Amendment 25-07 Air Quality Conformity Technical Report - Appendix E

TABLE OF CONTENTS

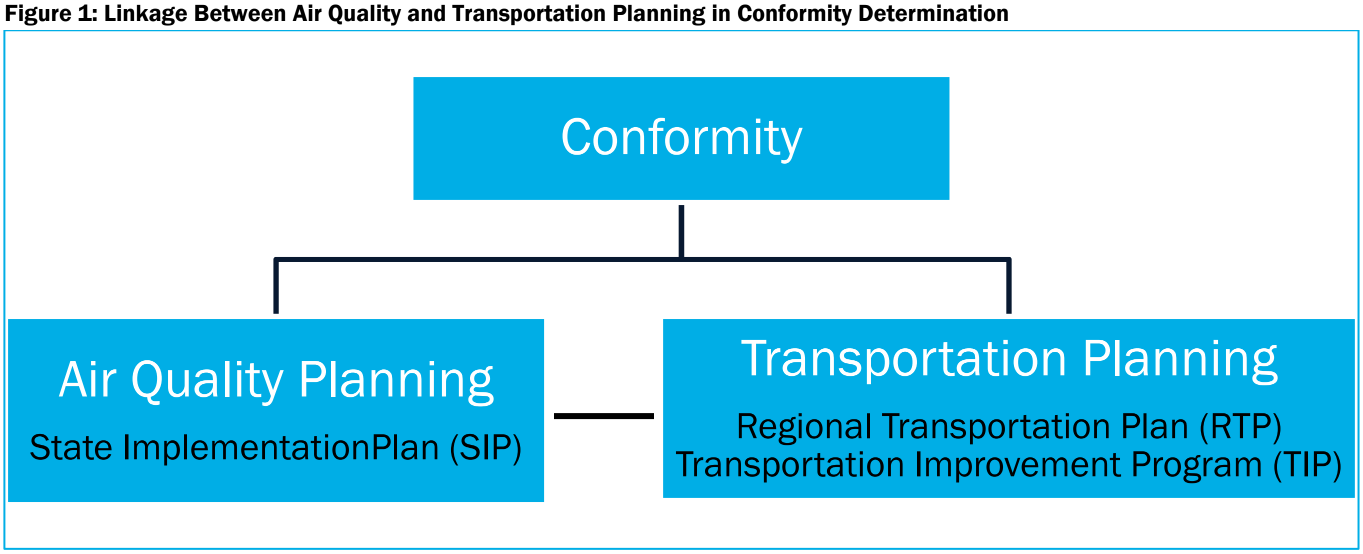
1. INTRODUCTION

Background

A necessary component of any Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP) is air quality conformity analysis. Since 1991, air quality and transportation have been linked through a process known as transportation plan conformity. Conformity is a demonstration that the levels of emissions from travel on the transportation system are consistent with the goals for air quality in the State Implementation Plan (SIP) that is a control plan developed by the State of Nevada's air quality planning agencies.

The RTP/TIP shall include a determination that the plan implementation will reduce certain pollutants to the acceptable levels in ways that conform in the SIP. The term "conformity" describes the determination of this acceptable result. Supporting the determination is a complex modeling process that assumes all projects and programs in the RTP/TIP are implemented as scheduled. The conforming RTP/TIP projects shall reduce the pollutants to acceptable levels within an acceptable time frame to meet the National Ambient Air Quality Standards (NAAQS). Failure to demonstrate conformity may result in withholding federal funding and associated project approval. Figure 1 shows the linkage between air quality planning and transportation planning toward conformity determination.

Figure 1: Linkage Between Air Quality and Transportation Planning in Conformity Determination



Source: *Transportation Conformity: A Basic Guide for State & Local Officials*, U.S. Department of Transportation Federal Highway Administration FHWA-HEP-17-034, Revised February 2017.

To this end, *Let's Go 2050 Amendment 25-07* is evaluated for air quality conformity. This document summarizes the analysis conducted to make a conformity determination.

Amendment 25-07

The following summarizes the amendment in terms of project and land use updates. Project details are provided in the attached Let's Go 2050 Amendment 25-07 Non-Exempt Project List.

Project Component

Nevada Department of Transportation (NDOT)

1. Removal of the I-515 Downtown Access Project
2. Addition of the Henderson Interchange Project
3. Rescheduling of the I-15 Phase 2 Project
4. Addition of the I-15 Central Corridor Project

City of Las Vegas:

1. Removal of the Downtown Access Local Improvement Project

Clark County Department of Aviation (CCDOA):

1. Addition of the Southern Nevada Supplemental Airport (SNSA) local roadway improvement projects
2. Rescheduling and modifications to I-15 interchanges and Super Arterial project to improve access to the SNSA

Land Use Component

Campus For Hope

The Campus for Hope is a transitional housing and social services project in Las Vegas and located at the corner of Charleston Blvd and Jones Blvd. designed to help people experiencing homelessness. It will provide housing, healthcare, job training, and other support services on one campus. The campus aims to serve up to 900 residents and employ roughly 300 staff. Construction is expected to begin in 2025, with opening by 2030.

Jean Redevelopment

The Jean Redevelopment project is an industrial development planned in Jean, Nevada, along Interstate 15. The project is led by Reno-based Tolles Development Company and will transform the area, formerly home to Terrible's Hotel & Casino and other underused parcels into a major warehouse and distribution complex serving Southern Nevada and Southern California.

Contents

This determination of conformity begins with a discussion of the conformity process conducted for *Amendment 25-07* and documents the emissions budgets. Next, a summary of the travel demand model (TDM) and its role in providing key information for input to the emissions analysis for the different horizon years is given. Lastly, forecast emissions are measured against their respective budgets for the modeled horizon years and a determination of conformity is made.

2. AIR QUALITY CONFORMITY PROCESS

This section describes the process for conducting the air quality conformity analysis for *Amendment 25-07*. It includes a general discussion of the conformity guidelines, the SIP applicable to Clark County, the emission budgets for key pollutants for which conformity is sought, and the procedures for determining conformity.

Background

The SIP defines how the area should act to improve air quality to meet the NAAQS and emission targets. The target or pollution limits are defined as "budgets" for transportation related emissions. These standards are set for several pollutants that can cause respiratory diseases and other health problems. A region that exceeds the maximum threshold for a given pollutant is defined in the Clean Air Act (CAA) as being non-attainment. Non-attainment is the term to describe the level of the pollutants that U.S. Environmental Protection Agency (EPA) designated as not meeting the clean air standards for the pollutant. The Clean Air Act Amendments of 1990 (CAAA) requires each non- attainment area to address the pollutant issue by way of the SIP.

There are six primary pollutants defined in NAAQS:

- Carbon monoxide (CO)
- Particulate matter 10 microns in size or less (PM_{10}) and 2.5 microns in size or less ($PM_{2.5}$)
- Ozone (O_3)
- Sulfur dioxide (SO_2)
- Lead
- Nitrogen dioxide (NO_2)

Many of these pollutants are produced by automobiles and other transportation modes and are classified as "mobile source emissions".

Conformity Guidelines and Interagency Consultation

As stated in *Transportation Conformity: A Basic Guide for State and Local Officials*[1], the concept of transportation conformity was introduced in the Clean Air Act (CAA) of 1977. The conformity process provides a provision to ensure the transportation investments conform to the state's SIP to meet the federal air quality standards. The transportation conformity regulations establish the criteria and procedures for transportation agencies to demonstrate that air pollutant emissions from metropolitan transportation plans or regional transportation plans (RTP), transportation improvement programs (TIP) and projects are consistent with ("conform to") the State's air quality goals in the SIP. Transportation conformity is required under CAA Section 176(c) to ensure that federally supported transportation activities are consistent with ("conform to") the purpose of a State's SIP.

Conformity requirements apply in areas that either do not meet or previously have not met national ambient air quality standards (NAAQS) for ozone (O3), carbon monoxide (CO), particulate matter (PM10 and PM2.5) or nitrogen dioxide (NO_2). These areas are known as "nonattainment areas" and "maintenance areas," respectively. Conformity applies to long-range metropolitan transportation plans (such as *Let's Go 2050 (RTP 2025-2050)*, transportation improvement programs (such as *TIP 2025-2029),* and transportation projects funded or approved by Federal Highway Administration (FHWA) or Federal Transit Administration (FTA).

A conformity determination demonstrates that implementation of the RTP, TIP, or project will not cause any new violations of the air quality standard, increase the frequency or severity of violations of the standard, or delay timely attainment of the standard or any interim milestone. For RTP and TIP conformity, the determination shows that the total emissions from on-road travel on an area's transportation system are consistent with goals for air quality found in the SIP. Before a SIP is available, other tests of conformity are used.

Conformity determinations are made by FHWA/FTA while Metropolitan Planning Organization (MPO) policy boards make initial conformity determinations for regional transportation plans (RTP) and TIPs in metropolitan areas. A formal interagency consultation process is required for developing SIPs, RTPs, TIPs and making conformity determinations. The process includes the EPA, FHWA, FTA, state and local transportation and air quality agencies.

Conformity determinations must be made at least every four years but may occur more often if RTPs or TIPs are updated more frequently or amended with nonexempt projects. Also, conformity determinations must be made within 24 months after SIP motor vehicle emission budgets (MVEB) are found adequate or approved, whichever is first.

---

[1] U.S. Department of Transportation Federal Highway Administration FHWA-HEP-17-034, Revised February 2017.

The specific procedures are those established under federal law for ensuring conformity between transportation plans and air quality improvement plans. This process of conformity is intended to ensure that the projects and programs proposed in the RTP, TIP and TIP amendments conform to the purpose of the CAA and the SIPs. This means "…conformity to the (implementation) plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards…". The provisions of the CAAA in relation to conformity are amplified in EPA Final Rule, 40 CFR Part 93, as amended September 15, 1997.

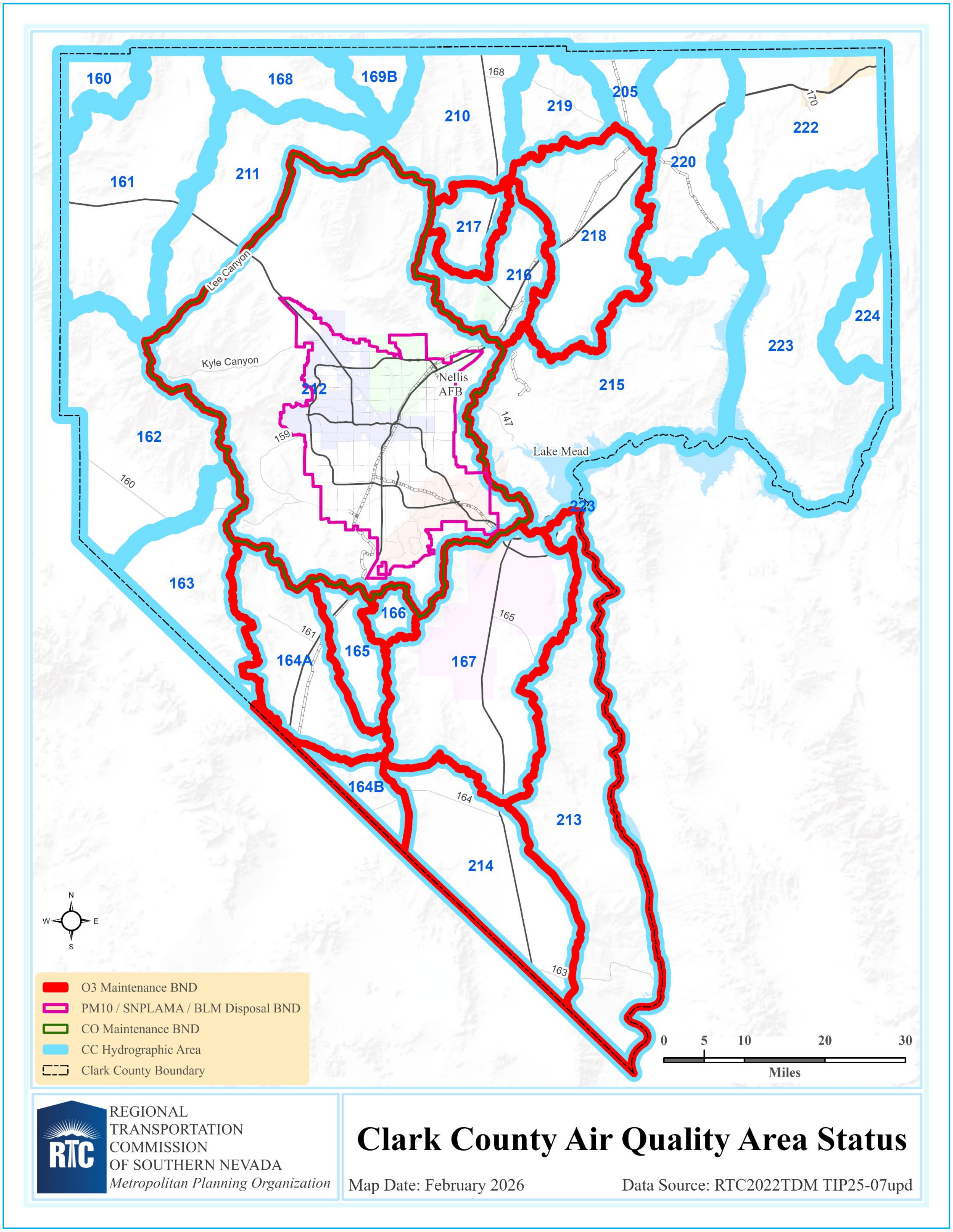
Consultation is required when making a conformity determination, developing or revising a RTP, TIP, or SIP (40 CFR 93.105(a)(1)). The RTC of Southern Nevada, as the MPO for the region, shall consult with all concerned agencies, including the Clark County Department of Environment and Sustainability's Division of Air Quality (hereinafter referred to as "CCDES" or "Clark County DES". CCDES was formerly called Clark County Department of Air Quality, and Clark County Department of Air Quality and Environment Management), Nevada Department of Transportation (NDOT), Nevada Division of Environmental Protection (NDEP), EPA, U.S. Department of Transportation (DOT), FHWA, and FTA, before making conformity determinations, or before developing or revising a RTP or TIP. In addition, the RTC shall ensure that the public and any interested organizations can participate in the planning process. Similarly, the CCDES shall consult with these agencies and the RTC before developing or revising a SIP that establishes motor vehicle emission budgets. (Clark County Transportation Conformity Plan, January 2008).

