. The CMP is an opportunity to centralize a regional dialogue around congestion and updated standards to manage regional congestion.

### Interactive Tools

As discussed in Chapter 2, various websites and interactive tools have been launched to make it easier for the public to find, digest, and use transportation information. These include:

- ❏ [www.LinkingTahoe.com](http://www.LinkingTahoe.com), a portal to all of the inter-related regional-level transportation plans and highlighted transportation projects.
- ❏ [www.TRPA.org/RegionalTransportationPlan](http://www.TRPA.org/RegionalTransportationPlan), an interactive website specific to the RTP.
- ❏ [www.LakeTahoeInfo.org](http://www.LakeTahoeInfo.org), an interactive site and data portal with details about all regional Environmental Improvement Program (EIP) projects, including all regional transportation plan projects, in a project tracker.

### Technological Innovation

Data, and the tools used to analyze it, are continually evolving. Since 2012, several studies shed more light on visitation. The 2014 Bay to Basin study conducted by the El Dorado County Transportation Commission<sup>3</sup>, estimated annual visitation to Lake Tahoe at roughly 8.5 million. The more recent Trans-Sierra Transportation Coalition's 2015 Trans-Sierra Plan<sup>4</sup> estimated 13.5 million visitors. Newly available data and analysis vastly improved information about travel patterns and day use visitors (those who do not stay overnight). Using a combination of traffic models, traffic counts, and recently available cell phone data, refined



South Shore Transit

Photo: Aurora Photos / Rachid Dahnoun

**Policy 4.13:** Establish regional and inter-regional cooperation and cost-sharing to obtain basin-wide data for transportation-related activities.

current estimates are that Lake Tahoe serves nearly 10 million visitor-vehicles. The estimate, at an 80 percent confidence level, provides more comprehensive information regarding day visitors and visitors staying in vacation rentals outside of the town centers. This new data is especially helpful for planning transit services connecting high-use recreation destinations, and is an example of continually evolving data and its use for better management of systems.

In addition to cell phone data, TRPA also uses INRIX Insights<sup>5</sup>, the first commercially-available platform for real-time traffic information. The application data shows vehicle movement over time in specific locations and is a means to predict, plan,

<sup>3</sup> El Dorado County Transportation Commission, 2014.

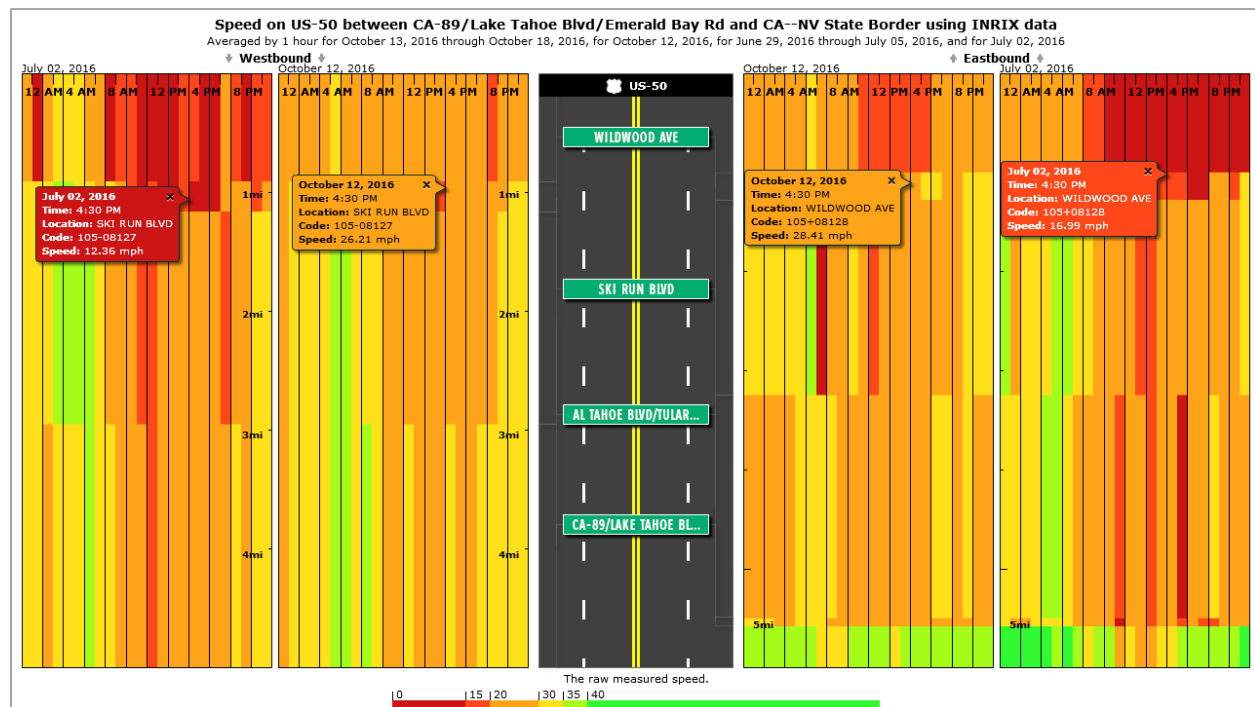
<sup>4</sup> Trans-Sierra Transportation Coalition, 2015.

<sup>5</sup> INRIX, 2016.



and prioritize investment in roads and transit across the Region. Moving forward, partners will continue to explore appropriate uses of these new technological innovations in conjunction with the evolution of the performance measurement framework and development of TRPA's congestion management process.

**Figure 5.1: INRIX Speed Data on US-50 in South Lake Tahoe from the State Line to CA-89 (the “Y”), comparing July 2, 2016 to October 12, 2016**



## Performance Measures and Targets

The 2016 FAST Act requires states and MPOs to develop targets for specific performance measures related to safety, transit, and roadway/bridge conditions. The legislation includes specific timetables for their development and provides guidance for states first to set targets and then MPOs, either by adopting the state-set target or by developing and adopting region-specific targets within six months. Tahoe's bi-state geography involves joint coordination with both California (Caltrans) and Nevada (NDOT) in the ongoing target setting process. Once established, these targets will serve as important benchmarks for understanding whether progress is being made toward federal, state, and regional transportation goals.

## Goals and Performance

*Performance Indicators* are regional and system-level data collected every 1 to 4 years. Indicators inform how the current transportation system is performing. *Performance Metrics* assess project performance and the assessment tool is built into the project proposal module of the EIP Project Tracker. As implementers propose new projects into the EIP Project Tracker, the assessment is completed and the resulting performance metrics are used to display expected performance of those proposed projects. Finally, *demographic and socioeconomic data* comes from the U.S. Census, counties or states, or other organizations such as the Nevada Gaming Control Board.

Specific existing performance measures are reviewed in this chapter. Additional performance measures and targets are still under development by the federal government and state departments of transportation. The regional performance measurement framework will be adaptive and improved with updated targets as performance targets are set in accordance with FAST Act requirements.

Much of the data here can already be viewed and downloaded from the LakeTahoeInfo.org - Data Center. The full suite of TRPA's current transportation performance measures, and trend data will be added as it becomes available. For this plan, a comprehensive list of performance measures monitored are in Appendix G: Performance Measures.



