Executive Summary

LINKING TAHOE
REGIONAL TRANSPORTATION PLAN

TAHOE REGIONAL PLANNING AGENCY || lake tahoe

DRAFT
February 2017

EXECUTIVE SUMMARY

The Lake Tahoe Region is an area of exceptional natural beauty, with one of the world's deepest, clearest lakes surrounded by pine forests, meadows, and snow-capped mountain peaks. Mark Twain, making his first visit in the 1860s, described it as, "the fairest picture the whole earth affords." Split by the California and Nevada border, this Jewel of the Sierra is a national treasure. Protecting its sensitive environment is a top priority for TRPA and dozens of public, private, and nonprofit partners at the local, state, and federal level. The Region's exceptional natural attributes are the biggest driver of its $5 billion annual economy, which is based on outdoor recreation and tourism that also contribute to some of the Region's largest transportation challenges.

The Region covers 500 square miles and has about 55,000 full-time residents. Its largest population centers are the City of South Lake Tahoe and unincorporated communities of Meyers and Stateline on the South Shore, and unincorporated communities of Tahoe City, Kings Beach, and Incline Village on the North Shore. Newly-available data show that upwards of 24 million people and 10 million vehicles travel to Lake Tahoe each year. This heavy visitation is in large part a result of Lake Tahoe's central location in the Northern California Megalopolis, a corridor of growing metropolitan areas that extends from the San Francisco Bay Area to Sacramento and Reno. More than 15 million people live in this corridor and many of them drive up to Lake Tahoe to enjoy its world-class summer and winter recreation opportunities.

This amount of visitation puts significant pressures on the Region's transportation system, which consists primarily of two-lane roadways leading to and around the lake. During times of peak visitation, visitor traffic causes significant congestion in community centers, at recreation areas, and at regional entry and exit points. With a large lake in the center of the Region, a rugged landscape, strong environmental protections, and nearly 90 percent of the Region in federal or state ownership, with most of it protected as state park or national forest, Lake Tahoe's roadways cannot simply be expanded in size to meet peak automobile travel demands. Meeting the transportation needs of Lake Tahoe's residents, commuters, and visitors while also protecting the Region's environment will require unique and dynamic solutions.

As the Lake Tahoe Region's federally-designated metropolitan planning organization, TRPA plays a leading role in identifying and planning solutions for its transportation challenges. Created through a Bi-State Compact between California and Nevada, TRPA leads the cooperative effort to preserve, restore, and enhance the Lake Tahoe Region, while improving local communities and visitors' interactions with its irreplaceable environment.

Every four years TRPA prepares a plan outlining the vision for developing, operating, and maintaining the Region's transportation system. This 2017 Regional Transportation Plan offers strategies to address the travel demands of residents, commuters, and the millions of people who visit Lake Tahoe each year. Projects and programs that implement the strategies will dynamically meet transportation needs and manage congestion with improved travel options, infrastructure, and information; improved non-automotive access to heavily-visited recreation areas; incentives that help disperse the times, places, and ways people travel; and safe, equitable access to all the places people want to visit to experience and enjoy this unique national treasure.

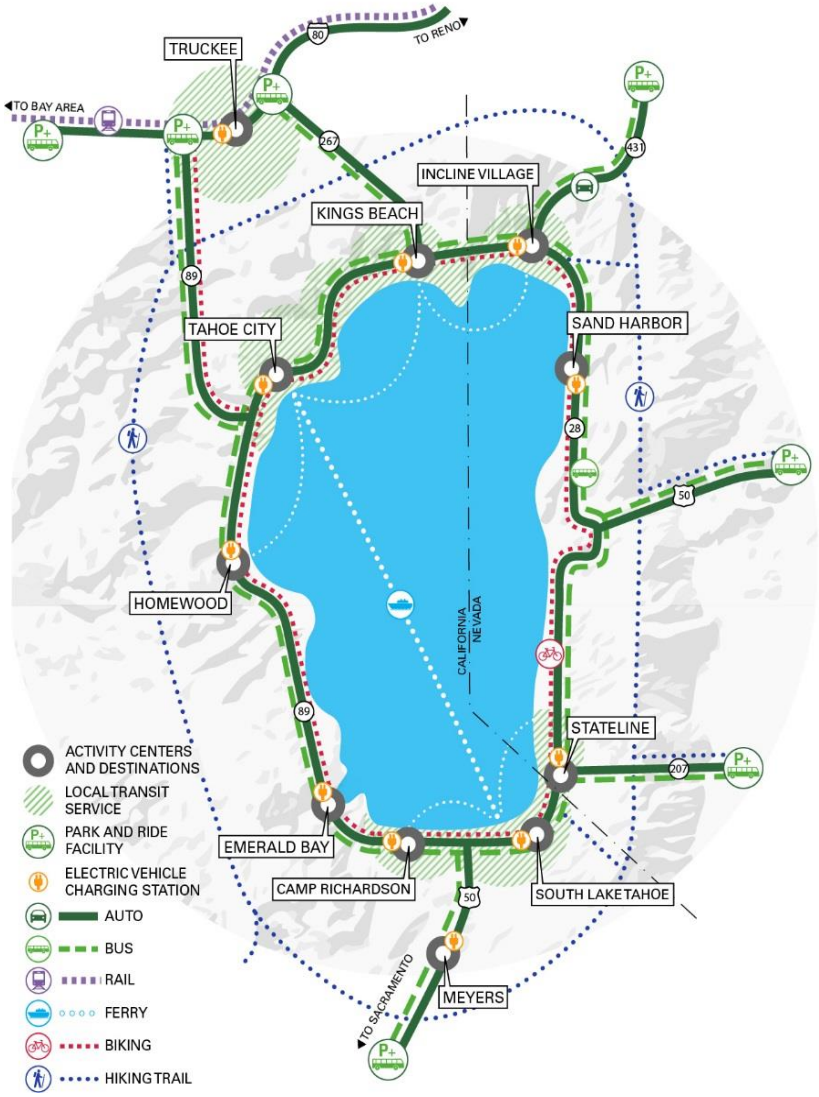
The Transportation Vision

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

Preserving the Lake Tahoe experience and environment that residents and visitors enjoy means managing the traffic congestion that occurs during times of peak visitation. Congestion is a significant challenge, but is not a constant experience on Lake Tahoe roadways. New data show the times of peak visitation throughout the year as well as the most heavily visited destinations. The projects and programs of this regional transportation plan focus intensely on those times of peak visitation and better serving heavily-visited destinations through three broad action categories—transit, trails, and technology—that work together to ease traffic congestion and improve non-automotive travel options.

Over the next two decades, a fully interconnected, multi-modal transportation system will give people real travel options to get to, from, and around the Lake Tahoe Region, and improve access to travel information so that people see and understand the costs, benefits, and impacts associated with their travel choices. To avoid congestion, travelers will choose among easy, reliable, safe, and affordable travel options that seamlessly interconnect. At the most heavily congested times and locations, non-auto options will become visitors' and residents' best choice to get to preferred locations (Chapter 1, Regional Goals and Key Concepts).

Envisioned Tahoe Region Transportation System

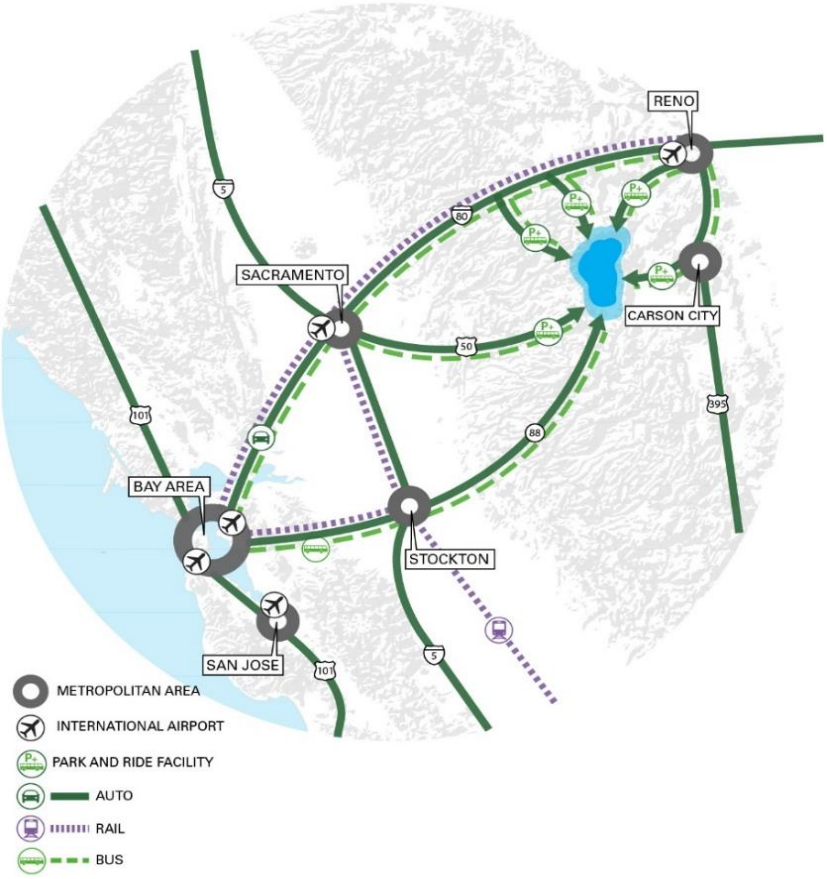


Transit: A comprehensive and coordinated bus transit system will seamlessly link the Lake Tahoe Region's communities and recreation areas and connect them to major airports, rail lines, and metropolitan areas outside the Region with frequent, reliable, and in some locations free-to-the-user transit service. Passenger ferries will connect the North and South shores, providing convenient cross-lake water

transit that is linked with the bus transit system and trail networks.

Trails: Integrated with the transit system, a complete active transportation network of trails, sidewalks, and bike lanes interspersed with bike-share options will facilitate bicycle and pedestrian travel throughout the Lake Tahoe Region for recreation and daily travel needs. The network will link community centers, neighborhoods, schools, entertainment and shopping areas, employment, tourist lodging, transit centers, and recreation areas, providing a scenic trail around Lake Tahoe and connections to the famous Tahoe Rim and Pacific Crest trails.

Envisioned Mega-Region System



Technology: With technology improvements, residents, commuters, and visitors will use personal digital devices to access real-time information about the best way to reach their destinations at Lake Tahoe. Technology upgrades will optimize traffic signalization for better traffic flow and prioritize the passage of transit and emergency response vehicles. A user-friendly network of charging stations in the Lake Tahoe Region will promote the use of zero-emission electric vehicles. Technology upgrades will also provide real-time information about traffic congestion, travel times, the availability and cost of parking in high-use areas, and help people quickly find easy-to-use transit and trail alternatives to the personal automobile. People will also be able to see information about the environmental impacts of using various travel modes.

Phased Implementation

Achieving the Lake Tahoe Region's long-term transportation vision will take time, collaboration, dedication, and successful solutions for significant funding shortfalls. It will also require a phased approach that builds upon infrastructure and programs already in place to leverage and maximize investments. Geographic constraints and the policy direction of the TRPA Bi-State Compact limit the expansion of roadways as a potential solution. Instead, the first need is the foundation of a seamlessly interconnected, well-functioning transportation system within the Region to assure travel options and easy movement once people arrive. The priorities of this 2017 plan's transportation infrastructure, programs, and management activities will implement this foundation. They encourage the use of multi-modal options to increase the efficiency, capacity, and flexibility of what is fundamentally a fixed regional transportation system.

The 2012 Regional Transportation Plan set the stage to achieve the long-term transportation vision. The starting point for building the seamless interconnections are the Region's community centers, designed as walkable, bikeable communities with complete streets that are the jumping off points

for visitors from their places of lodging and residents from their neighborhoods. This 2017 plan builds on that ongoing work by focusing on the delivery of seamless transit systems and trail networks that will provide easy, convenient, fun, and in some locations free-to-the-user travel options to recreation and other destinations throughout the Lake Tahoe Region.

Assuming the operation of seamless, efficient, and flexible transportation options within the Lake Tahoe Region, TRPA and partners can continue working with neighboring metropolitan areas to provide added transit services to and from Lake Tahoe to further reduce visitor reliance on the private automobile. This sequenced approach—prioritizing improved travel options within the Region ahead of expanding inter-regional options—will first allow more people to travel around the Lake Tahoe Region without having to drive their personal vehicle and, ultimately, allow visitors to choose to travel to and from the Lake Tahoe Region without need for a personal vehicle because they will have convenient travel options available while they are here.

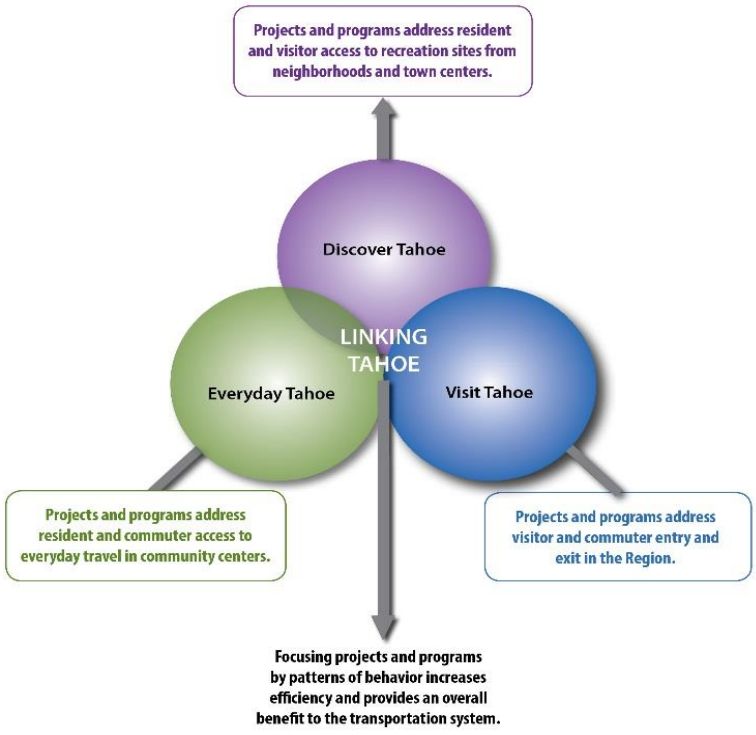
Transportation plays an essential role in the vision residents and visitors share for the future of Lake Tahoe, and for restoring and protecting the environment, strengthening the economy, and revitalizing communities. More walkable, bikeable, and transit-connected community centers and recreation destinations will improve public access, spur investment and redevelopment, create healthier communities, and ensure residents, commuters, visitors, and people with special needs have diverse mobility options. Water quality improvements packaged with transportation system upgrades will reduce stormwater pollution that harms Lake Tahoe's famous water clarity. Reducing reliance on the private automobile by providing convenient transit and trail alternatives in the Lake Tahoe Region and for visitors from neighboring metropolitan areas will improve air quality, help meet greenhouse gas reduction targets, and better manage traffic congestion.

The Plan

The plan is a blueprint to achieve the long-term transportation vision for Lake Tahoe. Applying its three major action categories of transit, trails, and technology at a more detailed level means addressing the needs and travel patterns of three distinct user groups: Residents, commuters, and visitors. TRPA and its partners now have much better information about the primary patterns of travel behavior at Lake Tahoe: Visitation to recreation sites, visitors entering and exiting the Region, and daily activities of residents and employees.

This plan organizes these primary patterns of travel behavior into three focus areas: **Discover Tahoe** (recreational travel), **Visit Tahoe** (regional entry and exit travel), and

Lake Tahoe Travel Behavior Pattern Focus Areas



Everyday Tahoe (residential and workforce travel). Coupled with a transportation corridor planning process that identifies the primary role of the transportation system in specific geographic areas around the Lake Tahoe Region and bundles projects and programs to address the primary goals for each corridor and maximize investment and benefit, these three focus areas are used to create tailored strategies that will spread travel over different modes, times, and destinations (Chapter 3, The Plan).

The priorities of the 2012 Regional Transportation Plan began by creating walkable, bikeable community centers to better address Everyday Tahoe travel needs. Today, as a result, more residents, visitors, and commuters are using trails and transit to travel in Lake Tahoe's community centers. This 2017 plan's priorities now focus most intensely on the Discover Tahoe travel behavior because recreational travel makes up the majority of daily vehicle trips by both residents and visitors to areas that are especially prone to heavy traffic and parking congestion because of high use and visitation.

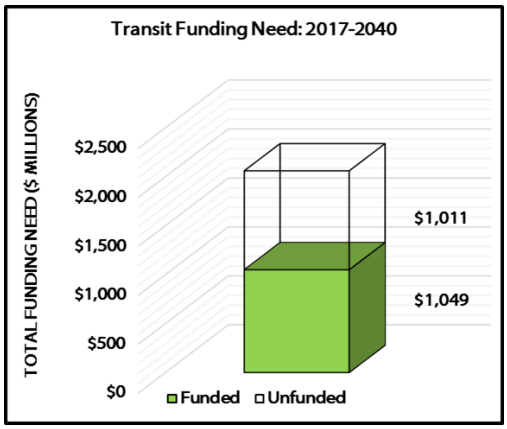
Funding

Federal law requires regional transportation plans to be "fiscally constrained," which means including only projects and programs that have reasonably foreseeable funding sources. The 2017 Regional Transportation Plan's constrained project list estimates about $2.055 billion of local, state, and federal revenue will be available for transportation investments in the Lake Tahoe Region over the next 23 years (Chapter 4, Funding the Plan). The plan also includes a "fiscally unconstrained" list. It identifies projects and programs that are considered important and necessary to achieve Lake Tahoe's long-term transportation vision, but will require additional, unidentified funding for implementation. The amount of funding needed to deliver both the constrained and unconstrained projects over the next 23 years is estimated below for each of the priority actions of transit, trails, and technology. Implementing the fiscally constrained list will accomplish many of Lake Tahoe's goals for the transportation system and deliver significant transit, trail, and technology improvements for residents, commuters, and visitors. Reasonably foreseeable revenues will provide incremental progress toward the achievement of Lake Tahoe's long-term transportation vision. Building out the full vision to meet regional needs and demands will come from regional partners working together to find new funding sources.

Projects and programs on the constrained list will reduce vehicle miles traveled and make it possible for the Lake Tahoe Region to reduce its greenhouse gas emissions from 2005 levels 8.8 percent by 2020 and 5 percent by 2035. A smaller greenhouse gas reduction is forecast for 2035 based on the projections of increased population growth in metropolitan areas surrounding Lake Tahoe and the related increases in visitation from those areas.

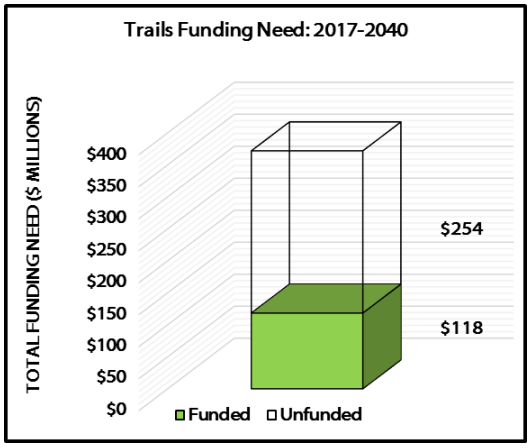
Transit

Constrained list projects will increase transit frequency from 60-minute to 30-minute intervals on all main routes; provide free-to-the-user transit throughout the Lake Tahoe Region; link North Shore and South Shore transit systems for around-the-lake service; provide new transit services to heavily-visited recreation sites at Echo Summit, Emerald Bay, and Zephyr Cove; provide new or enhanced transit services to Meyers and Truckee; improve and install transit shelters; launch passenger ferry service for cross-lake water transit linking the North and South shores; and enhance limited inter-regional transit services to Sacramento and Reno for travel to and from Lake Tahoe.



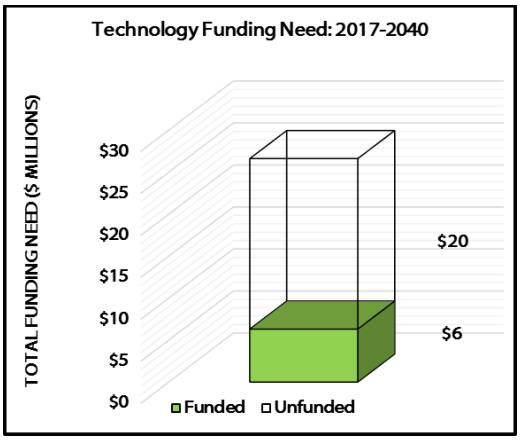
Trails

Projects on the constrained list will continue to close critical gaps in Lake Tahoe's existing 127-mile active transportation network, building about 20 miles of new shared-use path by 2021 to improve safety, access, and convenience. They will also complete corridor revitalization projects such as state Route 89 improvements between Camp Richardson and Emerald Bay to encourage the use of trails and transit to recreation areas through parking management systems, adaptive roadway management, and targeted advertising campaigns that encourage visitors to seek out less visited but equally scenic and enjoyable areas. The constrained list also includes funding for operations and maintenance by local and state agencies.



Technology

Technology enhancements on the constrained project list will provide real-time information about bus arrival times through personal digital devices and at major transit stops; provide real-time information about parking availability at high-use recreation sites; and optimize signalization on U.S. Highway 50 to improve traffic flow and prioritize the passage of transit and emergency response vehicles.



Major projects and services needed to more thoroughly address congestion associated with visitor travel cannot be achieved through reasonably foreseeable funding sources. Such projects include frequent transit from neighboring metropolitan areas with mobility hubs that provide park and ride options, adaptively managed roadways that prioritize transit passage through transit-only zones or transit-only lanes, increased local transit service with 15-minute intervals, and necessary but deferred maintenance. Projects and programs on the unconstrained list will be needed to achieve Lake Tahoe's long-term transportation vision. Over the next four years, it is critical for TRPA and its partners to identify and establish new funding sources, including regional revenue, to move into planning and implementation of these projects and programs to further address congestion at the Lake Tahoe Region's entry and exit points.

Implementing The Plan

The backbone of transportation planning and implementation to achieve the vision of a well-connected, multi-modal transportation system that meets the needs of all users at Lake Tahoe are overarching goals, data, and implementation strategies. These elements of the plan will continue to guide the design of future projects and programs, the allocation of funding, and measurement of system performance and progress (Chapter 1, Regional Goals and Key Concepts).

Regional Goals

Regional goals set the organizing framework for transportation planning and desired outcomes at Lake Tahoe. The goals of the plan carry forward and update the concepts of previous regional transportation plans with public and stakeholder feedback received from hundreds of people at public meetings and workshops. Each goal has specific policies to guide the actions of project planners, implementers, and funders.

GOAL 1: ENVIRONMENT
Protect and enhance the environment, promote energy conservation, and reduce greenhouse gas emissions.

GOAL 2: CONNECTIVITY

Enhance 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, and monitoring.

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.

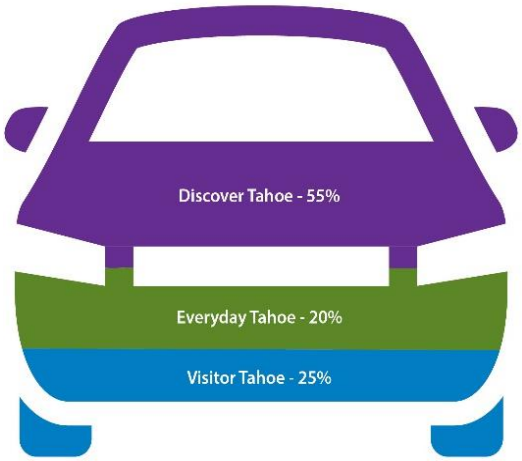
GOAL 6: SYSTEM PRESERVATION

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

User Groups and Patterns of Behavior

Vastly improved data and analysis since 2012 has improved the 2017 plan's approach and strategies. We now have better estimates to understand the often-differing needs of three distinct user groups: Residents, commuters, and visitors. Recognizing these user groups is especially pertinent to addressing the seasonal roadway congestion that occurs during times of peak visitation. Lake Tahoe's residential population of 55,000 people accounts for about 55 percent of estimated daily vehicle trips in the Lake Tahoe Region. Commuters from outside the Region account for about 3 percent of estimated daily vehicle trips, while the Region's visitors account for about 42 percent of estimated daily vehicle trips.

Daily Trips by Travel Behavior



Source: TRPA, 2016

Users' needs are generalized into different strategies to address Lake Tahoe's primary patterns of travel behavior: Visitation to recreation sites, visitors entering and exiting the Region, and the daily activities of residents and employees. This plan organizes these travel behavior patterns into three focus areas—Discover Tahoe, Visit Tahoe, and Everyday Tahoe—to group projects and incentive programs for tailored strategies that spread travel over different modes, times of day or month, and destinations, particularly in regard to the recreational travel that makes up the majority of trips by both residents and visitors.

- **Discover Tahoe, Recreational Travel (55 percent of daily trips):** To better manage congestion and improve safety at recreation areas, parking management systems coupled with new trails and frequent, free-to-the-user transit service work together to encourage people to use transit to get to recreation areas and reduce dangerous parking on roadway shoulders.

- **Visit Tahoe, Regional Entry and Exit Travel (25 percent of daily trips):** To better manage congestion for people entering and exiting the Region, adaptively managing roadways to prioritize transit passage, offering park and ride facilities with frequent and reservable transit services, dynamic signalization, and incentives encouraging the spread of travel times are strategies that work together to improve travel options and maximize the capacity and efficiency of the existing transportation system.

- **Everyday Tahoe, Residential and Workforce Travel (20 percent of daily trips):** To encourage residents and commuters to use multi-modal options, transit services will be frequent and reliable and connect to the trails and locations where people need and want to go.

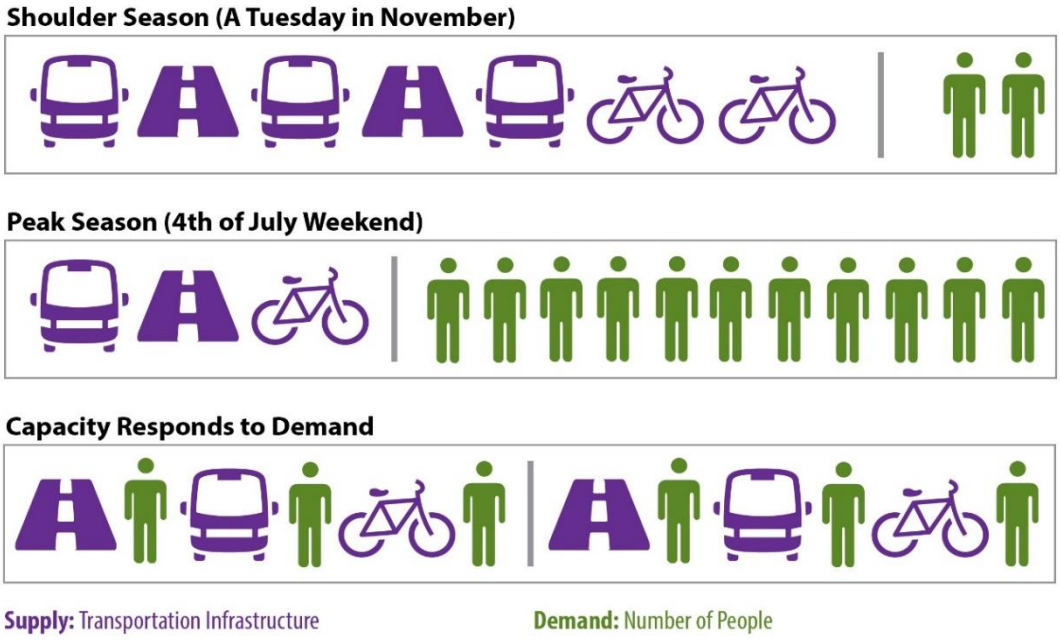
Planning a Flexible Transportation System

The Lake Tahoe Region's travel patterns are more variable than fixed. Roadways become congested only during times of high visitation or periodic events. The Region experiences some common and recurring daily commute patterns. And the renowned, year-round recreation destination and its snow-prone mountain location creates a travel environment with intense seasonal peaks in visitation and periodic events such as chain controls and road closures that can queue or hold traffic for extended periods of time.

Tahoe's limits on development to protect the sensitive environment mean that building new or bigger roads is not a solution. Instead, the strategy is having systems that can rapidly respond to

changing seasonal travel demands with multi-modal travel options, including frequent and in some locations free-to-the-user transit, especially when heavy visitation threatens to cause congestion. Transportation system operators can respond with dynamic traffic and parking management actions, diverse seasonal public transit services, real-time travel information, and incentives for people to use public transit, mobility hubs, bicycling and walking trails, and zero-emission electric vehicles. A new congestion management process will be used to evaluate and direct funding to projects and programs with the greatest benefit.

Dynamic Transportation System



Transportation System Management looks at how parts of the transportation system work together to address the needs of users and operators. It considers the movement of goods, aviation, maintenance, emergency response, evacuation, and the overall functioning of transit, trails, and technology. Services such as emergency response, maintenance, and roadway alignment and design can be improved for safety and efficiency. This plan focuses on: Preserving the environment with equipment upgrades and planning for climate change resiliency; improving emergency response times with signal preemption; and improving traffic flow and safety by reducing conflicts through corridor revitalization. This approach will increase public health and safety and more effectively manage congestion for residents, commuters, and visitors.

Residents: Signal preemption for emergency response vehicles and resiliency planning focused on climate change impacts and reducing wildfire risk will improve safety and public health.

Commuters: Upgraded maintenance equipment will provide safer travel conditions while preserving the environment through up-to-date technologies that more quickly clear roads and reduce greenhouse gas emissions and stormwater runoff.

Visitors: Corridor revitalization projects will provide multi-modal travel options for visitors to access lodging, commercial services, and recreation sites while reducing traffic conflicts and improving traffic flow in town centers.

Measuring Performance

The 2017 Regional Transportation Plan is a performance-based plan and progress and success will be continuously monitored, measured, and reported. Outcomes will be used to direct funding as it becomes available to the projects and programs most directed at meeting the priority goals and desired outcomes. Existing performance measures are identified in Chapter 5, Measuring Performance. These measures are being updated following state and federal processes as required by Congress's current transportation funding bill, Fixing America's Surface Transportation (FAST) Act. A congestion management process is also being developed as required by the FAST Act and will become part of the regional transportation plan's implementation procedures.

Leveraging Implementation

Detailed transportation corridor planning by the Tahoe Transportation District, TRPA, and local, state, and federal agencies will maximize the delivery and effectiveness of projects and reduce their cost by enhancing partnerships and implementation alignment. More specific planning is underway on six transportation corridors at Lake Tahoe and the north and south entry corridors. This next level of planning keys in on the primary transportation roles in each corridor and links that clearer understanding of people's needs in each area with projects and programs to better meet those needs. This corridor-level approach facilitates the bundling of multi-modal projects and incentive programs with environmental improvements, enhances coordination among partners, achieves multiple project benefits, and maximizes cost savings to extend investment dollars. For more information about the corridor planning process, visit www.LinkingTahoe.com.

Partner Roles and Responsibilities

TRPA's primary role is to plan the Lake Tahoe Region's transportation system and direct funding to projects that help meet regional goals. TRPA is active in the implementation of certain policies, such as working with partners to incorporate active transportation and transit infrastructure into projects. TRPA also encourages and guides collaboration among partner agencies. The primary responsibility for building and maintaining Lake Tahoe's transportation system lies with transportation partners, including El Dorado, Placer, Douglas, and Washoe counties; the City of South Lake Tahoe; public utility districts; state transportation agencies; regional transportation districts; and public lands management agencies. Private partners play an important role by providing easements, building and maintaining trails, and offering transportation services for their employees and customers. Regular input from the public, advocacy groups, and other associations is also an essential part of project planning, design, and implementation.

Planning Context: This 2017 Regional Transportation Plan fulfills multiple statutory requirements, integrates existing land use patterns and forecasts, incorporates public input, and recognizes other federal, state, and local plans.

Compact: The Tahoe Regional Planning Compact requires TRPA to develop a long-range transportation plan designed to reduce dependency on the private automobile by providing alternative travel options.

Federal: As a federally-designated metropolitan planning organization, TRPA developed this plan to meet transportation planning requirements under federal law, including the development of a long-range transportation plan.

California: As a metropolitan planning organization in California, this Regional Transportation Plan is required by state law and includes a Sustainable Communities Strategy required by California Senate Bill 375 to demonstrate how the Lake Tahoe Region will meet regional greenhouse gas emission reduction targets for 2020 and 2035.

Moving Forward

The impacts of continued population growth in metropolitan areas surrounding the Lake Tahoe Region and increased visitation from those areas will take time to address with incremental improvements. The constrained project list for this 2017 Regional Transportation Plan makes significant progress but more will be needed. As the Region pushes forward to deliver the constrained list with seamless and frequent free-to-the-user transit services, a significantly improved active transportation network, and technology improvements, TRPA and transportation partners must take concerted action to find ways to pay for the projects and programs needed to more fully address congestion associated with visitor travel to Lake Tahoe.

Fully exploring options for a regional revenue source dedicated to completing a first-class transportation system for Lake Tahoe, including transit connections between Lake Tahoe and surrounding metropolitan areas, is needed to achieve the long-term transportation vision. Such funding policy debates have been ongoing since the 1990s without resolution. With a clearer understanding of the number and types of users and their travel needs and patterns, the time is ripe to raise and resolve the issue of regional funding so the Lake Tahoe Region is well-positioned in 2021 to chart a clear path to buildout of the transportation system that assures continued preservation of the environment, quality of life for residents, and a high-quality experience for the millions of people who travel to Lake Tahoe each year.

Photo: Aurora Photos / Rachid Dahnoun

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February 2017

Linking Tahoe: Regional Transportation Plan and Sustainable Communities Strategy

Horizon Year 2017-2040

Prepared by:

Tahoe Regional Planning Agency
PO Box 5310, Stateline, NV 89449
Contact: Morgan Beryl, Senior Transportation Planner
Phone: (775) 589-5208; Fax: (775) 588-0917
Email: mberyl@trpa.org
www.trpa.org/transportation

ACKNOWLEDGEMENTS

This update to the Regional Transpiration Plan, is a collaborative process that includes robust community stakeholder and staff participation. Everyone plays an important role in shaping the vision and developing the content of these documents. Special acknowledgment is given to former TRPA principal planner Karen Fink for her work and dedication to Tahoe transportation.

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Sondra Rosenberg	Nevada Department of Transportation
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Neil Mortimer	Washoe Tribe of California and Nevada

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Greg Chew	SACOG - Housing
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Darrel Cruz	Washoe Tribe
Amy Cummings	Washoe RTC
Woodrow Deloria	El Dorado County Transportation Commission
Dan Doenges	Washoe RTC
Azadeh Doherty	SACOG
Paul Enos	Nevada Trucking Association
Jon Erb	Douglas County Public Works
Brendan Ferry	El Dorado County
Mike Gabor	USFS-LTBMU
Chris Gansen	California Governor's Office of Planning and Research
Dirk Goering	Carson City Public Works/Carson Area Metropolitan Planning Organization
Carl Hasty	Tahoe Transportation District
Elijah Henley	Central Federal Lands
Heidi Hill Drum	Tahoe Prosperity Center
Wade Hobbs	Federal Highways Administration, CA Division
Stephanie Holloway	Placer County
Loren Holt	North Tahoe Public Utility District
Clint Holtzen	SACOG - Planning
Jay Howard	Nevada State Parks
Aaron Hoyt	Placer County Transportation Planning Agency
Dan Inouye	Washoe County Health District Air Quality Management Division
Ray Jarvis	City of South Lake Tahoe
Sig Jaunarajs	Nevada Division of Environmental Protection
Heather King	Air Resources Board
Ted Koch	US Fish and Wildlife
Peter Kraatz	Placer County
Robert Larsen	Lahontan Regional Water Quality Control Board
Christina Leach	Federal Highways Administration, NV Division
William Leady	U.S. Army Corps of Engineers
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Ted Matley	Federal Transit Administration
John McCamman	California Department of Fish and Game
Richard Moorehead	Placer County
Arthur Murray	California Department of Transportation
Karina O'Connor	U.S. Environmental Protection Agency, Region 9
Patrick Pitinger	Carson City Public Works/Carson Area Metropolitan Planning Organization
Sondra Rosenberg	Nevada Department of Transportation
Tamara Sasaki	Calif. Dept of Park & Recreation, Sierra District
Dave Solaro	Washoe County
Tara Styer	Tahoe Transportation District
Steve Teshara	SSTMA
Laura Whitney	U.S. Army Corps of Engineers
Indra Winquest	Assistant Parks & Recreation Director
Mike Woodman	Nevada County Transportation Commission
Jaime Wright	Truckee-North Tahoe Transportation Management Association
Patrick Wright	California Tahoe Conservancy
Shawn Yadon	CEO

Tahoe Regional Planning Agency Staff

Principal Contributors

Morgan Beryl	Senior Transportation Planner
Lucia Maloney	Senior Planner

Communication Team Contributors

Thomas Lotshaw	Public Information Officer
Sarah Underhill	Senior Graphics Designer

Transportation and Long Range Planning Team

Nick Haven	Manager
Brandy McMahon	Principal Planner
Jennifer Cannon	Senior Planner
Lucia Maloney	Senior Planner
Morgan Beryl	Senior Transportation Planner
Judy Weber	Associate Transportation Planner
Devin Middlebrook	Associate Planner
Joe Marzocco	Program Manager Specialist
Mitch Koch	Transportation Technical Assistant
Lindsay Bourgoine	Transportation Technical Assistant

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Joanne S. Marchetta	Executive Director
John Marshall	General Counsel
John Hester	Chief Operating Officer
Julie Regan	Chief, External Affairs
Chris Keillor	Finance Director
Marja Ambler	Clerk to the Governing Board

Photography and Rendering Contributors

Alta Planning + Design
Aurora Photos/Rachid Dahnoun
Corey Rich
Design Workshop
Fehr and Peers
Jay Colyer
Kate Levine
Mike Vollmer
Morgan Beryl
Nevada Department of Transportation
Robert Liberty
Sarah Zimmerman
Tahoe City Public Utility District
Tom Lotshaw

Contributing Consultants

Airsage Analytics
Ascent Environmental
Fehr and Peers
HDR
Stantec Consulting Services

Advocacy and Advisory Groups

City of South Lake Tahoe Bicycle Advisory Committee
Lake Tahoe Bicycle Coalition
Lake Tahoe Sustainability Collaborative: Community Mobility Work Group
South Shore Transportation Management Association
Truckee North Tahoe Transportation Management Association

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Federal Highway Administration Credit/Disclaimer

This report was funded in part through grants from the Federal Highway Administration, U.S. Department of Transportation. The views and opinions of TRPA expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.

Title VI Program

TRPA/TMPO, as a federal grant recipient, is required by the Federal Highway Administration (FHWA) to conform to Title VI of the Civil Rights Act of 1964 and its amendments TRPA/TMPO's sub-recipients and contractors are required to prevent discrimination and ensure non-discrimination in all of their programs, activities and services.

The TRPA/TMPO Title VI Program is embedded in all aspects of the programs and planning activities carried out by TRPA/TMPO. This includes contractors and sub-recipients that provide services for TRPA/TMPO. Other documents that speak to Title VI include the Public Participation Plan, Regional Transportation Plan, Federal Transportation Improvement Program, and TRPA Contracting Procedures.

TRPA meets all Federal Highway Administration (FHWA) Title VI requirements. For more information on Title VI compliance please visit www.trpa.org/document/title-vi-program/

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

100-year flood zone	An area within which a flood can be expected to occur every 100 years on average
AADT	Annual Average Daily Traffic
Active Transportation	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.
ADA	Americans with Disabilities Act
ATP	Active Transportation Plan
ACIP	Airport Capital Improvement Program
ACS	American Community Survey
AMI	Area Median Income
ARB	California Air Resources Board
BEV	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.
BID	Business Improvement Districts: local funding mechanism for economic development and improvement via self-assessment by businesses
BlueGO	South Shore transit system
CAFE	Corporate Average Fuel Economy
Caltrans	California Department of Transportation
CCTV	Closed circuit television
CDP	Census-Designated Place
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulation
CIP	Capital Improvement Program
CMAQ	Congestion Mitigation & Air Quality Program
CMP	Congestion Management Process
CO	Carbon Monoxide
CO2	Carbon Dioxide
CPI	Consumer Price Index
Complete Streets	Streets built and managed to be comfortable and safe for all users and modes
CTC	California Tahoe Conservancy
DCFC	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.
DEM	Division of Emergency Management
DOT	U.S. Department of Transportation
DUE	Dwelling Unit Equivalent
EIP	Environmental Improvement Program
EMCC	Emergency Management Community Council
EMFAC2011 model	Emissions estimation model used by the California Air Resources Board
EVSE	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.
FAST Act	Fixing America's Surface Transportation Act, the latest federal transportation bill, approved December 4, 2015.
FAA	Federal Aviation Administration
Financial Constraint	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.
FHWA	Federal Highway Administration
FTIP	Federal Transportation Improvement Program
GHG	Greenhouse Gas
HAR	Highway Advisory Radio: provides real time highway information to travelers
ICE	Internal Combustion Engines: are vehicles that require gasoline to fuel operation of the engine (not electricity).
ITS	Intelligent Transportation Systems
L1	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.
L2	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.
LOS	Level of Service: a measure of the quality of vehicle traffic flow at an intersection or on a road segment
LRTP	Long Range Transportation Plan
LTBMU	Lake Tahoe Basin Management Unit, United States Forest Service
MPO	Metropolitan Planning Organization
MMLOS	Multi-Modal Level of Service
NDOT	Nevada Department of Transportation

OES	Office of Emergency Services
PBD	Parking Benefit District: funding mechanism for local streetscape and transportation improvements from revenues generated by parking management strategies
PDT	Project Development Team
PEV	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.
PHEV	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.
PPP	Public Participation Plan
PMADT	Peak Month Average Daily Traffic
RFTA	Roaring Fork Transportation Authority
RHNA	Regional Housing Needs Assessment
RSTP	Regional Surface Transportation Program
RTAC	Regional Targets Advisory Committee
RTIA	Reno/Tahoe International Airport
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agency
SACOG	Sacramento Area Council of Governments
SAFETEA-LU	Safe Accountable, Flexible, Efficient, Transportation Equity Act; a Legacy for Users: 2005 Federal Transportation Investment bill
SB 375	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
SCS	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
Secchi depth	Depth at which the pattern on a circular disk lowered into a body of water is no longer visible; used to measure water clarity
SEMS	Standardized Emergency Management System
SHOPP	California State Highway Operation and Protection Program
SLT	South Lake Tahoe
SNPLMA	Southern Nevada Public Lands Management Act
SRTS	Safe Routes to School
STIP	State Transportation Improvement Program
TAC	Technical Advisory Committee: convened to review and provide input on the RTP
TART	Tahoe Truckee Area Regional Transit
TCPUD	Tahoe City Public Utility District

TDM	Transportation Demand Management
TIF	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
TIP	Transportation Improvement Program
TMA	Transportation Management Association
TMDL	Total Maximum Daily Load: Federally legislated maximum amount of certain pollutants in a body of water
TMPO	Tahoe Metropolitan Planning Organization
TNC	Transportation Network Company
TOT	Transient Occupancy Tax
TransCAD/TranPlan	Software for mapping and analyzing transportation data
TRPA	Tahoe Regional Planning Agency
TSM	Transportation System Management: measures such as dedicated turn lanes, signal synchronization, bicycle-activated signals, roundabouts
TTC	Tahoe Transportation Commission
TTD	Tahoe Transportation District
U.S.	United States
VMT	Vehicle Miles Traveled
VTG	Vehicle Trip Generation

1 REGIONAL GOALS & KEY CONCEPTS

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 and 24 million annual visitors 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[1]. 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

[1] 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:

- Offering better travel mode options
- Creating incentives that spread out the times, places, and ways people travel to improve traffic flow
- Providing environmentally innovative infrastructure
- Improving safe and equitable access to the places people want to go

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 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.

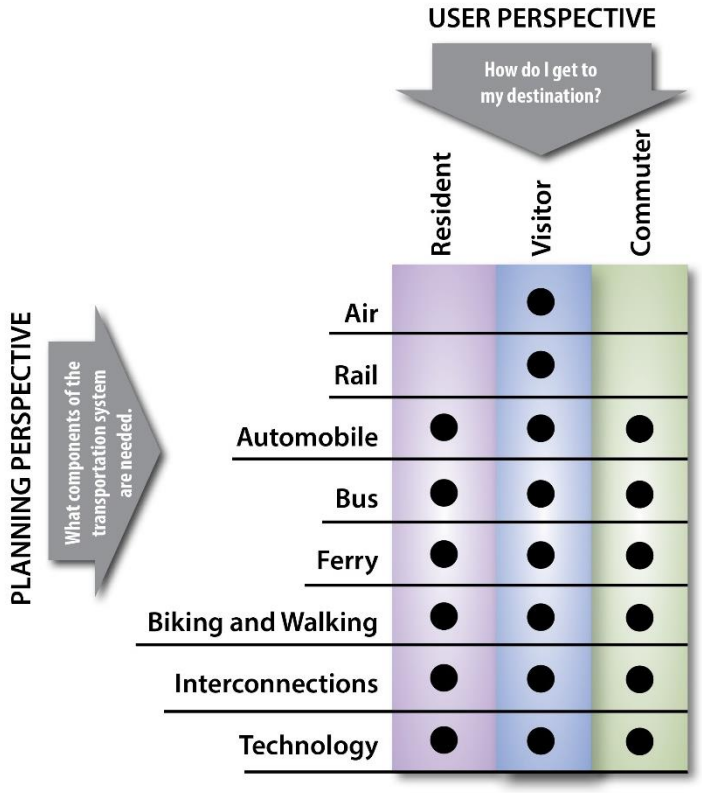
Apache Avenue Pedestrian Safety and Connectivity Project Conceptual rendering
Designed by Fehr & Peers

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 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.

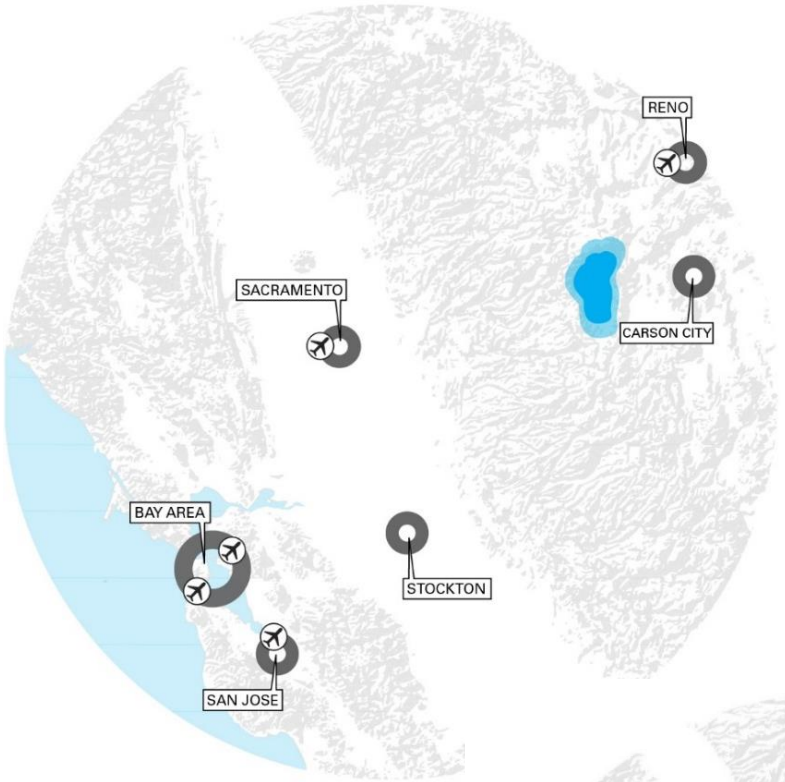
Figure 1.1: User and Planner Perspectives



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.

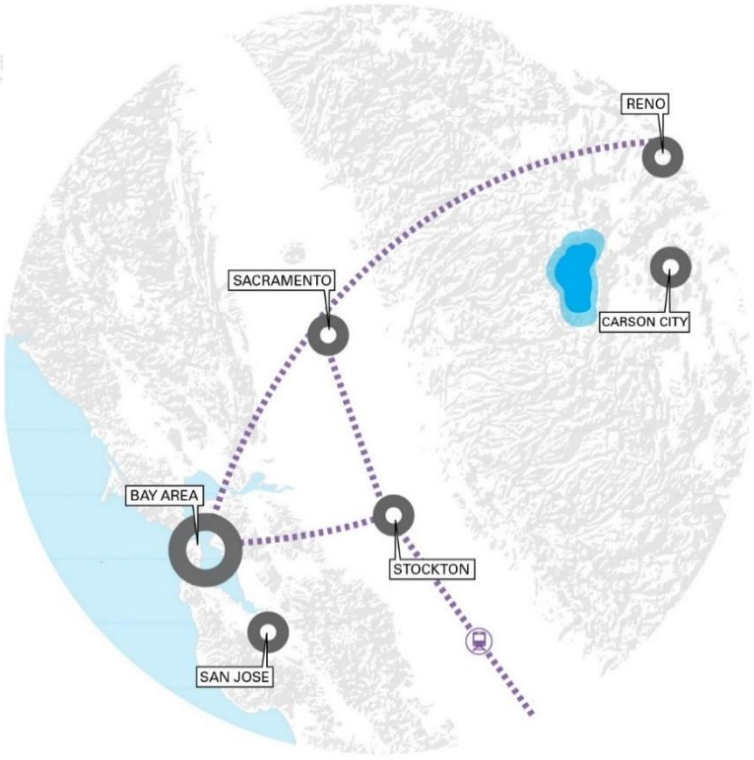
The Envisioned Mega-Region System

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.

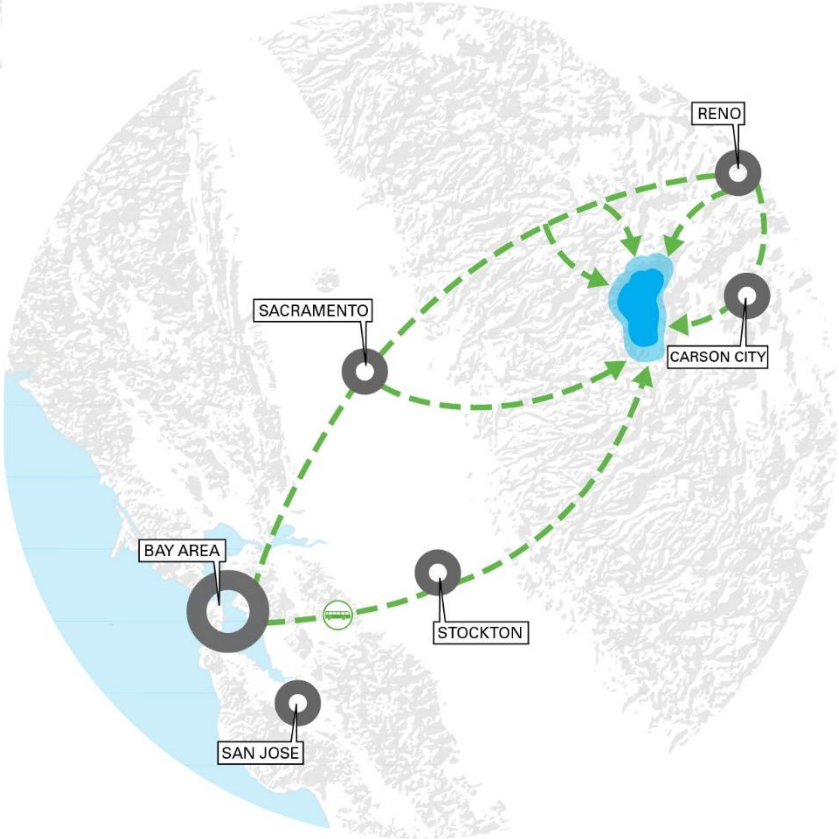


Air: The Tahoe Region is well-served by the Reno/Tahoe International Airport, Sacramento International Airport, Oakland International Airport, and San Francisco International Airport.

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.

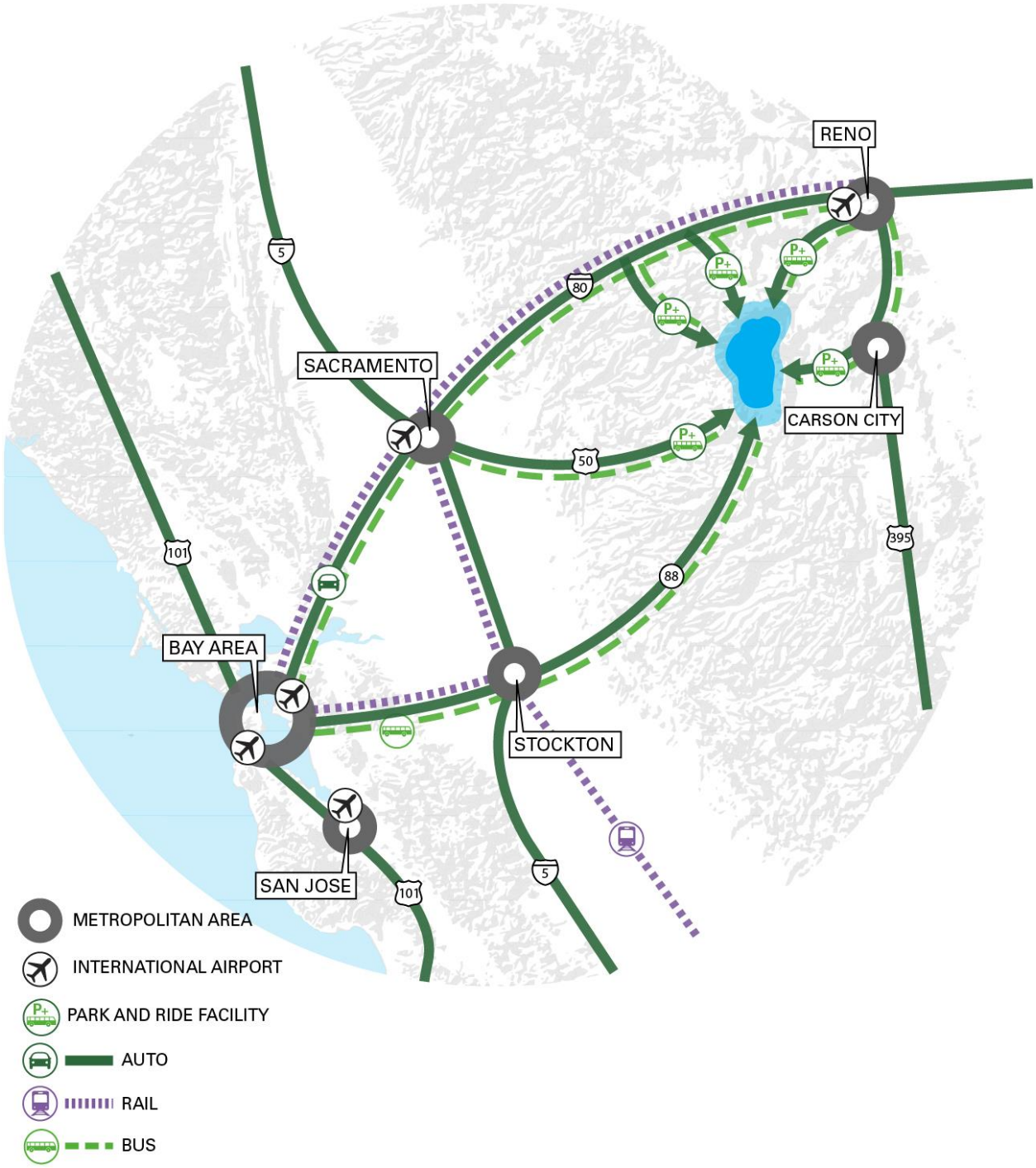


Automobile:
The automobile, once the only way to reach all parts of the Lake Tahoe Region, remains a major form of transportation. However, the automobile system is integrated into the overall transportation system with well-placed parking areas where travelers can transfer to rail or bus services to 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.



