



Arizona Department of Transportation
**Air Quality Regional Conformity Analysis: Nogales PM2.5/
PM10 Nonattainment Areas**

**State Route 189, International Border to Grand Avenue
Environmental Assessment** azdot.gov/SR189

Federal-aid No. STP-189-A(201)T ADOT Project No. 189 SC 000 H8045 01L

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Nogales PM_{2.5}/PM₁₀ Nonattainment Areas Analysis

Purpose and Organization

This report documents the regional emissions analysis conducted to demonstrate the conformity of Arizona's 2017–2021 State Transportation Improvement Program (STIP) and current long-range transportation plan (LRTP), *What Moves You Arizona 2010–2035*, to the U.S. Environmental Protection Agency (EPA)-approved State Implementation Plans (SIPs) for the Nogales PM₁₀ and PM_{2.5} Nonattainment Areas. This conformity demonstration and analysis were based on data provided by the Arizona Department of Transportation (ADOT), Arizona Department of Environmental Quality (ADEQ), and EPA's 2014 National Emissions Inventory (2014 NEI).

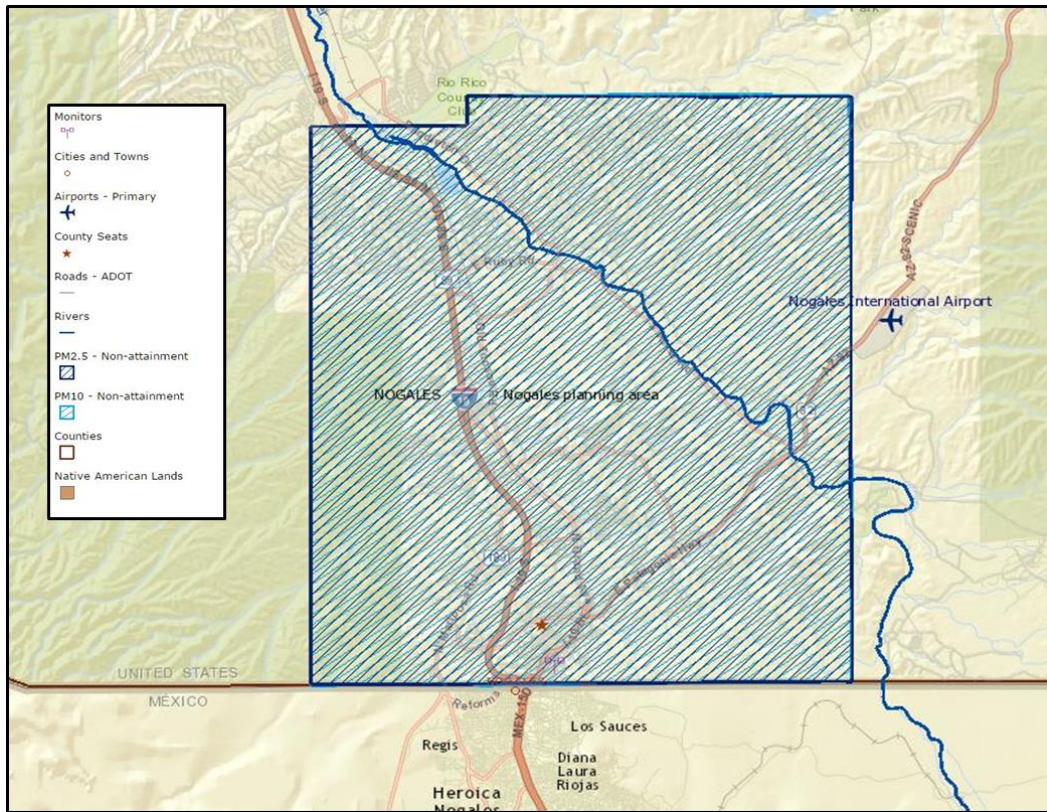
The report is organized into the following sections:

- **Introduction:** This section includes information on the two Nogales Nonattainment Areas (NNAs), the applicable National Ambient Air Quality Standards (NAAQS), transportation conformity, and ADOT's STIP and LRTP.
- **Interagency Consultation:** This section outlines interagency consultation requirements and summarizes all decisions made through consultation.
- **Analysis Methodology and Data:** This section outlines all of the technical information collected to conduct the regional emissions analysis and includes details on the EPA Vehicle Emission Simulator (MOVES) model and the data and assumptions used to estimate emissions.
- **Regional Emissions Analysis and Conformity Test Results:** Using the information and methodologies described in the previous section, this section describes the conformity "tests" given each analysis year.
- **Conformity Determination:** This section provides the final result of the conformity analysis, which includes demonstrating financial constraint, public participation, and a formal conformity statement.
- **Resources and Glossary:** These sections list informational websites and guides, particularly with regard to the MOVES2014a model, and commonly used terms and acronyms.
- **Appendices:** These appendices contain additional details regarding on-road source assumptions, MOVES2014a input and output files, and interagency consultation.

Introduction

Nonattainment areas are places that have experienced violations of the NAAQS for a given pollutant. The NNA is an area covering approximately 76 square miles along the international border with Mexico in Santa Cruz County, Arizona. It is designated as a nonattainment area for violating both the coarse particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}) NAAQS. The NNA is 66 miles south of Tucson and includes the city of Nogales, Arizona, and portions of Rio Rico, an unincorporated community north of Nogales. Both the PM₁₀ and PM_{2.5} nonattainment areas are shown in Figure 1.

Figure 1. Nogales Nonattainment Areas



Source: ADEQ eMaps (<https://gisweb.azdeq.gov/arcgis/emaps/?topic=nonattain>)

All nonattainment areas must demonstrate that their transportation programs and long-range transportation plans conform to air quality plans that were established by the state and approved by EPA. In urban areas, this demonstration is conducted by metropolitan planning organizations (MPOs). However, Nogales does not meet the population requirements needed to establish an MPO and is, therefore, considered a rural nonattainment area. Thus, transportation planning processes in the NNA are conducted by ADOT as part of its statewide planning and programming efforts. As a result, ADOT is required to coordinate the regional transportation conformity process with ADEQ and other regulatory authorities including EPA and the Federal Highway Administration (FHWA).

Background on Transportation Conformity

Transportation conformity is required by the Clean Air Act (CAA), Section 176(c), to ensure that federal funding and approvals are given to highway and transit projects that are consistent with an area's air quality goals established in SIPs. Demonstrating conformity means verifying that planned transportation improvement projects will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS.

Regional conformity, or conformity of a plan or Transportation Improvement Program (TIP), demonstrates that the total emissions from an area's future transportation system are consistent with goals for air quality

found in the SIP. Regional conformity is demonstrated by conducting an analysis that shows future year emissions are less than or equal to a motor vehicle emission budget (MVEB) established by the SIP(s) (§ 93.118). If an area does not have an approved MVEB, other tests, known as interim emissions tests (§ 93.119), must be performed. Interim emissions tests include:

- Demonstrating that the emissions predicted for a future or “action” scenario represented by a TIP or LRTP are not greater than the emissions predicted given a no-action, or “baseline” scenario. This is often referred to as the “build-no-build” test.
- Demonstrating that the emissions predicted in the “action” scenario are not greater than the emissions in a baseline year for a given standard. This is referred to as the “no-greater-than” test.

Typically, transportation conformity demonstrations include an assessment of the first year of a TIP, the last year of a TIP, the horizon (or end year) of the LRTP, and interim analysis years between the last year of the TIP and LRTP horizon year with no more than 10 years in between. Emissions are estimated using the latest available planning assumptions and analytical tools, including EPA’s latest mobile sources emissions model. The conformity demonstration includes a tabulation of the analysis results for applicable pollutants showing the required tests were met for each analysis year.

National Ambient Air Quality Standards

The CAA requires EPA to set NAAQS for pollutants considered harmful to public health and the environment. The NNA has been designated under the NAAQS for PM_{2.5} and PM₁₀. *Particle pollution* (also called particulate matter, or PM) is the term describing a mixture of solid particles and liquid droplets found in the air. Some particles—such as dust, dirt, soot, or smoke—are large or dark enough to be seen with the naked eye. Others are so small they can be detected only by using an electron microscope.

Particle pollution includes “inhalable coarse particles,” with diameters larger than 2.5 microns and smaller than 10 microns (PM₁₀), and “fine particles,” with diameters 2.5 microns and smaller (PM_{2.5}). Some particles, known as primary particles, are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires. Others form through complicated reactions in the atmosphere and are known as secondary particles.

PM_{2.5}

The NNA was designated under the 2006 PM_{2.5} 24-hour NAAQS. Effective February 6, 2013, EPA took final action to determine that the NNA attained the 2006 PM_{2.5} standard (Table 1). The finding did not constitute a redesignation of the NNA to attainment. The nonattainment classification and designation status remain in place until EPA determines that ADEQ has met the CAA requirements for requesting a redesignation of the NNA to attainment.

At this time, the Nogales PM_{2.5} area does not have approved MVEBs and will, therefore, use one of the interim conformity tests. According to EPA’s Final Rule for the 24-hour PM_{2.5} standard, PM_{2.5} areas without MVEBs may use either the “build-no-build” test or the “no-greater-than 2008” test. Following interagency consultation, ADOT decided on the “no-greater-than 2008” test for both primary PM_{2.5} and oxides of nitrogen (NO_x), which is considered a precursor pollutant contributing to formation of secondary PM_{2.5} in the NNA.

EPA did not make a finding in the PM_{2.5} SIP emissions inventory that on-road mobile fugitive dust emissions (unpaved and paved sources) were significant. Therefore, they are not included as part of the “no-greater-than 2008” test.¹

Table 1. Nogales Nonattainment and Maintenance Areas and current SIP status, by pollutant

County	Current SIP status	Notes (as of February 1, 2013)
Nogales, Arizona 24-hour PM_{2.5} Nonattainment Area		
Santa Cruz (Partial)	Attainment finding Effective 2/6/2013 78 <i>Federal Register</i> 887	Area remains in nonattainment until a maintenance plan is submitted and approved. Regional transportation conformity applies.
Nogales, Arizona 24-hour PM₁₀ Moderate Nonattainment Area		
Santa Cruz (Partial)	2012 SIP Approval effective 10/25/2012 77 <i>Federal Register</i> 58962	EPA approved the SIP demonstrating that the Nogales Nonattainment Area is attaining the NAAQS for PM ₁₀ , but for international emissions sources in Nogales, Mexico.

Notes: NAAQS = National Ambient Air Quality Standards, SIP = State Implementation Plan

PM₁₀

The Nogales area was designated as a nonattainment area under the 1987 24-hour PM₁₀ standard, which was retained under EPA’s 2006 PM NAAQS review (effective December 18, 2006). EPA approved the Nogales 2012 PM₁₀ nonattainment area SIP, *2012 State Implementation Plan, Nogales PM₁₀ Nonattainment Area*, accepted by EPA on October 25, 2012. As part of that process, EPA approved an MVEB and an attainment demonstration showing the NNA would meet the 24-hour PM₁₀ NAAQS but for emissions sources in Nogales, Mexico. Table 2 provides the EPA-approved PM₁₀ MVEB, which must be used for transportation conformity determinations.

Table 2. 2011 Nogales Nonattainment Area motor vehicle emissions budgets for PM₁₀

Sector	PM ₁₀ (tons per year)
Dust – unpaved road	864.9
Dust – paved road	121.4
Dust – road construction	26.0
Mobile – gasoline and diesel (including exhaust and brake and tire wear)	21.0
2011 motor vehicle emission budget	1,274.3

Source: Table 7.1 in the 2012 *State Implementation Plan Nogales PM₁₀ Nonattainment Area*; August 24, 2012

¹ email from Jerry Wamsley, EPA Region 9, to Beverly Chenausky, ADOT, January 31, 2017

Status of the Fiscal Year 2017–2021 State Transportation Improvement Program and 2035 Long-Range Transportation Plan

The 2017–2021 STIP was approved by FHWA on December 21, 2016, and ADOT’s LRTP was adopted by the Arizona State Transportation Board on November 18, 2011. Both the STIP and LRTP are fiscally constrained and identify only one regionally significant, federally funded transportation project in the NNA between 2017 and 2035 (the horizon of the LRTP).

The State Route (SR) 189, International Border to Grand Avenue project (ADOT Project No.: 189 SC 000 H8045 01L) will improve SR 189, also known as Mariposa Road, and the existing Interstate 19 (I-19)/Mariposa Road Traffic Interchange (TI) by increasing speeds, reducing delay, and decreasing travel time through the area. SR 189/Mariposa Road conveys heavy truck traffic, along with passenger vehicle traffic, from the international port of entry between Mexico and the United States to I-19 and its northern terminus with Grand Avenue in Nogales, Arizona.

This project will be constructed in two phases. The first phase, referred to as the interim phase, will improve traffic flow on the existing SR 189/Mariposa Road through intersection improvements, elimination/consolidation of existing driveways, and construction of a eastbound-to-northbound flyover ramp at the I-19 TI. The second phase (or ultimate phase) will add a southbound-to-westbound flyover ramp. The interim phase is programmed to begin construction in 2019 and be completed by 2020. The ultimate phase is not yet funded but is included in the last year of the STIP (2021).

Interagency Consultation

As required by the federal transportation conformity rule (§ 93.105), the conformity process includes a significant level of cooperation among federal, state, and local agencies. For this air quality conformity analysis, interagency consultation was conducted as required by the Arizona Conformity SIP. The regional conformity analysis and demonstration assumptions were distributed to ADOT, ADEQ, EPA, and FHWA for consultation on December 8, 2016. A follow-up conference call was conducted on January 25, 2017, to review all input planning assumptions, methodologies, and analysis years. Table 3 summarizes the key planning decisions made by the interagency consultation group. Appendix C contains documentation regarding the consultation conducted.

Table 3. Planning decisions made through interagency consultation

Item	Decision
Vehicle miles traveled data	Use the most representative dataset between the 2014 National Emissions Inventory, Highway Performance Monitoring System, and ADOT's Statewide Travel Demand Model.
EPA emission model(s)	MOVES2014a and EPA's 2014 National Emissions Inventory
Regionally significant projects, projects with a significant change in design concept and scope	As shown in the <i>Statewide Transportation Improvement Program</i> and <i>Long-Range Transportation Plan</i> .
Transportation control measures progress	EPA has not approved any transportation control measures for the Nogales Nonattainment Area in the Arizona State Implementation Plan. Consequently, there is no need to address transportation control measures. ²
Triggers for conformity	Federally funded, regionally significant traffic project: State Route 189, International Border to Grand Avenue, ADOT Project No.: 189 SC 000 H8045 01L.
24-hour PM _{2.5} conformity test	No-greater-than 2008 Analysis years: <ul style="list-style-type: none"> • 2017 – first year of <i>Statewide Transportation Improvement Program</i> • 2021 – last year <i>Statewide Transportation Improvement Program</i> • 2030 – interim year • 2035 – horizon year of <i>Long-Range Transportation Plan</i>
24-hour PM ₁₀ conformity test	Budget test; compare with EPA-approved PM ₁₀ State Implementation Plan motor vehicle emissions budget Analysis years: <ul style="list-style-type: none"> • 2017 – first year of <i>Statewide Transportation Improvement Program</i> • 2021 – last year <i>Statewide Transportation Improvement Program</i> • 2030 – interim year • 2035 – horizon year of <i>Long-Range Transportation Plan</i>
Project identification	No regionally significant, nonexempt projects, regardless of funding source, were identified other than the State Route 189 project.
Latest planning assumptions	MOVES inputs will include recent information for Santa Cruz County, where available. See <i>Analysis Methodology and Data</i> section of this report for specific information used in the analysis.
Pollutants and emissions sources	PM ₁₀ – sources dictated by MVEB PM _{2.5} – on-road only NO _x – on-road

Notes: ADOT = Arizona Department of Transportation, EPA = U.S. Environmental Protection Agency

² email from Jerry Wamsley, EPA Region 9, to Beverly Chenausky, ADOT, January 31, 2017

Analysis Methodology and Data

The regional emissions analysis developed to support this conformity demonstration was conducted using the latest version of EPA's MOVES (version 2014a) model and 2014 NEI. The pollutant and emissions sources included in the emissions analysis are:

- PM₁₀ from re-entrained paved road dust
- PM₁₀ from unpaved road dust
- PM₁₀ from road construction
- on-road PM₁₀ (exhaust emissions, brake and tire wear)
- on-road PM_{2.5} (exhaust emissions, brake and tire wear)
- on-road NO_x

The MOVES model was used to develop annual emissions estimates for on-road emissions (PM₁₀, PM_{2.5}, and NO_x), while the 2014 NEI was used to estimate annual PM₁₀ dust emissions. These are the same approaches used to develop the emissions inventories for the PM₁₀ and PM_{2.5} SIPs. Both SIPs relied on the 2008 NEI and a previous version of MOVES (MOVES2010) to develop emissions inventories and the PM₁₀ MVEB. Because no formal request was received from EPA, ADEQ, or FHWA to include dust emissions sources of PM_{2.5}, only on-road PM_{2.5} emissions and NO_x were analyzed for the PM_{2.5} nonattainment area (§ 93.119).

The only regionally significant, federally funded road construction projects planned in the NNA are the interim and ultimate phases of the SR 189, International Border to Grand Avenue, project. Estimates of the construction dust for this project are included in the appropriate analysis year and represent a conservative, worst-case scenario for the NNA.

National Emissions Inventory

The NEI is a periodic, comprehensive, and detailed estimate of air emissions conducted by EPA. The NEI is released every 3 years based primarily on data provided by state and local air agencies for sources in their jurisdictions, supplemented with data developed by EPA. It uses MOVES to estimate on-road emissions in every state except California given information provided by state and local air agencies. It also estimates emissions from point, nonpoint (area), and nonroad sources using the methodologies provided in AP-42, EPA's compilation of emissions factors. NEI data are available on EPA's website (<https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>).

Both the PM₁₀ and PM_{2.5} SIPs for the NNA used the 2008 NEI as the basis for their emissions inventories and subsequent PM₁₀ MVEB. Data for the 2008 NEI were collected in 2009 and finalized in 2010. Since then, EPA has updated the NEI twice, once for 2011 and again for 2014. Data for the 2014 NEI were collected and processed by EPA in 2015. Thus, the 2014 NEI represents a more current set of assumptions than those used to develop the 2008 NEI and was used as the basis for estimating fugitive dust sources for the conformity demonstration.

On-Road Analysis

MOVES is the EPA-approved model required for estimating emissions from on-road vehicles. EPA first released MOVES in March 2010 (75 *Federal Register* [FR] 9411). In October 2014, EPA released a major revision June 2017

to the model (MOVES2014) and gave jurisdictions a 2-year grace period for its use and implementation (79 FR 60343). The most current version of the model (MOVES2014a) is a minor model revision released in November 2015.

MOVES uses a variety of local and/or national data to estimate emissions. Regional emissions analyses are required to use the most current planning assumptions available when the analysis begins. Nonattainment areas are encouraged to review and update their planning assumptions on a regular basis, especially population, employment, and vehicle registration information. MPOs often collect and maintain the planning assumptions needed to conduct a conformity demonstration for a given nonattainment area. However, given the NNA is rural and does not have an MPO, this demonstration must rely on readily available data from ADOT, ADEQ, and EPA (via the NEI).

The on-road emissions analysis was developed using EPA guidance documents, including:

- *Policy Guidance on the Use of MOVES2014 and Subsequent Minor Revisions for State Implementation Plan Development, Transportation Conformity, and Other Purposes*, EPA Office of Air and Radiation, EPA-420-B-14-008, July 2014
- *MOVES2014 and 2014a Technical Guidance: Using MOVES to Prepare Emission Inventories for State Implementation Plans and Transportation Conformity*, EPA Office of Air and Radiation and Office of Transportation and Air Quality, EPA-420-B-15-093, November 2015
- *MOVES2014a User Guide*, EPA-420-B-15-095, November 2015

Data for the on-road emissions analysis were obtained from a variety of sources, including previous MOVES runs conducted for the PM₁₀ and PM_{2.5} SIPs. ADOT provided current data on vehicle population and vehicle type mix for Santa Cruz County. Additionally, ADOT provided MOVES data generated from its statewide travel demand model (TDM). The model is based on 2010 traffic volumes and was validated using a series of screen lines and port of entry data. ADOT has a Microsoft Excel-based MOVES conversion spreadsheet that translates its TDM data into formats used by MOVES. This information was supplemented with activity data used to develop the 2014 NEI, when appropriate. The following sections describe the source of the information used to create the County Data Manager (CDM) input databases used by MOVES to estimate on-road emissions for the regional emissions analysis. Appendix A provides additional information on the data used to develop the on-road emissions estimates.

Meteorology – The same MOVES dataset used for the PM₁₀ and PM_{2.5} SIPs was used for this analysis. It provides average hourly temperature and relative humidity values for each month over an average year. This dataset was selected to maintain consistency with the SIP and MVEB. The analysis assumed that meteorological conditions in the NNA have not changed significantly since the SIPs were developed. The analysis of each forecast year assumed the meteorology did not change over time.

Vehicle Population – Vehicle population data for Santa Cruz County (as of January 2017) were provided by ADOT and were used to develop vehicle population data for the analysis. The vehicle categories reported by ADOT were mapped to the 13 MOVES model types using ADOT's MOVES data converter spreadsheet tool. Vehicle populations were then grown to each analysis year using current county-wide population forecasts June 2017

obtained from the Arizona Department of Administration, Employment and Population Statistics, Office of Economic Opportunity.

Vehicle Age Distribution – Vehicle age distribution data for Santa Cruz County (as of January 2017) were provided by ADOT and used to develop MOVES input files for the analysis. MOVES requires each of the 13 vehicle types have an age distribution starting with new vehicles through 30-year-old vehicles. Vehicles older than 30 years were aggregated into the oldest (30-year) fraction. For this analysis, it was assumed the vehicle age distribution did not change in the future.