## GOAL 1: ENVIRONMENT

*Protect and enhance the environment, promote energy conservation, and reduce greenhouse gas emissions.*

An efficient and connected transportation system has cross-cutting benefits to the environment and provides benefits to many other threshold categories. Several performance measures have been previously adopted or defined to assess this goal, including: Vehicle Miles Traveled (Regional and per Capita) and Greenhouse Gas Emissions (Reductions per Capita), due to their regional significance and overarching tie to the effectiveness of the transportation system.

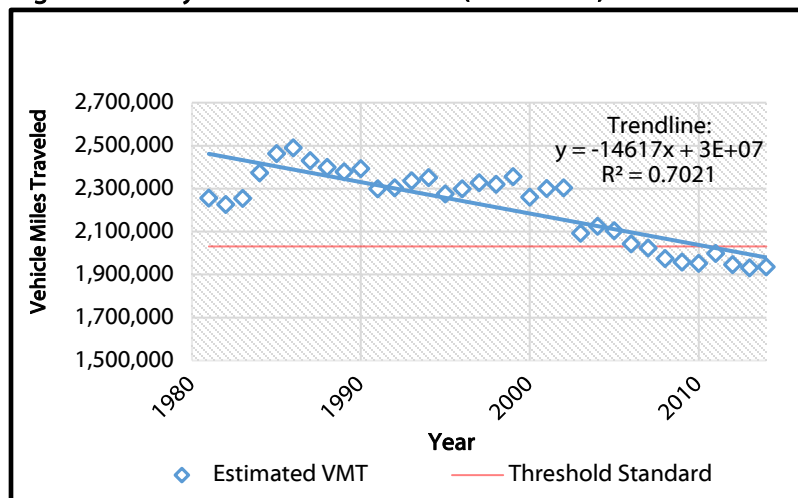
### Vehicle Miles Traveled (VMT) – In Attainment

Originally adopted as a TRPA air quality threshold standard in 1982. The VMT threshold indicator was established as a proxy for 1) increased nitrate loading into the atmosphere and deposition into Lake Tahoe, and 2) an increase in the airborne concentration of particulate matter known to impact regional and sub-regional visibility and human health<sup>6</sup>.

The target value for this threshold indicator is a 10 percent reduction from 1981 levels, or no more than 2,030,938 daily VMT<sup>7</sup>. TRPA models both the 1981 base value and the current year's daily VMT to measure compliance with the 10 percent reduction target. To be conservative TRPA estimates VMT for a peak summer day; a day that represents the theoretical highest demand of the year on the transportation system.

*Daily Vehicle Miles Traveled  
Target/Threshold Standard: 2,030,938  
Current Condition: 2014: 1,937,070  
Status: Meeting Target, Indicator Improving*

Figure 5.2: Daily Vehicle Miles Traveled (1981- 2014)



Since the early 1980s, TRPA has used a series of increasingly sophisticated travel models to estimate VMT for the Region. For more information on TRPA's model, see Appendix D: Methodology for Estimating Vehicle Miles Traveled and Greenhouse Gas Reductions in the 2017 Regional Transportation Plan.

VMT is the result of the complex interplay among a variety of factors including but not limited to: population (both inside and outside the Region), gas prices, employment rates, local housing costs, demand for and accessibility of recreational opportunities in the Region, access to alternative forms of transportation, and second home ownership.

<sup>6</sup> TRPA, 1982.

<sup>7</sup> TRPA, 2016.

Increasing access to transit services, access to bicycle and pedestrian facilities, and readily available alternatives to the private automobile have shown to reduce VMT. Over the last decade VMT has dropped significantly, by roughly nine percent. Likely contributors to this decline are a combination of regional transportation improvements, compact redevelopment (i.e.: Heavenly Village and Gondola), and the 2008 economic recession. VMT nationwide has also been dropping and data show that younger generations have lower rates of vehicle ownership and driving than their older cohorts had at the same age<sup>8</sup>. As shown in Figure 5.2, the VMT threshold indicator is currently in attainment.



The most recent regional threshold evaluation reports recommended that the link between the VMT standard and desired conditions should be assessed to ensure that regional daily VMT is still the most appropriate air quality measure. This plan takes that recommendation one step further, by recommending that the assessment include consideration of using a VMT standard as a regional transportation planning performance measure beyond the air quality purpose currently in place, and considering whether an alternate measure should be considered as the threshold standard for air quality. A work program initiative is underway to look into updating transportation measures, including the VMT air quality threshold standard.

### Vehicle Miles Travelled per Capita (Excluding Through Trips) – Level 1 – Target Met, Level 2 -Target Not Met

One of three transportation-related Regional Plan performance measures adopted by the TRPA Governing Board in 2013, existing per-capita VMT (excluding through trips) is a measure of the average distance driven each day by the Region's residents and visitors. Decreasing travel distances from 2013 levels (estimated to average 33.7 miles per day) is the Level 1 target and the Level 2 (2016) target is a 1 percent improvement over Level 1 (33.4 miles per day using the current transportation model). The most current (2014) estimate (for which data is available) is 33.53 regional VMT per capita (excluding through trips) per day, which meets the Level 1 target. With regional VMT forecast to increase by 2040, the Region will need to continue to implement methods for decreasing VMT per capita to meet the Level 2 performance target.

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<sup>8</sup> California Department of Transportation, 2014.



### Greenhouse Gas Emissions Per Capita Reduction from 2005 Levels – Targets Met

California's SB 375 requires metropolitan planning organizations to show that regional transportation plans will meet GHG emissions reduction targets for cars and light trucks. The targets are expressed as per capita reductions from the 2005 levels. This is part of the statewide policy to keep global climate temperatures from exceeding a two-degree Celsius increase, requiring GHG emissions to be reduced 40 percent by 2030<sup>9</sup>. CARB has set a 7 percent reduction target from 2005 levels by 2020 and a 5 percent reduction from 2005 levels by 2035 for the Lake Tahoe Region. Forecasting shows that the 2020 target of 7 percent will be met with an 8.8 percent actual reduction from 2005 levels and the 2035 forecast target of 5 percent will also be met with a 5 percent reduction from 2005 levels. For more details on this analysis, see Chapter 2: Planning Context. CARB and TRPA will be updating GHG emission reduction targets for future periods using the analysis of this plan.

#### *Greenhouse Gas Emissions per Capita Reduction from 2005 Levels*

*Target: 7% reduction from 2005 levels by 2020; 5% reduction from 2005 levels by 2035*

*Projected Estimates: 2020 – 8.8%; 2035 – 5.0%*

*Status: Meeting Target, Indicator Stable*



### GOAL 2: CONNECTIVITY

*Enhance and sustain the connectivity and accessibility of the Tahoe transportation system, across and between modes, communities, and neighboring regions, for people and goods.*

Surveys reveal that connectivity is a high priority for the public. Pathways and transit that link destinations invite more people to use them and reduce reliance on the automobile. Connectivity measures show the extent to which residents and visitors can easily reach the places they want to go by transit, bicycling, or walking. TRPA monitors or reports the following measures to understand progress toward achieving system connectivity: miles of active transportation facilities constructed; non-auto mode share; transit ridership and cost recovery; and percentage of overnight lodging and recreation areas with transit, bicycle, and pedestrian access, among others.