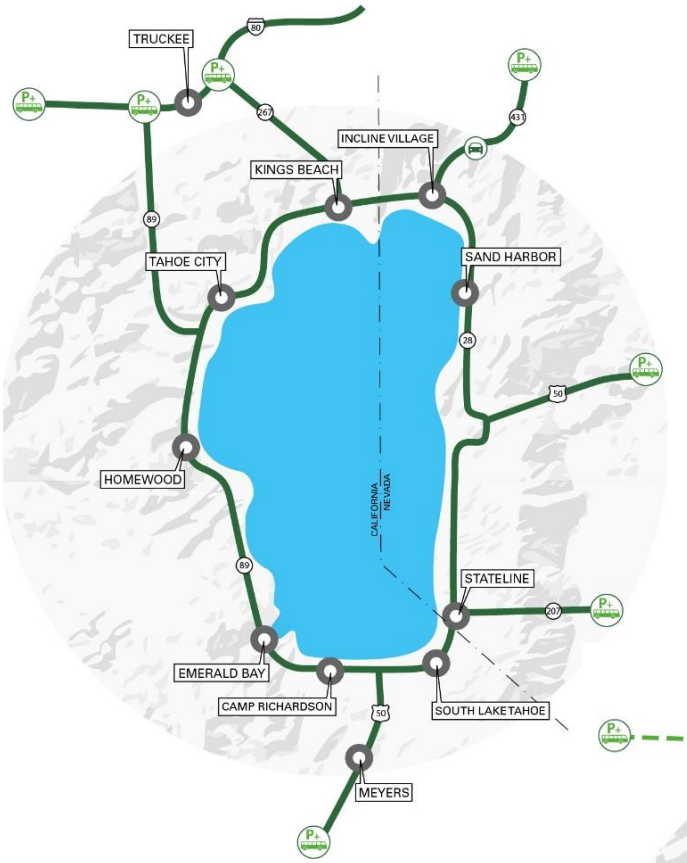
Bus: A comprehensive and coordinated bus and shuttle transit system is provided by multiple entities, connecting Lake Tahoe to major airports and population centers outside of the Region. Enhanced inter-regional transit connections are already funded in part, but increased frequency and subsidized private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

Figure 1.2: Envisioned Mega-Region System

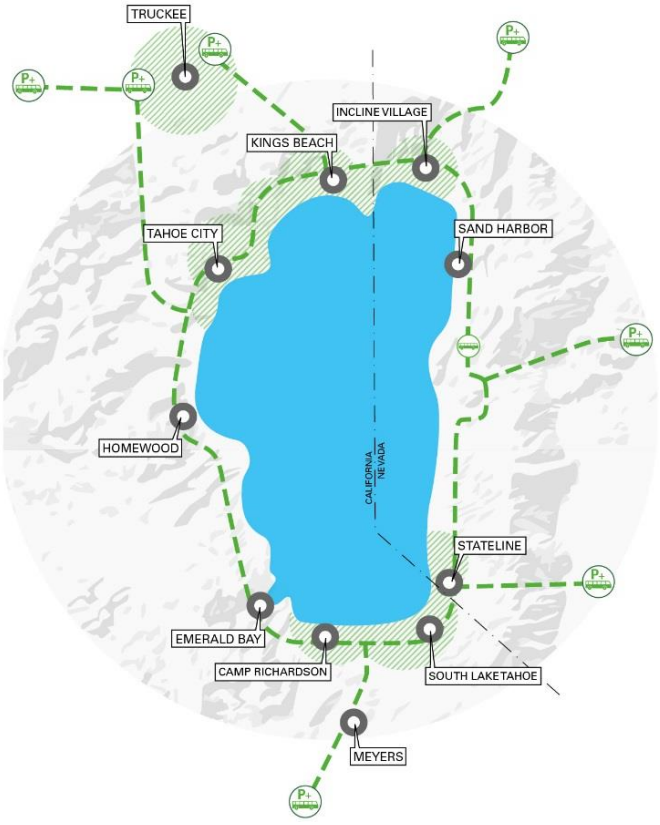


The Envisioned Tahoe Region System

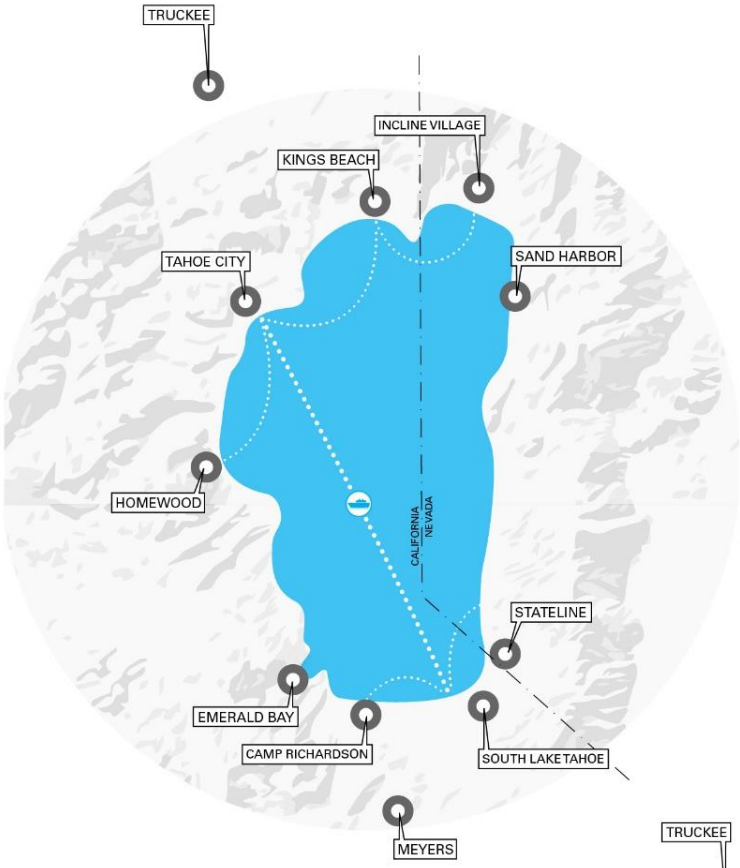
The Region's system of the future will be seamless and interconnected. More and better travel options to access recreation sites for residents and visitors are on the plan's funded project list. These projects will accomplish multiple goals, and make significant transit, trail, and technology improvements to Lake Tahoe's transportation system. But foreseeable funding provides the first actions, 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. Tahoe's roadways accommodate all users, treat stormwater runoff and are kept in a state of good repair.

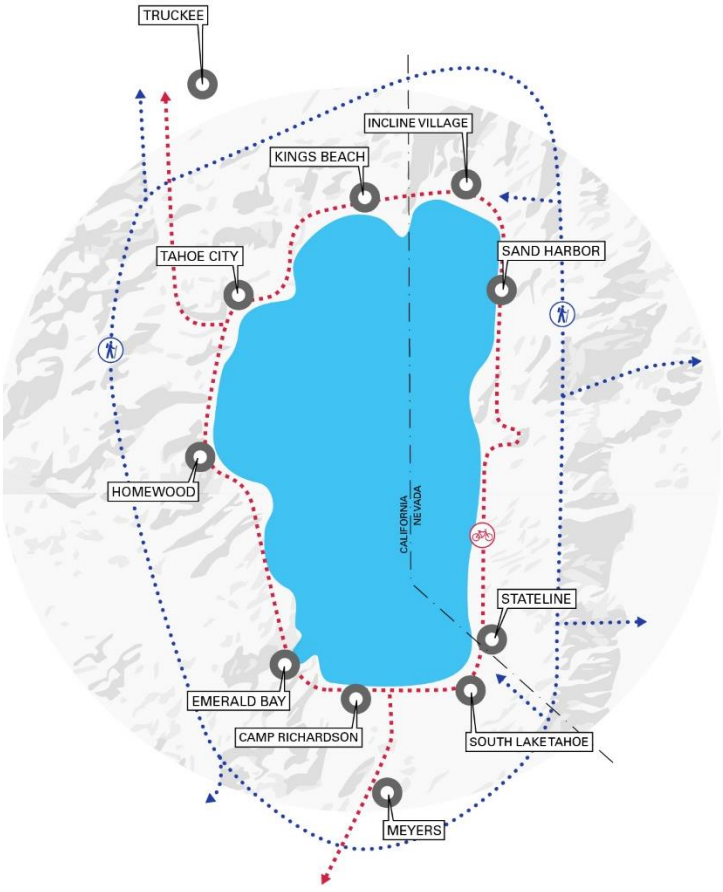


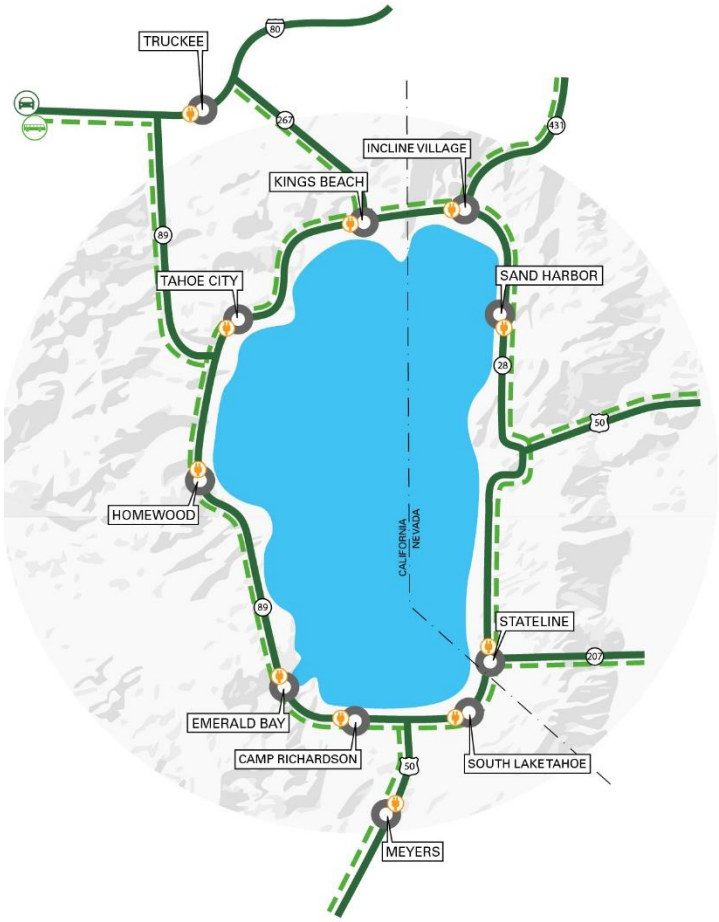
Bus: A comprehensive and coordinated bus and shuttle transit system will provide seamless around the lake service. Service has 30-minute frequency on major routes, is free-to-the-passenger, provides access to high-use recreation destinations, and connections with existing transit centers. Increased service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

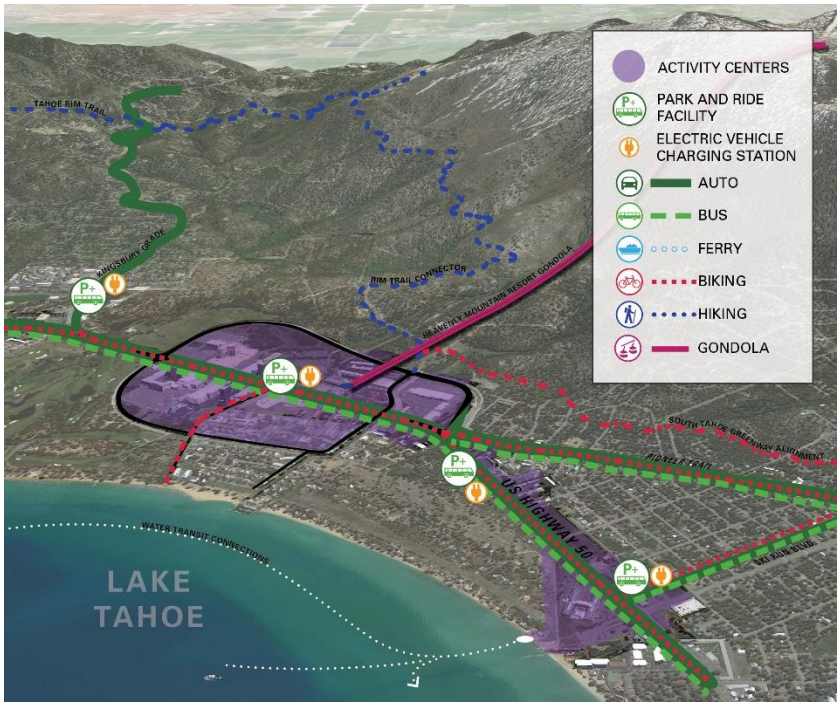
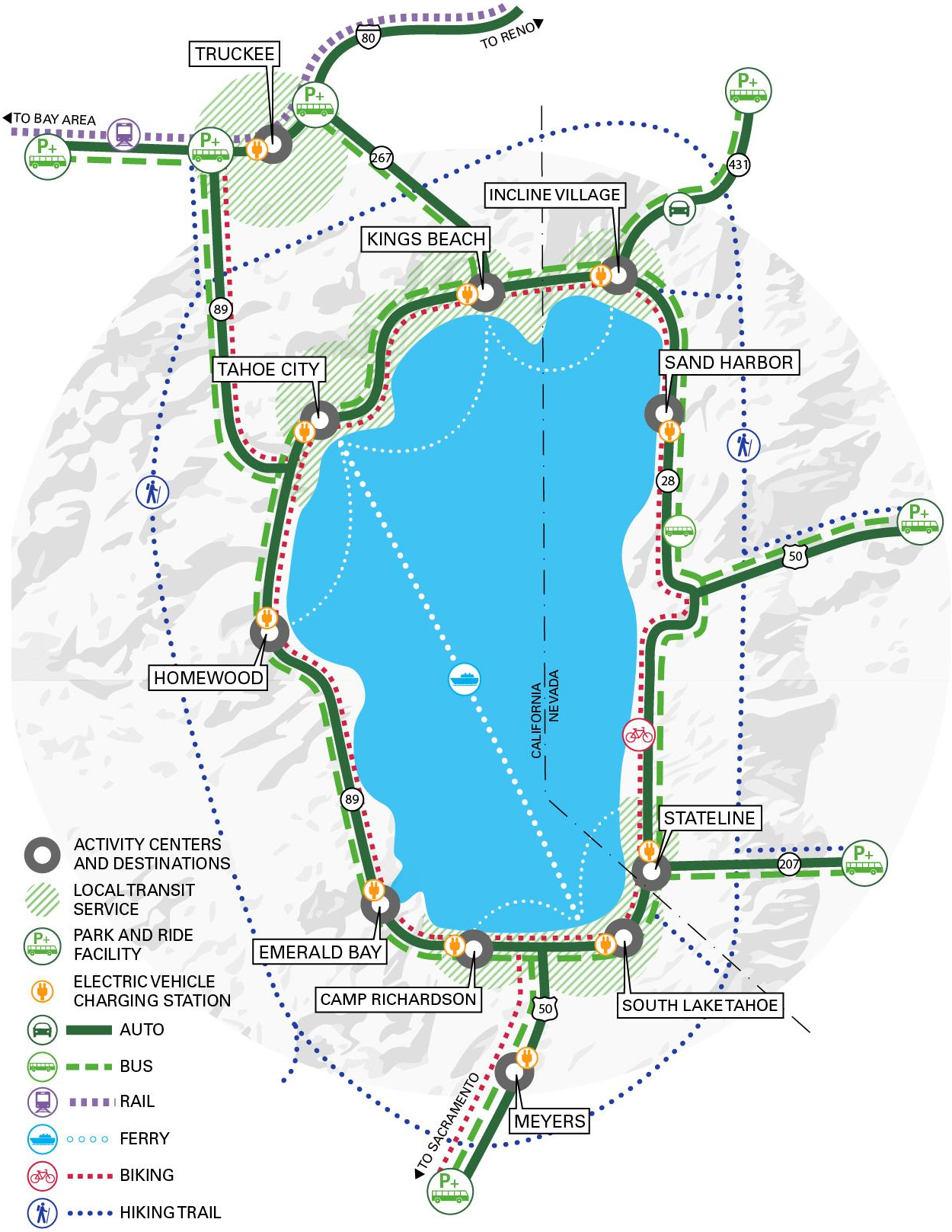


Figure 1.3: Envisioned Tahoe Region Transportation System



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 2014 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 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 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

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

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

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 projects that comprehensively support regional and local transportation, housing, land use, environment, and other goals.

GOAL 6: SYSTEM PRESERVATION

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

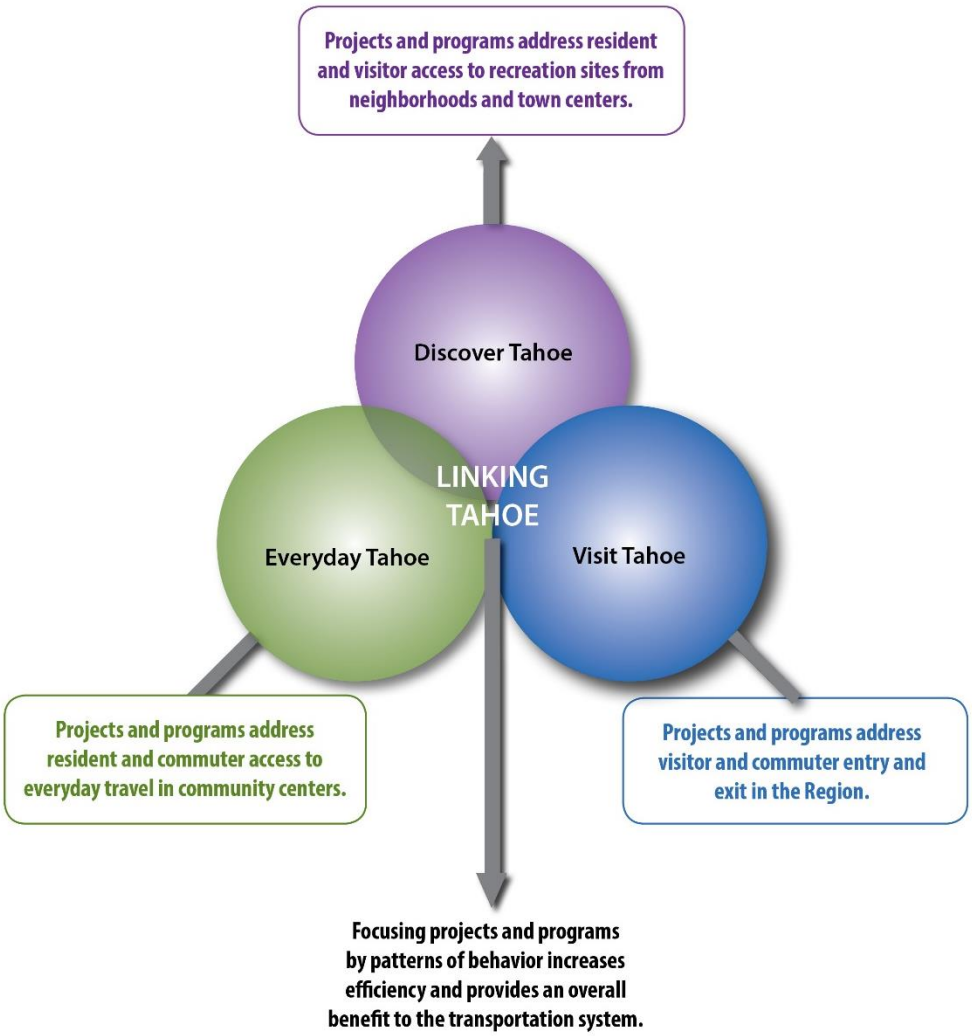
Policy 6.1: Preserve the condition of sidewalks and bicycle facilities and where feasible, maintain their year-round use.

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

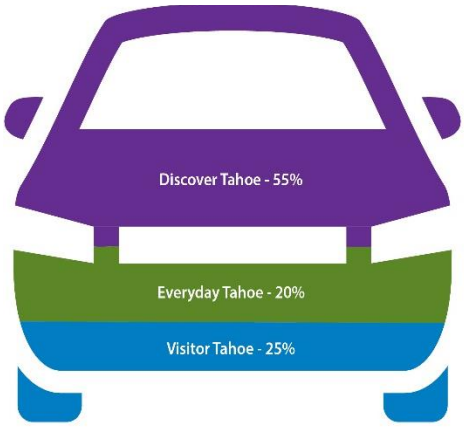


Travel behavior also separates into three predominant trends: Everyday Tahoe, the short-distance trips by residents and commuters in community centers and residential areas, accounting for 20 percent of daily vehicle trips; Discover Tahoe, the longer distance trips by residents and visitors to recreation 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.

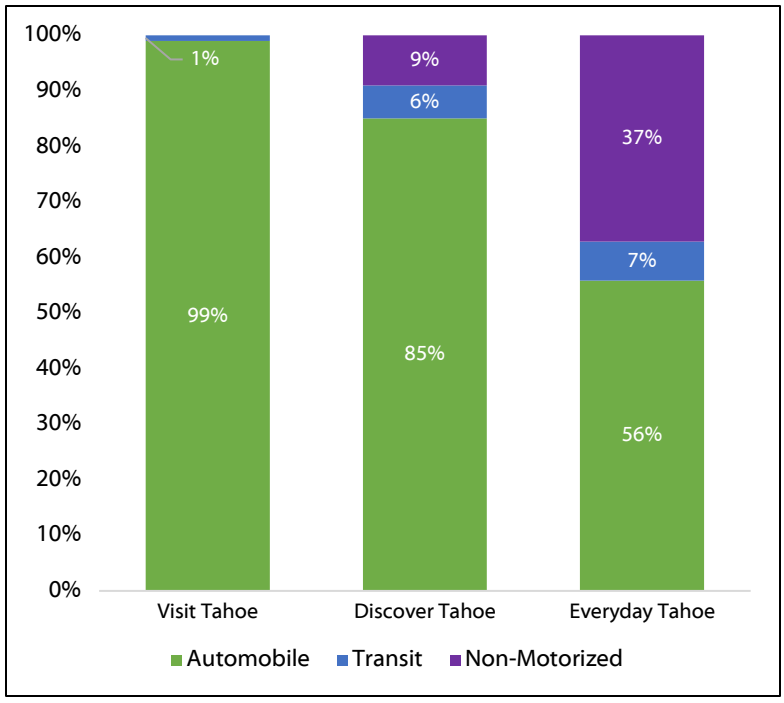
Figure 1.5: Daily Trips by Travel Behavior



Source: TRPA, 2016

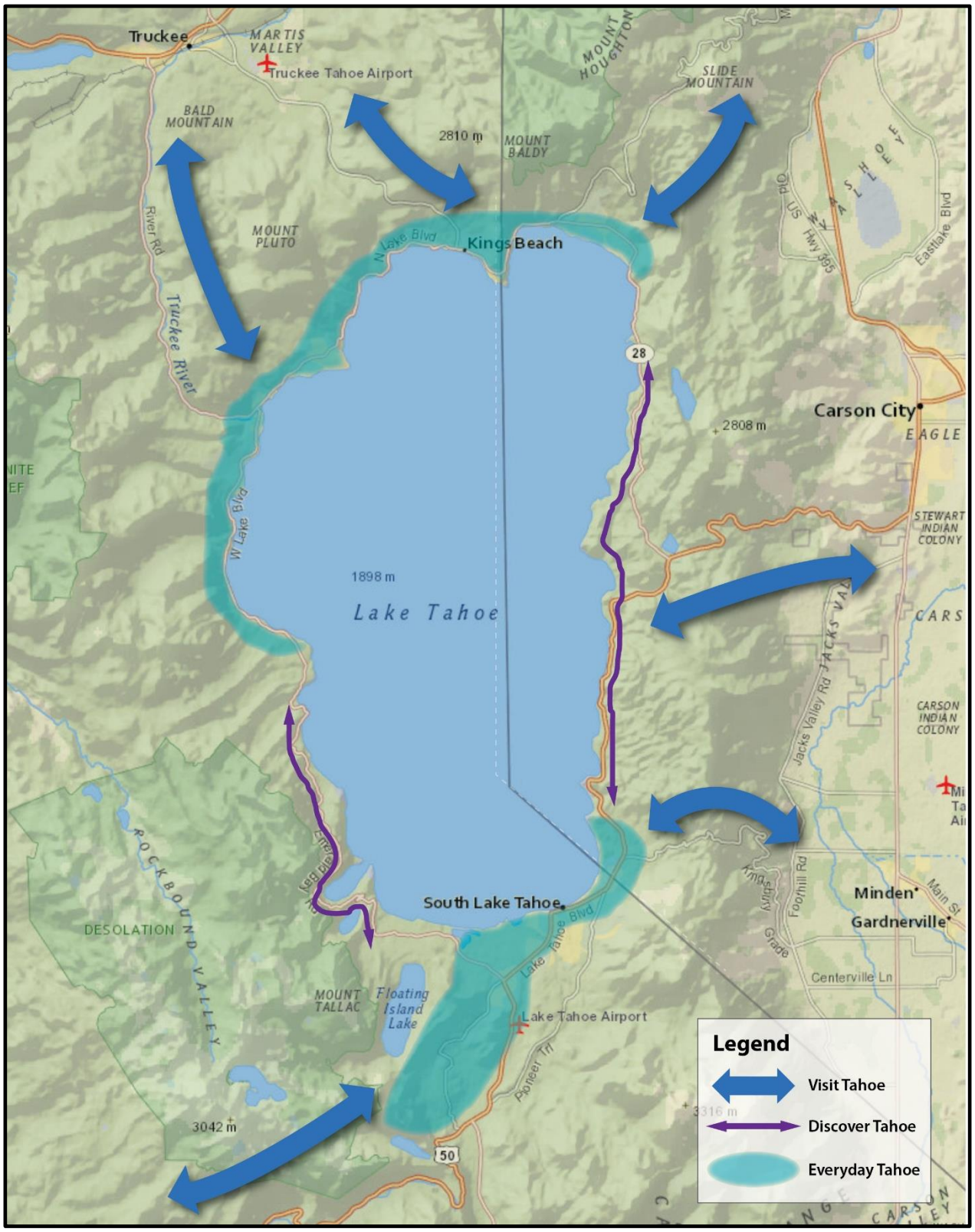
- **Visit Tahoe: Regional Entry and Exit Travel**
  Strategies to ease congestion for people entering and exiting the Region include adaptively managing the roadway system to prioritize the passage of transit, offering park and ride lots with frequent and reservable transit, implementing dynamic signalization, 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 1.6: 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

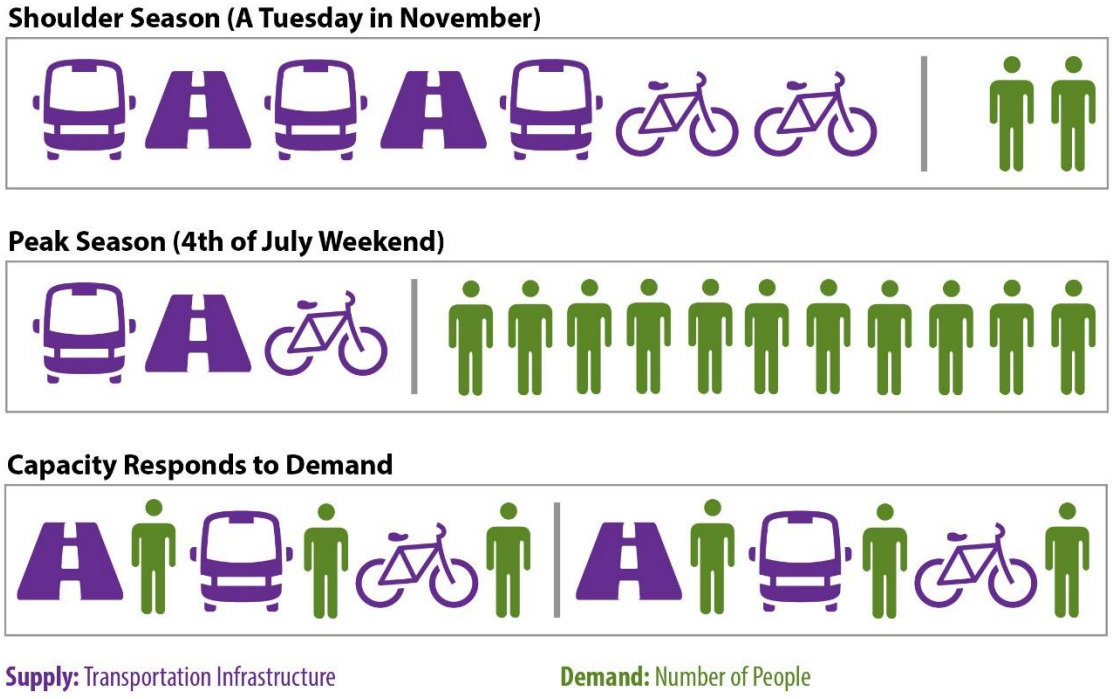


Key Concept #3: Planning for a Flexible System

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

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.

Figure 1.8: Dynamic Transportation System



Key Concept #4: Leveraging Implementation

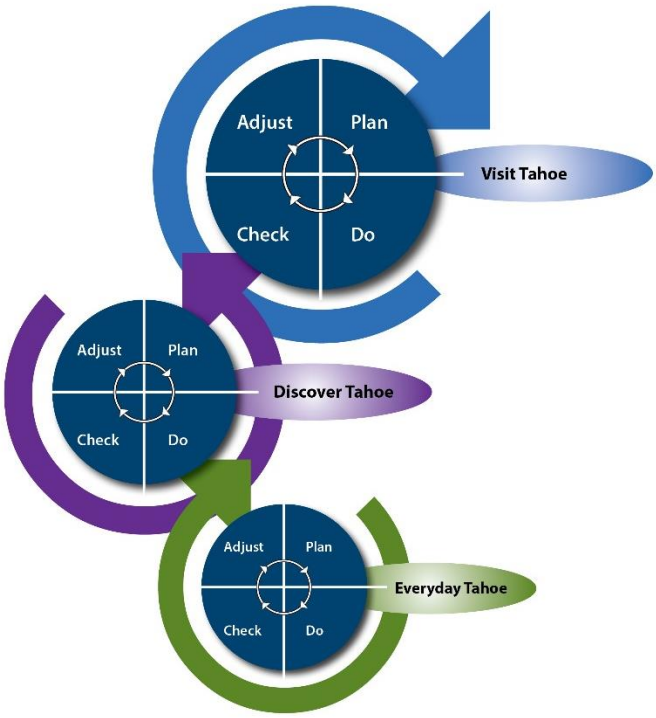
Integrating delivery of all necessary transportation system elements is a key to successful implementation. Detailed transportation corridor planning can maximize the delivery and effectiveness of projects by establishing partnerships and implementation alignment. The region's limited transportation 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.

Bundled Approach: State Route 89 Recreation Corridor

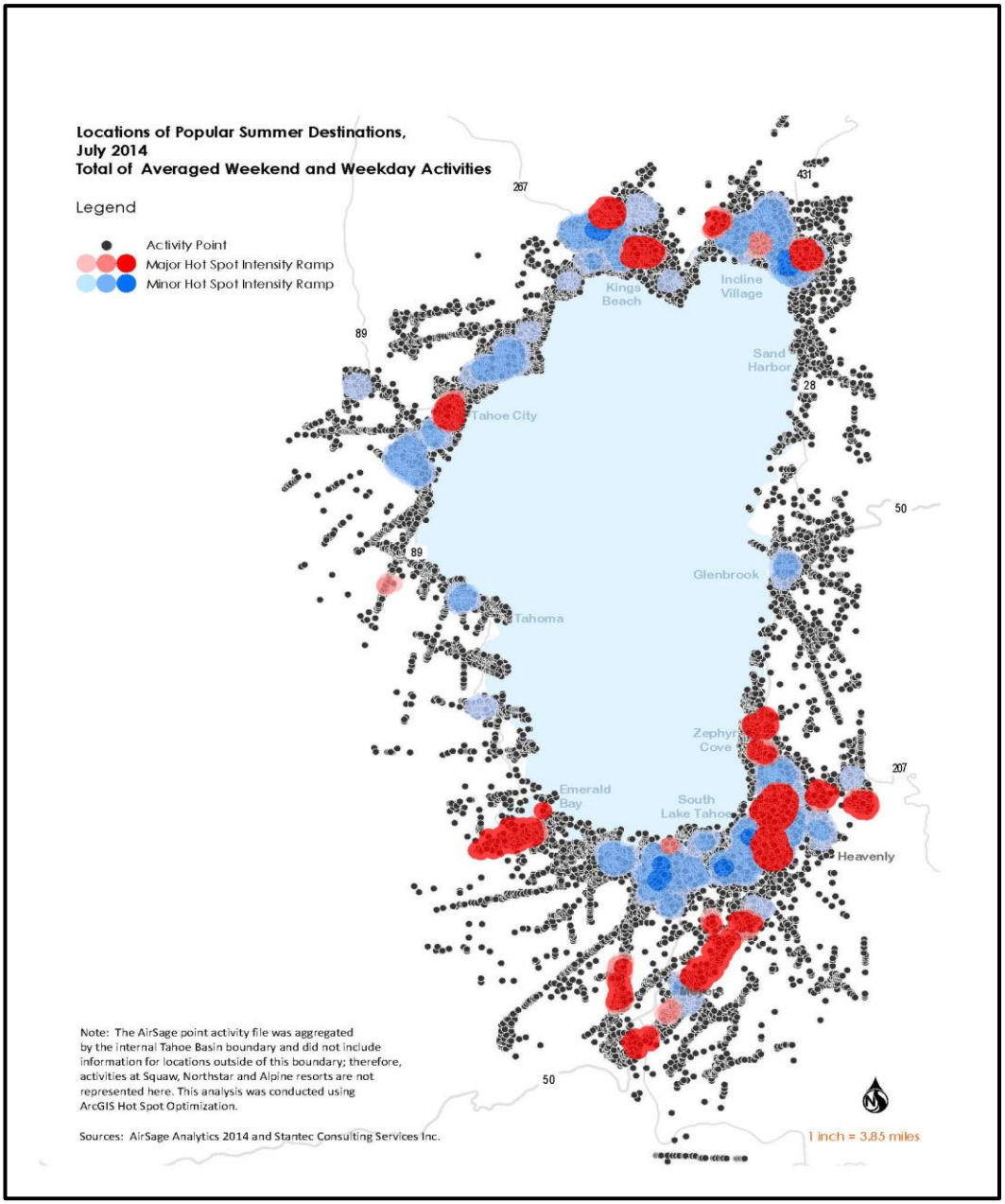
Bundling projects for implementation in a common corridor has proven success in saving time, cutting cost, and improving plans. One example is the State Route 89 Recreation Corridor Improvement Project. This U.S. Forest Service project will engage theTTD, Caltrans, California State Parks, private commercial 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 within the corridor operates at 1 hour frequency, with its hub and a park and ride lot at the Tahoe City the existing Transit Center. There are 30 miles of shared-use path for biking and walking, and 17 miles still to be built.

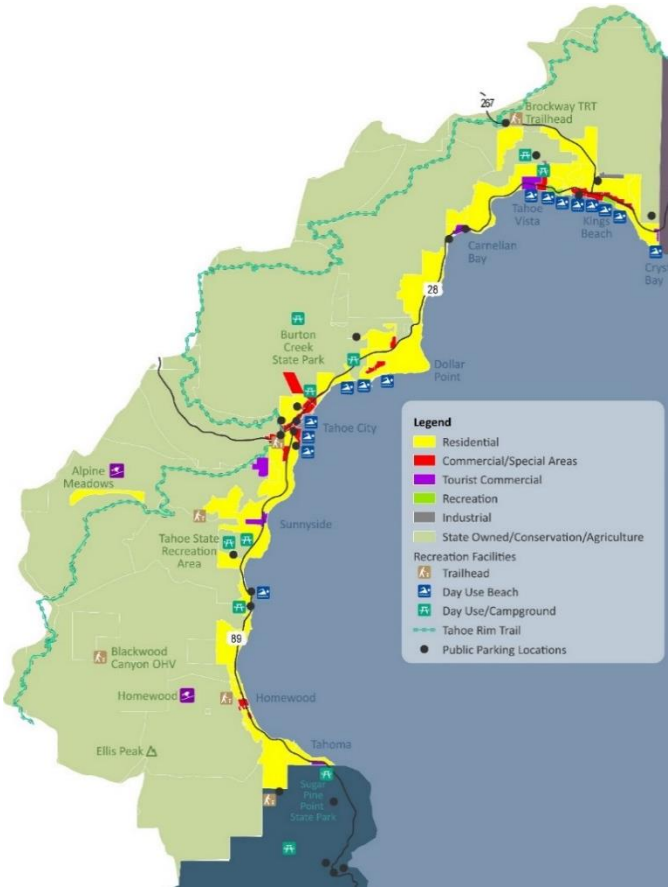


Table 1.1: Trips made within the Corridor[2] (winter vs. summer during high visitation periods)

	February, 2014			July, 2014			
User Group	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	TART Daily Transit Trips (2015-16)
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%	
TOTAL	**46,700**	**635,410**	**100.0%**	**61,290**	**928,440**	**100.0%**	

[2] Stantec Consulting; AirSage Analytics

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.

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 provides transit service with 1 hour frequency from Tahoe City to Incline Village. 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[3] (winter vs summer during high visitation periods)

	February, 2014			July, 2014			
User Group	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	TART Daily Transit Trips (2015-16)
Resident Worker	10,303	144,955	29%	13,608	214,464	22%	92 (0.2% of daily tips 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%	
TOTAL	**35,795**	**491,653**	**100.0%**	**65,173**	**993,257**	**100.0%**	

[3] Stantec Consulting; AirSage Analytics

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 no known 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. 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[4] (winter vs summer during high visitation periods)

	February, 2014			July, 2014			
User Group	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	TTD Daily Transit Trips (2015-16)
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%	
TOTAL	**8,061**	**108,548**	**100.0%**	**20,289**	**313,631**	**100.0%**	

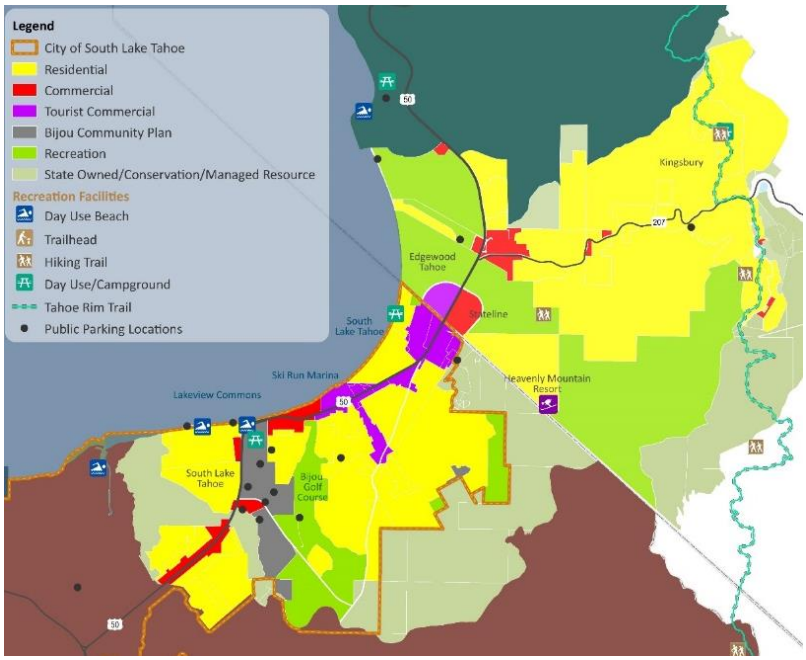
Note: Route 21x used to run along east shore to Carson City and Back 25,388 riders 2015-16 (21X has been discontinued in 2016)

[4] Stantec Consulting; AirSage Analytics

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, and the Heavenly Gondola that connects to the Tahoe Rim Trail. 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[5] (winter vs summer during high visitation periods)

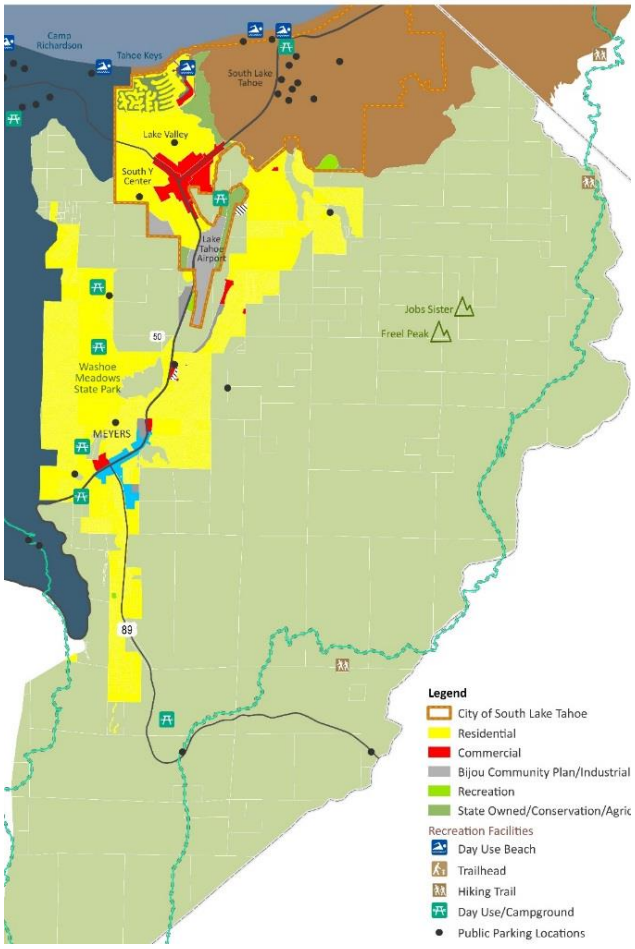
	February, 2014			July, 2014			
User Group	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	TTD Daily Transit Trips (2015-16)
Resident Worker	30,260	424,529	22%	25,105	392,870	18%	1,157 (Less than 1% of daily trips made)
Home Based Worker	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%	
TOTAL	**140,304**	**1,908,081**	**100.0%**	**148,090**	**2,243,390**	**100.0%**	

[5] Stantec Consulting; AirSage Analytics, 2016.

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 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[6] (winter vs summer during high visitation periods)

	February, 2014			July, 2014			
User Group	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	TTD Daily Transit Trips (2015-16)
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%	
TOTAL	**58,653**	**802536**	**100.0%**	**154,833**	**2,299,806**	**100.0%**	

[6] Stantec Consulting; AirSage Analytics, 2016.

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 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[7] (winter vs summer during high visitation periods)

	February, 2014			July, 2014			
User Group	Daily Trip Count	Monthly Trip Count	User Group % of Total	Daily Trip Count	Monthly Trip Count	User Group % of Total	TTD Daily Transit Trips (2015-16)
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%	
TOTAL	**7,709**	**103,660**	**100.0%**	**28,114**	**423,007**	**100.0%**	

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

[7] Stantec Consulting; AirSage Analytics, 2016.

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, 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 Morganzers
Photo: Tom Lotshaw

2 PLANNING CONTEXT

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 ɬaw. Lake Tahoe's famed water clarity is designated a national outstanding resource. These spectacular resources now attract approximately 24 million annual visitors 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

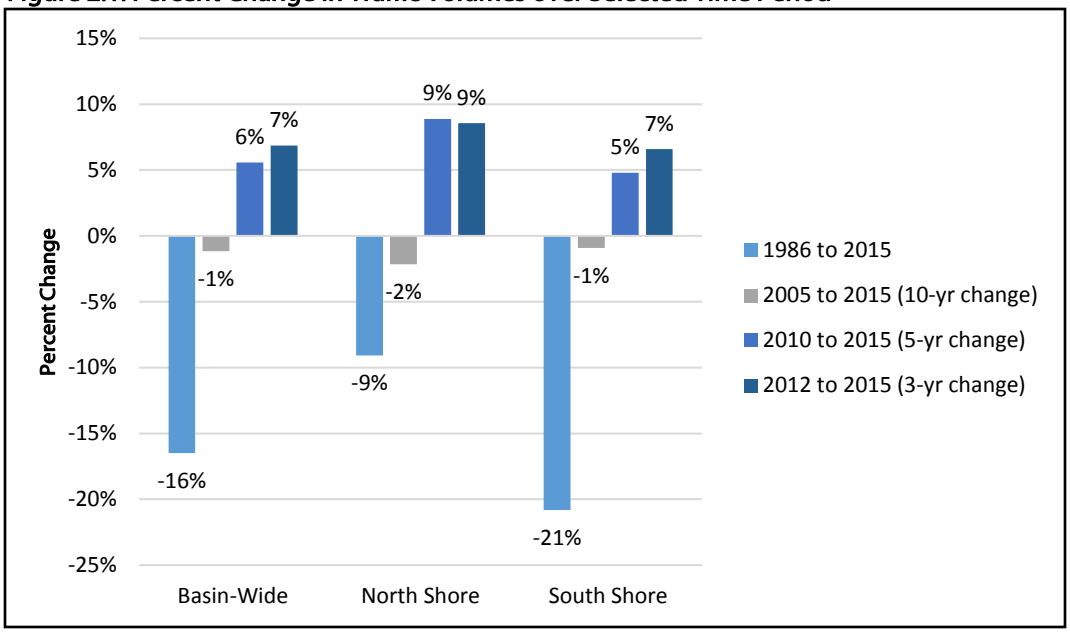
TRPA, via the Tahoe Regional Planning Compact, is required to develop a long-range Regional Transportation Plan. The Bi-State Compact states that TRPA's Regional Plan shall include a transportation plan and that the goal of transportation planning shall be:

(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.

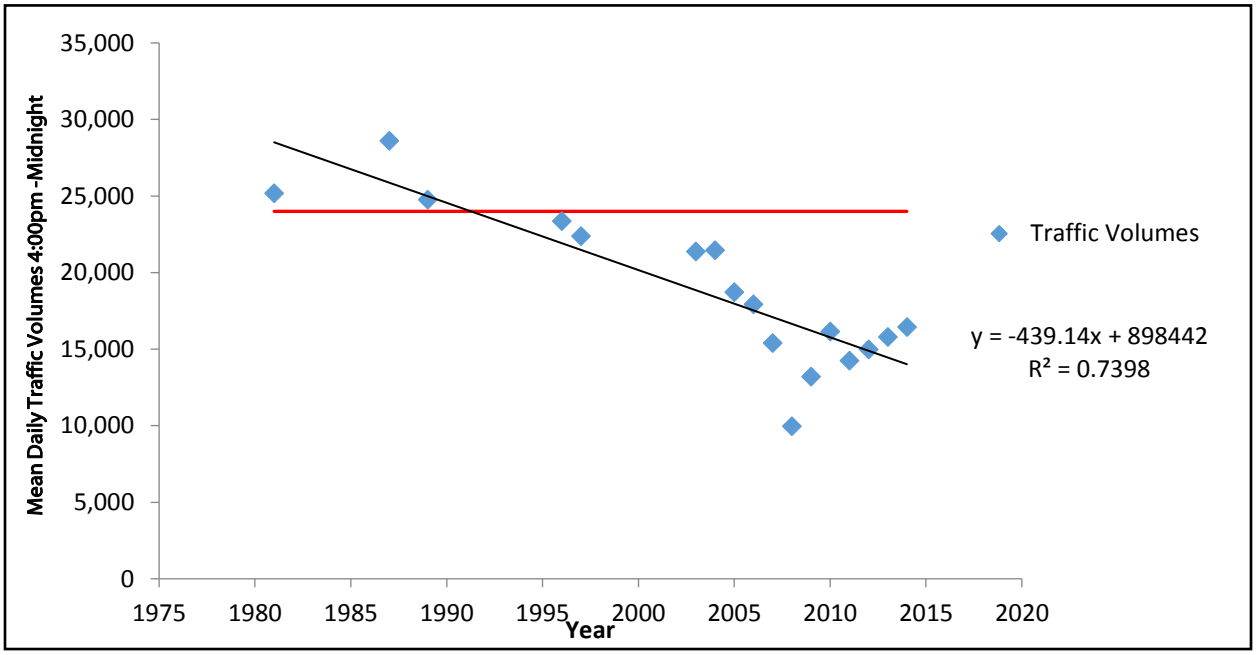
Figure 2.1: Percent Change in Traffic Volumes over Selected Time Period



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[1]. 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

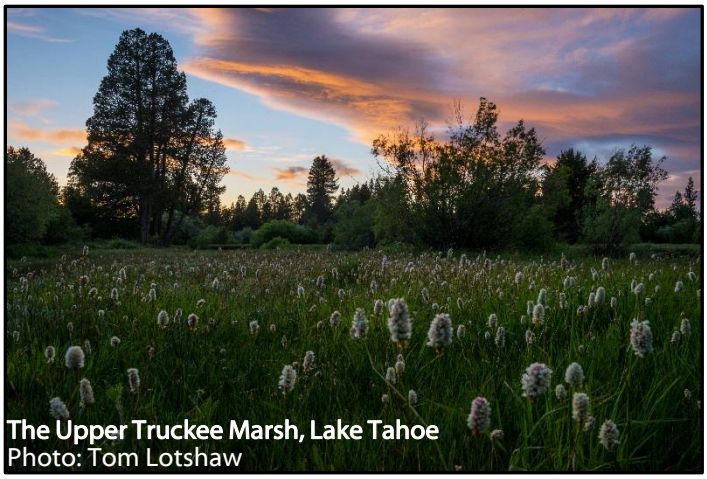


[1] California Department of Transportation, 2014.

Federal

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. 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 and 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.



The Upper Truckee Marsh, Lake Tahoe
Photo: Tom Lotshaw

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.[2] 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 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 Project Development Team
Photo: Morgan Beryl

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.

[2] 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.

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.

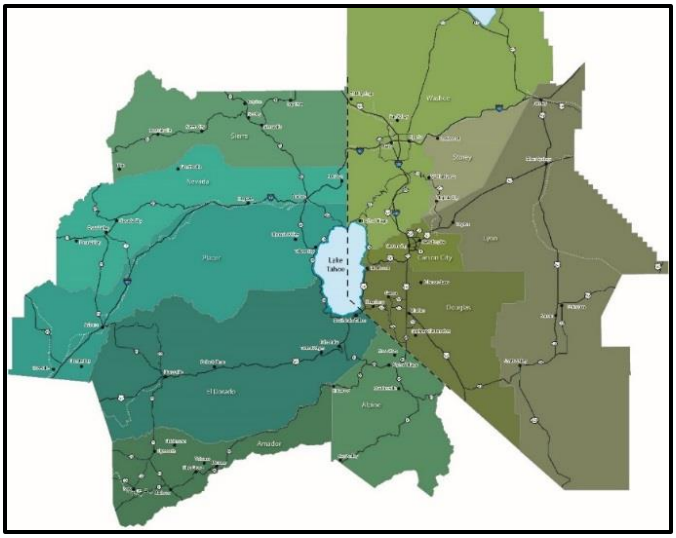
TRPA supports the implementation of regional transportation plan policies by working with the partners to incorporate active transportation and transit services into projects. The primary responsibility for construction and maintenance of the transportation network lies with local jurisdictions, public 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



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 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.

Tahoe Transportation District

The TTD was established in Article IX 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 Talks: Transportation & Technology
Representatives from TRPA, TTD, and Lake Tahoe Bicycle Coalition

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 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.

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

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

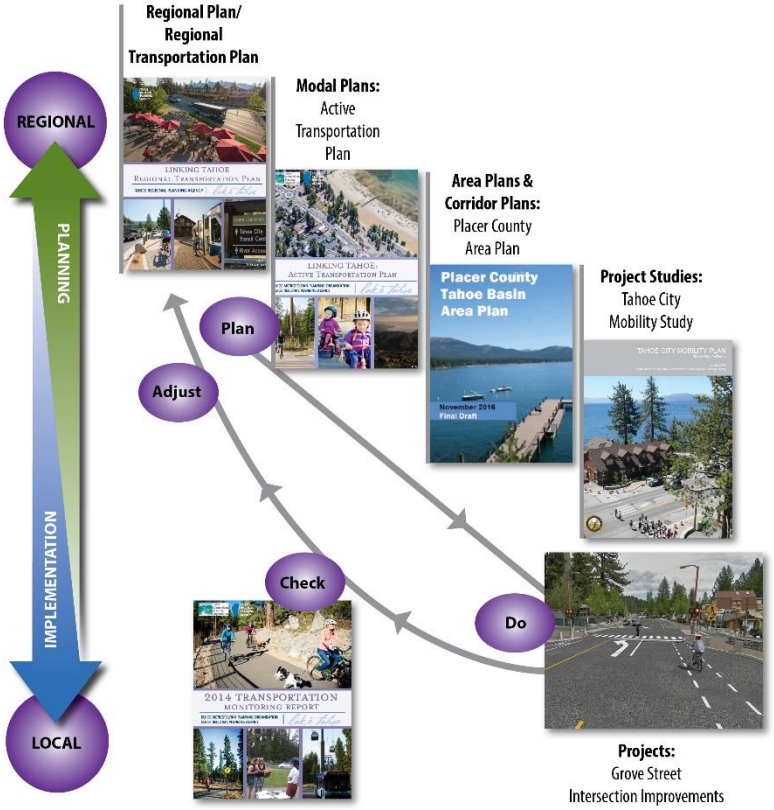
TRPA has an important relationship with federal land management agencies due to the large amount of public lands under federal management in the Region. TRPA works closely with the U.S. Forest Service Lake Tahoe Basin Management Unit to provide coordinated access to its lands. TRPA also works with the 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.