State Implementation Plans Relating to Clark County

Within the RTC planning area, Hydrographic Area (HA 212) is currently designated as a serious nonattainment area for the 2015 ozone standard. HAs 212/164A&B/165-167/213/214/216-218, excluding the areas within Moapa River Indian Reservation and Fort Mojave Indian Reservation are designated maintenance areas for the 1997 ozone standard.[2] HA 212 is the designated maintenance area for the PM_{10} standard[3]. In October 2021, the EPA approved Clark County's Second 10-Year CO Maintenance Plan[4], which is a Limited Maintenance Plan (LMP).[5] Federal regulation states that areas that qualify for an LMP may demonstrate conformity without a regional emissions analysis because it is unreasonable to expect that such an area will experience so much growth in the 10-year period of the LMP that a violation of the CO NAAQS would result. Thus, this RTP is not required to have regional emissions analysis for CO conformity demonstration. The RTC planning area is in attainment or otherwise unclassifiable for other pollutants. Figure 2 illustrates the area designations in Clark County for these key pollutants.

[2] 89 FR 23916 (April 5, 2024) [federalregister.gov].
[3] Second Maintenance Plan for the 1987 24-hour PM10 NAAQS in the Las Vegas Valley Maintenance Area of Clark County, August 5, 2025, Clark County Department of Environment and Sustainability Division of Air Quality.
[4] 86 FR 58579 (October 22, 2021) [federalregister.gov].
[5] A Limited Maintenance Plan is a streamlined demonstration of conformity to a particular pollutant based on an expectation that future violations of an air quality standard are unlikely to occur because emissions are less than or equal to 85 percent of the NAAQS standard and historically are so.

Figure 2: Clark County Area Designations



Motor Vehicle Emissions Budgets

The principal step towards making a conformity determination is to demonstrate that the anticipated levels of atmospheric pollution which will result from planned and programmed transportation projects will be less than the relevant budgets defined in the SIPs. The ozone and PM10 budgets developed by the Clark County DES and established in the Maintenance Plan are used in the conformity findings for this *Let's Go 2050 (RTP 2025-2050)* and *TIP 2025-2029*.

Ozone Emission Budgets

Two precursors of ozone are volatile organic compounds (VOC) and the oxides of nitrogen (NO_x). Table 1 describes the motor vehicle emissions budgets (MVEB) for ozone set forth in the Maintenance Plan.

Table 1: MVEB for Las Vegas Area Ozone Source Emissions Budgets
(HA 212 164A 164B 165-167 213 214 216-218 Excluding the Indian Reservations)

Year	NOx (tons/day)	VOC (tons/day)
2025	26.77	20.92
2030	26.77	20.92
2040	23.35	15.51
2050	23.35	15.51

Source: *Revision to Motor Vehicle Emissions Budgets for the 1997 Ozone NAAQS, 2nd Maintenance Plan, CCDES, 2021 (effective May 2024).*

Mobile Source PM_{10} Emission Budgets

Table 2 shows the MVEB set forth for PM_{10} in the Maintenance Plan.

Table 2: MVEB for Las Vegas Area PM_{10} Source Emissions Budgets
(HA 212)

Year	PM_{10} (tons/day)
2025	141.41
2030	141.41
2040	141.41
2050	141.41

Source: *Second Maintenance Plan for the 1987 24-hour PM10 NAAQS in the Las Vegas Valley Maintenance Area of Clark County, August 5, 2025, Clark County DES.*

Mobile Source CO Emission Budgets

As reported above, this RTP does not require a regional emissions analysis for conformity determination as the CO maintenance plan is a Limited Maintenance Plan. Accordingly, Table 3 shows there are no CO emissions budgets for this analysis area.

Table 3: Mobile Source CO Emissions Budgets for HA 212

Year	CO (tons/day)
2025	N/A
2030	N/A
2040	N/A
2050	N/A

Source: *2nd 10-Year CO Limited Maintenance Plan, CCDES, May 2019*.

Conformity Procedures

Under Federal regulations, conformity must be determined for a series of "horizon" years. These must include the designated attainment year, if applicable, and the last year of the Transportation Plan and they must be not more than 10 years apart. For this conformity determination, conformity is performed for ozone and PM_{10} for 2025 (RTP base year), 2030, 2040, and 2050 (RTP last horizon year). Year 2022 is also modeled as it is the base year of the TDM.

Key technical steps leading to the conformity determination are outlined below and detailed in the ensuing sections of this report:

- Each horizon year forecast population and employment for the region are documented, as these are key drivers of vehicular travel and hence, motor vehicle emissions.
- All regionally significant transportation projects are included in the TIP25-07 for the appropriate horizon year(s).
- The RTC2022TDM TDM25-07 is run for each horizon year required for the conformity analysis to produce forecast vehicle miles of travel (VMT) and travel speeds throughout the region.
- The TDM output VMT and speed information are used as input to the MOVES4 emissions model. MOVES4 is run for the same horizon years to yield mobile source emissions.
- The emission benefits from transportation control measures (covered in section 7) may be subtracted from the modeled vehicle emissions to produce a forecast of net mobile source emissions.
- The resulting forecast net emissions are then compared with the mobile source emissions budgets to facilitate the conformity finding.

3. FORECAST POPULATION AND EMPLOYMENT

Background

Among the key planning assumptions of the air quality emission analysis are the land use, population, and employment projections. They are used to determine the future travel demand, travel patterns and the effects on mobile source emissions in the model horizon years.

Due to the complexity of land-use forecasting, the Southern Nevada Regional Planning Coalition (SNRPC)[6] formed a Land Use Working Group (LUWG) at the request of Regional Transportation Commission of Southern Nevada (RTCSNV). The LUWG is responsible for providing forecasted land use activity for RTC. The LUWG consists of planning staff from the RTC, Clark County, City of Las Vegas, City of North Las Vegas, City of Henderson, Southern Nevada Water Authority, Clark County Water Reclamation District, Harry Reid International Airport, Clark County School District, Nellis Air Force Base, and from other planning entities. According to the inter-local agreement and established practice, the population and employment used in this analysis are based on the baseline projections developed by Clark County and local government land use planning staff. The total projections from this baseline are matched to the control total projections published by the Center for Business and Economic Research (CBER) at the University of Nevada, Las Vegas. The CBER forecasts are approved by the LUWG as a control total for Clark County as a whole. The land use projections are converted into the RTC model input as Planning Variables. For the development of the Planning Variables, refer to Let's Go 2050 Appendix D -Regional Planning Forecasts and Planning Variable. The land use update for TIP25-07 is in Section 1 under section the subheading "Land Use Component".

Population Forecasts

Population forecasts are prepared annually by the CBER at the University of Nevada, Las Vegas. The projection issued in May 2023, covering the period from 2015 through 2050, was adopted as the population control totals for Clark County in conjunction with the employment forecasts. Table 4 summarizes the forecast population.

Table 4: Population Forecasts for Clark County, Nevada

Year	Population
2025	2,438,000
2030	2,645,000
2040	2,848,000
2050	3,014,000

Source: Center for Business and Economic Research at University of Nevada, Las Vegas, May 2023.

Employment Forecasts

The RTC's 2022 TDM uses a different classification of employment variables than predecessor RTC TDMs. Specifically, employment is now categorized by North American Industrial Classification System (NAICS) instead of more broadly defined land use categories. Table 5 summarizes the Clark County employment forecasts by NAICS for the different horizon years.

[6] In its 1997 session, the Nevada State Legislature enabled the formation of the Southern Nevada Regional Planning Coalition (SNRPC). There are ten members in the Coalition membership and Board. Two elected officials are appointed by the governing body of each public entity (except Boulder City and the Clark County School District with one appoint member each). The SNRPC conducts some of its business through subcommittees.

Table 5: Final Clark County Employment Forecasts by NAICS

NAICS Industry	Code	2022[1]	2025	2030	2040	2050
Ag, Forestry, Fishing & Hunting	11	2,059	2,059	2,133	2,133	2,133
Mining	21	302	302	313	313	313
Utilities	22	3,163	3,414	3,675	3,946	4,178
Construction	23	66,542	69,264	74,869	79,044	81,776
Durable & Non-Durable	31-33	26,760	28,251	30,711	33,058	34,942
Wholesale Trade	42	19,877	21,045	23,325	25,561	27,390
Retail Trade	44-45	102,341	107,319	117,035	126,563	134,355
Transp. & Warehousing	48-49	73,461	78,991	86,250	97,661	107,299
Information	51	8,117	8,997	9,876	10,769	11,413
Finance and Insurance	52	24,750	25,884	27,397	27,403	27,403
Real Estate, Rental & Leasing	53	18,977	20,329	22,221	23,911	25,208
Prof., Scientific & Tech. Services	54	37,026	37,026	41,960	47,789	53,067
Mgmt. Companies and Enterprises	55	19,941	21,690	25,207	30,308	35,331
Admin. and Support and Waste Services	56	71,073	77,255	88,882	105,241	121,172
Educational Services (Public and Private)	61	44,271	49,343	54,644	62,751	69,269
Health Care and Social Assistance	62	98,181	103,046	112,419	122,272	130,670
Arts, Entertainment and Recreation	71	24,207	25,015	26,277	26,277	26,331
Accommodation & Food Services	72					
Constrained		244,886	252,324	282,183	302,969	319,708
Unconstrained		244,886	252,324	282,183	315,828	336,984
Other Service	81	23,325	25,303	28,030	31,474	34,594
Public Admin.	92	50,624	52,809	56,075	60,442	64,585
Undet. Industry	99	2,187	2,372	2,628	2,951	3,244
TOTAL						
Constrained		**961,549**	**1,012,039**	**1,116,111**	**1,222,837**	**1,314,382**
Unconstrained		**961,549**	**1,012,039**	**1,116,111**	**1,235,696**	**1,331,657**

[1]Nevada Department of Employment Training and Rehabilitation (DETR).

Source: Planning Variables Methodology and Development, RTC, August 2024.

The Table 5 employment includes special generator employment, such as the air force bases, airports, colleges, and universities within Clark County. Table 6 enumerates the special generator employment forecasts and indicates in which NAICS industry code (Table 5) the special generator is included.