### Miles of Bicycle and Pedestrian Facilities Constructed – Target Met (Level 1 and Level 2)

TRPA reports on miles of bicycle and pedestrian facilities constructed in the Region each year. The measure is one of three transportation-related Regional Plan Performance Measures approved by the TRPA Governing Board in 2013. Bicycle and pedestrian infrastructure provides key links between Tahoe communities and recreation areas and reduces reliance on the automobile. The network encompasses all existing infrastructure: shared-use paths, bike lanes, bike routes, sidewalks, and enhanced crosswalks; 127 miles has been completed and roughly another 157 miles of facilities are planned.

#### *Miles of Bicycle and Pedestrian Facilities Constructed*

*Target: Level 1 Benchmark – 4.5 miles per year /  
Level 2 Benchmark (2016) – 9 miles per year*

*Current Condition: 2015: 9.2 miles*

*Status: Meeting Target, Indicator Stable*

The performance measure is influenced by policies supporting sidewalks and trails, and the implementation of bicycle and pedestrian projects. A 2012 coverage exemption policy reduces the cost of sidewalk and trail construction thereby stretching limited constrained monies and increasing improvements. From 2002 to 2011, partners constructed 4.15 miles per year on average. The Regional Plan

<sup>9</sup> State of California, 2017.

performance measure Level 1 target is 4.5 miles of facilities constructed per year and Level 2 (2016) target is 9 miles per year through 2020. The Level 1 target was achieved from 2012 through 2015, as an average of 4.6 miles were constructed each year during that period. 9.2 miles were constructed in 2015<sup>10</sup>, meeting the Level 2 target.

### Non-Auto Mode Share – Level 1 – Target Met, Level 2 – Target Not Met

The non-auto mode share measure demonstrates the extent to which residents and visitors in the Tahoe Region are using transit, biking, or walking for their travel needs. Non-Auto Mode Share is measured as a percentage of total trips, so fluctuations in visitation and population, which may be influenced by external factors such as weather, economic circumstances, or gas prices, do not affect this indicator. This

performance measure is the third of three transportation-related Regional Plan Performance Measures adopted by the TRPA Governing Board in 2013.

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#### *Non-Auto Mode Share*

*Target: Level 1 Benchmark – Increase non-auto mode share / Level 2 Benchmark (2016) – 19.3% non-auto mode share*

*Current Condition: 2014 (summer) / 2016 (winter): 18%*

*Status: Meeting Level 1 Target, Not Meeting Level 2 Target, Indicator Stable*

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Intercept surveys capture both visitor and resident travel at recreational and commercial sites throughout the Tahoe Region in both winter and summer. The target for this measure is 19.3 percent non-auto mode share<sup>11</sup>. Summer surveys were done in 2006, 2010, and 2014. Winter surveys were done in 2008, 2012, and 2016. The average of winter and summer surveys yield a year-round average. The Regional Plan Level 1 target was achieved as part of the 2014 Summer Mode Share Survey (21 percent in 2014). The Region fell short of the Level 2 (2016) target of 19.3 percent with a 2014/2016 computed annual average of 18 percent<sup>12</sup>.



Lake Tahoe Boulevard Path  
Photo: Mike Vollmer

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<sup>10</sup> TRPA EIP Tracker, 2016.

<sup>11</sup> TRPA, 2013.

<sup>12</sup> TRPA, 2006, 2008, 2010, 2012, 2014, 2016.

## Transit Ridership

While transit ridership can fluctuate, it remains a useful indicator of how many people the transit system is serving. Tahoe Truckee Area Transit (TART) ridership on the North Shore peaked in 2008, declined in 2009, and has remained steady since<sup>13</sup>. Similarly, South Shore ridership has declined but remained relatively steady since the recent peak in 2008<sup>14</sup>. Regional partners will continue to monitor transit ridership, ridership targets may be set once service frequency goals and available funding are established.

### Transit Ridership

**Target:** No Target

**Current Condition:** 2015/2016:

North Shore – 332,440 passengers;

South Shore – 792,875 passengers

**Status:** Indicator Stable

## Transit Passengers per Revenue Mile and Transit Passengers per Revenue Hour<sup>15</sup>

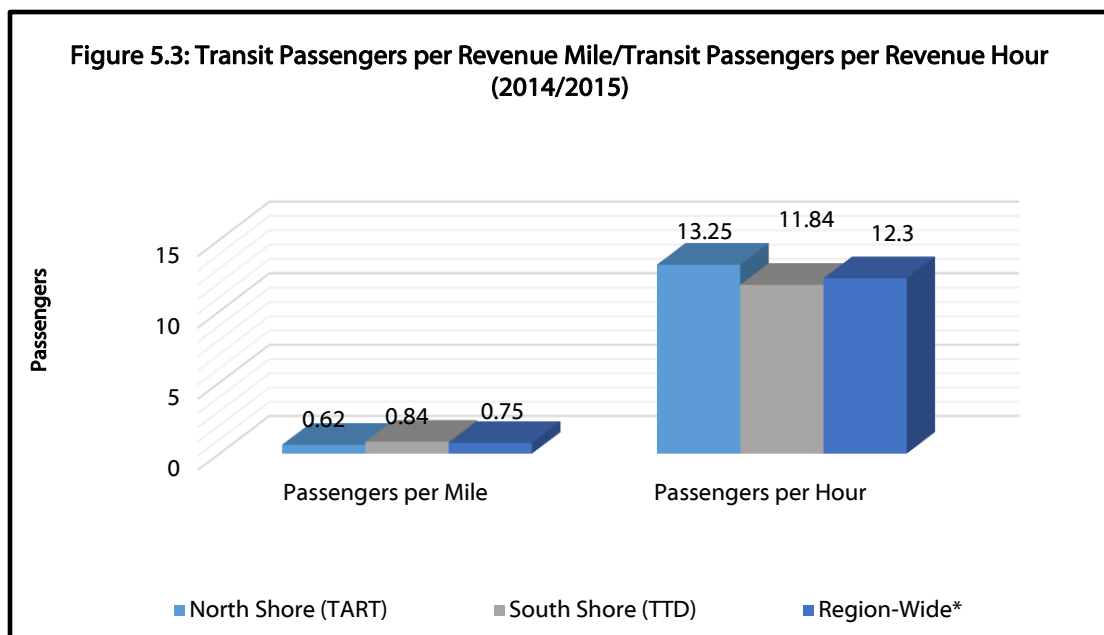
Transit passengers per revenue mile and transit passengers per revenue hour are measures of transit service efficiency, indicating how many passengers are being served for each mile or hour of service provided. The Federal Transit Administration reports that the 2014 national average for urban fixed route bus systems is 33.5 passengers per revenue hour but does not report passengers per revenue mile<sup>16</sup>. The comparison of Tahoe's data with national trends shows room for improvement in the long-term. Moving forward, TRPA will report on these measures annually, and will coordinate with State departments of transportation and other stakeholders for development of targets in fulfillment of FAST Act requirements.