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 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.

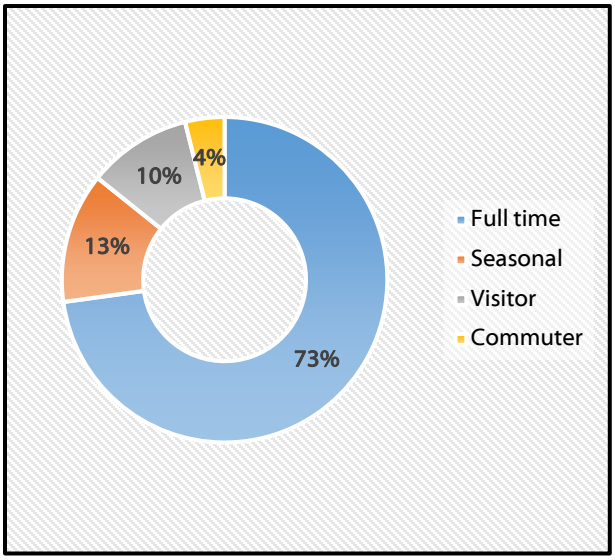
Figure 2.5: Connections Between Planning and Project Delivery



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 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 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.

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

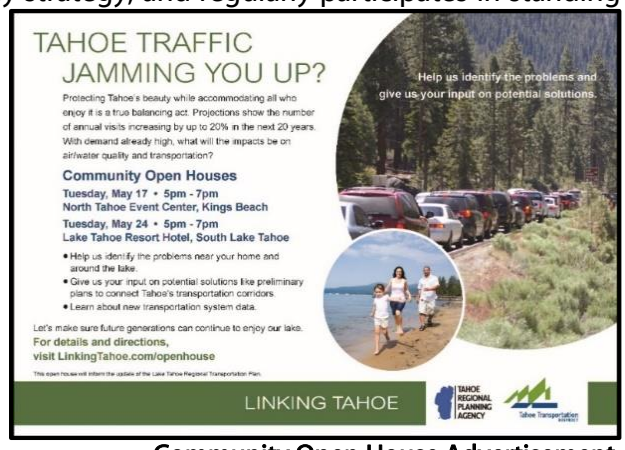
The Tahoe Talks series initiated in fall 2014 is a monthly lunchtime forum of community members and industry experts who present and discuss ideas on transportation, the environment, and the economy.

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 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.



Community Open House Advertisement

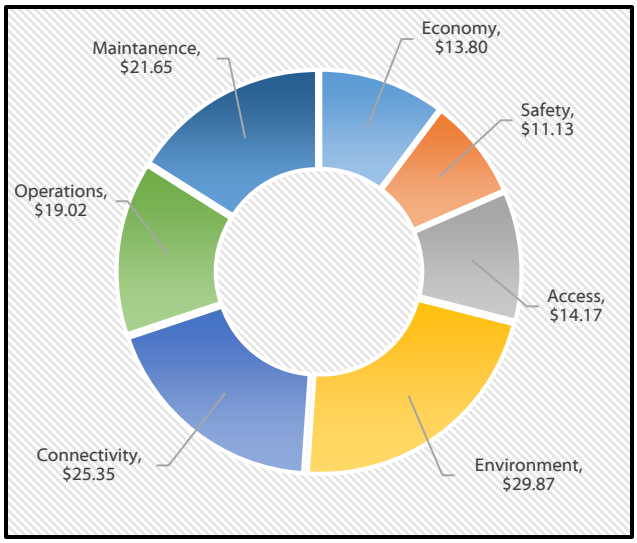
Spanish Language Outreach

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.

2015 Regional Transportation Plan and Corridor Connection Plan Project Development Team meeting

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.

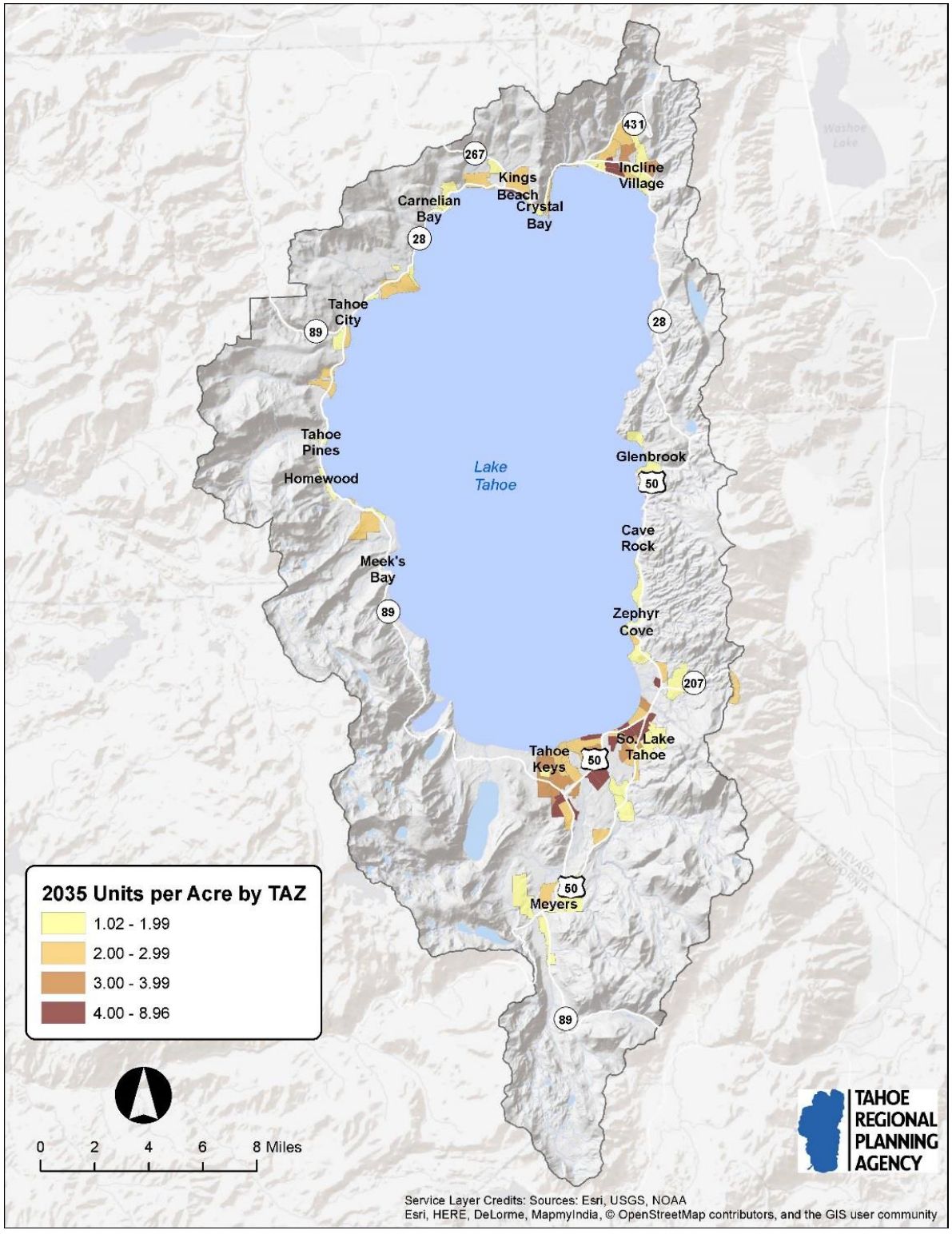
Policy 4.7: Regional transportation plan updates shall review projected travel into and within adopted area plans and effectiveness of mobility strategies.

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



Senior Housing
Photo: Corey Rich

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[3]. 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[4]	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
Total	**1,144**	**1,759**	**471**	**1474[5]**

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.

[3] Defined as households with household incomes less than 80% or 50%, respectively, of the area median income.
[4] 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.
[5] 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 24 million annual visitors, or roughly 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.

Impact on GHG Emissions

1.7%

The Plug-In Electric Vehicle Infrastructure Planning proposed in this section is forecast to reduce per capita transportation GHG emissions by 1.7% by 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[1]

2005		2020		2035	
Daily VMT[2]	1,041,890	Daily VMT	1,038,998	Daily VMT	1,149,601
Population[2]	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)[3]	445	GHG Emissions (tons/day)[3]	428	GHG Emissions (tons/day)[3]	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[4]	**-8.8**	**Adjusted % change GHG/capita from 2005[4]**	**-5.0**
		SB 375 Target	-7	SB 375 Target	-5
		SB 375 Target Met?	**Yes**	**SB 375 Target Met?**	**Yes**

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.

27th 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[6] (by 2025). 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 publicly owned. As new research becomes available to calculate the value of open space

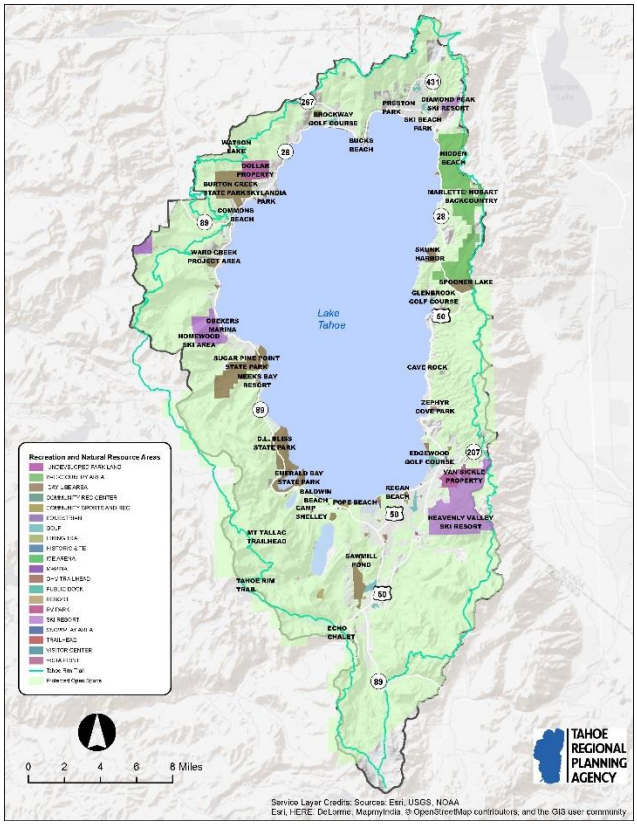
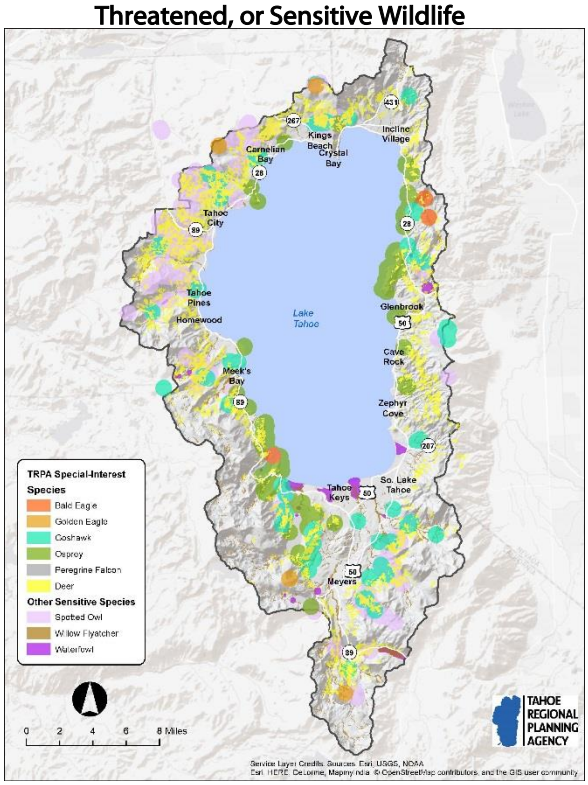


Figure 2.9: Parks and Protected Natural Resource Areas

[6] California Regional Water Quality Control Board & Nevada Division of Environmental Protection, 2010.

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[7].

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.

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[8]. These events 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.

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.

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[9] 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.

[7] Sonoma County, 2016.
[8] UC Davis, 2016.
[9] FHWA, 2015.

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. 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.

Homewood Path Ribbon Cutting
Photo: Tahoe City Public Utility District

Transit Service

Tahoe City Transit Center
Photo: Aurora Photos / Rachid Dahnoun

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. 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

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.

Technology

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.

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.

Kings Beach Commercial Core Project
Photo: Placer County

Water Quality Improvements

U.S. 50 Water Quality Improvement Project
Photo: Caltrans

Roadway water quality projects 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.

Trans-Sierra Coalition 2017 Meeting
Photo: Robert Liberty, Urban Sustainability Accelerator

3 THE PLAN

Stateline, Lake Tahoe

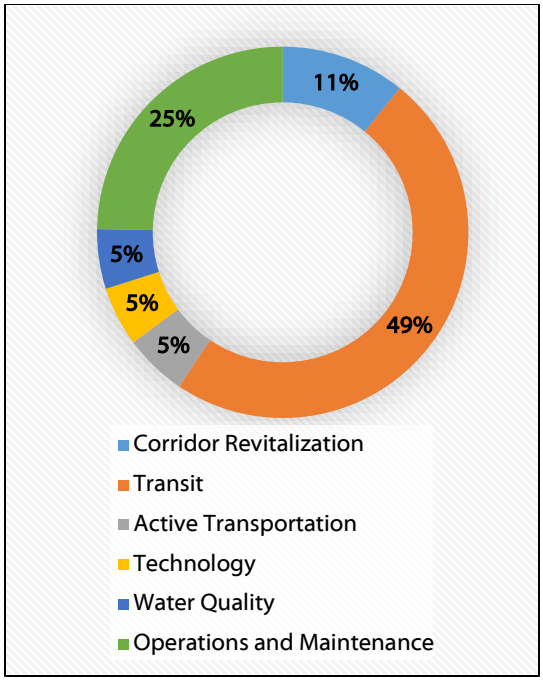
Imagine Lake Tahoe on a wintery blue sky day or a warm summer weekend leading up to the fourth of July. This can bring visions of skiing down powdery slopes, or biking to the beach with friends and family. Seasonal peaks and weekends also bring images of vehicle clogged roads when trying to cross town 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: Consider 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

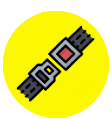
The Bi-State Compact and California legislation mandates the Region to reduce reliance on the private automobile to decrease vehicle miles travelled and associated GHG emissions, and protect water clarity among other responsibilities. Through planning for frequent and free-to-the-user transit, robust 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, and monitoring.

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[1].

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.

[1] 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. 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 detail 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:

TART
Tahoe Truckee Area Regional Transit

www.laketahoetransit.com

Tahoe Transportation DISTRICT

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 in the north, provide local bus services at Lake Tahoe. Short-range transit plans 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, Transportation Management Associations, 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 12:59 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

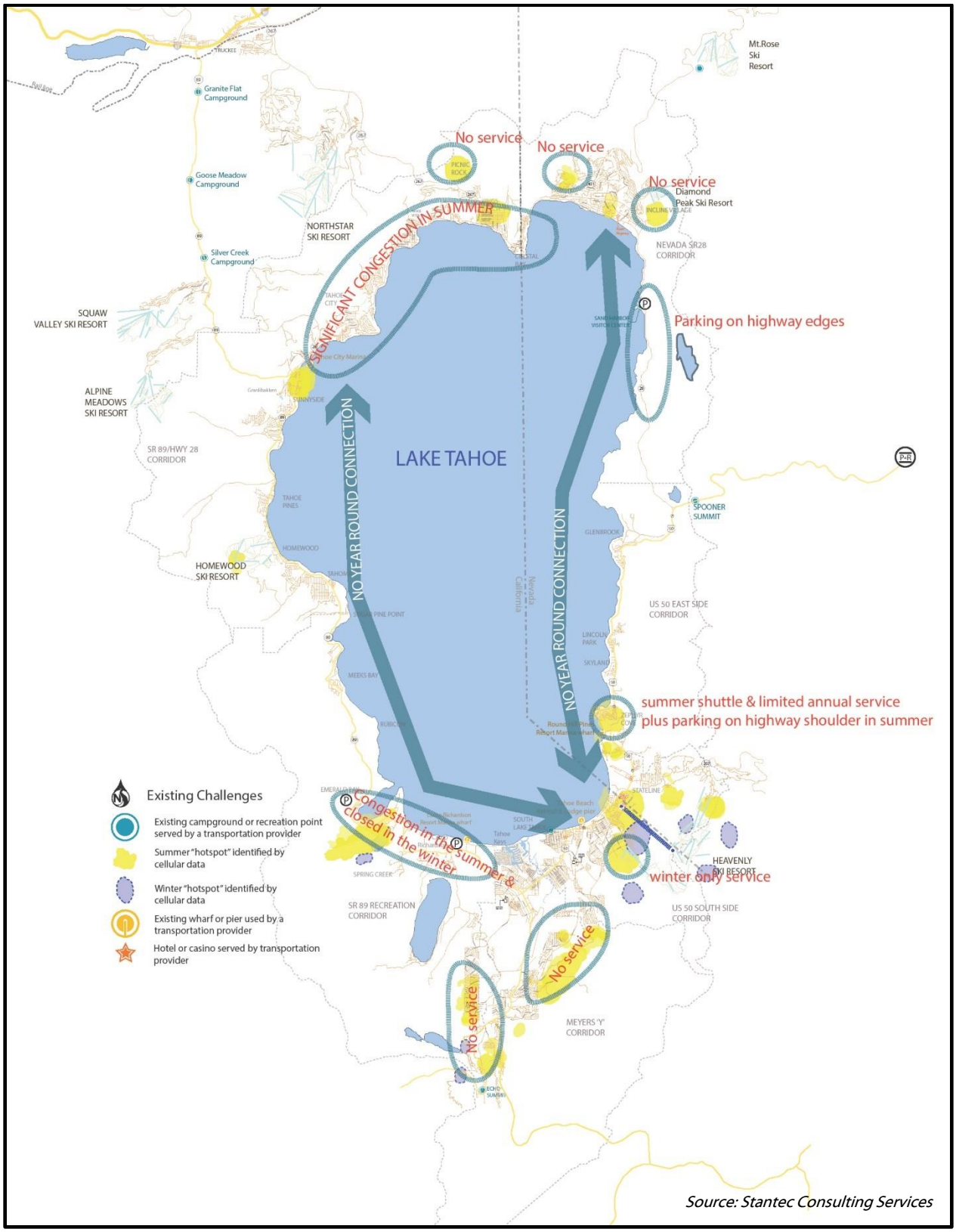
Amtrak and Greyhound provide connections to Lake Tahoe from surrounding areas of California and Nevada, including Sacramento, San Francisco, Sparks, and Reno. These services run three times daily from the Bay Area/Sacramento to and from the Town of Truckee and one time daily to and from Lake Tahoe's 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 operated 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. 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 partner with the Tahoe Rim Trail Association and 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, Over the Edge Sports, and Wanna Ride Tahoe Trail Shuttle.

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.

Figure 3.2: Regional Existing Transit Challenges



Source: Stantec Consulting Services

Proposed Transit Services

Increasing services at areas of known congestions 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.

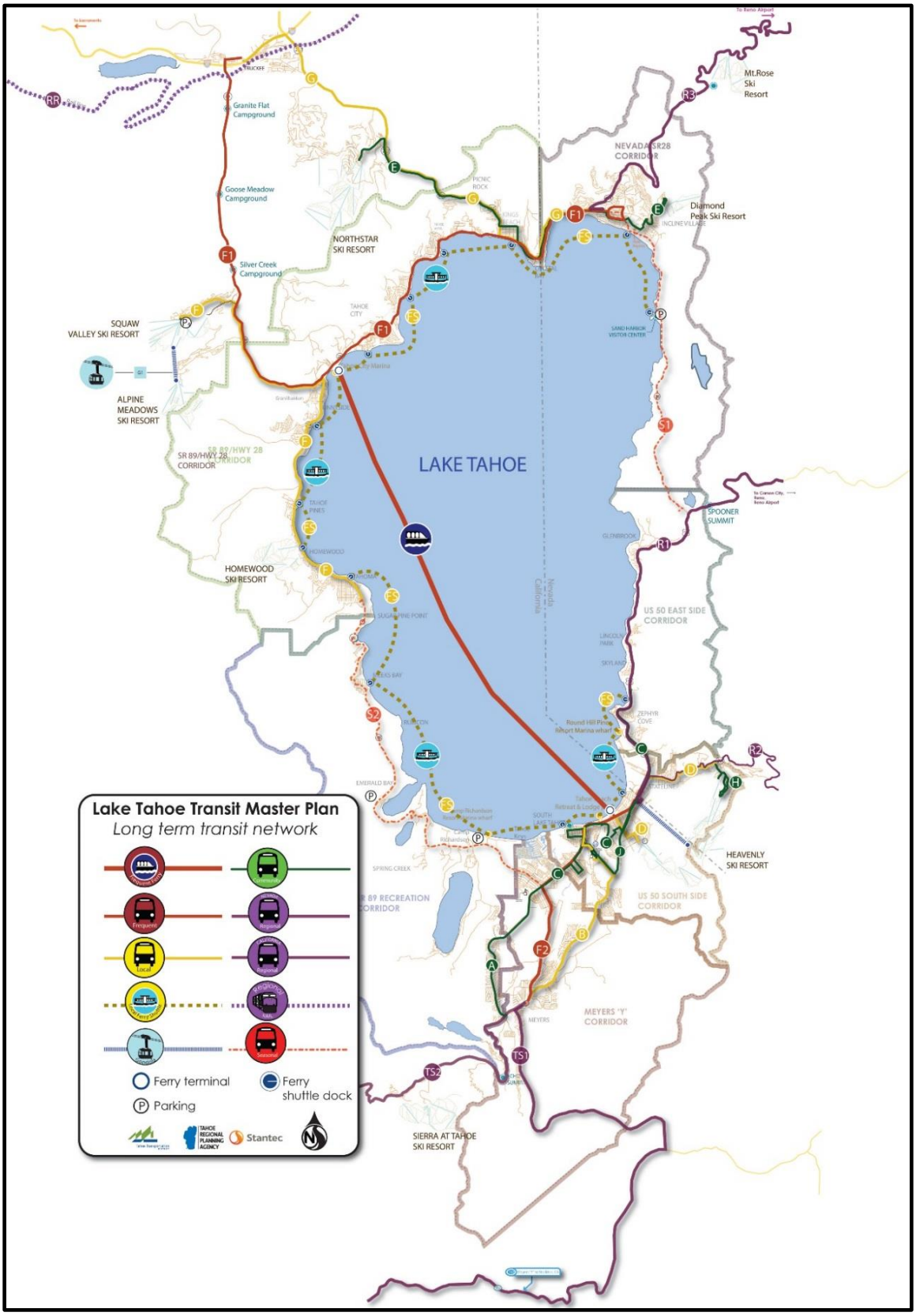
Attractive transit caters to the needs of users, by providing frequent service, reservations, door-to-door service, and the ability to bring dogs, bikes, and recreation equipment.

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.

Figure 3.3: Planned Regional Frequent Transit Service



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 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.

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.

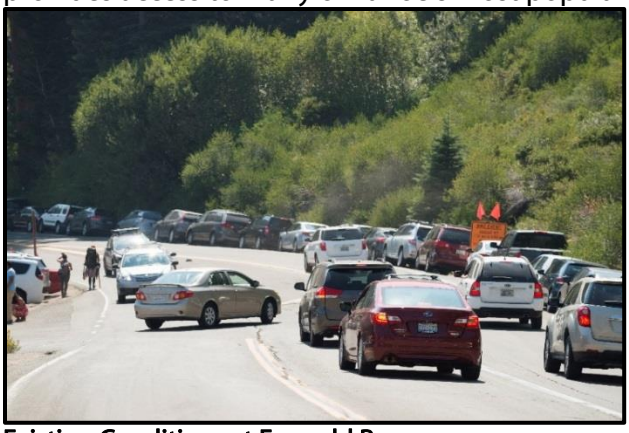
Free-To-The-User Transit

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 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.



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

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[2]. 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

[2] Constrained project list: "Parking Lot Information and Guidance System Integration/Parking Lot Detection System."

Figure 3.4: Complete Transit Vision

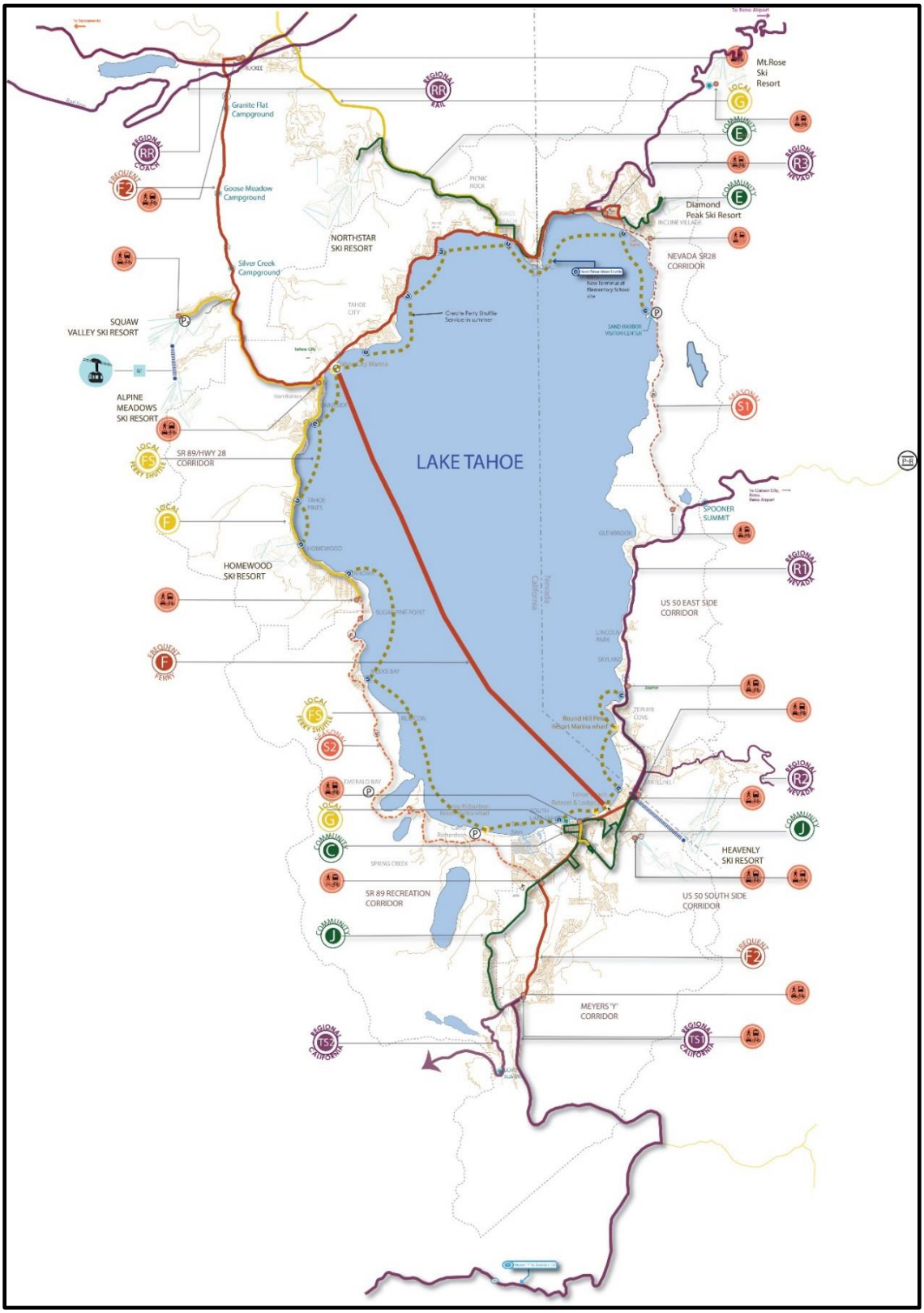


Table 3.2 illustrates differences between existing transit services and transportation enhancements realized with reasonable available funding (constrained list) and service enhancements possible beyond the foreseeable revenue sources for this 2017 plan (unconstrained list).

Table 3.2: Transit Services: Existing, Constrained and Unconstrained

Service Type	Existing	Constrained List	Unconstrained List
Community	One-hour service in neighborhoods	30-minute service in neighborhoods	15-minute service in neighborhoods
Local	One hour service on all routes	30-minute service on select routes	15-minute service on select routes
Regional	No year-round North to South shore regional connections	Hourly year-round regional connections	30-minute frequency year-round connections
Regional	No crosslake ferry, limited South shore watertaxi service	Crosslake ferry, complimentary South Shore watertaxi service	Crosslake ferry, complimentary regional watertaxi service
Regional - Recreation	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
Regional - Recreation	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.
Inter-Regional	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
Inter-Regional	Limited rail service to Truckee/ Reno	Limited rail service to Truckee/ Reno	Frequent Commuter rail service to Truckee/Reno
Infrastructure	Three Transit Centers	No additional transit centers	17 transit centers or mobility hubs within and outside the Region
Program: Transfer Information	Transfer points are not coordinated or well-advertised	Improved scheduled transfer coordination between TTD and TART	Online Transportation Trip Planning Tool
Program: Cost per ride	$2 per ride	Free-to-the-user on TTD and TART services	No additional enhancements necessary
Program: Adaptive Roadway Management	No priority access	Transit signal priority on California signals	Transit signal priority on Nevada signals, and adaptive roadway management on U.S. 50, SR 89, and SR 267
Program: real-Time Information	Real-time online transit location	Real-time bus arrival on smart phones and CMS signs	Information kiosks at activity centers
Program: Recreation Equipment	No recreation equipment carrying capacity on buses	No recreation equipment carrying capacity on buses	Ability to carry recreation equipment
Program: Parking Management	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:

- Right sizing roadways to include vehicle lanes, left turn pockets, and bicycle lanes.
- Optimizing signalized intersections so bicyclists are detected and have a leading head start before cars begin to move
- Appropriately distancing crosswalk opportunities so people can access their neighborhoods, commercial centers, and jobs without having to jay walk
- Providing shared-use paths that take children the entire way to school from home
- Adhering to ADA requirements so wheelchair users, visually disabled and the hearing impaired can get to their destinations safely.

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 vitally 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 scales 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. 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[3].

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. 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 Tahoe to Meyers via the Sawmill bike path, and the 25 miles already built of an eventual 72-mile "Tahoe Trail"

[3] To be completed in Spring 2017

paved path that will loop the entire lake. Separated shared-use paths are the public's preferred infrastructure type for active transportation, providing a duel 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 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.

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.

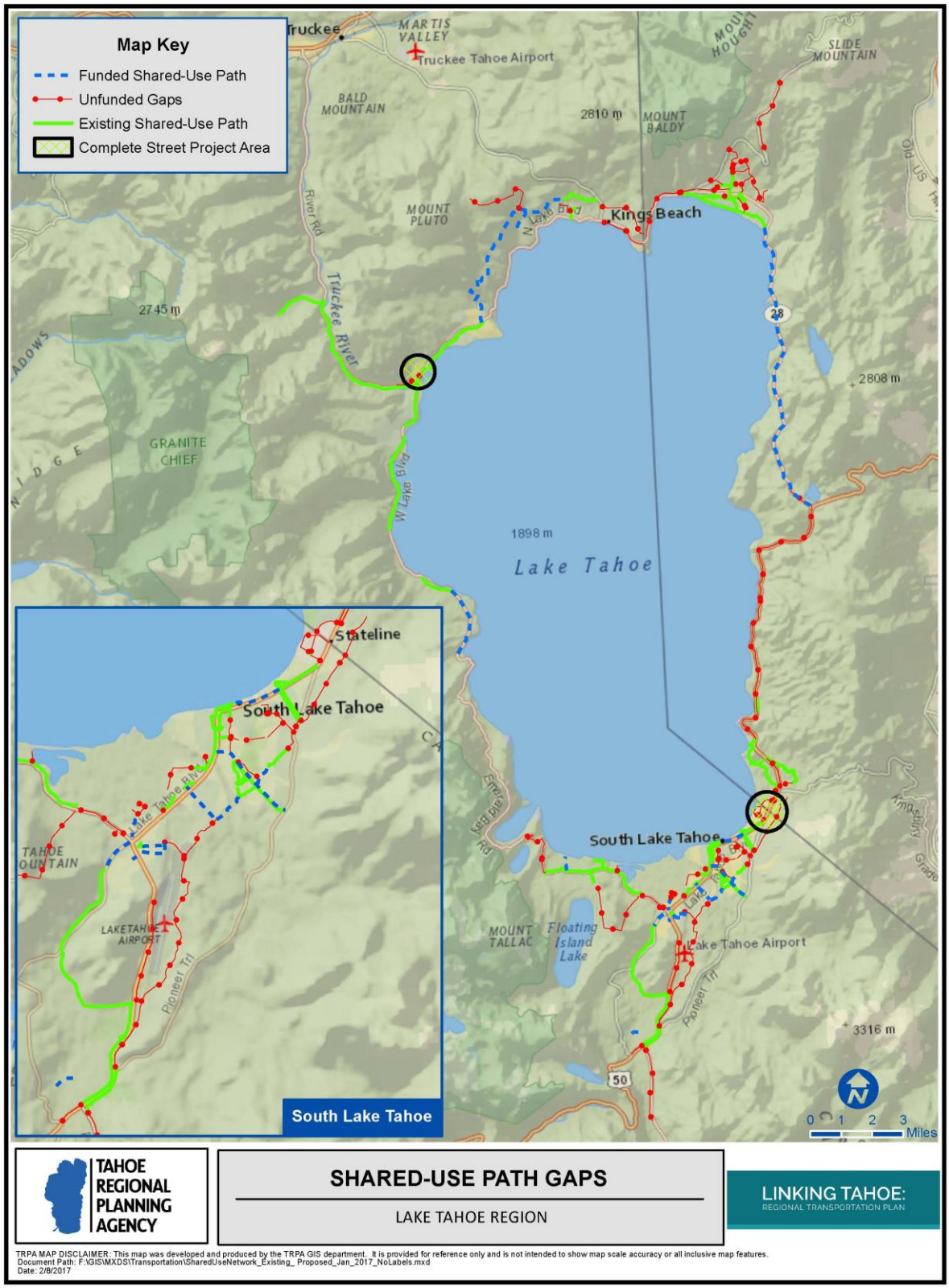
Connecting Off-Street to On-Street – Crosswalks and Roundabouts

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 jaywalk 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.

Lake Tahoe Boulevard Pedestrian Activated Beacon
Photo: Mike Vollmer

Figure 3.5: Shared-Use Path Gaps



Proposed Trails Network

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.

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.

South Shore Tahoe Trail, Kahle Drive
Photo: Mike Vollmer

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.

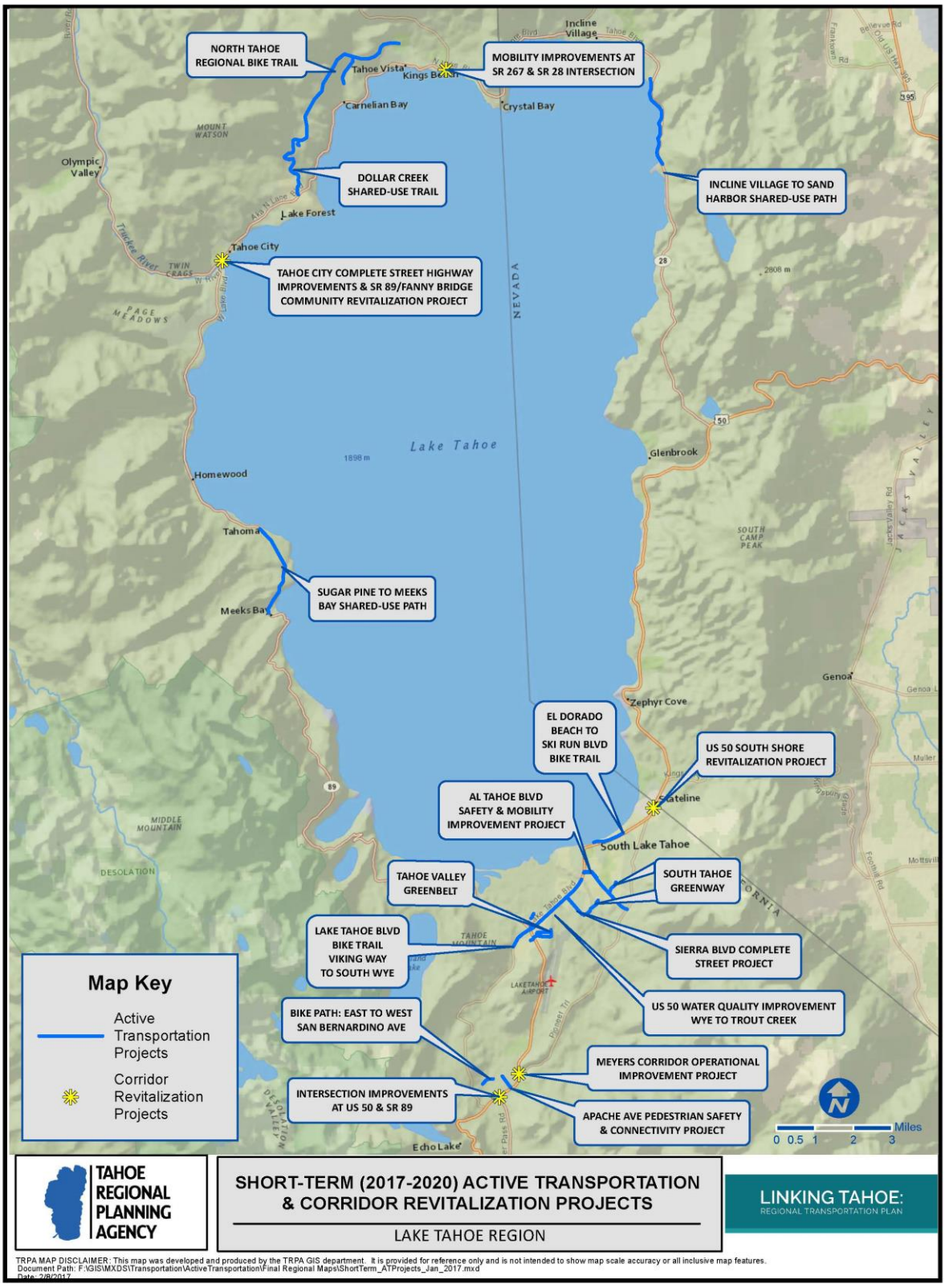
Visitors
The East Shore Tahoe Trail will connect Incline village to Spooner Summit providing beach access and gorgeous mountain views.

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.

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

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[4], 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.

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 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/.

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

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**

[4] 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

Environment

Safety

Operations & Congestion Management

System Preservation

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 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.

Policy 6.3: Make "dig once" the basin-wide standard, requiring public and private roadway projects to include the installation of conduit to support community needs. (e.g: fiber optic, broadband, lighting, etc.)

Regional partners collaborate on a variety of work groups and published 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.
- **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.
- **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.
- **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 2014 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.

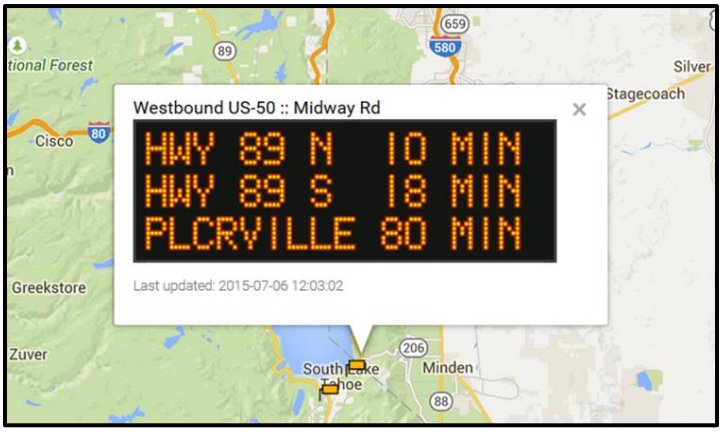
Finally, a partnership between TRPA and Truckee-Donner Public Utility District supported by the California Energy Commission will publish a Plug-In Electric Vehicle Readiness Plan in Spring of 2017. The goal is to establish the Tahoe-Truckee Region as a plug-in electric vehicle (PEV) destination, gateway, 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[5]. 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 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.



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

Data Collection

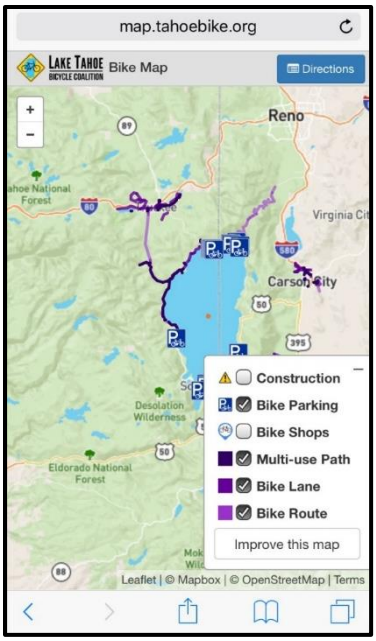
Technologies used to provide real-time travel information to the public also assist agencies in data collection. Logged information is used to create user trends, improve system functionality, and apply for construction funding. Remote sensors, cameras, loop detectors, and passive infrared counters installed 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

[5] 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.

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, 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

Safety

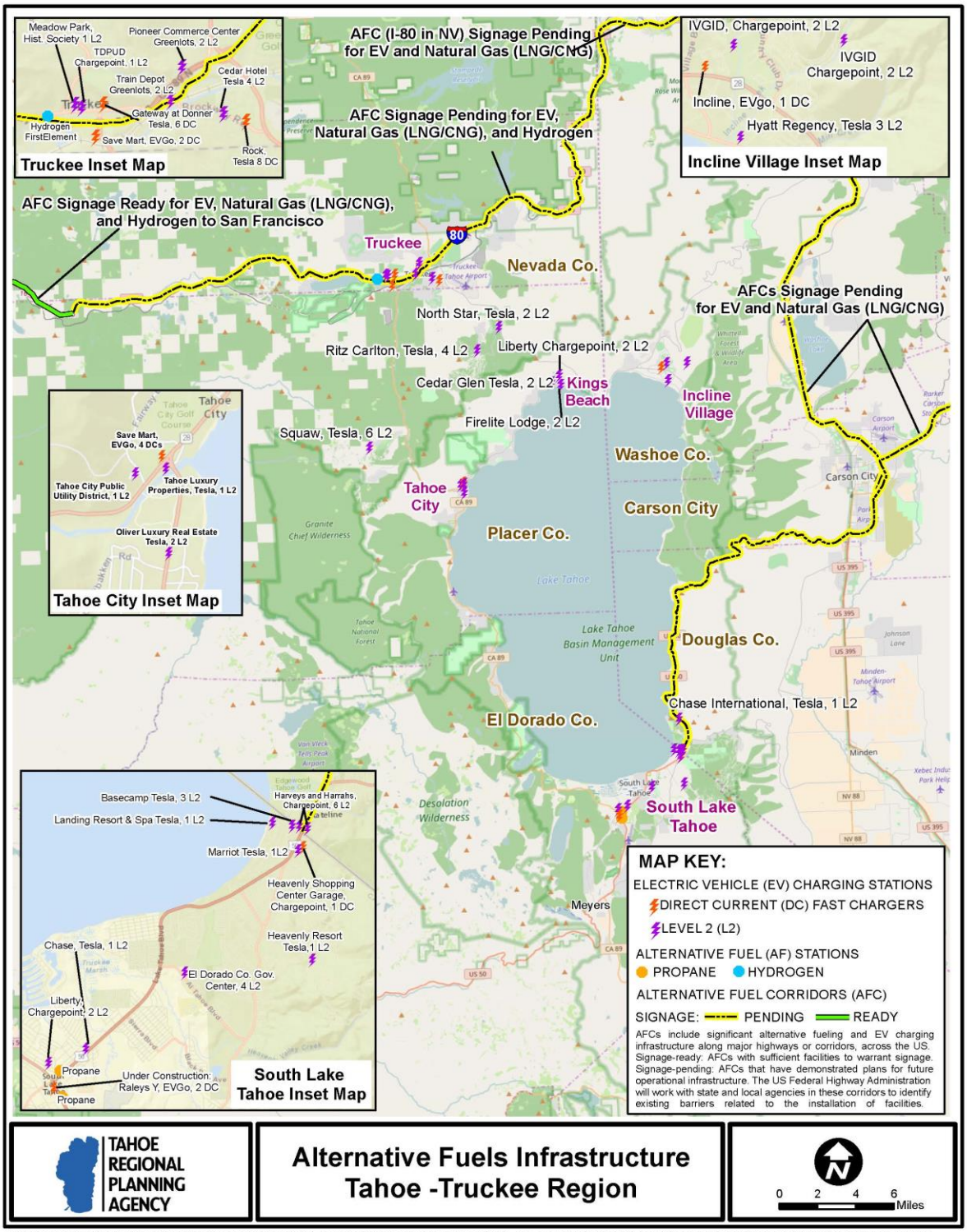
Technologies that improve safety for all roadway users are being adopted. The Cave Rock safety project installed sensors that detect bicyclists entering the tunnel and alert vehicles to their presence. Closed circuit television cameras are installed on transit buses and transit centers to increase security, 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, 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 Locater. Document Path: F:\GIS\MXDS\PlugElectVeh\AltFuelsRegionalMap.mxd

Proposed Technological Improvements

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.

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 weather variable speeds signs, a region-wide transportation trip planning tool, and information kiosks at activity centers are desired but require newly identified funding.

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

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

- Conduit is installed when digging occurs for roadway, bike, or utility projects, allowing easy upgrades to communication lines, increasing broad-band coverage.
- Provides opportunities for synchronization and connection of traffic signals, improving traffic flow.
- Parking management systems also benefit by encouraging installation of real-time information systems during routine maintenance or new construction.

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.

Incentive Programs:

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

Tahoe Fund Director, Amy Berry on electric bicycle

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.

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[6] 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[7].

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.

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

[6] Lyft and Uber are currently operating in Lake Tahoe.
[7] Brustein, 2016.

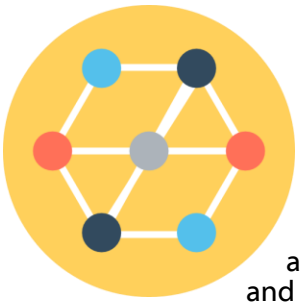
acquired by Ford, provides rides for up to 14 people who are requesting a ride along a common route. Advances in technology allow the creation of these routes through crowdsourcing by aggregating desired pick-up and destination data from user interactions with the mobile-app and determining which routes to serve once interest reaches a tipping point.[8] 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	Full build out of all public fleets and necessary 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

[8] 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 roads 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.

South Lake Tahoe Airport

Passenger air service to the Tahoe Region is 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. Charter flights resulted in an additional 11,000 passengers traveling through Reno in 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.[9] The South Lake Tahoe 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 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.[10]

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.

[9] Reno -Tahoe International Airport (personal communication, 2016).
[10] 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.[11]

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.

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. Technology is a primary element in providing transportation security. Examples include transit station surveillance cameras that reduce the risk of theft or harassment to 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.

[11]Reno -Tahoe International Airport (personal communication, 2016).

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.

NDOT repairing sinkhole on Kingsbury Grade
Photo: NDOT

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[12] 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[13] 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[14] 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[15] 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[16] was established for the South Lake Tahoe area. The council consists of numerous emergency responders, including El Dorado, Douglas, and Alpine counties.

[12] California: http://www.caloes.ca.gov/cal-oes-divisions/planning-preparedness/standardized-emergency-management-system
[13] Nevada: http://dem.nv.gov/
[14] Placer County: https://www.placer.ca.gov/departments/ceo/emergency
[15] Washoe County: https://www.washoecounty.us/em/files/PDFs/Washoe_Singles.pdf
[16] 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.

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.

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 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.

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. 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).

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.

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.

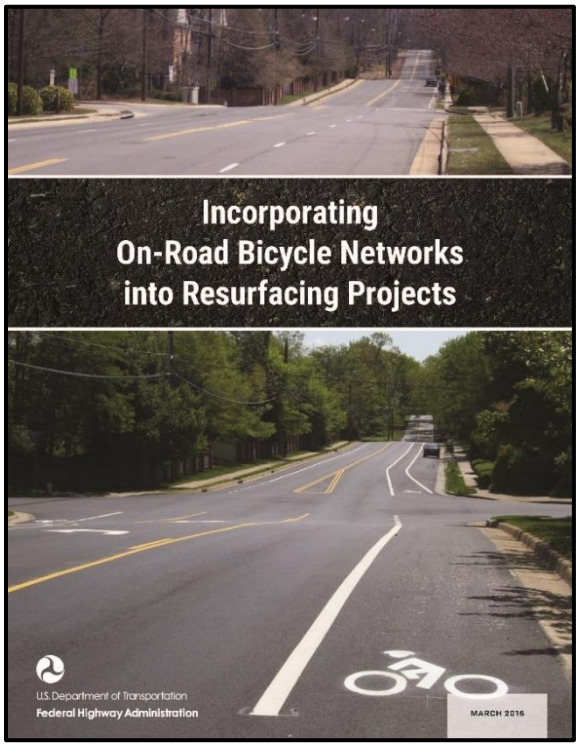


Table 3.5 summarizes differences between existing and additional transportation system management strategies realized with reasonably available funding (constrained list) and the planned strategies possible beyond the foreseeable revenue sources for this 2017 plan (unconstrained list).

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

Strategies	Existing	Constrained List	Unconstrained List
Operations and maintenance	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
Intersection function	Traditional intersection functioning	Multiple optimized intersections through re-design to roundabouts and enhanced signals	Increased intersection improvements
Signal coordination	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
Emergency Signal pre-emption	Limited on Nevada roadways	South Shore signals	Signals Region-wide
Transportation Security	Wide-spread agency coordination	Increased resiliency planning during project design	Increased resiliency planning during project design
Program: Adaptive Roadway Management	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
Corridor Revitalization	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

4 FUNDING THE PLAN

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.

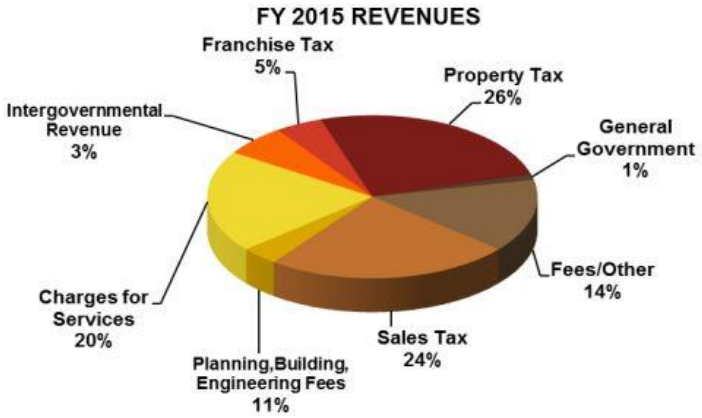
Similar to places like Park City, Utah and Aspen, Colorado, Lake Tahoe's daily population balloons during peak seasons and holiday weekends. Additionally, the Lake Tahoe Region's roughly 55 percent second home ownership and the growing populations in neighboring metropolitan areas continue to increase 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

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



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.

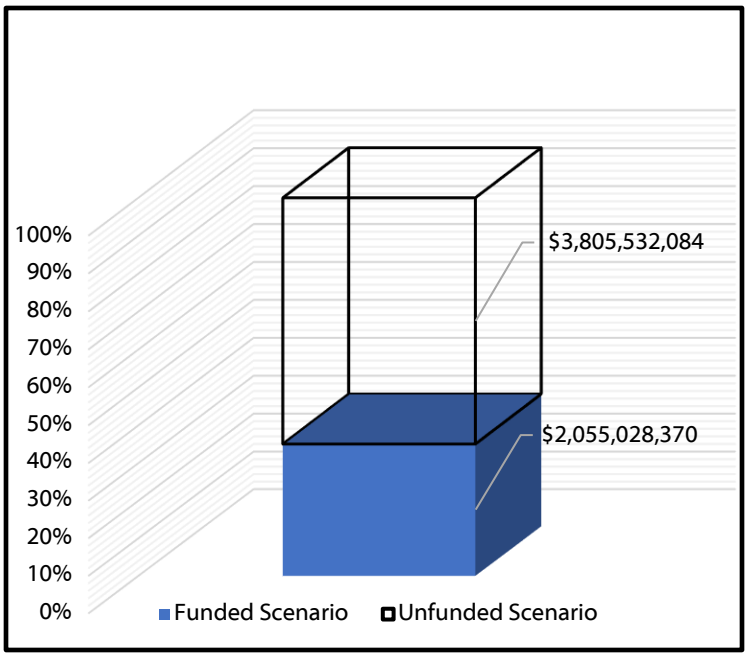

Photo: Aurora Photos / Rachid Dahnoun

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.

Funded, Constrained Vision

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

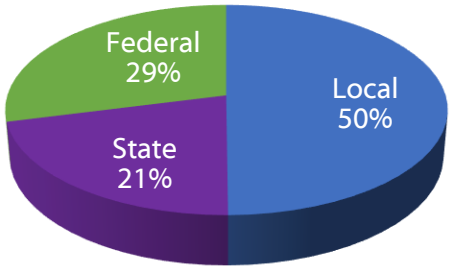
The funded, constrained strategies move the Region closer to a seamless, around the lake transit system that is frequent, free-to-the-user, and connects residents and visitors to recreation sites and town centers. About 26 miles of additional shared-use paths will be delivered in the short term between 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.

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 4.2 illustrates the percentage of funding that comes from federal, state, and local sources.

Figure 4.2: Forecast Revenue Percentages by Source



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, 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 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[1]; 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

[1] Farebox revenues will be eliminated as the Region delivers free-to-the-user transit

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.[2]

In November 2016, Placer County and the City of South Lake Tahoe pursued new funding through local sales tax measures, however these measures failed. Nevada counties have been passing legislation to index gasoline taxes to inflation, which has led to additional revenues for transportation projects in the State of Nevada. Washoe County has already passed gas tax indexing, while 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.