Table 6: Special Generator Information

Special Generator	NAICS Code	TAZ	2022		2025		2030		2040		2050	
			Enrollment/ Passengers	Employment	Enrollment/ Passengers	Employment	Enrollment/ Passengers	Employment	Enrollment/ Passengers	Employment	Enrollment/ Passengers	Employment
Creech Air Force Base	92	2595		4,320		4,320		4,320		4,320		4,320
Nellis Air Force Base (Zone 1)	92	2105		12,965		13,354		14,021		15,458		17,043
Nellis Air Force Base (Zone 2)	92	2128		2,100		2,163		2,271		2,503		2,760
Harry Reid International Airport	48-49	1	144,000	21,123	154,000	22,500	174,000	25,000	158,000	25,000	178,000	25,000
Southern Nevada Supplemental Airport	48-49	2542	—	—	—	—	—	—	58,000	6,700	90,000	12,500
University of Nevada, Las Vegas—Main Campus	61	49	25,045	3,792	25,350	3,838	27,205	4,119	31,346	4,746	36,141	5,472
University of Nevada, Las Vegas—Shadow Lane Campus	61	683	318	286	322	290	345	311	398	358	459	413
University of Nevada, Las Vegas—North Las Vegas Campus (Zone 1)	61	2323	—	—	—	—	1,750	130	3,500	259	5,250	389
University of Nevada, Las Vegas—North Las Vegas Campus (Zone 2)	61	2409	—	—	—	—	3,250	241	6,500	482	9,750	722
Nevada State University	61	2284	2,533	333	2,598	339	3,317	443	4,458	705	5,483	1,148
College of Southern Nevada—Charleston Campus (Zone 1)	61	1097	8,303	583	8,720	612	9,450	664	8,791	617	8,791	617
College of Southern Nevada – Henderson Campus (Zone 2)	61	1903	3,208	161	3,369	169	3,651	183	3,397	170	3,397	170
College of Southern Nevada – North Las Vegas Campus (Zone 3)	61	1706	5,791	392	6,082	412	6,591	446	6,132	415	6,132	415
High-speed Rail Station[1]	48	139	—	—	—	—	41,644	—	60,274	—	66,301	—

[1]The employment consists of station and on-train employees (NAICS 48), assumed to be 120 starting in 2028 and increasing to 230 starting in 2038 when train frequency is scheduled to increase from 46 to 90 daily runs. This employment is represented separate from the special generator file.
Source: RTC, 2024

4. TRAVEL DEMAND FORECAST MODEL

Introduction

In the Summer of 2024, RTC completed the update of its travel demand model, named RTC2022TDM, where 2022 refers to the base or calibration year of the model. Prior to its release, the RTC 2015 Model was used. The new RTC2022TDM is a “hybrid” model, meaning it has elements of the previous four-step model blended with elements typically found in activity based models (ABM). The principal among these elements is a population synthesizer and destination choice/trip distribution components that produce tours rather than trips. Traditional four-step models are aggregated in nature and limited in their ability to capture the complexities or nuances of travel demand. Hybrid models, on the other hand, are more robust and provide at least some connections between trips and offer improved consistency with tours. Travel in hybrid models is segmented by types of tours.

The RTC2022TDM utilizes the latest travel survey information collected for the model update—a household travel survey, a visitor survey, and transit on-board survey, all collected in 2023. The source of validation traffic counts is 2022 NDOT counts. The new model’s geographic domain has expanded to encompass all of Clark County, too, and now has 2,677 traffic analysis zones (TAZ). The RTC2022TDM uses TransCAD version 10.0 software platform, developed by Caliper Corporation of Newton, Massachusetts.

The RTC2022TDM is the approved travel demand model for use in regional planning applications. TIP25-07 amendment uses the same model.

Model Overview

RTCSNV’s new hybrid travel demand model balances fidelity and running time by forecasting detailed, disaggregate outcomes (at the level of individual households, persons and tours) for the most critical mandatory travel decisions while switching to a simpler, aggregate, trip-based approach for all other travels.

Mandatory (i.e. work, school, university) activities are associated with destination zones and tour characteristics (frequency, mode and time of day). Potential stops to and/or from the main activity location, with information about the location and activity duration of these stops round out the tour. The mandatory models are sensitive to key household variables (such as auto sufficiency levels and income), built environment factors (e.g. transit stop density, employment density and transit/walk accessibility), and network level-of-service effects that capture congestion.

Detailed tracking of vehicle use within each household maximizes the utilization of available vehicles through a tiered priority list, and explicit assignment of adults for school drop-off and pick-up ensures consistency of schedules and mode.

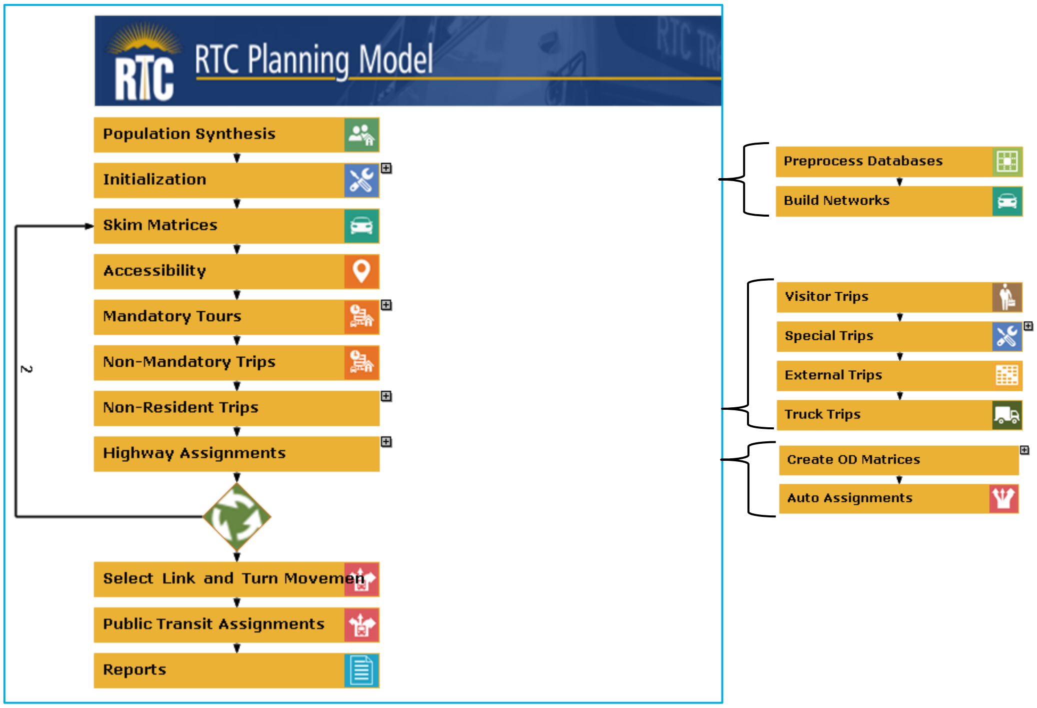
Such detailed treatment of mandatory tours is achieved with a state-of-the-art and efficient population synthesizer that enumerates each person and household in the region. For university-related travelers, dorm residents were also added to this synthetic population.

Non-mandatory travel is captured via a traditional trip-based approach, though mode and destination shares are predicted with aggregate logit models that provide more trip distribution fidelity than gravity models. Non-home-based travel is further anchored on home-based trip attractions to capture the often-complementary relationship between these two types of travel decisions.

Special markets such as air force bases, airport trips, visitors, and high-speed rail are captured in the model. Visitor travel, crucial to Las Vegas, is expanded from prior approaches by differentiating between trips that start or end near the visitors’ hotel or lodging location, and other trips. Decision tree-based machine learning algorithms were deployed to estimate the associated trip rates. Trips made by trucks and those entering/leaving the region were estimated from Big Data and external station counts, respectively.

The RTC2022TDM leverages TransCAD's modern flowchart graphical user interface for unparalleled transparency and ease of managing/analyzing scenarios. The interface includes custom calibration tools to adjust model constants to match survey totals, with the base year model outputs successfully validated against observed link count data. The model implementation leverages TransCAD's Master Network solution for easy, error-free maintenance of future highway and public transit projects that are automatically activated based on the scenario year. Also included are various reports and post-processes, including support for the necessary emissions analysis. Figure 3 illustrates the RTC2022TDM basic flowchart. The steps shown in the flowchart are briefly summarized in the bullets following.

Figure 3: RTC2022TDM Flowchart



- Population Synthesis – This first step takes the zonal population and employment information along with 2020 Census block and block group-based control totals and seed information to produce a full (synthetic) enumeration of the resident population and households. A visitor synthesis is applied to visitors to the region.
- Initialization – This step prepares the roadway and transit networks for use in the modeling realm.
- Skim Matrices – Computes the shortest path time and distance for all zone-to-zone movements for roadway, transit, bicycle, and walk networks. Additionally, transit skims are produced for the various components of using transit including fare, number of transfers, in-vehicle time, various out-of-vehicle time elements, and access drive distance.
- Accessibility – Computes the logsum calculation from the destination choice (trip distribution) model. Also measures how accessible various demographics are within a set distance of each TAZ, and the accessibility of various modes—auto, transit, and non-motorized—for zone-to-zone movements.
- Mandatory Tours – This step outputs mandatory (i.e., work, school, and university) tours made by the population and includes characteristics of the tour including household and person ID, purpose, home/origin and mandatory activity destination zones, travel mode(s), tour and activity start/end times, intermediate stops, and sub-tours as necessary. Mandatory in this sense describes workers and students are expected to perform these activities (i.e., travel to the same work or school location on a recurring basis). The tour outputs are converted to mandatory trip outputs containing similar information as the tour segments with an added field to indicate if the trip should be included in the assignment step.
- Non-Mandatory Trips – This step produces mode-specific zone-to-zone trip matrices by trip purpose and time of day for non-mandatory trip-making.