### Transit Passengers per Revenue Mile/Hour

**Target:** Targets set within 6 months of target setting by states, per 23 CFR 450.306(d)

**Current Condition:** 2014/2015: 0.75 Passengers per Revenue Mile; 12.3 Passengers per Revenue Hour

**Status:** No Indicator Status Determination



<sup>13</sup> Tahoe-Truckee Area Regional Transit (TART) (personal communication, July 2016).

<sup>14</sup> Tahoe Transportation District (personal communication, July 2016).

<sup>15</sup> North Shore (TART) Source Note: W. Garner (personal communication, July 22, 2016). Note: Region-Wide calculated as Total Passengers divided by Total Miles and Total Passengers divided by Total Hours.

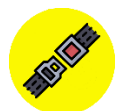
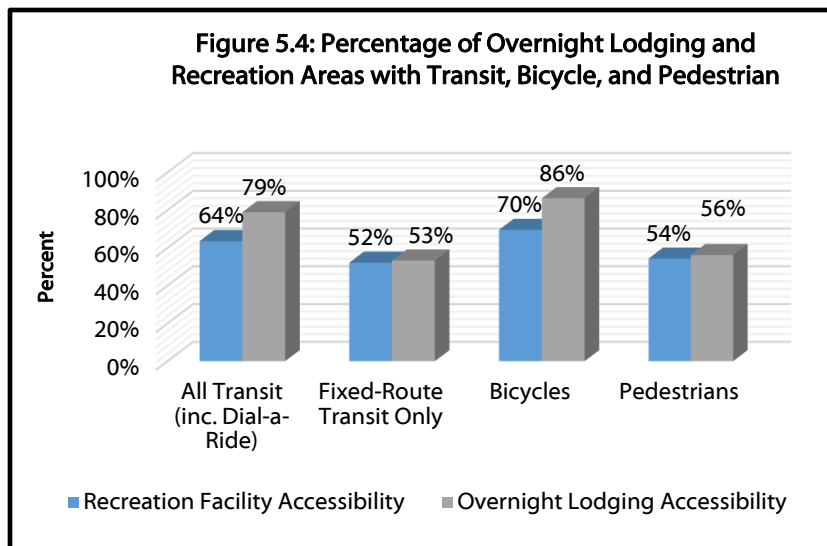
<sup>16</sup> Federal Transit Administration, 2015.



### Percentage of Overnight Lodging & Recreation Areas with Transit, Bicycle, & Pedestrian Access<sup>17</sup>

This measure uses geographic information system (GIS) mapping of existing transit and bicycle routes and compares proximity to Lake Tahoe recreation areas. For transit access, TRPA counts the percentage of recreation areas and overnight lodging facilities (including residences, hotels, and motels) that have a transit stop within one-quarter mile of the entrance. For bicycle access, TRPA counts the percentage of recreation and overnight lodging facilities that have a bicycle path, lane, or route within one-half mile of the entrance. For pedestrian access, TRPA counts the percentage of recreation and overnight lodging facilities that have a Class-I shared-use path or sidewalk within one-quarter mile of the entrance. Recreation areas considered in this measure are based on a list of 183 recreation sites around the Region. The list includes: all state park and state recreation areas, all public and private campgrounds, all U.S. Forest Service beaches, formal trailheads, and visitor centers, all designated sites maintained

by a regional recreation provider, downhill and cross-country ski areas, and public marinas. The performance measure shows system connectivity but not quality of the path or frequency of transit service. Through increased construction of bicycle and pedestrian infrastructure coupled with strategic transit enhancements described in this plan, access to recreation and overnight lodging by alternative modes will increase, showing a successful reduction in the Region's reliance on the private automobile consistent with the TRPA Compact.



### GOAL 3: SAFETY

*Increase safety and security for all users of Tahoe's transportation system.*

TRPA monitors detailed crash data annually for multiple plans; this plan, the 2016 Active Transportation Plan, and the 2017 Corridor Connection Plan once finalized. Additionally, the Lake Tahoe Region Safety Plan will include historical and current crash data. Further, planned projects are analyzed for their effectiveness of improving safety, with the goal of addressing hazards at specific locations.

**Policy 4.14:** Design roadway corridors, including driveways, intersections, and scenic turnouts, to minimize impacts to regional traffic flow, transit, and bicycle and pedestrian facilities by using shared access points where feasible.

Safety measures are currently included in federal rulemaking related to performance measurement. Metropolitan planning organizations are required to report on safety indicators and targets beginning no later than six months after state departments of transportation set their targets. TRPA will set targets pursuant to these FAST Act requirements and integrate them into the performance measurement framework and the congestion management process. This includes target-setting to track 5 system-level performance indicators for safety:

<sup>17</sup> TRPA Geographic Information Systems (GIS), 2016.

Number of Fatalities, Rate of Fatalities per 100 million VMT, Number of Serious Injuries, Rate of Serious Injuries per 100 million VMT, and Number of Non-Motorized Fatalities and Serious Injuries. Current statistics for these measures are in Table 5.1, below.

Table 5.1: Safety Performance Measures and Targets

Performance Measure <sup>18</sup>	Current Condition	Target	Status
Number of Fatalities	2009-2013: 13 Fatalities	Targets set by September 2019, per 23 CFR 450.306(d)	No Indicator Status Determination
Rate of Fatalities* (per 100 million VMT)	2009-2013: 0.87 Fatalities per 100 million VMT		
Number of Serious Injuries	2009-2013: 956 Injuries		
Rate of Serious Injuries* (per 100 million VMT)	2009-2013: 64.16 Injuries per 100 million VMT		
Number of Non-Motorized Fatalities and Serious Injuries	2009-2013: 134 Fatalities and Serious Injuries		



#### GOAL 4: OPERATIONS AND CONGESTION MANAGEMENT

*Provide an efficient transportation network through coordinated operations, system management, technology, monitoring, and targeted investments.*

An efficient transportation network that functions through coordinated operations, system management, technology, and monitoring is one that benefits the environment, the local economy, resident quality of life, and visitor quality of experience. The efficient management and operation of the Tahoe transportation system is measured using transit farebox revenue and recovery indicators. Transit fare recovery ratios are indicators of how efficiently our transit services operate considering roadway demand and other system constraints. They are an indication of the successful implementation of multi-modal alternatives to the private automobile and the pressure on other revenue sources when fares cover less than full operating costs.

