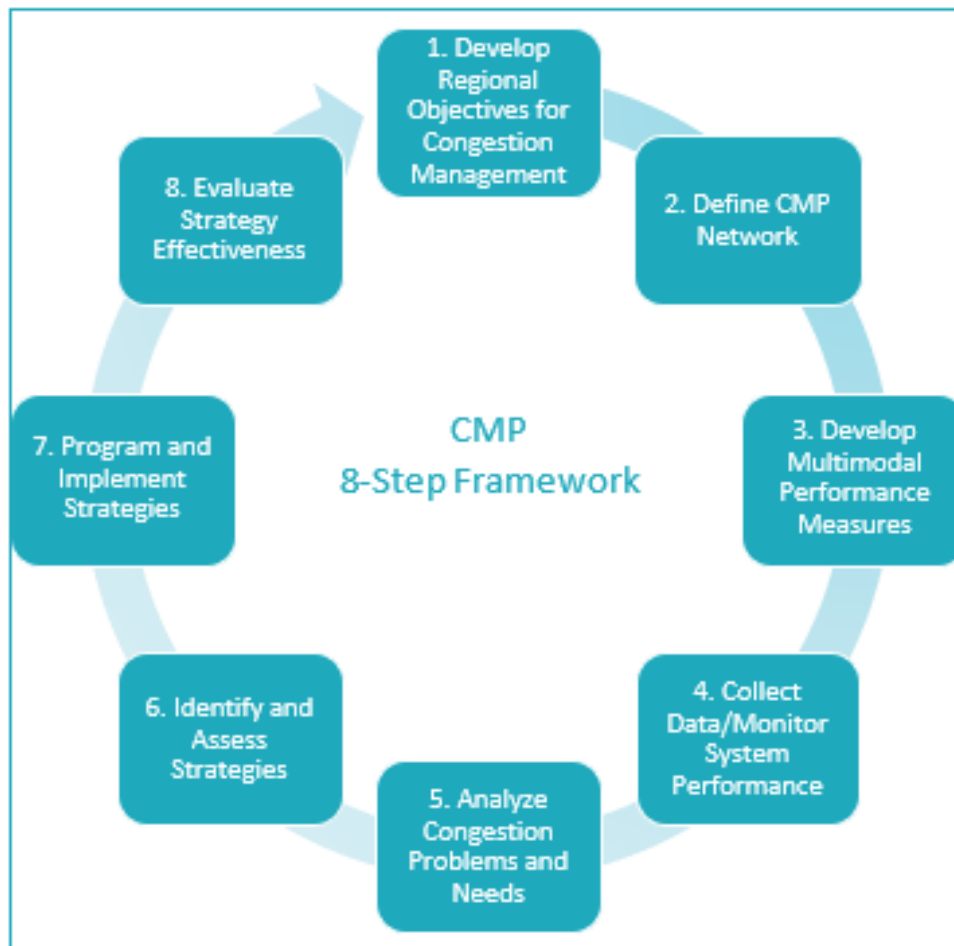


Appendix G: Congestion Management Process

BACKGROUND

All MPOs with a population over 200,000 are federally required (23 CFR 450.320) to develop, establish, and implement a formal congestion management process (CMP).



The CMP is a systematic way of measuring and monitoring current and forecasted future congestion on the region’s multimodal transportation system; monitoring and evaluating performance measures related to congestion; and requiring strategies to address current and future regional congestion.

Federal regulations are not prescriptive regarding the methods and strategies of a CMP. This flexibility allows MPOs to design appropriately for their individual needs. The CMP must, at minimum, be updated often enough to provide relevant and timely information for the region’s transportation plan update. For efficiency, many metropolitan planning organizations synch updates to their RTP, CMP, and TIP cycles.

Flexible approaches are needed because congestion in Tahoe does not occur during the typical weekday commutes. Rather, congestion occurs in Tahoe from a high volume of visitors to the region and its

popular recreation destinations on roadways that have a fixed capacity. In Tahoe, the road network will not be expanded; rather congestion will be addressed by improving mobility for all users, including pedestrians, bicyclists, transit riders, and automobile drivers. In a recreation destination like Tahoe, there may be times that congestion is accepted, for example on a winter Sunday when skiers are returning to neighboring regions. Instead of addressing these discrete periods of congestion, the Plan and this CMP provide multimodal benefits, such as bikeable and walkable destinations that are connected by frequent transit.