Annual Vehicle Miles Traveled – Two sources of annual vehicle miles traveled (VMT) were evaluated to determine which resulted in the most conservative regional emission estimate. The sources included VMT used by the 2014 NEI to estimate paved road dust for Santa Cruz County and the county-level 2013 VMT estimate developed from ADOT’s statewide TDM. 2014 NEI data were obtained from FHWA’s Highway Performance Monitoring System (HPMS). The HPMS is a national database of highway information. Roadway extent, use, condition, and performance data are collected by and for ADOT and are submitted to FHWA annually as part of the HPMS program.

According to EPA guidance, baseline inventory VMT computed by the statewide model must be adjusted (or calibrated) to HPMS VMT totals. Therefore, ADOT’s base year (2010) network is calibrated using factors based on HPMS data. These factors are applied to roadway group combinations within each county and are important for accounting for local roadway VMT not represented in the model.

Both sources of data were compared with three other sources of VMT: VMT used for SIP development (that is, the 2008 NEI), VMT used for the 2011 NEI, and VMT reported by ADOT on October 10, 2016, as part of its HPMS data submittal. The comparison was conducted to ensure that the 2014 NEI and ADOT’s TDM data were appropriate for use in the regional emissions analysis. The comparison is summarized in Table 4. VMT data from each source are comparable—despite representing a 7-year span. The 2008 NEI/SIP VMT dataset had the highest total for the county, while the 2011 NEI had the lowest. Both the 2014 NEI and the ADOT TDM VMT datasets showed higher annual totals than the 2015 HPMS data submittal, but were slightly lower than the 2008 NEI estimate. As a result, it was determined that either dataset (the 2014 NEI or the ADOT TDM) was reasonable to use for the regional emissions analysis.

Table 4. Comparison of annual vehicle miles traveled datasets

Data source	Annual vehicle miles traveled estimate
2008 National Emissions Inventory and State Implementation Plan	471,074,100
2011 National Emissions Inventory	424,265,260
2014 National Emissions Inventory	460,577,964
2013 ADOT Travel Demand Model	447,274,054
2015 Highway Performance Monitoring System data submitted by ADOT	435,810,000

Note: ADOT = Arizona Department of Transportation

MOVES requires that annual county-wide VMT estimates be distributed amongst five HPMS vehicle (or source) types. Both the 2014 NEI and ADOT TDM provided datasets broken out into the required source types. ADOT's MOVES converter tool was used to apportion county-level VMT forecasts from the statewide TDM into each of five HPMS vehicle types. A comparison of the two datasets revealed a significant difference. The ADOT TDM VMT had a smaller percentage of light-duty passenger vehicle VMT and a larger percentage of heavy vehicle VMT than the 2014 NEI. Table 5 displays the difference in apportionment between the two datasets. As a result of attributing more VMT to diesel vehicle types, activity data (VMT) from ADOT's statewide TDM yielded more conservative on-road emissions estimates of PM₁₀, PM_{2.5}, and NO_x.

Table 5. Comparison of annual vehicle miles traveled, by vehicle type

Vehicle type		Percentage of vehicle miles traveled	
HPMS vehicle type	Source type ID	2014 NEI	ADOT TDM
Motorcycles	10	0.6	0.7
Light-duty vehicles	25	94.1	86.9
Buses	40	0.3	0.5
Single-unit trucks	50	1.7	5.1
Combination trucks	60	3.3	6.8

Notes: ADOT = Arizona Department of Transportation, HPMS = Highway Performance Monitoring System, NEI = National Emissions Inventory, TDM = Travel Demand Model

Both of the evaluated VMT data sets (2014 NEI and ADOT TDM) represent county-wide activity. The PM₁₀/PM_{2.5} SIPs used population data to apportion county-level emissions estimates to the NNA. To verify that this method of apportionment was conservative, an NNA-specific VMT estimate was developed using each of the county-wide datasets and geographic information system (GIS) data for the 2013 HPMS roadway network in Santa Cruz County obtained from FHWA. ArcMap software was used to identify HPMS roadway segments within the NNA boundaries. The HPMS dataset contained information on roadway length (in miles) and annual average daily traffic (AADT) for each roadway segment. AADT was multiplied by the segment length to estimate average daily VMT for each segment. Daily VMT estimates for each segment were then multiplied by 365 days per year and summed to estimate annual VMT for the NNA. The resulting annual VMT estimate for the NNA was approximately 181,135,500. This represents 38.5 percent of the county-wide VMT. The population apportionment method used to develop the PM₁₀/PM_{2.5} SIPs resulted in 55.1 percent of county-wide on-road mobile emissions being apportioned to the NNA for 2008 and 56.9 percent for 2011 (the year on which the MVEB was based).

Both the GIS-based and population-based apportionment methods were used given the 2014 NEI and ADOT TDM annual VMT datasets. Tables 12a and 12b in the *Regional Emissions Analysis and Conformity Test Results* section of this report show the emissions estimates developed using the different VMT datasets and NNA apportionment methods.

Each VMT dataset was grown to each analysis year using growth factors derived from ADOT's TDM forecast for 2030, with the exception of the 2017 analysis year. It was assumed, based on ADOT's most recent HPMS data submittal, that each of the preferred datasets (2014 NEI and ADOT TDM) was representative of current conditions (2017). Two growth factors were developed, based on ADOT's TDM forecast, to prevent overestimating growth on high-volume, higher-speed roadways and underestimating growth on low-volume, lower-speed roadways. A factor of 0.49 percent annual VMT growth was calculated for restricted access roadways (for example, I-19), and a factor of 0.68 percent was calculated for unrestricted access roadways (for example, SR 189). VMT forecasts were apportioned to each of the five HPMS vehicle types using the VMT fractions provided in Table 5. Table 6 shows the VMT forecast by vehicle type developed for each of the two preferred VMT datasets. Additional documentation related to developing VMT estimates for the regional conformity analysis (RCA) is provided in Appendix A.

Table 6. Annual county-wide vehicle miles traveled forecasts, by vehicle type

Highway Performance Monitoring System vehicle type ID	2014 National Emissions Inventory annual vehicle miles traveled estimate				Arizona Department of Transportation Travel Demand Model annual vehicle miles traveled estimate			
	2017	2021	2030	2035	2017	2021	2030	2035
10	2,864,148	2,932,414	3,046,594	3,116,766	2,713,711	2,780,294	2,930,107	3,013,337
25	433,295,425	443,622,886	460,896,344	471,512,081	388,815,432	398,355,413	419,820,369	431,745,344
40	1,127,893	1,154,776	1,199,740	1,227,373	2,171,583	2,224,865	2,344,750	2,411,352
50	7,933,645	8,122,741	8,439,018	8,633,392	22,974,024	23,537,715	24,806,020	25,510,634
60	15,356,853	15,722,879	16,335,085	16,711,327	30,599,303	31,350,088	33,039,354	33,977,835
Total (County)	460,577,964	471,555,696	489,916,780	501,200,940	447,274,054	458,248,375	482,940,600	496,658,502

Monthly/Daily/Hourly VMT Fractions

Vehicle speeds and emissions vary considerably depending on the time of day. Therefore, it is important to estimate the pattern by which the roadway volume varies by month, day, and hour. MOVES requires annual VMT by HPMS vehicle class as an input. However, to further refine emissions specific to month, day, and hour, VMT fractions for a given roadway type and source (that is, vehicle type) can be input for every hour of the day (weekday or weekend), day of the month, and/or month of the year. Both the SIPs and the 2014 NEI relied on national data for monthly, daily, and hourly VMT fractional distributions by roadway type and vehicle type. However, ADOT's TDM conversion tool produces a VMT distribution by hour based on TDM-generated activity data for Santa Cruz County. Therefore, this hourly distribution was used with the ADOT TDM dataset, while national distribution data were used for the 2014 NEI dataset. National data for daily VMT were used to estimate emissions for both the 2014 NEI and ADOT TDM datasets.

A county-specific monthly VMT distribution was developed for both datasets using traffic count data collected by an ADOT automated traffic recorder located in the NNA. Daily traffic volumes recorded during 2015 at ADOT's traffic recorder site 101763 [State Route 19B(1)] were aggregated for each month of the year and divided by the total traffic volume recorded for the year. Because no information regarding how the VMT related to specific source types was available, it was assumed the monthly VMT fraction remained consistent for each of the 13 MOVES vehicle types. Table 7 shows the monthly VMT fractions generated using ADOT traffic volume data at site 101763 for 2015.

Table 7. Monthly vehicle miles traveled fractions, by vehicle type, for the Nogales Nonattainment Area

Month	Vehicle miles traveled fraction	
	Typical year	Leap year
1	0.0852	0.0850
2	0.0813	0.0840
3	0.0882	0.0880
4	0.0872	0.0870
5	0.0901	0.0898
6	0.0806	0.0804
7	0.0747	0.0744
8	0.0803	0.0801
9	0.0793	0.0791
10	0.0834	0.0832
11	0.0817	0.0815
12	0.0880	0.0877

Analysis year forecasts assumed VMT fractions did not change from year to year. Thus the same monthly, daily, and hourly VMT fractions used to estimate 2017 on-road emissions were used for analysis years 2021, 2030, and 2035.

Average Speed Distribution

MOVES uses average speed distributions by road type, source type, and hour of the day to calculate operating mode distributions. The operating mode distributions, in turn, determine the calculated emission rates. MOVES provides an average speed distribution based on national data for use in areas where specific speed distribution data are either unavailable or unreliable. Both the PM₁₀ and PM_{2.5} SIPs used MOVES average speed distribution data to estimate emissions.

Two types of average speed distributions were needed for this regional emissions analysis: one for existing conditions and one for “build” conditions. Existing conditions reflect travel speeds on the roadway network as it currently exists. The “build” condition represents speeds on an “improved” roadway network, as identified in both the STIP and LRTP for the NNA. The current STIP and LRTP identify only one regionally significant roadway project being constructed between 2017 and 2035, the SR 189, International Border to Grand Avenue, project. Therefore, the “build” distribution was based on travel speed information provided by the traffic study for the SR 189 project (*Year 2040 Traffic Operations Analysis Report, SR 189/Mariposa Road: International Border to Grand Avenue*, revised October 2016).

Tables 2-1 and 5-1 of the project's traffic study provided the current and future traffic conditions for specific roadway segments along the 3.4-mile-long project. AADT was aggregated and multiplied by the project length to estimate average daily VMT in the project area. Given the amount of access and the rural setting of the project area, it was assumed the project would only affect unrestricted, rural roadways (MOVES road type 5) and improve travel time for only 12 hours of the day (from 7 a.m. to 7 p.m.). Comparing the daily project area VMT with that estimated for Santa Cruz County and the NNA, it was estimated that approximately 12 percent of the county's VMT would increase in speed as a result of the project and 30 percent of the NNA VMT would increase speed. Based on the travel time estimates presented in Table 5-1 of the traffic study, it was estimated that average speeds in the area would go from 13.55 miles per hour (mph) to almost 25 mph as a result of the project. Thus, adjustments were made to the average speed distributions to reflect more VMT in MOVES speed bin 6 and less in MOVES speed bin 4:

$$SB4_a = SB4_i - (SB4_i * F_{VMT})$$

$$SB6_a = SB6_i + (SB4_i - SB4_a)$$

Where:

$SB4_a$ = the adjusted fraction of VMT in speed bin 4 for the appropriate roadway type and time of day

$SB4_i$ = the initial fraction of VMT in speed bin 4 for the appropriate roadway type and time of day

F_{VMT} = the fraction of VMT changing speed bin as a result of the project (12% county or 30% NNA)

$SB6_a$ = the adjusted fraction of VMT in speed bin 6 for the appropriate roadway type and time of day

$SB6_i$ = the initial fraction of VMT in speed bin 6 for the appropriate roadway type and time of day

Minor adjustments were made as needed to ensure the VMT fractions for each hour of the day across all 16 speed bins summed to 1.0000000. It was assumed that average speed distributions would not change between 2021 and 2035 because no other regionally significant roadway projects are planned for construction in the NNA between 2021 and 2035.

MOVES average distributions were used as the basis for both the existing and build conditions for the 2014 NEI activity data. However, the ADOT TDM produces a speed distribution for Santa Cruz County. Therefore, estimates developed using VMT from the ADOT TDM used model-based average speed distributions as the basis for both existing and build average speed distributions.

Road Type Distribution

Typical drive cycles and associated operating conditions vary by roadway type. Therefore, MOVES requires a VMT fraction for each roadway type by source type. MOVES includes five different road types:

- 1) Off-network (related to emissions from parked vehicles and refueling)
- 2) Rural restricted access
- 3) Rural unrestricted access
- 4) Urban restricted access
- 5) Urban unrestricted access

Two sets of road type distributions were created based on the two VMT datasets considered. One is the same distribution used to develop the PM₁₀/PM_{2.5} SIPs and is based on county-wide HPMS data. It was applied to the 2014 NEI VMT estimates. The other distribution was developed using county-level output from ADOT's TDM and was applied to the VMT estimates produced by the TDM.

The primary difference between the two is that the SIP/NEI distribution has a greater fraction of light-duty vehicles and heavy-duty vehicles using restricted access rural roads than the TDM distribution. The TDM distribution has more VMT on urban roadway types, both restricted and unrestricted. Table 8 shows the VMT fractions used to create the road type distributions used. It was assumed road type distributions remained consistent between each of the analysis years given that no new roadways were planned to be constructed in the area between 2017 and 2035.

Table 8. Roadway type vehicle miles traveled fractions, by vehicle type, for the Nogales Nonattainment Area

MOVES vehicle type	MOVES roadway type							
	Travel Demand Model vehicle miles traveled fraction				State Implementation Plan/ National Emissions Inventory vehicle miles traveled fraction			
	2	3	4	5	2	3	4	5
11, 21, 31, 32	0.101631	0.240321	0.244767	0.413280	0.188277	0.216653	0.243867	0.351204
41	0.140927	0.281196	0.219592	0.358285	0.140927	0.281196	0.219592	0.358285
42	0.138444	0.281313	0.219602	0.360642	0.138444	0.281313	0.219602	0.360642
43	0.138391	0.281315	0.219602	0.360692	0.138391	0.281315	0.219602	0.360692
51, 52, 53, 54	0.124394	0.257200	0.244664	0.373742	0.326072	0.214565	0.228626	0.230737
61 and 62	0.149949	0.297081	0.239249	0.313721	0.438430	0.184483	0.223676	0.153411

Ramp Fraction – EPA's average ramp fraction was used. It is 8 percent of vehicle hours traveled on both rural and urban interstates (road types 2 and 4). Forecasts assume the ramp fraction would not change in the future.

Fuel – The current local fuel supply and fuel formulation data for Santa Cruz County provided by EPA with MOVES were used. It is assumed EPA's data for Santa Cruz County were used to develop the 2008 NEI and 2014 NEI. Additionally, it is assumed fuel properties will not significantly change in the future.

Inspection/Maintenance Programs – No inspection/maintenance programs exist in Santa Cruz County or the NNA. This is assumed to continue in the future.

Vehicle Starts – EPA average values provided with MOVES were used.

Retrofit Data – None. These data are not required unless a vehicle retrofit program exists that needs to be modeled. No program exists in the NNA. This is assumed to continue in the future.

Hoteling – Hoteling is a non-driving activity associated with long-haul combination trucks. Four operating modes are associated with hoteling: extended idle, diesel auxiliary power, battery power, and engine-off. Detailed, local data regarding hoteling hours and operating mode fractions do not exist for the NNA. Therefore, EPA’s national data were used to estimate emissions.

MOVES Runs

MOVES takes the data (described above) and creates an “input” database referenced by a run specification file (*.mrs). The file also specifies key data options for the run, output options, and the name of an “output” database. A summary of key MOVES run specification settings is shown in Table 9. For this analysis, MOVES is applied using the *inventory-based* approach where actual VMT and vehicle populations are provided as inputs to the model and MOVES produces a total emissions estimate for the selected time period.

Table 9. MOVES run specification file parameter settings

Parameter	Setting
Scale	County
Calculation type	Inventory
Time span	Annual runs: 12 months, weekday and weekend, 24 hours
Time aggregation	Hour
Geographic selection	Santa Cruz County
Vehicle selection	All 13 vehicle (source) types Gasoline, diesel, compressed natural gas, electricity, ethanol (E-85)
Road type	All road types (2, 3, 4, 5) and off-network (1)
Pollutants and processes	PM _{2.5} , PM ₁₀ , and NO _x PM includes exhaust, tire, and brake
General output	Units: emission = pounds, distance = miles, time = hours, energy = million British thermal units

For this analysis, an annual emissions estimate for on-road PM₁₀, PM_{2.5}, NO_x was produced. Four sets of MOVES input files were generated to assess the differences between using 2014 NEI/SIP VMT data versus ADOT TDM data and the difference between apportioning county-wide emissions using population estimates versus using VMT estimates for the NNA based on HPMS shape files. An output database was generated for each MOVES run. Emissions tables produced by MOVES were exported to Microsoft Excel and are provided in Appendix B. The run specification files and CDM databases are provided in Appendix D.

Fugitive Dust Analyses

The arid conditions and soil composition in many areas of Arizona makes fugitive dust a major contributor to ambient concentrations of PM₁₀ and, to a lesser extent, PM_{2.5}. MVEBs for PM₁₀ include fugitive dust from paved roads, unpaved roads, and roadway construction activities. The methods used to calculate fugitive dust

emissions for this regional emissions analysis are consistent with those used to develop the MVEB contained in the PM₁₀ SIP and with EPA's AP-42 methodologies.

EPA did not make a formal finding that fugitive dust sources of PM_{2.5} were significant to the NNA. Additionally, ADOT has not received any requests to include fugitive sources of PM_{2.5} as part of the RCA. Therefore, this analysis does not include PM_{2.5} emissions from fugitive dust sources.

Paved Roadway Emissions

Paved road dust emissions were estimated for Santa Cruz County using the 2014 NEI and were then apportioned to the NNA using population. Uncontrolled emissions were first calculated at the county level by roadway type and year. This was done by multiplying VMT by an appropriate emission factor generated using the AP-42 emissions factor equation:

$$EF_{RT} = [k (sL)^{0.91} \times (W)^{1.02}]$$

$$E_{RT} = VMT_{RT} * EF_{RT}$$

Where:

EF_{RT} = annual average emission factor for a given FHWA roadway type in grams per VMT (g/VMT)

E_{RT} = annual emission for a given FHWA roadway type in grams per year (g/year)

VMT_{RT} = annual vehicle miles of travel for a given FHWA roadway type in Santa Cruz County

k = particle size multiplier for particle size range and units of interest (PM₁₀ = 1.0 g/VMT)

sL = road surface silt loading (ranged between 0.0105 g/m² and 0.6 g/m², based on road type)

W = average weight (tons) of the vehicles traveling a given roadway type (ranged between 3.68 and 2.19 tons, based on roadway type)

The 2014 NEI did not adjust emissions to account for precipitation days. However, it did include control factors. These were applied to the uncontrolled paved road dust emissions in counties with serious and/or moderate PM₁₀ nonattainment areas. Because the NNA is a moderate nonattainment area, controls representing vacuum sweeping of paved roads twice per month were applied to urban roadway types in Santa Cruz County. A control efficiency of 79 percent was assumed with a rule penetration between 64 and 88 percent, depending on roadway class (that is, freeway, minor arterial, collector, or local). Rule effectiveness was assumed to be 100 percent. Controlled emissions by roadway class were then totaled for each county. The difference between uncontrolled and controlled emissions for Santa Cruz County was 18.8 percent.

Controlled county-level emissions were apportioned to the NNA using the relationship between county population and the estimated NNA population. The PM₁₀ SIP used GIS data to establish a methodology to estimate the NNA population. It assumed 88.7 percent of Rio Rico's southeast census designated place and 19.1 percent of Rio Rico's southwest census designated place are in the NNA. Each of these census designated places represents 18 and 28 percent of Rio Rico's population, respectively.

Thus, the population of the NNA was estimated:

$$POP_{NNA} = POP_N + ((POP_{RR} * .28) * .191) + ((POP_{RR} * .18) * .887)$$

Where:

POP_{NNA} = population of the NNA

POP_N = population of Nogales

POP_{RR} = population of Rio Rico

The PM_{10} SIP used U.S. Census Bureau data instead of data from the Arizona Department of Administration, Employment and Population Statistics, Office of Economic Opportunity. U.S. Census data show a -2 percent annual growth rate between when the SIP inventory was done (2010) and 2014. However, State statistics show a 1.1 percent annual increase in population over that same period. Therefore, paved road dust allocations to the NNA were adjusted to account for the differences between the two sources of population data. This resulted in the emissions allocated to the NNA increasing by 16.1 percent.

2014 NNA emissions were forecast to each analysis year (that is, 2017, 2021, 2030, and 2035) using county-wide population growth estimates developed using forecasts provided by the Arizona Department of Administration, Employment and Population Statistics, Office of Economic Opportunity.

Unpaved Roadways

The main contributor to PM_{10} emissions in the NNA is dust emissions from unpaved roads. Emissions estimates for unpaved road dust in the NNA were developed using the 2014 NEI for Santa Cruz County and recent population estimates/forecasts from the Arizona Department of Administration, Employment and Population Statistics, Office of Economic Opportunity. The 2014 NEI estimated unpaved road dust emissions at the county level by roadway type by multiplying annual VMT estimates by an emissions factor generated using the AP-42 emissions factor equation:

$$EF = ([k(s/12)^1(S/30)^{0.5}] / [(M/0.5)^{0.2}]) - C$$

Where:

EF = PM_{10} emission factor (lb/VMT), calculated for each of 9 unpaved roadway types

k = empirical constant = 1.8 lb/VMT; from AP-42

s = surface material silt content (%) = 3.0%; average state value based on samples taken as part of the 1985 NAPAP Inventory

M = surface material moisture content (%) = 0.5% (conservative national default value used for the NEI)

S = mean vehicle speed (mph) = varied between 39 mph and 20 mph based on roadway type

C = 0.00047 lb/VMT; PM_{10} emission factor for 1980s vehicle fleet exhaust, brake wear, and tire wear (EPA AP-42 Chapter 13.2.2, 2006)

Emissions factors were multiplied by specific VMT estimates for each unpaved roadway type in the county. No controls were applied to the emissions estimate given the rural nature of Santa Cruz County and the fact

that the NNA is a moderate PM₁₀ area. The 2014 NEI also did not adjust county-level unpaved road dust emissions to account for precipitation days.