Transit measures are currently included in federal rulemaking related to performance measurement. Metropolitan planning organizations are required to report on transit indicators and targets beginning no later than six months after state departments of transportation set targets. TRPA will set targets pursuant to these FAST Act requirements and integrate them into the performance measurement framework and the congestion management process. This includes target-setting to track 3 system-level performance indicators for transit: transit cost per revenue mile and transit cost per revenue hour (Figure 5.5), and transit farebox recovery rate (Figure 5.6). As technology advances are implemented in the Region through projects identified in the 2014 ITS Plan, TRPA will continually assess whether additional performance measures should



**Emerald Bay Parking Conditions**

Photo: Aurora Photos / Rachid Dahnoun

<sup>18</sup> Note: The rate of fatalities and serious injuries is calculated over a five-year period per 100 million VMT. In the future, to comply with federal law, a VMT rate that is consistent with the rate used by other metropolitan planning organizations in California and Nevada will be used, and may be calculated using a statewide model. This 2016 plan used the five-year VMT estimate of 1,490,062,515 calculated for the existing conditions report for the 2017 Corridor Connection Plan. As TRPA has not previously reported on this indicator, there is no historical data for comparison.

be monitored to understand whether this goal is being achieved.

### Transit Cost per Revenue Mile and Transit Cost per Revenue Hour<sup>19</sup>:

National trends provided by the Federal Transit Administration for fixed route bus systems costs are \$1.05 per revenue mile and \$130.72 per revenue hour in 2014<sup>20</sup>. Lake Tahoe's rural and climatic conditions partly explain Tahoe higher average generally<sup>21</sup>, however, there is a need for continued improvement in this area.

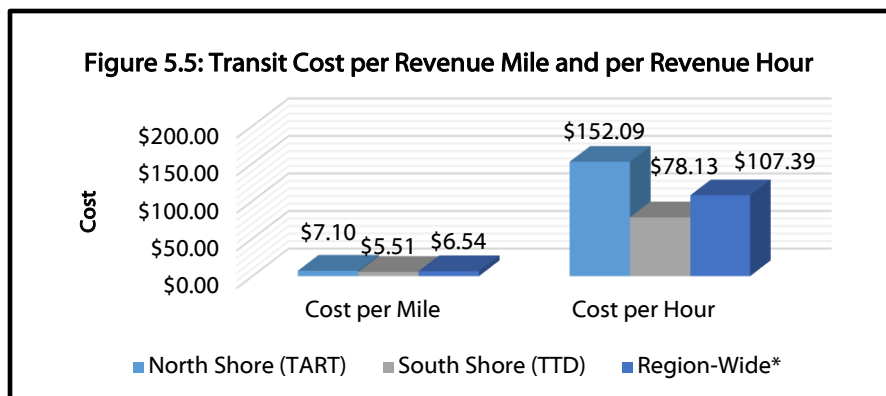
**Transit Cost per Revenue Mile/Hour**  
**Target:** Targets set within 6 months of target setting by states, per 23 CFR 450.306(d)

#### Current Condition:

2014/2015: \$6.54 per Revenue Mile;

2014/2015: \$107.39 per Revenue Hour

**Status:** No Indicator Status Determination



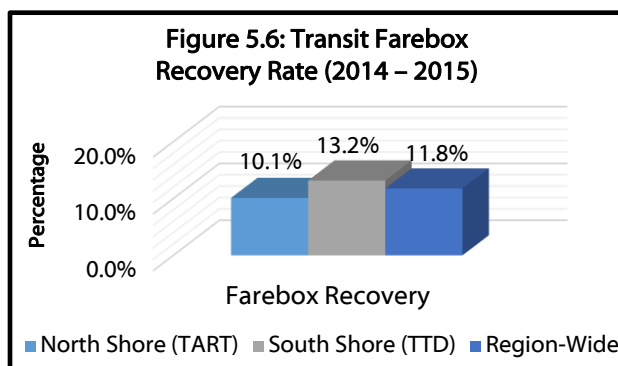
### Transit Farebox Recovery Rate<sup>22</sup>

For 2014, national farebox recovery trends at 26.2 percent are substantially higher than the Tahoe Region. Lake Tahoe's rural and climatic challenges partly explain a higher average generally<sup>23</sup>. There is need for continued improvement in this area. TRPA will report these indicators annually to meet federal requirements and will compare the results with those of other regions in California and Nevada once FAST Act targets are set.

**Transit Farebox Recovery Rate**  
**Target:** Targets set within 6 months of target setting by states, per 23 CFR 450.306(d)

**Current Condition:** 2014/2015: 11.8%

**Status:** No Indicator Status Determination



<sup>19</sup> W. Garner (personal communication, July 22, 2016). Note: Region-Wide calculated as Total Cost divided by Total Miles and Total Cost divided by Total Hours.

<sup>20</sup> Federal Transit Administration, 2015.

<sup>21</sup> Jarrett Walker, 2011.

<sup>22</sup> W. Garner (personal communication, July 22, 2016).

<sup>23</sup> Jarrett Walker, 2011.





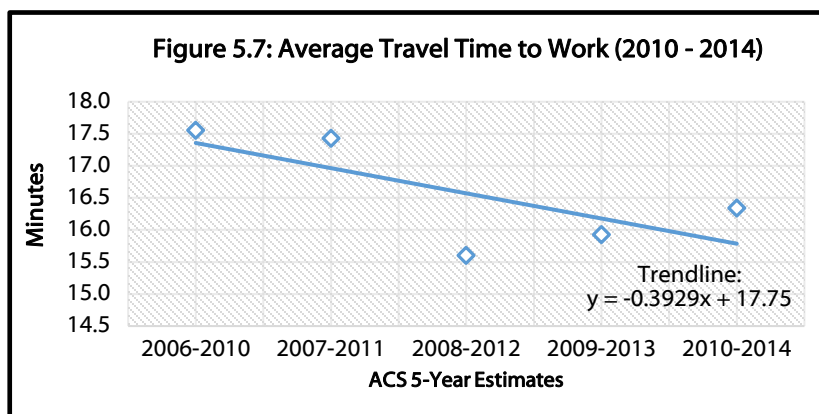
## GOAL 5: ECONOMIC VITALITY & QUALITY OF LIFE

*Support the economic vitality of the Tahoe Region to enable a diverse workforce, sustainable environment, and quality experience for both residents and visitors.*

TRPA monitors a variety of performance measures to provide an overall indication of economic success. For some indicators, the link is stronger than others: sales tax revenue, resident average travel time to work, VMT of each user group, and Housing and Transportation Affordability Index. For the plan, TRPA will report average travel time to work and the Housing and Transportation Affordability Index. Additional measures related to economic vitality and quality of life are reported at LakeTahoeInfo.org and in Appendix G: Performance Measures. The Tahoe Prosperity Center periodically reports comprehensive socioeconomic conditions for the Region.

### Average Travel Time to Work<sup>24</sup>

Average travel time to work indicates the integration of land use development patterns with transportation options. The measure tells us how efficiently the system connects residents' homes and work locations. As development is concentrated within community centers and jobs grow within the Region, travel time to work is expected to decrease. Likewise, with viable alternatives to the private automobile, travel time to work is also expected to decrease. For Lake Tahoe residents, average travel time to work has been trending downward (see Figure 5.7). The number of workers in the Region has decreased by 6 percent from 2010-2014.



### Housing and Transportation (H+T) Affordability Index

The Housing and Transportation (H+T) Affordability Index, an online tool developed by the Center for Neighborhood Technology (CNT)<sup>25</sup>, measures the underlying housing and transportation expenses associated with a specific location (MPO, County, City, census block).