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.

President Obama at 2016 Tahoe Environmental Summit
Photo: Tom Lotshaw

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.[3] 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.

[2] Douglas County, 2015
[3] 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 Creak 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 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 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.

Bijou Bike Park Opening Day
Photo: Mike Vollmer

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.

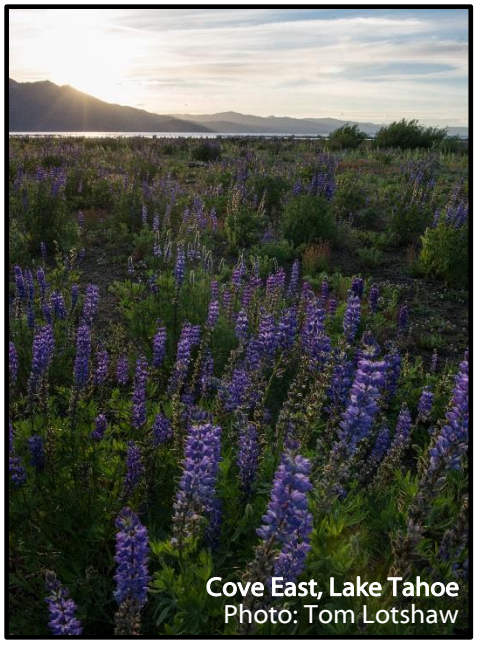
Trans-Sierra and Mega-Regional Funding

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 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.

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.

Funding Tomorrows Vision Today

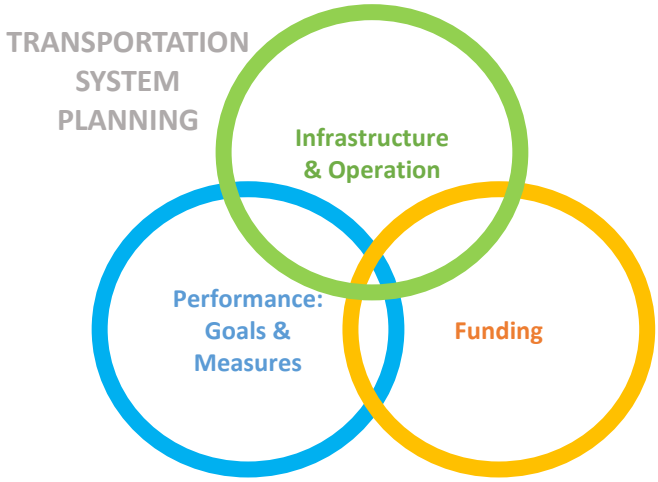
The transformation that Lake Tahoe deserves and communities around the lake demand will require dedication, collaboration, and difficult political decisions. Creating new sources of funding to pay for high-priority projects, services, and programs is vital. While continued progress can be made under 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. 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. 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.



Cove East, Lake Tahoe
Photo: Tom Lotshaw

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.

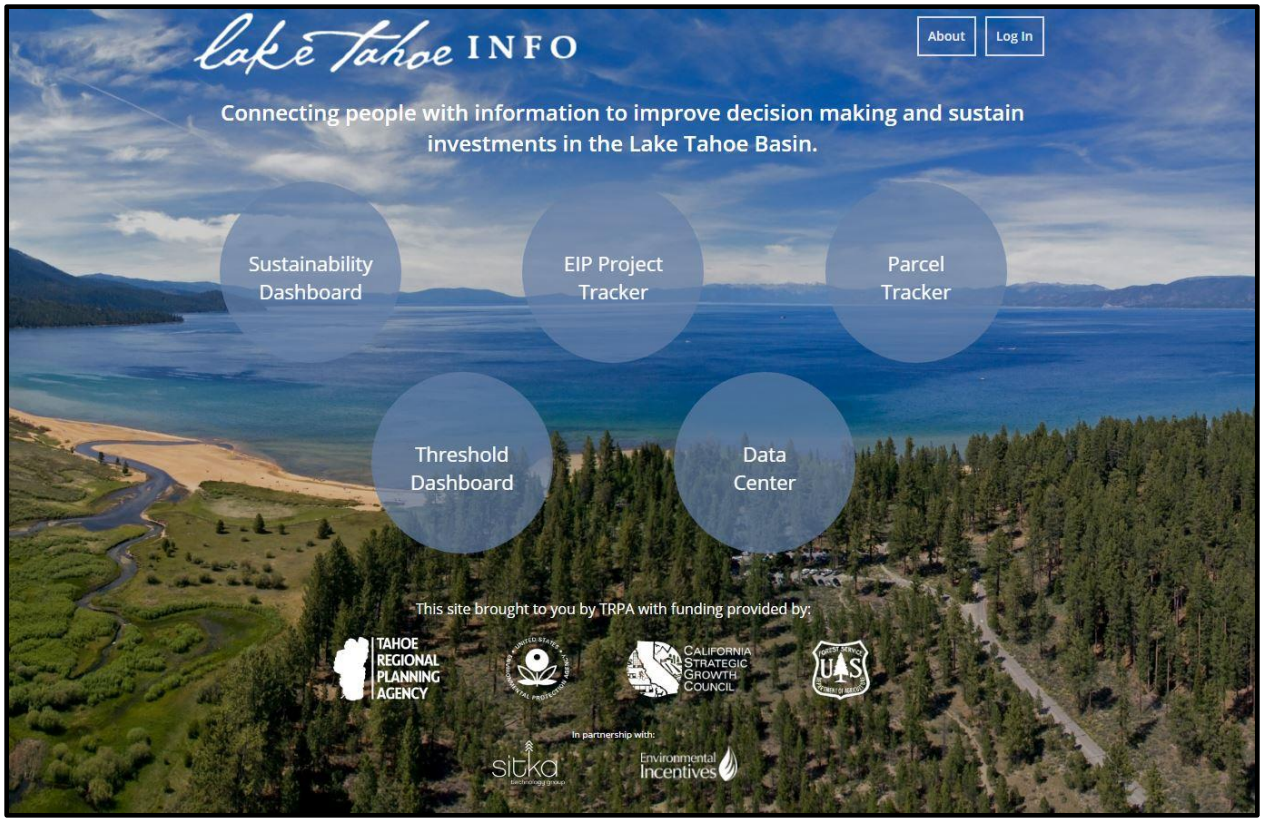
Performance Measurement Framework

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 website).

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

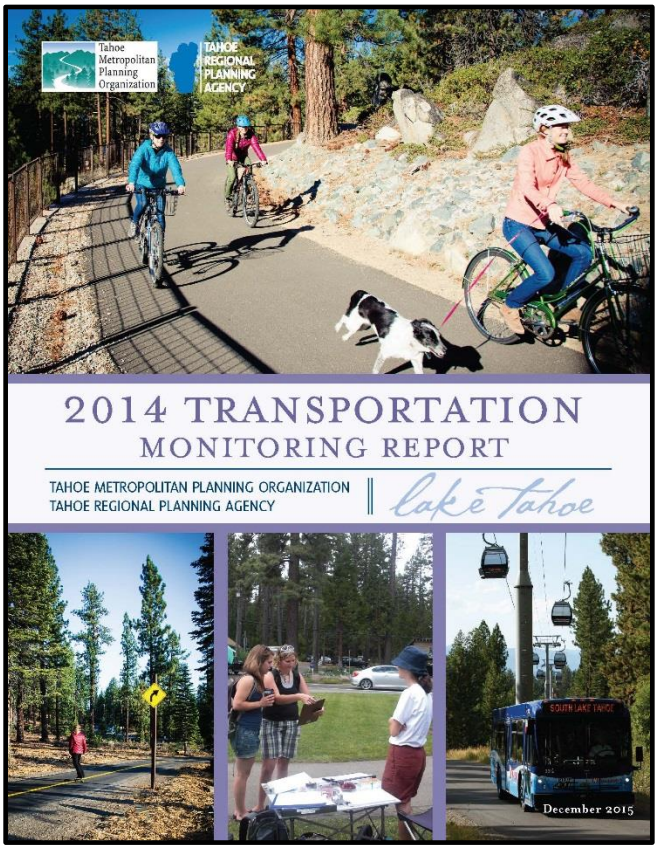
Planning at every scale provides stakeholders and the public with information to understand progress toward goals. Specific data are collected per prescribed data collection and monitoring protocols which make it reproducible, consistent, and reliable for analysis and informed decision making. The interrelationships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

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[1] and Washoe[2] 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).

[1] TRPA, 2016.
[2] 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, a portal to all of the inter-related regional-level transportation plans and highlighted transportation projects.
- www.TRPA.org/RegionalTransportationPlan, an interactive website specific to the RTP.
- 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

South Shore Transit
Photo: Aurora Photos / Rachid Dahnoun

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[3], estimated annual visitation to Lake Tahoe at roughly 8.5 million. The more recent Trans-Sierra Transportation Coalition's 2015 Trans-Sierra Plan[4] 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 current estimates are that Lake Tahoe serves nearly 10 million visitor-vehicles and roughly 24 million visitors annually. 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.

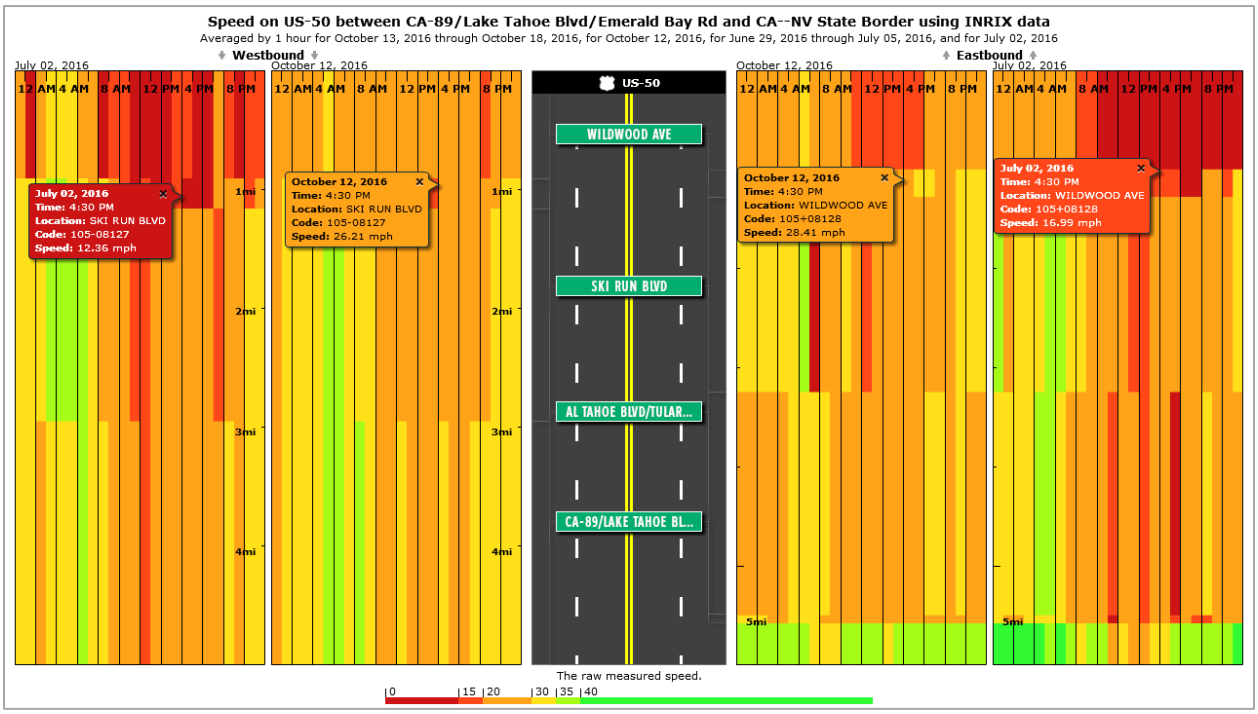
Policy 4.13: Establish regional and inter-regional cooperation and cost-sharing to obtain basin-wide data for transportation-related activities.

In addition to cell phone data, TRPA also uses INRIX Insights[5], 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,

[3] El Dorado County Transportation Commission, 2014.
[4] Trans-Sierra Transportation Coalition, 2015.
[5] 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.

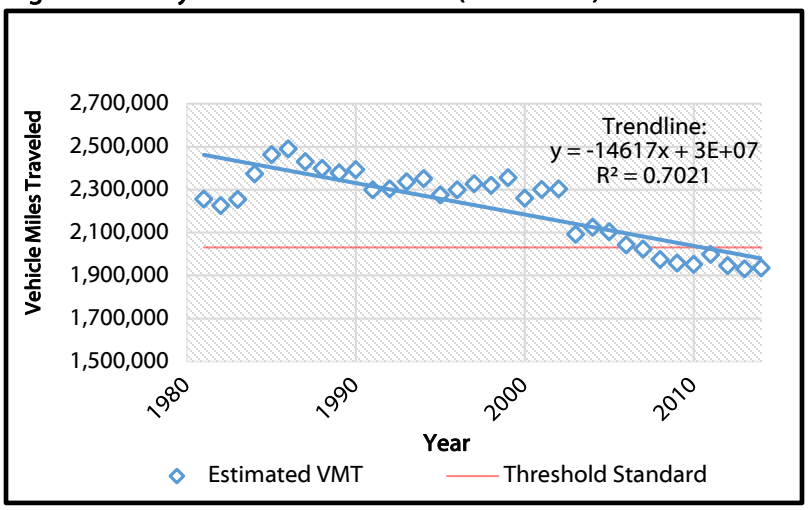
Vehicle Miles Traveled (VMT) – In Attainment

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[6].

The target value for this threshold indicator is a 10 percent reduction from 1981 levels, or no more than 2,030,938 daily VMT[7]. 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.

[6] TRPA, 1982.
[7] 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[8]. As shown in Figure 5.2, the VMT threshold indicator is currently in attainment.

Heavenly Village
Photo: Aurora Photos / Rachid Dahnoun

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.

[8] 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[9]. 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

[9] 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[10], 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.

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*

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[11]. 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[12].

Lake Tahoe Boulevard Path
Photo: Mike Vollmer

[10] TRPA EIP Tracker, 2016.
[11] TRPA, 2013.
[12] 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[13]. Similarly, South Shore ridership has declined but remained relatively steady since the recent peak in 2008[14]. Regional partners will continue to monitor transit ridership, ridership targets may be set once service frequency goals and available funding are established.

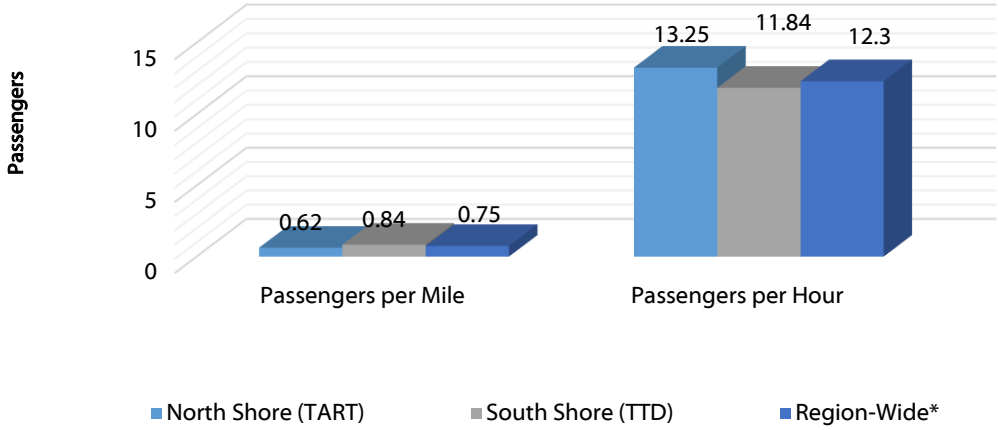
Transit Ridership
Target: *No Target*
Current Condition: *2015/2016: North Shore – 332,440 passengers; South Shore – 792,875 passengers*
Status: *Indicator Stable*

Transit Passengers per Revenue Mile and Transit Passengers per Revenue Hour[15]

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[16]. 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*

Figure 5.3: Transit Passengers per Revenue Mile/Transit Passengers per Revenue Hour (2014/2015)

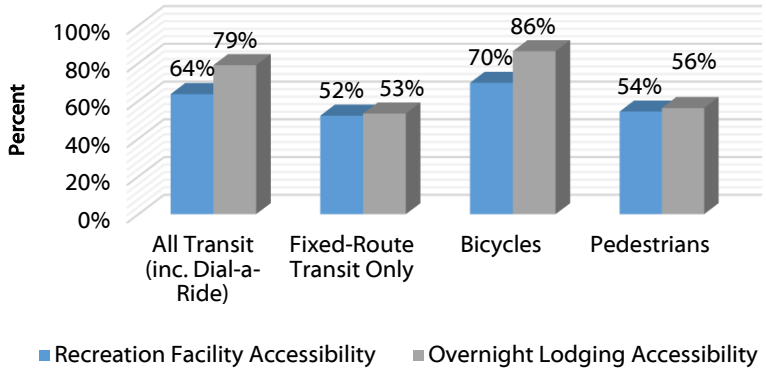


[13] Tahoe-Truckee Area Regional Transit (TART) (personal communication, July 2016).
[14] Tahoe Transportation District (personal communication, July 2016).
[15] North Shore (TART) Source Note: W. Garner (personal communication, July 22, 2016). Note: Region-Wide calculated as Total Passengers divided by Total Miles and Total Passengers divided by Total Hours.
[16] Federal Transit Administration, 2015.

Percentage of Overnight Lodging & Recreation Areas with Transit, Bicycle, & Pedestrian Access[17]

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.

Figure 5.4: Percentage of Overnight Lodging and Recreation Areas with Transit, Bicycle, and Pedestrian



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:

[17] 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[18]	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, and monitoring.

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

[18] 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.

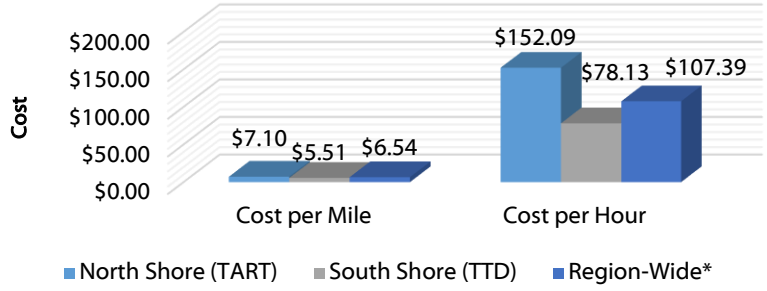
be monitored to understand whether this goal is being achieved.

Transit Cost per Revenue Mile and Transit Cost per Revenue Hour[19]:

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 [20]. Lake Tahoe's rural and climatic conditions partly explain Tahoe higher average generally[21], 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*

Figure 5.5: Transit Cost per Revenue Mile and per Revenue Hour

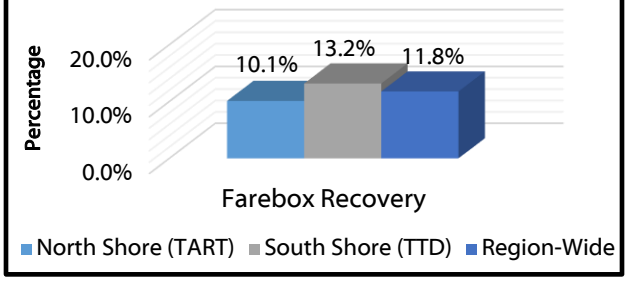


Transit Farebox Recovery Rate[22]

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[23]. 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*

Figure 5.6: Transit Farebox Recovery Rate (2014 – 2015)



[19] 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.
[20] Federal Transit Administration, 2015.
[21] Jarrett Walker, 2011.
[22] W. Garner (personal communication, July 22, 2016).
[23] Jarrett Walker, 2011.

GOAL 5: ECONOMIC VITALITY & QUALITY OF LIFE

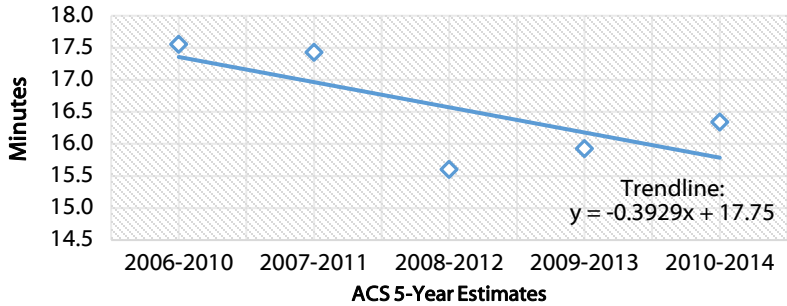
Support the economic vitality of the Tahoe Region to enable a diverse workforce, sustainable environment, and quality experience for both residents and visitors.

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[24]

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.

Figure 5.7: Average Travel Time to Work (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)[25], measures the underlying housing and transportation expenses associated with a specific location (MPO, County, City, census block).

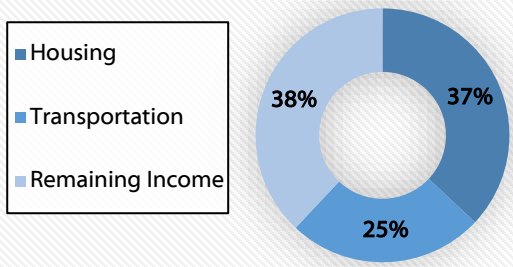
> *"By taking into account the cost of housing as well as the cost of transportation, H+T provides a more comprehensive understanding of the affordability of place. Dividing these costs by the representative income illustrates the cost burden of housing and transportation expenses placed on a typical 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*

[24] 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.

[25] 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.

Figure 5.8: Housing and Transportation Affordability Index

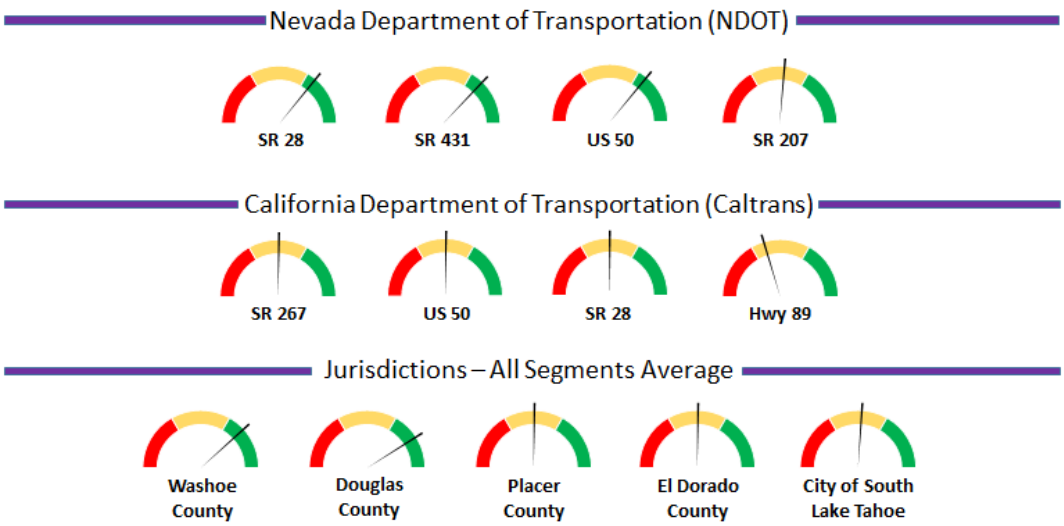


GOAL 6: SYSTEM PRESERVATION

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.

6 MOVING FORWARD

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.

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

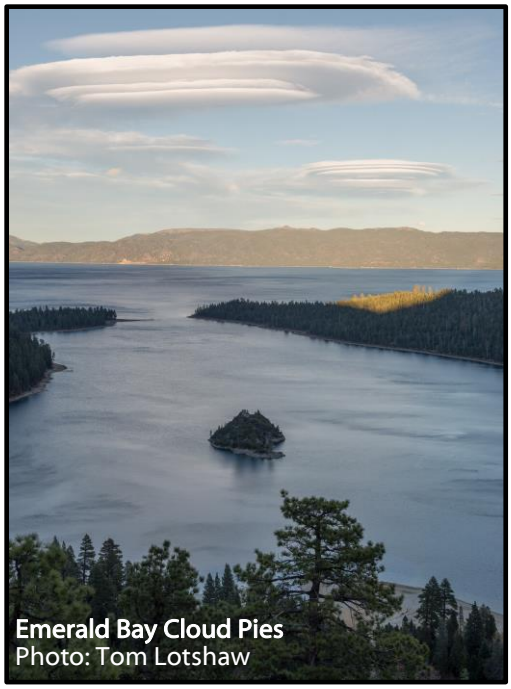
Data and Performance Driven Program

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

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 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.

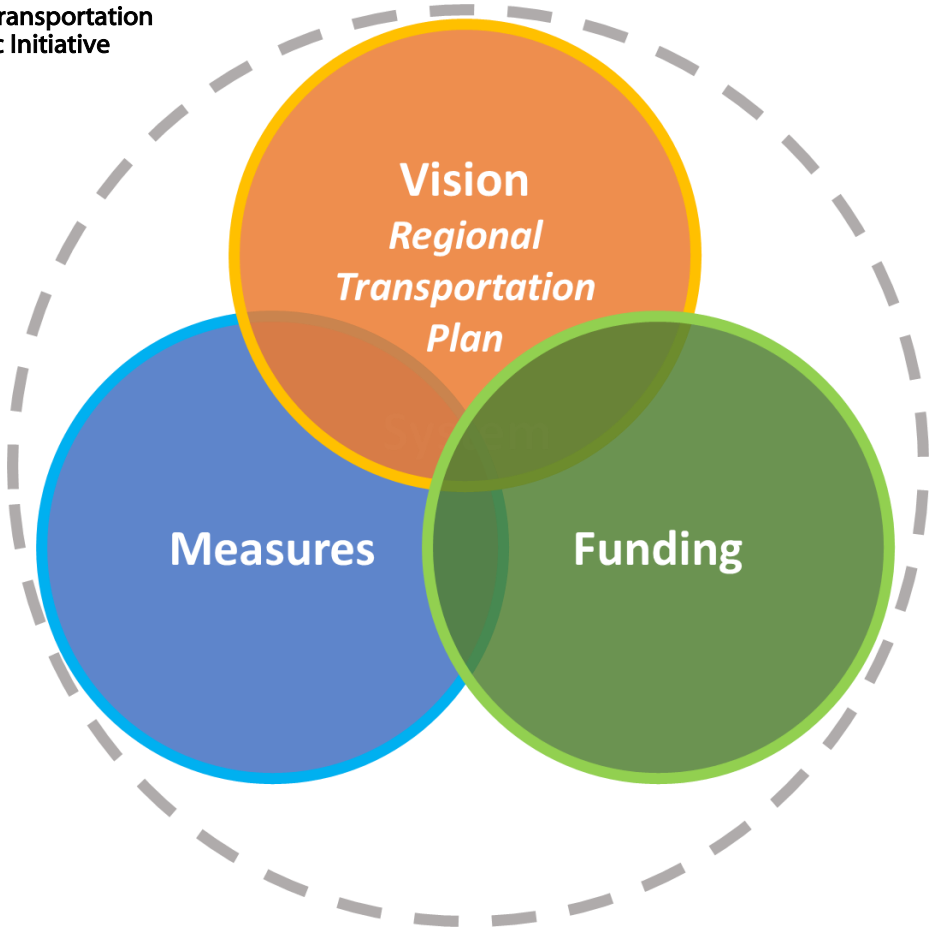
Transportation System Management: Multiple corridor revitalization projects better manage congestion by redesigning roadways and intersections using a complete street approach. Operation and maintenance enhanced by shared-use path snow removal and improved equipment. Resiliency planning and project design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

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 in the 2021 regional transportation plan.

Figure 6.1: Transportation Strategic Initiative



Technology and Innovation

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

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

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

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

West Shore Tahoe Trail
Photo: Aurora Photos / Rachid Dahnoun

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/ 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.

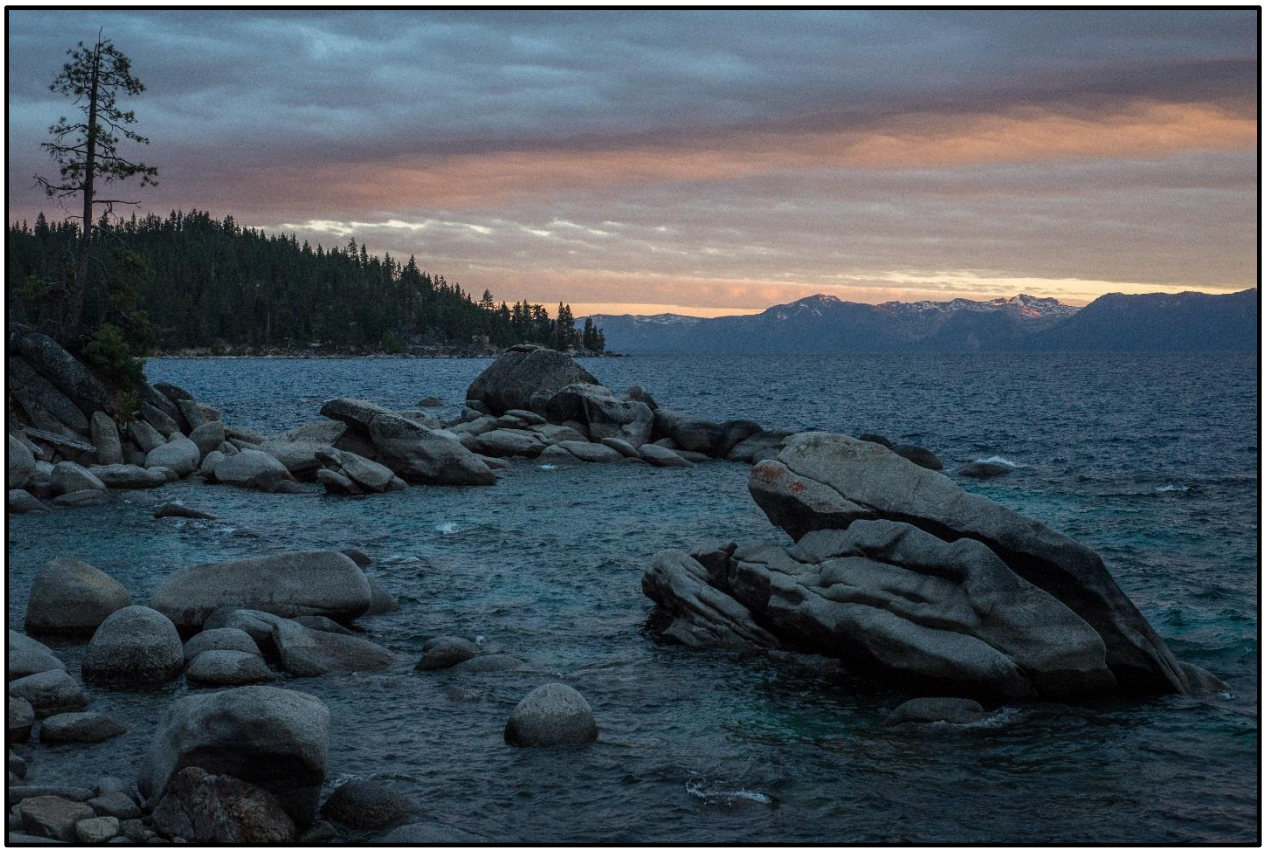
The first projects of the coalition are getting underway: a Tahoe transportation trip-planning tool, cost-sharing agreements for advanced data collection, investigating comprehensive parking management systems, coordination agreements, and shared legislative frameworks. Many of these projects will be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

Conclusion

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

View the plan online at: trpa.org/regionaltransportationplan

TAHOE
REGIONAL
PLANNING
AGENCY

APPENDIX A: GOALS AND POLICIES

GOAL 1: ENVIRONMENT

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

Policies

1.1 Support mixed-use development that encourages walking, bicycling, and easy access to existing and planned transit stops in town centers.

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

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.

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.

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

1.6 Require new and encourage existing major commercial interests providing gaming, recreational activities, excursion services, condominiums, timeshares, hotels and motels to participate in transportation demand programs and projects.

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.

1.8 Consider traffic calming and noise reduction strategies when planning transportation improvements.

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.

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.

Policies

Transit

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 transportation alternative to the private automobile for all categories of travelers in the Region.

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

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

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.

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

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.

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

2.8 Make transit and pedestrian facilities ADA-compliant and consistent with Coordinated Human Services Transportation Plans.

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

2.10 Provide public transit services at locations nearby school campuses.

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

Active Transportation

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.

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

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

Intermodal

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.

2.16 Encourage parking management programs that incentivize non-auto modes and discourage private auto-mobile use at peak times in peak locations, alleviate circulating vehicle trips associated with parking availability, and minimize parking requirements through the use of shared-parking facilities while potentially providing funding that benefits infrastructure and services for transit, pedestrians, and bicyclists.

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.

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.

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.

GOAL 3: SAFETY

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

Policies

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.

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.

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

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.

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.

GOAL 4: OPERATIONS AND CONGESTION MANAGEMENT

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

Policies

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

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

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

4.4 Incorporate programs and policies of the Tahoe Basin Intelligent Transportation Systems Strategic Plan into regional and local land use plans and regulatory processes.

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.

4.6 Level of service (LOS) criteria for the Region's highway system and signalized intersections during peak periods shall be: "C" on rural recreational/scenic roads; "D" on rural developed area roads; "D" on urban developed area roads; "D" for signalized intersections. Level of Service "E" may be acceptable during peak periods in urban areas, but not to exceed four hours per day. These vehicle LOS standards may be exceeded when provisions for multi-modal amenities and/or services (such as transit, bicycling, and walking facilities) are adequate to provide mobility for users at a level that is proportional to the project-generated traffic in relation to overall traffic conditions on affected roadways.

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

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.

4. 9 Require the development of traffic management plans for major temporary seasonal activities, including the coordination of simultaneously occurring events.

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

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

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 website).

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

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.

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.

Policies

5.1 Encourage community revitalization projects that comprehensively support regional and local transportation, housing, land use, environment, and other goals.

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.

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.

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.

GOAL 6: SYSTEM PRESERVATION

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

Policies

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

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

6.3 Make "dig once" the basin-wide standard, requiring public and private roadway projects to include the installation of conduit to support community needs. (e.g: fiber optic, broadband, lighting, etc.)

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.

Appendix B: Project List and Revenue Narrative

CONSTRAINED PROJECT LIST

Corridor Revitalization

EIP Project #	Project Name	Lead Implementer	Implementation Start Year	Completion Year	Funding Type	Estimated Total Cost in 2017 Dollars	Estimated Total Cost in Year of Expenditure
03.01.02.0023	SR 89/Fanny Bridge Community Revitalization Project- Phase 1 Highway Improvements and Dollar Creek Path	Tahoe Transportation District	2016	2018	Capital	$38,271,000	$38,271,000
03.01.02.0016	SR 89/Fanny Bridge Community Revitalization Project - Phase 2 Complete Street Improvements and Meeks Bay Path	Tahoe Transportation District	2017	2018	Capital	$5,400,000	$5,400,000
03.01.02.0004	Sierra Boulevard Complete Streets Project (From US Highway 50 to Barbara Avenue)	City of South Lake Tahoe	2018	2019	Capital	$4,000,000	$4,284,900
01.01.02.0003	U.S. Highway 50 Water Quality Improvement Project - "Y" to Trout Creek	California Department of Transporta	2017	2020	Capital	$52,641,000	$52,641,000
03.01.01.0015	Mobility Improvements at SR 267 / SR 28 Intersection	Placer County, CA	2019	2020	Capital	$4,750,000	$5,088,319
03.01.02.0074	Meyers Corridor Operational Improvement Project	El Dorado County, CA	2019	2020	Capital	$11,000,000	$11,783,475
03.01.01.0018	Meyers Intersection Improvements at US Highway 50 and State Route 89	California Department of Transporta	2018	2021	Capital	$5,240,000	$5,240,000
03.01.02.0024	U.S. 50 South Shore Community Revitalization Project	Tahoe Transportation District	2018	2021	Capital	$72,000,000	$74,520,000
03.01.02.0072	Tahoe City Complete Streets Highway Improvements	Placer County, CA	2018	2018	Capital	$570,000	$589,950
03.01.02.0118	Tahoe City Downtown Access Improvements	Placer County, CA	2021	2023	Capital	$5,000,000	$5,737,615
03.01.01.0004	Apache Avenue Pedestrian Safety and Connectivity Project	El Dorado County, CA	2019	2021	Capital	$1,873,650	$2,007,101
03.01.02.0108	US 50 Safety Improvement and Complete Streets	Nevada Department of Transportation	2020	2022	Capital	$9,000,000	$9,978,461
03.01.02.0138	Meeks Bay Highway Corridor Improvements	U.S. Forest Service - Lake Tahoe Basin Management Unit	2021	2023	Capital	$1,500,000	$1,721,285
01.01.04.0014	Tallac Historic Site, Valhalla, and the Visitor Center Improvements	U.S. Forest Service - Lake Tahoe Basin Management Unit	2013	2027	Capital	$5,225,628	$5,225,628
01.01.03.0036	State Route 89 Recreation Corridor Improvements	U.S. Forest Service - Lake Tahoe Basin Management Unit	2021	2023	Capital	$5,000,000	$5,737,615
04.01.03.0137	Round Hill Pines Resort Highway Intersection Improvements	U.S. Forest Service - Lake Tahoe Basin Management Unit	2018	2018	Capital	$3,000,000	$3,105,000
01.01.02.0019	US Highway 50 Water Quality Improvement Project - Wildwood to State Line	California Department of Transportation	2025	2025	Capital	$2,222,000	$2,925,950
03.01.02.0125	West Shore Highway Crossing Improvements	Placer County, CA	2021	2022	Capital	$500,000	$593,843
					TOTAL	**$227,193,278**	**$234,851,142**

Transit

EIP Project #	Project Name	Lead Implementer	Implementation Start Year	Completion Year	Funding Type	Estimated Total Cost in 2017 Dollars	Estimated Total Cost in Year of Expenditure	Estimated Annual Operating Cost in 2017 Dollars	Estimated Total Operating Cost for Life of Project
03.01.02.0092	TTD Transit Technology and Amenities	Tahoe Transportation District	2020	2021	Capital	$1,725,000	$1,912,538		
03.01.02.0109	TTD Only Free to the User Transit	Tahoe Transportation District	2020	2040	O&M			$742,011	$22,319,380
03.01.02.0119	TART Only Free to the User Transit	Placer County, CA	2022	2040	O&M			$750,000	$20,912,940
03.01.02.0059	Inter-Regional Transit Service Operations - Short Term	Tahoe Transportation District	2020	2040	O&M			$1,100,000	$33,087,538
03.01.02.0060	Inter-Regional Transit Capital Project - Short Term	Tahoe Transportation District	2020	2020	Capital	$11,000,000	$12,195,897		
03.01.02.0038	TTD Fleet and Facilities Upgrade - Baseline Short term	Tahoe Transportation District	2017	2020	Capital	$18,425,000	$18,425,000		
03.01.02.0054	TTD Transit Operations - Baseline Short Term	Tahoe Transportation District	2017	2040	O&M			$6,500,000	$215,548,511
03.01.02.0117	TTD Fleet and Facilities Upgrade - Medium and Long Term	Tahoe Transportation District	2021	2040	Capital	$82,095,000	$94,205,901		
03.01.02.0085	TTD Transit Operations Enhancements - Short Term	Tahoe Transportation District	2020	2040	O&M			$2,900,586	$87,248,410
03.01.02.0139	TTD Capital for Operations Enhancements - Short Term	Tahoe Transportation District	2020	2021	Capital	$8,560,000	$9,490,625		
03.01.02.0113	TTD Expanded East Shore Service	Tahoe Transportation District	2020	2040	O&M			$827,610	$24,894,162
03.01.02.0114	TTD Capital for Expanded East Shore Service	Tahoe Transportation District	2020	2020	Capital	$3,050,000	$3,381,590		
03.01.02.0058	East Shore Transit Service Facility Upgrades	Tahoe Transportation District	2021	2025	Capital	$5,200,000	$5,200,000		
03.01.02.0116	South Shore Transit Enhancements Operations - Short Term	Tahoe Transportation District	2018	2040	O&M			$2,875,011	$92,464,118
03.01.02.0115	South Shore Transit Enhancements Capital - Short Term	Tahoe Transportation District	2017	2020	Capital	$5,570,000	$5,570,000		
03.01.02.0056	TART Transit Fleet and Facility Upgrades - Short Term	Placer County, CA	2020	2021	Capital	$8,114,600	$8,996,802		
03.01.02.0126	TART Transit Fleet and Facility Upgrades - Long Term	Placer County, CA	2031	2040	Capital	$5,614,600	$9,088,322		
03.01.02.0055	TART Local Service Enhancements - Short Term	Placer County, CA	2020	2040	O&M			$868,260	$26,116,896
03.01.02.0129	TART Additional and Expanded Service to Truckee - Short Term	Placer County, CA	2020	2040	O&M			$981,100	$29,511,076
06.01.03.0013	TART Transit Ongoing Operations and Maintenance	Placer County, CA	2017	2040	O&M			$4,500,000	$150,353,260
03.01.02.0021	Lake Tahoe Waterborne Ferry Project	Tahoe Transportation District	2020	2023	Capital	$40,000,000	$44,348,715		
03.01.02.0052	Lake Tahoe Waterborne Ferry Operations	Tahoe Transportation District	2023	2040	O&M			$4,600,000	$123,010,582
03.01.02.0121	South Shore Water Taxi Pilot Project	Tahoe Transportation District	2023	2040	O&M			$100,000	$2,674,143
03.01.01.0020	South Lake Tahoe Airport Improvement Project	City of South Lake Tahoe	2017	2022	Capital	$8,103,500	$8,103,500		
					TOTAL	**$197,457,700**	**$220,918,890**	**$26,744,578**	**$828,141,018**

Active Transportation

EIP Project #	Project Name	Lead Implementer	Implementation Start Year	Completion Year	Funding Type	Estimated Total Cost in 2017 Dollars	Estimated Total Cost in Year of Expenditure
03.01.02.0002	El Dorado Beach to Ski Run Boulevard Bike Trail	City of South Lake Tahoe	2017	2017	Capital	$3,100,000	$3,100,000
01.01.01.0012	Tahoe Valley Greenbelt	City of South Lake Tahoe	2017	2017	Capital	$6,000,000	$6,000,000
03.01.02.0005	Al Tahoe Safety and Mobility Enhancement Project	City of South Lake Tahoe	2017	2018	Capital	$2,160,928	$2,145,000
01.01.02.0032	SR 28 Shared Use Path and Water Quality Improvements GMP 2 - Incline Village to Sand Harbor	Nevada Department of Transportation	2017	2018	Capital	$23,000,000	$23,000,000
03.01.02.0094	Lake Tahoe Boulevard Class 1 Bicycle Trail (Viking Way to South Wye)	City of South Lake Tahoe	2018	2019	Capital	$2,500,000	$2,587,500
03.01.02.0087	South Tahoe Greenway Shared Use Trail Phases 1b & 2	California Tahoe Conservancy	2015	2020	Capital	$4,027,000	$4,464,807
03.01.02.0040	Class I Bike Path: East San Bernardino - West San Bernardino	El Dorado County, CA	2019	2020	Capital	$1,460,000	$1,563,989
03.01.01.0019	Pioneer Trail Pedestrian Project - Phase II	City of South Lake Tahoe	2020	2021	Capital	$2,110,000	$2,339,395
03.01.02.0049	SR 28 Central Corridor Improvements – Sand Harbor to Spooner State Park	Tahoe Transportation District	2019	2021	Capital	$36,200,000	$38,775,345.00
03.01.02.0011	North Tahoe Regional Bike Trail	Placer County, CA	2021	2023	Capital	$12,000,000	$13,770,276
03.01.02.0044	Baldwin Beach Bike Path	U.S. Forest Service - Lake Tahoe Basin Management Unit	2021	2021	Capital	$500,000	$573,762
Not yet identified	Bicycle and Pedestrian Improvements from the Active Transportation Plan 2021-2030	Various		2021-2030	Capital	$10,000,000	$10,000,000
Not yet identified	Bicycle and Pedestrian Improvements from the Active Transportation Plan 2031-2040	Various		2031-2040	Capital	$10,000,000	$10,000,000
					TOTAL	**$113,057,928**	**$118,320,074**

Technology & Transportation System Management

EIP Project #	Project Name	Lead Implementer	Implementation Start Year	Completion Year	Funding Type	Estimated Total Cost in 2017 Dollars	Estimated Total Cost in Year of Expenditure	Estimated Annual Operating Cost in 2017 Dollars	Estimated Total Operating Cost for Life of Project
03.01.02.0102	Tahoe Basin Transportation Smartphone Application Pilot	Tahoe Transportation District	2018	2025	Capital	$350,000	$362,250		
03.01.02.0077	Traffic Monitoring Stations in Nevada	Nevada Department of Transportation	2020	2021	Capital	$200,000	$221,744		
03.01.01.0016	Parking Lot Information and Guidance System Integration/Parking Lot Detection System	Tahoe Transportation District	2017	2021	Capital	$600,000	$600,000		
03.01.02.0076	Sierra Nevada Operation System	California Department of Transportation	2017	2021	Capital	$1,700,000	$1,700,000		
03.01.02.0075	Changeable Message Signs in Nevada	Nevada Department of Transportation	2021	2021	Capital	$500,000	$573,762		
03.01.02.0078	California Multi-Modal Signal Control Optimization	California Department of Transportation	2021	2021	Capital	$1,000,000	$1,147,523		
03.01.02.0090	TTD Transit Safety and Security	Tahoe Transportation District	2017	2020	Capital	$750,000	$750,000		
03.01.02.0106	Transit Signal Priority Along South Shore	California Department of Transportation	2031	2031	Capital	$475,000	$768,880		
Not Located in Tracker	Transportation Demand Management Programs	Tahoe Regional Planning Agency	2017	2020	Program			$180,000.00	$180,000.00
					TOTAL	**$5,575,000**	**$6,124,159**	**$180,000**	**$180,000**

Water Quality (TMDL)

EIP Project #	Project Name	Lead Implementer	Implementation Start Year	Completion Year	Funding Type	Estimated Total Cost in 2017 Dollars	Estimated Total Cost in Year of Expenditure
Grouped in Tracker	Nevada Department of Transportation Stormwater / TMDL Projects	Nevada Department of Transportation	2017	2018	Capital	$14,986,113	$14,986,113
Grouped in Tracker	California Department of Transportation Stormwater/ TMDL Projects	California Department of Transportation	2017	2017	Capital	$93,382,000	$93,382,000
Grouped in Tracker	Local County and City Stormwater / TMDL Projects	Various	2017	2017	Capital	$3,873,680	$3,873,680
					TOTAL	**$112,241,793**	**$112,241,793**

Operation and Maintenance

EIP Project #	Project Name	Lead Implementer	Implementation Start Year	Completion Year	Funding Type	Estimated Total Cost in 2017 Dollars	Estimated Total Cost in Year of Expenditure	Estimated Annual Operating Cost in 2017 Dollars	Estimated Total Operating Cost for Life of Project
01.01.02.0030	Highway 50 Echo Summit Bridge Rehabilitation	California Department of Transportation	2018	2020	Capital	$10,645,000	$10,645,000		
Grouped in Tracker	Equipment upgrade to support Air and Water Quality Improvements - Short-term	Various	2018	2020	Capital	$697,850	$784,635		
Grouped in Tracker	Equipment upgrade to support Air and Water Quality Improvements - Medium -Term	Various	2021	2031	Capital	$200,000	$1,000,000		
06.01.03.0003	Nevada Department of Transportation Sweeping Program	Nevada Department of Transportation	2015	2040	O&M			$150,000	$5,499,979
Grouped in Tracker	Bicycle and Pedestrian Facilities Operation and Maintenance	Various	2017	2040	O&M			$907,098	$33,260,134
Grouped in Tracker	Stormwater Treatment Facilities Operations and Maintenance	Various	2017	2040	O&M			$1,347,300	$49,400,813
Grouped in Tracker	Streets and Roads Operations and Maintenance	Various	2017	2040	O&M			$10,527,151	$385,994,079
06.01.03.0034	Emergency Roadway Repair Program	Nevada Department of Transportation	2017	2040	O&M			$100,000	$3,666,653
Not Yet Identified	SHOPP- Various Safety, Mobility, Road Preservation, Collision Reduction, and Emergency Roadway Repair	California Department of Transportation	2021	2040	Capital	$44,000,000	$44,000,000		
					TOTAL	**$55,542,850**	**$56,429,635**	**$13,031,549**	**$477,821,658**

CONSTRAINED PROJECT LIST TOTAL COST

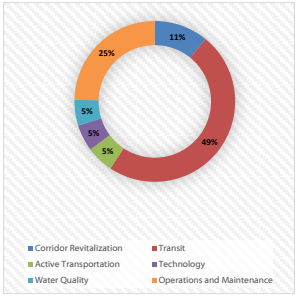
Total By Project Category

Category	Estimated Total Cost in 2017 Dollars	Cost in Year of Expenditure for RTP	Est. Annual Operating Cost	Total Operating Cost for life of project
Corridor Revitalization	$227,193,278	$234,851,142		
Transit	$197,457,700	$220,918,890	$26,744,578	$828,141,018
Active Transportation	$113,057,928	$118,320,074		
Technology & Transportation System Management	$5,575,000	$6,124,159	$180,000	$180,000
Water Quality	$112,241,793	$112,241,793		
Operations & Maintenance	$55,542,850	$56,429,635	$13,031,549	$477,821,659
TOTAL	**$711,068,549**	**$748,885,693**	**$39,956,127**	**$1,306,142,677**

Total By Implementation Term

Project Timeframes	Years	Total Capital Project Costs	Total O & M Costs	Total Capital and O & M Costs	Constrained Revenues
Short Term	2017-2020	$412,325,720	$118,168,619	$530,494,339	$530,505,420
Medium Term	2021-2030	$239,576,746	$500,839,111	$740,415,857	$740,455,640
Long Term	2031-2040	$96,983,227	$687,134,947	$784,118,174	$784,175,620
TOTAL		**$748,885,693**	**$1,306,142,677**	**$2,055,028,370**	**$2,055,136,680**

Percentage of Total Constrained Costs By Project Category



UNCONSTRAINED PROJECT LIST TOTAL COST

Transit

EIP Project #	Project Name	Lead Implementer	Implementation Start Year	Completion Year	Funding Type	Estimated Total Cost in 2017 Dollars	Estimated Total Cost in Year of Expenditure	Estimated Annual Operating Cost in 2017 Dollars	Estimated Total Operating Cost for Life of Project
03.01.02.0120	Mobility Hub and Transit Center Operations	Various	2025	2040	O&M			$2,125,000	$51,771,540
03.01.02.0123	Mobility Hub and Transit Center Capital	Various	2025	2040	Capital	$107,100,000	$141,030,248		
03.01.02.0099	Reno/Sparks - South Shore Transit Connection Subsidy	Washoe RTC & Tahoe Transportation District	2021	2040	O&M			$500,000	$14,498,187
03.01.02.0098	TART - Additional Summer/Winter Transit Service	Placer County	2020	2040	O&M			$876,000	$26,349,712
03.01.02.0131	TTD Inter-Regional Transit Services - Long-Term	Tahoe Transportation District	2031	2040	O&M			$15,000,000	$246,272,135
03.01.02.0135	TTD Inter-Regional Transit Capital - Long-Term	Tahoe Transportation District	2031	2040	Capital	$8,500,000	$13,758,903		
03.01.02.0128	South Shore Transit Service Enhancements - Medium-Term	Tahoe Transportation District	2021	2040	O&M			$12,000,000	$347,956,485
03.01.02.0136	South Shore Transit Capital Enhancements - Medium-Term	Tahoe Transportation District	2021	2030	Capital	$8,500,000	$9,753,946		
03.01.02.0137	Inter-Regional Rail Capital Corridor to Truckee to Reno - Capital	Various	2021	2030	Capital	$3,000,000	$3,442,569		
03.01.02.0132	Inter-Regional Rail Capital Corridor to Truckee to Reno - Operation	Various	2031	2040	O&M			$7,000,000	$114,926,996
03.01.02.0127	Regional Water Taxi Service Capital	Tahoe Transportation District	2031	2040	Capital	$5,000,000	$8,093,473		
06.01.03.0038	Regional Water Taxi Service operations	Tahoe Transportation District	2031	2040	O&M			$2,000,000	$32,836,285
					TOTAL	**$132,100,000**	**$176,079,139**	**$39,501,000**	**$834,611,339**

Active Transportation

EIP Project #	Project Name	Lead Implementer	Implementation Start Year	Completion Year	Funding Type	Estimated Total Cost in 2017 Dollars	Estimated Total Cost in Year of Expenditure
Not yet identified	Regional Active Transportation Improvements from the Active Transportation Plan - Short-Term	Various	2017	2020	Capital	$101,722,100	$116,728,449
Not yet identified	Regional Active Transportation Improvements from the Active Transportation Plan - Medium-Term	Various	2021	2030	Capital	$30,764,000	$48,113,544
Not yet identified	Regional Active Transportation Improvements from the Active Transportation Plan - Long-Term	Various	2031	2040	Capital	$40,221,900	$88,734,116
					TOTAL	**$172,708,000**	**$253,576,110**

Technology and Transportation System Management

EIP Project #	Project Name	Lead Implementer	Implementation Start Year	Completion Year	Funding Type	Estimated Total Cost in 2017 Dollars	Estimated Total Cost in Year of Expenditure
03.01.02.0097	Information Kiosks at Activity Centers	Tahoe Transportation District	2018	2020	Capital	$2,240,000	$2,318,400
Grouped in Tracker	Various ITS Solutions	Various	2018	2040	Capital	$5,000,000	$5,000,000
06.01.03.0036	Improved Parking Management and Wayfinding in Tahoe City	Placer County	2018	2021	Capital	$2,000,000	$2,070,000
03.01.02.0133	Adaptive Traffic Management on US 50	Various	2021	2031	Capital	$5,000,000	$5,737,615
03.01.02.0100	Adaptive Traffic Management on SR 89 and SR 267	Various	2018	2021	Capital	$5,000,000	$5,175,000
					TOTAL	**$19,240,000**	**$20,301,015**

Water Quality (TMDL)

EIP Project #	Project Name	Lead Implementer	Implementation Start Year	Completion Year	Funding Type	Estimated Total Cost in 2017 Dollars	Estimated Total Cost in Year of Expenditure
Grouped in Tracker	Local Stormwater / TMDL Projects	Various	2020	2022	Capital	$14,925,000	$16,273,940
					TOTAL	**$14,925,000**	**$16,273,940**