State-level FHWA data on length of unpaved roads by road type (in miles) and AADT were used to estimate annual VMT on unpaved roads. These state-level annual VMT estimates were allocated to each county for the 2014 NEI based on the proportion of rural population in the county per the 2010 U.S. Census.

As with paved road dust emissions, unpaved road dust emissions were allocated from the county level to the NNA using population. Emissions were then forecast to each analysis year using population forecasts provided by the Arizona Department of Administration, Employment and Population Statistics, Office of Economic Opportunity.

Road Construction

The PM₁₀ SIP relied on the 2008 NEI to estimate road construction dust emissions for Santa Cruz County. The 2008 NEI used ADOT's overall roadway program value (in dollars) apportioned to six roadway types (urban interstates, rural interstates, urban arterials, rural arterials, urban collectors, and rural collectors) to estimate emissions for each county in the state. General cost per mile factors were used to convert dollars to lane-miles constructed, and acres per lane mile factors were used to estimate acres of land under construction. Acres disturbed for the state were then apportioned to each county using housing starts information.

The method used to estimate PM₁₀ road construction dust in the NNA was similar to the one used for SIP development. However, more recent 2014 NEI data were used to estimate emissions for both general roadway construction (not associated with a specific project) and for specific roadway projects listed in the STIP or LRTP. The 2014 NEI used the same methodology as the 2008 NEI. The amount of land (in acres) disturbed at the state level was estimated using ADOT construction expenditure data and unit cost estimates for each roadway type. Total statewide acres of construction were then estimated and apportioned to each county using building permit information. A ratio of the number of building starts in each county to the total number of building starts in Arizona was applied to the state-level acres disturbed estimate to develop the total number of acres disturbed by road construction in each county. An emissions factor of 0.42 tons PM₁₀/acre-month was applied to the estimated amount of land under construction to reflect the high level of cut and fill activity associated with road construction. The emissions factor was then corrected to account for state-specific soil silt content values and average precipitation/evaporation values. The equation used by the 2014 NEI to adjust the emissions factors is:

$$EF_c = 0.42 \text{ tons PM}_{10}/\text{acre-month} * (24/PE) * (S/9\%)$$

Where:

EF_c = corrected emissions factor

PE = precipitation-evaporation value (in hours)

S = dry silt content in soil (%)

Construction was assumed to occur over a 12-month period. Table 10 provides the total number of acres, soil silt content, and average precipitation/evaporation values applied to develop the 2014 NEI emissions estimate for Santa Cruz County.

Table 10. 2014 National Emissions Inventory road construction dust activity and assumptions

Parameter	Value
State building starts (2015)	26,997
Total state acres	921.84
County building starts (2015)	44
Total county acres	1.5
State average precipitation/evaporation (in hours)	25.1
County soil silt percentage	22.33

County-level emissions were apportioned to the NNA using population data obtained from the Arizona Department of Administration, Employment and Population Statistics, Office of Economic Opportunity. Since specific housing start forecasts for the area were not available, population forecasts were used as a surrogate to estimate emissions for each analysis year.

Construction dust for specific roadway projects identified in the STIP and LRTP were estimated based on the identified number of acres disturbed for each project. The only regionally significant project programmed or planned in the NNA through 2035 is the SR 189, International Border to Grand Avenue, project. The currently funded interim project design will disturb approximately 56 acres between 2019 and 2020. In 2021, the ultimate configuration of the project will be constructed and is estimated to disturb approximately 12 acres. A corrected emissions factor (0.9963 ton PM₁₀/acre-month) was applied to the appropriate construction activity to estimate construction emissions from the project, assuming a 12-month project duration. These emissions were included only in the analysis year for which the project was programmed or planned and was not included in future-year analyses.

Transportation Control Measures

EPA has not approved any transportation control measures for the NNA. Therefore, there is no need to address them as part of this analysis. Emission reduction credits for road paving projects included in the STIP and/or LRTP can be applied as appropriate. However, ADOT does not have any paving projects programmed or planned in the NNA other than the SR 189 project. Likewise, not enough local data on which to base emission reduction credits are readily available.

Regional Emissions Analysis and Conformity Test Results

A regional emissions analysis of the current STIP and LRTP was completed for the NNA using the methodologies, assumptions, and data as presented in the previous sections. Results from the emissions analysis were used to perform the regional conformity tests according to the requirements of the federal June 2017

transportation conformity rule (40 Code of Federal Regulations [CFR] Part 93, Subpart A). The PM₁₀ RCA was performed in accordance with 40 CFR § 93.118 (Criteria and procedures: Motor vehicle emissions budget), while the PM_{2.5} analysis was conducted pursuant to 40 CFR § 93.119 (Criteria and procedures: Interim emissions in areas without motor vehicle budgets). Interagency consultation was conducted to identify applicable emission analysis methodologies, assumptions, analysis years, and conformity tests.

Analysis Years

EPA regulations, as outlined in § 93.118(b) and § 93.119(g) of the Final Transportation Conformity Rule, require that emissions analyses be conducted for specific analysis years:

- the first year of a transportation program
- the last year of a transportation program
- the horizon year of the LRTP
- each year for which the applicable SIP specifically establishes an MVEB(s)
- attainment year of the applicable standard, if within the timeframe of the STIP and LRTP
- an intermediate year or years, such that each analysis year is no more than 10 years apart

The inventory years identified through the interagency consultation process for the RCA are:

- 2017 – first year of the STIP
- 2021 – last year of the STIP
- 2030 – interim year
- 2035 – horizon year of the LRTP

A budget test is required for PM₁₀ because the SIP contains an approved MVEB for one year (2011) and does not include an attainment year. An interim test is required for PM_{2.5} because no MVEB was included or approved as part of the SIP. Similarly, the PM_{2.5} SIP does not include an attainment year.

Regionally Significant Transportation Projects

Projects that could have a significant impact on emissions were included in the regional emissions analysis in accordance with 40 CFR Parts 51 and 93. Essentially, only those projects that would increase capacity or significantly affect vehicular speeds were considered. Projects such as bridge replacements and roadway restoration projects have been excluded from consideration because they are not expected to significantly alter the volume or speed of traffic.

The only regionally significant transportation project identified in the STIP or LRTP that could affect regional emissions in the NNA is the SR 189 project. This project is programmed in two phases: an interim configuration programmed for construction in fiscal year 2019 and an ultimate configuration that is included in the last year of the STIP (2021). The interim configuration consists of intersection improvements and median installation along SR 189, a flyover ramp from eastbound SR 189 to northbound I-19, and widening SR 189 in the eastbound direction west of the Mariposa TI to add a third through lane. The ultimate configuration consists of constructing a southbound to westbound right exit flyover ramp from I-19 to SR 189 with a grade separation over Frank Reed Road. ADOT's approved 5 year construction program for 2018-2022 did not add any regionally significant projects in the NNA in 2022, likewise SEAGO did not include additional projects in

their TIP that will be included in the 2018-2022 ADOT STIP, and therefore this regional conformity analysis is still valid for both the 2017-2021 and 2018-2022 ADOT STIPs'.

Emissions impacts from both fugitive dust and on-road mobile sources were included. Construction dust emissions were estimated as described in the previous section and assigned to the 2021 analysis year. On-road emissions were estimated for 2017 and beyond using MOVES and an average roadway speed distribution representing the "build" condition for the ultimate configuration (that is, emissions in the NNA after the project has been completed).

Emissions Analysis Results

A PM₁₀, PM_{2.5} and NO_x regional emissions analysis was completed for the NNA. PM₁₀ emissions sources include paved road dust, unpaved road dust, road construction dust, and on-road mobile emissions (tailpipe, tire wear, and break wear). PM_{2.5} and NO_x emission include only on-road mobile sources (tailpipe, tire wear, and break wear). The results of the analysis are summarized in Tables 11, 12a, 12b, and 12c. Table 11 presents the PM₁₀ emission analysis for fugitive dust sources. Tables 12a to 12c present on-road mobile emissions estimated using MOVES, given the two sources of data and two VMT apportionment methodologies. Emissions were estimated for each pollutant given the methodologies described in previous sections of this report. A summary of MOVES input parameters is provided in Appendix B. All of the MOVES files generated for the analysis are provided in Appendix D.

Table 11. Annual PM₁₀ fugitive dust emission analysis results

Pollutant	2017 (tons/year)	2021 (tons/year)	2030 (tons/year)	2035 (tons/year)
Unpaved road dust	843.94	891.11	989.93	1,038.10
Paved road dust	52.07	54.99	61.08	64.05
Road construction dust	10.09	154.12	11.83	12.41
Total fugitive dust	906.10	1,100.21	1,062.85	1,114.56

Table 12a. Annual PM₁₀ emissions from on-road sources (MOVES analysis)

Analysis year	County-level VMT estimates allocated to Nogales Nonattainment Area by population		Nogales Nonattainment Area volumes based on geographic information system data	
	2014 NEI data (ton/year)	TDM data (ton/year)	2014 NEI data (ton/year)	TDM data (ton/year)
2017	17.38	20.24	14.10	16.27
2021	14.59	15.68	11.77	12.59
2030	11.82	11.32	9.43	9.08

Table 12a. Annual PM₁₀ emissions from on-road sources (MOVES analysis)

Analysis year	County-level VMT estimates allocated to Nogales Nonattainment Area by population		Nogales Nonattainment Area volumes based on geographic information system data	
	2014 NEI data (ton/year)	TDM data (ton/year)	2014 NEI data (ton/year)	TDM data (ton/year)
2035	11.41	10.78	9.01	8.57

Notes: NEI = National Emissions Inventory, TDM = Travel Demand Model, VMT = vehicle miles traveled

Table 12b. Annual PM_{2.5} emissions from on-road sources (MOVES analysis)

Analysis year	County-level VMT estimates allocated to Nogales Nonattainment Area by population		Nogales Nonattainment Area volumes based on geographic information system data	
	2014 NEI data (ton/year)	TDM data (ton/year)	2014 NEI data (ton/year)	TDM data (ton/year)
2017	9.29	12.73	7.99	10.60
2021	6.61	8.43	5.76	7.15
2030	3.82	4.16	3.45	3.71
2035	3.30	3.51	2.96	3.12

Notes: NEI = National Emissions Inventory, TDM = Travel Demand Model, VMT = vehicle miles traveled

Both paved and unpaved road dust emissions grow each analysis year as a function of VMT growth within the county and within the nonattainment area. Road construction dust emissions peak in 2021 because of the construction of the programmed SR 189 project. After the project is complete, road construction dust in the NNA grows as a result of the forecast population growth in Santa Cruz County.

Table 12c. Annual NO_x emission from on-road sources (MOVES analysis)

Analysis year	County-level VMT estimates allocated to Nogales Nonattainment Area by population		Nogales Nonattainment Area volumes based on geographic information system data	
	2014 NEI data (ton/year)	TDM data (ton/year)	2014 NEI data (ton/year)	TDM data (ton/year)
2017	411.2	522.1	415.4	497.4
2021	277.0	342.1	288.1	336.4
2030	134.7	155.3	147.2	162.5
2035	94.7	109.4	100.6	111.8

Notes: NEI = National Emissions Inventory, TDM = Travel Demand Model, VMT = vehicle miles traveled

The analysis of on-road emissions found:

- More emissions are estimated when allocating county-wide emissions to the NNA using population versus using estimates of VMT specific to the nonattainment area.
- In general, estimates produced using 2014 NEI sources of activity data were lower than estimates produced using activity data from ADOT's statewide TDM.
- Emissions estimates produced for the NNA using MOVES were comparable regardless of the method used to allocate county-level activity data to the nonattainment area or the source of the activity data (that is, 2014 NEI versus TDM).
- Emissions estimates decrease between 2017 and 2035 despite increasing VMT as a result of EPA vehicle fleet emissions standards built into the MOVES model.

The highest on-road emissions estimate generated by the analysis (in bold and italicized text in Tables 12a to 12c) was used for the applicable conformity test to ensure it was a conservative result.

Emission Tests

Two emissions tests were required for this RCA: a budget test for PM₁₀ and a no-greater-than 2008 test for on-road PM_{2.5} and NO_x. Table 13 and Figure 2 show the budget test for PM₁₀ for the NNA. Table 14 and Figures 3 and 4 show the results of the no-greater-than test for PM_{2.5} and NO_x. These tables and figures illustrate that all analysis years satisfy the regional conformity tests applicable to the NNA. As previously stated, only on-road emissions were included in the no-greater-than 2008 tests for PM_{2.5} and NO_x. Neither EPA nor ADEQ has concluded that fugitive dust emissions are a significant contributor to PM_{2.5} in the NNA.

Table 13. Nogales Nonattainment Area PM₁₀ motor vehicle emissions budget test

Source	2011 (tons/year)	2017 (tons/year)	2021 (tons/year)	2030 (tons/year)	2035 (tons/year)
Unpaved road dust	864.9	843.94	891.11	989.93	1,038.10
Paved road dust	121.4	52.07	54.99	61.08	64.05
Road construction dust	267.0	10.09	154.12	11.83	12.41
On-road emissions (exhaust brake and tire wear included)	21.0	20.24	15.68	11.82	11.41
Total (motor vehicle emissions budget)	1,274.3	926.34	1,115.89	1,074.66	1,125.97
Conformity test results		Pass	Pass	Pass	Pass

Figure 2. Nogales Nonattainment Area PM₁₀ motor vehicle emissions budget test

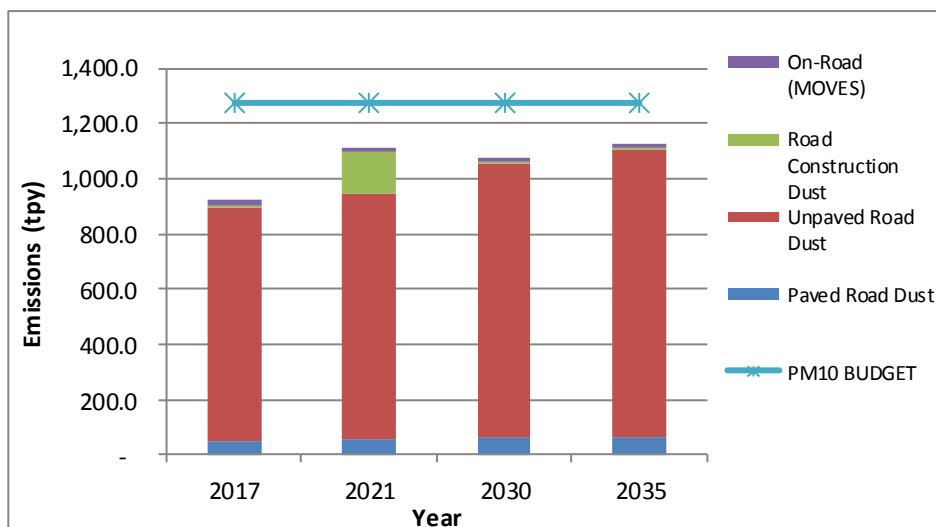


Table 14. Nogales Nonattainment Area PM_{2.5} and NO_x no-greater-than 2008 test

Source	2008 (tons/year)	2017 (tons/year)	2021 (tons/year)	2030 (tons/year)	2035 (tons/year)
On-road NO _x	912.9	522.1	342.1	162.5	111.8
Conformity test results		Pass	Pass	Pass	Pass
On-road PM _{2.5} (exhaust brake and tire wear included)	25.10	12.73	8.43	4.16	3.51
Conformity test results		Pass	Pass	Pass	Pass

Figure 3. Nogales Nonattainment Area PM_{2.5} test

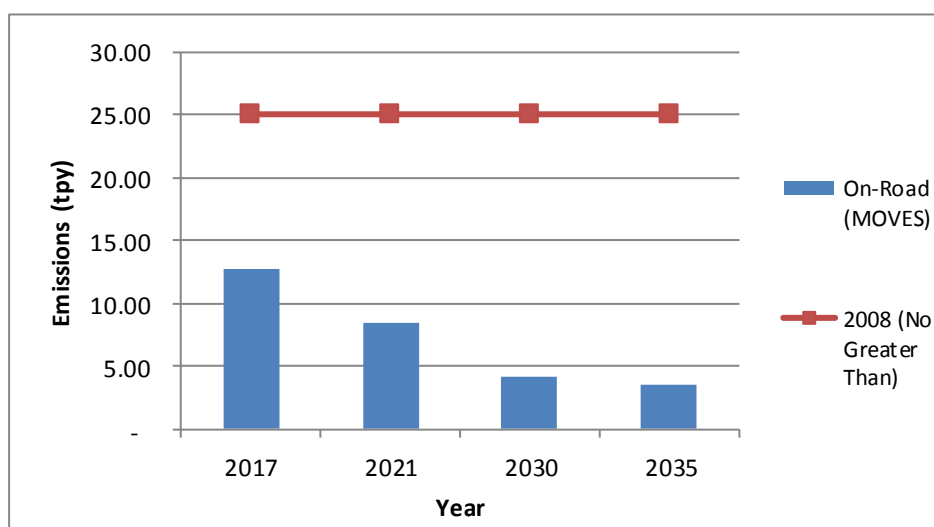
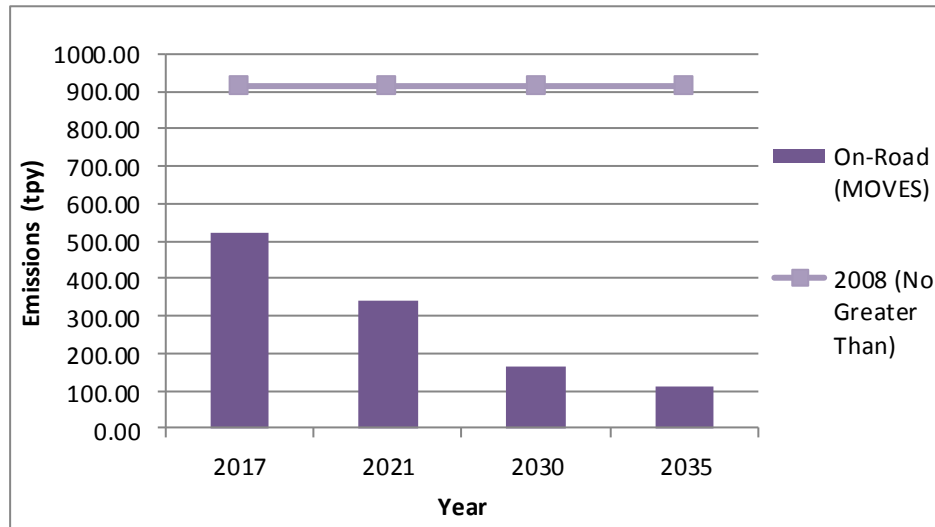


Figure 4. Nogales Nonattainment Area NO_x test



Conformity Determination

Financial Constraint

The federal planning regulations, Sections 450.322(b)(11) and 450.324(e), require ADOT's STIP and LRTP to be financially constrained and include only projects for which construction and operating funds are reasonably expected to be available. Both ADOT's STIP and LRTP have been determined to be financially constrained by FHWA. As part of its STIP and LRTP, ADOT has developed estimates of the cost to maintain and operate the existing interstates, highways, and bridges in Santa Cruz County and compared that cost with the estimated revenues and maintenance needs across the state.

Public Participation

The STIP and LRTP have undergone the public participation requirements and the comment and response requirements set forth in the Final Conformity Rule, the Final Statewide/Metropolitan Planning Rule, and Arizona's Conformity SIP. The Fiscal Year 2017–2021 STIP was made available for a 30-day public review and comment from September 10, 2016, through October 10, 2016. Likewise ADOT's current LRTP (*What Moves you Arizona, Long-Range Transportation Plan 2010–2035*) offered many opportunities for public comment and input between 2009 and 2011. The specific public outreach opportunities are described in Section 2.4 of the LRTP and include:

- outreach videos
- email campaigns
- Facebook
- meeting-in-a-box and surveys
- advertising campaigns
- common interest group workshops on goals and objectives
- investment choice workshops

- presentations

The Fiscal Year 2018–2022 STIP and all amendments are publically available on ADOT’s website <https://azdot.gov/planning/transportation-programming/state-transportation-improvement-program>, a link to this regional conformity analysis will be include as reference to the STIP for further action. ADOT Environmental Planning Website <https://azdot.gov/business/environmental-planning/air-quality/transportation-conformity>, also includes summary of transportation conformity actions, interagency consultation meetings and any necessary ADOT regional conformity analysis. A draft copy of this regional analysis was provided on the ADOT transportation conformity website with a 30-day public comment period through May 22nd, 2017, as documented in Appendix C, no public comments were received.

Conformity Statement

Based on the quantitative assessment of the ADOT STIP and LRTP as it applies to the NNA, it has been determined that the project elements and programmatic strategies of the STIP and LRTP conform to both the Nogales PM₁₀ SIP and the Nogales PM_{2.5} SIP.

Resources

MOVES Model

The MOVES webpage within EPA's Office of Mobile Sources website contains access to the MOVES model, a user guide, and other guidance information (<https://www.epa.gov/moves/moves2014a-latest-version-motor-vehicle-emission-simulator-moves>).

EPA. 2015. *MOVES2014 Technical Guidance: Using MOVES to Prepare Emission Inventories for State Implementation Plans and Transportation Conformity*. Transportation and Climate Division, Office of Transportation and Air Quality. January (EPA-420-B-15-007).

EPA. 2015. *MOVES2014a User Guide*. Assessment and Standards Division, Office of Transportation and Air Quality. November (EPA-420-B-15-095).

National Emissions Inventory

The 2008, 2011, and 2014 NEIs and documentation are accessible from EPA's website, accessed January 2017 (<https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>).

The supporting information and data files used for this analysis are available through an EPA ftp site, accessed January 2017 (<ftp://ftp.epa.gov/EmisInventory/2014/doc>).