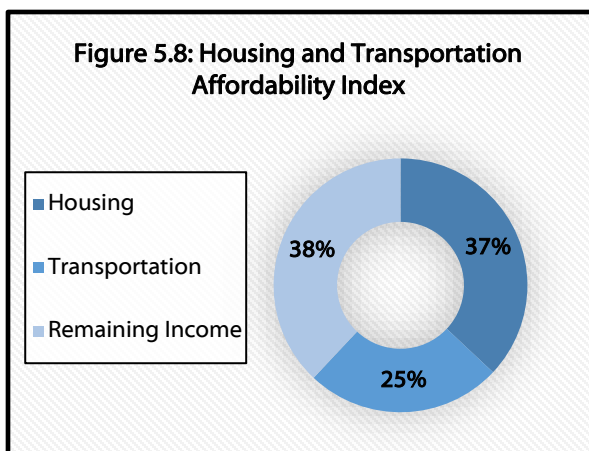
*"By taking into account the cost of housing as well as the cost of transportation, H+T provides a more comprehensive understanding of the affordability of place. Dividing these costs by the representative income illustrates the cost burden of housing and transportation expenses placed on a typical household. While housing alone is traditionally deemed affordable when consuming no more than 30% of income, the H+T Index incorporates transportation costs – usually a household's second-largest expense – to show that location efficient places can be more livable."*

*-Center for Neighborhood Technology*

<sup>24</sup> U.S. Census American Community Survey, 2006-2010, 2007-2011, 2008-2012, 2009-2013, and 2010-2014. Geographic Boundaries, Census Tracts: North Shore, Placer County - 201.04, 201.05, 201.06, 201.07, 221, 222, 223; North Shore, Washoe County - 33.05, 33.06, 33.07, 33.08, 33.09; South Shore, Douglas County - 16, 17, 18; South Shore, El Dorado County - 302, 303.01, 303.02, 304.01, 304.02, 305.02, 305.04, 305.05, 316, 320. Note: Travel times exclude those that work from home.

<sup>25</sup> Center for Neighborhood Technology, 2016.

For the Tahoe Region, a December 2016 H+T Affordability Index analysis found that Lake Tahoe residents spend an average of \$14,672 on annual transportation costs, or 37 percent of their income on housing and 25 percent on transportation; a total of 62 percent, leaving only 38 percent of annual incomes for non-housing and transportation expenditures. In comparison, Sacramento-Roseville area residents spend 56 percent, Reno area residents spend 58 percent, and San Francisco-Oakland-Hayward residents spend 50 percent of their incomes, on housing and transportation.

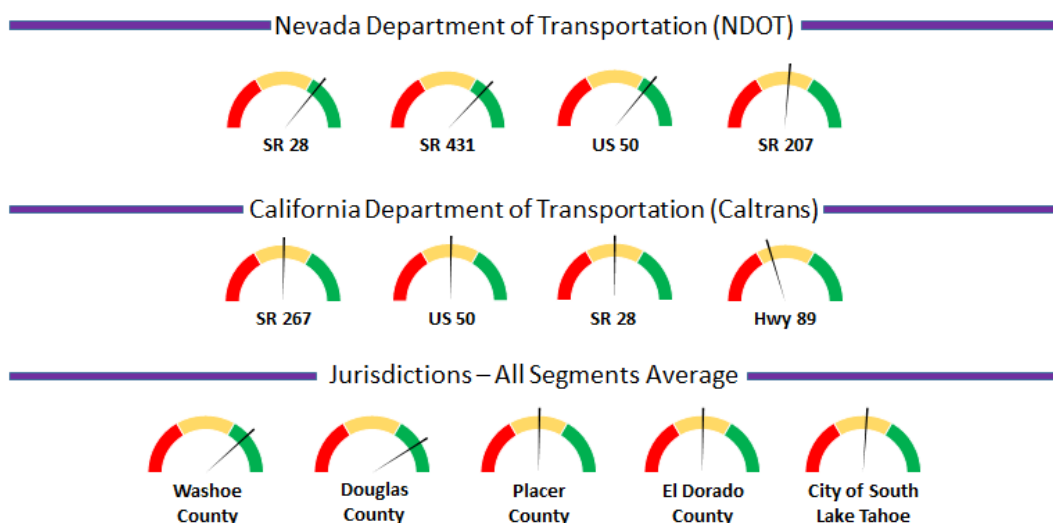


## GOAL 6: SYSTEM PRESERVATION

*Provide for the preservation of the existing transportation system through maintenance activities that support climate resiliency, water quality, and safety.*

This plan addresses asset management and the preservation and maintenance of the transportation system through policies that preserve the condition of sidewalks, bicycle facilities, roadways, and view turn-outs along scenic highways. Asset management maintains traffic flow and safety, and preserves the Region's investment in the transportation system. TRPA collected 2016 pavement condition data from partner agencies and reports it in Figure 5.9, below.

**Figure 5.9: 2016 Pavement Condition for Lake Tahoe Roadways**



Together with local governments, TRPA will continue to assess roadway pavement conditions and report the percentage of bridges and pavements in state of good repair. Targets for these performance measures will be set in accordance with federal FAST Act requirements and TRPA will report the measure in the plan and at [LakeTahoeInfo.org](http://LakeTahoeInfo.org).



The Tahoe Region's transportation system doesn't just move people, it works to restore and protect the environment, strengthen the economy, and revitalize communities. More walkable, bikeable, and transit connected town centers and recreation destinations will improve access, spur economic development, make for a healthier community, and ensure that residents, commuters, visitors, and those with special needs have mobility options. Stormwater projects on our roadways reduce pollutants that impact Lake Tahoe's famous water clarity. Reducing reliance on the private automobile will improve air quality, help the Region meet GHG reduction targets, and manage congestion. As a result, Lake Tahoe will be more resilient and sustainable. With continued innovation and broader partnerships, solutions needed to move the Lake Tahoe Region forward are within reach.



Photo: Aurora Photos / Rachid Dahnoun

## Implementing this 2017 Plan

Implementing this plan, over the next four years, will focus on the following elements:

### Responding to Complex Travel Patterns

Partners will deliver projects and incentive programs that target Tahoe's user groups – residents, commuters, and visitors – and the most problematic travel patterns and locations to help shift the times and ways people travel and the destinations they travel to.



## Managing Congestion at Peak Periods

Partners will continue to monitor traffic patterns and respond to identified hot spots. Strategies to manage congestion during peak periods at peak locations will include increasing transit services and reducing transit cost to passengers, providing real-time information through mobile apps, and improving intersection functionality to create a flexible system that is responsive to demand.