Operation and Maintenance

EIP Project #	Project Name	Lead Implementer	Implementation Start Year	Completion Year	Funding Type	Estimated Annual Operating Cost in 2017 Dollars	Estimated Total Operating Cost for Life of Project
06.01.03.0030	Deferred Maintenance – Washoe County	Washoe County, NV	2017	2040	O&M	$1,950,000	$71,499,730
06.01.03.0027	Deferred Maintenance – Placer County	Placer County, CA	2017	2040	O&M	$1,000,000	$36,666,528
06.01.03.0029	Deferred Maintenance – City of South Lake Tahoe	City of South Lake Tahoe	2017	2040	O&M	$49,000,000	$1,796,659,882
06.01.03.0031	Deferred Maintenance - Douglas County	Douglas County, NV	2017	2040	O&M	$2,000,000	$73,333,056
06.01.03.0028	Deferred Maintenance - El Dorado County	El Dorado County, CA	2017	2040	O&M	$14,360,000	$526,531,345
					TOTAL	**$68,310,000**	**$2,504,690,542**

UNCONSTRAINED PROJECT LIST TOTAL COSTS

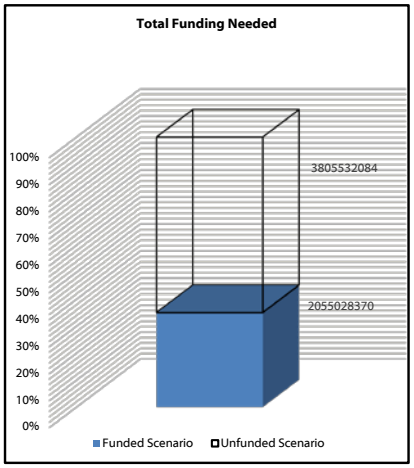
Total By Project Category

Category	Estimated Total Cost in 2017 Dollars	Cost in Year of Expenditure for RTP	Est. Annual Operating Cost	Total Operating Cost for life of project
Transit	$132,100,000	$176,079,139	$39,501,000	$834,611,339
Active Transportation	$172,708,000	$253,576,110		
Technology & Transportation System Manageme	$19,240,000	$20,301,015		
Water Quality	$14,925,000	$16,273,940		
Operations & Maintenance			$68,310,000	$2,504,690,542
Totals	**$338,973,000**	**$466,230,203**	**$107,811,000**	**$3,339,301,881**

Total By Implementation Term

Project Timeframes	Years	Total Capital Project Costs	Total O & M Costs	Total Capital and O & M Costs
Short Term	2017-2020	$147,565,789	$288,871,637	$436,437,426
Medium Term	2021-2030	$208,077,922	$1,104,721,600	$1,312,799,522
Long Term	2031-2040	$110,586,492	$1,945,708,643	$2,056,295,135
Total		**$466,230,203**	**$3,339,301,881**	**$3,805,532,084**

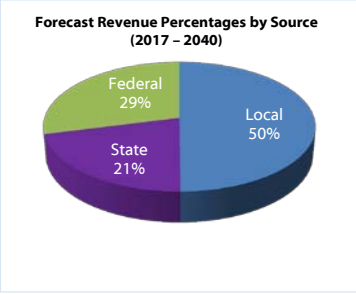
Total Funding Needed



LINKING TAHOE: REGIONAL TRANSPORTATION PLAN 2017 - 2040 REVENUE FORECASTS

Source	2017-2020	2021-2030	2031-2040	Total
LOCAL SOURCES				
Farebox Revenues	$4,071,661	$507,333	$0	$4,578,995
TRPA Rental Car Mitigation Fund	$502,408	$1,444,753	$1,761,146	$3,708,307
TRPA Air Quality Mitigation Fund	$1,677,828	$4,824,858	$5,881,475	$12,384,162
TRPA Water Quality Mitigation Fund	$1,999,240	$5,749,127	$7,008,154	$14,756,521
Local Funds (on-going)	$28,343,639	$81,506,578	$99,356,064	$209,206,281
Local Funds (project specific)	$13,172,000	$81,350	$0	$13,253,350
Private Funds	$6,100,000	$14,375,000	$12,200,000	$32,675,000
Ferry Partnership	$46,000,000	$39,481,658	$59,014,979	$144,496,637
O&M (bike trail, ped facilities, roadway, stormwater)	$54,927,235	$175,431,279	$247,463,145	$477,821,659
Environmental Stormwater Capital	$112,241,793	$0	$0	$112,241,793
Total Local	**$269,035,804**	**$323,401,937**	**$432,684,964**	**$1,025,122,704**
STATE SOURCES				
State Transit Assistance and Local Transportation Fund	$8,086,656	$49,273,745	$60,064,420	$117,424,820
Regional Improvement Program (STIP)	$14,766,000	$22,378,423	$20,428,424	$57,572,847
Low Carbon Transit Operations	$735,707	$2,115,641	$2,578,954	$5,430,302
Affordable Housing Sustainable Communities	$3,250,000	$9,950,000	$11,940,000	$25,140,000
California Proposition 1B	$75,431	$0	$0	$75,431
California Tahoe Conservancy	$3,362,204	$6,154,007	$7,501,700	$17,017,911
Active Transportation Program (CA)	$10,198,800	$13,690,611	$16,688,779	$40,578,190
Emergency Road Repair	$420,404	$1,208,938	$1,473,688	$3,103,030
California SHOPP	$70,226,000	$25,184,358	$24,609,498	$120,019,856
Nevada Question 1	$2,700,000	$0	$0	$2,700,000
Nevada State Funds	$15,778,320	$13,283,177	$16,192,118	$45,253,615
Total State	**$129,599,522**	**$143,238,900**	**$161,477,582**	**$434,316,004**
FEDERAL SOURCES				
Surface Transportation Block Grant	$12,842,244	$38,030,347	$46,358,781	$97,231,372
Surface Transportation Block Grant Set-Aside (TAP)	$673,597	$1,937,032	$2,361,232	$4,971,861
Federal Lands Transportation Program	$840,808	$21,287,823	$7,079,790	$29,208,421
Federal Lands Access Program	$54,018,000	$82,050,000	$2,500,000	$138,568,000
Congestion Mitigation & Air Quality Program	$7,835,737	$22,323,481	$27,212,199	$57,371,417
National Highway Performance Program	$3,000,000	$6,000,000	$9,000,000	$18,000,000
Highway Safety Improvement Program	$5,034,860	$19,779,005	$11,018,456	$35,832,321
FHWA Ferry Program	$21,020,201	$5,520,404	$0	$26,540,605
FTA 5307 Urbanized Area Formula Program	$18,077,373	$51,984,320	$63,368,596	$133,430,289
FTA 5310 Enhancement Mobility of Seniors and individuals with Disabilities	$344,731	$991,329	$1,208,424	$2,544,485
FTA 5311 Rural Area Formula Grants (NV)	$5,476,534	$14,338,995	$17,479,156	$37,294,685
FTA 5339 Bus and Bus Facilities	$1,051,010	$2,278,916	$2,426,442	$5,756,368
Federal Aviation Administration Airport Improvement Program	$0	$7,293,150	$0	$7,293,150
High Priority Projects Program	$1,655,000	$0	$0	$1,655,000
Total Federal	**$131,870,094**	**$273,814,803**	**$190,013,075**	**$595,697,972**
Total Local/State/Federal	**$530,505,420**	**$740,455,640**	**$784,175,620**	**$2,055,136,680**

Forecast Revenue Percentages by Source



Constrained Local Revenue Source Details

Funding Source	Description	Source
Farebox Revenues	Revenues collected by transit operators from passenger fees.	TART Short Range Transit Plan and South Shore transit actuals for 2015
TRPA Rental Car Mitigation Fund	Cars rented in the Region are assessed a mitigation fee of $5.50 per day. This fee is used for transit operations. Mitigation fees found in the Rules of Procedure Section 10.8.5.	TRPA: Average of past four years
TRPA Air Quality Mitigation Fund	This fee offsets impacts from indirect sources of air pollution in the Basin. The current program charges $325.84 per daily vehicle trip for new tourist accommodations units or for new campground site or recreational site.	TRPA: Average of past four years
TRPA Water Quality Mitigation Fund	This fee is assessed for each square foot of additional land coverage created. The current fee is $1.86 per square foot.	TRPA: Average of past four years
Local Funds (On-Going)	Funds that local jurisdictions generate and use towards transportation capital and operations.	Placer County Traffic Impact Fees, North Lake Tahoe Resort Association Transient Occupancy Tax, City of South Lake Tahoe, Tahoe Douglas Transportation District Transient Occupancy Tax, PUDs, GIDs, and others, Transit local funds
Local Funds (Project Specific)	Funds that local jurisdictions generate and use towards transportation capital.	Placer County, Tahoe City Public Utility District, Nevada Department of Transportation, City of South Lake Tahoe
Private Funds	Private funding consists of revenue from South Shore Transit operations, skier shuttles, the Tahoe Fund, and mitigation fees from large projects in the Region.	South Shore Transit, Tahoe Fund, Mitigation Fees from large projects
Ferry Partnership	Public and private funds to operate waterborne transit.	Tahoe Transportation District
Operations and Maintenance	Estimates of funding expenditures to maintain active transportation facilities, roadways, and stormwater in the Region. This amount is adjusted to match the costs reported by local jurisdictions.	Jurisdiction consultation and confirmation through Environmental Improvement Program Tracker.
Environmental Stormwater Capital	Funding for Environmental Improvement Program projects in the Region from 2017 - 2019. This amount is adjusted to match the costs reported by local jurisdictions.	Jurisdiction consultation and confirmation through Environmental Improvement Program Tracker.

Constrained State Revenue Source Details

Funding Source	Description	Source
State Transit Assistance and Local Transportation Fund	The Transportation Development Act provides two funding sources: Local Transportation Fund (LTF) and State Transit Assistance Fund (STA). Annual increase in revenue is in anticipation of CA legislation recognition of the Tahoe FAST Act population increase.	Transportation Development Act Allocations
Regional Improvement Program California only	The Statewide Transportation Improvement Program is a capital improvement program that provides transportation funding for projects on and off the State Highway System.	California Department of Transportation Statewide Transportation Improvement Program Shares
Low Carbon Transit Operations Program California Only	The Low Carbon Transit Operations Program is one of several programs that are part of the Transit, Affordable Housing, and Sustainable Communities Program. It was created to provide operating and capital assistance for transit agencies to reduce greenhouse gas emissions and improve mobility with a priority on serving disadvantaged communities.	California State Controller 2016-2017 Allocation
Affordable Housing Sustainable Communities Program California Only	Administered by the Strategic Growth Council and implemented by the Department of Housing and Community Development, this program funds land-use, housing, transportation, and land preservation projects to support infill and compact development that reduce greenhouse gas emissions. Tahoe Region expects to be competitive for three grants over the 24 year planning horizon.	California Strategic Growth Council
California Proposition 1B	The California 2006 Proposition 1B Transportation Act established a series of discretionary funding programs through voter approval on November 7, 2006. Funding expires in 2017.	California Department of Transportation
California Tahoe Conservancy	The California Tahoe Conservancy provides funding for projects that sustain a balance between the natural and human environment and between public and private uses.	Propositions 84 & 12
Active Transportation Program California Only	Competitive program in California promoting active modes of transportation. This program consolidated existing federal and state transportation programs into a single program. The Tahoe Region expects to be competitive every other funding cycle.	California Department of Transportation
Emergency Road Repair	State funds set aside for unforeseen emergency repairs on roadways.	California Department of Transportation
California State Highway Operation and Protection Program	Estimates of revenues to maintain state roadway operational improvements.	California Department of Transportation
Nevada Question 1	Nevada voters approved a bond for trails and recreation. $5 million was available for Lake Tahoe Bicycle Trails, expiring 2013. NV Division of State Lands provides funds carried over to 2016/2017.	Nevada Division of State Lands
Nevada State Funds	The majority of Nevada state funding comes from the state gas tax. Estimates of revenues fund projects in the Annual Work Plan.	Nevada Annual Work Program

Constrained Federal Revenue Source Details

Funding Source	Description	Source
Surface Transportation Block Grant Program (STBG)	The STBG program replaces the Regional Surface Transportation Program (RSTP). The program provides flexible funding to address State and local transportation needs.	Fixing America's Surface Transportation Act
Surface Transportation Block Grant Program set-aside (TAP)	These set-aside funds include all projects and activities that were previously eligible under TAP, encompasses a variety of smaller scale transportation projects such as pedestrian and bicycle facilities, recreational trails, and safe routes to school projects.	Fixing America's Surface Transportation Act
Federal Lands Transportation Program	Administered through the United States Forest Service (USFS)	Fixing America's Surface Transportation Act
Federal Lands Access Program	The program provides funds for projects on Federal Lands Access Transportation Facilities that are located on, adjacent to, or that provide access to Federal lands.	Fixing America's Surface Transportation Act
Congestion Mitigation and Air Quality Funds (CMAQ)	The CMAQ program funds projects and activities that reduce congestion and improve air quality. Local jurisdictions within El Dorado County are eligible for CMAQ funding in the Tahoe Region.	2016 California Department of Transportation Final Estimate CMAQ table
National Highway Performance Program (NHPP)	The NHPP provides funding for federal aid highway system bridges that are not on the National Highway System since the Highway Bridge Program was eliminated in MAP-21.	Federal Highway Administration
Highway Safety Improvement Program	Federal program that strives to achieve a significant reduction in traffic fatalities and serious injuries on all public roads through the implementation of infrastructure-related highway safety improvements.	Federal Highway Administration
Federal Highway Administration Ferry Boat Program	The FAST Act continues the Ferry Boat Program which funds the construction of ferry boats and ferry terminal facilities.	Fixing America's Surface Transportation Act
FTA 5307 Urbanized Area Formula Program	Formula based program provides funding to states to support public transportation in urban areas.	Fixing America's Surface Transportation Act
FTA 5310 Enhancement Mobility of Seniors and Individuals with Disabilities	This FTA program is intended to serve the special needs of transit-dependent populations beyond traditional public transportation services and Americans with Disabilities Act complementary paratransit services.	California Department of Transportation & Nevada Department of Transportation
FTA 5311 Rural Area Formula Grants - Nevada Only	FTA program that provides capital, planning, and operating assistance to states for rural areas. NDOT is reimagining how they allocate 5311 statewide and looking to implement a competitive process.	Fixing America's Surface Transportation Act & 2016 Tahoe Transportation District Apportionment
FTA 5339 Bus and Bus Facilities	FTA program that makes federal resources available to states and direct recipients to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities including technological changes or innovations to modify low or no emission vehicles or facilities.	Fixing America's Surface Transportation Act
Federal Aviation Administration (FAA) Airport Improvement Program	The FAA program provides federal funds for airport improvement projects. The South Lake Tahoe Airport is eligible for these funds.	2017-2020 City of South Lake Tahoe Airport Capital Improvement Program
High Priority Projects Program Earmark Funds	Earmarked funds for City of South Lake Tahoe's El Dorado Beach to Ski Run Blvd Bike Trail.	Moving Ahead for Progress in the 21st Century Act

Inflation Rate Methodology

The 2017 Regional Transportation Plan's constrained and unconstrained project cost and revenue estimates are in 2017 dollars. TRPA inflates both capital and operations costs and foreseeable revenues. The year of expenditure is determined by the implementation start year. To respond to an evolving industry, TRPA researched the methods used by MPOs and transit agencies in California and Nevada to estimate project costs. Based on this research, TRPA established a method of estimating the year of expenditure cost of the constrained and unconstrained projects by applying an annual inflation rate to 2017 dollars beginning in 2018 and to apply this inflation rate each year until the project's implementation start year. This is because the project's funding will be programmed into the FTIP at the beginning of the project's implementation start year.

The following list explains the structure of inflation and provides a brief description as to how this method was determined.

Inflation Methods:

- **Revenues:** An annual 2 percent inflation rate will be applied to foreseeable revenues. If a specific amount of funding is already secured, revenues are included without inflation. This method was determined through agreements made between the Nevada MPOs and Nevada FHWA.

- **Capital Projects:** An annual inflation rate of 3.5 percent is applied to all capital projects costs beginning in 2018 until the implementation start year of the project which is the estimated year of expenditure. The cost of capital projects will be deducted from the budget at the implementation start year. This method was determined through agreements made between the Nevada MPOs and Nevada FHWA.

- **Transit Operations:** An annual inflation rate of 2.7 percent is applied to transit operations costs beginning in 2018 and continues to be applied each year until 2040. The cost of transit operations projects is deducted from the budget at the beginning of the implementation start year. Transit operations are comprised of both labor and materials expenditures. TRPA determined the annual inflation rate by utilizing Consumer Price Index data for the San Francisco metropolitan area, which is also used for rent inflation comparisons at lake Tahoe. TRPA estimates labor costs will increase by 2 percent annually and materials costs will increase by 3 percent annually. TRPA took the average of these estimates to obtain an annual inflation rate of 2.7 percent for transit operations costs.

- **On-going Operations, Maintenance and Rehabilitation:** An annual inflation rate of 3.5 percent is applied to the project cost beginning in 2018 and will continue to be applied each year either until 2040 or the project is complete. The cost of ongoing operations, maintenance and rehabilitation is deducted from the budget beginning at the implementation start year. This method was determined through agreements made between the Nevada MPOs and Nevada FHWA. TRPA did not average this cost using a similar method as was done for transit operations because the primary cost for these projects are materials.

- **Large Capital Projects:** These projects may be completed in multiple phases in which case the total cost of these projects is distributed to match the Year of Expenditure, which is the implementation start year.

APPENDIX C: PUBLIC PARTICIPATION, CONSULTATION, AND COOPERATION

Table of Contents

Public Participation Overview

Input from the public, including residents and visitors, shapes the vision, goals, and projects in this plan and the direction of the transportation system. Public outreach is an ongoing process across all transportation plans and projects. Outreach includes gathering input from stakeholder groups, making draft documents available to the public, and extensive proactive and quantitative methods including surveys, door-to-door interactions, online information, and workshops. All the input gathered helps inform and direct the update of the regional transportation plan.

Meyers Corridor Project Outreach
Photo: Alta Planning + Design

The multiple plans that support the regional transportation plan also included frequent interactions with the public and gathered input on a variety of transportation topics. TRPA also works with agency partners and the community on location-specific projects, such as the design of safe routes to schools, and on larger regional planning issues, such as connecting the trail network or improving the quality of the travel experience through busy highway corridors. TRPA also actively engages with partners and the public both within and outside of the Lake Tahoe Region.

Multiple themes and goals generated from the public are integrated into the 2017 Regional Transportation Plan.

- 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;
- Accelerating implementation of all improvements to the transportation system.

Considering the Needs of All Transportation System Users

2016 Active Transportation Plan Advertisement

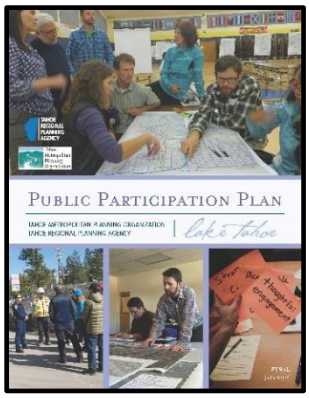
The investments proposed in this plan aim to better connect jobs, services, and recreational opportunities for all residents, workers, and visitors regardless of age, race, income, national origin, or physical ability. Over the last four years, TRPA has continued to expand public outreach activities to better reach and assess possible adverse effects on traditionally underserved communities by enhancing Spanish language outreach, launching a monthly transportation email newsletter, partnering with several Lake Tahoe organizations to hold an ongoing series of brown-bag lunch talks, and regularly attending a variety of standing association meetings. 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 apply a range of ideas and solutions to current transportation issues. To ensure input from a large and broad range of residents and visitors, TRPA followed the guidelines of the 2016 Lake Tahoe Public Participation Plan, developed in accordance with federal and state requirements.

Title VI of the Civil Rights Act states that "no person in the United States, shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance." In 1994, this requirement was expanded to include low-income populations. Both federal and state laws have continued to advance the cause of social equity, also known as environmental justice, through numerous guidelines and orders. Environmental Justice as defined by FHWA means "identifying and addressing disproportionately high and adverse effects of the agency's programs, policies, and activities on minority and low-income populations to achieve an equitable distribution of benefits and burdens. This includes the full and fair participation by all potentially affected communities in the transportation decision-making process."[1]

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 underrepresented and underserved populations to understand their views and needs of the transportation system. Proposed projects have been analyzed to consider and avoid adverse environmental and health impacts on these communities.

[1] California Transportation Commission, 2017.

Public Participation Plan



In accordance with federal and state requirements, TRPA maintains and regularly updates its public participation plan[2] which outlines the process for providing citizens, affected public agencies, advocacy organizations, and all other stakeholders with reasonable opportunities to be involved in the transportation planning process. The development of the public participation plan includes two public workshops and provides a 45-day public comment period.

Continual plan updates enable TRPA to stay up-to-date with best practices for community engagement. Over time, new methods are incorporated into standard outreach activities. TRPA tracks the effectiveness of outreach strategies to ensure outreach is effective and that the agency continues to innovatively engage with the public in their preferred way.

The 2016 Public Participation Plan outlines standard activities and specific outreach tools that can be utilized based on project and target group type. The most significant shift in TRPA transportation outreach is a focus on attending regularly scheduled meetings and incorporating door-to-door outreach for traditionally underserved and underrepresented communities. These strategies help build long lasting relationships, increase the number of well-informed constituents, and better reach historically underserved populations. The public participation plan includes protocols for public outreach for the regional transportation plan and sustainable communities strategy.

Table C.1: Regional Transportation Plan / Sustainable Communities Strategy Outreach Protocol

Activity Type	Public Meetings	Draft Document Public Review	Public Comment Incorporation
Time Required	Two	30-day comment period and circulated not less than 55 days before adoption of a final	60-day incorporation period
Locations	North & South Shore	E-mail, written mail, and fax	In document alterations & comment/ response posted on TRPA website
General Details	Central locations, ADA accessible, Public Transit accessible, information available online	Two public hearings in different parts of the Region	Comments and responses will be summarized and provided to TRPA/TMPO Board
Additional Services	Targeted workshops for Spanish speaking community & visualization techniques	If final RTP differs significantly from the draft, an additional 10-day public comment period added	Comments and responses will be summarized and provided to TRPA/TMPO Board
AMENDMENTS			
Activity Type	Public Meetings	Draft Document Public Review	Public Comment Incorporation
Administrative	None	7-day public review period	In document alterations & comment/ response posted on TRPA website
Formal (conformity analysis triggered)	Monthly TTC meeting and advertised on TRPA website	30-day public review period	Comments and responses will be summarized and provided to TRPA/TMPO Board

[2] TRPA, 2016. www.linkingtahoe.com

Public Participation Summary

For the 2017 Regional Transportation Plan / Sustainable Communities Strategy, TRPA developed a comprehensive outreach strategy for the regional transportation plan and other, ongoing relevant plan development outreach activities. TRPA also received a grant from the Federal Highway Administration for stakeholder outreach assistance, provided by the Community Transportation Association of America which assisted in broadening outreach methods. Table C.2 outlines the outreach strategy used specifically for the update of this regional transportation plan. A detailed discussion of each engagement activity and outreach methods are also described below.

Figure C.1: Percentage of Outreach Participants by Residency Status

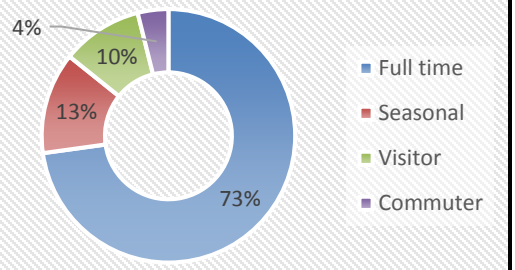


Table C.2: Summary of the Regional Transportation Plan Outreach Strategies

Outreach Strategy			
Target Audience	Citizens, visitors, commuters into the Region, affected public agencies, neighborhood and community groups, providers of transportation, advocacy groups, private industry, freight providers, and other groups who may use or be affected by the transportation system.		
			Number of People Reached
Outreach Methods	Proactive Outreach	Workshops	485
		Tahoe Talks	
		Association Meetings	
		Event Booths	
	Quantitative Outreach	Surveys	327
	Traditionally Underserved: Latino Community	Door-to-Door & Surveys	111[3]
TOTAL			812

Websites and Interactive Tools

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

- 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 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.

[3] This total is also captured in the total for proactive and quantitative outreach and is not included in the overall total.

Monthly Newsletter

TRPA established a monthly electronic newsletter in 2014 to keep people informed about project updates and opportunities for input. The newsletter has over 970 subscribers. The newsletter is one of the primary ways that TRPA provides updates to the public with news, events, and ways to provide input.

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. The forum is free to the public and includes an hour of presentations or webinars followed by a half hour of discussion. TRPA, in partnership with other local organizations and agencies, hosts the Tahoe Talks Series with the aim of stimulating conversation and education around new ideas among the Region's citizens and partner agencies. The series is held on the North and South Shores.

Spanish Language Outreach


Cafecitos meeting
Photo: Design Workshop

To ensure the transportation system is meeting the needs of traditionally underserved community members, TRPA proactively reaches out to the Latino community. TRPA provides translation services, childcare, and food at public workshops and ensures locations are accessible by transit. On the South Shore, staff attended Cafecitos meetings, a Spanish-language parent-teacher group. On the North Shore, staff completed door-to-door surveys. Over 100 surveys were collected in Spanish for both the Active Transportation Plan survey and the 2017 Regional Transportation Plan survey.

Latino Community Key Findings:

- A protected bike lane would encourage more people to ride their bicycle on U.S. Highway 50.
- More lighting is needed in residential areas for walking home from the bus at night.
- Spanish-language survey respondents ranked environment, system maintenance, and safety the highest.
- A need for more bus shelters in highly-used neighborhood locations.

Association Meetings

A 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. While TRPA had already identified giving presentations and soliciting feedback at existing association meetings as a key strategy, and regularly participates in some standing meetings, such as chamber of commerce and transportation management association meetings, staff started regularly attending additional meetings. TRPA began attending the meetings of the Lake Tahoe Community Collaborative on the South Shore and the Community Collaborative of Tahoe-Truckee, both of which are monthly gatherings of representatives from social service organizations. Being a part of these meetings helps provide staff with greater insight on major issues facing Lake Tahoe populations, particularly those of traditionally underserved or hard-to-reach groups. The functionality of the transportation system may have a direct bearing on many of these issues, such as access to health services or availability of affordable housing. Understanding how these issues affect Lake Tahoe communities helps staff better integrate solutions into transportation efforts early in the process. TRPA attends and presents at multiple association meetings around the Region. For a full list of outreach conducted by TRPA staff for the regional Transportation Plan see Table C.3.

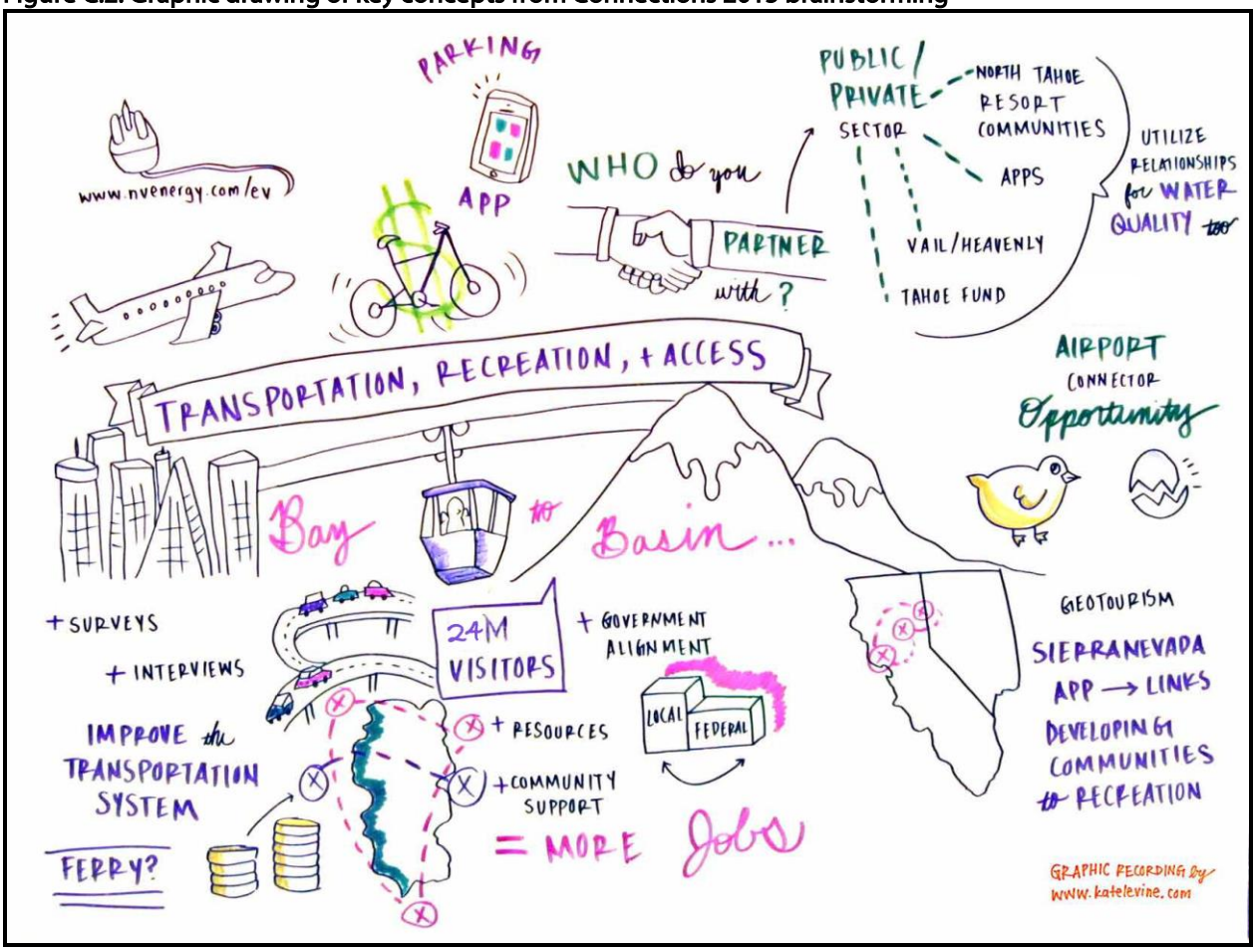
Table C.3: Detailed List of Regional Transportation Plan Public Outreach: February – July 2016

Date	Group Name	Group Type	Activity	Number of Participants
2.25.16	North Lake Tahoe/Truckee Leadership Program	Community	Presentation	60
3.2.16	Leadership Lake Tahoe	Community	Panel	25
4.14.16	NDOT's Cave Rock Tunnel Extension Open House	Community	Booth at Workshop	25
5.3.16	Community Collaborative of Tahoe-Truckee	Social Services Advocacy Group	Presentation	30
5.4.16	JPA Bicycle Advisory Committee	Agency Advisory Committee	Presentation	6
5.9.16	Lake Tahoe Collaborative (South Shore)	Social Services Advocacy Group	Presentation	35
5.10.16	Lake Tahoe Bicycle Coalition Board meeting	Advocacy	Presentation	7
5.16.16	Cafecitos (Bijou)	Latino Community	Presentation	11
5.16.16	Cafecitos (Bijou)	Latino Community	Presentation	11
5.17.16	North Shore Open House, Kings Beach	Community	Workshop	48
5.20.16	South Shore Transportation Management Association	Public & Private Association	Presentation	6
5.21.16	Lake Village Homeowner Association	HOA	Presentation	30
5.24.16	South Shore Open House, South Lake Tahoe, CA	Community	Workshop	73
6.22.16	TRPA Governing Board	Elected Officials	Presentation	15
7.3.16	Marla Bay Homeowners Association	HOA	Presentation	35
8.2.16	North Shore Breakfast Club	Community & Agency	Presentation	54
7.21.16	Live at Lakeview, South Lake Tahoe, CA	Community	Booth	0
7.24.16	Concert at Commons Beach, Tahoe City	Community	Booth	0
7.25.16	Washoe CAB	Community Advisory	Presentation	25
7.30.16	N/A	Community	Survey	327
Total Participants:				**823**

Connections 2015

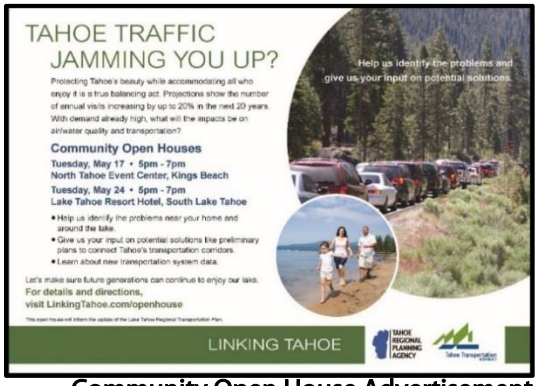
In 2015 TRPA hosted Connections 2015, a sustainability conference. The conference was widely attended by over 50 representatives from local and mega-region jurisdictions, state and local resource agencies, non-profits, water districts, universities, transportation management associations, and more. Participants brainstormed solutions related to transportation, recreation, and public access. Several key concepts and action categories were identified including enhancing partnerships, transit, sustainable recreation, technology, and the local economy. These concepts are evident throughout the 2017 Regional Transportation Plan. As part of the conference a graphic artist captured meeting notes in the form of a drawing. The results from the transportation, recreation, and public access brainstorm session are illustrated in Figure C.2.

Figure C.2: Graphic drawing of key concepts from Connections 2015 brainstorming



Community Open Houses

TRPA held two community open houses to gather feedback specifically on the concepts and projects presented in the 2017 Regional transportation Plan / Sustainable Communities Strategy. The open houses were held on May 17, 2016 at the North Tahoe Events Center in Kings Beach, California, and on May 24 at Lake Tahoe Resort Hotel in South Lake Tahoe, California. Over 100 people total attended both events. TRPA worked jointly with TTD to illustrate proposed transportation concepts and projects in the regional transportation plan and the upcoming Corridor Connection Plan. TRPA and TTD developed visually attractive booths, interactive posters, and a survey to provide multiple options for feedback. These materials educated the public on the significant challenges the transportation system faces related to moving high numbers of visitors, commuters, and residents. Materials also presented a variety of options for addressing challenges and asked participants to vote for their preferences.



Community Open House Advertisement


Community Open House
Photo: TRPA

Table C.4: Recurring public comments from the 2017 Regional Transportation Plan Survey

Location	Type	Common Public Recommendations
Kings Beach & Tahoe City	Walking, Traffic	Better circulation of traffic in Kings Beach and Tahoe City, particularly with how pedestrians cross the roadway. In Kings Beach the pedestrian crossing with relation to the roundabouts seems to be problematic.
Everywhere	Biking, Transit, Parking	Maintain infrastructure year-round. When parking lots and bike trails are closed in the winter, there is no access (applies to backcountry skiing access also)
Marla Bay/US 50 East Shore	Roadway	Road diet between Marla Bay and Glenbrook; unsafe crossing at Warrior Way
Viking Way, South Shore	Roadway	Roundabout or improvements to traffic congestion here
Everywhere	Transit	Beach/Recreation Area shuttle
North Upper Truckee & South Shore	Roadway	Weekend traffic blocking neighborhood travel and speeding through neighborhoods, making neighborhoods very unenjoyable for locals

Informational Meetings

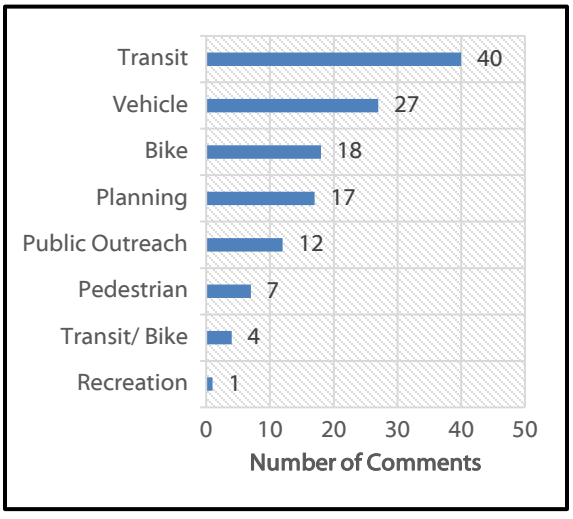
At the state level, California SB 375 specifies that metropolitan planning organizations must conduct informational meetings for members of each county board of supervisors and city councils as part of the outreach for the sustainable communities strategy. The purpose of these meetings is to discuss the sustainable communities strategy, including key land use and planning assumptions, with these elected officials, and to solicit and consider their input and recommendations.


Live at Lakeview: Transportation Booth
Photo: TRPA

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 on the progress of, and concepts in, the 2017 Regional Transportation Plan.

Public Hearings

Figure C.3: Number of comments received from the public by category



California SB 375 also requires that multiple-county metropolitan planning organizations, such as TRPA, must hold at least three public hearings for the sustainable communities strategy. To the maximum extent feasible, the hearings shall be in different parts of the Region to maximize the opportunity for participation by members of the public throughout the Region. TRPA held these hearings 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 held at Inn by the Lake in South Lake Tahoe, in El Dorado County, California, and on March 10, 2017, at the Tahoe Transportation Commission Meeting, held in Kings Beach, California.

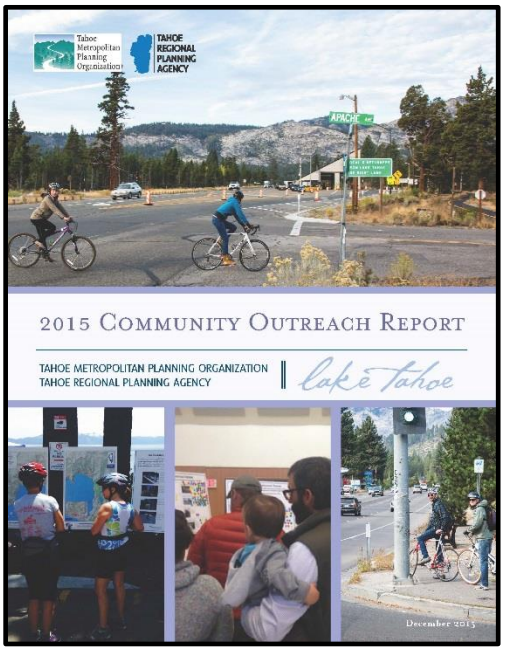
Online Opportunities & Surveys

TRPA and TTD complemented the in-person community workshops with an online version. Staff created an online slide show with an electronic survey open for the month of July 2016. TRPA uses surveys to offer the public an opportunity to engage and provide feedback on transportation questions. The surveys, offered both electronically and in a paper format, often use photographs, renderings, graphics, and other visualization tools to help the public understand different transportation options and to make the surveys a fun and easy way to participate in the planning process. TRPA aims to reach the diverse groups who utilize the regional transportation system,

including full time and seasonal residents, occasional visitors, and people who commute into the Region for work.

Survey Results

This planning cycle TRPA released three surveys that gathered information in support of the 2017 Regional Transportation Plan / Sustainable Communities Strategy. The first was an Active Transportation Plan Survey released in March 2015, which gathered respondent preferences on the Lake Tahoe Region's bicycle and pedestrian network. The survey sought to understand current mobility patterns and identify specific locations within the network that are working well or need improvements. The survey also included questions about crash history, user comfort level on existing infrastructure, and the types of infrastructure that would encourage increased use. TRPA recorded over 650 responses to the survey and used the information to inform recommendations in the 2016 Active Transportation Plan and 2017 Regional Transportation Plan. Also, respondent-identified locations of high discomfort for bicyclists and pedestrians were added to the regional transportation plan's project evaluation tool as a measure of how well a project addresses safety. This information was consolidated and analyzed in the 2015 Community Outreach Report, located online at www.trpa.org/transportation.



TRPA initiated two other surveys that inform this plan. One solicited input on the draft vision, goals, and proposed projects. This survey also was used as an educational tool regarding knowledge of the transportation system, and to solicit feedback on parking management strategies, funding mechanisms, and more. This survey garnered 227 English speaking respondents and 100 Spanish speaking respondents. The other survey supported the Tahoe-Truckee Plug-In Electric Vehicle Infrastructure Readiness Plan, and gathered input on vehicle ownership trends that may influence deployment of electric vehicle charging infrastructure in the Tahoe Region. This survey garnered 424 respondents. In total, TRPA's transportation department received over 1,400 survey responses. The following figures are select results from the 2017 Regional Transportation Plan and Corridor Connection Plan survey.

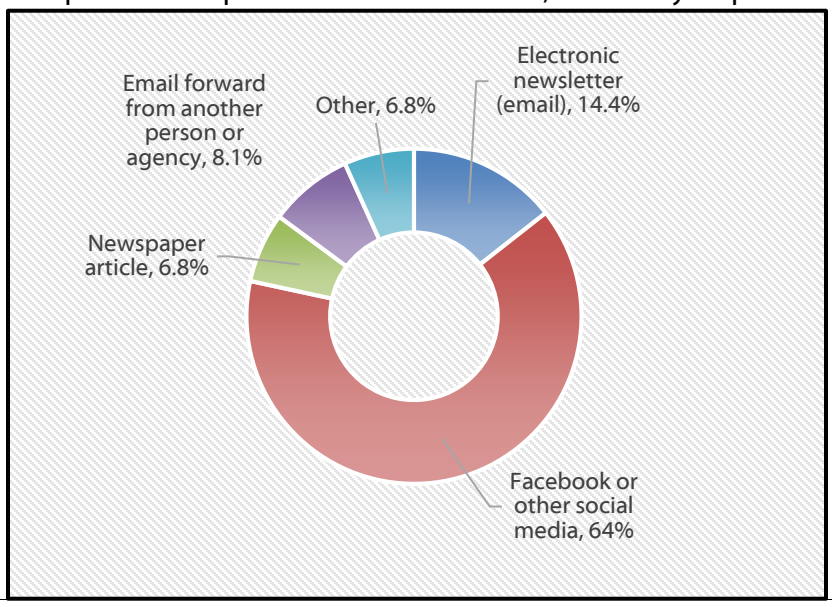
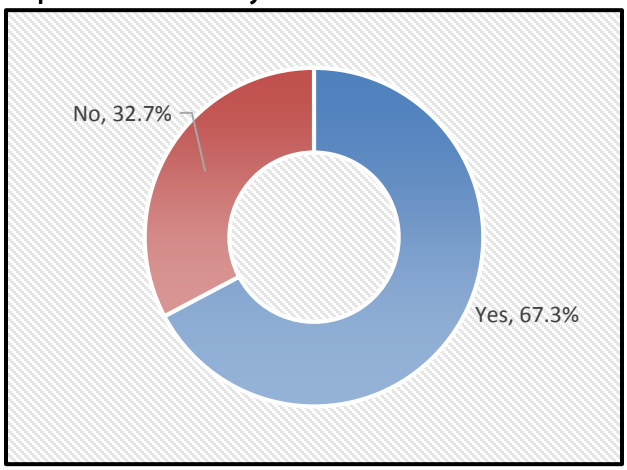


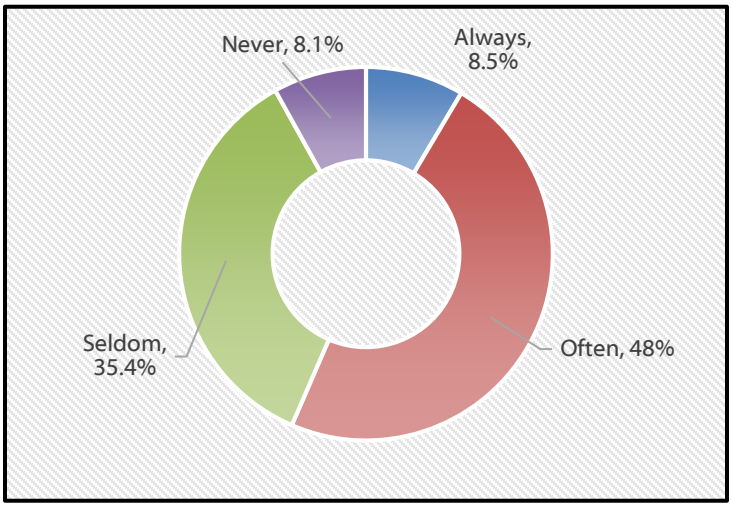
Figure C.4: How survey respondents learned about the survey

Figure C.5: Knowledge of Transportation system impact on Lake Clarity



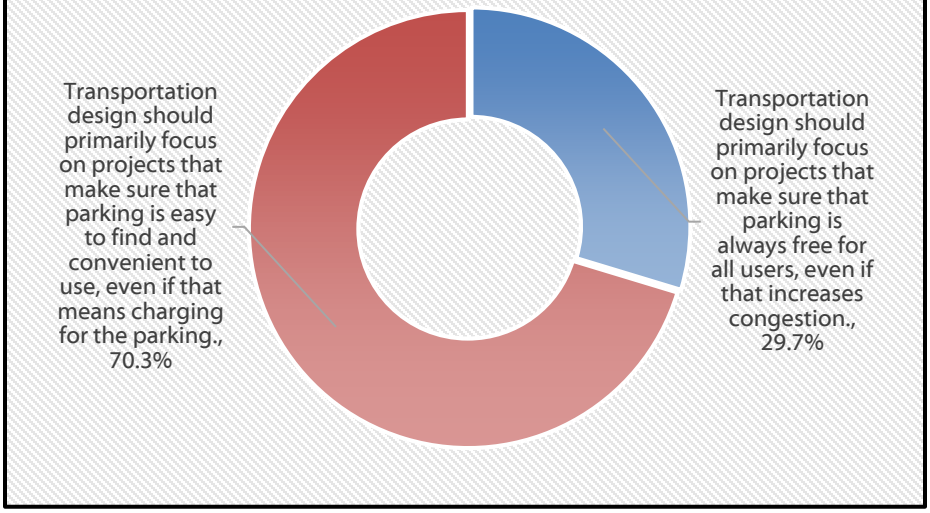
According to a report from the Lahontan Water Quality Control Board and Nevada Division of Environmental Protection, over 70% of the particulates impacting Lake Tahoe clarity are coming from the transportation system and built environment. Were you aware of this fact?

Figure C.6: Transit Use Preference



If a convenient, frequent, dependable, and reasonably priced public transit system was available to residents, would you use it?

Figure C.7: Preference on Parking Management Strategies



Please choose which of the following two statements comes closer to a transportation system which you would like to see in Lake Tahoe?

Figure C.8: Preference on Regional and Local Funding Mechanisms

For more than 10 years, federal and state transportation funding sources have diminished or remained flat, meaning less is being done to take care of our transportation system. Many communities around the country have moved to create more local or regional funding sources to fill the gap. Would you support the Tahoe Region moving in a direction where those benefiting and enjoying Lake Tahoe will help pay for needed transportation system improvements?

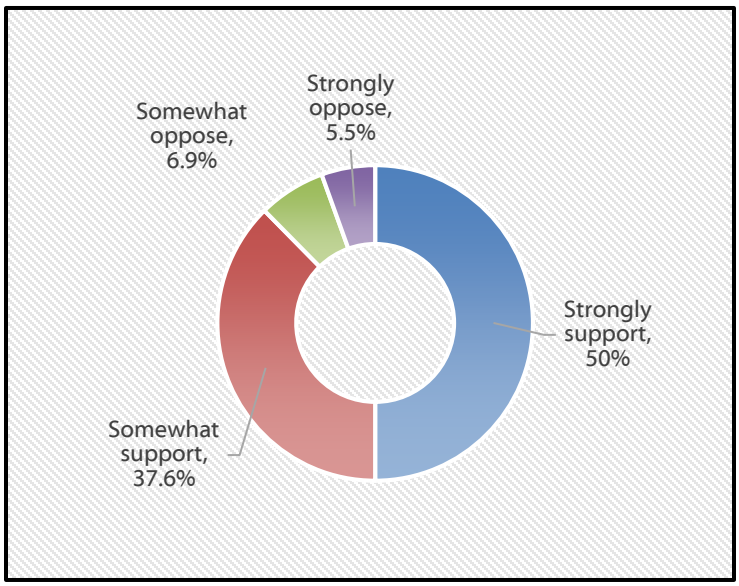
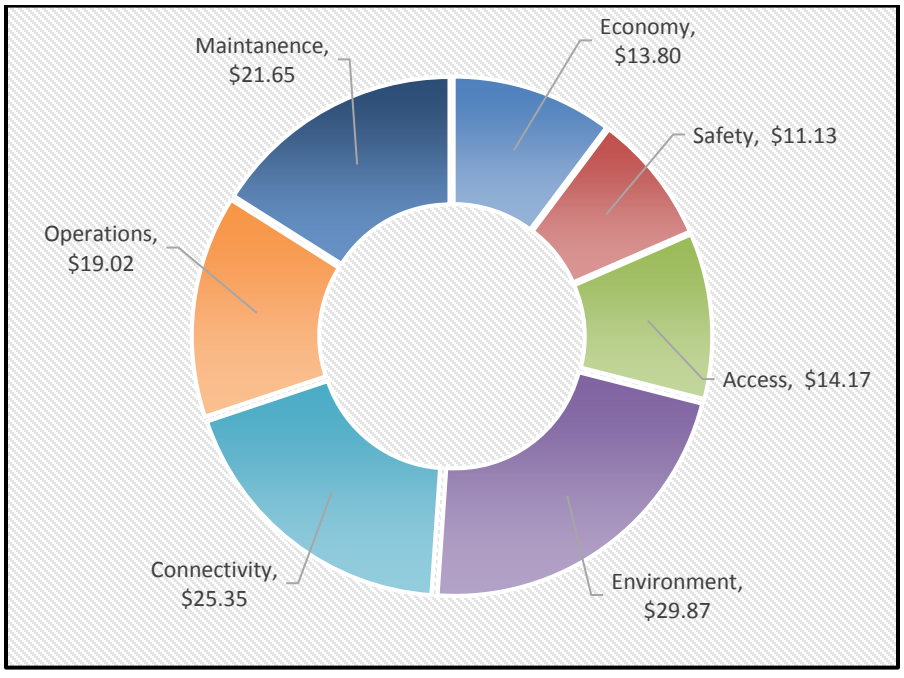


Figure C.9: Average of Dollar Amount Community Would Spend by Project Type



If you were given $100 to spend on projects that would directly achieve the following 7 goals for Lake Tahoe, how would you spend it? (The sum of all answers must total $100.)

Figure C.10: Average Ranking of Preferred Facility Types

How would you prioritize the need for improvements for the following transportation facility types? (1 = Highest Priority, 4 = Lowest Priority).

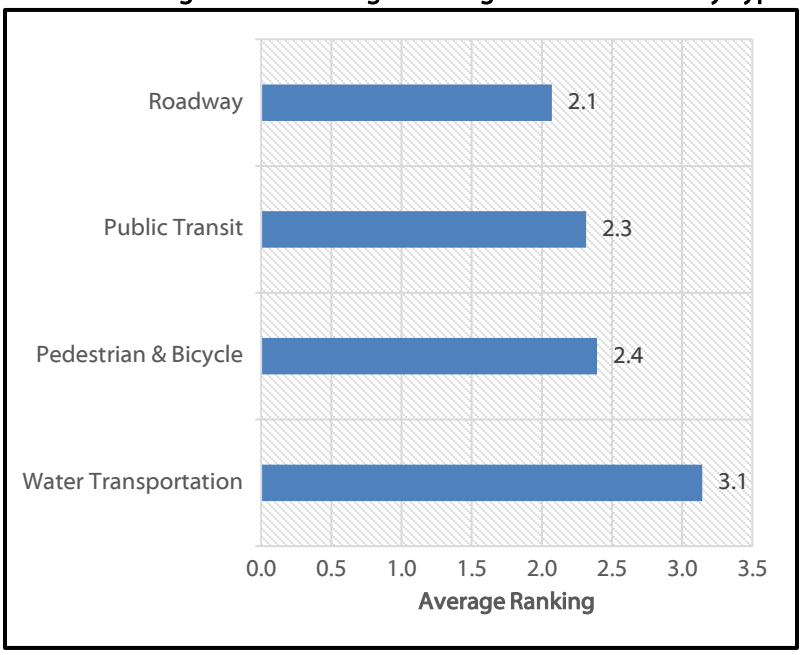
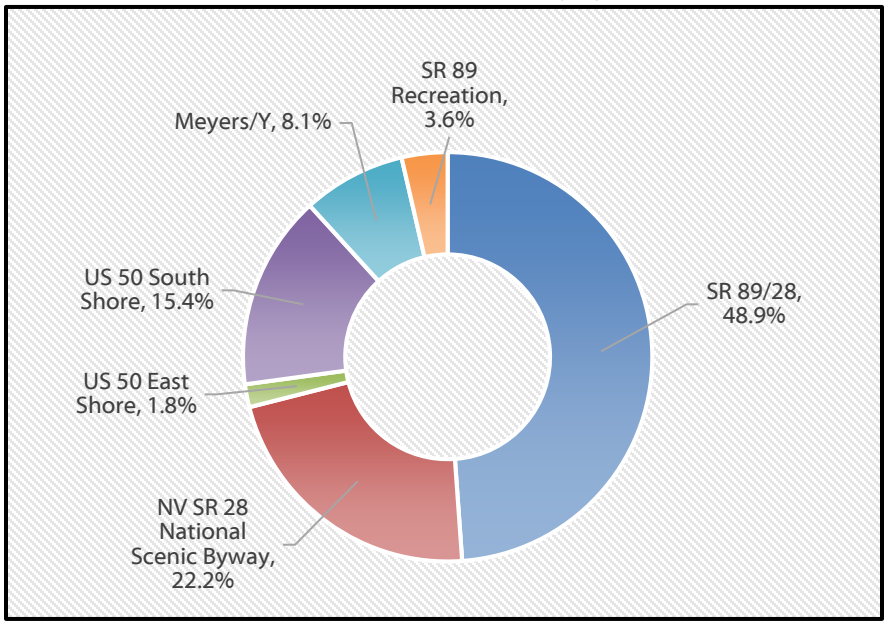


Figure C.11: Percentage of Visitation or Residency by Corridor



In which Corridor do you live or spend the majority of your time when visiting?

Based on the corridor in which you live or spend the majority of your time, please rate the problems listed below, as they affect you throughout the year. Which problems do you feel are the most serious? Which problems are the least serious? Use the sliders to show level of seriousness, 1 = least serious, 10 = most serious.