FEDERAL REQUIREMENTS AND 8-STEP FRAMEWORK

The Federal Highway Administration's (FHWA), *Congestion Management Process: A Guidebook* (2011), outlines an 8-step framework for the development of a CMP. A review of the required steps and current development approach is provided below.

Step 1: Develop Regional Objectives for Congestion Management

The Regional Transportation Plan's goals and policies represent the guidance of the TRPA Bi-State Compact, federal and state (California) transportation planning requirements, and serve as the regional objectives for congestion management for the plan's CMP. The goals of the TRPA Regional Plan and the RTP are consistent with CMP objectives.

Step 2: Define the CMP Network

The defined CMP network includes roadways, transit and active transportation facilities that serve pedestrians and cyclists. The transit, bicycle, and pedestrian maps analyze the watershed and identify smaller demographics. Keeping these communities in mind when analyzing congestion is important to ensure that the region is achieving its transportation goals.

The Tahoe roadway network includes all local, county, and state-maintained roadways within the Lake Tahoe Basin. The network is controlled by six entry and exit points that include SR 28/US50 Spooner Summit, SR 89 Alpine Meadows, SR 89 Luther Pass, Highway 50 Echo Summit, SR 431 Mount Rose, SR 267 Brockway Summit, and SR 207 Kingsbury Grade within the Tahoe Basin.

The transit network includes all existing transit service within the region and those transit lines that service outside the Tahoe Basin connect to inter-regional routes to and from Truckee and Reno to the north, Carson City to the east, Minden and Gardnerville to the southeast, and Sacramento to the south.

The bicycle and pedestrian network include shared-use paths (Class I), bicycle lanes (Class II), bicycle routes (Class III), sidewalks, marked crosswalks, and enhanced pedestrian crossings.

Step 3: Develop Multimodal Performance Measures

Performance measures are used in the CMP to measure progress toward meeting regional objectives, such as congestion mitigation, and to communicate performance to public officials, private sector stakeholders, and the general public. The following CMP performance measures are discussed in more detail in the *Measuring and Managing for Success* chapter and Appendix I: Performance Measures.

There are seven primary performance measures collected by TRPA, separated into three classes of transportation modes: transit, active transportation, and automobile. Transit performance measures include total transit ridership, population and neighborhoods served by frequent transit service (20-minute headways or better), and population and neighborhoods served by basic transit service (60-minute headways or better). Active transportation performance measures include bicycle/pedestrian mode share and the number of lane miles that are low-stress for bicycle and pedestrian travelers. Automobile performance measures include average daily vehicle miles traveled (VMT) per capita and median travel time between key control points in the region.

In addition to primary performance measures, TRPA collects additional data that is used to analyze underlying factors and address specific needs. Added data includes metrics that address supply, condition and state of good repair, programming and information, and safety.

Step 4: Collect Data/Monitor System Performance

TRPA conducts ongoing data collection and monitoring of system performance through its monitoring program. The Data Collection Monitoring Site map includes bicycle and traffic monitoring sites for the Region. TRPA maintains an activity-based travel model for estimating daily activity of persons, households, and traveler groups on our transportation system. TRPA also coordinates with each state's department of transportation to collect and monitor roadway volumes and collects real time bicycle and pedestrian volumes from partner jurisdictions and through intercept surveys.

In 2024 the Tahoe Transportation District in Tahoe, an agency responsible for implementing large regional and bi-state projects, was awarded a Federal Smart Grant to pilot new data collection systems in rural communities. The project is underway and will be expanding the region's ability to collect data. The camera based system will provide real time data and beyond counting cars with non auto travel and even in some instances safety data.