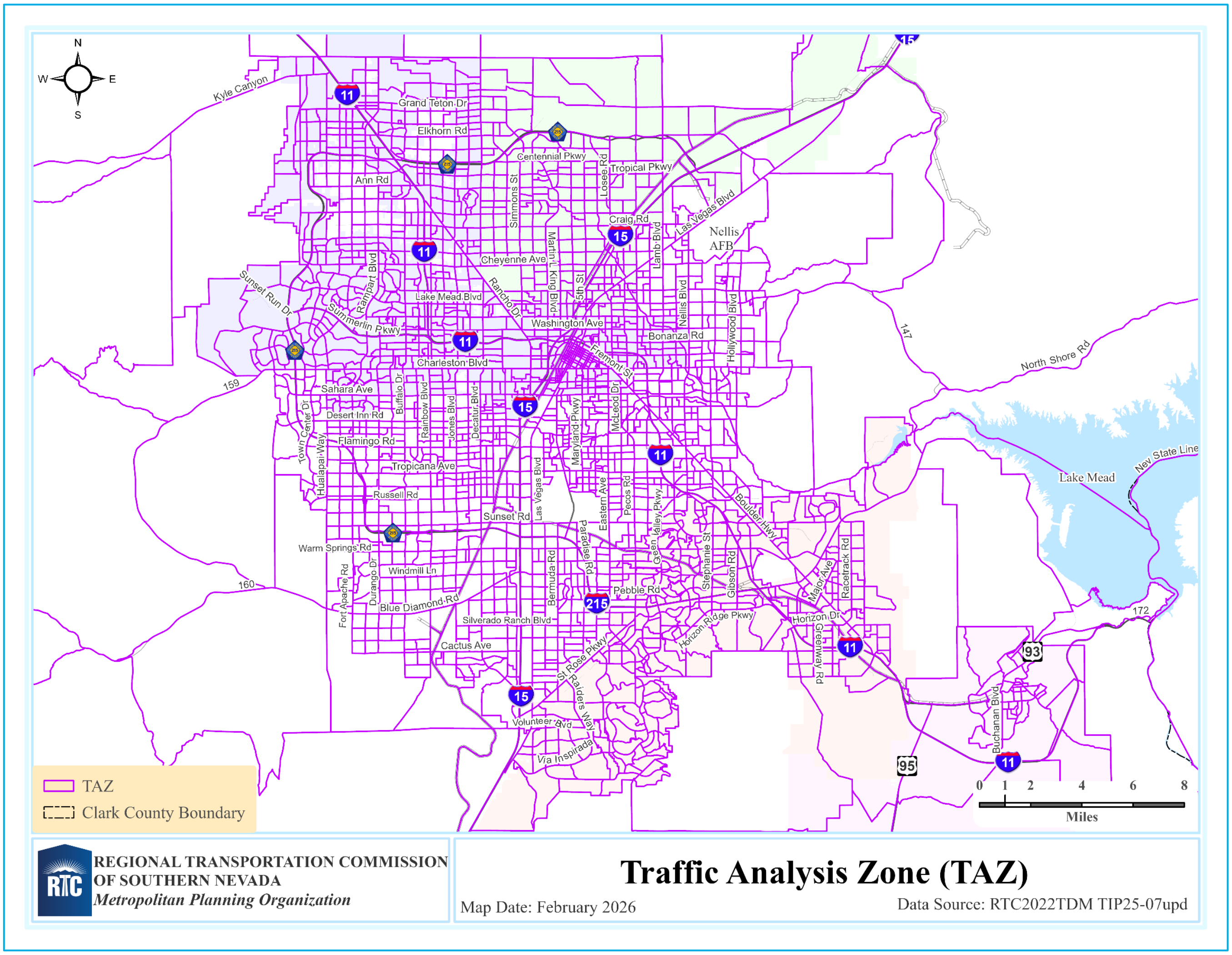
- Non-Resident Trips – This encompasses generation and distribution of lodging and non-lodging-based trips made by visitors to the region, heavy truck trips, external trips, and special trips such as single- and multi-day airport trips and special generator trips.
- Highway Assignments – This step assigns the relevant vehicle trips to the roadway network and outputs vehicle flows, speeds, travel times, VMT and VHT by link and time of day.
- Feedback – Once congested travel times are computed in the previous step, this information is fed back to the Skim Matrices step and the model flow is repeated with the updated skim information until assignment convergence.
- Select Link and Turn – Following assignment convergence, the model can output (if requested) select link path and flow information as well as intersection turning movements.
- Public Transit Assignments – Transit ridership flows by route and route segment are produced, along with transit boardings and alightings by route and stop.
- Reports – Various reports and files summarizing the modeled scenario are output. Among the reports produced are VMT and VHT aggregations by area type, functional classification, and speed category for air quality analysis.

Model Zone Structure

The TDM has 2,678 TAZ, the boundaries for which are largely determined by 2020 census block groups, major roadways or railways, census published employment concentration[7], natural features, as well as from input from the land use working group. Figure 4 illustrates the TDM zone system focusing on the Las Vegas Valley portion of Clark County.

[7] U.S. Census Bureau. LEHD Origin-Destination Employment Statistics Data (2002-2021). Washington, DC: U.S. Census Bureau, Longitudinal-Employer Household Dynamics Program, accessed at https://lehd.ces.census.gov/data/#lodes. LODES 8.1

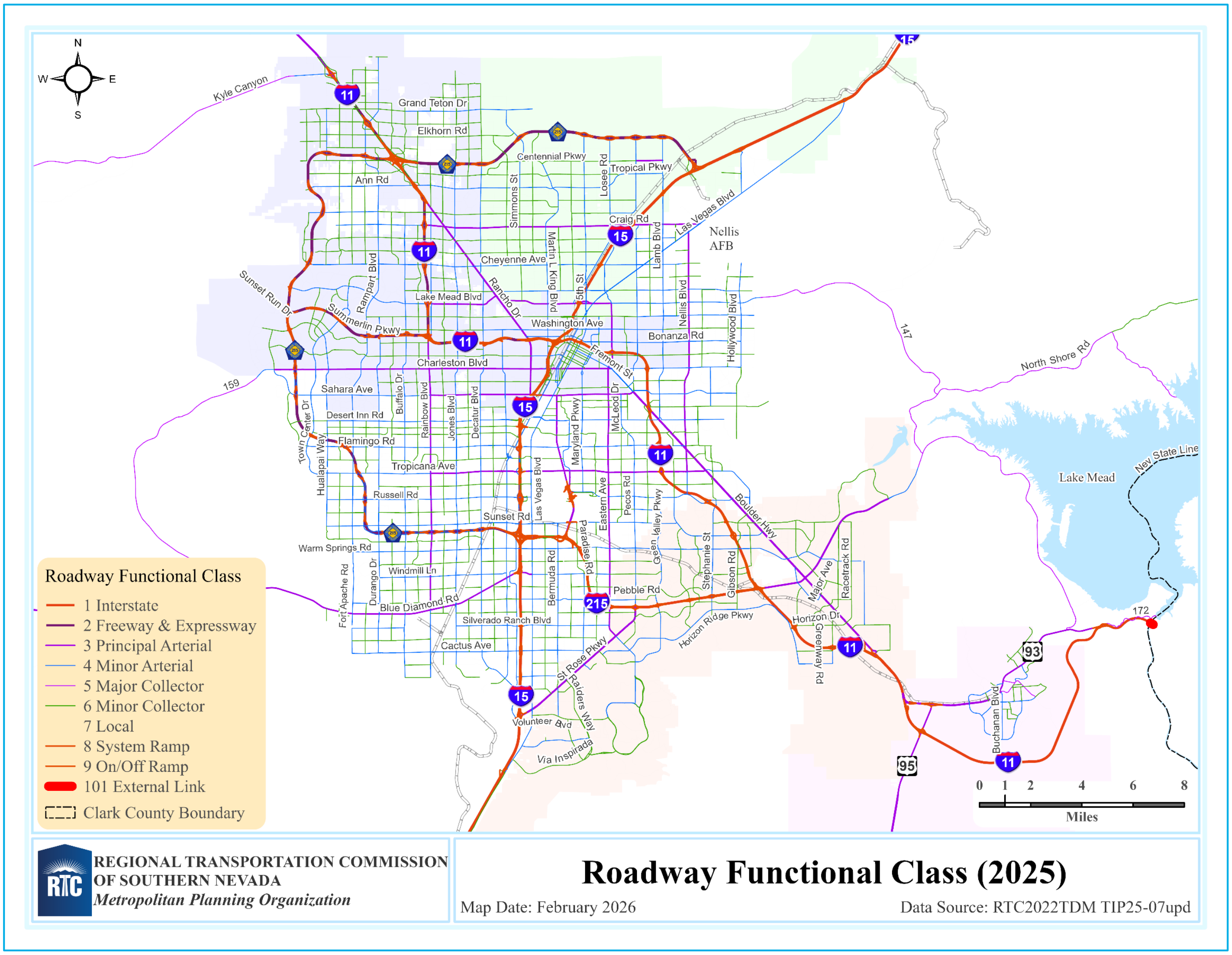
Figure 4: Traffic Analysis Zones in Las Vegas Valley Portion of Clark County



Roadway Functional Classification

Figure 5 depicts the functional classification for the 2025 RTP base year roadway network, focusing on the Las Vegas Valley region within Clark County.

Figure 5: 2025 RTP Base Year Functional Classification in Las Vegas Valley Portion of Clark County



RTP Horizon Year Networks

Those non-exempt air quality projects identified by the RTP are coded onto the 2022 base year roadway network to create 2025, 2030, 2040, and 2050 horizon year networks which form the basis for the transportation supply input to the TDM. The demand for transportation comes from the forecast population and employment information. The TDM is then run to produce outputs necessary for air quality conformity analysis. The non-exempt air quality project list is attached.

Table 7 summarizes the incremental change in both roadway miles and lane miles between RTP analysis years associated with the projects identified in the Let's Go 2050 Plan Non-exempt Project List. This information is subsequently used as one emissions component in the overall PM_{10} emissions analysis.

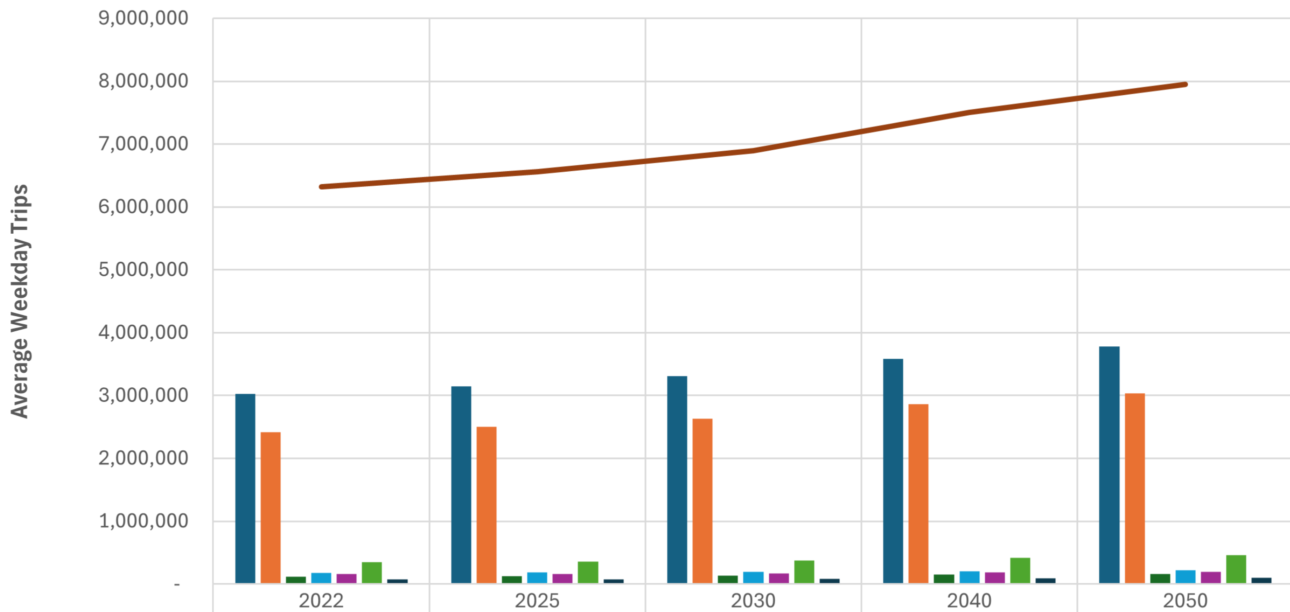
Table 7: Incremental Change in Road Miles and Lane Miles Associated with RTP Projects within PM_{10} Geography (HA 212)

Functional Classification (ID)	2022		2025		2030		2040		2050	
	Link Miles	Lane Miles	Link Miles	Lane Miles	Link Miles	Lane Miles	Link Miles	Lane Miles	Link Miles	Lane Miles
Interstate (1)	72	504	72	554	72	557	72	567	72	567
Freeway/Expressway (2)	61	417	62	429	62	452	62	452	68	492
Principal Arterial (3)	160	901	161	914	161	906	161	906	164	926
Minor Arterial (4)	534	2,528	545	2,607	557	2,661	558	2,673	561	2,686
Major Collector (5)	60	121	60	121	60	121	60	121	60	121
Minor Collector (6)	623	1,999	634	2,060	630	2,089	642	2,137	630	2,109
Local (7)	642	1,496	646	1,499	644	1,496	643	1,492	641	1,486
System Ramp (8)	33	55	43	74	43	74	46	81	47	82
Ramp (9)	171	234	172	238	174	241	174	243	181	250
Transit Only (98)	18	44	18	44	18	44	23	50	23	50
Centroid Connector (99)	1,499	2,997	1,499	2,997	1,499	2,997	1,498	2,995	1,497	2,994
Externals (101)	0	0	0	0	0	0	0	0	0	0
Totals	3,872	11,297	3,912	11,537	3,920	11,638	3,938	11,716	3,945	11,762
Change vs. 2022	--	--	39	240	48	341	66	419	72	465
Change vs. 2025	--	--	--	--	8	101	26	179	33	225
Change vs. 2030	--	--	--	--	--	--	18	78	25	124
Change vs. 2040	--	--	--	--	--	--	--	--	7	46

TDM Output Summary

The RTC2022TDM TIP25-07 produces a significant amount of information for a given scenario. This section provides a very high-level summary, focusing on the change in trips output by the model over the RTP planning horizon. Average daily trip-making by mode for each modeled scenario in the planning period is shown in both Figure 6 and Table 8. Overall, trips are forecast to increase by 0.8% compounded annually over the 28-year period. Trips increase across all modes proportionally about the same over the planning horizon. By 2050, private auto trip share (both drive-alone and high occupancy vehicles) will decrease slightly with increasing transportation network companies (TNC) and non-motorized shares offsetting that decrease.