Figure C.12: Average Ranking of the listed Problems

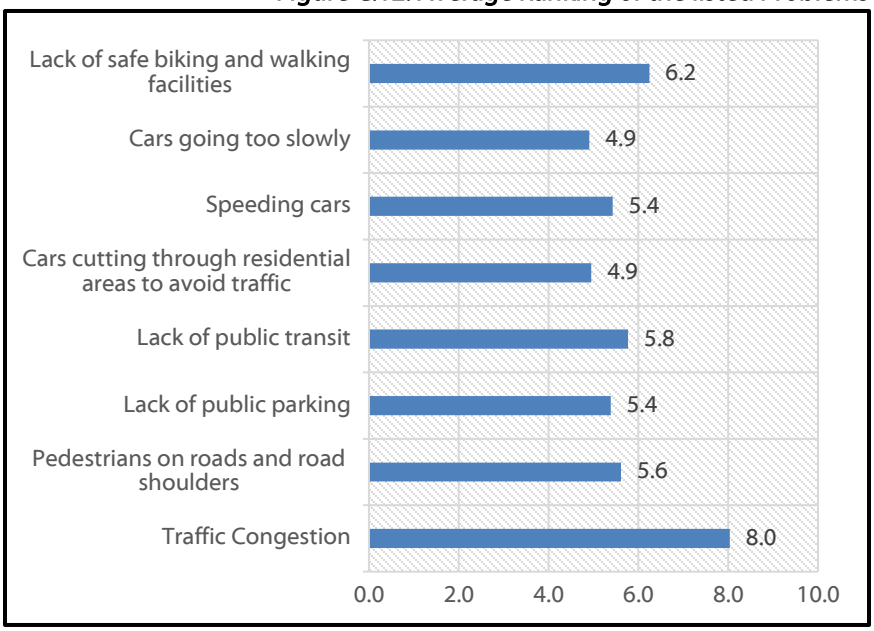
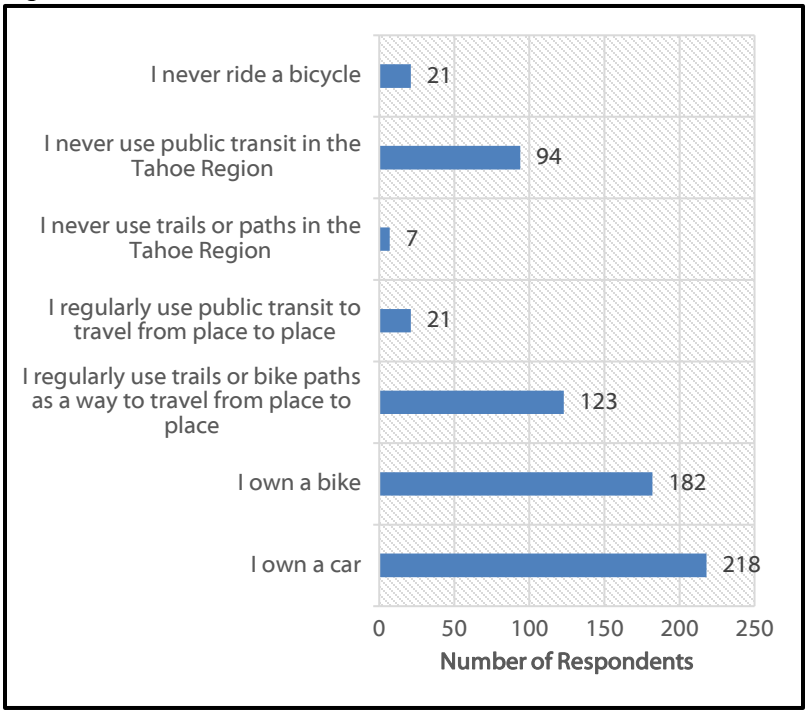


Figure C.13: Travel Mode Use

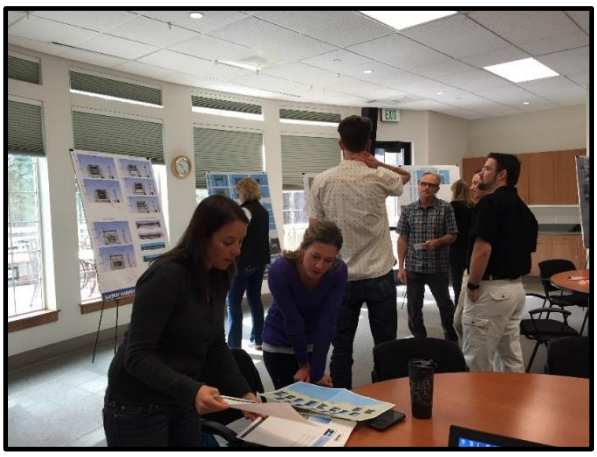


Which of the following are true for you? (Select all that apply.)

California Senate Bill 375 Requirements for Public Outreach

Actions the regional agency intends to take to meet SB 375 requirements are incorporated into the public participation plan and must include:

- Outreach to encourage the active participation of a broad range of stakeholder groups in the planning process, including but not limited to affordable housing advocates, transportation advocates, neighborhood and community groups, environmental advocates, home builder representatives, broad-based business organizations, landowners, commercial property interests, and homeowner associations.
- Consultation with congestion management agencies, transportation agencies, and transportation commissions.



SR 28 Signage Master Plan Meeting
Photo: Morgan Beryl

In accordance with these requirements, the TRPA updates mailing lists to include all the required organizations, agencies, and groups. These groups are contacted through the TRPA Transportation E-Newsletter, personal email, phone, and hardcopy mail.

The TRPA e-mail list includes the following groups:

- Citizens
- Tourism
- Reduction of risk of natural disasters
- Affected public agencies
- Representatives of public transportation employees
- Freight shippers
- Representatives of users of public transportation HOAs, newspaper, websites that reach visitors – send them the survey
- Providers of freight transportation
- Private providers of transportation
- Representation of users of pedestrian walkways and bicycle transportation facilities
- Representatives of the disabled
- Affordable housing advocates
- Transportation advocates
- Neighborhood and community groups
- Home builder representatives
- Broad-based business organizations
- Landowners
- Commercial property interests
- Homeowner associations
- Taxi associations
- Limousine services
- Large employers in the Lake Tahoe Region – Safeway, Raley's, Vail, Grocery Outlet
- School Districts
- Uber
- Lyft

Additional SB 375 public outreach requirements and TRPA's activities to meet requirements are illustrated in Table C.5.

Table C.5: SB 375 public outreach requirements and TRPA activities

SB 375 Requirement	Outreach Activity	Date
(2D) The metropolitan planning organization shall conduct at least two informational meetings in each county within the region for members of the board of supervisors and city councils on the sustainable communities strategy and alternative planning strategy, if any. The metropolitan planning organization may conduct only one informational meeting if it is attended by representatives of the county board of supervisors and city council members representing a majority of the cities representing a majority of the population in the incorporated areas of that county.	TRPA Governing Board Meeting (Kings Beach, CA)	January 27, 2016
	TTD/TTC Meeting (Inn by the Lake, South Lake Tahoe, CA)	April 8, 2016
(2E) Each metropolitan planning organization shall adopt a public participation plan, for development of the sustainable communities strategy and an alternative planning strategy	TRPA 2016 Public Participation Plan	Approved July 2016
(2Ei) Outreach efforts to encourage the active participation of a broad range of stakeholder groups in the planning process, consistent with the agency's adopted Federal Public Participation Plan, including, but not limited to, affordable housing advocates, transportation advocates, neighborhood and community groups, environmental advocates, home builder representatives, broad-based business organizations, tourism organizations, landowners, commercial property interests, and homeowner associations.	Public workshops, online and hardcopy surveys, attended association meetings, and public events.	January 2014 - October 2016
(2Eii) Consultation with congestion management agencies, transportation agencies, agencies responsible for reducing the risk of natural disasters, and transportation commissions.	Corridor Connection Plan Project Development Team meetings	June 3, 2015 October 7,2015 April 12, 2016
	Regional Transportation Plan Technical Advisory Committee Goals, Policies, and Project List Review	July – October 2016
	TTC/ TTD Presentations	Dec. 11, 2015 January 8, 2016 April 8, 2016 November 18, 2016
(2Eiii) Two workshops throughout the region to provide the public with the information and tools necessary to provide a clear understanding of the issues and policy choices. Each workshop, to the extent practicable, shall include urban simulation computer modeling to create visual representations of the SCS and the alternative planning strategy.	North Shore Open House (North Tahoe Events Center, Kings Beach, CA)	May 17, 2016
	South Shore Open House (Lake Tahoe Resort Hotel, South Lake Tahoe, CA)	May 24, 2016

Table C.5: SB 375 public outreach requirements and TRPA activities continued

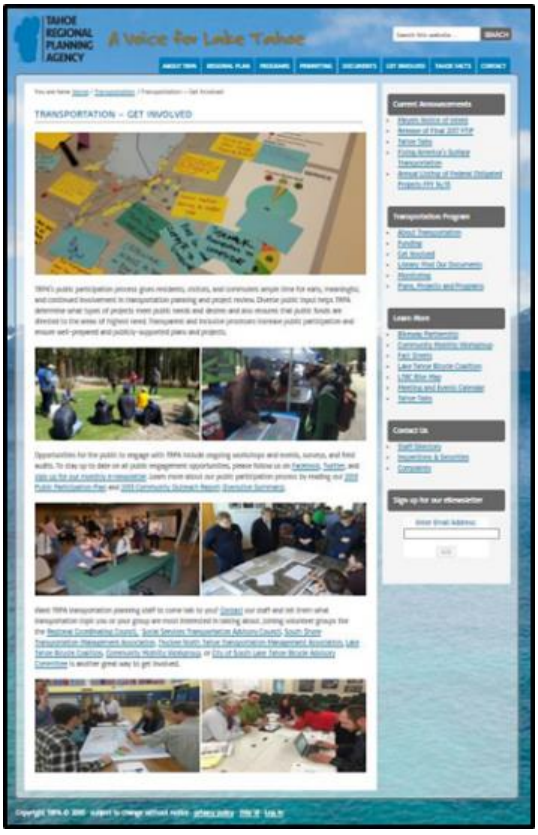
SB 375 Requirement	Outreach Activity	Date
(2Eiv) Preparation and circulation of a draft SCS and an alternative planning strategy, if one is prepared, not less than 55 days before adoption of a final regional transportation plan.	Draft available at trpa.org/transportation by February 22, 2016. Advertised in print in Lake Tahoe newspapers, through TRPA e-newsletter, and TRPA social media outlets.	February 22, 2016
(2Ev) At least three public hearings shall be held (page 66 of RTP Guidelines). To the maximum extent feasible, the hearings shall be in different parts of the region to maximize the opportunity for participation by members of the public throughout the region.	Tahoe Metropolitan Planning Organization (Kings Beach, CA)	January 27, 2016
	TTD/TTC Meeting (Inn by the Lake, South Lake Tahoe, CA)	April 8, 2016
	TTD/TTC Meeting (North Tahoe Event Center, Kings Beach, CA)	March 10, 2017
(2Evi) A process for enabling members of the public to provide a single request to receive notices, information, and updates.	http://www.trpa.org/transportation/	On-going
(2Ji) Prior to starting the public participation process adopted pursuant to subparagraph (F), the metropolitan planning organization shall submit a description to the state board of the technical methodology it intends to use to estimate the greenhouse gas emissions from its sustainable communities strategy and, if appropriate, its alternative planning strategy.	TRPA sent a memorandum to Nicole Dolney, Chief of the Transportation Planning Branch at California Air Resources Board (ARB). More information located in Appendix E: 2017 Transportation Conformity.	May 16, 2016
Developing Regional Housing Needs Methodology (4c) Public participation and access shall be required in the development of the methodology and in the process of drafting and adoption of the allocation of the regional housing needs. Participation by organizations other than local jurisdictions and councils of governments shall be solicited in a diligent effort to achieve public participation of all economic segments of the community. The proposed methodology, along with any relevant underlying data and assumptions, and an explanation of how information about local government conditions gathered pursuant to subdivision (b) has been used to develop the proposed methodology, and how each of the factors listed in subdivision (d) is incorporated into the methodology, shall be distributed to all cities, counties, any sub-regions, and members of the public who have made a written request for the proposed methodology. The council of governments, or delegate sub-region, as applicable, shall conduct at least one public hearing to receive oral and written comments on the proposed methodology.	Developed by SACOG	December 2011
Distribute Environmental Document to federal, state, and tribal land management, wildlife, and regulatory agencies. (Raymond Hess RTP checklist): A discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the metropolitan transportation plan. The discussion may focus on policies, programs, or strategies, rather than at the project level. The discussion shall be developed in consultation with Federal, State, and Tribal land management, wildlife, and regulatory agencies. The MPO may establish reasonable timeframes for performing this consultation.	When draft is released sent by email, through e-newsletter, posted on social media, mailed hardy copy, and available online.	February 22, 2017

Table C.5: SB 375 public outreach requirements and TRPA activities continued

SB 375 Requirement	Outreach Activity	Date
Send letters with link to draft RTP to all the agencies on the TAC, requesting comments. (page 73, RTP Guidelines).	When draft is released sent by email with link to online location	February 22, 2017
If responses not received, send a follow-up letter asking why a response was not received (Page 73, RTP Guidelines)	Will send email one week prior to close of comment period.	March 17, 2017
Conformity consultation requirements - document the consultation that you did.	Located in Appendix E: 2017 Transportation Conformity	

Ongoing Outreach and Engagement

TRPA staff conducts ongoing outreach and continues contact with agency stakeholders, nonprofits, advocacy groups, and the public. A continuous presence at association meetings, through the electronic newsletter, social media, and events will provide opportunities for ongoing feedback on how the plan is being implemented and updated community needs. Staff will catalogue new issues that need to be addressed in the next regional transportation plan update in 2021. Additionally, through stakeholder processes TRPA will engage agencies, organizations, private entities and the public to help bring life to the projects and programs identified throughout this plan.



TRPA Website for Transportation Public Outreach

Agency and Inter-Governmental Consultation and Cooperation Overview

In developing transportation and land use plans TRPA collaborates closely with multiple public agencies, a tribal government, and a cross section of private stakeholders. This section lists all partners consulted in development of the 2017 Regional Transportation Plan as well as the consultation procedure documentation as required by FAST ACT and by CFR 450.201 and 450.316.

TRPA and TTD invited a broad array of agencies and groups to be part of a project development team to provide ideas on both the Corridor Connection Plan and the Regional Transportation Plan / Sustainable Communities Strategy. These representatives were from local jurisdictions, neighboring regions such as Washoe Regional Transportation Commission and the Carson Area Metropolitan Planning Organization, state and federal implementing agencies such as California and Nevada State Parks, Caltrans, NDOT, and the U.S. Forest Service, and federal funding and planning agencies such as the Federal Highway Administration. The project development team met four times between 2015 and 2016 to identify goals, key issues, and possible solutions for each of the eight highway corridors in the Lake Tahoe Region. The ideas that came out of these workshops have directly informed the transportation system proposed in this plan. TRPA also made frequent presentations to the Tahoe Transportation Commission Board, as well as identifying a group of representatives from local, state, surrounding regions, and federal agencies to serve as a feedback group on individual sections of the Regional Transportation Plan / Sustainable Communities Strategy, as appropriate.

Regional Transportation Plan & Corridor Connection Plan PDT

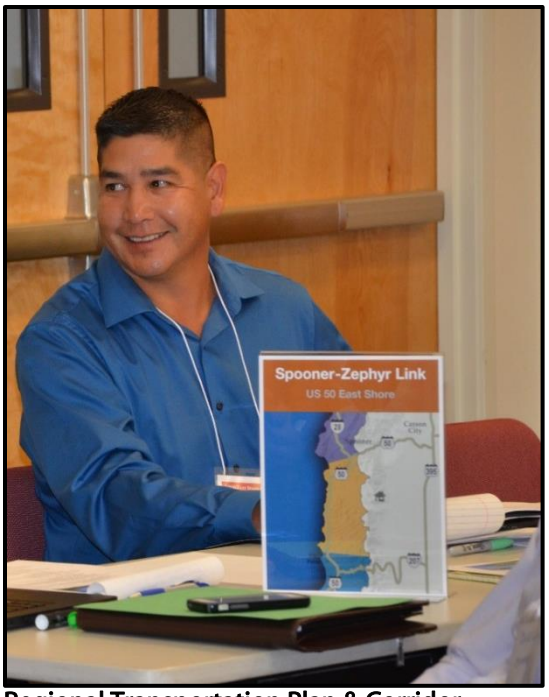
Some of the greatest impacts to Lake Tahoe's environment and the transportation system come from the high number of visitor trips from outside the Region. Visitor trips make up nearly 50 percent of all vehicle miles traveled, therefore working closely with outside partners from surrounding population centers is extremely important. These partnerships help develop successful strategies for capturing visitor trips on transit or spreading these trips out over different times to reduce congestion. TRPA has been expanding collaboration with surrounding partners to identify transportation solutions and work toward common interests. In addition to having partner agencies serve on the project development team, TRPA worked with Sacramento Area Council of Governments to complete a series of interviews of staff from the Washoe Regional Transportation Commission, Placer County Transportation Planning Agency, the Nevada County Transportation Commission, Placer County, and the Tahoe Transportation District on barriers to transportation solutions to address travel into the Lake Tahoe Region. The interviews were followed up by a workshop in January 2017.

Technical Advisory Committee

TRPA utilizes a technical advisory committee (TAC) for input on the projects, goals, and policies located in the regional transportation plan. TAC members are listed below.

Kurt Althof	Tahoe City Public Utility District
Erin Casey	Placer County Executive Office
Derek Chernow	California Department of Conservation
Greg Chew	SACOG - Housing
Ruth Coleman	California State Parks
Darrel Cruz	Washoe Tribe
Amy Cummings	Washoe RTC
Woodrow Deloria	El Dorado County Transportation Commission
Dan Doenges	Washoe RTC
Azadeh Doherty	SACOG
Paul Enos	Nevada Trucking Association
Jon Erb	Douglas County Public Works
Brendan Ferry	El Dorado County
Mike Gabor	USFS-LTBMU
Chris Gansen	California Governor's Office of Planning and Research
Dirk Goering	Carson City Public Works/Carson Area Metropolitan Planning Organization
Carl Hasty	Tahoe Transportation District
Elijah Henley	Central Federal Lands
Heidi Hill Drum	Tahoe Prosperity Center
Wade Hobbs	Federal Highways Administration, CA Division
Stephanie Holloway	Placer County
Loren Holt	North Tahoe Public Utility District
Clint Holtzen	SACOG - Planning
Jay Howard	Nevada State Parks
Aaron Hoyt	Placer County Transportation Planning Agency
Dan Inouye	Washoe County Health District Air Quality Management Division
Ray Jarvis	City of South Lake Tahoe
Sig Jaunarajs	Nevada Division of Environmental Protection
Heather King	Air Resources Board
Ted Koch	US Fish and Wildlife
Peter Kraatz	Placer County
Robert Larsen	Lahontan Regional Water Quality Control Board
Christina Leach	Federal Highways Administration, NV Division
William Leady	U.S. Army Corps of Engineers
Kacey Lizon	SACOG
Ted Matley	Federal Transit Administration
John McCamman	California Department of Fish and Game
Richard Moorehead	Placer County
Arthur Murray	California Department of Transportation
Karina O'Connor	U.S. Environmental Protection Agency, Region 9
Patrick Pitinger	Carson City Public Works/Carson Area Metropolitan Planning Organization
Sondra Rosenberg	Nevada Department of Transportation
Tamara Sasaki	Calif. Dept of Park & Recreation, Sierra District
Dave Solaro	Washoe County
Tara Styer	Tahoe Transportation District
Steve Teshara	SSTMA
Laura Whitney	U.S. Army Corps of Engineers
Indra Winquest	Assistant Parks & Recreation Director
Mike Woodman	Nevada County Transportation Commission
Jaime Wright	Truckee-North Tahoe Transportation Management Association
Patrick Wright	California Tahoe Conservancy
Shawn Yadon	CEO

The Washoe Tribe



Regional Transportation Plan & Corridor Connection Plan PDT

The Washoe Tribe of Nevada and California is an important partner in transportation planning at Lake Tahoe, 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 into Lake Tahoe. The Washoe are the original inhabitants of the Lake Tahoe Region. The Tribe and TRPA have acknowledged the mutual benefit of a formalized process for communication for land, transportation, and resource management decision making and other governmental relations. Both parties have a strong interest in the protection of social, biological, and tribal cultural resources in the Lake Tahoe Region and recognize that collaboration and cooperation is the best method to achieve these goals.

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 Tahoe Transportation Commission (TTC) and the Advisory Planning Commission (APC), which are the advisory bodies to TRPA/TMPO. Regular communication between the Tribe and TRPA serve as another method for both parties to discuss any other issues that may arise through formal consultation.

On June 8, 2016 TRPA staff met with the Washoe Tribe at their offices in Garnerville, NV to discuss the update to the Regional Transportation Plan, updating our memorandum of understanding for formal government to government consultation, and any other issues related to transportation projects, programs, and planning. Morgan Beryl, Karen Fink, and Nick Haven of TRPA and Chairman Neil Mortimer, Kenneth Cruz, Darrel Cruz, and Rob Beltramo of the Washoe Tribe attended this meeting. The projects and programs found in the 2017 plan take into account the feedback the Washoe Tribe provided on June 8, 2016. The main topics we discussed at our meeting and their inclusion into the plan are described below:

1. **Reducing Congestion as a Regional Goal:** Managing congestion is a major theme throughout the 2017 plan and will continue to be a focus of transportation planning through the development of the congestion management process. TRPA/TMPO is now designated as a Transportation Management Area which requires maintaining a congestion management process. Additionally, the plan has six regional goals, number 4 is: Operations and Congestion Management. Related policies can be found under this goal.
2. **Maintaining Tahoe's environment while also allowing for more visitation:** Preserving Tahoe's environment while enhancing recreational access by both visitors and residents is also a major theme of this plan. Many of the transit projects located on the constrained (funded) project list increase transit frequency, eliminate costs to passengers, and add routes to recreational destinations. These projects will increase transit ridership reducing reliance on the private automobile. This shift in travel choice will benefit air and water quality by reducing greenhouse

gas emissions and stormwater runoff. Regional Goal 1 of this plan is Environment, though many policies under multiple goals also serve to preserve the environment.

3. **Adaptive roadway management on State Route 89 must consider access to Meek Bay:** There are a few projects on the constrained and unconstrained (unfunded) projects lists that include the Meek's Bay area. The U.S. Forest Service will lead improvements along the SR 89 Recreation Corridor that could include better connecting active transportation infrastructure, improving the parking management system, and increasing transit service through partnerships with Tahoe Transportation District and the Tahoe Truckee Area Regional Transit. Once this planning effort begins, the Washoe Tribe is encouraged to participate in that process. Adaptively managing the roadway, which could include operating the roadway in non-typical ways during peak times is located on the unconstrained project list. This effort will require robust collaboration between multiple partners, of which the Tribe should be an active partner.

Local Jurisdictions and Districts

- **City of South Lake Tahoe** maintains local roadways, implements transportation projects, manages the South Tahoe airport, and generates local area plans.
- **Douglas County** maintains local roadways, implements transportation projects, and generates local area plans.
- **El Dorado County** maintains local roadways, implements transportation projects, generates local area plans, and provides demand response transit service for unincorporated areas outside of the City of South Lake Tahoe.
- **Incline Village General Improvement District** a quasi-public agency chartered to provide water, sewer, trash, and recreation services for the communities of Incline Village and Crystal Bay, Nevada.
- **Placer County** maintains local roadways, implements transportation projects, and operates TART, a public transit service along the west and North shore of Lake Tahoe.
- **Tahoe Transportation District (TTD)** facilitates and delivers transportation projects, provides operational authority for transit services within the Region as well as services that serve access to and from Lake Tahoe.
- **Tahoe City Public Utility District** builds and maintains bicycle infrastructure projects along the West and North shore of Lake Tahoe.
- **Washoe County** maintains local roadways, and implements transportation projects in the Incline/Crystal Bay portion of Lake Tahoe.

State and Federal Agencies

- **California Tahoe Conservancy** protects and restores the natural environment and promotes public recreation and lake access through building and funding appropriate transportation projects in the Tahoe Region.
- **Federal Land Management Agencies for the State of California** will provide a venue to collaboratively facilitate state departments of transportation, local governments, tribal governments, and federal land management agencies in identifying opportunities, benefits, strategies, and guidance for long range transportation planning throughout the state of California. Through interagency coordination, the plan will establish common goals and objectives for maintaining and improving the transportation system (including roads/bridges, trails, and transit) that provide public access to, through and within Federal Lands. Issue areas in the Lake Tahoe Region will be part of the statewide plan. Scenario planning workshops are scheduled for throughout 2017, with a draft plan ready in the fall of 2017.
- **California Department of Transportation (Caltrans)** is the state agency responsible for highway, bridge, and rail transportation planning, construction, and maintenance in California. Caltrans

implements multiple roadway improvement projects in the Lake Tahoe Region, and sits on the Tahoe Transportation Commission board.

- **Nevada Department of Transportation (NDOT)** is responsible for the planning, construction, operation and maintenance of the highways and bridges which make up the Nevada state highway system. NDOT implements roadway improvement projects on the Nevada highways in the Lake Tahoe Region, and sits on the Tahoe Transportation Commission board.
- **US FHWA (Nevada and California Division Office & Central Federal Lands Highway Division)** provides funding to TRPA to carry out the transportation planning process, environmental review, and preliminary engineering and design to complete environmental documentation for transportation projects. As a partner to delivering transportation improvements, the Central Federal Lands Highway Division of FHWA maintains oversight of the funds, and coordinates closely with TRPA on project progress.
- **US Federal Transit Administration (FTA)** is an active partner in providing transit capital and operating assistance to the Tahoe Region. Region IX of FTA, located in San Francisco provides planning assistance and guidance on various transit projects in the Region.
- **United States Forest Services Lake Tahoe Basin Management Unit (LTBMU)** manages over 75% of the area around the lake. This land includes beaches, hiking and biking trails, wilderness, historic estates and developed recreation areas such as campgrounds and riding stables. The LTBMU manages these lands to provide access for the public and to protect the natural resources of the area. The LTBMU sits on the Tahoe Transportation Commission board.

Local Emergency Services

- **Emergency Management Community Council (EMCC)** was established in 2006 for the South Lake Tahoe area. The EMCC consists of numerous emergency responders, including El Dorado, Douglas, and Alpine counties.
- **Office of Emergency Services (OES)** provides emergency management services to Placer County, 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, OES helps to facilitate the resources necessary for first responders to protect the community.
- **Washoe County Emergency Management Program** 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.

Neighboring Transportation Agencies and Tribal Governments

- **Carson Area Metropolitan Planning Organization (CAMPO)** designated as the metropolitan planning organization for the Carson Urbanized Area, CAMPO provides inter-regional input on transportation issues.
- **Placer County Transportation Planning Agency (PCTPA)** works in conjunction with TRPA to coordinate unmet transit needs, transportation planning over the I-80 corridor, and coordinates transit service to Squaw Valley and Alpine Meadows along S.R. 89 between Tahoe City and the Town of Truckee. The PCTPA is the sister RTPA in Placer County.
- **El Dorado County Transportation Planning Commission (EDCTC)** is the regional transportation planning agency for majority of El Dorado county outside of the TRPA boundary. TRPA works very closely with EDCTC on joint planning initiatives involving the US 50 corridor and traveler information technology deployment among other activities.
- **Tahoe Douglas Transportation District (TDTD)** coordinates development of the Douglas County five-year Transportation Improvement Plan and approves expenditures of county Transient Occupancy Tax (hotel tax), revenues for transportation purposes at Lake Tahoe.

- **Washoe County Regional Transportation Commission (RTC)** contracts with Placer County to fund Tahoe Truckee Area Regional Transit (TART) operations in Incline Village and Crystal Bay and provides inter-regional input on transportation issues.
- **Washoe Tribe of Nevada and California** is a voting member of the Tahoe Transportation Commission and provides input to TPRA on Tribal issues.

Private Sector and Advocacy Groups

- **Truckee-North Tahoe Transportation Management Association (TNT-TMA)** founded in 1990, the Truckee-North Tahoe Transportation Management Association is a non-profit, community-based organization that coordinates public-private partnerships and is dedicated to solving traffic congestion and air quality problems in the greater Truckee-North Tahoe-Incline Village Resort Triangle. The TNT-TMA administers the North Lake Tahoe Express which provides affordable airport shuttle service from Reno/Tahoe International Airport to the North Lake Tahoe and Truckee region.
- **North Lake Tahoe Resort Association (NLTRA)** serves as a forum for local input and recommendations on the planning and development of tourism and community related infrastructure and transportation projects, including transit services, for which the association is a funding partner. The source of NLTRA funding is a percentage of the Transient Occupancy Tax (TOT) funds generated in the North Lake Tahoe area of eastern Placer County. The Placer County Board of Supervisors grants these funds to the NLTRA on an annual basis.
- **South Shore Transportation Management Association (SSTMA)** founded in 1994, the South Shore TMA is a non-profit community-based organization that coordinates public-private partnerships and encourage the implementation of the Employer Trip Reduction Ordinance.
- **Lake Tahoe Visitors Authority (LTVA)** markets the South Shore of Lake Tahoe as a unique, world-class, year-round destination to the regional, national and international marketplace to favorably impact the South Shore economy through overnight stays and tourism spending.
- **Community Mobility Workgroup** advocates for improving active transportation safety, access, and connectivity with an emphasis on infrastructure planning, outreach and education programs.
- **Lake Tahoe Bicycle Coalition** is a volunteer organization that promotes bicycling through safety campaigns, generation of bike maps, hosting bike events, and advocating for improved bicycle infrastructure in the Tahoe Region.
- **South Lake Tahoe Joint Powers Authority Bicycle Advisory Committee** enhances the recreational facilities in the South Lake Tahoe area of El Dorado County and consists of the City of South Lake Tahoe, El Dorado County, and Tahoe Paradise Resort Improvement District. The JPA also administers Measure S funds which maintains shared-use paths.

Plans Reviewed for Consistency

Consultation procedure documents are denoted with an *.

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APPENDIX D: METHODOLOGY FOR ESTIMATING VEHICLE MILES TRAVELED AND GREENHOUSE GAS REDUCTIONS IN THE 2017 REGIONAL TRANSPORTATION PLAN

Table of Contents

Overview

This appendix describes the methodology developed by the Tahoe Regional Planning Agency (TRPA) for estimating daily regional vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions reductions for use in the 2017 Regional Transportation Plan. These two indicators are estimated utilizing the Lake Tahoe Transportation Model, a state-of-the-art activity-based model that estimates travel behavior and use of the transportation system.

Because the modeling process is extremely lengthy, TRPA began development of the Regional Transportation Plan model inputs in the summer of 2015. Since land use regulations and information regarding existing and available development rights is constantly being updated, running the model necessitates selecting a cutoff date and loading the model with the best available data as of that date. To provide adequate time to perform quality assurance reviews of the model inputs and outputs, December 31, 2014 was selected as the cutoff date. Therefore, the modeled land-use scenario included all regulations in place as of December 31, 2014, and all data on existing and planned development in place up to December 31, 2014. All available documentation on August 2015 was used for this purpose. This appendix has three parts:

- **Part 1:** Information Used for Modelling the 2017 RTP
- **Part 2:** Estimation of Daily Regional VMT
- **Part 3:** Calculation of the share of vehicle miles traveled (VMT) attributable to the California portion of the Lake Tahoe Region

Background

TRPA monitors daily regional VMT for several reasons. For planning purposes, daily regional VMT is the performance measure used to better understand use of, and activity on, the Region's roadways. Daily regional VMT is also monitored for regulatory purposes. TRPA maintains a VMT threshold standard requiring attainment of a daily regional VMT reduction target of "10% Reduction from 1981 VMT Base Year Values". Additionally, in its role as a Metropolitan Planning Organization (MPO), California state legislation (SB 375) requires TRPA to incorporate a Sustainable Communities Strategy (SCS) for reducing passenger vehicle-related GHG emissions in the Regional Transportation Plan and must also show compliance with GHG reduction targets set by the California Air Resources Board (CARB). GHG emissions are estimated, in part, using the VMT estimates produced by TRPA's Lake Tahoe Transportation Model. The integrated land use policies from the Regional Plan and the transportation policies from the Regional Transportation Plan must demonstrate achievement of these thresholds and standards.

Part 1: Information Used for Modelling the 2017 RTP

Lake Tahoe Transportation Model and Assumptions

Model Description

The Lake Tahoe Transportation Model is one of the Region's most powerful analytic tools 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. Several 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. This section briefly summarizes the key assumptions used for development of this Regional Transportation Plan, however, for additional information concerning the Lake Tahoe Transportation Model, please refer to the *Lake Tahoe Resident and Visitor Model; Model Description and Final Results, August 2007* available on the TRPA transportation website, Library page: http://www.trpa.org/transportation/library/.

Since development of the previous RTP, the 2012 RTP, the Lake Tahoe Transportation Model and it's inputs have been updated to include the most up-to-date information available. Model updates that have occurred since the development of the 2012 RTP include:

- **Land Use Updates:** Updated business and employee information and updated hotel-motel information, including the number of rooms and employees was acquired from InfoGroup and incorporated.
- **Single-Family Residence Updates:** TRPA conducted internal and external validations of the number and locations of single family dwellings built since 2012. TRPA contacted local jurisdictions to identify the parcels where a completed building permits and certificates of occupancy were issued.
- **Cordon Station License Plate Survey:** TRPA conducted a video surveillance license plate survey and follow-up post card survey at the Region's seven basin-entry points to re-calibrate the travel characteristics of residents and visitors entering the basin.
- **2010 U.S. Census Data Updates:** Census tract-level updates to demographic variables including: resident–second home ownership, persons per household, and income distribution were completed using the recently released 2012 U.S. Census data.
- **School Enrollment Updates:** TRPA acquired updated school enrollment data from Lake Tahoe Unified School District, Tahoe Truckee Unified School District, Washoe County and Douglas County School Districts which was used to validate the model.
- **Traffic Counts Updates:** The traffic counts used for development of the 2012 RTP (latest available were 2010 counts) were updated to include traffic counts from 2011-2014 (latest available at the time the model was run for the 2017 RTP).
- **Independent Model Review:** TRPA contracted with Kittleson and Associates pursuant to the Travel Forecasting Guidelines (California Department Transportation and Nevada Department of Transportation (NDOT) Traffic Forecasting Guidelines) to conducted an independent review and assessment of the TRPA model.

For the 2017 Regional Transportation Plan, there are two model base years, 2005 and 2014, and three forecast model years, 2020, 2035, and 2040. Staff selected the 2005, 2020 and 2035 model years based on requirements by the California Air Resources Board (ARB) to show reductions in greenhouse gas (GHG) emissions for the forecast years 2020 and 2035 as compared to 2005. Staff selected 2014 as an additional base year to make comparisons between future estimates and current known on-the-ground conditions. 2040 is the forecast year of the 2017 Regional Transportation Plan, so it is also considered, although for modeling purposes 2035 and 2040 are very similar.

The potential impact of the RTP is influenced by the amount and distribution of new development (i.e. residential units, commercial floor area (CFA), and tourist accommodation units (TAUs)), and the rate of utilization of visitor accommodations such as hotels, motels, and vacation rentals. Because the modeling process is extremely lengthy, TRPA began development of the Regional Transportation Plan model inputs in the summer of 2015. Since land use regulations and information regarding existing and available development rights is constantly being updated, running the model necessitates selecting a cutoff date and loading the model with the best available data as of that date. TRPA selected December 31, 2014 as the cutoff date. Therefore, the modeled land-use scenario included all regulations and in place as of December 31, 2014, and all data on existing and planned development in place up to December 31, 2014, with the documentation available by August 2015.

Staff updated the TransCAD model to include the total residential, commercial, and tourist development that was constructed (for base years) and that is allowable (for forecast years). It is not possible to know the exact distribution of future development, thus the process necessitated a series of assumptions related to the distribution of residential allocations, residential bonus units, commercial floor area, and tourist accommodation units. A description of each of these types of development rights (sometimes called "commodities") is below, as well as a description of the transfer of development rights program that was instituted with approval of the 2012 Regional Plan. This description is followed by detailed modeling assumptions for each type of development right.

Land Use Policies Overview

In 2012, TRPA approved an update to the Regional Plan. This update affirmed major components of the Region's existing land use policies, such as requirements to obtain development rights before constructing new residential, commercial floor area, or tourist units projects, and also included important changes to the development rights program, including a new transfer of development program. These programs are captured in the transportation model because they help shape the rate and location of development. The following description of the three different commodity types has been adapted from the Lake Tahoe Sustainable Communities Program Documents Series #7, "Development Commodities Transfer Policies Analysis," December 2013.

Residential Development Rights

To develop a residential parcel a property owner must have a residential development right, a residential development allocation, and the necessary amount of land coverage for the project. As an alternative, a property owner may acquire and remove an existing residential unit of use from a property, or, in the case where a residence does not yet exist, remove a development right and transfer it to a different property, per the transfer of development regulations outlined below.

Residential development rights are the right to develop a vacant, privately-owned, residential parcel. The upper limit on residential development rights has been established by prohibiting any new land subdivisions. The upper limit on residential development rights in the Basin is approximately 51,000.

The annual level of residential allocations has been set by the Regional Plan. The 1987 Regional Plan allowed up to 300 allocations per year for 20 years (i.e., 6,000). The 2012 Regional Plan revised the allocation system to a significantly reduced level, allowing for a maximum of 130 allocations per year (i.e.,

2,600). These allocations are distributed to jurisdictions annually based on a number of criteria, including compliance with code requirements and implementation of water quality improvement projects.

Commercial Development Rights

Commercial floor area is generally defined as the square footage of the floor area on all levels of a commercial building. To develop a commercial project both commercial floor area and coverage are required. The 1987 Regional Plan allowed coverage to be transferred on a sliding scale up to a "two-to-one" basis (i.e. two square feet of coverage removed for each new square foot placed). The 2012 Regional Plan changed the coverage transfer basis to "one-to-one" when coverage is transferred off of sensitive lands to provide an incentive to remove coverage from where it is most environmentally impactful (pursuant TRPA Code Section 30.4.3).

The 1987 Regional Plan also allowed commercial floor area to be transferred on a "one-to-one" basis. To create an incentive to move commercial floor area from more sensitive lands to targeted mixed-use redevelopment areas, the 2012 Regional Plan changed the commercial floor area transfer ratio to a sliding scale as described below.

At the time of model development, staff estimated that there were approximately 6.4 million square feet of commercial floor area in the Lake Tahoe Basin. The 1987 Regional Plan allocated 800,000 square feet for commercial development. When the 2012 Regional Plan was prepared, slightly less than 400,000 square feet were remaining and available for use. Hence, the 2012 Regional Plan did not allocate additional commercial floor area to the jurisdictions, but a pool of 200,000 square feet of CFA was established with the limitation that it could only be distributed once the remaining CFA from the 1987 plan has been utilized. However, as mentioned above, the 2012 Regional Plan did change the transfer ratio for commercial development, allowing transfers on a sliding scale ranging from "one-to-one" to "one-to-three", depending on the sensitivity of land from which it is being transferred (i.e. three square feet of commercial floor area can be placed for each square foot removed from the most sensitive lands).

Tourist Accommodation Unit Development Rights

A tourist accommodation unit, or TAU, is generally defined as a hotel, motel or other rental lodging unit with one or more bedrooms primarily designed to be rented temporarily by the day or week. To develop a tourist accommodation project both TAUs and coverage are required. As also described above, the 2012 Regional Plan changed the coverage transfer ratio to "one-to-one" when coverage is transferred from sensitive lands to provide an incentive to remove coverage from where it is most impactful. The 2012 Regional Plan also changed the TAU transfer ratio so TAUs can be transferred on a sliding scale ranging from "one-to-one" to "one-to-three", depending on the sensitivity of land from which it is being transferred (i.e. three TAUs can be placed for each TAU removed from the most sensitive lands).
At the time of model development, staff estimated that there were 11,947[1] TAUs in the Lake Tahoe Basin. Because there are TAUs from the 1987 Regional Plan that have remained unused, the 2012 Regional Plan does not include any additional TAUs. However, as mentioned above, the 2012 Regional Plan did change the transfer ratio for TAUs.

Transfer of Development Rights (TDR) Program[2]

Transfer of development rights, otherwise known as TDR, is a TRPA regulatory strategy used to manage growth within the Lake Tahoe Basin. Voluntary and incentive-based, TDR capitalizes on market forces to direct development away from sensitive lands into more desirable areas such as town centers. TDR is based on the designation of standard sending and receiving areas, as well as the distinction between land ownership and the rights necessary to develop a parcel.

[1] Regional Plan Update Final EIS, Response to Comments, Volume 1, Chapter 3, p. 3-46, Table 3-8.
[2] The description of the TDR program is adapted from the TRPA webpage, "Transferring Development Rights," http://www.trpa.org/permitting/transfer-development-rights/. It also encompasses transfer of existing development.

Sending areas are typically lands that have been identified for preservation or deemed environmentally sensitive and therefore not suitable for development. Receiving lands are areas in which additional growth is desirable and beneficial. Development rights serve to quantify development and act as the building blocks for growth management. By transferring the rights from a sending to a receiving parcel, TDR works to implement programs designed to increase affordable housing as well as other desirable development, restore sensitive lands, and achieve the following:

- Help direct growth away from sensitive areas, facilitating achievement of environmental goals;
- Contribute to more compact development patterns thus making downtown areas more walkable, reducing the need for vehicle trips and reducing greenhouse gas emissions (GHG);
- Allow property owners to realize value through sales of rights from their parcels.

In Tahoe, transferable development rights are those that can be banked and/or verified as legally existing by TRPA. These rights include:

- land coverage (existing and potential) (not captured in the Transportation model)
- commercial floor area (CFA)
- existing residential units of use (ERU)
- tourist accommodation units (TAU)
- residential development rights (RDR)
- residential allocations
- restoration credits (not captured in the Transportation model)

Table D.1 shows the amount of estimated development that was known to be on the ground in the two base years at the time of the model development. The amount of known, existing development in 2012 is also shown for comparison purposes. These amounts represent the basic land use assumptions for the base year modeling. TRPA designated Centers are shown for the North and South shores in Figure D.1 and Figure D.2.

Table D.1: Existing development in 2005, 2012 and 2014

TYPE	2005 Existing[1]	2012 Existing[2]	2014 Existing[3]
Residential Units	46,359	46,962	47,092
CFA	6,338,000	6,403,893	6,417,970
TAUs	11,583	11,947	11,947

Notes:
1 - "Existing" refers to estimated constructed units in 2005. Source: TRPA Transportation Model, 2000 Census.
2 - Included for comparison purposes only. Source: Regional Plan Update Final EIS, Response to Comments, Volume 1, Chapter 3, p. 3-46, Table 3-8.
3 – The estimated development as of 2014 was modeled using best available information at the time of the model run. TRPA has since published an updated accounting of development rights in the 2015 Threshold Evaluation Report (see TRPA 2015 Threshold Evaluation Report, Implementation Chapter, http://www.trpa.org/wp-content/uploads/18_Ch12_Implementation_FINAL_9_30_2016.pdf).

Table D.2 shows the amount of development potential remaining in 2012 (as reported in the Regional Plan Update Final EIS) compared with the amount known to be used in 2013 and 2014, with the amount of total development potential known to be remaining as of December 31, 2014.

Table D.2: Development rights used or constructed in 2013 and 2014 compared to remaining development potential

TYPE	Remaining from 1987 plan in 2012[1]	Authorized in the 2012 RPU[1]	Total Potential Development Remaining in 2012	2013 and 2014 Construction[2]	Total Potential Development Remaining December 31, 2014[3]
Residential Allocations	114	2,600	2,714	130	2,584
Residential Bonus Units	874	600	1,474	0	1,474
CFA	383,579	200,000	583,579	14,077	569,502
TAUs	342	-	342	0	342

Notes:
1 - Source: Regional Plan Update Final EIS, Response to Comments, Volume 1, Chapter 3, p. 3-46, Table 3-8; excludes banked units.
2 - Source: TRPA Permit Data and Research and Analysis Division tracking, August 17,2015. Additional units that have been allocated but not built are shown in Table D.4.
3- The potential remaining development as of 2014 was compiled using best available information at the time of the model run. TRPA has since published an updated accounting of development rights in the 2015 Threshold Evaluation Report (see TRPA 2015 Threshold Evaluation Report, Implementation Chapter, http://www.trpa.org/wp-content/uploads/18_Ch12_Implementation_FINAL_9_30_2016.pdf).

Remaining Development Potential Modeling Assumptions

To forecast development patterns in the two forecast years, 2020 and 2035 (2040 land use assumptions are the same as 2035, since development rights are forecast to be used up by 2035), remaining development potential was allocated in the model to the different planning jurisdictions, as well as across time. Table D.3 provides a summary of how all remaining development potential was allocated. The individual sections below provide additional detail.

Table D.3: Modeling Forecast Assumptions Summary

		Model Timeframe		
Commodity Type		**2020**	**2035[1]**	**Totals[2]**
Residential Allocations	Already assigned	232		2,584
	Distributed per methodology	792	1,560	
Residential Bonus Units (RBUs)	Already assigned	36	349	1,474
	Distributed per methodology	363	726	
Commercial Floor Area (CFA)	Already assigned	209,155		569,502
	Distributed per methodology		360,347	
Tourist Accommodation Units (TAUs)	Already assigned	180		342
	Distributed per methodology		162	

Notes:
1 - The 2,600 new allocations authorized by the 2012 Regional Plan are modeled to be exhausted after 2032, at the current pace of 130 units released per year. For 2033-2035, no new residential allocations are modeled.
2- The potential remaining development as of 2014 was compiled using best available information at the time of the model run. TRPA has since published an updated accounting of development rights in the 2015 Threshold Evaluation Report (see TRPA 2015 Threshold Evaluation Report, Implementation Chapter, http://www.trpa.org/wp-content/uploads/18_Ch12_Implementation_FINAL_9_30_2016.pdf).
Source: Regional Plan Update FEIS; TRPA Code of Ordinances February 9, 2013; Research and Analysis 2015

Residential Allocations: Remaining residential development potential includes residential allocations remaining from the 1987 Plan, and new allocations authorized in the 2012 Regional Plan Update. The text and tables below describe the modeling assumptions for geographic distribution of these allocations, and their distribution over time. Table D.4 provides a summary of how these allocations were distributed, and Table D.5 and Table D.6 provide more detail.

The 1987 Regional Plan authorized 6,000 residential allocations. At the time of the model development, best available data showed that by the end of 2012, all but 114 of these allocations had been used. The remaining 114 allocations had been distributed to local jurisdictions, but not yet used. The model assumes that all of these remaining allocations will result in residential development by the year 2020, and that they will remain in the jurisdiction to which they were allocated. See Table D.5, below, for the distribution of these units by jurisdiction.[3]

Since the Regional Plan was adopted in December 2012, 248 Residential Allocations were released in 2013 and 2014[4]. In 2013 and 2014, 130 allocations were used to construct residential development projects, including 38 allocations from the 2009/2011 releases (1987 Plan) and 92 allocations from the 2013/2014 releases[5] . Consequently, 232 Residential Allocations remain unused (248+114, minus 130). The model assumes these remaining 232 Residential Allocations are available to local jurisdictions as allocated, and that these will result in constructed residential units by 2020.

Finally, 2,352 Residential Allocations remaining from the 2,600 authorized in the 2012 Regional Plan Update were considered to be available for future releases between 2015 and 2032[6]. For the model, these 2,352 allocations remaining to be released were assumed to be released to the local jurisdictions at a rate of 130 per year, and distributed proportionately between the counties based on the percent of vacant developable parcels within each county. Table D.6 shows the approximate number and percent of vacant developable parcels within each county. Once the proportional distribution of allocations between each county was determined, individual allocations were randomly assigned to developable parcels within each county.

[3] The number of remaining allocations per the 2012 FEIS used best available information at the time. TRPA has since published an updated accounting of development rights in the 2015 Threshold Evaluation Report (see TRPA 2015 Threshold Evaluation Report, Implementation Chapter, http://www.trpa.org/wp-content/uploads/18_Ch12_Implementation_FINAL_9_30_2016.pdf), which updated the number of remaining allocations from the 1987 plan to 149 units.
[4] Ten allocations were also put into the TRPA Pool during this period, for a total of 258 allocations.
[5] Source: TRPA LakeTahoeInfo.org/Parcel Tracker and TRPA permit tracking in Accela. The allocation release is pursuant Ordinance 2014-07 and TRPA Code of Ordinance Section 50.5.1.
[6] Although the timeframe for modeling is 2035, allocations are released up until 2032. Between 2032 and 2035, it is assumed that no new residential allocations will be released.

Table D.4: Summary of Residential Allocation Distribution over the 2020 and 2035 Model Years

	Model Timeframe			
Residential Allocation Type	**2015 – 2020 (6 years)**		**2021 – 2032 (12 years)[7]**	**Totals**
Remaining from 1987 Plan	114		0	114
Allocated in 2013/2014(non-TRPA Pool)	248			248
Units constructed in 2013/2014	-130			-130
Subtotal	*232*			
New units authorized in 2012, remaining after 2013/2014 release	780 (130 units x 6 years)	10 units allocated to the TRPA Pool in 2013/2014	1,560 (130 x 12)	2,350
Subtotal	*790*		*1,560*	*2,350*
Total	1,022		1,560	2,582

Table D.5: Remaining Residential Allocations as of December 2014 within Each Jurisdiction

Jurisdiction	Estimated Remaining Residential Allocations as of December 2012[1]	2013/2014 New Residential Allocations[2]	Allocations Redeemed (built) in 2013/2014	Total Estimated Remaining Residential Allocations as of December 2014, assumed to be constructed by 2020
City of South Lake Tahoe	3	38	-23	18
Douglas County	10	17	-16	11
El Dorado County	40	92	-68	64
Placer County	32	57	-18	71
Washoe County	29	44	-5	68
TOTAL	**114**	**248**	**-130**	**232**

Notes:
1- The estimated development as of 2014 was modeled using best available information at the time of the model run. TRPA has since published an updated accounting of development rights in the 2015 Threshold Evaluation Report (see TRPA 2015 Threshold Evaluation Report, Implementation Chapter, http://www.trpa.org/wp-content/uploads/18_Ch12_Implementation_FINAL_9_30_2016.pdf).
2- In 2013/2014 258 Residential Allocations were issued; however 10 units were allocated to the TRPA Pool.
Source: TRPA LakeTahoeInfo.org/Parcel Tracker and TRPA permit tracking in Accela. The allocation release is pursuant Ordinance 2014-07 and TRPA Code of Ordinance Section 50.5.1.

[7] Although the timeframe for modeling is 2035, allocations are released up until 2032. Between 2032 and 2035, it is assumed that no new residential allocations will be released.

Table D.6: The estimated number and percent of total developable parcels with a development right within each county, for determining the Residential Allocation potential[1]

County	Approximate developable parcels with Development Rights	Percent of Total Developable Parcels
Douglas County, NV	197	4%
El Dorado County, CA (including the CSLT)	3,015	60%
Placer County, CA	1,169	23%
Washoe County, NV	670	13%
TOTAL	*5,051*	100%

Notes:
1-The determination of the number of vacant developable parcels outside of Centers required the selection of parcels (local Property Assessors) outside of a TRPA-designated Center with an IPES score greater than 0 (TRPA), within either Residential, Mixed Use, and Tourist Regional Land Use Areas (TRPA), not including building footprints (pursuant the Impervious Surface GIS dataset, produced by Spatial Informatics in 2010). This necessitated Geographic Information System (GIS) analysis and estimations.

Residential Bonus Units (RBU): Based on what is remaining from the 1987 Plan and authorized in the 2012 Regional Plan, the model assumed a total of 1,474 Residential Bonus Units will be available between the years 2015 and 2035. For modeling purposes, all of these RBUs were assumed to be distributed to TRPA-designated Centers (also referred to as Receiving Areas) because of the requirements associated with their use. These requirements are:

- The 600 RBUs authorized through the 2012 Regional Plan Update can only be allocated as transfer bonus units in TRPA-designated Centers.
- Among the total RBUs, 385 RBUs are already allocated to specific Community Plan Areas or Community Enhancement Projects in the different jurisdictions; consequently, the model assigned them to these jurisdictions. See Table D.7.
- Finally, 489 bonus units carried over from the 1987 Plan can be used for transfers or the construction of deed-restricted affordable housing, and the majority of areas zoned for multi-family housing are in Centers.

Table D.7 below gives an overview of the available Residential Bonus Units and how they were modeled. Those units that are assigned to CEP Projects were assumed to be used by 2020, and those to Community Plan Areas by 2035 (shown as 2032 in the table below for consistency with the Regional plan timeframe). See Table D.8 and the "Residential and Commercial Transfer Assumptions" section for an accounting of how the remaining Residential Bonus Units were accounted for in the model.

Table D.7: Residential Bonus Units (RBUs) Remaining from the 1987 Plan Accounting Summary[8]

Community Plan Area or Community Enhancement Program (CEP) Project	CEP Project RBUs[9]	Community Plan RBUs remaining from 1987 Plan[10]	Total
Tahoe City, Placer County		20	20
Tahoe Vista, Placer County		20	20
California North Stateline, Placer County		13	13
Nevada North Stateline, Washoe County		37	37
Incline Commercial, Washoe County		14	14
Incline Tourist, Washoe County		19	19
Ponderosa Ranch, Washoe County		50	50
South Shore Area Plan, Douglas County (formerly referred to as the Kingsbury Community Plan)		67	67
Tourist Core Area Plan, City of South Lake Tahoe (formerly referred to as the Stateline/Ski Run Community Plan)		89	89
Bijou/Al Tahoe, City of South Lake Tahoe		20	20
Homewood CEP	12		12
Boulder Bay CEP	24		24
Subtotal	*36*	*349*	*385*
TRPA Residential Bonus Pool	0	489	489
Total	36	838	874
Grand Total	874		

Table D.8: Residential Bonus Units distribution in the Transportation Model

Residential Bonus Unit Type	Modeled in 2015 – 2020 (6 years)	Modeled in 2021 – 2032 (12 years)[11]	Total
Residential Bonus Units remaining from the 1987 Plan, assigned to Community Plan Areas and CEP Projects	36	349	385
TRPA Residential Bonus Pool, remaining from 1987 (489 RBUS) + Bonus Units allowed from 2012 Regional Plan (600 RBUs) (1,089 total)	Approximately 10% are assumed to be used for affordable housing, metered out at a rate of approximately 6 per year (36)	Approximately 10% are assumed to be used for affordable housing, metered out at a rate of approximately 6 per year (72)	108
	Remaining amount are used for transfer match and metered out at a rate of approximately 55 per year (327)	Remaining amount are used for transfer match and are metered out at a rate of approximately 43 per year (654)	981
Total	399	1,075	1,474

[8] Source: Regional Plan Update Draft EIS, Page 3.2-9, Table 3.2-3. Per conversation with Paul Nielsen, Current Planning Division Manager, August 25, RBUs for all CEP Projects except for Homewood and Boulder Bay were returned to the TRPA Pool.
[9] Assumed to be used by 2020
[10] Assumed to be used by 2035
[11] This is the 2035 model year.