Population Data and Forecasts

The demographic information used for the analysis was obtained from the Arizona Department of Administration, Employment and Population Statistics, Office of Economic Opportunity website, accessed January 2017 (<https://population.az.gov/population-estimates>). Population estimates are published once a year near the end of the calendar year for the state, counties, and incorporated places. Population projections (or forecasts) are made for July 1 of each year in the projection period. The most recent forecasts of population for Santa Cruz County are dated December 2015. The baseline projections (that is, medium series), were used for the analysis.

Highway Performance Monitoring System Geospatial Data

Shape files used to estimate VMT in the NNA were obtained from FHWA's Office of Highway Policy Information, HPMS Public Release of Geospatial Data Shapefile Format website, accessed January 2017 (<https://www.fhwa.dot.gov/policyinformation/hpms/shapefiles.cfm>).

Arizona Department of Transportation Information Sources

ADOT Statewide TDM data were provided with the MOVES Converter Tool. Data were provided in December 2016.

The ADOT website was used to access the current STIP and LRTP:

STIP website (accessed January 2017): <http://azdot.gov/planning/transportation-programming/state-transportation-improvement-program>

LRTP website (accessed January 2017): <http://azdot.gov/docs/default-source/planning/lrtp-2011-1129.pdf?sfvrsn=4>

ADOT traffic counts and forecasts for I-19 and SR 189 are available from the Transportation Data Management System website, accessed February 2017 (<http://adot.ms2soft.com/tcds/tsearch.asp?loc=Adot&mod=>).

SR 189 traffic study report:

Wilson & Company Engineers & Architects. 2016. *Year 2040 Traffic Operations Analysis Report, SR 189/Mariposa Road: International Border to Grand Avenue*. Revised October 2016.

AP-42 References

Paved road dust:

EPA Office of Air Quality Planning and Standards. 2011. *Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition. Volume I: Stationary Point and Area Sources, Section 13.2.1, Paved Roads*. Research Triangle Park, North Carolina. January.

Unpaved road dust:

EPA Office of Air Quality Planning and Standards. 2011. *Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition. Volume I: Stationary Point and Area Sources, Section 13.2.2, Unpaved Roads*. Research Triangle Park, North Carolina. January.

Glossary

AADT: average annual daily traffic, average of all days

ADEQ: Arizona Department of Environmental Quality

ADOT: Arizona Department of Transportation

CAA: Clean Air Act, as amended

CDM: County Data Manager. User interface developed to simplify importing specific local data for a single county or a user-defined custom domain without requiring direct interaction with the underlying MySQL database.

CFR: Code of Federal Regulations

Emission rate or factor: Expresses the amount of pollution emitted per unit of activity, usually in grams of pollutant emitted per mile driven for highway vehicles.

EPA: U.S. Environmental Protection Agency

FHWA: Federal Highway Administration

Final Rule: Current conformity guidance under CAA

FR: *Federal Register*

GIS: geographic information system

Growth factor: Factor used to convert volumes to future years.

HPMS: Highway Performance Monitoring System

I-19: Interstate 19

LRTP: ADOT's Long-Range Transportation Plan, *What Moves You Arizona 2010–2035*

MOVES: The latest model EPA has developed to estimate emissions from highway vehicles.

MPO: metropolitan planning organization

MVEB: motor vehicle emissions budget

NAAQS: National Ambient Air Quality Standards

NEI: National Emissions Inventory

NNA: Nogales Nonattainment Area

NO_x: oxides of nitrogen, precursor pollutant to PM_{2.5}

PM₁₀: particulate matter with an aerodynamic diameter of 10 microns or less

PM_{2.5}: particulate matter with an aerodynamic diameter of 2.5 microns or less

RCA: regional conformity analysis

Road type: Functional code applied in data management to road segments to identify their type (rural/urban highways, rural/urban arterials, etc.)

SIP: State Implementation Plan, air quality plan for a nonattainment area

STIP: ADOT's *Statewide Transportation Improvement Program, 2017-2021*

Source type: One of 13 vehicle types used in MOVES modeling.

SR 189: Arizona State Route 189

TDM: ADOT's statewide travel demand model

TI: traffic interchange

TIP: Transportation Improvement Program

VMT: Vehicle miles traveled. In modeling terms, it is the simulated traffic volume multiplied by the link length.

APPENDIX A

On-Road Supporting Information and Data

Appendix A: ADOT Vehicle Population Report; Santa Cruz County

MVD Report 1/7/2017

County	Year	Veh. Year	Light Duty Veh.			Light Duty Truck		Heavy Duty Veh.		Bus	Motorcycles	Alternate Fuels	Electric
		Subtotal	Gas	Diesel	Gas Tk1	Gas Tk2	Diesel	Gas	Diesel				
SAN	2017	216	158	0	31	1	1	1	10	10	4	0	0
SAN	2016	1,803	1,369	9	270	14	20	2	74	6	39	0	0
SAN	2015	2,281	1,758	11	334	19	44	5	51	10	47	1	1
SAN	2014	2,157	1,637	23	340	7	24	0	78	0	48	0	0
SAN	2013	1,883	1,485	17	243	6	20	2	64	13	30	0	3
SAN	2012	1,804	1,414	14	223	10	34	7	44	4	51	0	3
SAN	2011	1,508	1,152	10	225	8	24	5	37	5	40	0	2
SAN	2010	1,556	1,181	11	244	10	11	2	52	3	34	0	8
SAN	2009	1,356	984	11	181	10	15	3	70	5	72	0	5
SAN	2008	2,368	1,665	18	455	22	56	9	58	11	72	0	2
SAN	2007	3,042	2,208	12	587	13	63	10	69	2	77	0	1
SAN	2006	3,155	2,198	29	619	14	94	12	79	12	96	0	2
SAN	2005	3,307	2,410	27	608	13	64	9	108	4	59	2	3
SAN	2004	3,353	2,381	15	719	14	83	9	56	8	66	1	1
SAN	2003	3,094	2,241	17	616	15	64	10	53	5	72	0	1
SAN	2002	3,149	2,283	10	651	17	53	8	56	12	53	2	4
SAN	2001	3,015	2,059	20	718	13	53	11	85	5	44	4	3
SAN	2000	3,054	2,061	19	713	20	40	11	132	7	38	5	8
SAN	1999	2,452	1,609	12	579	22	57	12	118	7	32	2	2
SAN	1998	1,962	1,261	9	540	10	19	6	90	1	23	1	2
SAN	1997	1,761	1,051	15	557	14	37	8	54	2	21	1	1
SAN	1996	1,348	802	5	395	15	27	4	85	2	12	0	1
SAN	1995	1,330	734	4	430	23	25	5	88	3	17	0	1
SAN	1994	1,071	562	7	392	16	22	4	50	1	13	2	2
SAN	1993	793	439	4	250	16	16	5	49	2	12	0	0
SAN	1992	613	330	9	201	12	7	3	37	4	10	0	0
SAN	1991	533	305	0	183	13	6	6	14	0	5	0	1
SAN	1990	528	278	3	198	10	8	6	17	2	5	0	1
SAN	1989	472	244	8	167	17	10	2	22	1	1	0	0
SAN	1988	389	193	4	150	12	2	2	17	3	6	0	0
SAN	1987	337	175	5	121	5	5	4	15	0	7	0	0
SAN	1986	357	148	2	166	6	4	7	10	2	11	0	1
SAN	1985	321	130	9	148	4	3	3	14	1	9	0	0
SAN	1984	251	112	3	106	10	5	4	7	0	4	0	0
SAN	1983	125	60	4	44	3	4	1	3	0	5	0	1
SAN	1982	133	57	3	52	1	5	0	6	2	7	0	0
SAN	1981	152	53	5	66	6	3	3	2	0	14	0	0
SAN	1980	130	40	3	64	5	1	5	2	0	10	0	0
SAN	1979	200	89	0	85	13	3	3	1	0	5	1	0
SAN	1978	180	64	1	96	8	1	2	2	1	5	0	0
SAN	1977	113	42	0	65	3	0	1	0	1	1	0	0
SAN	1976	110	45	1	56	3	0	1	0	0	4	0	0
SAN	1975	67	25	1	32	2	1	0	0	1	5	0	0
SAN	1974	93	44	3	37	5	0	0	0	2	2	0	0
SAN	1973	110	47	1	48	4	3	2	0	3	2	0	0
SAN	1972	107	54	0	43	7	1	0	0	1	1	0	0
SAN	1971	921	529	1	352	16	0	6	2	2	13	0	0

ADOT MOVES Conversion Tool Description

Emission rates within MOVES vary significantly by the type of vehicle. ADOT's statewide travel demand model splits total volume into the following vehicle groups by facility (roadway) type and time period:

- Autos
- Single Unit Trucks (SUT)
- Multiple Unit Trucks (MUT)

ADOT's MOVES conversion tool (spreadsheet) uses EPA's national VMT by HPMS vehicle type distribution to split the above vehicle groups (autos, SUT and MUT) into the six HPMS vehicle classes required for MOVES. **The figure below** illustrates how the statewide model traffic is used to develop vehicle type mix.

ADOT MOVES Conversion Tool

VMT Data Source		MOVES Source Type Mapping	Calculate Vehile Mix Distribution
AZ Statewide Model	Auto	Auto by MOVES Source Type 11_Motorcycle 21_Passenger Car 31_Passenger Truck 32_Light Commercial Truck	Auto VMT Mix Based on MOVES Default VMT Mix (AZ Statewide 2008 Total) Normalized by Auto Grouping [Do not vary by county & road type]
	SUT	SUT by MOVES Source Type 42_Transit Bus 43_School Bus 41_Intercity Bus 51_Refuse Truck 52_Single Unit Short-haul Truck 53_Single Unit Long-haul Truck 54_Motor Home	SUT VMT Mix Based on MOVES Default VMT Mix (AZ Statewide 2008 Total) Normalized by SUT Grouping [Do not vary by county & road type]
	MUT	MUT by MOVES Source Type 61_Combination Short-haul Truck 62_Combination Long-haul Truck	MUT VMT Mix Based on MOVES Default VMT Mix (AZ Statewide 2008 Total) Normalized by MUT Grouping [Do not vary by county & road type]

Appendix A: Population Data;
 Arizona Department of Administration – Employment & Population Statistics, Office of Economic Opportunity

SANTA CRUZ COUNTY*	Census 2010	2010**	2011**	2012**	2013	2014	2015	2016	2017	2018	2019
	47,420	47,539	48,088	48,724	49,218	49,554	50,270	50,999	51,728	52,455	53,181
Incorporated Places											
Nogales	20,837	20,880	21,063	21,392	21,580	21,647	21,910	22,391	22,711	23,030	23,349
Patagonia	913	909	924	936	947	953	963	980	993	1,008	1,022
Unincorporated Balance of County	25,670	25,750	26,101	26,396	26,691	26,954	27,397	27,628	28,023	28,417	28,810
Census Designated Places (Census 2010 population >=500)											
Rio Rico CDP	18,962	19,021	19,280	19,498	19,716	19,910	20,238	20,409	20,700	20,991	21,282
Sonoita CDP	818	821	832	841	851	859	873	880	893	906	918
Tubac CDP	1,191	1,195	1,211	1,225	1,238	1,251	1,271	1,282	1,300	1,318	1,337

* Projections for 2016 and beyond refer to July 1 of each year.

** For incorporated places, these are previously published estimates for July 1 of each year; for CDPs and reservations, these are estimates produced in the projection process.

2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
53,903	54,618	55,326	56,027	56,720	57,404	58,080	58,745	59,399	60,044	60,677	61,298	61,905	62,496	63,071	63,629
23,666	23,980	24,291	24,599	24,903	25,203	25,500	25,792	26,079	26,362	26,640	26,913	27,179	27,439	27,691	27,936
1,035	1,049	1,063	1,076	1,090	1,103	1,115	1,128	1,141	1,153	1,166	1,178	1,189	1,201	1,212	1,222
29,202	29,589	29,973	30,352	30,727	31,098	31,465	31,825	32,179	32,529	32,871	33,207	33,537	33,857	34,168	34,471
21,571	21,857	22,140	22,421	22,698	22,972	23,242	23,509	23,770	24,029	24,282	24,530	24,773	25,009	25,239	25,463
931	943	955	967	979	991	1,003	1,014	1,025	1,037	1,047	1,058	1,069	1,079	1,089	1,098
1,355	1,373	1,391	1,408	1,426	1,443	1,460	1,477	1,493	1,509	1,525	1,541	1,556	1,571	1,585	1,599

2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
64,170	64,695	65,200	65,688	66,157	66,609	67,047	67,472	67,886	68,289	68,682	69,069	69,449	69,824	70,194
28,173	28,404	28,626	28,840	29,046	29,244	29,437	29,623	29,805	29,982	30,155	30,324	30,491	30,656	30,818
1,233	1,243	1,252	1,261	1,271	1,280	1,288	1,296	1,304	1,312	1,319	1,327	1,334	1,341	1,348
34,764	35,048	35,322	35,586	35,841	36,085	36,322	36,553	36,777	36,995	37,208	37,418	37,623	37,827	38,027
25,679	25,890	26,092	26,287	26,475	26,655	26,830	27,001	27,166	27,327	27,485	27,640	27,792	27,942	28,090
1,108	1,117	1,126	1,134	1,142	1,150	1,157	1,165	1,172	1,179	1,186	1,192	1,199	1,205	1,212
1,613	1,626	1,639	1,651	1,663	1,674	1,685	1,696	1,706	1,716	1,726	1,736	1,746	1,755	1,764

SANTA CRUZ POPULATION PROJECTIONS: 2015 TO 2050, MEDIUM SERIES**TABLE 1: TOTAL POPULATION & COMPONENTS OF POPULATION CHANGE**

Year	Population	Population Change	Population % Change	Births	Deaths	Natural Change *	Net Domestic Migration	Net Foreign Migration	Total Net Migration **	Special Population Change
2015	50,270	-----	-----	620	279	341	236	138	374	-----
2016	50,999	729	1.4%	648	298	349	252	128	380	0
2017	51,728	729	1.4%	656	309	347	263	120	383	0
2018	52,455	728	1.4%	665	322	343	259	126	385	0
2019	53,181	725	1.4%	674	333	341	228	157	385	0
2020	53,903	722	1.4%	682	344	338	202	182	384	0
2021	54,618	716	1.3%	690	357	334	193	190	382	0
2022	55,326	708	1.3%	698	369	328	183	197	381	0
2023	56,027	700	1.3%	704	383	321	175	205	380	0
2024	56,720	693	1.2%	710	396	314	167	213	379	0
2025	57,404	684	1.2%	715	410	305	159	221	380	0
2026	58,080	676	1.2%	719	423	295	152	229	381	0
2027	58,745	665	1.1%	721	437	284	146	237	383	0
2028	59,399	655	1.1%	723	452	270	140	245	386	0
2029	60,044	644	1.1%	723	466	256	135	254	389	0
2030	60,677	634	1.1%	721	479	242	131	263	393	0
2031	61,298	620	1.0%	719	495	224	132	266	398	0
2032	61,905	607	1.0%	716	509	206	132	270	402	0
2033	62,496	591	1.0%	712	525	187	132	274	406	0
2034	63,071	575	0.9%	708	540	168	131	277	408	0
2035	63,629	559	0.9%	703	553	149	129	281	410	0
2036	64,170	541	0.9%	698	567	131	127	285	411	0
2037	64,695	524	0.8%	693	580	114	124	288	412	0
2038	65,200	505	0.8%	689	595	94	120	292	412	0
2039	65,688	488	0.7%	685	607	78	115	295	411	0
2040	66,157	470	0.7%	682	620	62	110	299	409	0
2041	66,609	452	0.7%	679	634	45	105	303	408	0
2042	67,047	438	0.7%	677	646	31	101	306	408	0
2043	67,472	424	0.6%	675	656	18	98	310	408	0
2044	67,886	414	0.6%	673	665	8	94	314	408	0
2045	68,289	403	0.6%	672	674	-3	90	317	408	0
2046	68,682	393	0.6%	671	684	-13	87	321	408	0
2047	69,069	386	0.6%	671	691	-20	83	325	408	0
2048	69,449	380	0.6%	671	697	-26	79	328	408	0
2049	69,824	375	0.5%	672	704	-31	76	332	408	0
2050	70,194	370	0.5%	673	709	-36	72	336	408	0

* Natural Change = Births - Deaths

** Total Net Migration = Net Domestic Migration + Net Foreign Migration

*** Population Change = Natural Change + Total Net Migration + Special Population Change

Arizona Department of Administration, Office of Employment & Population Statistics, 12/11/2015

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Appendix A: Population Data Comparison

US Census Data:

Santa Cruz					
	County	Nogales	Rio Rico	NNA	% NNA
2010	47,420	20,837	18,962	24,879	52.47%
2014	46,653	20,251	17,154	21,627	46.36%
2015	46,461	20,252	17,158	21,629	46.55%

Arizona Department of Administration – Employment & Population Statistics, Office of Economic Opportunity data:

Santa Cruz					
	County	Nogales	Rio Rico	NNA	% NNA
2010	47,539	20,880	19,010	24,932	52.45%
2014	49,554	21,674	19,815	25,769	52.00%
2015	50,270	21,910	20,102	26,149	52.02%

Comparison: US Census vs. ADoA -EPS

Santa Cruz				
	County	Nogales	Rio Rico	NNA
2010	0.3%	0.2%	0.3%	0.2%
2014	5.9%	6.6%	13.4%	16.1%
2015	7.6%	7.6%	14.6%	17.3%

ADoD - EPS Population Forecast

Santa Cruz				
	County	Nogales	Rio Rico	NNA
2017	51,728	22,711	20,700	27,123
2021	54,618	23,980	21,857	28,639
2025	57,404	25,203	22,972	30,099
2030	60,677	26,640	24,282	31,815
2035	63,629	27,936	25,463	33,363

