

CHAPTER II – ASSETS, OPERATIONS & MAINTENANCE



Roadway Systems

There are a total of 34,624 centerline miles of roads in Nevada, 29,202 miles are maintained by the local agencies and 5,422 miles are maintained by NDOT. Nevada’s interstates, urban freeways, principal arterials, and rural minor arterials were rated #1 for the smoothest roads in the Nation by the Federal Highway Administration.

Sixteen percent of all Nevada’s roads are on the state maintained system, however, that 16% carries 58% of the total vehicle miles of travel. The remaining 42% of the travel is carried on roads maintained by county, city or other governmental agencies. The state maintained system also carries 83% of all truck traffic and 87% of the heavy truck traffic.

Vehicle miles of travel on all Nevada roads exploded from 9 billion in 1990 to 20.8 billion in 2006. That number is expected to increase to 35 billion vehicle miles by 2010. A little over thirty-nine million people visit Las Vegas every year and approximately 53% percent of them arrive by automobile or bus. Almost every major road leading into and out of the Las Vegas Valley and the Reno area is in

need of capacity improvements in order to keep up with growth.

The highway system falls under four categories:

- National Highway System (NHS) is a system of major federal-aid roads including all of the Interstate Routes, most principal arterials, the defense strategic highway network and strategic connectors.
- Surface Transportation Program (STP) includes federal-aid roadways that are not on the NHS but are functionally classified as principal arterials, minor arterials, major collectors and urban collectors.
- Other Improved Roads that are not part of the NHS or STP are mainly functionally classified as local or rural collectors. They are public facilities which are regularly maintained. These roads are typically designated as access roads, frontage roads and state park roads when maintained by NDOT. The cities and counties maintain most of the other improved roads.
- Unimproved Roads are functionally classified as locals but are not regularly maintained. They carry sporadic traffic and do not qualify for federal aid or Nevada’s gas tax distributions.

Centerline Mileage

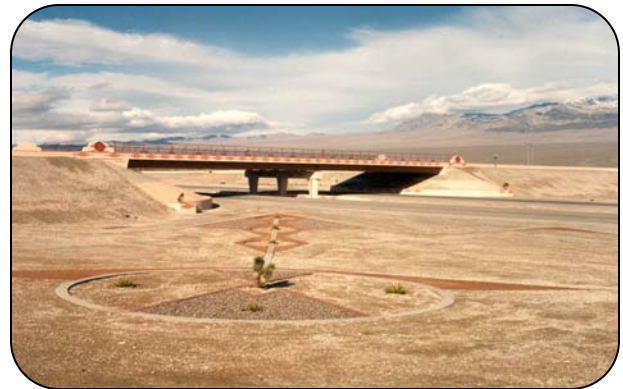
	NDOT Maintained	Locally Maintained	Statewide Total
Federal Aid			
NHS	2,123	23	2,146
STP	2,666	1,595	4,261
Non-Federal Aid			
Other Improved	633	21,045	21,678
Unimproved	0	6,539	6,539
Total	5,422	29,202	34,624

With the NHS and associated funding, states can choose from a range of improvements. They can make operational changes, such as a program to locate and remove stalled vehicles that are impeding smooth traffic flow. NDOT has initiated such a program called the “Freeway Service Patrol” in the Las Vegas and Reno areas and it has been a highly successful service. States can also employ available technology improvements such as Intelligent Transportation (ITS), which help reduce congestion and keep traffic moving without major roadway expansion. These programs have also been implemented by NDOT in the Las Vegas and Reno areas.

Our transportation system must be unified with each mode complementing the other. Intermodal carriers rely on all forms of transportation to deliver goods and services to consumers in the most efficient manner possible. NHS fulfills that goal by serving 198 ports, 207 airports, 67 Amtrak stations, 190 rail/truck terminals, 82 intercity bus terminals, and 20 multipurpose passenger terminals across United States. By providing these essential linkages to other modes, NHS creates a seamless transportation system for the rapid movement of people and products. It also helps us meet the challenges of global economic competition by enhancing our different modes of transportation, increasing America’s productivity and bolstering its economy.