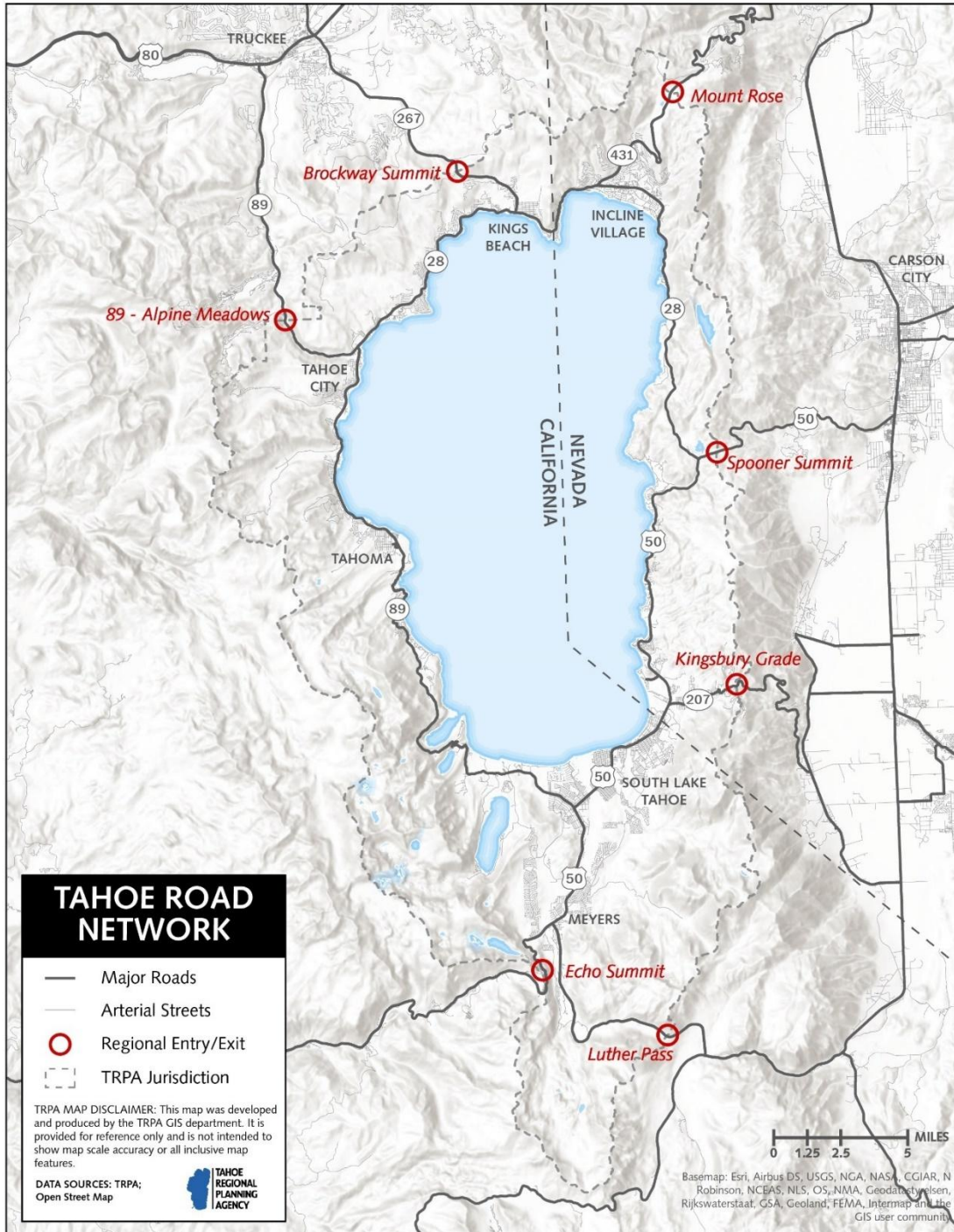
TRPA has access to several big data providers whose platforms are used to monitor conditions in the region. INRIX vehicle probe data is utilized to monitor speeds and travel times throughout the region. Replica is used to examine regional and interregional travel on a seasonal basis. Placer.ai is used to monitor daily, monthly, and seasonal foot traffic both regionwide and in small portions of the region. While no one big data source is perfect, the use of multiple sources allows TRPA to identify periods that are significantly different from normal, and days/periods with unusual visitation or weather conditions are examined to ensure big data sources produce results that match observed conditions.