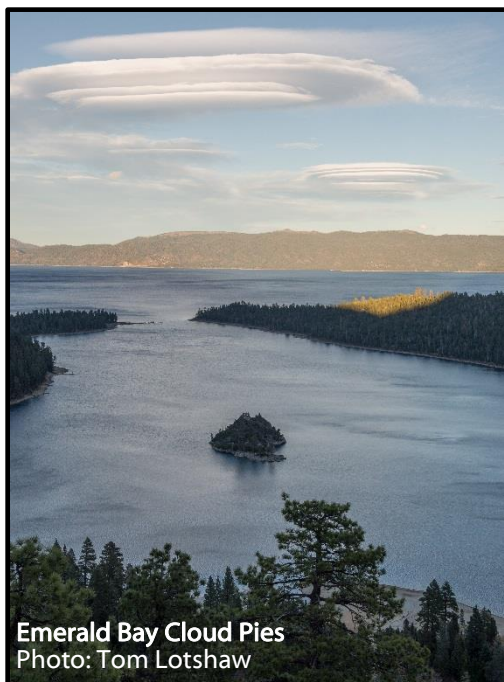
## Data and Performance Driven Program

Data collection and analysis will continue to evolve to support regional needs. Projects and programs devised to meet regional goals will be tracked through the performance measurement framework. Individual project performance will direct federal and state funding allocated through TRPA.

## Efficient and Accelerated Implementation

Corridor level planning and a bundled project delivery approach will accelerate transportation system implementation. Bundling projects will spread constrained dollars further by providing engineering and construction efficiencies, leveraging multi-modal and technological implementation, and incorporating environmental improvements. Efficient completion of a seamless internal transportation network sets the stage to strengthen multi-modal options to visitors entering and exiting the Region in the next round of transportation plan updates.

## Incentivizing Walking, Biking, and Transit through Transportation Demand Management Programs



**Emerald Bay Cloud Pies**  
Photo: Tom Lotshaw



**Harrison Avenue, South Lake Tahoe**  
Photo: Aurora Photos / Rachid Dahnoun

Incentive programs to influence travel choice and behavior are strategies needed to change the growing perception of unmanaged congestion. Through a broad reaching stakeholder process with both public and private entities, transportation demand management strategies will be developed and rolled out over the period of the plan. The process will focus on nationally successful best practices and incorporate stakeholder feedback and interest. Strategies to be coordinated, sequenced, and strategically implemented are myriad, and can include parking management, commute benefit packages, lodging deals, recreation equipment and shuttle partnerships, marketing techniques for visitor awareness, and new online tools such as a transportation trip planning tool. Based on the outcome of the collaborative process, TRPA can help launch public-private partnerships for employers, lodging properties, recreation providers, and local agencies to take advantage of available resources, new technology, and infrastructure while providing incentives for the public to participate in updated programs. Capitalizing on already existing regional partnerships and collaboration will be the engine of success for developing and implementing the right mix of transportation demand management strategies for the Tahoe Region.

## Sustainable Recreation at Lake Tahoe

Lake Tahoe has long been a recreation destination for millions of visitors every year. With increasingly high visitation and limited funding, regional partners are focusing on how to create a sustainable recreation system and maintain quality user experiences.

The US Forest Service Lake Tahoe Basin Management Unit and partners have initiated stronger coordination around sustainable recreation at Lake Tahoe.

A public-private coordinated response is key to providing outstanding recreational opportunities and conserving natural and cultural resources that underpin Lake Tahoe's recreation opportunities. Actions to continue to enhance and achieve sustainable recreation, include:

- 📌 *Education and outreach programs*
- 📌 *Monitoring and understanding visitor behavior and use patterns*
- 📌 *Seamless multi-modal transportation options from town centers to recreation sites*

The Regional Transportation Plan provides guidance, implementing policies, and project funding to sustainably connect the transportation system to recreation sites.



**Recreation Shuttle**

Photo: Aurora Photos / Rachid Dahnoun

## Moving from 2017 to 2021

To match Tahoe's world-class recreation assets, the Region needs a first-class transportation system. This plan takes the first essential steps to enhance transit, trails, technology, and transportation system management to serve the growing needs of residents, commuters, and visitors.



**Transit:** Improved service frequency, expanded service seasons, added routes to recreation sites, reduced costs to passengers by providing free-to-the-user service in targeted locations, and extended services to Meyers and Truckee.

**For 2021:** Partners will develop and fund projects that provide inter-regional transit services connected to mobility hubs with park and ride locations and travel amenities to make taking transit to visit the Region a convenient and preferred option.



**Trails:** Increased connectivity and safety by closing gaps in shared-use paths and improved crosswalks along the North, South, East, and West shores.

**For 2021:** Close large active transportation gaps to increase the number of people using biking and walking as a mode of transportation.



**Technology:** Improved real-time information accessible by adding changeable message signs and enhancing mobile-friendly online applications for transit, trails, and parking management systems. Data collection and analysis becomes more transparent with reporting on [www.ltinfo.org](http://www.ltinfo.org) and more sophisticated collection methods.

**For 2021:** Real-time information technologies for parking management systems and deployed in public and private parking venues. New data collection and analysis methods and cost sharing agreements to increase transparency, consistency, and implementation.



**Transportation System Management:** Multiple corridor revitalization projects better manage congestion by redesigning roadways and intersections using a complete street approach. Operation and maintenance enhanced by shared-use path snow removal and improved equipment. Resiliency planning and project design promotes transportation security.

**For 2021:** Corridor planning bundles projects further accelerating regional systems implementation. Adaptive roadway management projects begin to come online for U.S. Highway 50, state Route 89, and state Route 267.



### Adaptive Roadway Management at Lake Tahoe

Adaptive roadway management challenges implementing agencies to operate roadways in atypical ways. This keystone strategy of transportation systems management is an important tool for Lake Tahoe operators due to the inability or desire to expand roadway capacity within the Region. The combination of limited entry roadways and peak recreation travel makes delivering adaptive roadway management at the Lake Tahoe Region, similar to practices already operating in Tahoe City, vital as it can assist partners in better managing congestion, and encouraging people to walk, bike, and use transit. Locations where this is being considered at Lake Tahoe include U.S. Highway 50, SR 89, and SR 267

#### Examples of Adaptive Roadway Management Include:

- ❖ *Reversing travel lanes for one direction travel during intense peak periods and during evacuation procedures*
- ❖ *Prioritize emergency vehicles, buses, and high-occupancy vehicles by holding single occupancy vehicles and allowing others to pass first*
- ❖ *Providing transit only lanes during peak periods, or within two way left turn lanes*
- ❖ *Limiting vehicle access to high use recreation destinations*

### Partner Actions to Prepare for 2021 Regional Transportation Plan

The regional transportation plan is updated every four years to authorize federal and state transportation program funding. This ongoing cycle provides opportunities to update data analysis, funding mechanisms, policies, program strategies, and projects. Partners collaborate to accelerate the delivery of the long-term transportation vision through performance measures, regional policy direction, strengthening mega-region partnerships, and better communicating the intricacy of transportation planning solutions in the Tahoe Region. The results are integrated into related planning and funding strategies and carry forward into the 2021 regional transportation plan.