Nevada is the 7th largest state in land area with two major urban population areas separated by approximately 450 miles: Las Vegas in the South and Reno in the North. The growth of these metropolitan areas has put significant strain on NDOT’s ability to meet the transportation needs in those areas. In addition to identifying new financing methods, NDOT has been pursuing a highway relinquishment program where certain roads on the system may be more adequate to serve the local needs rather

than the statewide system. These roads have been identified and proposals are being submitted to the local entities to take over ownership and maintenance responsibility. This may free up resources to accommodate the growing urban centers of the state and those roads that are more crucial to Nevada’s economy, safety and environment and the regional transportation needs.



Bridges

Age, traffic volumes, and heavy truck loadings have been increasing considerably in the last 10 years and this is taking its toll on our bridges. In addition, a significant number of our bridges are expected to turn 50 years old by 2010 causing a substantial backlog in our bridge preservation status. At this time, only 16% of our bridges are 50 years old. But by 2020, 555 of our bridges will become 50 years old making 67% of our bridges at least 50 years old. By 2020, NDOT is projecting a backlog in bridge preservation funding of \$24 million.

There are 1,898 public bridges in Nevada, 1084 are owned by NDOT (57%), 709 are owned by other governmental agencies, 60 are federally owned, 38 are privately owned, and 7 are owned by the railroad. Nevada’s bridges have been rated #1 in the Nation by the FHWA with only 5% being rated as deficient compared to the national average of 25%.

However, Nevada has a relatively low number of bridges in their inventory, they are fairly new compared to the eastern states, and we have a relatively benign climate.

Asset Preservation

NDOT is responsible for protecting highway assets, and preserving existing highways is a top priority. In fact, Nevada's interstates, urban freeways, principal arterials, and rural minor arterials were rated #1 for the smoothest roads in the Nation by the Federal Highway Administration. However, our investment in highways is substantial. Today's cost to replace the pavement surface alone is \$3 billion.

NDOT manages our highway assets using two systems: A pavement management system and a bridge inventory system. Both systems provide an inventory of our existing assets, their condition, needed repairs, and repair priorities.

Generally, pavement-preservation work consists of sealing, crack filling, patching, milling, overlaying or reconstructing the highway surface. Sealing, crack filling, patching are typically accomplished by NDOT maintenance crews. Milling, overlaying, or reconstructing the highway surface is normally contracted out.

NDOT's pavement preservation action plan in priority order consists of the following tasks:

- Continue to maintain our Interstate system and high-volume roads at a high level of serviceability by applying timely overlays and reconstructing inferior segments.
- Continue to maintain our non-Interstate Principal arterials, minor arterials, and other moderate-volume roads at a modest to high

level of serviceability by applying timely overlays and reconstructing inferior segments.

- To further develop economically sound methods to improve our low-volume roads and maintain them at a limited, but acceptable, level of service.
- To continue coordinating the integration of our routine pavement maintenance activities with planned overlay and reconstruction work.

Security

In light of the terrorist attack on September 11, 2001 and the resulting increase nationally in security concerns, NDOT has recognized the need for increased security awareness, and the need to protect our facilities, equipment, and the transportation infrastructure from physical damage or from being rendered inoperable, as best we can.

The State of Nevada, in accordance with Nevada Revised Statutes, Chapter 414 (NRS 414), is required to mitigate against, prepare for, respond to, and recover from emergencies/disasters in order to provide assistance that saves lives and protects health, safety and property. These emergencies/disasters may range from a small, localized event to a large scale event which requires a presidential Declaration.

A disaster may severely damage the transportation infrastructure. The damage inflicted may influence the means and accessibility of relief services and supplies. The Nevada Department of Transportation (NDOT) is responsible for keeping State highways and roads repaired and open during a disaster and will assist in traffic control on these routes. This will normally be accomplished through the

NDOT District Engineers and Managers at the Maintenance District level.

The Department of Homeland Security (DHS) issued Homeland Security Presidential Directive – 3: the Homeland Security Advisory System (HSAS). The HSAS provides five graduated threat conditions identified by both word and color, with appropriate security countermeasures for each threat level. Its implementation is mandatory for federal facilities and is strongly recommended for State, local and private facilities. The HSAS stated that it strongly appears to be in the Nation’s interest for State/State Department of Transportations to have a “parallel” system to reduce confusion and facilitate needed countermeasure implementation as appropriate during heightened security threat levels. Following the issuance of the HSAS Directive, the American Association of State Highway and Transportation Officials (AASHTO) established a Transportation Security Task Force which is requesting each State DOT to thoroughly evaluate existing security threat and countermeasures in place, documenting the State DOT’s security system, and providing guidelines to secure the nation’s highways and bridges.