Photo: Rachid Dahnoun

Regional data trends are reported every four years with RTP updates and the Lake Tahoe Info webpage Monitoring Dashboard (www.laketahoeinfo.org). Improvements to Tahoe’s model and monitoring data will be implemented into Future CMP’s.

Figure 1: Tahoe Road Network



Step 5: Analyze Congestion Problems and Needs

TRPA staff analyzes data on a biennial basis. Once collected, raw data is analyzed and translated into meaningful measures of performance that identify and document progress toward meeting the Region’s goals. The Regional Transportation Plan sets the performance measurement framework including monitoring and managing. The CMP will be implemented in such a way as to identify the underlying causes of recurring and non-recurring congestion.



Congestion analysis in the Tahoe region is a multi-step process tailored to the unique needs of the region. In most of the United States, peak traffic volumes are driven by weekday commuter travel, but this is not the case in the Tahoe region. Locally, peak traffic volumes occur during periods of high visitation, while peak congestion often occurs during periods of inclement weather or road construction. For these reasons, TRPA analyzes congestion seasonally and with distinct analyses for weekdays and weekends. To improve public understanding of regional congestion, TRPA utilizes median (50th percentile) and 95th percentile travel times in public communication about congestion, with the 95th percentile assumed to represent peak congestion outside of worst-case events. While a deviation from the standard congestion indices, these metrics were found to be more useful to decision makers, agency staff, and the public. These travel times are associated with an average travel speed along the corridor, which is presented relative to the posted speed limit.

After performing initial congestion analysis, feedback was obtained from both regional agencies and the public via a new TRPA board created Transportation Performance Technical Advisory Committee (TPTAC), to determine how to best to convey conditions to the public while acknowledging concerns. In response to feedback, TRPA modified congestion reporting to perform more detailed analyses and created visuals

for locations where median and 95th percentile conditions have worsened in recent years, as well as highlight areas of public concern. These detailed analyses examined daily and hourly trends to determine if congestion was due to unusual conditions (weather, construction, special events, etc.) or a recurring issue. The TPTAC meets biannually to review metrics and prepare a performance report that not only drives congestion management but also the regional transportation plan.

MONITORING PROGRAM TRAFFIC VOLUMES

In partnership with the state DOTs, TRPA collects, monitors, and analyzes roadway traffic volume data from several dozen count stations throughout the Tahoe region.

PROGRAM OVERVIEW

- Program Name:** Traffic Volumes
- Monitoring Program Category:** Transportation
- Monitoring Approach:** Traffic volume monitoring is part of a regional strategy to create a well executed transportation management system that incorporates monitoring data, real-time information, and dynamic operations that respond to seasonal and periodic congestion. 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. Both the California Department of Transportation (Caltrans) and the Nevada Department of Transportation (NDOT) manage several dozen permanent traffic count stations, which collect data on the number of vehicles traveling throughout the region. TRPA aggregates and analyzes this data for a variety of purposes, including project planning, development of our Regional Transportation Plan, and travel demand modeling.

To download all of the traffic volume data on this page please see [Tahoe Open Data](#).

MONITORING SITES

- Country Club - North of First Green Drive
- Country Club - North of Lakeshore Blvd
- Country Club - North of SR-28
- Elks Point Road
- Lakeshore Blvd - 100ft E of Village Blvd
- Lakeshore Blvd - N of SR-28 (0.1 mile)
- Lakeshore Boulevard - 100 ft E of SR-28
- Northwood Blvd - East of Village Blvd

Select a Monitoring Site from the list or click a location marker on the map to explore.

Segment	2017	2018	2019	2020	2021	2022	2023
CA 267	5.6	5.6	5.5	5.2	5.4	5.1	5.8
NV 28 (Country Club - US 50)	21.3	22.2	19.5	18.7	19.0	19.2	21.2
NV 28 (California - Country Club)	10.3	10.3	10.5	10.4	10.9	10.3	12.1
CA 28	23.4	22.7	23.4	22.9	25.4	25.6	25.5
CA 89 (CA 28 - I-80)	22.0	20.1	21.4	19.6	20.6	20.6	23.9
CA 89 (CA 88 - US 50)	16.3	17.1	15.5	15.8	15.7	15.5	16.7
NV 207	5.9	6.0	6.4	6.2	6.3	6.3	6.9
NV 431	19.8	20.0	20.0	19.0	19.4	20.6	22.4
Pioneer Trail	15.0	15.3	15.3	14.7	16.1	15.4	17.7
US 50 (Echo Summit - South Lake Y)	17.6	16.9	18.0	16.5	18.1	17.5	18.8
US 50 (South Lake Y - State Line)	18.4	16.5	16.4	14.3	14.7	13.4	14.0
US 50 (State Line - Spooner Summit)	23.4	23.0	23.1	21.9	22.4	21.3	24.0
All Segments	199.0	195.7	195.0	185.3	193.9	190.8	209.0