Figure 6: Trips by Mode by Year



	2022	2025	2030	2040	2050
Drive Alone	3,023,122	3,148,709	3,305,661	3,579,410	3,783,954
HOV	2,414,394	2,505,038	2,633,699	2,865,297	3,031,726
TNC	120,483	123,133	136,027	151,159	163,978
School Bus	177,897	185,512	192,825	207,388	217,170
Transit	158,049	163,442	170,936	185,248	195,109
Non-Motorized	348,742	357,565	373,877	420,096	459,135
Trucks	73,843	77,298	83,110	90,180	96,231
Total	6,316,529	6,560,697	6,896,134	7,498,778	7,947,303

Drive Alone | HOV | TNC | School Bus | Transit | Non-Motorized | Trucks | Total

Source: RTC2022TDM

Table8: Trip Shares by Mode by Year

Year	Drive Alone	HOV	TNC	School Bus	Transit	Non-Motorized	Trucks	Total
2022	47.9%	38.2%	1.9%	2.8%	2.5%	5.5%	1.2%	100%
2025	48.0%	38.2%	1.9%	2.8%	2.5%	5.5%	1.2%	100%
2030	47.9%	38.2%	2.0%	2.8%	2.5%	5.4%	1.2%	100%
2040	47.7%	38.2%	2.0%	2.8%	2.5%	5.6%	1.2%	100%
2050	47.6%	38.1%	2.1%	2.7%	2.5%	5.8%	1.2%	100%

Source: RTC2022TDM

Figures 7 through 9 illustrate the assignment of vehicle trips to the roadway network in each of the RTP years. The red bands on each of the figures denote the forecast daily traffic volume on the road at a given location, with the thickness of the band proportional to the assigned volume. Note while the RTC2022TDM encompasses all of Clark County, Figures 7 through 11 focus on showing the Las Vegas Valley region of the county to be able to more clearly see volume gradations on the network.

Figure 7: 2022 Daily Volumes

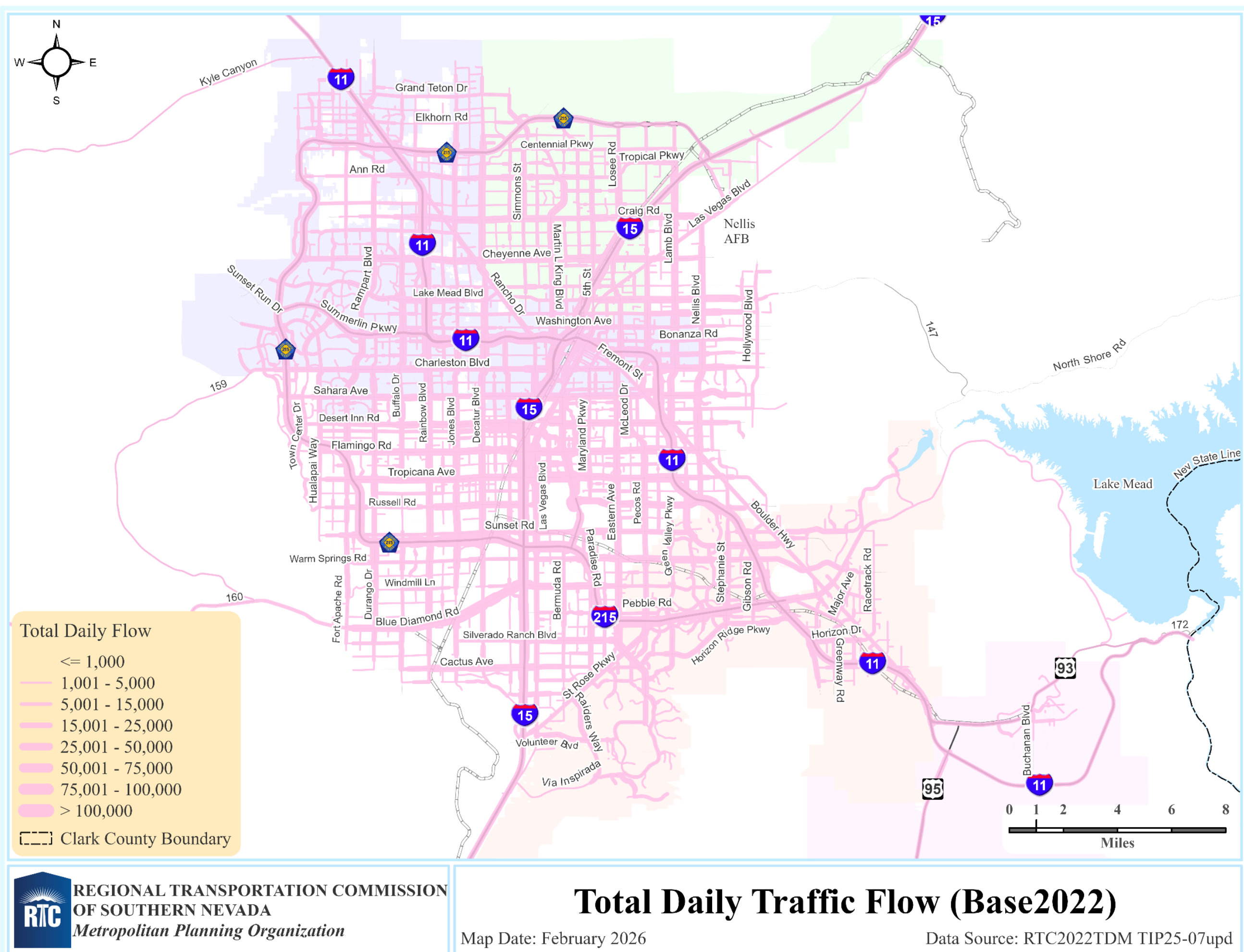


Figure 8: 2025 Daily Volumes

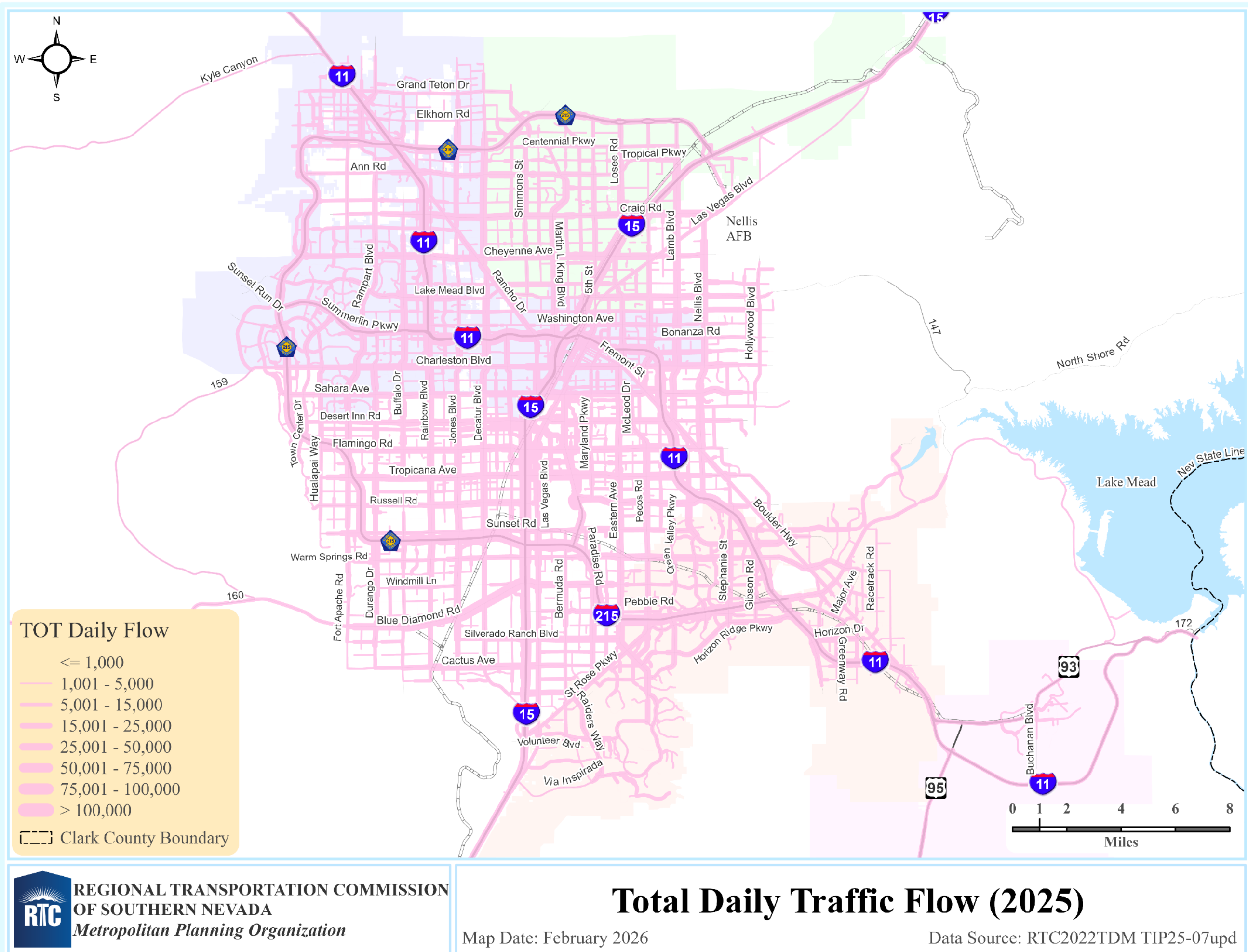
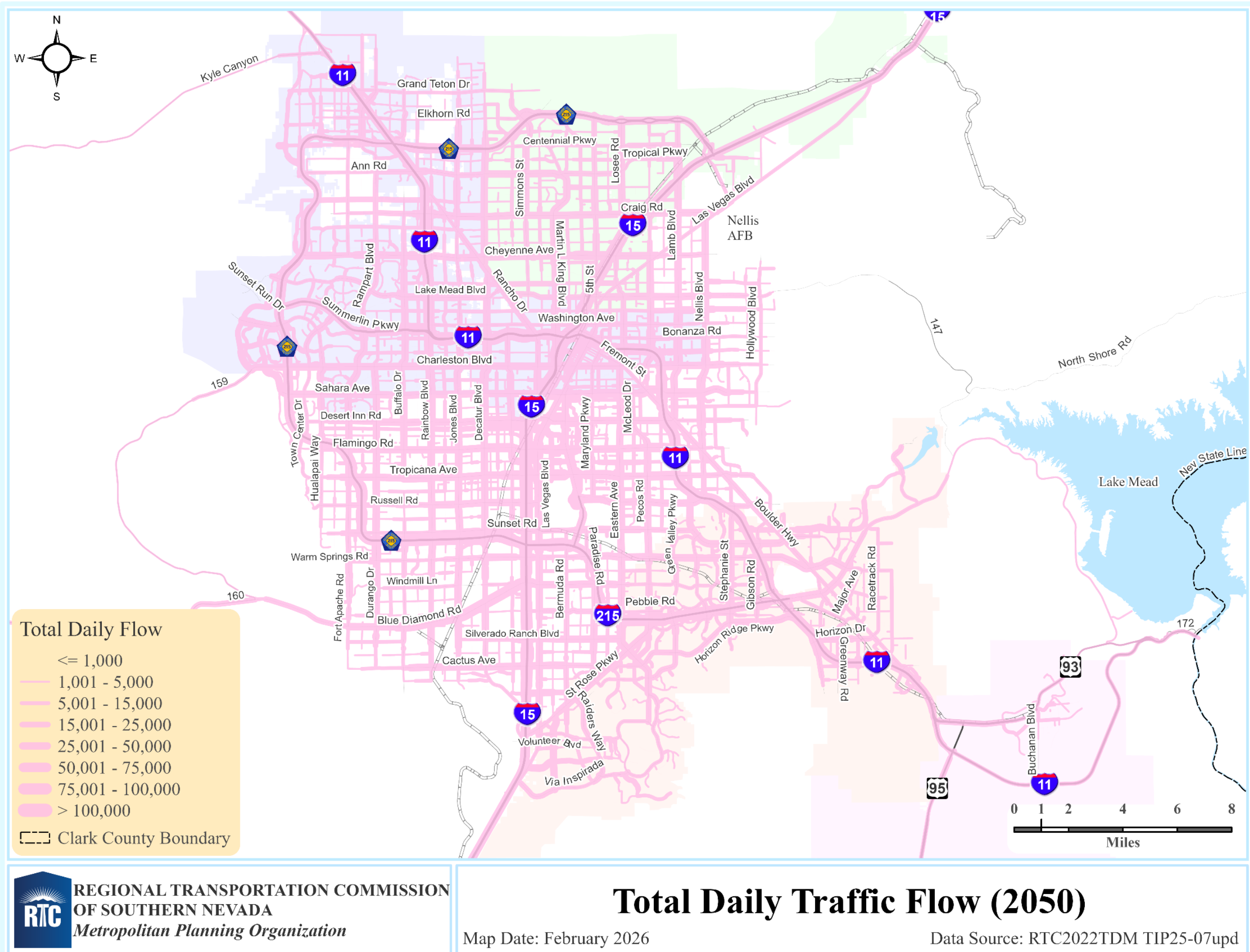


Figure 9: 2050 Daily Volumes



Air Quality (MOVES4) Interface

After a full model run of a horizon year scenario, RTC2022TDM TDM25-07 comes with a post-processing tool that can automatically produce a series of outputs necessary to run MOVES4. These include a ratio of observed count over modeled volume by urban code and functional class for the 2022 base year, and a series of VMT and VHT aggregations by urban code and functional class for the relevant air quality geographic areas for every TDM scenario year.