Appendix A: HPMS Roadway VMT in the NNA 2013 HPMS NAA

ROUTE_ID	BEG_POINT	END_POINT	SECTION_LENGTH	AADT	Daily VMT	Annual VMT	COMMENTS
I 019	0.0000000000	1.1720000000	1.172	9437	11060	4036960	Source: AADT TimeStamp: 2014-06-20_045602
I 019	1.1720000000	2.9540000000	1.783	11954	21314	7779603.43	Source: AADT TimeStamp: 2014-06-20_045602
I 019	2.9540000000	5.3030000000	2.349	21359	50172	18312886.22	Source: AADT TimeStamp: 2014-06-20_045602
I 019	5.3030000000	7.7170000000	2.414	31966	77166	28165562.26	Source: AADT TimeStamp: 2014-06-20_045602
I 019	7.7170000000	10.8800000000	3.163	24225	76624	27967641.38	Source: AADT TimeStamp: 2014-06-20_045602
I 019	0.0670000000	3.3420000000	3.275	3000	9825	3586125	Source: AADT TimeStamp: 2014-06-20_045602
I 019			14.156	101941	246161	89848778	
I 019001E	0.0000000000	0.0110000000	0.011	7192	79	28875.88	Source: AADT TimeStamp: 2014-06-20_045602
I 019001E	0.0110000000	0.0860000000	0.076	6432	489	178423.68	Source: AADT TimeStamp: 2014-06-20_045602
I 019017E	0.0000000000	0.0690000000	0.069	9692	669	244093.02	Source: AADT TimeStamp: 2014-06-20_045602
I 019017E			0.156	23316	1237	451392.58	
S 082	0.0000000000	0.5400000000	0.540	6416	3465	1264593.6	Source: AADT TimeStamp: 2014-06-20_045602
S 082	0.5430000000	0.5560000000	0.014	6416	90	32785.76	Source: AADT TimeStamp: 2014-06-20_045602
S 082	0.5560000000	1.8470000000	1.291	4399	5679	2072874.785	Source: AADT TimeStamp: 2014-06-20_045602
S 082	1.8470000000	4.6220000000	2.775	2681	7440	2715517.875	Source: AADT TimeStamp: 2014-06-20_045602
S 082	4.6220000000	6.7220000000	2.100	1724	3620	1321446	Source: AADT TimeStamp: 2014-06-20_045602
S 082			6.720	21636	20294	7407218.02	
S 189	0.0000000000	0.3440000000	0.344	99	34	12430.44	Source: AADT TimeStamp: 2014-06-20_045602
S 189	0.3440000000	0.8400000000	0.496	9843	4882	1781976.72	Source: AADT TimeStamp: 2014-06-20_045602
S 189	0.8410000000	1.1270000000	0.286	9843	2815	1027510.77	Source: AADT TimeStamp: 2014-06-20_045602
S 189	1.1270000000	1.9140000000	0.788	14718	11598	4233191.16	Source: AADT TimeStamp: 2014-06-20_045602
S 189	1.9140000000	2.6850000000	0.771	14939	11518	4204058.685	Source: AADT TimeStamp: 2014-06-20_045602
S 189	2.6850000000	2.9750000000	0.290	20324	5894	2151295.4	Source: AADT TimeStamp: 2014-06-20_045602
S 189	2.9750000000	3.7570000000	0.782	18069	14130	5157434.67	Source: AADT TimeStamp: 2014-06-20_045602
S 189001E8	0.0000000000	0.0190000000	0.019	3752	71	26020.12	Source: AADT TimeStamp: 2014-06-20_045602
S 189			3.776	91587	50942	18593917.97	
S 289			0.0000000000	2.309	1074	2480	905151.09 Source: AADT TimeStamp: 2014-06-20_045602
SB019	0.0040000000	0.6690000000	0.665	9668	6429	2346665.3	Source: AADT TimeStamp: 2014-06-20_045602
SB019	0.6690000000	1.6060000000	0.936	18223	17057	6225705.72	Source: AADT TimeStamp: 2014-06-20_045602
SB019	1.6060000000	2.7610000000	1.155	23071	26647	9726156.825	Source: AADT TimeStamp: 2014-06-20_045602
SB019	2.7610000000	2.8650000000	0.104	17636	1834	669462.56	Source: AADT TimeStamp: 2014-06-20_045602
SB019	2.8670000000	3.9420000000	1.075	17636	18959	6919925.5	Source: AADT TimeStamp: 2014-06-20_045602
SB019	3.9440000000	4.5790000000	0.635	18738	11899	4342999.95	Source: AADT TimeStamp: 2014-06-20_045602
SB019	4.5790000000	5.7030000000	1.124	13755	15461	5643126.3	Source: AADT TimeStamp: 2014-06-20_045602
SB019	0.2860000000	0.7150000000	0.429	9667	4147	1513707.195	Source: AADT TimeStamp: 2014-06-20_045602
SB019			6.123	128394	102432	37387749.35	
CAMINO CARALAMPI			2.7670000000	0.610	4265	2602	949602.25 Source: AADT TimeStamp: 2014-06-20_045602
12 DUQUESNE RD	0.0010000000	0.3400000000	0.339	237	80	29325.195	Source: AADT TimeStamp: 2014-06-20_045602
12 DUQUESNE RD	0.3400000000	1.1875000000	0.848	268	227	82902.45	Source: AADT TimeStamp: 2014-06-20_045602
DUQUESNE RD			1.187	505	307	112227.645	
12 KINO SPRINGS DR	0.0580000000	1.4720000000	1.415	633	896	326928.675	Source: AADT TimeStamp: 2014-06-20_045602
12 OLD TUCSON RD	0.0000000000	0.0180000000	0.018	2153	39	14145.21	Source: AADT TimeStamp: 2014-06-20_045602
12 OLD TUCSON RD	0.0180000000	1.1740000000	1.155	2154	2488	908072.55	Source: AADT TimeStamp: 2014-06-20_045602
12 OLD TUCSON RD	1.1740000000	2.6000000000	1.426	2320	3308	1207536.8	Source: AADT TimeStamp: 2014-06-20_045602
OLD TUCSON RD			2.599	6627	5835	2129754.56	
12 PENDLETON DR	0.7000000000	1.8780000000	1.178	1008	1187	433409.76	Source: AADT TimeStamp: 2014-06-20_045602
12 PENDLETON DR	1.8780000000	3.3850000000	1.507	2455	3700	1350385.025	Source: AADT TimeStamp: 2014-06-20_045602
12 PENDLETON DR	3.3850000000	5.3520000000	1.967	2228	4382	1599603.74	Source: AADT TimeStamp: 2014-06-20_045602
PENDLETON DR			4.652	5691	9270	3383398.525	
12 YAVAPAI DR	0.0690000000	0.1350000000	0.066	8452	558	203608.68	Source: AADT TimeStamp: 2014-06-20_045602
12E ADAMS ST	0.0000000000	0.1980000000	0.198	488	97	35267.76	Source: AADT TimeStamp: 2014-06-20_045602
12E DOE ST	0.0010000000	0.0720000000	0.071	3113	221	80673.395	Source: AADT TimeStamp: 2014-06-20_045602
12E EAST ST	0.0000000000	0.1790000000	0.179	611	109	39919.685	Source: AADT TimeStamp: 2014-06-20_045602
12E EAST ST	0.4120000000	0.4450000000	0.033	1552	51	18693.84	Source: AADT TimeStamp: 2014-06-20_045602
E East St			0.212	2163	161	58613.525	
12E INTERNATIONAL ST	0.0000000000	0.0650000000	0.065	1817	118	43108.325	Source: AADT TimeStamp: 2014-06-20_045602
12E LA CASTELLANA DR	0.0000000000	0.2780000000	0.278	639	178	64839.33	Source: AADT TimeStamp: 2014-06-20_045602
12E LA CASTELLANA DR	0.2780000000	0.4410000000	0.163	1563	255	92990.685	Source: AADT TimeStamp: 2014-06-20_045602
LA CASTELLANA DR			0.441	2202	432	157830.015	
12E MONROE ST	0.0000000000	0.1100000000	0.110	1420	156	57013	Source: AADT TimeStamp: 2014-06-20_045602
12E MORLEY AVE	0.0000000000	0.0860000000	0.086	3443	296	108075.77	Source: AADT TimeStamp: 2014-06-20_045602
12E PARK ST	0.0000000000	0.0250000000	0.025	4049	101	36947.125	Source: AADT TimeStamp: 2014-06-20_045602
12E RANCHO GRANDE DR	0.0010000000	0.2560000000	0.255	475	121	44210.625	Source: AADT TimeStamp: 2014-06-20_045602
12E RUBY RD	0.0000000000	0.9780000000	0.978	6429	6288	2294960.13	Source: AADT TimeStamp: 2014-06-20_045602
12E RUBY RD	0.9780000000	1.2030000000	0.224	7343	1645	600363.68	Source: AADT TimeStamp: 2014-06-20_045602
12E RUBY RD	1.2030000000	1.6110000000	0.408	4017	1639	598211.64	Source: AADT TimeStamp: 2014-06-20_045602
12E RUBY RD	1.6110000000	1.9250000000	0.315	3997	1259	459555.075	Source: AADT TimeStamp: 2014-06-20_045602
Ruby RD			1.925	21786	10830	3953090.525	
12N APACHE BLVD	0.0000000000	0.5990000000	0.599	3661	2193	800422.735	Source: AADT TimeStamp: 2014-06-20_045602
12N APACHE BLVD	0.5990000000	0.7220000000	0.124	5595	694	253229.7	Source: AADT TimeStamp: 2014-06-20_045602
12N APACHE BLVD	0.7220000000	1.1410000000	0.419	4933	2067	754428.355	Source: AADT TimeStamp: 2014-06-20_045602
Apache Blvd			1.142	14189	4954	1808080.79	
12N AURORA DR	0.0000000000	0.6070000000	0.607	213	129	47191.215	Source: AADT TimeStamp: 2014-06-20_045602
12N BANKERD AVE	0.0000000000	0.2370000000	0.237	3305	783	285899.025	Source: AADT TimeStamp: 2014-06-20_045602
12N BAYZE AVE	0.0010000000	0.0770000000	0.077	741	57	20825.805	Source: AADT TimeStamp: 2014-06-20_045602
12N BAYZE AVE	0.0770000000	0.1430000000	0.066	830	55	19994.7	Source: AADT TimeStamp: 2014-06-20_045602

BAYZE AVE				0.143	1571	112	40820.505
12N BEJARANO	ST	0.0000000000	0.0260000000	0.026	1098	29	10420.02 Source: AADT TimeStamp: 2014-06-20_045602
12N BEJARANO	ST	0.0260000000	0.0560000000	0.030	1235	37	13523.25 Source: AADT TimeStamp: 2014-06-20_045602
12N BEJARANO	ST	0.0560000000	0.1440000000	0.088	830	73	26659.6 Source: AADT TimeStamp: 2014-06-20_045602
BEJARANO ST				0.144	3163	139	50602.87
12N CAMINO VISTA DEL CIELO		0.0000000000	0.3390000000	0.339	668	226	82654.98 Source: AADT TimeStamp: 2014-06-20_045602
12N FRANK REED	RD	0.0230000000	0.0510000000	0.027	7768	210	76553.64 Source: AADT TimeStamp: 2014-06-20_045602
12N FRANK REED	RD	0.0510000000	0.2290000000	0.178	5237	932	340247.89 Source: AADT TimeStamp: 2014-06-20_045602
Frank Reed RD				0.205	13005	1142	416801.53
12N HIGHLAND	DR	0.0000000000	0.1090000000	0.109	1556	170	61905.46 Source: AADT TimeStamp: 2014-06-20_045602
12N HIGHLAND	DR	0.1090000000	0.2810000000	0.172	961	165	60331.58 Source: AADT TimeStamp: 2014-06-20_045602
N Highland DR				0.281	2517	335	122237.04
12N INDUSTRIAL PARK	AVE	0.0000000000	0.4360000000	0.436	1428	623	227251.92 Source: AADT TimeStamp: 2014-06-20_045602
12N INDUSTRIAL PARK	AVE	0.4360000000	0.8020000000	0.367	1874	688	251031.67 Source: AADT TimeStamp: 2014-06-20_045602
12N INDUSTRIAL PARK	DR	0.0000000000	0.2880000000	0.288	3243	934	340904.16 Source: AADT TimeStamp: 2014-06-20_045602
12N INDUSTRIAL PARK	DR	0.2880000000	0.4980000000	0.210	2983	626	228646.95 Source: AADT TimeStamp: 2014-06-20_045602
12N INDUSTRIAL PARK	DR	0.4980000000	0.6820000000	0.184	3981	733	267363.96 Source: AADT TimeStamp: 2014-06-20_045602
12N INDUSTRIAL PARK	DR	0.6820000000	0.7340000000	0.051	6179	315	115022.085 Source: AADT TimeStamp: 2014-06-20_045602
Industrial Park Dr				1.536	19688	3918	1430220.745
12N KELSEY	AVE	0.0000000000	0.1500000000	0.150	1981	297	108459.75 Source: AADT TimeStamp: 2014-06-20_045602
12N KELSEY	AVE	0.1500000000	0.1880000000	0.038	528	20	7323.36 Source: AADT TimeStamp: 2014-06-20_045602
KELSEY AVE				0.188	2509	317	115783.11
12N MACNAB	DR	0.0000000000	0.2780000000	0.278	558	155	56620.26 Source: AADT TimeStamp: 2014-06-20_045602
12N MACNAB	DR	0.2780000000	0.6390000000	0.360	514	185	67539.6 Source: AADT TimeStamp: 2014-06-20_045602
12N MACNAB	DR	0.6390000000	0.9230000000	0.284	2594	737	268894.04 Source: AADT TimeStamp: 2014-06-20_045602
N MacNab DR				0.922	3666	1077	393053.9
12N MORLEY	AVE	0.0780000000	0.1820000000	0.104	2738	285	103934.48 Source: AADT TimeStamp: 2014-06-20_045602
12N MORLEY	AVE	0.1820000000	0.3140000000	0.132	3009	397	144973.62 Source: AADT TimeStamp: 2014-06-20_045602
12N MORLEY	AVE	0.3140000000	0.7180000000	0.405	3734	1512	551978.55 Source: AADT TimeStamp: 2014-06-20_045602
12N MORLEY	AVE	0.7180000000	0.8410000000	0.122	3926	479	174824.78 Source: AADT TimeStamp: 2014-06-20_045602
12N MORLEY	AVE	0.8410000000	0.9300000000	0.090	4705	423	154559.25 Source: AADT TimeStamp: 2014-06-20_045602
12N MORLEY	AVE	0.9300000000	1.0400000000	0.109	4822	526	191843.27 Source: AADT TimeStamp: 2014-06-20_045602
12N MORLEY	AVE	1.0400000000	1.3960000000	0.356	3041	1083	395147.54 Source: AADT TimeStamp: 2014-06-20_045602
N Morley Ave				1.318	25975	4705	1717261.49
12N NELSON	AVE	0.0000000000	0.1410000000	0.141	703	99	36179.895 Source: AADT TimeStamp: 2014-06-20_045602
12N OLD PATAGONIA	RD	0.0000000000	0.3080000000	0.308	579	178	65091.18 Source: AADT TimeStamp: 2014-06-20_045602
12N OLD PATAGONIA	RD	0.3080000000	0.6380000000	0.330	668	220	80460.6 Source: AADT TimeStamp: 2014-06-20_045602
N OLD PATAGONIA RD				0.638	1247	399	145551.78
12N OLD TUCSON	RD	0.0020000000	0.3590000000	0.357	1926	688	250967.43 Source: AADT TimeStamp: 2014-06-20_045602
12N PERKINS	AVE	0.0000000000	0.0350000000	0.035	1268	44	16198.7 Source: AADT TimeStamp: 2014-06-20_045602
12N PERKINS	AVE	0.0350000000	0.2060000000	0.171	1121	192	69967.215 Source: AADT TimeStamp: 2014-06-20_045602
12N PERKINS	AVE	0.2060000000	0.3210000000	0.115	1529	176	64179.775 Source: AADT TimeStamp: 2014-06-20_045602
N PERKINS AVE				0.321	3918	412	150345.69
12N RIDGELINE	DR	0.0600000000	0.1240000000	0.064	552	35	12894.72 Source: AADT TimeStamp: 2014-06-20_045602
12N ROYAL	RD	0.0510000000	0.9430000000	0.892	1306	1165	425207.48 Source: AADT TimeStamp: 2014-06-20_045602
12N SANTA CRUZ	ST	0.0000000000	0.1230000000	0.123	500	62	22447.5 Source: AADT TimeStamp: 2014-06-20_045602 (Modified)
12N SONOITA	AVE	0.1540000000	0.2750000000	0.121	1192	144	52644.68 Source: AADT TimeStamp: 2014-06-20_045602
12N TARGET RANGE	RD	0.0000000000	0.3000000000	0.300	2930	879	320835 Source: AADT TimeStamp: 2014-06-20_045602
12N TARGET RANGE	RD	0.3000000000	0.4470000000	0.146	3477	508	185289.33 Source: AADT TimeStamp: 2014-06-20_045602
Target Range RD				0.446	6407	1387	506124.33
12N TERRACE	AVE	0.0000000000	0.1270000000	0.127	2594	329	120244.87 Source: AADT TimeStamp: 2014-06-20_045602
12N TYLER	AVE	0.0340000000	0.1020000000	0.067	1196	80	29248.18 Source: AADT TimeStamp: 2014-06-20_045602
12N TYLER	AVE	0.1020000000	0.1270000000	0.025	1268	32	11570.5 Source: AADT TimeStamp: 2014-06-20_045602
N Tyler Ave				0.092	2464	112	40818.68
12N WESTERN	AVE	0.0000000000	0.0060000000	0.006	7343	44	16081.17 Source: AADT TimeStamp: 2014-06-20_045602
12N WESTERN	AVE	0.1120000000	0.3120000000	0.201	5861	1178	429992.265 Source: AADT TimeStamp: 2014-06-20_045602
12N WESTERN	AVE	0.3120000000	0.6640000000	0.351	6433	2258	824163.795 Source: AADT TimeStamp: 2014-06-20_045602
12N WESTERN	AVE	0.6640000000	1.0120000000	0.348	5685	1978	722108.7 Source: AADT TimeStamp: 2014-06-20_045602
N Western Ave				0.906	25322	5458	1992345.93
12S RIVER	RD	0.0000000000	0.4310000000	0.431	472	203	74252.68 Source: AADT TimeStamp: 2014-06-20_045602
12S RIVER	RD	0.4310000000	1.5890000000	1.158	536	621	226551.12 Source: AADT TimeStamp: 2014-06-20_045602
12S RIVER	RD	1.5890000000	2.2060000000	0.617	852	526	191874.66 Source: AADT TimeStamp: 2014-06-20_045602
12S RIVER	RD	2.2060000000	3.0970000000	0.891	975	869	317084.625 Source: AADT TimeStamp: 2014-06-20_045602
12S RIVER	RD	3.0970000000	6.1130000000	3.016	681	2054	749672.04 Source: AADT TimeStamp: 2014-06-20_045602
12S RIVER	RD	6.1130000000	6.5890000000	0.476	692	329	120228.08 Source: AADT TimeStamp: 2014-06-20_045602
River RD				6.589	4208	4602	1679663.205
12W ANTHONY	DR	0.0000000000	0.2040000000	0.204	1419	289	105658.74 Source: AADT TimeStamp: 2014-06-20_045602
12W ANZA	DR	0.0000000000	0.0240000000	0.024	1684	40	14751.84 Source: AADT TimeStamp: 2014-06-20_045602
12W CRAWFORD	ST	0.0000000000	0.3730000000	0.373	774	289	105376.23 Source: AADT TimeStamp: 2014-06-20_045602
12W ELM	ST	0.4320000000	0.5720000000	0.140	2509	351	128209.9 Source: AADT TimeStamp: 2014-06-20_045602
12W HUGHES	ST	0.2020000000	0.3390000000	0.137	1812	248	90609.06 Source: AADT TimeStamp: 2014-06-20_045602
12W INDUSTRIAL PARK	DR	0.0200000000	0.1060000000	0.086	3287	283	103178.93 Source: AADT TimeStamp: 2014-06-20_045602
12W INDUSTRIAL PARK	DR	0.1060000000	0.1570000000	0.051	2809	143	52289.535 Source: AADT TimeStamp: 2014-06-20_045602
W INDUSTRIAL PARK DR				0.137	6096	426	155468.465
12W KINO	ST	0.0000000000	0.3350000000	0.335	633	212	77400.075 Source: AADT TimeStamp: 2014-06-20_045602
12W KINO	ST	0.3350000000	0.7700000000	0.411	683	281	102460.245 Source: AADT TimeStamp: 2014-06-20_045602
W KINO ST				0.746	1316	493	179860.32
12W PARK	ST	0.0000000000	0.0250000000	0.025	2537	63	23150.125 Source: AADT TimeStamp: 2014-06-20_045602

12W PLUM	ST	0.138000000000	0.345000000000	0.207	1336	277	100941.48	Source: AADT TimeStamp: 2014-06-20_045602
12W TARGET RANGE	RD	0.000000000000	0.344000000000	0.344	3423	1178	429791.88	Source: AADT TimeStamp: 2014-06-20_045602
12W TARGET RANGE	RD	0.344000000000	0.411000000000	0.068	7343	499	182253.26	Source: AADT TimeStamp: 2014-06-20_045602
W TARGET RANGE	RD			0.412	10766	1677	612045.14	
12W WALNUT	ST	0.000000000000	0.184000000000	0.184	1428	263	95904.48	Source: AADT TimeStamp: 2014-06-20_045602
12W WALNUT	ST	0.448000000000	0.751000000000	0.303	1429	433	158040.255	Source: AADT TimeStamp: 2014-06-20_045602
W WALNUT	ST			0.487	2857	696	253944.735	
12W WESTERN	AVE	0.000000000000	0.610000000000	0.610	5142	3137	1144866.3	Source: AADT TimeStamp: 2014-06-20_045602

Appendix A: NNA-Specific VMT estimates; Base Year

2014 ADOT TDM			NAA (based on HPMS Shape File = 38.4516% of County)		2014 NEI Paved Road			NAA (based on HPMS Shape File = 38.4516% of County)	
County			Average Daily VMT for		County			Average Daily VMT for NAA	
HPMS Vehicle type ID	County	Annual	Average Daily VMT for NAA	Annual	HPMS Vehicle type ID	Average Daily VMT for County	Total Annual County VMT by MOVES Road	Average Daily VMT for NAA	Annual
10	7,435	2,713,711	2,859	1,043,465	10	7,847	2,864,148	3,017	1,101,310
25	1,065,248	388,815,432	409,605	149,505,717	25	1,187,111	433,295,425	456,463	166,608,982
40	5,950	2,171,583	2,288	835,008	40	3,090	1,127,893	1,188	433,693
50	62,943	22,974,024	24,202	8,833,878	50	21,736	7,933,645	8,358	3,050,613
60	83,834	30,599,303	32,235	11,765,919	60	42,074	15,356,853	16,178	5,904,954
TOTAL (COUNTY)	1,225,408	447,274,054	471,189	171,983,987	TOTAL (COUNTY)	1,261,857	460,577,964	485,204	177,099,552

CNTLOCID	ROUTE	BMP	START	TCS MP	EMP	END	Length	AADT 2010	AADT 2030	BASE YEAR	AAGR DEV	Annual Growth Rate	Average Growth Rate	MOVES Road Type
100451	I 19	0.00	SB 19 (1) - Nogales	0.70	1.18	Exit 1 Western Ave	1.18	10,500	12,000	2007	3	0.63%	0.49%	2
100452	I 19	1.18	Exit 1 Western Ave	2.00	2.95	Exit 4 SR 189 / Mariposa Rd	1.77	14,500	16,000	2007	3	0.47%		
100453	I 19	2.95	Exit 4 SR 189 / Mariposa Rd	4.00	5.31	Exit 8 SB 19 (1)	2.36	22,500	25,500	2007	3	0.59%		
100454	I 19	5.31	Exit 8 SB 19 (1)	6.50	7.72	Exit 12 SR 289 / Pena Blanca Rd	2.41	34,000	36,000	2007	3	0.28%		
100883	SR 82	1.19	SB 19 - Nogales	1.60	1.66	Thelma St	0.47	7,700	9,200	2008	5	0.82%	0.68%	3
100884	SR 82	1.66	Thelma St	2.90	2.95	Old Patagonia Rd	1.29	5,000	6,000	2008	5	0.83%		
100886	SR 82	2.95	Old Patagonia Rd	4.90	5.87	South River Rd/Duquesn e Rd.	2.92	2,900	3,200	2008	4	0.47%		
100887	SR 82	5.87	South River Rd/Duquesn e Rd.	9.00	12.14	Patagonia Lake Rd	6.27	1,900	2,300	2008	4	0.87%		
101366	SR 189	0.00	International Border and POE - Nogales	0.60	1.10	Target Range / Arbo National Pit Rd	1.10	10,000	11,500	2008	5	0.65%		
101368	SR 189	1.10	Target Range / Arbo National Pit Rd	1.38	1.88	Industrial Park Dr (South)	0.78	10,000	11,500	2008	5	0.65%		
101370	SR 189	1.88	Industrial Park Dr (South)	2.00	2.64	Frank Reed Rd	0.76	15,500	18,000	2008	5	0.69%		
101372	SR 189	2.64	Frank Reed Rd	2.70	2.95	I-19 (Exit 4) / Mariposa Rd	0.31	24,000	27,000	2008	5	0.56%		
101374	SR 189	2.95	I-19 (Exit 4) / Mariposa Rd	3.40	3.75	SB 19 - Nogales	0.80	20,500	23,000	2008	5	0.54%		