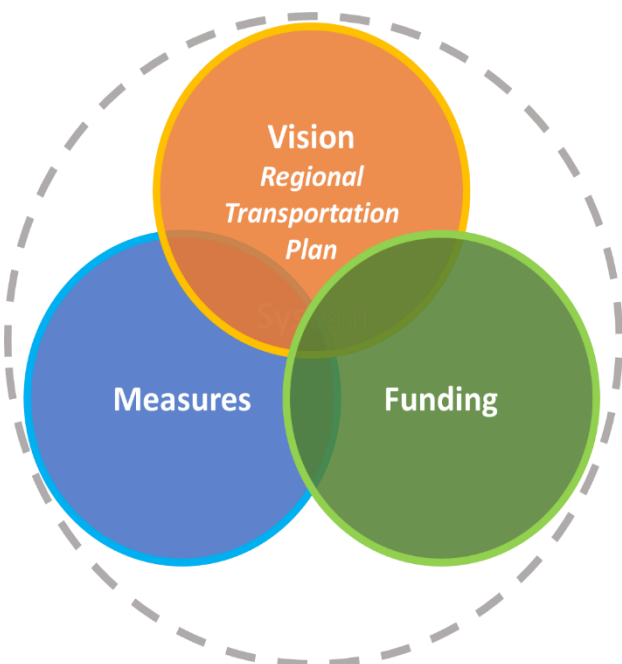


Figure 6.1: Transportation Strategic Initiative

## Technology and Innovation

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As the Tahoe-Truckee Plug-In Electric Vehicle Readiness Plan nears completion, work now shifts to plan implementation. In January 2017, partners were awarded a California Energy Commission grant to begin implementation of the readiness plan for more ZEV and PEV vehicles in the Tahoe-Truckee Region. The project starts with public awareness and outreach campaigns, data collection and analysis for infrastructure site identification, and a streamlined permitting and inspection process. By 2021, partners will begin to implement region-wide electric vehicle infrastructure and increase use in public and private fleets.

## Policy Issues

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As the federal, state, and regional regulatory landscapes continue to evolve, high-level policies must also adapt. At Lake Tahoe, policy issues such as using level of service to determine roadway functionality and manage congestion may need to be revised. Formalization of regional parking management requirements and agency responsibilities will assist in shifting travel to active transportation and transit at high use town center and recreation sites. These policy issues and more will be discussed and vetted over the next four years in preparation of the 2021 regional transportation plan.

## Performance Measurement Framework & Updating Transportation Measurement

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The performance measurement framework guides investment by directing project funding and design to meet regional objectives. The framework will evolve with new data and funding sources. Future work will include performance based funding programs, continued refinement of the project selection process, and a continued commitment to using best-available science to evaluate strategy effectiveness and inform investment. This work will also include the required congestion management process and the updates of transportation performance measures and related transportation threshold indicators.

Delivery of this plan preserves the environment by supporting TRPA thresholds and California state mandated GHG emission reduction targets. As GHG emission reduction targets are recalibrated and become stricter, partners will continue to engage with CARB to understand the impacts of visitation, surrounding growth, and a relatively fixed residential population on estimated VMT and GHG emission methodologies. The TRPA Advisory Planning Commission will sponsor a transportation measurement working group to establish a foundation to evaluate the best transportation metrics to assess system performance.

## Innovative Regional Revenue

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This plan outlines the future needs to realize the envisioned transportation system and secure the funding levels needed to transform the Tahoe Region's transportation system. As existing funding sources no longer keep pace with identified needs, partners will consider new regional revenue streams to fund transportation investments, identify funding gaps, and develop plans for implementing appropriate funding mechanisms.

## Broadening Partnerships to Work Outside Traditional Boundaries

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Building off existing relationships in the Lake Tahoe Region, partners will continue to enhance and formalize planning, funding, and project collaboration with adjacent regional partners. In January 2017, partners including Placer County, SACOG, Washoe RTC, Squaw Valley/



**West Shore Tahoe Trail**

Photo: Aurora Photos / Rachid Dahnoun

Alpine Meadows, Nevada County Transportation Committee, the Town of Truckee, Caltrans, the League to Save Lake Tahoe, Tahoe Transportation District, Nevada Department of Conservation and Natural Resources, and TRPA formally launched an inter-regional coalition to enhance mega-regional planning, revenue generation, and multi-jurisdictional projects that will better connect surrounding metropolitan areas with Lake Tahoe. New partners will be invited to participate as the work progresses.

The first projects of the coalition are getting underway: a Tahoe transportation trip-planning tool, cost-sharing agreements for advanced data collection, investigating comprehensive parking management systems, coordination agreements, and shared legislative frameworks. Many of these projects will be developed further and advanced into the 2021 Regional Transportation Plan.

## Conclusion

### Funding Focus: Transit A Bi-State Priority

This plan identifies transit as a priority investment area for new funding. This plan will guide alignment around near-term transportation needs and guide the pursuit of new funding to implement them.

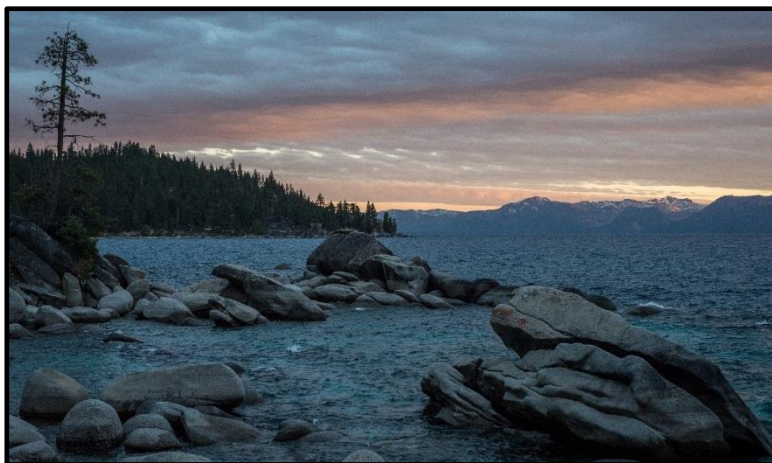
#### Near-term transit investments include:

- High frequency transit (30 minute headways)
- “Free to the user” transit
- Increased recreation access

Transportation investments are one of the best ways for TRPA and its partners to achieve many of Lake Tahoe’s regional goals, from restoring the lake’s famous water clarity to protecting the environment, improving air quality, revitalizing communities, and enhancing the public recreation opportunities that drive the Region’s economy.

The 2017 Regional Transportation Plan builds upon the Tahoe Region’s decades of progress by improving transit services, the active transportation network, technology, and transportation system management. It also prepares TRPA, partners, and Lake Tahoe communities for the next regional transportation plan in 2021. Creating a seamless, efficient, and connected multi-modal transportation system in the Region, positions the inter-regional transit services and travel options with neighboring metropolitan areas for success.

Lake Tahoe will see significant progress continue over the next four years as this transportation plan is implemented. Achieving the long-term transportation vision for the Region will require smart investment, creativity, collaboration, and dedication among many partners in and beyond Tahoe, and new funding sources to pay for needed transportation projects and programs. This regional transportation plan is the blueprint and framework for the Lake Tahoe Region to meet those challenges in coming years and deliver a world-class transportation system for one of the world’s natural treasures.



East Shore, Lake Tahoe  
Photo: Tom Lotshaw



[linkingtahoe.com](http://linkingtahoe.com)

View the plan online at: [trpa.org/regionaltransportationplan](http://trpa.org/regionaltransportationplan)