The count-to-model volume ratio file for the 2022 base year supplies urban code/functional class-specific correction factors which get applied to the output VMT. The factors account for differences that exist between observed traffic counts and model estimated volumes for the base year and get applied to all scenario years. Thus, if the RTC2022TDM TIP25-07 is 5 percent low collectively on minor arterials in the urban areas, the output VMT for this classification is increased by 5 percent to reflect this under-assignment.

Should a pollutants' geographic area for which emissions are to be measured change over time, the geography file must be updated before utilizing the air quality output files in MOVES4. For this RTP, each pollutant's geography files reflect the proper areas designated in the SIP.

5. EMISSION FORECAST METHODOLOGY

MOVES Methodology

Mobile source emissions for CO and Ozone were calculated using an emissions inventory developed through the Motor Vehicle Emissions Simulator (MOVES) model. MOVES model was developed by the U.S. EPA to estimate emissions for mobile sources covering a broad range of pollutant emissions from cars, trucks, and motorcycles The current official MOVES model version is MOVES5; however, MOVES4 remains acceptable for use during the two-year grace period ending December 11, 2026. For the air quality conformity analysis conducted for the RTP/TIP 25-07 amendment, RTC elected to use MOVES4.

MOVES4 requires county-specific data for each of the inputs listed below for each forecast horizon year:

- Fleet population data
- Annual Average daily vehicle miles traveled (AADVMT)
- Inspection/maintenance (I/M) programs
- Vehicle fuel types and technologies
- Seasonal fuel types and formulations
- Hourly temperature and relative humidity data
- Road type
- Fleet age distribution
- Vehicle speed distribution

The CCDES compiled some of these local input files for MOVES3 when developing Ozone budgets for a SIP revision entitled "Revision to Motor Vehicle Emissions Budgets for the 1997 Ozone NAAQS" (approved by EPA and effective on November 9, 2021). The RTC received those local input files for MOVES3 on Aug 9, 2021. In 2024, CCDES confirmed to the RTC that there was one change to the input files since that time—for the SIP work, CCDES utilized meteorological data from Harry Reid International Airport to calculate the average hourly temperature and humidity for July of the base year.

Although EPA developed the MOVES model to utilize regional-specific data for all the above inputs, regional-specific default data are provided for some of the inputs. Default data are used for vehicle fuel types and technologies parameters. Both AAWDVMT and vehicle speed distributions by facility type are generated from RTC2022TDM. The TDM traffic assignment module estimates vehicle volumes and congested speeds for every network roadway for the 6 modeled time periods (Early AM, AM, MD, PM, EV, NT). The TDM roadway network also contains attribute information such as facility type and urban/rural code classifications. Link Vehicle Miles Traveled (VMT) was estimated by roadway (link) distance and vehicle volumes. It is then grouped to time period VMT, and then summarized to daily VMT at congested speed, facility type, and urban/rural categories. The result is then overlaid with AQ boundary to provide AQ boundary level summary. These data are converted to annual VMT by Highway Performance Monitoring System (HPMS) facility type and monthly, daily, and hourly VMT fractions by vehicle type using the AADVMT Calculator workbook developed by EPA (EPA, updated August 2023).

The Let's Go 2050 Air Quality Conformity Analysis used annual vehicle population by vehicle type updated by CCDES for the 2022 base year. This air quality determination update remains consistent with it by using the same data. To extrapolate this data for different horizon years, 2022 base year vehicle population is adjusted based on MOVES default vehicle populations for the base year and horizon year. MOVES runs are conducted for each horizon year for January and July. January is the month when the CO emission rates are the highest for each roadway type and July is the month when the Ozone (VOC and NOx) emission rates are the highest for each roadway type.

VMT Adjustment Factors

A composite correction factor is applied to the VMT output by the TDM for all RTP years analyzed. This composite correction factor is the product of three separate factors, as follows:

1. Link Calibration Adjustment Factor – This was discussed under the Travel Demand Forecast Model section (under Air Quality (MOVES) Interface). This factor corrects for base year 2022 under-/over-assignment as compared to counts so that the model-based VMT is more in line with actual traffic count data throughout the region.
2. HPMS Average Daily VMT-to-Average Weekday VMT Adjustment Factor – The NDOT HPMS output VMT for Clark County in 2022 is annual. This is converted to an average day by first dividing by 365 and then converted to an average weekday by multiplying the average daily VMT by 1.06736 (provided by CCDES). When factored, the HPMS VMT is in an equivalent unit to the RTC2022TDM TIP25-07 output VMT, which represents the average annual weekday.
3. HPMS Calibration Adjustment Factor – The 2022 NDOT HPMS-based VMT for Clark County, adjusted to represent the average weekday, is then compared to the TDM-produced VMT by facility type. The HPMS calibration adjustment factor is the ratio of HPMS VMT for Clark County in 2022 to the model-produced VMT for base year 2022. Recognizing the HPMS VMT includes roadways functionally classified as locals and higher, certain classifications are removed from the model-produced VMT to better facilitate the comparison. These include local roads, and centroid connectors. Local roads are removed because due to practical considerations, the TDM cannot include all the local roads represented in the HPMS. With these removed, the HPMS VMT is 6.3 percent more than the model-produced VMT. Accordingly, the HPMS calibration adjustment factor is 1.063 and is applied countywide.

   The steps involved in computing this HPMS Calibration Adjustment Factor are enumerated below:

   a) 2022 NDOT Clark County HPMS annual VMT is 14,312,210,599, excluding local roads[8]
   b) Step a) converted to average daily VMT is 39,211,536 (14,312,210,599 / 365)
   c) Step b) converted to average weekday VMT is 41,852,825 (39,211,536 x 1.06736)
   d) Base year 2022 RTC2022TDM VMT, excluding local roads, centroid connectors and externals is 39,365,144
   e) Ratio of Step c) to Step d) is 1.063 (41,852,825 / 39,365,144)

In summary, the first factor is both facility type- and urban classification type-specific generated from available count post data, while the second and third factors are countywide. Above step c) is introduced to convert HPMS average daily VMT to HPMS average weekday VMT to align it with TDM output unit average weekday VMT. Table 9 shows the basis for the first factor (link calibration adjustment) along with resulting composite adjustment factors. Again, the composite factors are applied to the TDM output VMT for all RTP years. While the adjustment factors for rural collector and local road classifications are relatively large, it is noted the sample size of counts for rural local roads is small. In the case of rural collectors, which have a slightly larger sample size, the average count is 656 vehicles per day (vpd). In model validation, percent root mean square error (% RMSE) tolerances are greater for low-volume facilities, as it is difficult for travel demand models to accurately represent such low volumes and the impact of error on facility sizing is less critical at such low volumes.

The postprocessed average weekday VMT is then used as an input to the “moves4-aadvmt-converter-tool” to produce annual HPMS VMT by vehicle type that is used by the MOVES4 model.

[8] Source: NDOT Annual Vehicle Miles of Travel, 2022 HPMS Data, August 2023.

Table 9: Development of VMT Composite Adjustment Factors

MOVES4 Classification	Number of Observations	Count VMT	TDM VMT	Link Calibration Adjustment Factor[1]	Composite Adjustment Factor[2]
Rural - Freeway	41	2,795,482	2,793,369	1.001	1.064
Rural - Expressway/Beltway	2	26,937	24,159	1.115	1.185
Rural - Super Arterial	35	516,863	700,591	0.738	0.784
Rural - Major Arterial	34	84,323	172,396	0.489	0.520
Rural - Minor Arterial	70	95,138	54,926	1.732	1.842
Rural - Collector	60	39,357	13,817	2.849	3.029
Rural - Local	8	14,100	1,876	7.517	7.992
Rural - Ramp	0	-	-	-	1.063
Rural - System to System Ramp	73	35,688	28,711	1.243	1.322
Rural - Unknown	0	-	-	-	1.063
Rural - Centroid Connector	0	-	-	-	1.063
Rural - Externals	0	-	-	-	1.063
Urban - Freeway	88	3,612,617	4,046,148	0.893	0.949
Urban - Expressway/Beltway	26	822,879	992,586	0.829	0.881
Urban - Super Arterial	271	1,043,898	983,565	1.061	1.128
Urban - Major Arterial	1015	2,354,804	2,230,939	1.056	1.122
Urban - Minor Arterial	18	2,672	1,724	1.549	1.647
Urban - Collector	924	711,290	519,735	1.369	1.455
Urban - Local	146	69,852	45,017	1.552	1.650
Urban - Ramp	35	352,522	210,222	1.677	1.783
Urban - System to System Ramp	260	766,369	899,428	0.852	0.906
Urban - Unknown	0	-	-	-	1.063
Urban - Centroid Connector	0	-	-	-	1.063
Urban - Externals	0	-	-	-	1.063

[1]Count VMT divided by TDM VMT.

[2]Product of the link calibration adjustment factor and 1.063.

In past applications of MOVES, seasonal adjustment factors were applied to HPMS VMT to reflect seasonal peaking of CO and ozone emissions. Such factors are no longer required as EPA developed a workbook "moves4-aadvmt-converter-tool-2023-08.xlsx" to automatically calculate monthly adjusted AAWDVMT for MOVES. In addition, a previous ozone non-attainment area spanned an area larger than the TDM geographic domain. The RTC2022TDM expansion of this domain to include the entirety of Clark County ensures the TDM explicitly captures VMT within any applicable non-attainment area.

PM_{10} Fugitive Emissions Methodology

Fugitive emissions of PM_{10} resulting from roadway travel and construction activities are calculated in addition to the mobile source emissions discussed above. The PM_{10} Emission calculation methodology remains the same as that used for the previous RTP Conformity Determination.

PM_{10} Roadway Emissions Calculation

During PM10 Maintenance Plan development, CCDES updated PM10 emission factors (EF) based on the average paved road silt loading (i.e. the amount of dust on a paved road) factors by road type from the most recent samples. Clark County sampled 22 sites in 1999 and conducted quarterly sampling from 2002 through the first quarter of 2006 using the procedures outlined in AP-42 (EPA 1995, Appendix C.1). Silt loadings were collected on major arterials, minor arterials, collectors, and local roads, but not freeways. The data indicates that silt loading values have decreased since 2003, a trend that corresponds to the implementation of best construction practices in the Construction Activities Dust Control Handbook (DAQEM, 2003). Table 10 shows the average silt loading values by major road type. While larger differences are noted between the traffic counts and the TDM's VMT estimates for Rural Collector and Rural Local roads, it's duly noted that the RTC TDM is designed to primarily model roadway links that are at the collector level and above. A small number of local street links have been included when they form TAZ boundaries or are used by public transit routes. So, that larger difference may be attributed to (a) small sample sizes in the traffic count data and (b) the isolated locations of some of these links that make it harder to load flow with model's practical centroid connectors. In general, the TDM validates well with the broader set of traffic counts available and is consistent with HPMS VMT estimates.