95th Percentile Travel Time

Figure 2: Existing and Proposed Active Transportation Facilities

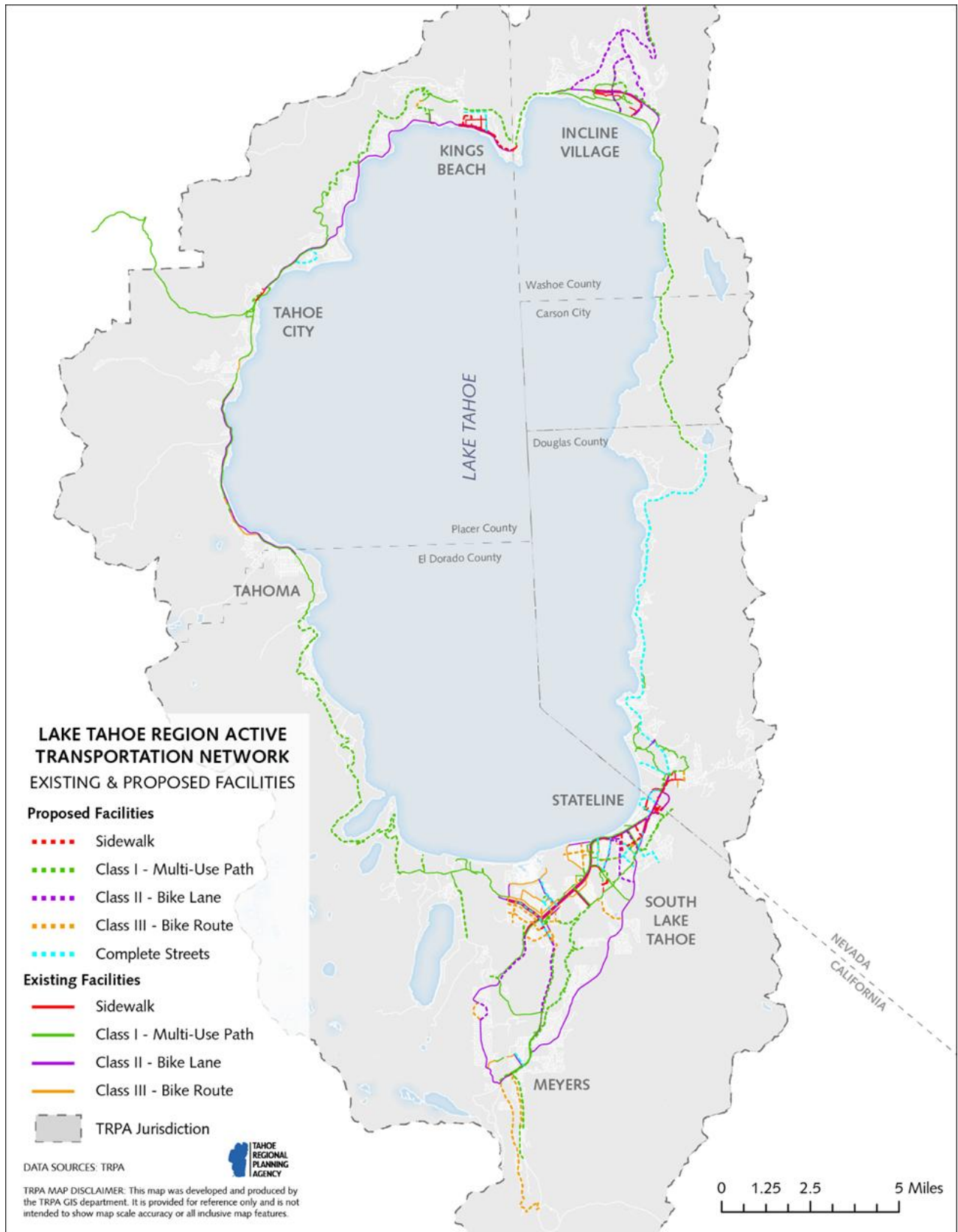


Figure 3: Data Collection and Monitoring Sites

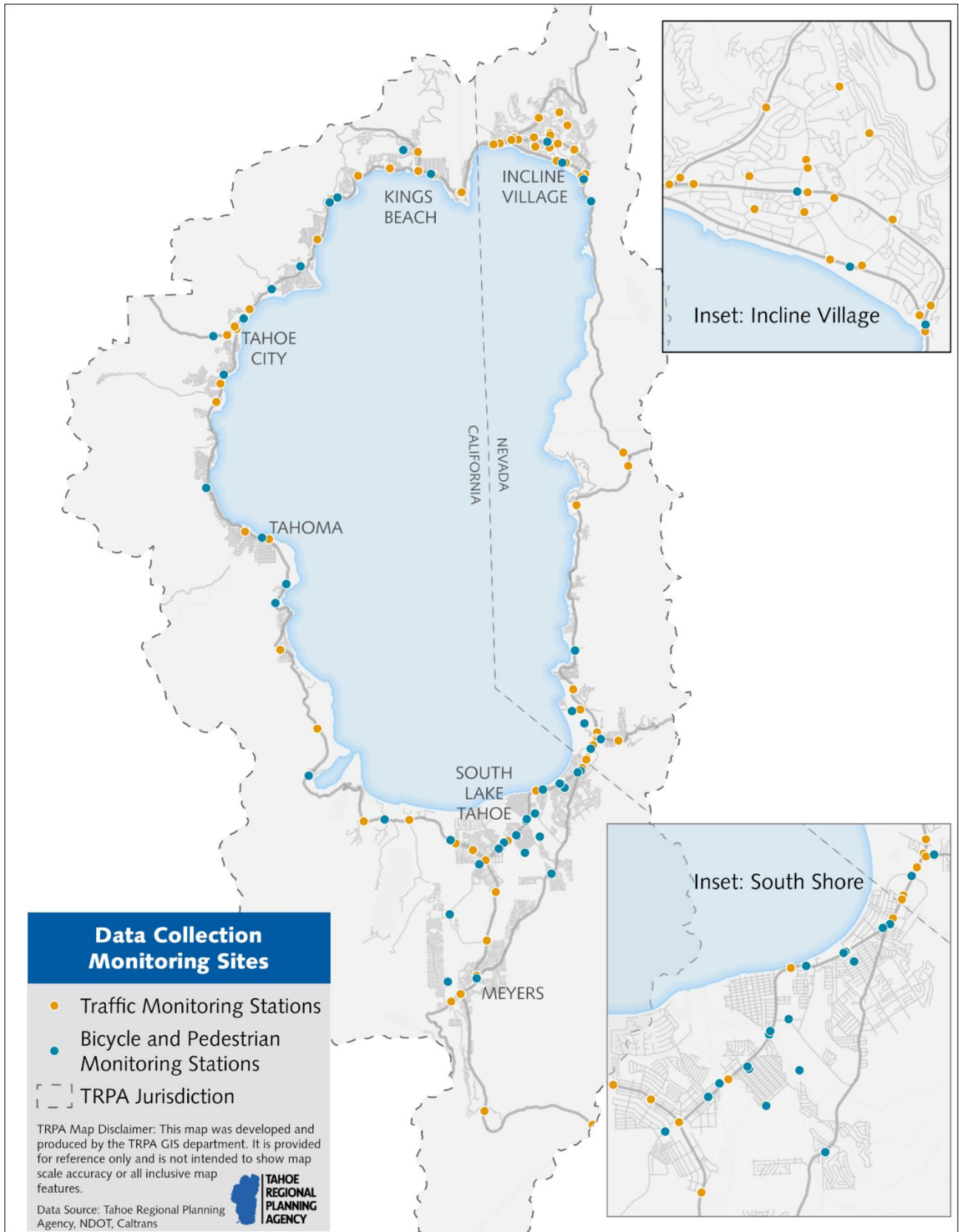
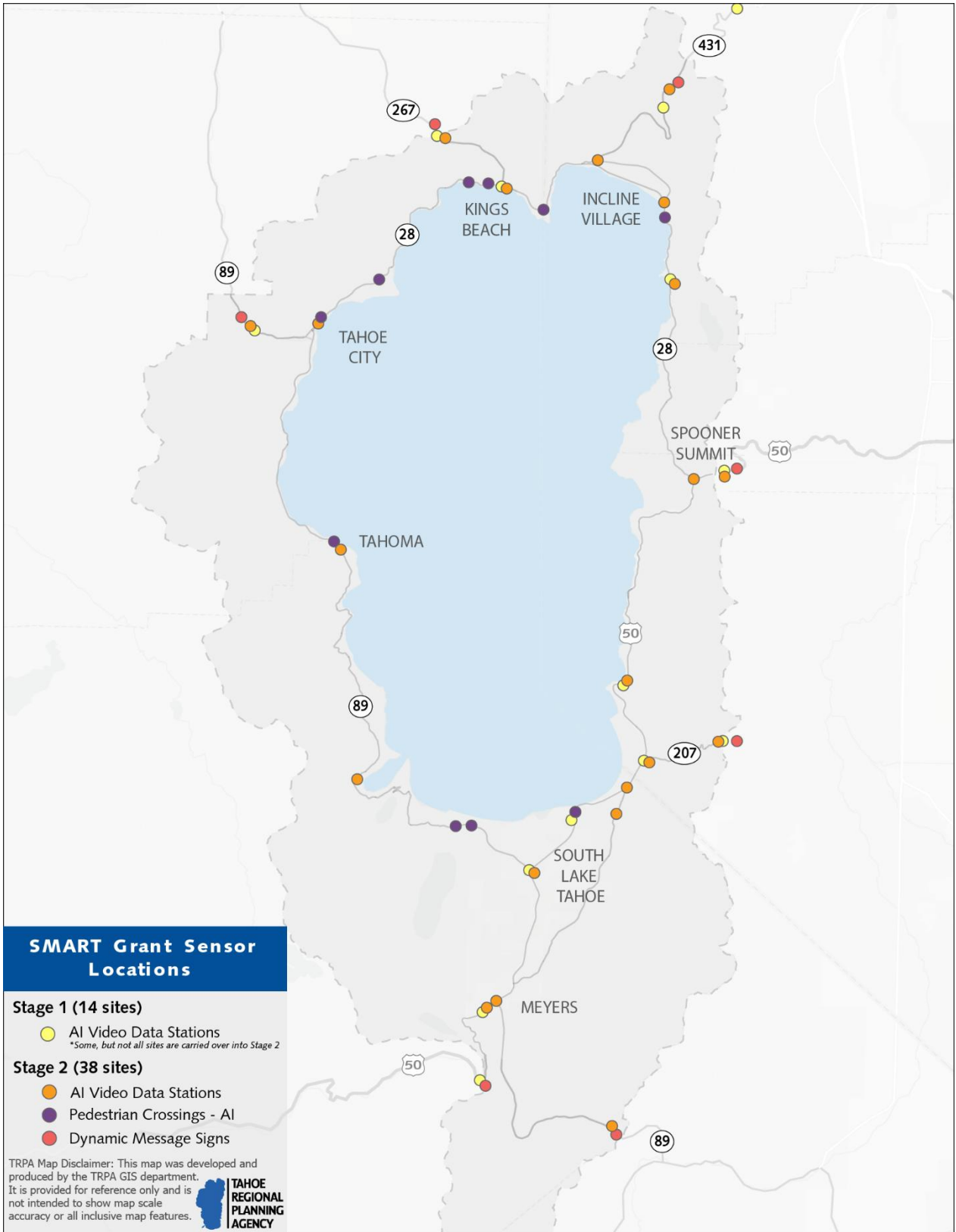


Figure 4: SMART Sensor Locations



Step 6: Identify and Assess Strategies

The RTP goals and policies provide a “toolbox” for addressing local and regional congestion needs, such as supporting mixed-use, transit-oriented development, and community revitalization projects that encourages walking, bicycling, and easy access to existing and planned transit stops, and to collaborate with jurisdictions and state departments of transportation to develop adaptive traffic management strategies and best practice for maintaining the system.