NDOT has developed a Facility and Transportation Infrastructure Security Plan to provide guidelines for security at our facilities. This plan addresses employee training in what to watch for and how to respond to a suspected security problem, the appropriate actions to take in regards the security of NDOT’s mobile fleet, and physical measures which can be taken to protect NDOT facilities.

Districts

NDOT’s maintenance forces are divided into three Districts:

- District I is located in the southern region of our state and it is the most populous district. It includes the fastest growing city in the nation – Las Vegas with a population of close to 2 million out of a statewide total of 2.7 million. In addition, Las Vegas is one of the world’s most popular tourist destinations with 39 million visitors a year. District I borders three states – California, Arizona, and Utah.

- District II is located in the northwestern region of our state and covers a diverse area of both rural and urban population centers. It covers many miles of rural areas with smaller bedroom communities that are developing at an increasing rate. This district also includes Lake Tahoe, one of our national treasures. District II borders two states – California and Oregon.

- District III covers the most rural areas of Nevada and borders on three states – Oregon, Idaho, and Utah. Within this area hundreds of miles of state maintained roads wind through high desert plains and across passes in snow covered mountains.

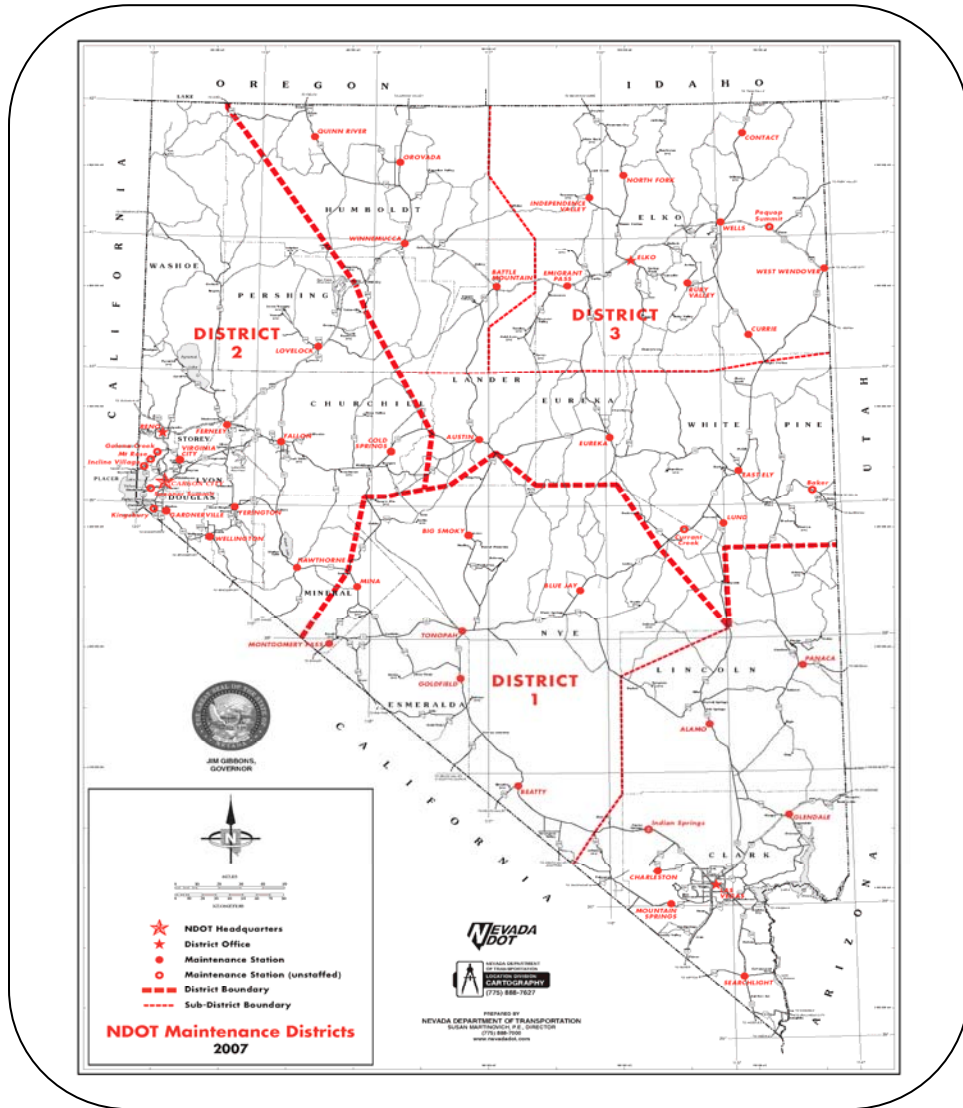


There are approximately 98 maintenance tasks performed by the maintenance crews under the Maintenance Management System. Typical maintenance activities include, but are not limited to:

- Debris/Trash Removal
- Fill Slope Repair
- Urban Sweeping
- Landscaping
- Maintain Road Markers

Blade Shoulders
 Weeding & Burning
 Crackfilling
 Machine Patching
 Graffiti Removal
 Plowing and Snow Removal
 Anti-Icing Strategies

Storm Cleanup
 Weather Forecasting
 Bridge Inspection and Maintenance
 Sign Removal and Replacement
 Animal Interaction



Most importantly, our Districts perform public outreach. They have daily contact with those who use our roads and they understand the issues within the communities they live in and serve. Our Districts also perform specialized public outreach such as conducting community

workshops, coordinating and working special events, attending public meetings and working with the media.

NDOT will be closely watching the affects that global warming is predicted to have

on our assets and the type of work we perform in our Districts. Research studies have identified the serious impacts climate change poses for our transportation system. Increases in very hot days is expected to increase the frequency of wildfires, compromising pavement integrity; increased flooding is expected to inundate roads and bridges; and increases in Arctic temperatures is expected to cause subsidence of permafrost, disrupting roads. Heavier rainfall in many parts of the country will require redesign and replacement of drainage structures.

Reservation Roads



There are 26 federally recognized Native American tribes in Nevada and a total of 31 Native American Reservations and Colonies. Their properties cover almost 2,000 square miles, ranging from as small as .03 square miles to as much as 725 square miles. Tribal holdings are scattered across vast geographic areas of the state that are near both urban areas and semi-rural or extremely rural areas. There are close to 9,000 tribal members in the state, and 26,000 people who classify themselves as American Indian or Alaska Native.

All of the Interstate and US Highways, and several of the State highways pass through or along an Indian Reservation or Colony in Nevada. And in some areas, our roads go

directly to a reservation. By allowing us to build and maintain roads through a reservation, NDOT recognizes the key role they have in connecting our state and interstate highway system. At the same time, our transportation system provides Indian communities with access to schools, work, shopping, hospitals, and emergency services. Many reservations in Nevada are isolated, so getting to urban areas for simple things such as medical appointments, work, and shopping are challenges.

Transit programs provide tribal members with needed mobility within the reservations and for the remote reservations around the state. Almost every tribe in Nevada has purchased a van through NDOT utilizing Federal Transit Administration funding. These vans contribute to the quality of life and independence for many of the elderly and disabled tribal members. They provide access to employment, medical, shopping, and government services.

The Bureau of Indian Affairs (BIA) has been involved in the repair and reconstruction of roads on Indian Reservations since the 1920’s. The BIA is part of the Department of the Interior in Washington, D.C. In 1982, the Surface Transportation Act created the Federal Lands Highways Program which established Indian Reservation Roads (IRR) as a category of public roads providing access to or within Indian reservation lands. An IRR is defined as a public road that is located within or provides access to an Indian reservation or Indian trust land. IRR roads have multiple owners, including Native American tribes, the BIA, states, and counties.

IRR funds go directly to the tribes and are distributed based on a mathematical formula using 1) cost to construct, 2) vehicle miles of travel, and 3) population. The tribes are required to produce a 20-year long range transportation plan for their IRR roads to

address future land use, economic development, traffic demand, public safety, and health and social needs. The tribal government uses its IRR long-range transportation plan to develop a tribal priority list or Tribal Transportation Improvement Program (TTIP). The TTIP is required to be consistent with State and MPO planning practices. Acceptable use of IRR funds is planning, design, construction and maintenance.

The California/Nevada Tribal Technical Assistance Program (CA/NV TTAP) is a collaborative strategy between the Federal Highway Administration and the BIA, funded by the US Department of Transportation. It is one of seven TTAP's nationwide serving tribal governments. The CA/NV TTAP serves the transportation program of the tribal governments in the California Nevada region. The purpose of the CA/NV TTAP is to assist and promote the development of safe modern transportation facilities and policies within California/Nevada Indian country for all users. It is a transportation resources center designed to serve the transportation program of the tribal government of California/Nevada region.