Commercial Floor Area (CFA): The model assumed a total of 569,502 square feet (sq. ft.) of unused CFA. This included 209,155 sq. ft. of CFA remaining from the 1987 plan assigned to jurisdictions or CEP Projects (i.e. Homewood), 160,347 sq. ft. of bonus CFA remaining from the 1987 Regional Plan for Special Projects and Community Enhancement; and the 200,000 sq. ft. of bonus CFA that was authorized by the 2012 Regional Plan that may be released once the remaining 1987 plan supply is depleted. The model assumed that the remaining CFA assigned to jurisdictions (209,155) will be constructed within those jurisdictions by 2020. The remaining 360,347 sq. ft. of CFA is assumed to be used by 2035, see Table D.9. An explanation of how the CFA available for transfers was distributed is in the Residential and Commercial Transfer Assumptions section.

Table D.9: Commercial Floor Area (CFA) Accounting[12]

Jurisdiction	Remaining from 1987 Plan and 2012 Plan	CFA Constructed in 2013 and 2014	Accounting as of End of 2014[13]	CFA Remaining from the 1987 Plan, Accounting as of end of 2014 [14]
CSLT (various eligible areas)	52,986	8,847	44,139	
Douglas County (South Shore Area Plan is the eligible area)	36,250	2,730	33,520	
El Dorado County (Meyers CP is the eligible area)	36,150	2,500	33,650	
Placer County (eligible areas include Carnelian Bay CP, Kings Beach CP, Kings Beach Industrial CP, North Stateline CP, Placer non CP, and Tahoe City CP)	72,609	0	72,609	
Washoe County (eligible area is non CP areas)	2,000	0	2,000	
Homewood CEP			23,237	
TRPA pool for transfer match from sensitive lands (referred to as TRPA Special Project, CEP Pool)	0	0	0	160,347
TRPA pool for transfer match from sensitive lands (2012 Regional Plan update, available after 1987 Plan is exhausted)				200,000
Totals	199,995	14,077	209,155	360,347

Source: TRPA Code of Ordinances, effective February 9, 2013, Section 50.4, Allocation of Commodities and Development Rights Accounting, Table 50.4.1-1; and Research and Analysis Division, August 2015.

Tourist Accommodation Units (TAUs): The model assumed 342 TAUs were remaining from the 1987 plan as of December 31, 2014. Of these remaining TAUs, a total of 180 were already assigned to individual Community Plans or CEP projects, and these TAUs were distributed in the model as assigned, and assumed to be used by 2020. Based on supply and demand and market considerations, all of the remaining 162 TAUs were assigned as a bonus unit match for the hypothetical transfer of a South Lake Tahoe motel

[12] The estimated development as of 2014 was modeled using best available information at the time of the model run. TRPA has since published an updated accounting of development rights in the 2015 Threshold Evaluation Report (see TRPA 2015 Threshold Evaluation Report, Implementation Chapter, http://www.trpa.org/wp-content/uploads/18_Ch12_Implementation_FINAL_9_30_2016.pdf).
[13] Assumed to be constructed by 2020
[14] Assumed to be constructed by 2035

located in a Stream Environment Zone outside of a Center. A parcel in Tahoe City (within the Center) in Placer County is modeled as the receiving area for this transfer. See Table D.10.

Table D.10: Tourist Accommodation Unit Distribution Summary[15]

Jurisdiction	Remaining TAUs from 1987 Plan, assumed to be used by 2020	Remaining TAUs (assumed to be used by 2035)	Total
City of South Lake Tahoe	*25*		25
Douglas	*25*		25
El Dorado	*10*		10
Placer	*25*		25
Homewood[16]	*50*		50
Washoe	*45*		45
TRPA Pool		162	162
Total	180	162	342

Residential and Commercial Transfer Assumptions

Residential Bonus Units: As noted in the Residential Bonus Unit description above, a total of 1,474 RBUs are available for adopted programs including the Special Projects or Community Enhancement Programs (CEP) which allocate bonus units for projects that result in substantial or threshold-related environmental gain and/or rehabilitation of substandard development (see Code Chapters 50-53); and as an incentive to property owners who transfer existing residential development or development rights from areas less suitable for development to within Town Centers, the Regional Center, or the High Density Tourist District (collectively referred to as Centers or Receiving Areas). For transfers, different numbers of RBUs are offered depending on whether existing development is torn down and the parcel restored or whether a development right is transferred off an undeveloped parcel and the parcel is then protected from future development. More RBUs are offered for transfers of development from land that is more sensitive than for transfers from land that is less sensitive. More RBUs are also offered for transfers that are from parcels further from major transportation routes. Any one parcel may combine RBUs offered based on the sensitivity of the sending parcel with RBUs offered based on the distance from transportation routes or receiving areas. This results in a total of 30 different possible transfer ratios based on the land capability of the sending site, its distance from primary transit routes, and whether existing development is present. Based on these factors, each eligible parcel could earn a total of between 0 and 5 RBUs. Table D.11 shows the RBU transfer ratios for different categories of sending parcels.

[15] Note: This table shows modeled numbers. Current accounting differs slightly from the modeled numbers.
[16] These were taken from the TRPA Pool.

To evaluate the potential effects of the residential transfer incentives shown in Table D.11, TRPA modeled likely transfers of residential uses. Since it is impossible to know exactly how many and which parcels would utilize the residential transfer incentives, it was necessary to make a series of reasonable assumptions based on the best available information. These assumptions are described in more detail below, and relate to the following: 1) the total number and rate of RBU utilization, 2) the proportion of units assigned to existing development transfers and development rights transfers; 3) the number of transfers from each combination of land capability and distance categories; and 4) the proportion of development transferred to each receiving area. Once these assumptions were made, the resulting changes in the distribution and number of residential units were incorporated into the transportation model.

Table D.11: Residential Bonus Unit Incentives for Transfers of Development to Centers

1) Land Capability Classification		
	Transfer Existing Development (ERU, CFA, TAU) to Town Centers, Regional Centers and/or the High-Density Tourist District and restore and retire parcel	Transfer Development Right to Town Centers, Regional Centers and/or the High-Density Tourist District and retire parcel
Stream Environment Zone (SEZ)	1:3	1:1.5
Sensitive Lands (1a, 1c, 2 and 3) other than a SEZ	1:2	1:1.25
Non-Sensitive lands (4, 5, 6 and 7)	1:1	1:1
2) Distance from Primary Transit Routes (additional transfer ratio only available for transfers of residential development and development rights into Centers)		
Less than ¼ Mile or on the Lake-ward side of primary transit routes	1:1	
¼ Mile to ½ Mile	1:1.25	
½ Mile to 1 Mile	1:1.5	
1 Mile to 1½ Mile	1:1.75	
Greater than 1½ Mile	1:2	

Source: TRPA Code of Ordinances Sections 51.3 and 51.5.

Total Number and Rate of RBU Utilization: A total of 1,089 RBUs were modeled as available and unassigned (i.e. not already allocated to a pending development project). This included an estimated 489 RBUs carried over and available from the RBUs authorized in the 1987 Regional Plan, as well as 600 new RBUs. Under the existing Regional Plan, these RBUs can only be assigned in the following ways: for projects that construct deed-restricted, affordable housing, RBUs can be earned through completion of mitigation above and beyond that required for project approval (pursuant Code section 52.3.3); or they can be assigned as incentives for transfer of existing development or development rights into Centers.[17]

[17] In addition to RBU transfer incentives; there are other programs to incentivize transfer of development into Centers. These include: increasing the maximum coverage allowed for a redevelopment project in a receiving area (pursuant to Section 30.4.2.B in the TRPA Code), allowing

The existing sensitive lot retirement program has demonstrated that demand exists for incentives that encourage property owners to retire sensitive lots. The sensitive lot retirement program provides an allocation to property owners who retire a sensitive lot. Since the sensitive lot retirement program went into effect in 1999, 233 lots have been retired in exchange for an allocation. The allocation offered under this program is substantially less of an incentive than the bonus units (i.e. the one allocation earned under the sensitive lot program still needs to be paired with a development right, whereas the 2012 Regional Plan allows up to 5 bonus units to be earned for transferring one unit, and these bonus units do not require a development right). In addition, several 2012 TRPA Regional Plan policies encourage the reservation of RBUs for transfers since they support the restoration of Sensitive Lands and incentivize the transfer of development from Sensitive Lands and outlying residential areas to Centers (LU-3.5, LU-3.6, LU-3.7, and LU-3.8). It is reasonable to assume that the majority of available RBUs would be used for the transfer of residential development given the large number of properties that would be eligible for the residential transfer incentives, the additional incentives, the Regional Plan goals, and the high amount of demand demonstrated by participation in a more limited program that offered fewer incentives. Of the total supply of Residential Bonus Unit supply available in the TRPA pools, 10% were set aside for affordable housing projects, leaving a total of 981 Residential Bonus Units available for residential transfers. Therefore, the model assumes that approximately 80% of the available RBUs (785 out of a total of 981) would be used to facilitate the transfer of residential development right transfers, and 20% (196 out of a total of 981) would be used to facilitate the transfer of existing residential development. This results in utilization of 196 Residential Bonus Units for Existing Residential Development and 785 for Development Right transfers and a total of 981 Residential Bonus Units used for all the modeled transfers (Tables Table D.13 and Table D.14).

Proportion of Units Assigned to Existing Development Transfers and Development Rights Transfers: It is necessary to make an assumption about the proportion of transfers that would occur from developed and from undeveloped parcels. Two different sets of residential transfer incentives are available including the transfer of residential development rights to Centers which requires sending development rights from vacant eligible parcels (TRPA Code Section 51.3) and the transfer of existing residential development to Centers which requires transferring existing residential development from eligible built parcels (TRPA Code Section 51.5). Undeveloped parcels are less expensive to purchase than developed parcels and therefore more likely to be acquired by a project proponent acquiring development rights for a transfer. In addition, the transfer of existing development requires investment involved with the demolition of development and restoration of land. Many undeveloped parcels eligible for RBUs are in Sensitive Lands. These Sensitive parcels are subject to greater development restrictions and, therefore, they are very unlikely to be developed. The most likely use for these parcels is a transfer of development rights. While there are more eligible developed parcels than undeveloped parcels and a higher number of RBUs are offered for transfers of existing development, the lower cost and limited uses of undeveloped sensitive parcels would make it likely that significantly more development rights would be transferred than existing development. Therefore, the model assumed that approximately 80% (or 785 Residential Bonus Units and 1,109 development rights) of transfers would be sent from undeveloped parcels and approximately 20% (or 196 Residential Bonus Units and 143 existing units) would be sent from developed parcels.

Number of Transfers from Each Combination of Land Capability and Distance Categories: Fourteen possible combinations of land capability categories and distance categories provide bonus unit incentives for transfers of existing residential development, and an additional fourteen categories provide bonus unit incentives for transfers of development rights (although fifteen combinations are shown in the tables below, one of them has a transfer ratio of 1:1, and is therefore not considered to provide an incentive). Once the proportion of transfers of existing development and transfers of development rights was

transfers of non-conforming coverage from sensitive land (pursuant to Section 30.4.2.C in the TRPA Code), and increasing allowable multi-family residential density (pursuant to Section 31.3 and 31.4 in the TRPA Code and with the adoption of an Area Plan, Centers can receive up to 25 units per acre of Multi-Family Development), among other incentives. In combination with the residential bonus units, these measures serve to incentivize transfers of residential units for redevelopment projects in receiving areas.

established, it was necessary to make assumptions about the number of units moved within each category. Table D.13 and Table D.14 show each possible combination of land capability and distance categories for both developed and undeveloped parcels, list the transfer ratio for each combination, and show the number of bonus units received for modeled transfers. The tables show the number of units transferred and bonus units provided by the years 2020 and 2035, and the percent of all eligible parcels utilizing the transfer incentive program within each category.

As described above, fewer transfers are expected from existing residentially developed parcels. The transfers from existing residentially developed parcels are anticipated to follow a similar pattern as the transfers from undeveloped lands. More transfers are assumed to come from sensitive land because they receive more transfer incentives, and redevelopment and expansion of those parcels is constrained by coverage limitations and other restrictions. A total of 34 eligible developed SEZ parcels (out of a total of 3,387 eligible parcels) and 22 sensitive parcels (out of a total of 2,163 eligible parcels) are assumed to participate in the transfer program. A lower proportion of developed parcels on high capability land are assumed to transfer due to the lower incentives offered for those parcels and the lack of constraints to redevelopment. A total of 87 eligible high capability developed parcels (out of a total of 12,794 parcels eligible for transfer bonus incentives) are assumed to participate (Table D.13 and Table D.14).

Proportion of Development Transferred to Each Receiving Area: Once the assumptions described above were made regarding sending parcels, an assumption was necessary about the distribution of the transferred development rights and RBUs within the various receiving areas. The proportion of transferred development rights and RBUs assigned to each receiving area was determined based on the level of redevelopment that has already occurred within each receiving area and the size of receiving areas. TRPA and local jurisdiction staff familiar with development trends in the receiving areas were consulted to determine the level of development or redevelopment likely to occur within each receiving area. Receiving areas that have experienced more redevelopment recently were expected to provide fewer opportunities for future redevelopment and receive fewer transferred development rights and RBUs. Smaller receiving areas were presumed to offer fewer opportunities for receiving transferred development rights and RBUs than larger receiving areas. The assumed percent of development transferred to each TRPA designated Center (or receiving area) is provided in

Table *D.12*. TRPA designated Centers are shown for the North and South shores in Figure D.*1* and D.2

Table D.12: Proportion of development transferred to each receiving area

Jurisdiction	Center	Percent
City of South Lake Tahoe	Regional Center	20%
	South "Y"	20%
Placer County	Kings Beach	15%
	Tahoe City	5%
	North Stateline	2.5%
Washoe County	Incline Village	5%
	North Stateline	2.5%
Douglas County	High Density Tourist District	20%
	Kingsbury	5%
El Dorado County	Meyers	5%
Total		**100%**

Figure D.1: North Lake Tahoe Traffic Analysis Zones and Centers

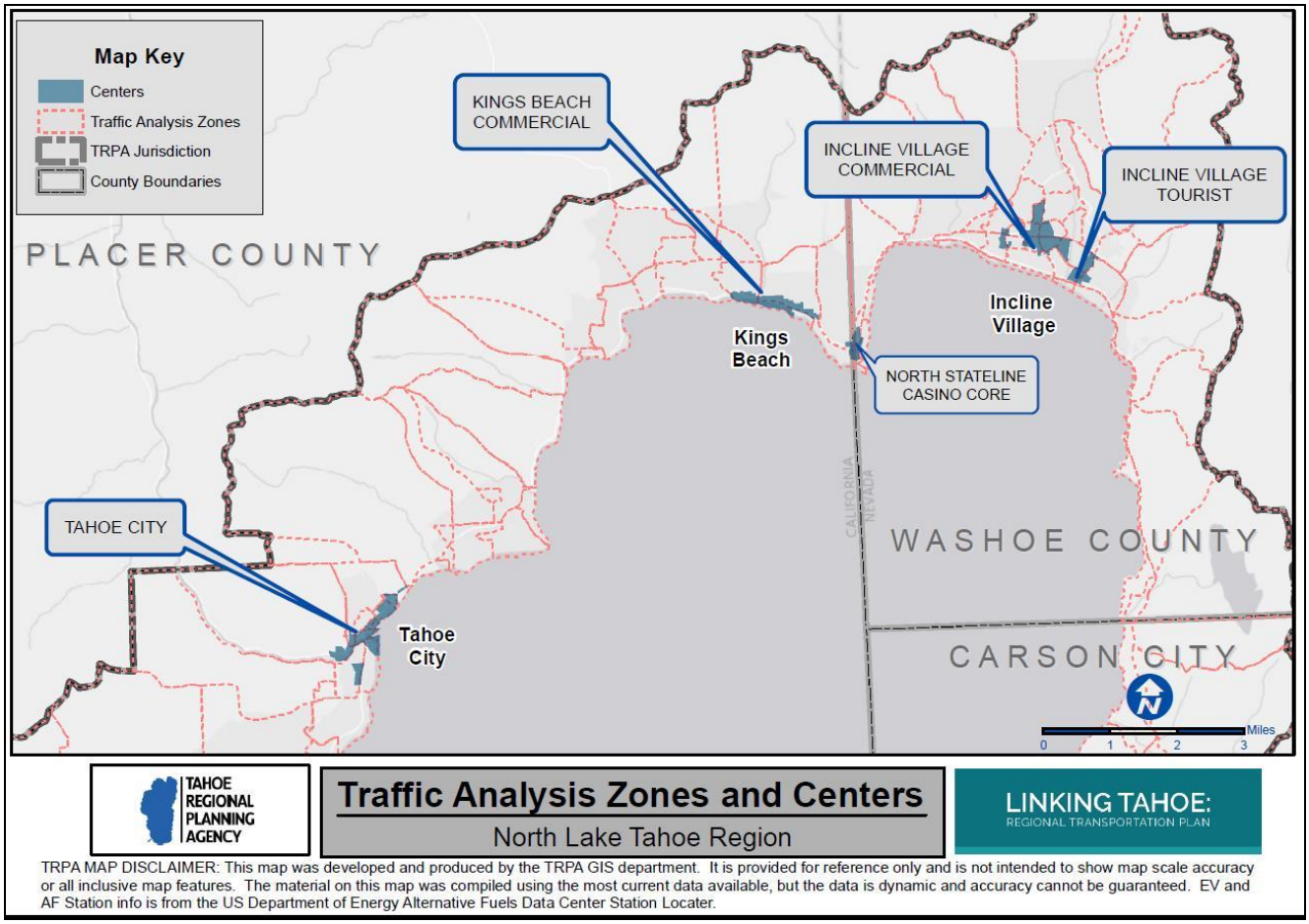
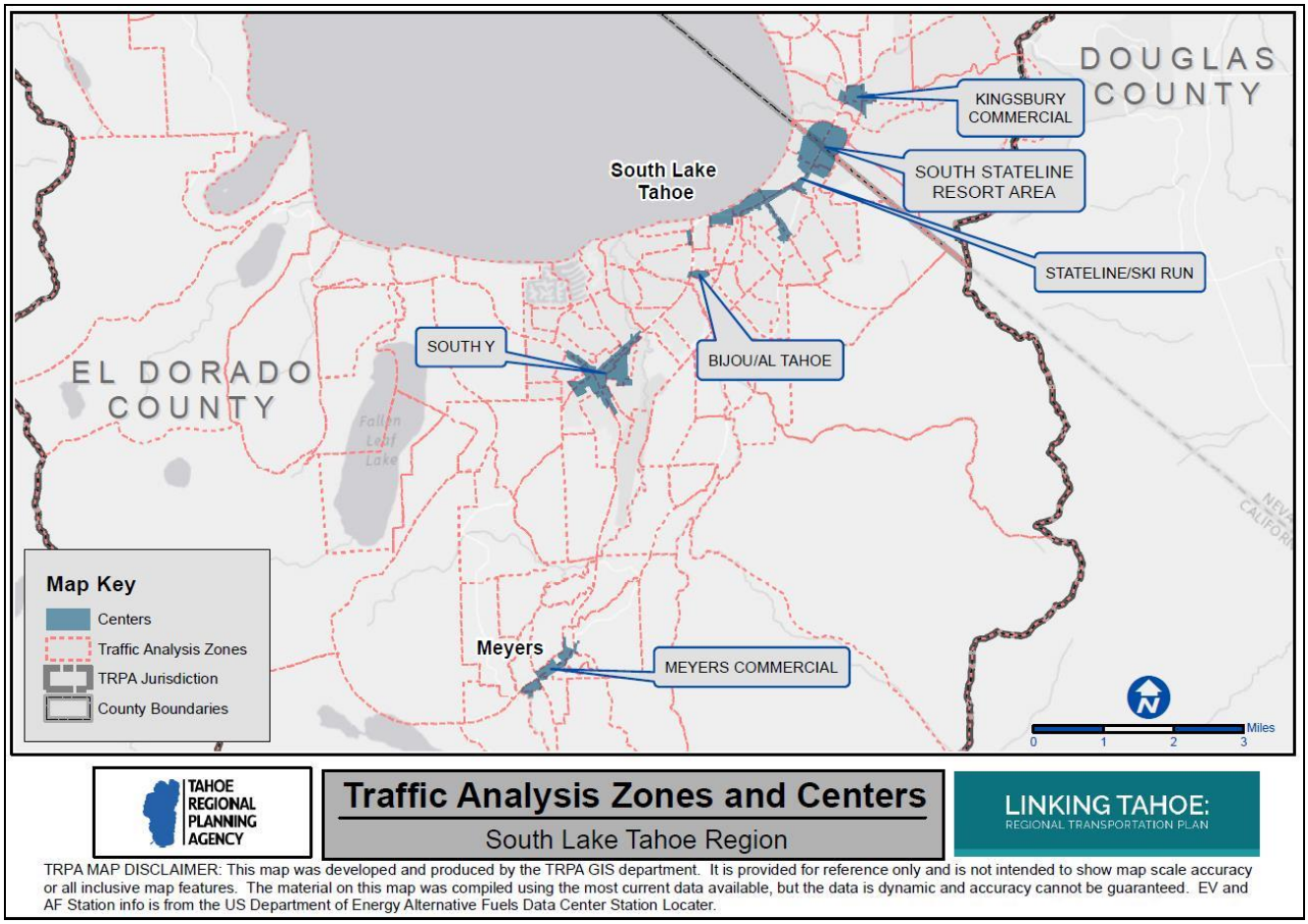


Figure D.2: South Lake Tahoe Traffic Analysis Zones and Centers



Residential Bonus Unit Modeling Approach

To input the residential transfer assumptions into the transportation model, TRPA used the best available GIS data to perform the following steps (described generally):

Existing Residential Development Transfers:

1. Identify eligible Sending parcels in the Region by selecting parcels outside of TRPA designated Centers, not owned by public agencies. Then, pursuant the respective property assessor descriptions, select only the parcels described as having existing residential development (such as Single Family dwelling) and as a safeguard, retain only the parcels with building footprint(s) as indicated by the 2010 impervious dataset (Spatial Informatics, Inc.).

2. Identified the land capability category (e.g. 1b), pursuant to the Bailey-Sinclair land capability classifications and transfer ratio data, and the distance category (e.g. >1.5 miles) measured as "a crow flies" for each of the selected parcels in the Region. Then randomly select the appropriate number of existing residential parcels within each combination of land capability, distance, and development categories based on the assumptions shown in Table D.13.

3. Removed those existing residential development sending parcels from the sending Traffic Analysis Zone (TAZ). TAZs are a modeling unit in the transportation model. Then assigned those residential units to receiving area TAZs as shown in above

4. Table D.12 (these parcels were evenly distributed to all the TAZs within each respective Center).

5. Calculated total number of units leaving each TAZ and total number to be received by each TAZ and incorporated into the transportation model.

Residential Development Rights Transfers:

1. Identify eligible Sending parcels in the Region by selecting parcels outside of TRPA designated Centers, not owned by public agencies. Next, pursuant the respective property assessor descriptions select only the parcels described as having vacant (private) existing land uses and as a safeguard, retain only the parcels without building footprint(s) as indicated by the 2010 impervious dataset (Spatial Informatics, Inc.).

2. Identified the land capability category (e.g. 1b), pursuant to the Bailey-Sinclair land capability classifications and transfer ratio data, and the distance category (e.g. > 1.5 miles) measured as "a crow flies" for each of the selected parcels in the Region. Then randomly select the appropriate number of existing residential parcels within each combination of land capability, distance, and development categories based on the assumptions shown in Table D.14.

3. Removed those residential development rights sending parcels from the sending Traffic Analysis Zone (TAZ), and assigned those residential units to receiving areas at the proportions shown in above

4. Table D.12 (these parcels were distributed evenly across all TAZs within each respective Center). For each transfer of development right, one new Residential Allocation was used (these Residential Allocations were evenly deducted from each model year) in conjunction with the transferred development right and the resulting residential unit was assigned to the receiving area.

5. Calculated total number of units leaving each TAZ and total number to be received by each TAZ and incorporated into the transportation mode

Table D.13: The transfer ratios and number of bonus units earned for transfers of existing residential development, the percent of eligible parcels, the modeled number of units moved from each sending category, and the number of bonus units provided

Existing Residential Development (See Section 51.5.3, Transfer of Existing Development to Centers)		Transfer Ratio (Sending: Receiving)	Bonus Units Per Transfer (TRPA Match)	Total Eligible Parcels (GIS Analysis Based Estimate[1])	Percent of Total Eligible Parcels from Each Category (Eligible units/total)	**Adjusted Existing Units Transferred 2015-2020 (Sending Parcels)	**Adjusted Existing Units Transferred 2021-2035 (Sending Parcels)	Total Bonus Units Available for 2015-2020 (Rounded down***)	Bonus Units Available for 2021-2035 (Rounded down***)	*Total Bonus Units Available for both model years (Rounded down***)*
Less than 1/4 mile from primary transit routes	SEZ	1:3	**2**	2,292	12%	3	6	*6*	*12*	*18*
	Sensitive	1:2	**1**	1,197	7%	2	3	*2*	*3*	*5*
	High Capability	1:1	**0**							
1/4 to 1/2 mile from primary transit routes	SEZ	1:3.75	**2.75**	287	2%	2	4	*5*	*11*	*16*
	Sensitive	1:2.5	**1.5**	337	2%	1	2	*1*	*3*	*4*
	High Capability	1:1.25	**0.25**	5,291	29%	12	20	*3*	*5*	*8*
1/2 mile to 1 mile from primary transit routes	SEZ	1:4.5	**3.5**	409	2%	3	5	*10*	*17*	*27*
	Sensitive	1:3	**2**	493	3%	2	6	*4*	*12*	*16*
	High Capability	1:1.5	**0.5**	3,885	21%	12	20	*6*	*10*	*16*
1 mile to 1.5 mile from primary transit routes	SEZ	1:5.25	**4.25**	109	1%	2	3	*8*	*12*	*20*
	Sensitive	1:3.5	**2.5**	59	0%	1	2	*2*	*5*	*7*
	High Capability	1:1.75	**0.75**	1,998	11%	3	8	*2*	*6*	*8*
Greater than 1.5 mile from primary transit routes	SEZ	1:6	**5**	290	2%	2	4	*10*	*20*	*30*
	Sensitive	1:4	**3**	77	0%	1	2	*3*	*6*	*9*
	High Capability	1:2	**1**	1,620	9%	3	9	*3*	*9*	*12*
				18,344	100%	49	94	65	131	*196*

Notes:
*Distance measured 'as a crow flies'. Total bonus units, rounded down correspond with above Table D.8.

***After calculating the Bonus Units gained per transfer ratios, these numbers are rounded down (pursuant policy/procedures, Current Planning). GIS analysis was used to determine the number of eligible parcels (property assessor information, TRPA Regional Land Uses, TRPA IPES data, and the Impervious Surface data produced in 2010 by Spatial Informatics).

Table D.14: The transfer ratios and number of bonus units earned for transfers of residential development rights, the modeled number of units moved from each sending category, the number of bonus units provided, and the percent of eligible parcels

Residential Development Rights (See Section 51.3. and Table 51.3.6-1, Transfer of Development Rights to Centers)		Transfer Ratio (Sending: Receiving)	Bonus Units Per Transfer (TRPA Match)	Total Eligible Parcels (GIS Analysis Based Estimate[2])	Percent of Total Eligible Parcels from Each Category (Eligible units/total)	**Adjusted Existing Units Transferred 2015-2020 (Sending Parcels)	**Adjusted Existing Units Transferred 2021-2035 (Sending Parcels)	Total Bonus Units Available for 2015-2020 (Rounded down***)	Bonus Units Available for 2021-2035 (Rounded down***)	*Total Bonus Units Available for both model years (Rounded down***)*
Less than 1/4 mile from primary transit routes	SEZ	1:1.5	**0.5**	158	5%	16	40	*8*	*20*	*28*
	Sensitive	1:1.25	**0.25**	207	6%	12	40	*3*	*10*	*13*
	High Capability	1:1	**0**							
1/4 to 1/2 mile from primary transit routes	SEZ	1:1.875	**0.875**	33	1%	2	6	*1*	*5*	*6*
	Sensitive	1:1.5625	**0.5625**	51	1%	3	8	*1*	*4*	*5*
	High Capability	1:1.25	**0.25**	751	22%	80	160	*20*	*40*	*60*
1/2 mile to 1 mile from primary transit routes	SEZ	1:2.25	**1.25**	82	2%	20	51	*25*	*63*	*88*
	Sensitive	1:1.875	**0.875**	77	2%	12	30	*10*	*26*	*36*
	High Capability	1:1.5	**0.5**	879	25%	80	160	*40*	*80*	*120*
1 mile to 1.5 mile from primary transit routes	SEZ	1:2.625	**1.625**	18	1%	4	6	*6*	*9*	*15*
	Sensitive	1:2.1875	**1.1875**	16	0%	2	4	*2*	*4*	*6*
	High Capability	1:1.75	**0.75**	572	17%	36	60	*27*	*45*	*72*
Greater than 1.5 mile from primary transit routes	SEZ	1:3	**2**	67	2%	18	38	*36*	*76*	*112*
	Sensitive	1:2.5	**1.5**	22	1%	2	4	*3*	*6*	*9*
	High Capability	1:2	**1**	526	15%	80	135	*80*	*135*	*215*
				3,459	100%	***367***	***742***	262	523	*785*

Notes:
1) Distance is measured as a crow flies from a primary transit route.
2) GIS analysis was used to determine the number of eligible parcels (property assessor information, TRPA Regional Land Uses, TRPA IPES data, and the Impervious Surface data produced in 2010 by Spatial Informatics).

Commercial Transfer Assumptions Overview: The model assumed 160,347 sq. ft. of Commercial Floor Area (CFA) remaining from the 1987 Regional Plan and 200,000 sq. ft. of CFA allocated in the 2012 Regional Plan would be available for transfers. Both of these supplies are in the TRPA pool and are assigned to incentivize transfers from environmentally sensitive land, anywhere in the Lake Tahoe Region. The model assumed that all 360,347 of this CFA would be distributed in the 2020-2035 model timeframe, while the 209,155 sq. ft. of CFA that has already been assigned to jurisdictions, but not yet constructed, was assumed to be used in the 2015 – 2020 timeframe. An overall total of 360,347 sq. ft. of CFA was included in the modeling of commercial related transfers. This CFA is available as an incentive to property owners who transfer existing eligible commercial development from environmentally sensitive areas, deemed less suitable for development, into Town Centers, the Regional Center, or the High-Density Tourist District. The following assumptions were made about the portion of development transferred from Sending Areas and to Receiving Areas.

Proportion of Commercial Development Transferred from Sending Areas: For transfers, more CFA sq. ft. is offered for transfers of existing development from more sensitive lands than for transfers from less sensitive lands. Specifically, the transfer ratio from Stream Environment Zones with a land capability classification of 1b (SEZs) is 1:3; meaning that for every square foot of CFA transferred from an SEZ into a Center, two square feet of CFA bonus units are available (see Table D.15 for more information). Additionally, the transfer ratio is 1:2 for transfers out of environmentally sensitive lands other than SEZs with a land capability classification of 1a, 1c, 2, or 3 into a Center. The model assumed that equal transfers would occur from SEZs and other environmentally sensitive lands since the incentives are comparable and higher than a transfer from non-environmentally sensitive lands. The model does not include transfers from non-environmentally sensitive, high capability lands since there would not be any transfer incentives for these types of transfers.

Proportion of Development Transferred to Each Receiving Area: Under the existing Regional Plan, various policies act as incentives to promote transfers into Centers (receiving areas). These include: increasing the maximum coverage allowed for a redevelopment project in a receiving area (pursuant to Section 30.4.2.B in the TRPA Code), allowing transfers from sensitive land to transfer non-conforming coverage (pursuant to Section 30.4.2.C in the TRPA Code), among other incentives. In combination with the bonus units, these measures serve to incentivize transfers of commercial establishments for redevelopment projects into receiving areas.

Similar to the Residential Bonus Unit transfer program, the proportion of transferred CFA assigned to each receiving area was determined based on the level of redevelopment that has already occurred within each Center and the size of receiving areas. These proportions were the same as those used for the Residential Bonus Unit transfers, and are shown in

Table D.12. The assumed percent of development transferred to each receiving area and the associated percent and amount of transferred CFA and bonus CFA from SEZs and other environmentally sensitive areas is provided below in Table D.16, for the 2021-2035 model timeframe.

Table D.15: Existing Development Transfer Ratios (TRPA Code Section 51.5.3)

Existing Commercial Development	Transfer Ratio (Sending: Receiving)	Bonus Units Per Transfer (TRPA Match)	% of Eligible CFA Allocations Transferred from Each Category (Eligible units/total)
SEZs	1:3	2	50.0%
Other Sensitive Lands	1:2	1	50.0%

Table D.16: The proportion of development transferred to each Receiving Area based on the supply, the transfer ratios, and number of units and bonus units earned for CFA transfers for the 2021-2035 modeled timeframe.

Center Name (Receiving Areas for Transfers)	Jurisdiction	Percent to be Transferred	Total Existing Business Sq. Ft. of CFA Transferred from SEZ to Center	Total Bonus CFA Match for SEZ Transfers (Transfer Ratio of 1:3 or double of existing CFA)	Total Existing Business Sq. Ft. of CFA Transferred from Other Sensitive Lands to Center	Total Bonus CFA for Other Sensitive Land Transfers (Transfer Ratio of 1:2)	Total Bonus CFA (SEZ & Other Transfers)
High density tourist district	Douglas	20%	24,023	48,046	24,023	24,023	72,069
Kingsbury	Douglas	5%	6,006	12,012	6,006	6,006	18,017
Regional center	CSLT	20%	24,023	48,046	24,023	24,023	72,069
South "Y"	CSLT	20%	24,023	48,046	24,023	24,023	72,069
Meyers	El Dorado	5%	6,006	12,012	6,006	6,006	18,017
Incline Village	Washoe	5%	6,006	12,012	6,006	6,006	18,017
North Stateline, Washoe	Washoe	4%	4,420	8,841	4,420	4,420	13,261
North Stateline, Placer	Placer	1%	1,586	3,171	1,586	1,586	4,757
Tahoe City	Placer	5%	6,006	12,012	6,006	6,006	18,017
Kings Beach	Placer	15%	18,017	36,035	18,017	18,017	54,052
Total	0	100%	120,116	240,231	120,116	120,116	360,347

Source: TRPA, 2016.

Commercial Transfer Assumptions Model Approach

To run the commercial transfer model and produce an output to be used in the transportation model, TRPA used the best available GIS data to perform the following steps:

1) Identified the commercial establishments using the InfoGroup Business dataset (2014) in the SEZ and Environmentally Sensitive lands other than SEZs based on the land capability category pursuant to the Bailey-Sinclair land capability designations. Included only the business establishments eligible for transfers (for example certain types were excluded, such as Automated Teller Machines - ATMs, Accessory CFA, tourist accommodation facilities, home businesses, and government/educated related establishments). Excluded those businesses located inside Centers. Accessory CFA is accessory commercial uses designed to serve the primary commercial uses and that meet all the criteria specified in Code Chapter 21. Examples include: employee facilities, restricted gaming (Nevada only), ski rental shops in ski areas, gift shops in airports, tackle shops used by patrons of marinas, restaurants in a hotel, pro shops at golf courses, and cafeterias in hospitals. See Code Chapters 21, 50, and 90 for additional detail. Derived ground floor CFA for the above identified parcels with businesses eligible for CFA based on the building footprint areas provided in the 2010 Impervious Surface GIS dataset.

2) Assigned the appropriate transfer ratio to each eligible parcel based on land capability category.

3) Randomly selected the appropriate number of business establishments to meet the target CFA to be transferred to Centers. Businesses were selected in the corresponding jurisdiction where the Centers were located.

4) Removed the CFA from the sending Traffic Analysis Zone (TAZ) and assigned the CFA to receiving areas at the proportions shown in the above tables (and distributed evenly across all TAZs within the receiving area).

5) Calculated total number of units leaving each TAZ and total number to be received by each TAZ and incorporated into the transportation model.

Tourist Lodging Transfer Assumptions Model Approach

1) Identified the tourist lodging establishments using the InfoGroup Business dataset (2014) in the SEZ and Environmentally Sensitive lands other than SEZs based on the land capability category pursuant to the Bailey-Sinclair land capability designations. Excluded tourist lodging located inside Centers.

2) Assigned the appropriate transfer ratio to the eligible parcel based on land capability category (1:3 for transfer of existing development out of a SEZ to a Center).

3) Based on supply and demand and market considerations, all of the remaining 162 TAUs were assigned as a bonus unit match for the transfer of a South Lake Tahoe motel located in a Stream Environment Zone outside of a Center. A parcel in Tahoe City (within the Center) in Placer County is modeled as the receiving area for this transfer.

4) Removed the TAUs from the sending Traffic Analysis Zone (TAZ) and assigned the TAUs to receiving areas at the proportions shown in the above tables (and distributed evenly across all TAZs within the receiving area).

5) Calculated total number of units leaving each TAZ and total number to be received by each TAZ and incorporated into the transportation model inputs for TAU by TAZ.

Visitor Assumptions

In addition to assumptions about the distribution of development, another factor that influences transportation model outputs is the amount of visitation to the Region. There are two inputs to the model that most directly impact the model's estimation of visitation to the Region, and those are hotel and motel occupancies, and the percent of housing that is owned as a second home and operated as a seasonal residence or a vacation rental. The assumptions used in the 2020, 2035 and 2040 forecast years for the 2017 RTP are described below, as well as assumptions for day visitors.

Hotel/Motel Occupancies: A key factor in estimating future traffic volumes and vehicle miles traveled are assumptions related to the number of overnight visitors coming to the Region. It is very difficult to predict future levels of visitation to the Region because visitation can be influenced by a number of external factors such as population growth in nearby counties, the overall state of the economy, gas prices, and the weather, to name a few. With the exception of population growth in nearby counties, there is very little in the way of statewide or nation-wide forecasts to assist with predictions.

In light of the available data, to develop reasonable assumptions about overnight visitor growth, TRPA considered a variety of sources: 1) population forecasts; 2) the recent "Bay to Tahoe Basin Recreation and Tourism Rural Roadway Impact Study" completed by El Dorado County in October 2014; and 3) input from local lodging representatives and visitor authorities, and the Strategic Marketing Group, a marketing consulting firm

that provides marketing and strategic planning services for the tourism, recreation, and hospitality industries. The assumptions made in the model err on the side of high visitor growth, in order to maintain a conservative analysis of the potential increase in VMT over the next 20 years.

1) Population Forecasts. The state demographer's office for California and Nevada maintain population forecasts by county by decade. These were analyzed for the counties housing major population centers and that are a high source of tourists for the Lake Tahoe Region. On the California side these counties included Alameda, Contra Costa, El Dorado, Sacramento, San Francisco, Santa Clara, and Yolo counties which house the major population centers of the San Francisco Bay Area, San Jose, and Sacramento. Between 2010 and 2020, 2030, and 2040, population in these areas was projected to grow approximately 1% per year (California Department of Finance, Report P-1, State and County Population Projections by Major Age Groups, December 15, 2014). Growth in the working age population group, ages 25-64 years, was projected to grow even less in these counties, only slightly more than a half a percent per year. On the Nevada side, Washoe County projects 1-2% growth per year between 2013 and 2033, with an overall average annual growth rate of 1.2%. This estimate incorporates the addition of the Tesla factory (Nevada State Demographer's Office, Nevada October 2014 Population Projections).

2) Bay to Tahoe Basin Recreation and Tourism Rural Roadway Impact Study. The purpose of this study was to evaluate the impacts of regional tourism travel on the highway system within the Study Area, evaluate the existing and future tourism market, associated impacts and needs based upon existing conditions, and to provide an evaluation of existing transportation funding sources and programs and likely future funding opportunities. The Study Area for this report was comprised of four California counties: Amador, El Dorado, Placer, and Nevada, plus the Lake Tahoe Basin which included residents who live in the western-most sections of Washoe, Carson City, and Douglas counties, Nevada. The report analyzed visitor spending trends over the past ten to twelve years, as well as future planned developments and attractions that may influence visitor spending and travel. The study predicts that the North Shore of Lake Tahoe will continue recent trends and realize visitor-spending growth in the range of three to five percent, per year. For the South Shore, the study predicts that visitor-spending growth will be relatively flat, due to recent downturns in visitor spending in the gaming economy, with perhaps a slight upward trend representing trends of the past two years. The report notes that if new approved facilities come online, such as the Edgewood Tahoe Lodge, the South Shore could see a modest rate of growth at between one and three percent per year (page 4-13, Bay to Tahoe Basin Recreation and Tourism Rural Roadway Impact Study).

3) Consultation with marketing and tourism experts. TRPA staff contacted marketing and tourism experts from both the North and South Shores to test visitor assumptions. These experts noted that a flat or no-growth scenario is not unrealistic, given recent reductions in visitation. They also noted that increases in revpar (revenue per available room--calculated by dividing a hotel's total guestroom revenue by the room count and the number of days in the period being measured) rather than overall occupancy could be expected, but much of that growth would be in increase in room rates, because the quality of hotel rooms is increasing. When demand goes up, hotel prices increase, and occupancies remain static. They noted that there is room for growth in winter and the off-season more so than summer. (Carl Ribaudo, Strategic Marketing Group, August 12, 2015; Sandy Evans-Hall, Executive Director, North Tahoe Resort Association, August 13, 2015; Jerry Bindel, Chairman of the South Lake Tahoe Tourism Improvement District, August 20, 2015.)

   Based on the above three sources, the model assumed between a ¼% to ¾% increase per year (the same as in the 2012 model), depending on location, for a total of between 6-19% between 2015 and 2035.

Seasonal and Vacation Use: From a modeling perspective, it is important to understand what percentage of homes operate as seasonal homes or vacation rentals, because seasonal visitors and vacationers have different travel patterns than full-time residents. For instance, the average number of trips per day for a full-time

residential household is approximately 9.6, while lodging properties geared towards visitors generate approximately 10.6 vehicle trips per day (Institute of Transportation Engineers (ITE) Trip Generation, 8th Edition, trip generation rates for Single–Family Detached Homes versus Recreation and Timeshare Homes).

Fluctuations in the economy have led to changes over time in the levels of residential versus second homeownership. Census data shows that the proportion of total housing units that are in seasonal use or vacant has changed from 51 percent in 1990, to 45 percent in 2000, and back up to 51 percent in 2010 (Lake Tahoe RTP/SCS Final EIR/EIS, Volume 1, page 3-369)[18]. These percentages vary between the North Shore and the South Shore, with a greater proportion of housing units used seasonally on the North Shore (U.S. Census 1990, 2000, 2010) (Regional Transportation Plan EIR/EIS, page 3.12-5).

For the 2014 base year, the 2010 census data of occupancy rates by census tract were applied to the appropriate TAZs. Occupancy rates vary, but range from twelve percent to 71 percent Region-wide, indicating the percent of total housing in seasonal use or vacant ranges from 28 percent to 88 percent. In the modeling for 2017 RTP forecast years 2020 and 2035, the percentage of existing housing units in seasonal/occasional use was assumed to remain unchanged from the base year because there are no forecasts available to indicate whether residential occupancy rates or second homeownership will increase or decrease in the future.

Finally, of the homes that are used seasonally or are vacant, 44 percent of these are assumed to be occupied on a peak day in August, the timeframe for the travel model analysis. This percentage is also carried through into the forecast years of 2020 and 2035 (Tahoe Regional Transportation Survey).

Day-Use Visitation, and Addition of External Trips from Development adjacent to TRPA Boundaries: In order to fully recognize the growth potential of recent proposed development adjacent to the TRPA Study Area, TRPA staff canvased those public transportation agencies responsible for modeling adjacent to the Basin. As shown in Table D.18 below, TRPA staff contacted Caltrans, NDOT, SACOG, and the responsible Regional Transportation Commissions (RTCs) and their modeling staff to discern the relative differences in projected 2035 peak month average daily traffic volumes at the respective entry points. Of particular concern was recent proposed development along California State Route 89 (Squaw Valley) which was estimated to generate an additional 2,804 peak hour vehicle trips into the Lake Tahoe Basin, and along California State Route 267 where additional proposed development (Martis West) was proposed to generate additional traffic volumes of 1,051 peak hour trips into the Lake Tahoe Basin.

In order to account for this additional traffic growth, TRPA staff conducted a series of sensitivity analyses to better characterize the anticipated increase in day-use visitation and increase in projected traffic counts along the two corridors**.** Within the modeling framework**,** day-use visitation was originally generated from the 2005 travel survey records and has since been updated with the 2010-2011 License Plate and Postcard Survey. External station cordon counts are then used to calibrate the day-use population size, which is then indexed to the overnight visitor population. Therefore, if the overnight visitor population increases, the day-use visitation component of the model increases accordingly. Another factor that affects the day use population in the model is increases in commercial center and recreational amenities (i.e. beach attractiveness and gaming). Each of these areas is assigned an attraction value, which influences the number of day visitors that are assumed to come to the Basin each day. To reflect the potential growth along the two north entry-corridors, TRPA staff made slight adjustments to the hotel-motel occupancies as well as to beach attractiveness factors to influence greater day-use visitation from the two projects along the SR 89 and SR 267 corridors. The purpose of the analysis was intended to match the forecasted entry volumes forecasted in the Squaw and Martis Valley analyses to be commensurate with the forecasted model values. The comparison of TRPA modeled traffic entry volumes and the modeled entry volumes by adjacent metropolitan planning organizations is shown in Table D.17, below. For

[18] The American Community Survey (2009-2013) shows a slightly higher percentage of seasonal+vacant (55%), however the numbers from the decennial census were used for consistency with other data used throughout the model.

additional information concerning how the Lake Tahoe Transportation Model generates day visitation, refer to the Lake Tahoe Resident and Visitor Model; Model Description and Final Results, August 2007.

Table D.17: Comparison of TRPA modeled entry volumes and modeled entry volumes of adjacent MPOs

California Entries	2014 Count	2014 Model	2035 TRPA Model Volumes	2035 Outside Model Volumes		Reference
SR 89 MP 0.00 Alpine-El Dorado	3600	4446	5309	5400		Caltrans PSR (April 2012)
US 50 MP 65.62 Echo Lake Road	15300	13171	16053	17500		SACOG Model - Caltrans PSR
SR 89 MP 13.72 Squaw Valley Rd	15000	21253	25520	22080	2804	Truckee Model (Shaw) Caltrans PSR 2012
SR 267 MP 6.23 Martis Peak Rd	12900	16556	19243	16500	1051	Martis Valley Model (Shaw) Caltrans PSR 2012
	46800	55426	66125	61480		
Nevada Entries						
SR 207 ATR 0531509 - sta 0024	7301	8467	11503	8950		Douglas County (Jeff Foltz-Parsons)
US 50 ATR 252125	15202	19894	21939	15900		Carson City RTC (John Long DKS)
SR 431 sta 770	4949	11053	12317	9000		Washoe RTC (Xuan Wang)
	27452	39414	45759	33850		
Table Date: 3/10/2016						

Part 2: Estimation of Daily Regional VMT

Calibration of Model with Traffic Counts

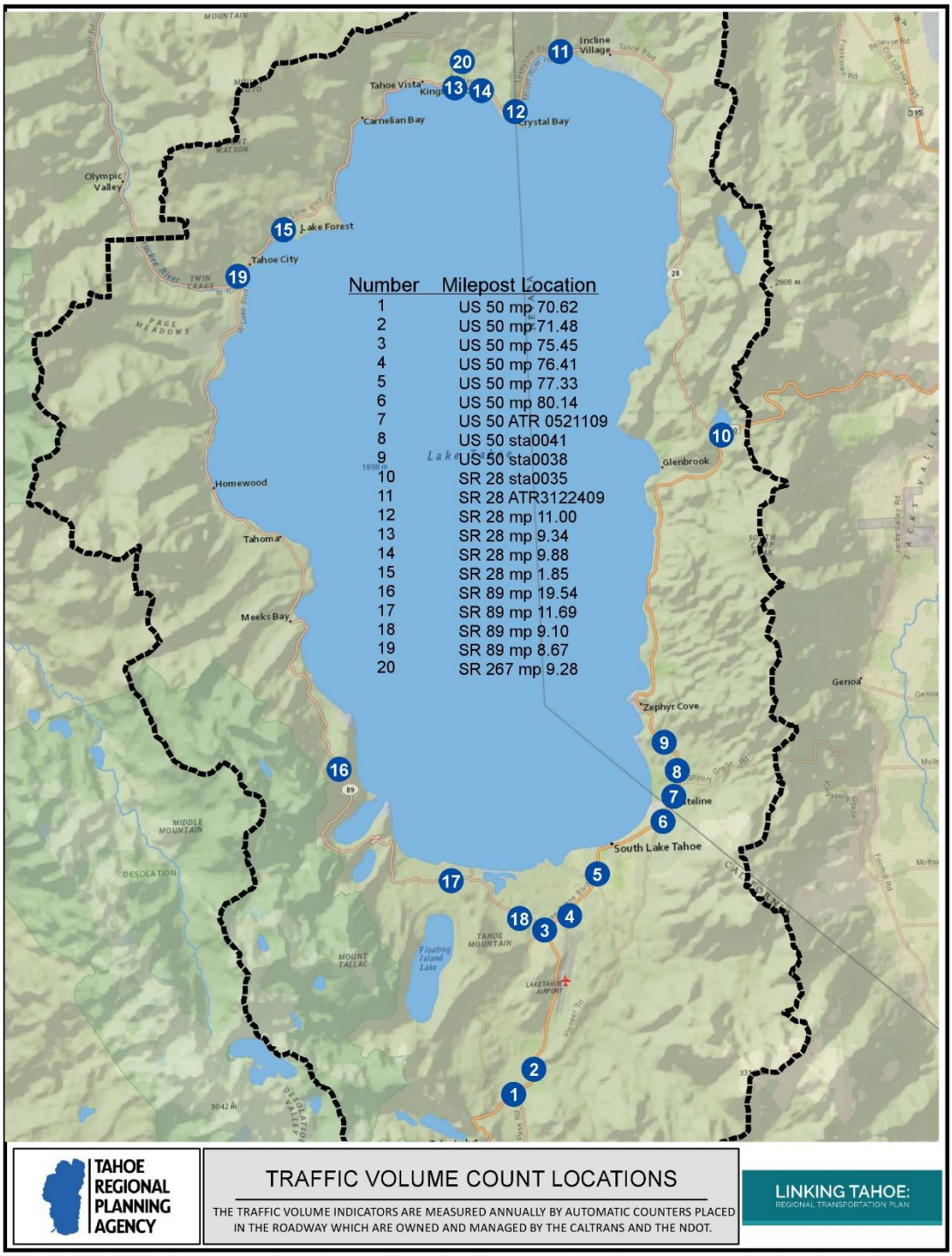
The raw VMT estimates output by the traffic model are compared, or "calibrated", using 20 traffic count stations continuously maintained by Caltrans and NDOT[19]. The distribution of the 20 continuously utilized internal count stations were primarily selected to correlate with the population differences between the south shore and north shore (two-thirds – one third, respectively) and to account for those permanent count stations where traffic is counted continuously. Notably, this dataset represents the best indicator of traffic levels available throughout the Tahoe Basin and across the necessary years of analysis. Count Station locations are shown in Figure D.3, and Table D.18 contains the percentage change in August daily traffic volumes as compared with 2015 traffic count data published by Caltrans and NDOT (latest available at the time this RTP was published).

Table D.18: Percentage Change in Peak Month (August) Daily Traffic Volumes

Percentage Change in Peak Month (August) Daily Traffic Volumes						
Count Location			1986 to 2015	2005 to 2015 (10-yr change)	2010 to 2015 (5-yr change)	2012 to 2015 (3-yr change)
1	US 50 mp 70.62	SR 89	-23%	4%	1%	1%
2	US 50 mp 71.48	Pioneer	1%	-3%	1%	1%
3	US 50 mp 75.45	Wye	-14%	0%	0%	0%
4	US 50 mp 76.41	Keys	-25%	5%	5%	5%
5	US 50 mp 77.33	Al Tahoe	-25%	4%	4%	-6%
6	US 50 mp 80.14	Park	-36%	-4%	7%	7%
7	US 50 ATR 0521109	Parkway	-22%	-12%	1%	-1%
8	US 50 sta 0041	Kingsbury	-12%	-3%	17%	21%
9	US 50 sta 0038	Elks Point	-4%	3%	-8%	51%
10	SR 28 sta 0035	Spooner	8%	5%	8%	25%
11	SR 28 ATR 3122409	W. Lakeshore	-14%	-10%	-4%	-1%
12	SR 28 mp 11.00	Stateline	-29%	-6%	4%	8%
13	SR 28 mp 9.34	SR 267	4%	7%	14%	6%
14	SR 28 mp 9.88	Coon St.	2%	15%	32%	35%
15	SR 28 mp 1.85	Lake Forest	-26%	-5%	0%	0%
16	SR 89 mp 19.54	Bliss Park	0%	-5%	-3%	0%
17	SR 89 mp 11.69	Fallen Leaf	12%	38%	47%	47%
18	SR 89 mp 9.10	10th St.	-13%	-9%	0%	0%
19	SR 89 mp 8.67	TC Wye	-6%	-23%	10%	10%
20	SR 267 mp 9.28	North Avenue	16%	8%	-2%	-2%
	North Shore Count Locations		-9%	-2%	9%	9%
	South Shore Count Locations		-21%	-1%	5%	7%
Total			*-16%*	*-1%*	*6%*	*7%*

[19] Note: From 1981 through 2006, TRPA utilized 27 traffic count stations. Between the 2006 and 2011 Threshold Evaluation Reports, TRPA removed seven cordon station count stations to better discern the increase and/or decrease in traffic volumes and visitation leading into the basin.