2 = Rural Restricted

3 = Rural Unrestricted

4 = Urban Restricted

5 = Urban Unrestricted

Appendix A: County-level VMT Forecasts based on 2014 NEI

2014 NEI Paved Road	2017		2021		2030		2035	
HPMS Vehicle type ID	Average Daily VMT for County	Total Annual County VMT by MOVES Road Type	Average Daily VMT for County	Total Annual County VMT by MOVES Road Type	Average Daily VMT for County	Total Annual County VMT by MOVES Road Type	Average Daily VMT for County	Total Annual County VMT by MOVES Road Type
10	7,847	2,864,148	8,034	2,932,414	8,347	3,046,594	8,539	3,116,766
25	1,187,111	433,295,425	1,215,405	443,622,886	1,262,730	460,896,344	1,291,814	471,512,081
40	3,090	1,127,893	3,164	1,154,776	3,287	1,199,740	3,363	1,227,373
50	21,736	7,933,645	22,254	8,122,741	23,121	8,439,018	23,653	8,633,392
60	42,074	15,356,853	43,076	15,722,879	44,754	16,335,085	45,784	16,711,327
TOTAL (COUNTY)	1,261,857	460,577,964	1,291,933	471,555,696	1,342,238	489,916,780	1,373,153	501,200,940
2014 NEI Paved Road	2017		2021		2030		2035	
HPMS Vehicle type ID	Average Daily VMT for NAA	Annual NAA	Average Daily VMT for NAA	Annual NAA	Average Daily VMT for NAA	Annual NAA	Average Daily VMT for NAA	Annual NAA
10	3,017	1,101,310	3,089	1,127,560	3,089	1,171,464	3,283	1,198,446
25	456,463	166,608,982	467,343	170,580,055	467,343	177,221,974	496,723	181,303,894
40	1,188	433,693	1,217	444,030	1,217	461,319	1,293	471,945
50	8,358	3,050,613	8,557	3,123,323	8,557	3,244,937	9,095	3,319,677
60	16,178	5,904,954	16,564	6,045,697	16,564	6,281,100	17,605	6,425,771
TOTAL (NNA)	485,204	177,099,552	496,769	181,320,665	516,112	188,380,794	527,999	192,719,733

Appendix A: ADOT TDM-Based VMT Forecasts

2014 ADOT TDM	2017		2021		2030		2035	
HPMS Vehicle type ID	Average Daily VMT for County	Total Annual County VMT by MOVES Road Type	Average Daily VMT for County	Total Annual County VMT by MOVES Road Type	Average Daily VMT for County	Total Annual County VMT by MOVES Road Type	Average Daily VMT for County	Total Annual County VMT by MOVES Road Type
10	7,435	2,713,711	7,617	2,780,294	8,028	2,930,107	8,256	3,013,337
25	1,065,248	388,815,432	1,091,385	398,355,413	1,150,193	419,820,369	1,182,864	431,745,344
40	5,950	2,171,583	6,096	2,224,865	6,424	2,344,750	6,606	2,411,352
50	62,943	22,974,024	64,487	23,537,715	67,962	24,806,020	69,892	25,510,634
60	83,834	30,599,303	85,891	31,350,088	90,519	33,039,354	93,090	33,977,835
TOTAL (COUNTY)	1,225,408	447,274,054	1,255,475	458,248,375	1,323,125	482,940,600	1,360,708	496,658,502
2014 ADOT TDM	2017		2021		2030		2035	
HPMS Vehicle type ID	Average Daily VMT for NAA	Annual	Average Daily VMT for NAA	Annual NAA	Average Daily VMT for NAA	Annual NAA	Average Daily VMT for NAA	Annual NAA
10	2,859	1,043,465	2,929	1,069,067	3,087	1,126,673	3,174	1,158,676
25	409,605	149,505,717	419,655	153,173,991	442,267	161,427,608	454,830	166,012,951
40	2,288	835,008	2,344	855,496	2,470	901,594	2,540	927,203
50	24,202	8,833,878	24,796	9,050,626	26,132	9,538,309	26,875	9,809,244
60	32,235	11,765,919	33,026	12,054,607	34,806	12,704,157	35,795	13,065,018
TOTAL (NNA)	471,189	171,983,987	482,750	176,203,788	508,763	185,698,341	523,214	190,973,093

APPENDIX B

On-Road Emissions Estimates

2014NEI: 2017 County-Wide (lbs/year)

Sum of emissionQuant	Column Labels						
	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Row Labels							
Off-Network	487963	6280.09	5654.55				
Rural Restricted Access	303831	8543.62	7779.37	1402.29	1570.48	175.286	235.571
Rural Unrestricted Access	218154	5240.85	4764.88	3788.98	1919.52	473.622	287.926
Urban Restricted Access	260948	6848	6199.82	2656.81	1914.69	332.1	287.203
Urban Unrestricted Access	309924	7816.78	7095.78	15091.6	3739.95	1886.45	560.989
Grand Total	1580820	34729.34	31494.4	22939.68	9144.64	2867.458	1371.689

2014NEI: 2017 Nogales NA (lbs/year)

Sum of emissionQuant							
Column Labels							
Row Labels	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
1	410645	4927.4	4410.07				
2	116828	3285.16	2991.3	539.2	603.875	67.4002	90.581
3	83883.7	2015.19	1832.17	1456.92	738.086	182.115	110.712
4	100338	2633.16	2383.93	1021.59	736.228	127.698	110.434
5	119171	3005.67	2728.44	5802.97	1438.07	725.372	215.709
Grand Total	830865.7	15866.58	14345.91	8820.68	3516.259	1102.5852	527.436

ADOT TDM: 2017 County-Wide Emissions (lbs/year)

Sum of emissionQuant	Column Labels						
Row Labels	Oxides of	Primary Exhaust	Primary Exhaust	Primary PM10 -	Primary PM10 -	Primary PM2.5 -	Primary PM2.5 -
	Nitrogen (NOx)	PM10 - Total	PM2.5 - Total	Brakewear	Tirewear	Brakewear	Tirewear
				Particulate	Particulate	Particulate	Particulate
Off-Network	447849	5566.89	4998.89				
Rural Restricted Access	203438	6245.33	5704.36	1459.21	914.161	182.402	137.123
Rural Unrestricted Access	418842	11384.2	10406.7	3757.39	2183.98	469.673	327.596
Urban Restricted Access	386416	11321.9	10317.8	3248.12	2033.95	406.015	305.091
Urban Unrestricted Access	550945	15092	13778	10634.5	3985.23	1329.31	597.782
Grand Total	2007490	49610.32	45205.75	19099.22	9117.321	2387.4	1367.592

ADOT TDM: 2017 Nogales NA Emissions (lbs/year)

Sum of emissionQuant	Column Labels						
Row Labels	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Off-Network	395877	4749.98	4243.61				
Rural Restricted Access	78006.4	2407.78	2199.06	598.439	355.584	74.8049	53.3371
Rural Unrestricted Access	161268	4400.72	4022.16	1443.88	835.568	180.485	125.334
Urban Restricted Access	148294	4371.86	3983.69	1297.87	786.621	162.233	117.992
Urban Unrestricted Access	211373	5819.75	5312.46	3946.28	1519.1	493.287	227.863
Grand Total	994818.4	21750.09	19760.98	7286.469	3496.873	910.8099	524.5261

2014NEI: 2021 County-Wide (lbs/year)

Sum of emissionQuant	Column Labels						
Row Labels	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 -	Primary PM10 -	Primary PM2.5 -	Primary PM2.5 -
				Brakewear Particulate	Tirewear Particulate	Brakewear Particulate	Tirewear Particulate
Off-Network	390074	4777.42	4299.75				
Rural Restricted Access	188556	5334.66	4847.92	1433.95	1606.77	179.243	241.014
Rural Unrestricted Access	134404	3415.51	3096.77	3876.48	1964.35	484.561	294.65
Urban Restricted Access	162425	4470.54	4037.51	2718.08	1959.4	339.759	293.91
Urban Unrestricted Access	189658	5303.71	4798.5	15423.9	3826.57	1927.99	573.981
Grand Total	1065117	23301.84	21080.45	23452.41	9357.09	2931.553	1403.555

2014NEI: 2021 Nogales NA (lbs/year)

Sum of emissionQuant	Column Labels						
	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Row Labels							
Off-Network	316667	3812.38	3411.92				
Rural Restricted Access	72503	2051.26	1864.11	551.374	617.828	68.9219	92.674
Rural Unrestricted Access	51680.3	1313.32	1190.76	1490.57	755.324	186.321	113.298
Urban Restricted Access	62454.8	1718.99	1552.48	1045.14	753.422	130.643	113.013
Urban Unrestricted Access	72867.3	2035.48	1841.6	5919.79	1470.71	739.973	220.606
Grand Total	576172.4	10931.43	9860.87	9006.874	3597.284	1125.8589	539.591

ADOT TDM: 2021 County-Wide Emissions (lbs/year)

Sum of emissionQuant	Column Labels						
	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Row Labels							
Off-Network	352041	4268.66	3832.03				
Rural Restricted Access	126123	3792.9	3458.55	1492.34	935.621	186.543	140.342
Rural Unrestricted Access	258218	6952.53	6344.2	3843.56	2235.53	480.445	335.33
Urban Restricted Access	239562	6979.03	6346.83	3322.66	2082.02	415.331	312.3
Urban Unrestricted Access	339464	9409.54	8570.52	10882.2	4079.83	1360.28	611.971
Grand Total	1315408	31402.66	28552.13	19540.76	9333.001	2442.599	1399.943

ADOT TDM: 2021 Nogales NA Emissions (lbs/year)

Sum of emissionQuant	Column Labels						
	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Row Labels							
Off-Network	302692	3690.96	3297.7				
Rural Restricted Access	48352	1461.55	1332.64	612.094	363.935	76.5117	54.5898
Rural Unrestricted Access	99481.8	2685.98	2450.62	1477	855.291	184.625	128.293
Urban Restricted Access	91941	2692.68	2448.54	1327.72	805.213	165.965	120.781
Urban Unrestricted Access	130292	3622.73	3299.51	4037.68	1555.14	504.709	233.269
Grand Total	672758.8	14153.9	12829.01	7454.494	3579.579	931.8107	536.9328

2014NEI: 2030 County-Wide (lbs/year)

Sum of emissionQuant		Column Labels					
Row Labels	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Off-Network	261781	2912.26	2608.51				
Rural Restricted Access	73292.4	2173.04	1953.02	1486.98	1667.52	185.873	250.126
Rural Unrestricted Access	50574.8	1549.57	1389.66	4022.89	2039.4	502.862	305.907
Urban Restricted Access	63766.9	2199.96	1966.62	2820.6	2034.27	352.572	305.138
Urban Unrestricted Access	68615.3	2543.54	2276.94	16010.9	3973.46	2001.36	596.016
Grand Total	518030.4	11378.37	10194.75	24341.37	9714.65	3042.667	1457.187

2014NEI: 2030 Nogales NA (lbs/year)

Sum of emissionQuant	Column Labels						
Row Labels	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Off-Network	195806	2519.16	2246.87				
Rural Restricted Access	28182.1	835.57	750.97	571.769	641.186	71.4711	96.1774
Rural Unrestricted Access	19446.9	595.833	534.346	1546.86	784.18	193.358	117.626
Urban Restricted Access	24519.5	845.919	756.195	1084.56	782.207	135.57	117.331
Urban Unrestricted Access	26358.4	976.153	873.84	6145.08	1527.18	768.135	229.076
Grand Total	294312.9	5772.635	5162.221	9348.269	3734.753	1168.5341	560.2104

ADOT TDM: 2030 County-Wide Emissions (lbs/year)

Sum of emissionQuant	Column Labels						
Row Labels	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Off-Network	229356	2763.83	2470.26				
Rural Restricted Access	48644.8	1405.76	1268.9	1673.19	995.816	209.149	149.371
Rural Unrestricted Access	98590.4	2577.25	2328.13	4038.12	2340.74	504.764	351.108
Urban Restricted Access	92964.8	2850.36	2564.31	3630.38	2203.78	453.798	330.566
Urban Unrestricted Access	127411	3720.55	3353.61	11046.1	4256.93	1380.76	638.539
Grand Total	596967	13317.75	11985.21	20387.79	9797.266	2548.471	1469.584

ADOT TDM: 2030 Nogales NA Emissions (lbs/year)

Sum of emissionQuant		Column Labels					
Row Labels	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Off-Network	183731	2491.9	2220.09				
Rural Restricted Access	18704.7	540.539	487.91	643.367	382.906	80.421	57.4358
Rural Unrestricted Access	37909.4	990.992	895.203	1552.72	900.049	194.09	135.007
Urban Restricted Access	35746.3	1096.01	986.016	1395.94	847.389	174.492	127.108
Urban Unrestricted Access	48988.8	1430.43	1289.35	4247.03	1636.85	530.878	245.527
Grand Total	325080.2	6549.871	5878.569	7839.057	3767.194	979.881	565.0778

2014NEI: 2035 County-Wide (lbs/year)

Sum of emissionQuant	Column Labels						
	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Row Labels							
Off-Network	206092	2465.82	2209.48				
Rural Restricted Access	48740.5	1643.84	1475.68	1520.92	1705.8	190.116	255.869
Rural Unrestricted Access	30646.2	1223.3	1095.46	4115.02	2086.36	514.379	312.953
Urban Restricted Access	39671.6	1688.34	1508.04	2885.17	2081.11	360.646	312.166
Urban Unrestricted Access	38766.7	2024.35	1809.81	16378	4065.08	2047.25	609.759
Grand Total	363917	9045.65	8098.47	24899.11	9938.35	3112.391	1490.747

2014NEI: 2035 Nogales NA (lbs/year)

Sum of emissionQuant	Column Labels						
Row Labels	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Off-Network	140572	2117.23	1888.78				
Rural Restricted Access	18741.5	632.081	567.424	584.819	655.904	73.1025	98.3853
Rural Unrestricted Access	11784	470.379	421.22	1582.29	802.239	197.787	120.335
Urban Restricted Access	15254.3	649.194	579.865	1109.39	800.221	138.674	120.033
Urban Unrestricted Access	14888	777.015	694.668	6285.98	1562.39	785.748	234.358
Grand Total	201239.8	4645.899	4151.957	9562.479	3820.754	1195.3115	573.1113

ADOT TDM: 2035 County-Wide Emissions (lbs/year)

Sum of emissionQuant	Column Labels						
Row Labels	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Off-Network	174303	2332.42	2085.37				
Rural Restricted Access	33603.5	1062.2	957.504	1720.2	1023.93	215.025	153.589
Rural Unrestricted Access	66935	1969.5	1776.24	4151.68	2406.9	518.96	361.034
Urban Restricted Access	62725	2174.01	1953.53	3732.5	2266.11	466.562	339.913
Urban Unrestricted Access	83156.4	2880.1	2591.89	11357.4	4377.44	1419.67	656.614
Grand Total	420722.9	10418.23	9364.534	20961.78	10074.38	2620.217	1511.15

ADOT TDM: 2035 Nogales NA Emissions (lbs/year)

Sum of emissionQuant	Column Labels						
Row Labels	Oxides of Nitrogen (NOx)	Primary Exhaust PM10 - Total	Primary Exhaust PM2.5 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Primary PM2.5 - Tirewear Particulate
Off-Network	128755	2090.02	1862.36				
Rural Restricted Access	12921.1	408.431	368.177	661.442	393.717	82.6803	59.0575
Rural Unrestricted Access	25737.7	757.304	682.995	1596.38	925.492	199.548	138.823
Urban Restricted Access	24118.7	835.941	751.162	1435.2	871.354	179.401	130.702
Urban Unrestricted Access	31972.9	1107.3	996.49	4366.72	1683.19	545.839	252.476
Grand Total	223505.4	5198.996	4661.184	8059.742	3873.753	1007.4683	581.0585

MOVES Input Data Summary

Data item	Input/Source
RunSpec	
Scale	County
Calculation type	Inventory
Time span	Annual runs: 12 months, weekday and weekend, 24 hours
Time aggregation	Hour
Geographic selection	Santa Cruz County
Vehicle selection	All 13 vehicle (source) types Gasoline, diesel, compressed natural gas, electricity, ethanol (E-85)
Road type	All road types (2, 3, 4, 5) and including off-network (1)
Pollutants and processes	PM _{2.5} , PM ₁₀ , and NO _x . PM includes exhaust, tire, and brake.
General output	Units: emission = pounds, distance = miles, time = hours, energy = million British thermal units
County Data Manager inputs	
Meteorology data	PM ₁₀ /PM _{2.5} State Implementation Plan on-road analysis
Vehicle population	ADOT, January 2017
Vehicle age distribution	ADOT, January 2017
Annual vehicle miles traveled	Highway Performance Monitoring System via 2014 National Emissions Inventory and ADOT Travel Demand Model County-wide and Nogales Nonattainment Area estimates
Vehicle miles traveled fractions monthly/daily/hourly	Monthly = ADOT 2015 traffic count data Daily = national average Hourly = national average and ADOT Travel Demand Model
Average speed distribution	Existing = national average Build = adjusted based on State Route 189 traffic study
Road type distribution	Highway Performance Monitoring System via 2014 National Emissions Inventory ADOT Travel Demand Model
Ramp fraction	EPA/national average
Fuel data	Santa Cruz County fuel data provided by EPA with MOVES
Inspection/maintenance programs	None
Vehicle starts	EPA average values provided with MOVES
Retrofit data	None

Notes: ADOT = Arizona Department of Transportation, EPA = U.S. Environmental Protection Agency

APPENDIX C

Agency Consultation and Public Review

Beverly Chenausky

From: Wamsley, Jerry <Wamsley.Jerry@epa.gov>
Sent: Monday, May 22, 2017 3:04 PM
To: Beverly Chenausky
Cc: OConnor, Karina; McKaughan, Colleen; Lo, Doris; meek, clifton; Ryan C. Templeton
Subject: RE: Availability of Draft Regional Conformity Analysis SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

Hello Beverly,

Thank you for the opportunity to review the Arizona Department of Transportation's (ADOT) draft Regional Conformity Analysis for the Nogales PM2.5/PM10 Nonattainment Areas (NRCA), dated April 2017. I appreciate your collaboration in providing agency consultation on the NRCA and I hope you found our past comments and suggestions to be helpful. We have no further comments on the NRCA.

If you have any questions or concerns, then please feel free to contact me.

Thanks again,
Jerry Wamsley

From: Beverly Chenausky [<mailto:BChenausky@azdot.gov>]
Sent: Thursday, April 20, 2017 12:08 PM
To: Wamsley, Jerry <Wamsley.Jerry@epa.gov>; 'Templeton.Ryan@azdeq.gov' <Templeton.Ryan@azdeq.gov>; 'Lucke-McDowell.Catherine@azdeq.gov' <Lucke-McDowell.Catherine@azdeq.gov>; Mike Sonenberg <Sonenberg.Mike@azdeq.gov>; OConnor, Karina <OConnor.Karina@epa.gov>; Ed Stillings <ed.stillings@dot.gov>; Tremaine Wilson <tremaine.wilson@dot.gov>
Cc: Joonwon Joo <JJoo@azdot.gov>; Mark Hoffman <Mhoffman@azdot.gov>; Ralph Ellis <REllis@azdot.gov>; Carlos Lopez <CLopez@azdot.gov>; Chris Vertrees <cdvertrees@seago.org>
Subject: Availability of Draft Regional Conformity Analysis SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

The draft Arizona Department of Transportation Air Quality Regional Conformity Analysis Nogales Nonattainment Area document has been posted online for review and comment for the SR 189 project, please provide comments by May 22nd, 2017. If you have any questions please let me know, the modeling files will be available on the project's Sharefile site.

<http://azdot.gov/business/environmental-planning/air-quality/transportation-conformity>

Thanks,

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov



Beverly Chenausky

From: Wamsley, Jerry <Wamsley.Jerry@epa.gov>
Sent: Tuesday, March 14, 2017 5:49 PM
To: Beverly Chenausky
Cc: 'Templeton.Ryan@azdeq.gov'; 'Lucke-McDowell.Catherine@azdeq.gov'; Mike Sonenberg; OConnor, Karina; Ed Stillings; Tremaine Wilson; Lo, Doris; McKaughan, Colleen
Subject: RE: Revised Regional Conformity Planning Assumptions Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

Follow Up Flag: Follow up
Flag Status: Flagged

Hello Beverly,

Thank you for the opportunity to review the final Project of Air Quality Concern Questionnaire (dated March 9, 2017) for the SR-189 project and interchange in Nogales, AZ and the revised regional conformity analysis protocol for the Nogales PM10 and PM2.5 nonattainment areas. We have no further comments on documents.

Again, thank you for your consultation efforts. We look forward to seeing the draft regional conformity analyses for the Nogales area.

Jerry

From: Beverly Chenausky [<mailto:BChenausky@azdot.gov>]
Sent: Thursday, March 9, 2017 10:58 AM
To: Wamsley, Jerry <Wamsley.Jerry@epa.gov>; 'Templeton.Ryan@azdeq.gov' <Templeton.Ryan@azdeq.gov>; 'Lucke-McDowell.Catherine@azdeq.gov' <Lucke-McDowell.Catherine@azdeq.gov>; Mike Sonenberg <Sonenberg.Mike@azdeq.gov>; OConnor, Karina <OConnor.Karina@epa.gov>; Ed Stillings <ed.stillings@dot.gov>; Tremaine Wilson <tremaine.wilson@dot.gov>
Cc: Joonwon Joo <JJoo@azdot.gov>; Mark Hoffman <Mhoffman@azdot.gov>; Ralph Ellis <REllis@azdot.gov>; Carlos Lopez <CLopez@azdot.gov>
Subject: RE: Revised Regional Conformity Planning Assumptions Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

Attached you will find a final version of the project level questionnaire summarizing the public comment results and a modified planning assumptions document that incorporates the changes from the [January 25th phone call](#) for review. Please let me know if other changes are needed to the regional conformity assumptions document within 10 business days as we would like to update this information on the website, thanks.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269

Beverly Chenausky

From: Beverly Chenausky
Sent: Thursday, March 09, 2017 11:58 AM
To: 'Wamsley.Jerry@epa.gov'; 'Templeton.Ryan@azdeq.gov'; 'Lucke-McDowell.Catherine@azdeq.gov'; Mike Sonenberg; Karina O'Conner; Ed Stillings; Tremaine Wilson
Cc: Joonwon Joo; Mark Hoffman; Ralph Ellis; Carlos Lopez
Subject: RE: Revised Regional Conformity Planning Assumptions Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L
Attachments: RCA_Method_Assumptions_Revised_3-8-17.docx; Final_ H8045_SR_189 _Project_Level_PM-10_Questionnaire.pdf

Attached you will find a final version of the project level questionnaire summarizing the public comment results and a modified planning assumptions document that incorporates the changes from the January 25th phone call for review. Please let me know if other changes are needed to the regional conformity assumptions document within 10 business days as we would like to update this information on the website, thanks.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov



Beverly Chenauský

From: Wamsley, Jerry <Wamsley.Jerry@epa.gov>
Sent: Tuesday, January 31, 2017 11:58 AM
To: Beverly Chenauský
Cc: McKaughan, Colleen; OConnor, Karina; Berry, Laura; Ed Stillings; Ryan C. Templeton; Lo, Doris
Subject: RE: Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

Hello Beverly,

Thank you for the opportunity to review the proposed methodology for the Nogales Nonattainment Area Regional Conformity Analysis (RCA), dated December 18, 2016. Our comments and suggestions follow below.