Table 10: Average Paved Road Silt Loading Factors by Road Type

Road Type	Silt Loading Value (g/m^2)
Major Arterial	0.29
Minor Arterial	0.49
Collector	0.49
Local	1.65
Freeway	0.02

Source: Redesignation Request and Maintenance Plan for Particulate matter (PM_{10}), Appendix A. Technical Support Document Table 8-1, August 2012, CCDES.

CCDES assessed average fleet vehicle weight using Nevada Department of Motor Vehicles data in 2005. Based on the assessment, it was determined that the average vehicle fleet weight for Clark County was 2.29 tons. The results were published in a report entitled *Average Vehicle Fleet Weight in Clark County, Nevada*, dated January 2006. The findings were presented to the Clark County Technical Advisory Committee for comment and reviewed by EPA Region 9 staff. Table 11 provides average paved road emissions factors by major road type based on the silt loading factors presented in Table 10.

Table 11: Average Paved Road Emission Factors by Road Type

Road Type	Emission Factor (g/VMT)
Major Arterial	0.761
Minor Arterial	1.220
Collector	1.225
Local	3.671
Freeway	0.066

Source: Redesignation Request and Maintenance Plan for Particulate matter (PM_{10}), Appendix A. Technical Support Document Table 8-2, August 2012, CCDES.

Roadway Construction PM_{10} Emissions

A series of PM10 inventories were conducted during the 1999-2000 period to support the SIP development. The following identifies the assumptions to estimate PM10 from highway constructions.

CONSTRUCTION: HIGHWAY CONSTRUCTION PM_{10} EMISSION RATES

1. Calculate total number of months for analysis period
2. Convert the Lane Miles of Project to Acres
    a. 5280 x 12 (average lane width) = 63,360 square feet in a lane mile
    b. 63,360/43,560 (number of square feet in an acre) = 1.45 acres per lane mile
    c. Factor: 1.45 x total project lane mile = number of acres under construction
3. Apply SIP emission factor = .42 tons/acre/month = 840 pounds/acre/month

4. Apply Best Management Practice reduction factor to total acres under construction = product - (product x .68)
5. Convert to Average Day Emissions: divide by number of days in analysis period

WIND EROSION: HIGHWAY CONSTRUCTION EMISSION CALCULATIONS FOR PM_{10}

1. Define project acres
2. Obtain acre calculation for analysis period from the steps of Highway Construction (above)
3. Apply PM_{10} wind erosion rates per day to acre calculation
    a. 65% of acres x 7.60×10^{-4} tons
    b. 35% of acres x 1.98×10^{-2} tons
4. Compute total daily wind erosion by adding the results of Steps 3a and 3b
5. Apply Sections 90 through 94 of Clark County Air Quality Regulations: Reduce by 71%

6. EMISSIONS CALCULATIONS

This section documents the emissions calculated for ozone, PM_{10}, and CO for the current RTP plan years: 2025, 2030, 2040, and 2050.

Ozone

MOVES4 is run for the month of July as that is the month of highest ozone emission estimates. Table 12 reports the estimated emissions for the two precursors of ozone: NO_x and VOC. The established emissions budgets are also shown and indicate both pollutants are below budget levels for all years analyzed and therefore satisfy ozone conformity requirements.

Table 12: Ozone Conformity Test Summary

Year	NO_x (tons/day)		Conformity Requirement	VOC (tons/day)		Conformity Requirement
	Emissions	Emissions Budget		Emissions	Emissions Budget	
2025	15.51	26.77	Satisfied	10.57	20.92	Satisfied
2030	9.22	26.77	Satisfied	8.41	20.92	Satisfied
2040	4.84	23.35	Satisfied	6.87	15.51	Satisfied
2050	4.46	23.35	Satisfied	6.17	15.51	Satisfied

Table 12 also indicates that while the emissions budgets become more stringent over the RTP planning horizon, the levels of emissions are forecast to decrease such that they meet the more stringent requirements, too. Figures 12 and 13 illustrate the decreasing rates of emission and budgets for both pollutants over the RTP planning horizon. The figures reveal both NO_x and VOC forecast emissions decline faster than the declining budgets. Thus, by the end of the 2050 RTP horizon, the amount of emission “reserve” (emissions budget – forecast emissions) is greater than at the start of the RTP.

Figure 12: NOx Emissions

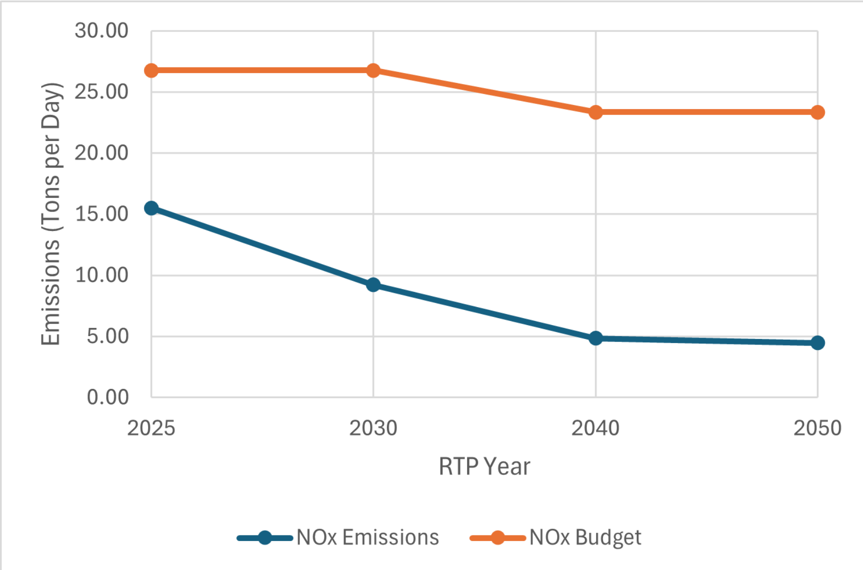
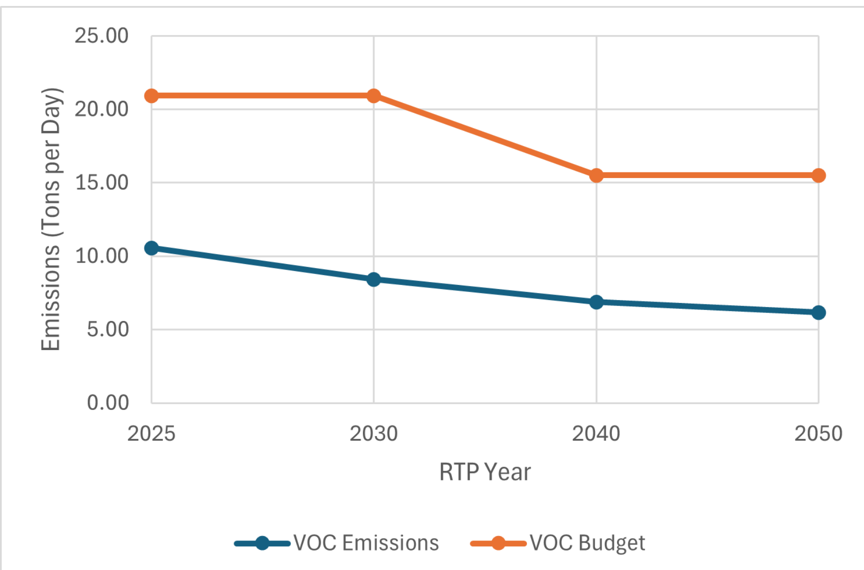


Figure 13: VOC Emissions



PM_{10}

The following sources of PM_{10} emissions are accounted for within the RTP air quality conformity process. These include:

- Vehicular exhaust
- Vehicular brake and tire wear
- Road construction[9]

Table 13 shows the calculation of PM_{10} emissions from paved roadways based on current silt loading factors and average vehicle fleet weight.

[9] Note road construction is treated the same way that general construction is treated: all applicable dust control regulations are applied to the site during construction activity to ensure emission reductions.

Table 13: PM_{10} Roadway Analysis for Horizon Years

Facility Type	Adjusted AAWDVMT					2006	2022	2025	2030	2040	2050
	2022	2025	2030	2040	2050	PM_{10} Emission Factors (g/v-m)	Paved Road Emissions (kg/day)	Paved Road Emissions (kg/day)	Paved Road Emissions (kg/day)	Paved Road Emissions (kg/day)	Paved Road Emissions (kg/day)
Rural - Freeway	1,062,421	1,130,949	1,263,013	1,739,714	2,113,329	*0.066*	70	75	83	115	139
Rural - Expressway/Beltway	81,355	98,087	119,287	161,084	278,397	*0.066*	5	6	8	11	18
Rural - Super Arterial	363,421	370,437	393,234	433,545	469,565	*0.761*	277	282	299	330	357
Rural - Major Arterial	25,481	52,294	90,003	107,823	130,249	*0.761*	19	40	68	82	99
Rural - Minor Arterial	126,094	124,644	132,408	142,301	159,200	*1.225*	154	153	162	174	195
Rural - Collector	236,530	219,799	235,496	639,964	836,945	*1.225*	290	269	288	784	1,025
Rural - Local	285,881	480,607	583,903	914,769	1,146,234	*1.225*	350	589	715	1,121	1,404
Rural - Ramp	0	6,143	9,455	13,832	19,331	*1.225*	-	8	12	17	24
Rural - System to System Ramp	37,068	32,418	40,535	53,805	85,840	*1.225*	45	40	50	66	105
Rural - Unknown	1,328	1,375	1,493	2,625	4,222	*1.225*	2	2	2	3	5
Rural - Centroid Connector	121,117	166,567	259,943	409,302	546,274	*3.671*	445	611	954	1,503	2,005
Rural - Externals	0	0	0	0	0	*1.225*	-	-	-	-	-
Urban - Freeway	7,511,108	7,809,681	8,224,835	8,801,329	9,223,444	*0.066*	496	515	543	581	609
Urban - Expressway/Beltway	4,704,733	4,952,234	5,246,822	5,663,470	5,953,273	*0.066*	311	327	346	374	393
Urban - Super Arterial	5,181,650	5,383,856	5,561,986	5,990,157	6,381,184	*0.761*	3,943	4,097	4,233	4,559	4,856
Urban - Major Arterial	11,586,435	12,012,571	12,554,992	13,433,978	13,979,194	*0.761*	8,817	9,142	9,554	10,223	10,638
Urban - Minor Arterial	0	0	0	0	0	*1.225*	-	-	-	-	-
Urban - Collector	4,471,036	4,668,685	4,850,477	5,249,306	5,441,945	*1.225*	5,477	5,719	5,942	6,430	6,666
Urban - Local	1,666,909	1,672,228	1,790,551	1,963,912	2,062,468	*1.225*	2,042	2,048	2,193	2,406	2,527
Urban - Ramp	886,210	1,028,190	1,064,220	1,180,844	1,194,311	*1.225*	1,086	1,260	1,304	1,447	1,463
Urban - System to System Ramp	1,458,918	1,510,303	1,577,506	1,666,574	1,711,907	*1.225*	1,787	1,850	1,932	2,042	2,097
Urban - Unknown	3,891	4,709	5,069	8,675	14,901	*1.225*	5	6	6	11	18
Urban - Centroid Connector	2,199,994	2,281,852	2,397,972	2,540,117	2,639,376	*3.671*	8,076	8,377	8,803	9,325	9,689
Urban - Externals	0	0	0	0	0	*1.225*	0	0	0	0	0
SUBTOTAL (Daily)	42,011,580	44,007,630	46,403,202	51,117,125	54,391,589		33,697	35,415	37,499	41,601	44,334
Public Transit Bus	57,442	57,442	69,836	75,695	80,560	*3.671*	211	211	256	278	296
Intra-zonal	45,856	50,913	57,634	91,707	127,881	*3.671*	168	187	212	337	469
TOTAL (Daily)	42,114,878	44,115,985	46,530,672	51,284,526	54,600,030		34,076	35,812	37,967	42,216	45,100
Factor to convert kg/day to US tons/day							0.001102	0.001102	0.001102	0.001102	0.001102
PM_{10} Paved Road Emissions (tons/day)							37.55	39.47	41.84	46.52	49.70

To calculate PM_{10} exhaust emissions, design day meteorological data sourced from CCDES' Redesignation Request and Maintenance Plan for Particulate Matter (PM_{10}) is input to MOVES4. Table 14 presents this data and Table 15 summarizes the mobile source PM_{10} exhaust emissions for the HA 212 region.