Figure D.3: Traffic Volume Count Locations Map



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.Document Path: F:\GIS\MXDS\Transportation\TrafficVolumeCounterLocations.mxd Date: 2/9/2017

TRIA Methodology

The TRPA developed and maintains a Trip Reduction Impact Analysis (TRIA) spreadsheet tool to evaluate the trip and VMT reduction impacts of various transportation policies and programs under consideration as part of the Sustainable Communities effort. While the TransCAD model is robust, it cannot capture more nuanced strategies that can have a significant effect on travel demand such as parking policies, traveler information systems, new transit operations, or construction of new bike trails and sidewalks. The purpose of the TRIA is to provide planning-level, order-of-magnitude, comparative estimates of the quantitative impacts on auto trips, vehicle miles traveled and greenhouse gas emissions of the continuation of existing policies and programs compared to the impacts of implementing new policies and programs in the areas of transit service expansion, bicycling and walking, and transportation demand management.

As noted above, the TRIA tool provides a way to make comparisons between different policy alternatives and their ultimate effect on greenhouse gas emissions. Using the tool allows TRPA to develop a package of policies tailored to the Tahoe area that will help the Region meet the greenhouse gas emissions reduction targets set by the California Air Resources Board under California's Senate Bill 375.

As far as possible, the TRIA used estimates based on current conditions in the Tahoe Basin, or existing forecasts developed locally, particularly in the case of new transit services and new active transportation facilities such as bike trails and sidewalks. For policies or projects for which there are no local studies the impacts were estimated based on a review of the available literature and studies of places where these policies have already been implemented. Where research shows that a policy might vary in effectiveness the more conservative approach will be chosen, so as not to overstate the trip and VMT reduction potential.

The TRIA is built around the main modes of transportation and analysis of how the land use plan and transportation strategies and policies proposed in the Regional Transportation Plan will impact these modes. The main categories considered in the model are:

- Bicycling and walking
- Public transit
- Intelligent Transportation System (ITS) technologies
- Transportation Demand Management measures
- Parking policy changes

The model is structured in such a way as to estimate the potential growth for each mode, for example the potential for new transit riders who were previously vehicle riders, and to take this growth as reductions in vehicle trips. See Table D.19 for an overview of the strategies analyzed and their trip reduction potential in 2020 and 2035.

Analysis by Mode

Bike and Pedestrian Facilities

The reductions for bicycle and pedestrian trips were developed based on the TRPA/TMPO Bicycle Trail User Model (available at http://www.trpa.org/transportation/monitoring/) and trip and VMT reduction estimates documented in the memo "Environmental, Economic, and Public Health Impacts of Shared Use Paths in Lake Tahoe"[20]. This model and report estimate trip and VMT reduction from bicycle and pedestrian facilities planned along major travel corridors in the Tahoe Region. The TRIA assumes that the implementation of the bicycle and pedestrian network will happen at a uniform rate across the timeframe of this plan, therefore by 2020 only a

[20] http://www.tahoempo.org/documents/Impacts_Memorandum_110107.pdf

portion of the network will have been completed, and therefore the VMT reduction is not as great in 2020 as in 2035.

Transit Services and Facilities

The transit portion of the trip and VMT reductions are based on ridership projections from the most recent available data from published and draft short- and long-range transit systems plans. Investments included:

- Lake Tahoe Waterborne Transit
- Sacramento - South Shore Summer Transit Service
- Reno - Truckee - Tahoe Public Bus Service
- Minden/Gardnerville Vanpool Service to South Lake Tahoe
- Summer All-Day Service on Route 267
- Half-Hourly Service on US 50 -- Stateline to Y
- TART Evening Service Improvements
- Meyers - SLT Limited Transit Service
- Half-Hourly Service on All TART Routes
- Free Fare Service
- Summer Stateline - Zephyr Cove Service
- East Shore Transit Service Operational Enhancements
- Emerald Bay Parking Restrictions with Existing Trolley service

Transportation Demand Management (TDM) Measures and Intelligent Transportation System (ITS) Technologies

Several strategies to increase the functionality and usability of transit were included in the TRIA. These included:

- Improved transit coordination between local and regional providers, through simplified trip planning (e.g. Google Transit).
- Improved transit coordination between local and regional providers, through the elimination or shortened wait time of transfers, improvements to ticketing structure and agency cooperation to eliminate "transfer anxiety".
- Real-time arrival information at transit stops, online, and/or via web-enabled mobile devices.
- Dynamic ridesharing for inter-regional trips. This strategy assumes that the use of transportation networks for sharing trips into the Basin will become more prevalent.

The TRIA also compared the effect of improving the compliance rate of the existing Employer Trip Reduction ordinance through improved enforcement or updating of policies. Compliance rates and trip reduction potential were based on literature review and local mode share survey data.

Parking Management: The TRIA evaluated adjusting parking requirements (reduction or elimination of minimum parking standards; creation of maximum parking standards; shared parking; in-lieu payment to meet parking requirements) in Town Center Areas. The parking calculations used in the trip and VMT reduction estimates were based on observed parking occupancy statistics and estimates of the total parking supply provided by existing studies, compared to the total parking supply estimated to be available after parking management strategies proposed in the RTP go into effect. Where occupancy and turnover data was not available, trip generation rates were based on data from Trip Generation, 9th Edition21.

[21] Trip Generation, 9th Edition, Institute of Transportation Engineers (2012)

Cumulative Effect

While the effect of each policy or project type will be analyzed individually, the cumulative effect of these policies will also be estimated. The cumulative effect of the policies cannot simply be the sum of individual effects. The impact of some policies depends on the origin and destination – for example whether they affect trips that start in Tahoe but end outside the region, or if the entire trip takes place within the Tahoe Basin. Other policies may be mutually exclusive – i.e. the measures could not reasonably be implemented at the same time. Where strategies are obviously mutually exclusive, only the project with the highest projected trip reduction was included.
Where there are several reduction measures that are not mutually exclusive, the total cumulative reduction does not equal Measure A + Measure B. Once Measure A has been applied, Measure B will be applied to a base that has already been reduced by Measure A. For example, if two trip reduction measures would each give a 10% trip reduction, the total cumulative reduction is not 20%. Rather, it would be equal to 100% - (90%*90%) = 19%.

Other Off-Model Reductions – Greenhouse Gas Reduction for Increased Plug-In Electric Vehicle Usage

An additional off-model reduction was applied to overall greenhouse gas emissions, to capture the reduction in greenhouse gas emissions from increased deployment of plug-in electric vehicle charging infrastructure, based on the Region's anticipated completion of the Tahoe-Truckee Plug-In Electric Vehicle Infrastructure and Readiness Plan. Because of the improved access to charging infrastructure anticipated in the plan, TRPA forecasts that PEV owners will be able to travel more miles using electricity.

Table D.19: Trip Reduction Impact Analysis (TRIA) Estimates Draft 2017 Regional Transportation Plan

Vehicle Trip Reduction Strategy	Primary Source of Reduced Vehicle Trips	Vehicle Trip Types Impacted		Percent Reduction in Vehicle Trips for SCS Horizon Year 2020 (Planning-Level Order-of-Magnitude Estimates)		Percent Reduction in Vehicle Trips for SCS Horizon Year 2035 (Planning-Level Order-of-Magnitude Estimates)	
				RP Alternative 3 Constrained	RP Alternative 4 Unconstrained	RP Alternative 3 Constrained	RP Alternative 4 Unconstrained
Parking Management							
Adjust parking requirements (Reduction or elimination of minimum parking standards; Creation of maximum parking standards; Shared parking; In-lieu payment to meet parking requirements) (Town Center Areas) (Not included in Alternative 4 2035 scenario because it is assumed that Intercept lots and associated disincentive captures this.)	Reduced trip generation from new parking spaces.	Mandatory (work)	Existing development				
			New Development	0.24%	0.25%	1.32%	0.00%
		Non Mandatory (discretionary)	Existing development				
			New Development	0.24%	0.25%	1.32%	0.00%
On-street parking management (demand-responsive pricing in commercial areas with residential permits to prevent parking spillover into residential areas) (Town Center Areas)	Reduced trip generation from managed on-street parking spaces and reduced VMT from circling for parking for trips to and from managed areas.	Mandatory (work)	Existing development	On-Street Parking Management will have many localized transportation and economic benefits, including improved parking availability within commercial districts, but given the relatively small number of parking spaces to be managed (351 on-street parking spaces in commercial districts in Tahoe City and South Lake Tahoe, out of a total supply of more than 100,000 parking spaces within the Tahoe Basin), and the widespread availability of public and private *off*-street parking within these commercial districts, this strategy is not expected to have a significant impact on vehicle trip reduction at the regional-level.			
			New Development				
		Non Mandatory (discretionary)	Existing development				
			New Development				
Transportation Demand Management							
Improve existing employer vehicle trip reduction program (carpool and vanpool matching programs, employee shuttles, on-site secure bicycle storage and shower facilities, flexible work hours, parking and transit use incentives.) (Town Center Areas)	Reduced peak-hour commuter trips.	Mandatory (work)	Existing development	0.89%	0.89%	0.89%	0.89%
			New Development	2.43%	2.43%	2.43%	2.43%
		Non Mandatory (discretionary)	Existing development				
			New Development				
Transit Service and Facilities							
Intra-regional transit capital projects (within Tahoe Basin; currently this only includes ferry service) (Region-wide)	Increased transit mode share, partially drawn from former vehicle trips.	Mandatory (work)	Existing development	0.20%	0.20%	0.19%	0.19%
			New Development	0.20%	0.20%	0.19%	0.19%
		Non Mandatory (discretionary)	Existing development	0.20%	0.20%	0.19%	0.19%
			New Development	0.20%	0.20%	0.19%	0.19%
Transit operational changes (Region-wide)	Increased transit mode share, partially drawn from former vehicle trips.	Mandatory (work)	Existing development	0.37%	0.37%	0.36%	0.36%
			New Development	0.37%	0.37%	0.36%	0.36%
		Non Mandatory (discretionary)	Existing development	0.37%	0.37%	0.36%	0.36%
			New Development	0.37%	0.37%	0.36%	0.36%
Transit operational changes (Non-Town Centers)	Increased transit mode share, partially drawn from former vehicle trips.	Mandatory (work)	Existing development	0.10%	0.10%	0.10%	0.10%
			New Development				

		Non Mandatory (discretionary)	Existing development				
			New Development				
Inter-Regional Transit Service. Applies to Internal-External and External-Internal Trips only (not counted in Alt 4, 2035 because Intercept Locations Strategy is assumed to capture these new trips as well)	Reduced commuter and recreational trips.	Mandatory (work)	Existing development	0.41%	0.41%	0.38%	0.00%
			New Development	0.41%	0.41%	0.38%	0.00%
		Non Mandatory (discretionary)	Existing development	0.41%	0.41%	0.38%	0.00%
			New Development	0.41%	0.41%	0.38%	0.00%
Inter-Regional Transit Service - Intercept Locations with Frequent Shuttles into the Region Applies to Internal-External and External-Internal Trips only	Reduced visitor trips		IX-XI Trips	0.00%	0.00%	0.00%	6.00%
ITS Strategies							
Improved transit coordination between local and regional providers, through simplified trip planning (for example Google Transit). (Town Center areas)	Increased transit mode share for trips in the corridor/district served by the project, partially drawn from former vehicle trips.	Mandatory (work)	Existing development	0.74%	0.74%	0.69%	0.69%
			New Development	0.74%	0.74%	0.69%	0.69%
		Non Mandatory (discretionary)	Existing development	0.74%	0.74%	0.69%	0.69%
			New Development	0.74%	0.74%	0.69%	0.69%
Improved transit coordination between local and regional providers, through the elimination or shortened wait time of transfers, improvements to ticketing structure and agency cooperation to eliminate "transfer anxiety". (Town Centers)	Increased transit mode share for trips in the corridor/district served by the project, partially drawn from former vehicle trips.	Mandatory (work)	Existing development	0.04%	0.04%	0.05%	0.05%
			New Development	0.04%	0.04%	0.05%	0.05%
		Non Mandatory (discretionary)	Existing development	0.04%	0.04%	0.05%	0.05%
			New Development	0.04%	0.04%	0.05%	0.05%
Enhanced transit trip planning (for example Google Transit). (Inter-Regional Trips)	Increased transit mode share for trips in the corridor/district served by the project, partially drawn from former vehicle trips.	Mandatory (work)	Existing development	0.17%	0.17%	0.15%	0.15%
			New Development	0.17%	0.17%	0.15%	0.15%
		Non Mandatory (discretionary)	Existing development	0.17%	0.17%	0.15%	0.15%
			New Development	0.17%	0.17%	0.15%	0.15%
Real-time arrival information at transit stops, online, and/or via web-enabled mobile devices. (Town Center areas)	Increased transit mode share for trips in the corridor/district served by the project, partially drawn from former vehicle trips.	Mandatory (work)	Existing development	0.22%	0.22%	0.21%	0.21%
			New Development	0.22%	0.22%	0.21%	0.21%
		Non Mandatory (discretionary)	Existing development	0.22%	0.22%	0.21%	0.21%
			New Development	0.22%	0.22%	0.21%	0.21%
Regionally implemented dynamic ridesharing (conservative implementation). Applies to Internal-External and External-Internal Trips only.	Reduced commuter and recreational trips.	Mandatory (work)	Existing development	0.00%	0.00%	0.00%	0.00%
			New Development	0.00%	0.00%	0.00%	0.00%
		Non Mandatory (discretionary)	Existing development	1.00%	1.00%	1.00%	1.00%
			New Development	1.00%	1.00%	1.00%	1.00%
Bike and Pedestrian Facilities							
			Existing development	0.30%	0.30%	0.75%	0.75%

Complete regional network of bike and pedestrian facilities (includes expanded bike parking) (Region-wide)	Increased bike and pedestrian mode share for trips in the corridor/district served by the project, partially drawn from former vehicle trips of 3 miles or less.	Mandatory (work)	New Development	0.30%	0.30%	0.75%	0.75%
		Non Mandatory (discretionary)	Existing development	0.45%	0.45%	1.13%	1.13%
			New Development	0.45%	0.45%	1.13%	1.13%
Other Projects							
TOWN CENTERS							
Cumulative Estimate (for all vehicle trip reduction strategies currently under consideration in the TRPA SCS)	n/a	Mandatory (work)	Existing development	2.73%	2.73%	3.11%	3.11%
			New Development	4.47%	4.48%	5.86%	4.61%
		Non Mandatory (discretionary)	Existing development	2.00%	2.00%	2.60%	2.60%
			New Development	2.24%	2.25%	3.89%	2.60%
NON TOWN CENTERS							
Cumulative Estimate (for all vehicle trip reduction strategies currently under consideration in the TRPA SCS)	n/a	Mandatory (work)	Existing development	0.97%	0.97%	1.41%	1.41%
			New Development	0.97%	0.97%	1.41%	1.41%
		Non Mandatory (discretionary)	Existing development	1.12%	1.12%	1.78%	1.78%
			New Development	1.12%	1.12%	1.78%	1.78%
INTERNAL-EXTERNAL TRIPS							
Cumulative Estimate (for all vehicle trip reduction strategies currently under consideration in the TRPA SCS)	n/a	Mandatory (work)	Existing development	0.57%	0.57%	0.53%	6.14%
			New Development	0.57%	0.57%	0.53%	6.14%
		Non Mandatory (discretionary)	Existing development	1.57%	1.57%	1.52%	7.08%
			New Development	1.57%	1.57%	1.52%	7.08%

TOWN CENTERS	Alt 3	alt 4	Alt 3	alt 4
Existing	2.16%	2.16%	2.72%	2.72%
New	2.73%	2.74%	4.32%	3.05%
Overall	2.18%	2.18%	2.83%	2.74%
NON TOWN CENTERS				
Existing	1.08%	1.08%	1.70%	1.70%
New	1.08%	1.08%	1.70%	1.70%
Overall	1.08%	1.08%	1.70%	1.70%
IX & XI Reductions				
Existing	1.35%	1.35%	1.31%	6.87%
New	1.35%	1.35%	1.31%	6.87%
Overall	1.35%	1.35%	1.31%	6.87%
Notes	Per the TRPA TransCAD model, 22 percent of regional trips are mandatory and 78 percent are non-mandatory.			

Part 3: Calculation of the share of vehicle miles traveled (VMT) attributable to the California portion of the Lake Tahoe Region

Because the Tahoe Transportation Model spans both California and Nevada in its region-wide VMT calculations, it is necessary to develop a methodology for splitting out the VMT attributable to the California portion of the Region for purposes of understanding California GHG estimates and comply with California SB 375. In addition, in accordance with the RTAC protocol for accounting for half of the VMT of all trips with an origin or destination outside the region, and none of the VMT for trips that cross through the region without stopping, additional post-processing of the transportation model results is necessary. This section explains how the TRIA is integrated into the model results, and how total VMT and GHG emissions for the California portion of the Region are calculated.

The TRPA developed an "accounting-based" approach to improve the accuracy of VMT estimates in the Tahoe Basin. As described below, this approach accounts for every vehicle trip in the TRPA model. By doing so, it does not have to rely on any interim assumptions, and produces accurate VMT estimates that can be readily reviewed/confirmed by others.

California VMT Estimation

This section outlines the process the TRPA took to calculate the California-side VMT for the 2005, 2020, and 2035 model years. As noted, VMT is estimated for a peak summer weekday.

Step 1: Obtain Daily Trip Table

The daily trip table is a large matrix displaying the total number of vehicle trips on a daily basis that travel from one particular traffic analysis zone (TAZ) to another. Trip tables also include the number of trips that remain internal to a particular TAZ and trips that have an origin or destination to an external gateway. Below is an illustration of TRPA's trip table.

Figure D.4: Example Trip Table Model Output

	1	2	3	4	5	6	7	9	10	11	12	13	
1	69.00	23.00	11.00	30.00	24.00	21.00	30.00	1.00	2.00	0.00	0.00	0.00	0.(
2	36.00	60.00	15.00	17.00	36.00	28.00	28.00	16.00	41.00	16.00	14.00	24.00	4.(
3	0.00	8.00	44.00	1.00	4.00	3.00	0.00	13.00	49.00	20.00	9.00	18.00	2.(
4	26.00	23.00	10.00	7.00	28.00	23.00	28.00	1.00	1.00	2.00	0.00	1.00	0.(
5	25.00	19.00	9.00	34.00	10.00	29.00	29.00	0.00	6.00	3.00	1.00	1.00	0.(
6	30.00	29.00	16.00	26.00	14.00	33.00	29.00	0.00	0.00	0.00	0.00	0.00	0.(
7	44.00	27.00	11.00	28.00	24.00	22.00	81.00	0.00	1.00	0.00	0.00	0.00	0.(
9	1.00	9.00	12.00	0.00	1.00	0.00	0.00	4.00	9.00	4.00	2.00	9.00	2.(
10	1.00	8.00	9.00	0.00	1.00	0.00	2.00	6.00	8.00	1.00	7.00	8.00	2.(
11	0.00	5.00	8.00	1.00	0.00	0.00	0.00	5.00	2.00	2.00	2.00	3.00	1.(
12	3.00	19.00	13.00	0.00	0.00	1.00	0.00	12.00	18.00	3.00	20.00	15.00	5.(
13	1.00	12.00	13.00	2.00	2.00	1.00	0.00	7.00	14.00	3.00	9.00	7.00	3.(
14	0.00	8.00	5.00	0.00	2.00	1.00	1.00	3.00	4.00	1.00	6.00	6.00	0.(
15	1.00	3.00	6.00	2.00	1.00	0.00	0.00	1.00	3.00	0.00	3.00	2.00	0.(

Step 2: Apply TRIA Adjustments

The TRIA quantifies the trip reduction benefits of various transportation programs and policies that are part of the SCS. Since the traffic model is not capable of modeling changes in behavior due to these strategies (e.g., employer shuttles, parking management, subsidized transit, etc.), it is necessary to model these behavior changes through 'post-processing' of the model results. TRPA will modify the daily trip table shown above by reducing trips in accordance with the percentages displayed in the TRIA in those TAZs where travel behavior would be affected by the SCS strategies.

Step 3: Estimate Distance of Trips

A distance-skim matrix is used to estimate the travel distance between all TAZs within a model. It is a matrix of identical size to a trip table, but whose contents are expressed as miles versus vehicle trips.

Step 4: Calculate Zone-to-Zone VMT

The TransCAD software program allows for matrix multiplication. The adjusted trip table from Step 2 is multiplied by the distance skim in Step 3 to yield a new matrix whose content is VMT (i.e., number of daily trips multiplied by distance) between all zones in the model.

Step 5: Aggregate Zones into California and Nevada Sides

To show achievement of the greenhouse gas targets associated with SB 375, VMT must be calculated for the California side only. The TRPA model contains 289 TAZs, of which 184 represent land uses on the California side of the Tahoe Basin and 105 represent land uses on the Nevada side of the Tahoe Basin and external gateways. The California and Nevada zones are identified so that Step 6 can be conducted.

Step 6: Apply RTAC's VMT Calculation Methodology

The Regional Targets Advisory Committee (RTAC) established under SB 375 recommends the following accounting of various trip types for VMT purposes[22]:

- Include 100% of internal-internal (I-I) trips
- Exclude external-external (X-X) trips
- Count 50% of internal-external (I-X) and external-internal (X-I) trips[23]

Since the SB 375 evaluation is for the California side of the Tahoe Basin, I-I trips are those that begin and end in this area. An example of an I-X trip is a trip from Meyers, CA to Incline Village, NV, or a trip from Sacramento to Tahoe City, CA. An example of an X-X trip is a trip from Echo Summit, CA to Incline Village, NV, or a trip from Placerville, CA to Carson City, NV.

The zone-to-zone VMT matrix from Step 4 was manipulated based on the aggregation of zones in Step 5 and the above VMT calculation methodology.

The results of this six-step process yield the VMT for the California side of the Tahoe Basin using the RTAC-recommended calculation method.

[22] Recommendations of the Regional Targets Advisory Committee (RTAC) Pursuant to Senate Bill 375. September, 2009. http://www.arb.ca.gov/cc/sb375/rtac/report/092909/finalreport.pdf
[23] TMPO has decided to count 100% of the modeled VMT for I-X and X-I trips with one trip end in the California side of the Basin and the other trip end to a California point.outside the Tahoe Basin, as the transportation model provides trip lengths only to the borders of the TMPO Region. For I-X and X-I trips occurring between the California portion of the Tahoe Basin and the Nevada portion of the Tahoe Basin, or external Nevada point, the TMPO will count 50% of the VMT, in recognition that not all of this VMT is attributable to the California side.

California Greenhouse Gas Emission Estimation

The California Air Resources Board requires MPOs to use the Emissions Factors (EMFAC) model to calculate greenhouse gas emissions associated with the SCS. In 2015 ARB released a memo entitled "*Methodology to Calculate CO2 Adjustment to EMFAC Output for SB 375 Target Demonstrations.*" The methodology states:

> *"In 2010, ARB established regional SB 375 greenhouse gas (GHG) targets in the form of a percent reduction per capita from 2005 for passenger vehicles using the ARB Emission Factor model, EMFAC 2007. EMFAC is a California-specific computer model that calculates weekday emissions of air pollutants from all on-road motor vehicles including passenger cars, trucks, and buses. ARB updates the EMFAC model periodically to reflect the latest planning assumptions (such as vehicle fleet mix) and emissions estimation data and methods. Since the time when targets were set using EMFAC2007, ARB has released two subsequent versions, EMFAC2011 and EMFAC2014."*

The memo continues:

> "*As MPOs estimate GHG emissions reductions from subsequent RTP/SCSs, they will use the latest approved version of EMFAC, but using a different model will influence their estimates and their ability to achieve SB 375 targets. The goal of this methodology is to hold each MPO to the same level of stringency in achieving their SB 375 targets regardless of the version of EMFAC used for its second RTP/SCS."*

The methodology describes a process for neutralizing the changes in fleet average emission rates between the version of EMFAC used for the first SCS and the version used for the second SCS. The methodology adjusts for the small benefit or drawback resulting from the use of a different version of EMFAC by applying an adjustment when quantifying the percent reduction in per capita CO2 emissions using the newest version of EMFAC.

After calculating the VMT attributable to the California side of the Tahoe Basin in accordance with RTAC procedures, the TRPA will use this VMT as an input to EMFAC2014 model to estimate GHG emissions. The resulting GHG emissions are then divided by the 2005, 2020, and 2035 residential populations to obtain GHG emissions per capita. Since the TRPA used EMFAC2011 to calculate GHG emissions in its first SCS, the TRPA will apply ARB's methodology for neutralizing the difference between EMFAC models in order to ensure that resultant estimates are comparable to the targets set for the Region.

Finally, as noted above in the discussion in the "Other Off-Model Reductions – Greenhouse Gas Reduction for Increased Plug-In Electric Vehicle Usage" of the TRIA discussion in Component 2, an additional off-model reduction was applied to the final greenhouse gas emission output, to capture the reduction in greenhouse gas emissions from increased deployment of plug-in electric vehicle charging infrastructure, based on the Region's anticipated completion of the Tahoe-Truckee Plug-In Electric Vehicle Infrastructure and Readiness Plan.

Ongoing Development Rights Accounting, Analysis, and Reconciliation

As described in at the beginning of this appendix, the data used to inform the land use assumptions was based on the best available information at the time that the transportation modeling was performed (June 2015 to March 2016). Since that time, TRPA and its partners have conducted ongoing accounting as well as additional analysis and reconciliation of historical development rights usage. As data are updated, TRPA will continue to utilize the best available data at the time that future analyses are conducted.

APPENDIX E: 2017 TRANSPORTATION CONFORMITY

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Transportation Conformity

Transportation conformity ("conformity") is a way to ensure that Federal funding and approval goes to those transportation activities that are consistent with air quality goals. Conformity applies to transportation plans, transportation improvement programs (TIPs), and projects funded or approved by the Federal Highway Administration (FHWA). The transportation conformity rule appears in 40 CFR Parts 51 and 93 and requires all jurisdictions in non-attainment areas or who are under federally approved maintenance plans to submit a conformity analysis if the planning or programming documents identify projects that have been defined as non-exempt. The CAAA also directs MPOs to facilitate the expeditious implementation of the Transportation Control Measures (TCMs) that are included in the SIP. No TCMs are applicable to the Tahoe Region therefore no control measures are identified for implementation.

Conformity Interagency Consultation Procedures

Transportation conformity requires an interagency consultation process to cooperatively develop and provide feedback on the analytical assumptions, methodology, and approach. The interagency consultation for the 2017 Regional Transportation Plan conformity analysis included a request to review associated modeling and analytical assumptions dated September 19, 2016. The request was sent to the California Department of Transportation (Caltrans), Nevada Department of Transportation (NDOT), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), California Air Resources Board (CARB), Nevada Department of Environmental Protection (NDEP) and Environmental Protection Agency (EPA) before concluding conformity findings. Air quality planning in this area is the joint responsibility of TMPO, El Dorado Air Pollution Control District (EDAPCD), Placer County Air Pollution Control District, Nevada Division of Environmental Protection, Washoe County District of Health, and the Tahoe Regional Planning Agency (TRPA). TMPO/TRPA circulated the methodology and analysis used to confirm air quality conformity to the above entities for an opportunity to comment. No outstanding issues were identified and TRPA/TMPO followed the methodology outlined in the request memo referenced above.

Air Quality Modeling and Analytical Assumptions

Pursuant to the conformity regulation, a regional emissions analysis which incorporates all conformity non-exempt projects must meet the emissions budget test before the 2017 Regional Transportation Plan can be determined to conform to the State Implementation Plan. This analysis is holistic in scope, with final conformity based on the program rather than on a project-by-project basis. This emissions test is required for Carbon Monoxide (CO). This analysis pertains solely to California Clean Air Amendments conformity mandates and should not be construed as environmental impact findings related to the National Environmental Policy Act or California Environmental Quality Act environmental review processes.

A conformity analysis must include the attainment milestone year of the SIP, the forecast horizon year of the applicable RTP and have no analysis gaps greater than ten years. Based on these requirements, the conformity analysis years selected for this analysis are: 2010, 2020, 2035 and 2040.

Conformity Results

For the California portion of the Lake Tahoe Air Basin (LTAB), the applicable federal air quality maintenance plan for Lake Tahoe is the Carbon Monoxide Maintenance Plan originally adopted in 1996 and revised in 2004[1]. Part of the maintenance strategy involves allocation of transportation emissions budgets to the maintenance areas as approved by the EPA (Federal Register / Vol. 70 No 229November 30, 2005). The motor vehicle emissions budgets for the Lake Tahoe Maintenance Areas are summarized in Table E.1.

Table E.1: Motor Vehicle Emission Budgets

Carbon Monoxide Maintenance Area Emissions Budgets		
CO Maintenance Area	2010	2018
Lake Tahoe North Shore (Eastern Placer County)	11	11
Lake Tahoe South Shore (Eastern El Dorado County)	19	10
Notes: CO = carbon monoxide; TPD = tons per day. Source: TMPO 2016:2.		

An analysis of conformity of the 2017 Regional Transportation Plan with the regional air quality plan for CO was conducted for the RTP/SCS IS/IEC. An absolute vehicle miles travelled (VMT) in the respective California portions of the Region (Placer and El Dorado Counties) was obtained from the TRPA travel demand model. VMT was interpolated to derive activity data for attainment milestone years 2018 and 2026. Daily CO emissions associated with VMT were modeled using EMFAC 2014 and compared with the applicable emissions budget for the respective portions of the Region (i.e., Placer and El Dorado Counties). The results of the analysis can be found in Table E.2.

[1] Nevada Department of Environmental Protection, 2004

Table E.2: CO Conformity Mobile Source Emission Modeling Results

CO Conformity Mobile Source Emissions Modeling Results				
2016 RTP (Post-TRIA)	El Dorado County		Placer County	
Vehicle Activity Data	VMT		VMT	
2005	569,892		471,998	
2010 (interpolated)	572,808		468,118	
2018 (interpolated)	577,472		461,911	
2020	578,638		460,360	
2026 (interpolated)	593,898		479,957	
2035	631,510		518,091	
2040	629,505		525,686	
	El Dorado County		Placer County	
EMFAC 2014 Outputs	Total CO (TPD)	Emissions Budget	Total CO (TPD)	Emissions Budget
2010		19		11
2018	1.36	10	0.99	11
2026	0.63	-	0.47	-
2035	0.41	-	0.31	-
Note: Assumes 2005 TRPA speed bin for 2010, and 2020 TRPA Speed Bins for 2018 and 2026. Assumes speed bins do not differ by vehicle class. VMT by vehicle class and speed bin was not available from TRPA. VMT Split between counties is based on EMFAC2014's default VMT mix multiplied by the total VMT.				

Conformity Determination

Based on the conducted analysis, and the results shown above, the LTAB is well below designated Carbon Monoxide budgets, therefore a **determination of conformity is recommended**.

APPENDIX F: REGIONAL TRANSPORTATION PLAN AND SUSTAINABLE COMMUNITIES STRATEGY CHECKLIST

By completing this checklist, the TRPA/TMPO verifies the Regional Transportation Plan / Sustainable Communities Strategy addresses all the following required information within the Regional Transportation Plan / Sustainable Communities Strategy

Name of MPO:
Tahoe Regional Planning Agency / Tahoe Metropolitan Planning Organization

Date of Draft Regional Transportation Plan / Sustainable Communities Strategy Completed:
February 22, 2016

Regional Transportation Plan / Sustainable Communities Strategy Adoption Date:
April 26, 2016

Certification date of Environmental Document:
April 26, 2016

Location of Environmental Document:
Separate Document: Initial Study/Initial Environmental Checklist and
http://www.trpa.org/regional-plan/regional-transportation-plan-2/

Regional Transportation Plan Contents

Table F.1: General

General			
Code of Federal or State Regulations	**Topic**	**Yes/No**	**Location in Plan**
23 CFR 450.322(a)	Does the RTP address no less than a 20-year planning horizon	Yes	Chapter 3: pg. 3-2, Chapter 4: pg. 4-3, and Appendix B: All Pages.
23 CFR part 450.322(b)	Does the RTP include both long-range and short-range strategies/actions	Yes	Chapter 3: pgs. 3-6 to 3-37. Appendix B: All Pages.
California Government Code Section 65080	Does the RTP address issues specified in the policy, action and financial elements identified in California Government Code Section 65080?	Yes	Multiple Locations: All pages of Appendix B, Chapter 2, and Chapter 3.
	Does the RTP include Project Intent i.e. Plan Level Purpose and Need Statements?	Yes	Chapter 1: pgs. 1-1 to 1-10.
California Government Code 14522.2	Does the RTP specify how travel demand modeling methodology, results and key assumptions were developed as part of the RTP process?	Yes	Appendix D: All Pages.

Table F.2: General Subsection - Sustainable Communities Strategy

Sustainable Communities Strategy			
Code of Federal or State Regulations	Topic	Yes/No	Location in Plan
California Government Code Sections 65080(b)(2)(B) and 65584.04(i)(l)	Does the RTP address the 10 issues specified in the Sustainable Communities Strategy?		
	Identify the general location of uses, residential densities, and building intensities within the region?	Yes	Chapter 2: pgs. 2-14 to 2-15. Appendix D: pgs. D-3 to D-29.
	Identify areas within the region sufficient to house all the population of the region, including all economic segments of the population over the course of the planning period of the regional transportation plan taking into account net migration into the region, population growth, household formation and employment growth?	Yes	Chapter 2: pgs. 2-14 to 2-15. Appendix D: pgs. D-3 to D-29.
Government Code Section 65584	Identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region pursuant to Government Code Section 65584?	Yes	Chapter 2: pgs. 2-14 to 2-15. Appendix D: pgs. D-3 to D-29.
	Identify a transportation network to service the transportation needs of the region?	Yes	Chapter 3: All Pages. Appendix B: All Pages.
Government Code Section 65080.01 (a) and (b)	Gather and consider the best practically available scientific information regarding resource areas and farmland in the region as defined in Government Code Section 65080.01 (a) and (b)?	Yes	Chapter 2: pgs. 2-19 to 2-20.
Government Code Sections 65580 and 65581	Consider the state housing goals specified in Government Code Sections 65580 and 65581?	Yes	Chapter 2: pgs. 2-14 to 2-15.
	Utilize the most recent planning assumptions, considering local general plans and other factors?	Yes	Chapter 2: pgs. 2-8, and 2-13. Appendix D: All Pages.
	Set forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportation measures and policies, will reduce the greenhouse gas emissions from automobiles and light trucks to achieve, if there is a feasible way to do so, the greenhouse gas emission reduction targets approved by the ARB?	Yes	Chapter 2: pgs. 2-14 to 2-17. Appendix D: All Pages.
California Government Code 65584.04(i)(1)	Provide consistency between the development pattern and allocation of housing units within the region.	Yes	Chapter 2: pgs. 2-14 to 2-15. Appendix D: pgs. D-3 to D-29.
42 U.S.C. Section 7506	Allow the regional transportation plan to comply with Section 176 of the federal Clean Air Act (42 U.S.C. Section 7506).	Yes	Chapter 2: pg. 2-19. Appendix E: All Pages.

Table F.3: Consultation and Cooperation

Consultation and Cooperation			
Code of Federal or State Regulations	Topic	Yes/No	Location in Plan
Title 23, CFR part 450.316(a)	Does the RTP contain a public involvement program that meets requirements?	Yes	Appendix C: pgs. C-4 and C-17 to C -19.
23 CFR450.316 (3)(b)	Did the MPO/RTPA consult with the appropriate State and local representatives including representatives from environmental and economic communities; airport; transit; freight during the preparation of the RTP?	Yes	Appendix C: pgs. C-20 to C-25.
	Did the MPO/RTPA who has federal lands within its jurisdictional boundary involve the federal land management agencies during the preparation of the RTP?	Yes	Appendix C: pgs. C-20 to C-25.
23 CFR part 450.322(g)	Where does the RTP specify that the appropriate State and local agencies responsible for land use, natural resources, environmental protection, conservation and historic preservation consulted?	Yes	Appendix C: pgs. C-20 to C-25.
23 CFR part 450.322(g)	Did the RTP include a comparison with the California State Wildlife Action Plan and (if available) inventories of natural and historic resources?	Yes	Chapter 2: pgs. 2-19 to 2-20. RTP/SCS IS/IEC Section 3.5.1. The RTP was compared with local and regional wildlife protection measures which are more comprehensive than the CA State Wildlife Action Plan.
Title 23 CFR part 450.316(c)	Did the MPO/RTPA who has a federally recognized Native American Tribal Government(s) and/or historical and sacred sites or subsistence resources of these Tribal Governments within its jurisdictional boundary address tribal concerns in the RTP and develop the RTP in consultation with the Tribal Government(s)?	Yes	Appendix C: pgs. C-22 to C-23.
23 CFR 450.316(i)	Does the RTP address how the public and various specified groups were given a reasonable opportunity to comment on the plan using the participation plan developed under 23 CFR part 450.316(a)?	Yes	Appendix C: pg. C-4.
23 CFR part 450.316 (a)	Does the RTP contain a discussion describing the private sector involvement efforts that were used during the development of the plan?	Yes	Appendix C: C-5 to C-19 and C – 25.
23 CFR 450.316(a)(2)	Does the RTP contain a discussion describing the coordination efforts with regional air quality planning authorities?	Yes	Appendix E: pg. E-1.
	Is the RTP coordinated and consistent with the Public Transit-Human Services Transportation Plan?	Yes	Appendix C: pg. C-26.

Table F.4: Consultation and Cooperation continued

23 CFR part 450.322(j))	Were the draft and adopted RTP posted on the Internet	Yes	www.trpa.org/transportation
Government Code 65080(D	Did the RTP explain how consultation occurred with locally elected officials?	Yes	Appendix C: pgs. C-20 to C - 23.
Government Code 65080(E	Did the RTP outline the public participation process for the sustainable communities strategy?	Yes	Appendix C: pgs. C-16 to E - 19.

Table F.5: Modal Discussion

Modal Discussion			
Code of Federal or State Regulations	Topic	Yes/No	Location in Plan
	Does the RTP discuss intermodal and connectivity issues?	Yes	Chapter 1: pgs. 1-4 to 1-10 and 1-12. Chapter 3: All Pages
	Does the RTP include a discussion of highways?	Yes	Chapter 1: pgs. 1-4 to 1-10. Chapter 3: pgs. 3-32 and 3-35.
	Does the RTP include a discussion of mass transportation?	Yes	Chapter 1: pgs. 1-4 to 1-10. Chapter 3: pgs. 3-6 to 3-11.
	Does the RTP include a discussion of the regional airport system?	Yes	Chapter 1: pg. 1-4. Chapter 3: pg. 3-32.
	Does the RTP include a discussion of regional pedestrian needs?		Chapter 1: pg. 1-8. Chapter 3: pgs. 3-15 to 3-22.
	Does the RTP include a discussion of regional bicycle needs?	Yes	Chapter 1: pg. 1-8. Chapter 3: pgs. 3-15 to 3-22.
Government Code 65080.1	Does the RTP address the California Coastal Trail?	n/a	n/a
	Does the RTP include a discussion of rail transportation?	Yes	Chapter 1: pg. 1-4.
	Does the RTP include a discussion of maritime transportation (if appropriate)?	Yes	Chapter 1: pg. 1-8.
	Does the RTP include a discussion of goods movement?	Yes	Chapter 3: pg. 3-33.

Table F.6: Programming and Operations

Programming and Operations			
Code of Federal or State Regulations	Topic	Yes/No	Location in Plan
23 CFR part 450.450.320(b)	Is a congestion management process discussed in the RTP?	Yes	Chapter 2: pg. 2-3. Chapter 5: pgs. 5-5 to 5-6.
	Is the RTP consistent (to the maximum extent practicable) with the development of the regional ITS architecture?	Yes	Chapter 2: pg. 2-4. Chapter 3: pg. 3-24.
	Does the RTP identify the objective criteria used for measuring the performance of the transportation system?		Chapter 5: pgs. 5-7 to 5-19.
	Does the RTP contain a list of un-constrained projects?	Yes	Appendix B: pgs. B-5 to B-8.

Table F.7: Financial

Financial			
Code of Federal or State Regulations	Topic	Yes/No	Location in Plan
23 CFR part 450.322(f)(10)	Does the RTP include a financial plan that meets requirements?	Yes	Chapter 4: All Pages. Appendix B: pgs. B-9 to B-12.
2006 STIP Guidelines, Section 19	Does the RTP contain a consistency statement between the first 4 years of the fund estimate and the 4-year STIP fund estimate?	Yes	Chapter 4: pg. 4-4
23 CFR part 450.322(f)(10)(ii)	Do the projected revenues in the RTP reflect Fiscal Constraint?	Yes	Chapter 4: pgs. 4-3 to 4-5. Appendix B: pgs. B-9 to B-12.
Government Code 65080(4)(A	Does the RTP contain a list of financially constrained projects? Any regionally significant projects should be identified.	Yes	Appendix B: pgs. B-1 to B-4.
(23 CFR part 450.322(f)(10)(iv))	Do the cost estimates for implementing the projects identified in the RTP reflect "year of expenditure dollars" to reflect inflation rates?	Yes	Appendix B: pgs. B-1 to B-4 and B-13.
(23 CFR 450.322(f)(10)(i))	After 12/11/07, does the RTP contain estimates of costs and revenue sources that are reasonably expected to be available to operate and maintain the freeways, highway and transit within the region?	Yes	Appendix B: B-9 to B-12.
(2006 STIP Guidelines section 33)	Does the RTP contain a statement regarding consistency between the projects in the RTP and the ITIP?	n/a	n/a
(2006 STIP Guidelines section 19)	Does the RTP contain a statement regarding consistency between the projects in the RTP and the FTIP?	Yes	Chapter 4: pg. 4-4
(23 CFR part 450.322(f)(10)(vi) *(nonattainment and maintenance MPOs only)*	Does the RTP address the specific financial strategies required to ensure the identified TCMs from the SIP can be implemented?	n/a	Appendix E: pg. E-1

Table F.8: Environmental

Environmental			
Code of Federal or State Regulations	Topic	Yes/No	Location in Plan
	Did the MPO/RTPA prepare an EIR or a program EIR for the RTP in accordance with CEQA guidelines?	Yes	Initial Study/Initial Environmental Checklist
	Does the RTP contain a list of projects specifically identified as TCMs, if applicable?	n/a	Appendix E: pg. E-1
	Does the RTP contain a discussion of SIP conformity, if applicable?	n/a	Appendix E: All Pages.
(23 CFR part 450.322(f)(7))	Does the RTP specify mitigation activities?	Yes	Initial Study/Expanded Environmental Checklist Section 3.5
	Where does the EIR address mitigation activities?	Yes	Initial Study/Expanded Environmental Checklist Section 3.5

Table F.9: Environmental continued

	Did the MPO/RTPA prepare a Negative Declaration or a Mitigated Negative Declaration for the RTP in accordance with CEQA guidelines?	Yes	Initial Study/Expanded Environmental Checklist
(federal nonattainment and maintenance areas only)	Does the RTP specify the TCMs to be implemented in the region?	n/a	Appendix E: pg. E-1

I have reviewed the above information and certify that it is correct and complete.

February 22, 2017

(Must be signed by MPO/RTPA Executive Director or designated representative)

Date

Nick Haven

Print Name

Long Range and Transportation Planning Division Manger

Title

APPENDIX G: PERFORMANCE MEASURES

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. Chapter 5: Measuring Success discusses the performance measurement framework and its use to inform policy-makers and guide investment toward programs and projects that will help to meet Regional goals. A summary of all performance measures monitored (including indicators ("I"), metrics ("M"), and other socio-demographic data ("O")) is below.

Table G.1: Goal 1 - Environment

Goal	Measure Type ("I", "M", "O")	Performance Measure	Data Source	Rationale for Inclusion	Frequency
Goal 1: Environment	I	Regional Daily Vehicle Miles Traveled (VMT)	TRPA TransCAD Model Output	Federal requirement for MPO Reporting in RTPs, SB 375, SB 743, Adopted TRPA Threshold Standard	4-yrs with development of RTP
		Greenhouse Gas Emissions per Capita from 2005 Levels		SB 375, SB 743	4-yrs with development of RTP
		Regional Daily Vehicle Miles Traveled (VMT) per Capita, Excluding Through Trips		Regional Plan Performance Measure (2013)	4-yrs with development of RTP
		Lake Clarity	University of California, Davis - Tahoe Environmental Research Center	Tahoe Maximum Daily Load (TMDL) Clarity Challenge	Annually
		Miles of Street Sweeping	Environmental Improvement Program (EIP) Project Tracker	TMDL Reporting Measure	Annually (Starting 2017)
		Miles of Roadway Treated			Annually (Starting 2017)
		U.S. Highway 50 at Park Ave., President's Weekend Traffic Volumes	California Department of Transportation (Caltrans), Nevada Department of Transportation (NDOT)	Adopted TRPA Threshold Standard	Annually
	M	Number of Vehicle Trips Reduced by Project	EIP Tracker - Project Performance Assessment	Determines extent to which projects support GHG/VMT reduction targets	New Project Proposals in EIP Project Tracker
		Project is located within a catchment area	EIP Tracker - Project Performance Assessment	Determines extent to which a project is located within a catchment area; potential water quality impacts	New Project Proposals in EIP Project Tracker
		Project is listed as a Water Quality Improvement Project (WQIP) on the EIP List		Determines whether a project is also listed as a WQIP and further in the planning process	New Project Proposals in EIP Project Tracker
	O	Regional Monthly Average Annual Traffic Volume Percentage Variation	Caltrans, NDOT	Lake Tahoe Transportation Model Calibration Factor	Annually
		Regional Daily Average Annual Traffic Volume Percentage Variation			Annually
		East Shore Parking Counts (Wednesday, Saturday)	TRPA, Bicycle and Pedestrian Monitoring Protocol	Lake Tahoe Transportation Model Input	Annually

Table G.2: Goal 2 - Connectivity

Goal	Measure Type ("I", "M", "O")	Performance Measure	Data Source	Rationale for Inclusion	Frequency
Goal 2: Connectivity	I	Non-Auto Mode Share	TRPA Travel Mode Share Survey	Regional Plan Performance Measure (2013)	Biennially (even years)
		Miles of Bicycle and Pedestrian Facilities Constructed	EIP Tracker - Project Performance Assessment		Annually
		Percentage of Overnight Lodging and Recreation Areas with Transit, Bicycle, and Pedestrian Access	TRPA Geographic Information Systems (GIS)	Lake Tahoe Transportation Model Input	Annually
		Transit Ridership	Transit Operators (Tahoe Transportation District - BlueGO/Placer County - TART)	Lake Tahoe Transportation Model Calibration Factor	Annually
		Transit Passengers per Revenue Mile		MAP-21/FAST Act (23 CFR 450.306(d))	Annually
		Transit Passengers per Revenue Hour		MAP-21/FAST Act (23 CFR 450.306(d))	Annually
	M	Overnight Population (residential and tourist) within 1/4 mile of a non-auto project	EIP Tracker - Project Performance Assessment	Determines extent to which projects encourage non-auto travel from overnight accommodations	New Project Proposals in EIP Project Tracker
		Provides or enhances a non-auto connection to a town center or recreation area		Determines extent to which projects increase access to town centers and recreation areas	New Project Proposals in EIP Project Tracker
		Project enhances traveler experience (ex. Wayfinding or real-time traveler information)		Determines extent to which projects improve the mobility and accessibility of people and goods	New Project Proposals in EIP Project Tracker
		Project improves connectivity within a mode. Examples include: Increased transit frequency or closing a trail gap.		Determines if projects improve connectivity within a mode	New Project Proposals in EIP Project Tracker
		Project improves connectivity across modes. Examples include: Park-n-Ride lot, bike racks at a transit stop, intermodal facility, trail connection to a transit stop, or interregional facility.		Determines if projects improve connectivity across modes	New Project Proposals in EIP Project Tracker
	O	Annual Bicycle and Pedestrian Highest Activity Locations	TRPA, Bicycle and Pedestrian Monitoring Protocol	Indicative of system usage	Annually
		Average Hourly Count Volumes by Active Transportation Facility Type			Annually

Goal	Measure Type ("I", "M", "O")	Performance Measure	Data Source	Rationale for Inclusion	Frequency
		Average Hourly, Daily, Weekly, and Monthly Count Volumes for Specific Bicycle and Pedestrian Facilities			Annually
		Seasonal Variation in Active Transportation Facility Usage			Annually
		Bicycle and Pedestrian Trail Use (Mid-Week Average Hourly Count Volumes)			Annually
		Bicycle and Pedestrian Trail Use (Mid-Week Hourly Count Volumes)			Annually
		Bicycle Trail Use Counts (Annual)			Annually
		Regional Average Daily Traffic Volumes (AADT)	Caltrans, NDOT		Annually
		Regional Peak Month Average Daily Traffic (PMADT)			Annually

Table G.3: Goal 3 - Safety

Goal	Measure Type ("I", "M", "O")	Performance Measure	Data Source	Rationale for Inclusion	Frequency
Goal 3: Safety	I	Number of Fatalities	NDOT/California Highway Patrol Statewide Integrated Traffic Records System (SWITRS)	MAP-21/FAST Act (23 CFR 450.306(d))	Annually
		Rate of Fatalities (per 100 million VMT)			Annually
		Number of Serious Injuries			Annually
		Rate of Serious Injuries (per 100 million VMT)			Annually
		Number of Non-Motorized Fatalities and Serious Injuries			Annually
	M	Project will address a modal conflict	EIP Tracker - Project Performance Assessment	Qualitative measure to determine whether projects address safety and/or security issues	New Project Proposals in EIP Project Tracker
		Project will address security issues. Examples may include reducing human exposure to, or perception of, risk of hazard or crime.			New Project Proposals in EIP Project Tracker
		Project will address an emergency response need			New Project Proposals in EIP Project Tracker
		Project is located within an identified Safety Improvement Area			New Project Proposals in EIP Project Tracker

Table G.4: Goal 4 - Operations and Congestion Management

Goal	Measure Type ("I", "M", "O")	Performance Measure	Data Source	Rationale for Inclusion	Frequency
Goal 4: Operations and Congestion Management	I	Transit Cost per Revenue Mile	Transit Operators (Tahoe Transportation District - BlueGO/Placer County - TART)	MAP-21/FAST Act (23 CFR 450.306(d))	Annually
		Transit Cost per Revenue Hour			Annually
		Transit Farebox Recovery Rate			Annually
	M	Project is expected to improve vehicular or multi-modal level of service, or improve upon the efficiency of the transportation system	EIP Tracker - Project Performance Assessment	Qualitative measure that determines extent to which project promotes the efficient operation of the transportation system.	New Project Proposals in EIP Project Tracker

Table G.5: Goal 5 - Economic Vitality and Quality of Life

Goal	Measure Type ("I", "M", "O")	Performance Measure	Data Source	Rationale for Inclusion	Frequency
Goal 5: Economic Vitality and Quality of Life	I	Sales Tax Revenue	City of South Lake Tahoe & Placer County Executive Offices	Lake Tahoe Transportation Model Input	Annually
		Average Travel Time to Work	U.S. Census American Community Survey 5-Year Estimates		Annually
		VMT by Traveler Type (Residents, Visitors, Commuters)	TRPA TransCAD Model		4-yrs with development of RTP
		Housing and Transportation (H+T) Affordability Index	Center for Neighborhood Technology	Indicates effectiveness of Land Use and Transportation Policy implementation.	Annually
	M	Project distance to/connectivity with a town center or recreation area	EIP Tracker - Project Performance Assessment	Determines extent to which projects improve access to economic drivers.	New Project Proposals in EIP Project Tracker
		Project improves one or more of the following: walkability/bikeability or liveability within the immediate vicinity		Qualitative measure to determine the extent to which projects improve upon quality of life.	New Project Proposals in EIP Project Tracker
		Project will benefit ambient noise			New Project Proposals in EIP Project Tracker
		Project will address access to a recreational area or is a recreation amenity itself			New Project Proposals in EIP Project Tracker
		Project will benefit scenic quality			New Project Proposals in EIP Project Tracker

Goal	Measure Type ("I", "M", "O")	Performance Measure	Data Source	Rationale for Inclusion	Frequency
		Project will benefit wildlife or fish habitat			New Project Proposals in EIP Project Tracker
		Project will benefit forest health			New Project Proposals in EIP Project Tracker
	O	Permanent Resident Population	U.S. Census American Community Survey 5-Year Estimates (Current, Historical), TRPA TransCAD Model Output (Forecast Years)	Lake Tahoe Transportation Model Input	Annually
		Transit-Dependent and Historically Underserved Populations	U.S. Census American Community Survey 5-Year Estimates	Lake Tahoe Transportation Model Input	Annually
		Lake Tahoe Unemployment Rates	Tahoe Prosperity Center, U.S. Census American Community Survey 5-Year Estimates		Annually
		Transient Occupancy Tax (TOT) Revenues	Placer County Executive Office & City of South Lake Tahoe	Lake Tahoe Transportation Model Calibration Factor	Annually
		Median Home Values	U.S. Census American Community Survey 5-Year Estimates	Lake Tahoe Transportation Model Input	Annually
		Median Household Income			Annually
		Low/Medium/High Income Population Percentage			Annually
		Tahoe Basin Tenure of Housing Units (Occupancy)			Annually
		Persons per Occupied Residential Unit			Annually
		Occupancy Rates (Hotel/Motel, Resort, Casino, Campground)	Nevada Gaming Control Board, State Parks		Annually
		Lake Tahoe Region School Enrollment	Lake Tahoe Unified School District, Truckee Tahoe School District, Washoe and Douglas School Districts		Annually

Table G.6: Goal 6 - System Preservation

Goal	Measure Type ("I", "M", "O")	Performance Measure	Data Source	Rationale for Inclusion	Frequency
Goal 6: System Preservation	I	Percent of Pavement in Good Condition	Caltrans, NDOT, CSLT, and Placer, Washoe, Douglas, and El Dorado Counties	MAP-21/FAST Act (23 CFR 450.306(d))	Annually
		Percent of Bridges in Good Condition			Annually
	M	Project supports preservation or regular maintenance of the existing system. Examples may include pavement maintenance to state of good repair.	EIP Tracker - Project Performance Assessment	Determines whether projects support the preservation of the existing system.	New Project Proposals in EIP Project Tracker
		Project maintains or enhances access for the movement of goods (i.e. freight)		Qualitative measure to ensure continued/enhanced freight mobility within the Region.	New Project Proposals in EIP Project Tracker
	O	Total Residential Units, Employment Locations (Service, Recreation, Gaming, Other)	TRPA Geographic Information Systems (GIS)	Lake Tahoe Transportation Model Input	4-yrs with development of RTP
		Number of Units (Hotel/Motel, Resort, Casino, Campground)			4-yrs with development of RTP