Most of the roads on the reservations in Nevada are dirt, and the tribes do not have adequate funding to maintain them properly or even consider paving them. In addition, over the past few years IRR funding has been decreasing while the BIA has been passing more and more road responsibilities to the Native American tribes. And because very few reservation roads are functionally classified as a "local collector" there have been few opportunities for NDOT to become directly engaged in projects on tribal lands.

Unlike many Native American tribes across the United State, the tribes in Nevada have chosen not to rely on gaming as a revenue source. As a result many are struggling

financially. Finding new sources of income is a challenge for the tribes of Nevada right now and this will continue to be a challenge over the next twenty years.

Improving the transportation system within the reservations and colonies is a joint responsibility not only for federal agencies, but a shared responsibility of state and local governments with transportation investments on or near Indian communities. Improving the transportation system provides increased public safety and economic opportunities in these communities.

Most Native American tribes have passed laws that give preference to tribal members for employment and contracting work on or near a reservation. All covered employers (including construction contractors) operating within the boundaries of an Indian Reservation are required to comply with Tribal Employment Laws.

Today Nevada's Native American tribes share common concerns such as land management, water rights, transportation and storage of nuclear waste, economic development and the decimation of ancestral burial sites. Protecting the cultural heritage and artifacts of our Native American tribes is imperative as we improve our transportation infrastructure in Nevada.

NDOT's Cultural Resources Section is responsible for ensuring that our projects comply with Federal and State requirements regarding protection of cultural resources (i.e., significant historic, architectural, archaeological and paleontological resources) and consultation and coordination with Native American Tribes. They identify affected tribal lands and interests and consult with tribal officials to address effects of proposed projects on their lands or interests. Our Archaeological Section protects,

preserves, researches and learns from Nevada’s past and strives to protect that past.

Landscape & Aesthetics

In 2002, NDOT adopted a Landscape and Aesthetics Master Plan for the state of Nevada. This Plan sets policies and procedures for addressing landscape and aesthetics in all state highway projects throughout their life cycle, and is the foundation upon which the program is built. It is the policy of the State of Nevada that landscape and aesthetics will be considered along with all other design factors in all transportation projects throughout their life cycles. Along with setting high-level policy, the Plan developed funding mechanisms for including landscape and aesthetic treatments in highway design.



The Landscape & Aesthetics Plan is an integral part of NDOT’s Roadway Design that addresses both the visual quality of the State’s highways, and the impact of highways on their surrounding landscapes. The Plan was developed as part of NDOT’s commitment to ensuring that all aspects of our highway’s surroundings, including scenic, historic, aesthetic and environmental resources, are carefully considered while maintaining safety and mobility. It is one of the primary ways that NDOT responds to citizens’ desires to improve the aesthetic quality of the State’s highways.

Landscape and aesthetics refers to the total visual quality of the highway, but includes more than plants and decorative designs. It includes carefully designed road alignments that preserve scenic vistas, and minimize disruptions to communities and natural habitat caused by the presence of a highway. Landscape and aesthetic treatments emphasize regionally appropriate materials and drought resistant plants.

The Plan also established programs to help communities develop their own landscape and aesthetics projects. Local governments, private citizens, civic groups and the business community are encouraged to work with NDOT to develop cooperative agreements for funding the design, construction and maintenance of landscape and aesthetic improvements.

Addressing landscape and aesthetics in highway design contributes to Nevada’s tourist-based economy, and improves its citizens’ quality of life.

Our Carbon Footprint

US temperatures have been rising over the last century, and they are projected to continue. These climate changes are a result primarily from emissions of Greenhouse Gases (GHG) associated with energy use. Americans are driving more, building more, consuming more energy, and emitting more carbon.

Carbon dioxide accounted for 83 percent of GHG emissions in the U.S. in 2006. Transportation – roads, rail, air, and marine – accounted for one-third of those emissions. However, road use accounts for most of the emissions from the transportation sector. Factors such as fuel economy, type of fuel used, vehicle miles of travel and traffic operations are what affects those emissions.

Scientists have identified five climate changes of particular importance to U.S. transportation:

- Increases in very hot days and heat waves,
- Increases in Arctic temperatures,
- Rising sea levels,
- Increases in intense precipitation events, and
- Increased hurricane intensity.