If you have any questions or concerns, then please feel free to contact me.

Thanks,
Jerry

General Analysis Framework and Vehicle Miles Traveled (VMT) Forecasts

Again, thank you for organizing our January 25 meeting to discuss VMT forecast options for the RCA. We concur that using the 2014 National Emissions Inventory (NEI) as a base year for projecting analysis year PM10 and PM2.5 emissions is the best available resource compared to the Statewide TIP or Highway Performance Monitoring System (HPMS) estimates. We suggest that you take care in using the 2014 NEI and do your "due diligence" in reviewing the NEI documentation and metadata, the emissions estimate inputs, and any modeling default inputs to ensure that the resulting emissions estimates are accurate and suited to your analysis.

Interim Procedure Analysis for PM2.5

As we have discussed, we recommend that you use the no greater than baseline year method for doing your PM2.5 conformity analysis as opposed to the build/no build method. EPA has approved an appropriate 2008 PM2.5 Emissions Inventory for the Nogales nonattainment area at 80 FR 6907, February 9, 2015. In addition to PM2.5 emissions, on-road mobile NOx emissions should be included in your analysis, as required by section 93.119(f)(9) of the conformity regulation. We have worked with ADEQ to pull the appropriate source category emissions estimates information from the submitted and approved 2008 PM2.5 emissions inventory and they are provided below.

PM2.5 Emissions by Source Category/Santa Cruz County (SCC) Estimate/Nogales Nonattainment Area (NNA) Estimate (tons per year):

Unpaved Roads (fugitive) -	SCC, 234.4	NNA, 154.9;
Paved Roads (fugitive) -	SCC, 75	NNA, 49.6;
Road Construction -	SCC, 96.9	NNA, 64.0;
On Road Mobile -	SCC, 38.0	NNA, 25.1, (Brake, Tire wear, and Exhaust emissions).

NOx Emissions by Source Category/Santa Cruz County Estimate/Nogales Nonattainment Area Estimate (tons per year):

On Road Mobile -	SCC, 1381.6	NNA, 912.9.
------------------	-------------	-------------

EPA did not make a finding in our emissions inventory action that on-road mobile fugitive (unpaved and paved road sources) PM2.5 emissions were significant and we understand that ADEQ wants ADOT to include these fugitive PM2.5

emissions in the regional conformity analysis. We have advised ADEQ to make a written request via their comments on the analysis methodology, if they have not done so. The important point is that ADEQ's request that fugitive emissions be considered and their assertion that fugitive emissions are significant is documented, per section 93.119(f)(8) of the conformity regulation. As a reminder, when estimating fugitive emissions from transportation projects, please use the latest version of the AP-42 emission factor equations, e.g., the June 2011 version for paved road fugitive PM10 emissions.

Timely Implementation of Transportation Control Measures

EPA has not approved any transportation control measures for the Nogales nonattainment area into the Arizona State Implementation Plan (SIP). Consequently, there is no need to address this requirement in the RCA. You may, however, take emission reduction credit for road paving projects included in the Nogales Transportation Improvement Program and Regional Transportation Plan. Local road paving projects/development requirements or street sweeping programs may be assumed in future analysis year emissions estimates, if the paving requirements/sweeping programs are codified locally and have a consistent and documented funding source. As always, please document your assumptions and calculations when estimating the effects of emission reduction efforts.

From: Beverly Chenausky [mailto:BChenausky@azdot.gov]

Sent: Friday, January 13, 2017 12:05 PM

To: Maslyk, Louis <Louis.Maslyk@hdrinc.com>; Joonwon Joo <JJoo@azdot.gov>; Wamsley, Jerry <Wamsley.Jerry@epa.gov>; OConnor, Karina <OConnor.Karina@epa.gov>; Berry, Laura <berry.laura@epa.gov>; meek, clifton <meek.clifton@epa.gov>; Ed Stillings <ed.stillings@dot.gov>; 'Templeton.Ryan@azdeq.gov' <Templeton.Ryan@azdeq.gov>; 'Christopher Vertrees' <cdvertrees@seago.org>; Patulski, Meg <patulski.meg@epa.gov>; McKaughan, Colleen <McKaughan.Colleen@epa.gov>; 'Lucke-McDowell.Catherine@azdeq.gov' <Lucke-McDowell.Catherine@azdeq.gov>; 'tremaine.wilson@dot.gov' <tremaine.wilson@dot.gov>; 'jeff.houk@dot.gov' <jeff.houk@dot.gov>; Carlos Lopez <CLopez@azdot.gov>; Ralph Ellis <REllis@azdot.gov>; Barton, Michael J. <Michael.Barton@hdrinc.com>; Witt, Jay <Jay.Witt@hdrinc.com>; Bennett, Jill <Jill.Bennett@hdrinc.com>; Amy.Moran@wilsonco.com; Sharon Gordon <sharon.gordon@dot.gov>; Mark Hoffman <Mhoffman@azdot.gov>

Subject: RE: Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

Please find attached information on the Public Hearing for the SR189 scheduled for January 31, 2017. The project website (azdot.gov/189) includes information on the conformity requirements for the project under the Technical Reports tab in addition to the updated Project of Air Quality Concern Questionnaire included Air Quality Appendix E found under the Draft Environmental Assessment tab. As there were no objections to the determination that this project was not a project of air quality concern the project level interagency consultation is complete with the project identified as a project that does not require a quantitative hot-spot analysis as listed under 40 CFR 93.123(b). In regards to the Regional Conformity requirements, please provide responses to the planning assumptions provided earlier by the public hearing date of January 31, 2017.

ADOT will also be providing an opportunity for stakeholders to comment on project and regional conformity in conjunction with all other project details in the Draft Environmental Assessment through February 14th, 2017 information on providing comments on this project is described in the attached document. Thank you for your continuous support and review of developing documents for this project, let me know if you have any questions and have a great extended weekend.

Beverly Chenausky

From: Beverly Chenausky

Sent: Thursday, December 08, 2016 9:02 AM

To: 'Maslyk, Louis'; Joonwon Joo; 'Wamsley.Jerry@epa.gov'; 'OConnor.Karina@epa.gov'; 'berry.laura@epa.gov'; 'meek.clifton@epa.gov'; Ed Stillings; 'Templeton.Ryan@azdeq.gov'; 'Christopher Vertrees'; 'patulski.meg@epa.gov'; 'McKaughan.Colleen@epa.gov'; 'Lucke-McDowell.Catherine@azdeq.gov'; 'tremaine.wilson@dot.gov'; 'jeff.houk@dot.gov'; Carlos Lopez; Ralph Ellis; 'Barton, Michael J.'; 'Witt, Jay'; 'Bennett, Jill'; 'Amy.Moran@wilsonco.com'; Sharon Gordon

Subject: Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

To Interested Parties:

ADOT is presenting the following project, **SR 189, International Border to Grand Avenue**, for interagency consultation per 40 CFR 93.105 as a potential project that is not a project of Air Quality Concern and thereby will not require a PM10 hot-spot analysis. If through interagency consultation it is determined that this project will not require a hot-spot analysis, other conformity provisions apply and will be addressed in the air quality analysis that will be submitted to FHWA. ADOT is requesting responses to the attached questionnaire within **10 business days**; a non-response will be interpreted as concurrence that the project is not a project of air quality concern and does not require a hot-spot analysis. If any consulted party believes this project should be treated as a project of air quality concern that requires a Quantitative PM hot-spot analysis, please document the appropriate section under 40 CFR 93.123 (b) that applies to the project and describe why the project should be treated as a project of air quality concern.

While this project may not require a quantitative hot-spot analysis, as a regionally significant project in an isolated rural PM10 and PM2.5 nonattainment area this project needs to be included in a regional conformity analysis prior to project approval, per

40 CFR 93.121(b). As required for interagency consultation per 40 CFR 93.105 (c) (ii), attached is ADOT's planning assumptions document that will be used for developing the regional conformity analysis for the Nogales nonattainment area(s). ADOT is requesting responses to the attached regional conformity analysis methodologies within **30 business days**; a non-response will be interpreted as concurrence on the planning assumptions that will be used for the regional conformity analysis.

As with before, additional technical information has been posted and shared on ADOT's ShareFile service as available, if you have any additional questions or need additional information that has not been posted prior on the ShareFile site please let me know, thanks.

Beverly T. Chenausky

Air & Noise Program Manager

MD EM02, Room 41

1611 W. Jackson St.

Phoenix, AZ 85007

602.712.6269

azdot.gov



From: Beverly Chenausky

Sent: Friday, September 16, 2016 1:29 PM

To: 'Maslyk, Louis'; Joonwon Joo; 'Wamsley.Jerry@epa.gov'; 'OConnor.Karina@epa.gov'; 'berry.laura@epa.gov';

'mejia.marina@azdeq.gov'; 'meek.clifton@epa.gov'; Ed Stillings; 'Templeton.Ryan@azdeq.gov'; 'Christopher Vertrees'; 'patulski.meg@epa.gov'; 'McKaughan.Colleen@epa.gov'; 'Lucke-McDowell.Catherine@azdeq.gov'; 'tremaine.wilson@dot.gov'; 'jeff.houk@dot.gov'; Carlos Lopez; Marinela Konomi; 'Barton, Michael J.'; 'Witt, Jay'; 'Bennett, Jill'; 'Thomas Deitering'; 'Amy.Moran@wilsonco.com'

Subject: RE: H8045 SR 189 Air Quality Discussion

To All:

You should have all received a notification from ShareFile the documents have been added to the SR189 project folder, if not a link is included in the Agenda attached directing you to the project folder. There has been discussions with stakeholders on including the option of a roundabout and other project changes, a summary of the stakeholder meeting and suggested schedule have been added to the project folder. You will be notified when the information for project and regional conformity consultation is available, just wanted to provide an update on the project and let you know that there has been a shift in schedule, thanks.

Beverly Chenausky
602.712.6269

From: Beverly Chenausky

Sent: Monday, May 23, 2016 4:05 PM

To: 'Maslyk, Louis'; Joonwon Joo; 'Wamsley.Jerry@epa.gov'; 'OConnor.Karina@epa.gov'; 'berry.laura@epa.gov'; 'mejia.marina@azdeq.gov'; 'meek.clifton@epa.gov'; Ed Stillings; 'Templeton.Ryan@azdeq.gov'; Christopher Vertrees; 'patulski.meg@epa.gov'; 'McKaughan.Colleen@epa.gov'; 'Lucke-McDowell.Catherine@azdeq.gov'; 'tremaine.wilson@dot.gov'; 'jeff.houk@dot.gov'; Carlos Lopez; Marinela Konomi; Barton, Michael J.; Witt, Jay; Bennett, Jill; Thomas Deitering; 'Amy.Moran@wilsonco.com'

Subject: RE: H8045 SR 189 Air Quality Discussion

Please find attached agenda with supporting materials listed on ADOT's Sharefile site you should receive information notifying you that you have access to the SR189 folder and content, let me know if you have any additional questions.

<< File: Nogales Agenda May 25th.pdf >>

Beverly T. Chenausky

Air & Noise Program Manager

MD EM04, Room 41

1611 W. Jackson St.

Phoenix, AZ 85007

602.712.6269

azdot.gov

<< OLE Object: Picture (Device Independent Bitmap) >>

Environmental Planning

-----Original Appointment-----

From: Maslyk, Louis [<mailto:Louis.Maslyk@hdrinc.com>]

Sent: Monday, May 23, 2016 10:37 AM

To: Beverly Chenausky; Joonwon Joo; 'Wamsley.Jerry@epa.gov'; 'OConnor.Karina@epa.gov'; 'berry.laura@epa.gov'; 'mejia.marina@azdeq.gov'; 'meek.clifton@epa.gov'; Ed Stillings; 'Templeton.Ryan@azdeq.gov'; Christopher Vertrees; 'patulski.meg@epa.gov'; 'McKaughan.Colleen@epa.gov'; 'Lucke-McDowell.Catherine@azdeq.gov'; 'tremaine.wilson@dot.gov'; 'jeff.houk@dot.gov'; Carlos Lopez; Marinela Konomi; Barton, Michael J.; Witt, Jay; Bennett, Jill; Thomas Deitering

Subject: H8045 SR 189 Air Quality Discussion

When: Wednesday, May 25, 2016 11:00 AM-12:00 PM (UTC-07:00) Arizona.

Where: Conference Call: 866-583-7984/Call-in Code: 1968494#

Hello Everyone,

We have scheduled a call to further discuss the topic of air quality for the SR 189 improvements project in Nogales, Arizona based on the interagency coordination that has recently been conducted.

Suggested agenda topics for the call include:

- 1 – General overview of project
- 2 – Project Level Conformity - Discussions on the updated POAQC (hope to send out prior to meeting for review)
- 3 - Regional Conformity Analysis approach
- 4 – Discussions on further action

Prior to the meeting, informational materials will be posted on the ADOT website under Interagency Consultation Meetings for May 25, 2016 at <http://azdot.gov/business/environmental-planning/air-quality/transportation-conformity>. We will let everyone know when they are posted.

Please contact Beverly Chenausky, ADOT Air Quality Lead, at 602-712-6269 or bchenausky@azdot.gov or me if anyone has any questions about the upcoming meeting next Wednesday May 25th from 11 am to 12 pm at the conference call number posted above.

Thanks

Lou Maslyk, AICP
Senior NEPA Project Manager
HDR
3200 E. Camelback Road, Suite 350
Phoenix, AZ 85018
D 602.474.3913 C 480.323.0298
louis.maslyk@hdrinc.com
hdrinc.com/follow-us

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Beverly Chenausky

From: Wamsley, Jerry <Wamsley.Jerry@epa.gov>
Sent: Tuesday, January 31, 2017 10:43 AM
To: Beverly Chenausky
Subject: RE: Nogales PM2.5 EI motor vehicle emissions

Hello Beverly,

Reviewing page 5 of your methodology write-up, the heading over the paragraph you cite below is "SIP Control Measures". Consequently, it appears that you have listed the Santa Cruz County and City of Nogales paving efforts as control measures approved into the Arizona State Implementation Plan (SIP). I think you have mischaracterized these local efforts, because we have not approved these paving efforts in to the SIP.

Thanks,
Jerry

From: Beverly Chenausky [<mailto:BChenausky@azdot.gov>]
Sent: Tuesday, January 31, 2017 7:57 AM
To: Wamsley, Jerry <Wamsley.Jerry@epa.gov>
Subject: RE: Nogales PM2.5 EI motor vehicle emissions

Jerry – I had one clarifying question that was mentioned on the phone in regards to the SIP Control Measures, on page 5 of the planning assumptions document we note:

" Two PM₁₀ control measures were implemented by the City of Nogales and Santa Cruz County. They involve paving or stabilizing unpaved roadways and stabilizing access points between paved and unpaved traffic surfaces. The PM_{2.5} SIP did not require any control measures as a result of the clean data finding. Therefore there are no PM_{2.5}-specific control measures that must be addressed by the emissions analysis."

However you noted that EPA didn't act on any TCMs in the SIP so are we mischaracterizing these as committed control measures?

From: Wamsley, Jerry [<mailto:Wamsley.Jerry@epa.gov>]
Sent: Monday, January 30, 2017 4:52 PM
To: Ryan C. Templeton
Cc: OConnor, Karina; Beverly Chenausky
Subject: Nogales PM2.5 EI motor vehicle emissions

Hello Ryan,

I spoke with Karina and colleagues at OTAQ in Ann Arbor concerning the AP-42/2008 NEI version 3.0 issue and the Nogales Regional Conformity Analysis. As you and I discussed, the PM₁₀ MVEB is unaffected. On the PM_{2.5} side, for an interim conformity analysis using the baseline emissions inventory teste, our recommendation is to use the PM_{2.5} emissions inventory as we approved 2015 (80 FR 6907, February 9, 2015) and as ADEQ submitted in September 2013.

In a secondary issue, since EPA did not make a finding that fugitive PM_{2.5} emissions were significant, if ADEQ wants ADOT to include fugitive PM_{2.5} emissions in the regional conformity analysis, then please make the request in writing through your comments on the analysis methodology, if you have not done so already. The important point is that ADEQ's request and assertion that fugitive PM_{2.5} emissions are significant is documented.

To help out Beverly at ADOT and avoid any confusion between the 2008 NEI versions, I looked up the PM2.5 emissions for mobile source related categories in the submitted and approved PM2.5 emissions inventory that ADOT might need for their Nogales Regional Conformity Analysis. The emissions estimates are listed below; the source is Appendix A to the submitted EI, Tables 4.2 and 4.3. Please look them over and confirm them?

If you have any questions or concerns, then please call me at 530-297-5271.

Thanks,
Jerry

PM2.5 Emissions by Source Category/Santa Cruz County Estimate/Nogales Nonattainment Area Estimate (tons per year):

Unpaved Roads (fugitive) -	SCC, 234.4	NNA, 154.9;
Paved Roads (fugitive) -	SCC, 75	NNA, 49.6;
Road Construction -	SCC, 96.9	NNA, 64.0;
On Road Mobile (BrTireExh) -	SCC, 38.0	NNA, 25.1.

NOx Emissions by Source Category/Santa Cruz County Estimate/Nogales Nonattainment Area Estimate (tons per year):

On Road Mobile -	SCC, 1381.6	NNA, 912.9.
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Beverly Chenausky

From: Wamsley, Jerry <Wamsley.Jerry@epa.gov>
Sent: Monday, January 30, 2017 4:52 PM
To: Ryan C. Templeton
Cc: OConnor, Karina; Beverly Chenausky
Subject: Nogales PM2.5 EI motor vehicle emissions

Hello Ryan,

I spoke with Karina and colleagues at OTAQ in Ann Arbor concerning the AP-42/2008 NEI version 3.0 issue and the Nogales Regional Conformity Analysis. As you and I discussed, the PM10 MVEB is unaffected. On the PM2.5 side, for an interim conformity analysis using the baseline emissions inventory teste, our recommendation is to use the PM2.5 emissions inventory as we approved 2015 (80 FR 6907, February 9, 2015) and as ADEQ submitted in September 2013.

In a secondary issue, since EPA did not make a finding that fugitive PM2.5 emissions were significant, if ADEQ wants ADOT to include fugitive PM2.5 emissions in the regional conformity analysis, then please make the request in writing through your comments on the analysis methodology, if you have not done so already. The important point is that ADEQ's request and assertion that fugitive PM2.5 emissions are significant is documented.

To help out Beverly at ADOT and avoid any confusion between the 2008 NEI versions, I looked up the PM2.5 emissions for mobile source related categories in the submitted and approved PM2.5 emissions inventory that ADOT might need for their Nogales Regional Conformity Analysis. The emissions estimates are listed below; the source is Appendix A to the submitted EI, Tables 4.2 and 4.3. Please look them over and confirm them?

If you have any questions or concerns, then please call me at 530-297-5271.

Thanks,
Jerry

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On Road Mobile (BrTireExh) -	SCC, 38.0	NNA, 25.1.

NOx Emissions by Source Category/Santa Cruz County Estimate/Nogales Nonattainment Area Estimate (tons per year):

On Road Mobile -	SCC, 1381.6	NNA, 912.9.
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Beverly Chenausky

From: Wamsley, Jerry <Wamsley.Jerry@epa.gov>
Sent: Thursday, January 26, 2017 1:44 PM
To: Beverly Chenausky
Cc: OConnor, Karina
Subject: RE: Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

Hello Beverly,

Our approval of the Nogales PM2.5 emission inventories was as follows: the proposal (NPRM) at 79 FR 51923, 9/2/14; and, the final action (NFRM) at 80 FR 6907, 2/9/15. The emissions data provided in the NPRM is the data as submitted by ADEQ (we may have trued up an estimate here and there after submittal) and subsequently approved in our final action. As noted in the September 2, 2014 NPRM, ADEQ used 2008 NEI V1.5/2.0 in their submittal and we did not find any problematic differences between 2008 NEI V1.5/2.0 and 2008 NEI V3.0.

Resolving yesterday's question about the January 2011 revision of the AP-42 paved road fugitive dust emission factor, however, may get into the detailed differences between the 2008 NEI versions? At present, I am trying to work out that issue with my colleagues. We hope to have a recommendation for you either tomorrow or Monday on how to proceed with a baseline EI interim analysis.

Again, thanks for organizing the call and the opportunity to talk yesterday.

Jerry

From: Beverly Chenausky [mailto:BChenausky@azdot.gov]
Sent: Thursday, January 26, 2017 8:12 AM
To: Wamsley, Jerry <Wamsley.Jerry@epa.gov>
Cc: OConnor, Karina <OConnor.Karina@epa.gov>
Subject: RE: Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

Thank you for taking time to discuss options and approaches on the analysis for this area, gave us some things to consider for the PM2.5 analysis we will be taking another look at data availability. If we were to use the no greater than 2008, what would be the correct source of emissions data to use for the comparison? Would it be the table that was included in the proposed rule for emissions inventory (is the version attached the same emissions data that was approved in Jan. 2015)?