Table 14: Design Day Meteorological Observations at McCarran International Airport[1]

Hour	Temperature (F)	Relative Humidity (%)
1	73.0	12
2	71.1	12
3	71.1	14
4	69.1	18
5	68.0	17
6	68.0	18
7	68.0	16
8	70.0	13
9	70.0	14
10	73.0	11
11	75.0	9
12	75.9	8
13	78.1	8
14	78.1	8
15	80.1	6
16	80.1	6
17	79.0	5
18	78.1	5
19	75.9	6
20	70.0	8
21	68.0	8
22	66.0	7
23	64.0	6
24	63.0	8

[1]Since renamed Harry Reid International Airport.
Source: Clark County DES Redesignation Request and Maintenance Plan for Particulate Matter (PM_{10}), Table 8-8.

Table 15: Mobile Source PM_{10} Emissions

	2025	2030	2040	2050
PM10 Vehicle Emissions (tons/day)	0.34	0.25	0.18	0.17

The PM_{10} emissions contributions from highway construction and wind erosion are shown in Tables 16 and 17, respectively, whereby acreages have been calculated based on projects identified in the RTP. The construction lane miles are those presented in Table 7.

Table 16: PM_{10} Emissions from Highway Construction

	2025	2030	2040	2050
Construction Lane Miles	240	101	78	46
Horizon Year Total Projects				
Number of Months in Horizon Year	36	60	120	120
Estimated Acreage	349	148	113	67
Emissions Factors (tons/acre/month)	0.42	0.42	0.42	0.42
PM_{10} Vehicle Emissions (tons/day)	4.82	2.04	1.56	0.93
Best Practices Reduction	68%	68%	68%	68%
Net PM_{10} Emissions (tons/day)	1.54	0.65	0.50	0.30

Table 17: PM_{10} Emissions from Wind Erosion

	2025	2030	2040	2050
Estimated Acreage	349	148	113	67
Erosion Rate (tons/acre/day)				
35 Percent of Site	0.00076	0.00076	0.00076	0.00076
65 Percent of Site	0.01980	0.01980	0.01980	0.01980
PM_{10} Emissions (tons/day)	4.58	1.94	1.49	0.88
Sections 90-94 (see Table 22) Reduction	71%	71%	71%	71%
Net PM_{10} Emissions (tons/day)	1.33	0.56	0.43	0.26

Table 18 summarizes the net PM_{10} emissions from the above sources (as identified in Tables 13, 15, 16 and 17) and compares them against the emissions budget established by the PM_{10} Maintenance Plan (Table 2). Table 18 reveals that all RTP years have forecast PM_{10} emissions below budget and therefore achieve conformity.

Table 18: Total PM_{10} Mobile Source Emissions and Budget (Tons/Day) for RTP Years

Source	2025	2030	2040	2050
Paved Road Dust	39.47	41.84	46.52	49.70
Vehicle Emissions	0.34	0.25	0.18	0.17
Highway Construction	1.54	0.65	0.50	0.30
Windblown Construction Dust	1.33	0.56	0.43	0.26
Total PM_{10} Mobile Source Emissions	42.68	43.31	47.63	50.43
PM_{10} Budget	141.41	141.41	141.41	141.41
Conformity Requirement	Satisfied	Satisfied	Satisfied	Satisfied

Carbon Monoxide

MOVES4 is run for both January and July to capture the highest emissions. Although the CO emission rates are usually higher in winter (January), the activity levels are higher in summer (July), and higher total CO emissions are experienced in July. For this RTP conformity analysis, both months' CO emissions are reviewed and the higher of the two (July) are reported. Table 19 shows the CO emissions for each of the RTP years. As indicated previously, the CO maintenance plan is a Limited Maintenance Plan and therefore this RTP does not require a regional emissions analysis for conformity determination. Therefore, there is no emissions budget. For reference, the previous CO emissions budget was 704 tons per day[10]. Table 19 reveals that all RTP plan years are below this previous budget. Furthermore, the forecast emissions decrease over time

[10] Clark County Carbon Monoxide Maintenance SIP, September 2010.

which supports the LMP designation requirement that it is unreasonable to expect that such an area will experience so much growth in the 10-year period of the LMP that a violation of the CO NAAQS would result.

Table 19: Mobile Source CO Emissions for HA 212

Year	CO (tons/day) Emissions	CO (tons/day) Emissions Budget
2025	158.73	N/A
2030	121.68	N/A
2040	74.72	N/A
2050	65.20	N/A

Note: As a point of reference, the previous CO emissions budget was 704 tons per day.

7. TRANSPORTATION CONTROL MEASURES

Background

A second component of conformity determination includes a progress assessment of the Transportation Control Measures (TCMs) implementation. These measures are intended to reduce pollutant emissions or concentrations from transportation sources by reducing vehicle use. As required by 23 CFR, Part 450.324, n(3), in non-attainment areas, the TIP document must describe the progress in implementing any required TCMs, including any reasons for significant delays in the planned implementation and strategies for ensuring their advancement at the earliest possible time. As part of the conformity process, MPOs in non-attainment areas must certify that TCMs identified in the SIPs are either programmed or are being implemented on schedule and that no Federal funds are being diverted from these projects in such a way as to delay their timely implementation.

Statement of TCM Progress and TCM Certification

Clark County 2012 PM_{10} SIP and Maintenance Plan proposes no changes to 2001 emission reductions control measures.[11] Control measures from 2001 PM_{10} SIP are still referenced below. Table 20 copied from the *CO Redesignation Request and Maintenance Plan* (Clark County DES, 2008) shows the previously adopted control measures.

Table 20: Transportation Control Measures Adopted for Clark County CO SIP

Control Measure	Adoption Year
Oxygenated Gasoline Program	1991/1995
CBG Wintertime Fuels Program	1999
Reduced RVP Gasoline Program	1995
Motor Vehicle I/M Program	1978
TCM/TDM Program	1999
Alternative Fuels for Government Fleets Program	1981

As stated in the *2019 10-Year CO Limited Maintenance Plan,* CCDES will continue to rely on the permanent and enforceable emission reduction control measures identified in the 2008 CO maintenance plan including: Federal Motor Vehicle Emissions Control Program (FMVECP), State Vehicle I/M Program, Oxygenated Gasoline Program, and State Technician

[11] Clark County submitted the second PM10 maintenance plan through 2035 to EPA in August 2025. The plan is currently under EPA review.

Training and Certification Program. The Las Vegas Valley attainment of the CO NAAQS is attributed to the development and implementation of these control measures and the area will maintain the standard through the second 10-year maintenance period ending in 2030. CCDES also retained the Reduced RVP Gasoline Program (a maximum RVP of 9 psi) contingency measure from the 2008 CO maintenance plan.

In 1999, the RTC implemented the Club Ride Commuter Services program that includes employer-based commuter incentive programs, telecommuting incentives, and area-wide ridesharing. This program is referenced in both the 2000 CO SIP and the 2005 CO SIP revision. This on-going, voluntary program, while no longer used for numeric emission reduction credit, continues to play an important role in improving air quality.

Table 21 summarizes the adopted mobile source TCMs, excluding the emission reduction credits based on the recent PM_{10} SIP revision, and provides the present status of TCMs from both the CO and PM_{10} SIPs.

Table 21: Status of Adopted Mobile Source Transportation Control Measures

Carbon Monoxide		
Control Measures from 2000 CO SIP and 2006 CO SIP Revision	**Emission Reduction**	**Status**
Voluntary Transportation Control Measure/Travel Demand Management	0%	Ongoing. See the following for details: https://www.rtcsnv.com/ways-to-travel/club-ride/.
Alternative Fuels Program for Government Fleets	0%	Ongoing; local government and transit authority committed to alternative fuels program
Previously Adopted Enforceable Control Measure	**Adoption Date**	**Status**
Motor Vehicle Inspection & Maintenance Program	1978	Ongoing
Fleet Over	1967	Ongoing

Particulate Matter 10 Microns or Less (PM_{10})	
Control Measures from 2001 PM_{10} SIP	**Status**
Transportation Construction - Rules 90-94[12]	Ongoing; all transportation construction projects must conform. All transportation construction contracts, regardless of funds source, include the requirement to conform to Rules 90-94 concerning fugitive dust.

Source: Regional Transportation Commission staff.

To achieve attainment of the 1997 8-hour ozone NAAQS, CCDES implemented emissions control measures that lead to a permanent and enforceable improvement in air quality. As outlined in the 2011 Maintenance Plan, these emissions reduction control measures included:

1. Federal Tier 2 vehicle emissions standards (65 FR 6822).
2. Federal highway diesel rule (66 FR 5001).
3. Federal large nonroad diesel engines rule (69 FR 38958).

[12] Clark County Air Quality Regulations, Amended June 7, 2022.

4. Nonroad spark-ignition engines and recreational engines standards (65 FR 76789).
5. Federal nonroad spark-ignition engines and equipment standards (73 FR 59034).
6. Nevada vehicle inspection and maintenance (I/M) program (Nevada Revised Statutes (NRS) 445B and Nevada Administrative Code (NAC) 445B).
7. Clark County stationary point and nonpoint source air quality regulations (AQRs). (DAQEM 2011)

These emissions control measures will remain in place in the maintenance area through the second maintenance period. Recently, however, the State of Nevada's 81st Legislative Session (which concluded on June 1, 2021) passed Assembly Bill 349 (AB 349) affecting the I/M program. Clark County Chapter 445B in the NRS and the NAC set forth the regulations governing motor vehicles in Clark County. Adopted in 1978 and administered by the Nevada Department of Motor Vehicles, these regulations establish annual testing procedures for 1968 or newer gasoline-powered vehicles, regardless of size, and for diesel-powered vehicles with a manufacturer's gross vehicle weight rating of up to 10,000 pounds.

8. CONCLUSION

An air quality conformity analysis is performed for this TIP Amendment 25-07 following current SIPs for Clark County. This analysis demonstrates that the anticipated levels of atmospheric pollution which will result from planned and programmed transportation projects will be less than the relevant budgets defined in the SIPs. The ozone and PM10 budgets developed by the Clark County DES and established in the Maintenance Plan are used in the conformity findings for this RTP. Tables 22 and 23 summarize the findings of this analysis.

Table 22: Summary of Findings of Conformity Analysis for Ozone

Year	NO_x (tons/day)		Conformity Requirement	VOC (tons/day)		Conformity Requirement
	Emissions	Emissions Budget		Emissions	Emissions Budget	
2025	15.51	26.77	Satisfied	10.57	20.92	Satisfied
2030	9.22	26.77	Satisfied	8.41	20.92	Satisfied
2040	4.84	23.35	Satisfied	6.87	15.51	Satisfied
2050	4.46	23.35	Satisfied	6.17	15.51	Satisfied

Table 23: Summary of Findings of Conformity Analysis for PM_{10}

Source	2025	2030	2040	2050
Paved Road Dust	39.47	41.84	46.52	49.70
Vehicle Emissions	0.34	0.25	0.18	0.17
Highway Construction	1.54	0.65	0.50	0.30
Windblown Construction Dust	1.33	0.56	0.43	0.26
Total PM_{10} Mobile Source Emissions	42.68	43.31	47.63	50.43
PM_{10} Budget	141.41	141.41	141.41	141.41
Conformity Requirement	Satisfied	Satisfied	Satisfied	Satisfied

In addition, carbon monoxide, by virtue of Clark County being in an LMP, does not have a specific emissions budget. Still, this analysis demonstrates forecast CO emissions are well below prior emissions budgets and decreasing over time—from 23 percent of the previous budget in 2025 to nine percent of that budget by 2050. This decrease further supports the LMP designation.

Finally, this conformity analysis provides a progress assessment of the Transportation Control Measures (TCMs) implementation, stating the TCMs are on-going and being implemented.