In general, the western portion of the U.S. has warmed more than the eastern portion. Potentially, the greatest impact of climate change for our transportation system will be flooding of coastal roads, railways, transit systems and runways because of global rising sea levels. This could also lead to land subsidence in some locations. Coastal roads, rail lines, and bridges, particularly those that serve as evacuation routes, may have to be elevated or parallel routes upgraded.

Temperature extremes (mainly heat waves) could lead to more frequent buckling of pavements and misalignment of rail lines. More intense precipitation could increase the severity of extensive flooding.

On the positive side, temperature rises could mean later onset of seasonal freezes and earlier seasonal thaws. This could mean reduced costs of snow and ice control for departments of transportation and safer travel conditions for passenger vehicles and freight.

Transportation planners may be required to design facilities to higher standards to hedge against the potentially negative impacts of climate change, but at what cost? Decision makers will have to weigh the risks and probabilities when making investment, maintenance and design decisions.

It is anticipated that more use of alternative fuels and hybrid vehicles in the future will help combat emissions. At this time, Nevada does not offer any incentives for alternative fuel vehicles, but that is expected to change in the future. Congress has also enacted harsher fuel economy standards for all new light-duty vehicles (cars, light trucks, and SUV) to achieve an average standard of 35 miles per gallon by 2020. And, there is great interest in developing policies that would shift travel demand to alternative modes of transportation, such as transit, biking, walking, and telecommuting.

Addressing the impacts of climate change will also require regional and multistate involvement. Planners will have to address climate change from a long-term perspective, recognizing that the investment decisions we make today, particularly about the location of our transportation infrastructure, are going to shape long-term development patterns.

Air Quality

There are only two areas in Nevada that are classified as “nonattainment”: Clark County in the South and Washoe County in the North. The rest of Nevada is largely rural or small urban and currently have no air quality attainment standards.

Clark County (Las Vegas) is currently in non-attainment for three pollutants: carbon monoxide (CO) particulate matter 10 microns in size or less (PM₁₀), and Ozone (O₃). Non-attainment is the term used to describe levels of these pollutants that the US Environmental Protection Agency (EPA) has designated as not meeting the clean air standards for that pollutants as defined in the National Ambient Air Quality Standards (NAAQS). The Clean Air Act Amendments of 1990 require that each

non-attainment area and pollutant be addressed by a control plan, referred to as the State Implementation Plan (SIP), developed by the state air quality planning agency. The SIP sets out policies and actions to ensure that air quality meets NAAQS within a time frame determined under EPA regulations.

The core area of the Truckee Meadows (RTC of Washoe County), in the North, is designated as in “moderate” non-attainment for carbon monoxide (CO) with a design value of less than 12.7 parts per million and “serious” non-attainment for particulate matter of less than 10 microns (PM₁₀). Washoe County, outside the Tahoe Regional Planning Agency (TRPA), is designated as “marginal” non-attainment for ozone (O₃).

These areas are eligible for federal Congestion Mitigation Air Quality (CMAQ) improvement funds and mitigation measures for these funds are carried out by their respective Metropolitan Planning Organizations (MPO). In addition, the MPO’s have various other emission reducing strategies such as traffic signal timing optimization, employee rideshare programs, transportation demand management activities and converting transit vehicles to alternative fuels. NDOT works in cooperation with the MPO’s in support of congestion mitigation measures.

The Carson Metropolitan Planning Organization planning area is currently in attainment for ozone (O₃) and is expected to continue as such until 2030. However, they continue to promote the level of air quality that is enjoyed today. They are monitoring and coordinating their traffic signals to provide optimum traffic flow and keep vehicles from idling. They promote alternative means to transportation by supporting bicycle and pedestrian improvements and encouraging transit use.

Conformity administration and other air pollutant concerns in the Tahoe Basin are complicated at best. The Tahoe Basin is divided between two states, California and Nevada. Each of these states administers the conformity process differently with the EPA. Furthermore, the sub-jurisdictional areas within each state present different classifications and therefore require unique analysis.

The TMPO Tahoe Basin is currently in attainment of the federal and state CO standards. A portion of the North Lake Tahoe Basin lies within Washoe County which is classified as “marginal” non-attainment for ozone. Therefore that northern portion of the Lake Tahoe Basin is also classified as “marginal” non-attainment for ozone.