Development of the RTP project list includes evaluation of strategies identified to implement CMP related goals and policies at the local and regional level. For example, regional CMP strategies will support carpooling and vanpooling, inter-regional transit service, and expanded mobility hub locations. Additionally, the TPTAC after reviewing data and performance create recommendations for improving transportation such as improvements to transit operations, specific projects to improve safety and even updates to transportation policies. The latest performance report can be found in Appendix I.

Step 7: Implement Strategies and Evaluate Effectiveness

The Plan lays out multimodal strategies that address congestion. The projects and programs to be implemented in the future as identified in the RTP are focused on transit improvements, trail connections, capitalizing on technology and building complete streets. The Plan provides forceable revenue to carry out the implementation.

Data collection and analysis post-implementation of the 2025 Regional Transportation Plans projects and programs will evaluate the effectiveness of each strategy and reported in the biannual Transportation Performance and Recommendations report. The RTP policies support data collection and analysis for the congestion management process and identify in the plan a performance management framework. As part of the 2024 Biennial Transportation Performance and Recommendations Report and the 2023 Tahoe Congestion Report, TRPA analyzed several locations with recurring congestion and recent improvements to determine the effectiveness of strategies and pinpoint where future improvements are needed. For example, US Route 50 through South Lake Tahoe has seen a trend of decreasing congestion in recent years, while some portions of the North Shore have seen degradation, particularly the California SR 28 corridor. The increased congestion on SR 28 may be related to construction and increased tourism, but this is a location where TRPA plans to focus monitoring efforts to determine if there are other causes.

2025 RTP/SCS Policy Highlights

Policy 6.2: 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).

Policy 6.1: Develop and implement a cooperative continuous, and comprehensive Congestion Management Process to adaptively manage congestion within the region’s multi-modal transportation system.

As the MPO, TRPA plays another role in the congestion management process with its Regional Grant Program. Proposed transportation projects selected to receive MPO programmed funding are scored based on their ability to meet the Regional Transportation Plan goals and current transportation needs which can vary for each biannual cycle of funding. This allows the MPO to manage priorities based on effectiveness of the strategies, making needed adjustments based on monitored performance.

The outcome of this analysis will inform future RTP financially constrained (foreseeable) project lists and biennial updates of the Federal Transportation Improvement Program. The CMP is built into the Regional Transportation Plan and will examine the effectiveness of regional strategies by continuously and iteratively applying performance management framework adopted as part of the 2020 RTP and this planning process.

Step 8: CMP Review and Update Process

The CMP review and update process commit to:

- Regional Plan and 2025 RTP goals and policies will be reflected in the CMP with revisions occurring no less often than future RTP updates.
- Changes to federal rules and associated requirements will be reflected in the CMP no less often than the future RTP updates.
- Congestion management objectives will be reviewed and revised as necessary, in coordination with updates to future RTPs.
- Transportation metrics such as bicycle trail use and transit ridership will be made available on the Lake Tahoe Info Monitoring Dashboard. <https://monitoring.laketahoeinfo.org/>
- Observed traffic volumes will be incorporated into the CMP database as they are made available by Caltrans and NDOT. Please see the [Lake Tahoe Info traffic volumes page](#) for volumes.
- Regional system performance will be analyzed on a biannual basis, and no less often than, future RTP updates.
- Regional system performance will be factored into the MPO Regional Grant Program project selection.

Other elements of the CMP may be reviewed and updated on a case-by-case basis as requested by federal and state partners.

CONCLUSION

The CMP includes a systematic process for determining acceptable mobility levels in the region, measuring the effectiveness of transportation strategies on the transportation system, and prioritizing changes to strategies and project development standards as needed. TRPA will continue to establish and implement the most relevant and feasible CMP performance measures and congestion management strategies, which should be considered and refined iteratively in conjunction with other transportation planning processes.