From: Wamsley, Jerry [mailto:Wamsley.Jerry@epa.gov]
Sent: Monday, January 23, 2017 1:16 PM
To: Beverly Chenausky
Cc: OConnor, Karina
Subject: RE: Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

Hello Beverly,

Got your invite. Thanks for setting up the call! Look forward to talking to you on Weds.

Jerry

From: Beverly Chenausky [<mailto:BChenausky@azdot.gov>]
Sent: Monday, January 23, 2017 7:42 AM
To: Wamsley, Jerry <Wamsley.Jerry@epa.gov>
Cc: OConnor, Karina <OConnor.Karina@epa.gov>
Subject: RE: Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

We will set up a teleconference call for Wednesday at 2:30PM AZ time (1:30PM CA) we will send out a calendar appointment soon. Thanks

From: Wamsley, Jerry [<mailto:Wamsley.Jerry@epa.gov>]
Sent: Thursday, January 19, 2017 4:13 PM
To: Beverly Chenausky
Cc: OConnor, Karina
Subject: RE: Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

Hello Beverly,

I have been looking over the Nogales Regional Conformity Analysis methodology and would like to discuss a few points prior to any formal comments. Would you be available on Monday, 1/23 in the afternoon? If so, please bounce back a time to call, perhaps an hour? An alternative time would be Wednesday afternoon timeframe, 1-5pm?

In general, Karina and I would like to discuss the following: (1) the utility of using the 2014 NEI estimates; (2) existing sources of VMT estimates, such as the STIP; and (3) have you considered a baseline year analysis for the PM2.5 interim procedures work?

Thanks,
Jerry

From: Beverly Chenausky [<mailto:BChenausky@azdot.gov>]
Sent: Friday, January 13, 2017 12:05 PM
To: Maslyk, Louis <Louis.Maslyk@hdrinc.com>; Joonwon Joo <JJoo@azdot.gov>; Wamsley, Jerry <Wamsley.Jerry@epa.gov>; OConnor, Karina <OConnor.Karina@epa.gov>; Berry, Laura <berry.laura@epa.gov>; meek, clifton <meek.clifton@epa.gov>; Ed Stillings <ed.stillings@dot.gov>; 'Templeton.Ryan@azdeq.gov' <Templeton.Ryan@azdeq.gov>; 'Christopher Vertrees' <cdvertrees@seago.org>; Patulski, Meg <patulski.meg@epa.gov>; McKaughan, Colleen <McKaughan.Colleen@epa.gov>; 'Lucke-McDowell.Catherine@azdeq.gov' <Lucke-McDowell.Catherine@azdeq.gov>; 'tremaine.wilson@dot.gov' <tremaine.wilson@dot.gov>; 'jeff.houk@dot.gov' <jeff.houk@dot.gov>; Carlos Lopez <CLopez@azdot.gov>; Ralph Ellis <REllis@azdot.gov>; Barton, Michael J. <Michael.Barton@hdrinc.com>; Witt, Jay <Jay.Witt@hdrinc.com>; Bennett, Jill <Jill.Bennett@hdrinc.com>; Amy.Moran@wilsonco.com; Sharon Gordon <sharon.gordon@dot.gov>; Mark Hoffman <Mhoffman@azdot.gov>
Subject: RE: Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

Please find attached information on the Public Hearing for the SR189 scheduled for January 31, 2017. The project website (azdot.gov/189) includes information on the conformity requirements for the project under the Technical

Reports tab in addition to the updated Project of Air Quality Concern Questionnaire included Air Quality Appendix E found under the Draft Environmental Assessment tab. As there were no objections to the determination that this project was not a project of air quality concern the project level interagency consultation is complete with the project identified as a project that does not require a quantitative hot-spot analysis as listed under 40 CFR 93.123(b). In regards to the Regional Conformity requirements, please provide responses to the planning assumptions provided earlier by the public hearing date of January 31, 2017.

ADOT will also be providing an opportunity for stakeholders to comment on project and regional conformity in conjunction with all other project details in the Draft Environmental Assessment through February 14th, 2017 information on providing comments on this project is described in the attached document. Thank you for your continuous support and review of developing documents for this project, let me know if you have any questions and have a great extended weekend.

Beverly Chenausky

From: Beverly Chenausky

Sent: Thursday, December 08, 2016 9:02 AM

To: 'Maslyk, Louis'; Joonwon Joo; 'Wamsley.Jerry@epa.gov'; 'OConnor.Karina@epa.gov'; 'berry.laura@epa.gov'; 'meek.clifton@epa.gov'; Ed Stillings; 'Templeton.Ryan@azdeq.gov'; 'Christopher Vertrees'; 'patulski.meg@epa.gov'; 'McKaughan.Colleen@epa.gov'; 'Lucke-McDowell.Catherine@azdeq.gov'; 'tremaine.wilson@dot.gov'; 'jeff.houk@dot.gov'; Carlos Lopez; Ralph Ellis; 'Barton, Michael J.'; 'Witt, Jay'; 'Bennett, Jill'; 'Amy.Moran@wilsonco.com'; Sharon Gordon

Subject: Interagency Consultation: Determining Project of Air Quality Concern in SEAGO Region STP-189-A(201)T / 189 SC 000 H8045 01L

To Interested Parties:

ADOT is presenting the following project, **SR 189, International Border to Grand Avenue**, for interagency consultation per 40 CFR 93.105 as a potential project that is not a project of Air Quality Concern and thereby will not require a PM10 hot-spot analysis. If through interagency consultation it is determined that this project will not require a hot-spot analysis, other conformity provisions apply and will be addressed in the air quality analysis that will be submitted to FHWA. ADOT is requesting responses to the attached questionnaire within **10 business days**; a non-response will be interpreted as concurrence that the project is not a project of air quality concern and does not require a hot-spot analysis. If any consulted party believes this project should be treated as a project of air quality concern that requires a Quantitative PM hot-spot analysis, please document the appropriate section under 40 CFR 93.123 (b) that applies to the project and describe why the project should be treated as a project of air quality concern.

While this project may not require a quantitative hot-spot analysis, as a regionally significant project in an isolated rural PM10 and PM2.5 nonattainment area this project needs to be included in a regional conformity analysis prior to project approval, per

40 CFR 93.121(b). As required for interagency consultation per 40 CFR 93.105 (c) (ii), attached is ADOT's planning assumptions document that will be used for developing the regional conformity analysis for the Nogales nonattainment area(s). ADOT is requesting responses to the attached regional conformity analysis methodologies within **30 business days**; a non-response will be interpreted as concurrence on the planning assumptions that will be used for the regional conformity analysis.

As with before, additional technical information has been posted and shared on ADOT's ShareFile service as available, if you have any additional questions or need additional information that has not been posted prior on the ShareFile site please let me know, thanks.

Beverly T. Chenausky

Air & Noise Program Manager

MD EM02, Room 41

1611 W. Jackson St.

Beverly Chenausky

Subject: EPA Phone Call on SR 189
Location: Phone Number 866-583-7984 Access Code 1968494#

Start: Wed 1/25/2017 2:30 PM
End: Wed 1/25/2017 3:00 PM

Recurrence: (none)

Meeting Status: Meeting organizer

Organizer: Beverly Chenausky
Required Attendees: Joonwon Joo; Witt, Jay; Maslyk, Louis; 'Templeton.Ryan@azdeq.gov'; Jerry Wamsley; Karina O'Conner; Mike Sonenberg

Discussions on the Planning Assumptions for the Regional Conformity Analysis.

- (1) the utility of using the 2014 NEI estimates;
- (2) existing sources of VMT estimates, such as the STIP; and
- (3) have you considered a baseline year analysis for the PM2.5 interim procedures work?

Please refer to email w/ADEQ suggestions provided (2/26/2016)

The number is 866-583-7984. The access code is 1968494#.

Beverly Chenausky

From: Catherine Lucke-McDowell <Lucke-McDowell.Catherine@azdeq.gov>
Sent: Wednesday, December 07, 2016 8:39 AM
To: Beverly Chenausky
Cc: Mike Sonenberg
Subject: Nogales Mariposa Project ADEQ Consultation

Beverly,

ADOT stated in their response to comments 3-5 that would include re-entrained road dust from paved and unpaved roads in the analysis. The emissions inventory showed that reentrained road dust for unpaved road at 35.7% of the total PM_{2.5} inventory in 2008 (Table 4.2) this would be considered significant. Road construction at 15% would also be considered significant. Since the submitted emissions inventory was approved by EPA and clearly shows that re-entrained road dust is a significant contributor to the PM emissions in the Nogales area ADOT is correct in including these emissions in their analysis.

As for the pollutants that ADEQ wants to see in the PM_{2.5} tests, ADEQ has not made an official finding per 40 CFR 93.102(b)(2)(iv) that NO_x is *not* a significant contributor and per 40 CFR 93.102(b)(2)(v) that VOCs, SO₂, and NH₃ are a significant contributor to the PM_{2.5} problem. In order to determine these things ADEQ would have to do some photochemical modeling for the Nogales area or a chemical speciation study for the monitor samples, both of which ADEQ has not done.

ADEQ would expect to see PM_{2.5} on-road mobile emissions, re-entrained road dust, road construction, and NO_x emissions for the Nogales project.

I hope that answers your questions. If I haven't answered them adequately you can contact me for further info.

The rest of the responses looked good.

Catherine

From: Mike Sonenberg
Sent: Wednesday, November 30, 2016 2:22 PM
To: Catherine Lucke-McDowell <Lucke-McDowell.Catherine@azdeq.gov>
Subject: FW: Nogales

Hi Catherine,

Can you review the following documents and provide feedback for ADOT?

Mike Sonenberg, P.E.
Arizona Department of Environmental Quality
Office: (602)771-4106
www.azdeq.gov

From: Ryan C. Templeton
Sent: Wednesday, November 30, 2016 7:53 AM
To: Mike Sonenberg <Sonenberg.Mike@azdeq.gov>
Subject: FW: Nogales

Mike,

Beverly Chenausky, the ADOT Air and Noise program manager, is looking for feedback on the attached documentation overviews their regional conformity analysis for a project in Nogales, AZ. You mentioned that there was some extra capacity in the Unit at the moment, would you like for someone else to work on this review?

Ryan Templeton
Environmental Engineer Specialist
Air Quality Improvement Planning Section
Air Quality Division, Arizona Department of Environmental Quality
1110 W. Washington Street
Phoenix, AZ 85007
(602) 771-4230
rct@azdeq.gov

From: Beverly Chenausky [<mailto:BChenausky@azdot.gov>]
Sent: Tuesday, November 29, 2016 3:27 PM
To: Ryan C. Templeton <Templeton.Ryan@azdeq.gov>
Cc: Joonwon Joo <Joo@azdot.gov>
Subject: FW: Nogales

Ryan – I am sending over a draft approach for the regional conformity analysis with comments and responses from Jeff Houk (JH). There are a few questions in regard to the level of analysis for PM2.5 as no SIP is in place that discusses what precursors are required and whether road dust is significant.

Can you please review the documents and responses, we hope to send out an updated PM Questionnaire and this document (revised) in the next couple of weeks.

What does ADEQ want to see for the emissions analysis for pollutants for PM2.5?

Thanks,
Beverly

From: Beverly Chenausky
Sent: Friday, February 26, 2016 12:41 PM
To: 'Ryan C. Templeton'
Cc: Joonwon Joo
Subject: RE: Nogales

Thanks for the information, the template we used included the no-greater than 2006 test for conformity for PM2.5 but we can substitute that test for build no-build, we will review the provided documents and contact you if have any questions. Beverly

From: Ryan C. Templeton [<mailto:Templeton.Ryan@azdeq.gov>]
Sent: Friday, February 26, 2016 12:18 PM
To: Beverly Chenausky; Joonwon Joo
Cc: Marina Mejia
Subject: RE: Nogales

Beverly,

Below, I have provided a link to the information we were able to compile for the Nogales PM10 and PM2.5 SIP work related to transportation emissions calculation. I have reviewed the plans and, as you stated, the PM10 SIP contained an approved MVEB, while the PM2.5 SIP did not. Therefore, as you have additionally noted, your PM10 conformity analysis will need to conform to the approved PM10 MVEB. I would recommend the PM2.5 conformity analysis utilize the build-no-build approach. If you decide to utilize a different approach for the PM2.5 conformity analysis, please let us know.

The information contained in the link below includes the following:

- MOVES run – ‘c04023y2008_in20110329’ – These are the modeling files we received from EPA for the MOVES modeling runs utilized in the PM10 plan. As you will quickly tell upon analysis, these files are basically just a shell for default inputs for the region. The same files were utilized in the PM2.5 work to maintain consistency with the PM10 plan.
- PM2.5 – We are providing: 1) the full plan (The emission inventory methodologies are discussed in Appendix A), 2) the results of the MOVES run for the plan, and 3) the emission inventory allocation spreadsheet. The origination of emissions was the 2008 EPS NEI in all cases except MOVES results.
- PM10 – We are providing the PM10 SIP (EPA’s emission inventory methodologies are discussed in Appendix B). Unfortunately, we don’t currently have any additional information on EPA’s methods, besides what is included in the SIP methodology.
- 2008 EPA NEI Nonpoint Methods – As the PM10 and PM2.5 plans heavily relied on the EPA NEI methodologies, we are including EPA’s detailed methods for calculating emissions for road construction, paved road fugitives, and unpaved road fugitives.

All emissions originated from the 2008 EPA National Emission Inventory and were based off the associated methodologies, except MOVES modeling runs. ADEQ feels that updating the information within these methodologies with the most recently available datasets will maintain consistency between your current PM10 conformity work and the original SIP work. A particular question was raised in our recent meeting regarding road construction emission calculations. Based on review of EPA methodologies for calculating road construction emissions, it does not appear as though the methodology distinguishes between FHWA funding provided for projects that are either regionally significant or non-regionally significant. Therefore, I would say that any project receiving FHWA funding should be included when determining total road construction emissions.

As it pertains to on-road emissions growth, it appears that EPA assumed no VMT growth between 2008 and 2011 based on economic conditions. Therefore, with no on-road emissions growth, fugitive dust from paved and unpaved roads did not increase, while MOVES related emissions (i.e. exhaust, tire and brake wear) reduced due to cleaner vehicles. I would say ADOT should utilize internally developed VMT growth factors since economic factors have changed since the time of original creation. Additionally, ADOT is the most qualified to determine these growth factors. However, additional consultation with EPA may be needed to confirm this is appropriate.

Please let me know if we can be of additional help as you move forward with this project.

<https://files.shareazdeq.gov/?ShareToken=B921AA6F21B3B991ED12E609AC17AAB2C4D9635D>

Ryan Templeton
Environmental Program Supervisor
Arizona Department of Environmental Quality
rct@azdeq.gov
(602) 771-4230

From: Marina Mejia
Sent: Friday, February 19, 2016 10:55 AM

To: Ryan C. Templeton <Templeton.Ryan@azdeq.gov>

Subject: FW: Nogales

Hi Ryan,

I spoke with Beverly earlier and she was wondering if we could send her the following information for Nogales:

- MOVES files for Nogales PM10, the files that were used to do the MVEB
- Nogales PM2.5 and PM10 EI information that we have.

Would you have someone in your team gather the information and send it her way please? They are working on a conformity analysis for that area.

Thank you!

Marina

From: Beverly Chenausky [<mailto:BChenausky@azdot.gov>]

Sent: Friday, February 19, 2016 9:04 AM

To: Marina Mejia <Mejia.Marina@azdeq.gov>

Subject: Nogales

Including a link to a general template we plan to use that outlines approaches (lost the license for the PPSUITE that converts travel demand model output data to MOVES that portion will be modified to reflect what approach is used), overall I believe this illustrative example should capture all the requirements. There are some references to the new PM2.5 annual standard that needs updating other details, dates etcl.. page 5-4 is the general assumptions on how we plan to do the analysis based on current SIP information, 5-7 has information on data needed ie., control measures made assumptions only 1 was in SIP pg 5-16.

<http://azdot.gov/docs/default-source/planning/aqguidebook-chapter5-121813.pdf?sfvrsn=2>

We will be sending out a hot-spot questionnaire soon showing that at the project level diesel emissions are not significant.

Beverly T. Chenausky

Air & Noise Program Manager

MD EM04, Room 41

1611 W. Jackson St.

Phoenix, AZ 85007

602.712.6269

azdot.gov



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Environmental Planning

Air Quality

Overview	Congestion Mitigation Air Quality / Transportation Control Measures	Reports and Guidance
Transportation Conformity	Motor Vehicle Emissions Modeling	

Transportation Conformity

Transportation Conformity ensures that transportation plans, programs and projects do not produce new air-quality violations, worsen existing violations or delay timely attainment of the National Ambient Air Quality Standards (NAAQS).

The ADOT Air Quality Team is responsible for implementing and developing the statutory and regulatory requirements for conformity state implementation plans ([conformity SIPs](#)). A conformity SIP includes a state's specific criteria and procedures for certain aspects of the transportation conformity process. Clean Air Act section 176(c) is the statutory authority for transportation conformity (42 U.S.C. 7506(c)). The regulations that explain the requirements for a conformity SIP are found at 40 CFR 51.390, which was updated Jan. 24, 2008 ([73 FR 4420](#)).

Isolated Rural Area Conformity Documents

ADOT is currently developing a regional conformity analysis in support of the [State Route 189 Study: International Border to Grand Avenue](#) project under current study. This project is in Nogales, which is in nonattainment for the Federal standard for particulate matter less than or equal to 2.5 microns in diameter (PM2.5) and for the particulate matter less than or equal to 10 microns in diameter (PM10).

The U.S. Environmental Protection Agency (EPA) transportation conformity regulations requires certain projects in nonattainment areas to engage in interagency consultation and complete PM2.5/PM10 analyses as part of the project-level conformity determination process. In rural areas, interagency consultation on regional and project level conformity required for federal funded transportation projects is conducted through the ADOT's Environmental Planning Air Quality staff. ADOT submitted a Project of Air Quality Concern Questionnaire for PM2.5 and PM10 Interagency Consultation in December 2016 and held two Interagency Consultation Meetings on February 22nd, and May 25th 2016. It was determined through consultation that the project does not fit the description of a project of air quality concern regarding PM2.5 and PM10 as defined in 40 CFR 93.123(b)(1), this process is described [here](#).

Transportation Conformity also requires that FHWA/FTA projects in PM10 and PM2.5 nonattainment and maintenance areas demonstrate that during the time frame of the transportation plan no new local violations will be created and the severity or number of existing violations will not be increased as a result of the project, and the project has been included in a regional emissions analysis that meets applicable §§ 93.118 and/or 93.119 requirements. The demonstration must be performed according to the consultation requirements of § 93.105(c)(1)(i) and the methodology requirements of § 93.123.

ADOT is providing the draft [Arizona Department of Transportation Air Quality Regional Conformity Analysis Nogales Nonattainment Area](#) document for review and comment for the project level analysis of the Environmental Assessment process as identified on the SR 189 project website. Comments will be requested through **May 22nd , 2017** by clicking the Contact tab above and selecting Air Quality as the issue under the contact information or by emailing BChenausky@azdot.gov.

Prior Draft Documents include:

- [Suggested Draft Template for Use in Regional Conformity Analysis](#) (pdf)
- [Regional Conformity Analysis Methods and Assumptions](#) (revised 03/08/17)

MPOs' Conformity Documents

2017 Conformity Finding Letters

- Pima Association of Governments: [2017-2021 TIP](#)

2016 Conformity Finding Letters

- Sun Corridor Metropolitan Planning Organization: [2016-2025 TIP, Amended](#)
- Maricopa Association of Governments [FY2017-2021 TIP](#)

2015 Conformity Finding Letters

- Pima Association of Governments: [2016-2018 TIP](#)

2014 Conformity Finding Letters

- Maricopa Association of Governments: [2014-2018 TIP](#)
Note: Includes projects from SCMPO and Pinal County PM10 and PM2.5 nonattainment areas.

2013 Conformity Finding Letters

- Pima Association of Governments: [2014-2018 TIP](#)
- Yuma Metropolitan Planning Organization: [2014-2018 TIP](#)

2011 Conformity Finding Letters

- Pima Association of Governments: [2012-2016 TIP](#)
- Yuma Metropolitan Planning Organization: [2011-2014 TIP](#)

2010 Conformity Finding Letters

- Maricopa Association of Governments: [2011-2015 TIP](#)
- Maricopa Association of Governments: [2008-2012 TIP](#)
- Pima Association of Governments: [2011-2015 TIP](#)

2009 Conformity Finding Letters

- Pima Association of Governments: [2009-2013 TIP](#)

2009 Conformity Finding Letters

- Maricopa Association of Governments: [2008-2012 TIP](#)
- Pima Association of Governments: [2008-2012 TIP](#)

2007 Conformity Finding Letters

- Yuma Metropolitan Planning Organization: [2007-2011 TIP](#)

Interagency Consultation Meetings

Agendas

- [Feb. 12, 2013](#)
- [Aug. 6, 2013](#)
- [Oct. 17, 2013](#)
- [May 20, 2014](#)
- [July 22 - 24, 2014](#)
- [Feb. 22, 2016](#)
- [May 25, 2016](#)

Minutes

- Draft [Aug. 23, 2012](#)
- Draft [Feb. 12, 2013](#)
- [Aug. 6, 2013](#)
- [Oct. 17, 2013](#)
- [May 20, 2014](#)
- ADEQ and ADOT - [July 22, 2014](#)
- MAG and ADOT - [July 24, 2014](#)
- MCAQD and ADOT - [July 24, 2014](#)
- ADEQ and ADOT - [Feb. 22, 2016](#)
- EPA, FHWA, ADEQ, SEAGO, ADOT, and SR189 Project Team – [May 25, 2016](#)

APPENDIX D

Modeling Files (available upon request)

16 MOVES RunSpec Files (*.mrs)

16 CDM Input Databases (2014nei_c04023y20XX and tdm_c04023y20XX)

16 MOVES Output Databases (2014nei_c04023y20XX and tdm_c04023y20XX)

16 MOVES Output Export (2014NEI_Moves... .csv and TDM_Moves... .csv)