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# YMPO 2018-2041 Regional Transportation Plan

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## **Amendment No. 1** Air Quality Conformity **Conformity Documentation**

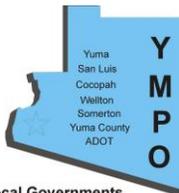
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**"Local Governments  
And Citizens  
Working Together"**

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# 1. INTRODUCTION

As the number of vehicles on the nation's roadways increased, air pollution from mobile sources was identified as an important national health concern. Recognizing this connection, the 1990 Clean Air Act Amendments (CAAAAs) and the Arizona Transportation Conformity Rules require transportation plans, programs (TIP), and projects to conform to the purpose of the Arizona State Implementation Plan (SIP). Conformity to a SIP means that planned transportation activities will not produce new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards (NAAQS). The current federal transportation legislation, Fixing America's Surface Transportation Act and its predecessor, Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21), reinforces the need for coordinated transportation and air quality planning through the metropolitan planning provisions.

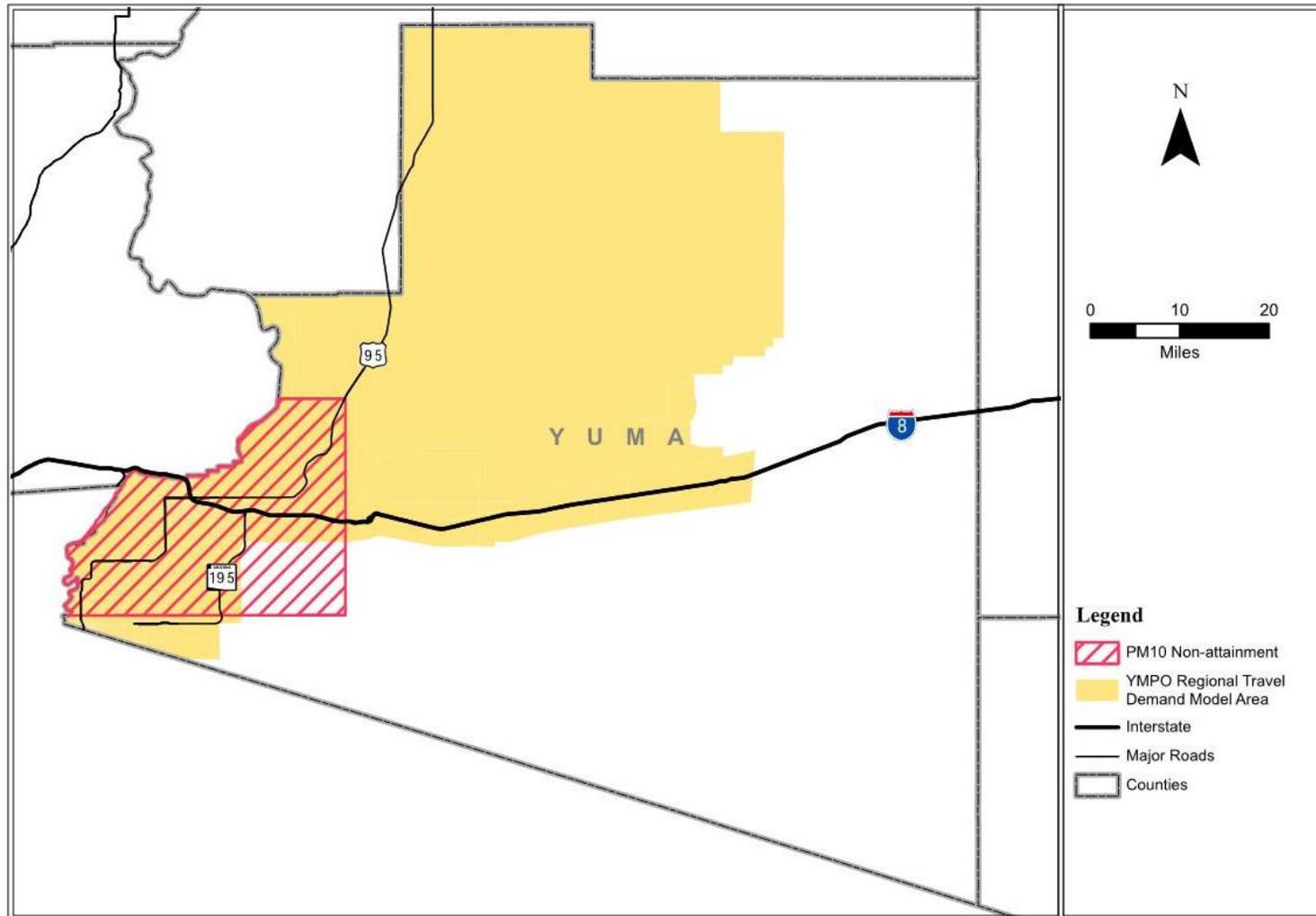
The YMPO has the responsibility to ensure that the transportation plans and programs within the YMPO planning boundaries, generally the greater Yuma area, conform to the state and national air quality plans and standards. Specifically, the emissions generated from proposed projects in the YMPO's five-year Transportation Improvement Program (TIP) for 2018-2022 and the twenty-three year Regional Transportation Plan (RTP) for 2018-2041 must be consistent with and conform to national ambient air quality standards (NAAQS).

The YMPO is required to undertake an air quality conformity analysis for two specific reasons:

- to ensure that transportation investments (projects), strategies and programs, taken as a whole, have air quality impacts consistent with and conforming to state and national air quality plans and standards; and
- to ensure that neither the transportation system as a whole nor individual transportation projects cause new air quality violations or worsen existing conditions.

The air quality conformity process establishes the connection between transportation planning and emission reductions from transportation sources and is intended to ensure that integrated transportation and air quality planning occurs in areas designated as Non-Attainment or Maintenance Areas by the United States Environmental Protection Agency (EPA). A regional emissions analysis must be conducted to assess the impacts that transportation projects will have on emissions within an air quality planning area.

A *Non-Attainment* area is an area that has violated one or more of the National Ambient Air Quality Standards (NAAQS). A portion of the greater Yuma area is currently designated as a nonattainment area. Yuma County comprises the southernmost part of the Colorado River Valley. The City of Yuma, the county seat, is located just south of the confluence of the Colorado and Gila Rivers. The non-attainment area is geographically located in the far southwest portion of the Lower Colorado River Valley as shown in **Figure 1**. The yellow area in Figure 1 represents the YMPO Regional Travel Demand Model Boundary. The red hatched area represents the designated PM10 non-attainment area. There is a portion of the PM10 non-attainment area that is outside of the travel demand model boundary. This area is Federal Land that is not subject to air quality conformity. The PM10 non-attainment area contains a total of 16 full and partial townships comprising approximately 456 square miles or 300,000 acres.



**Figure 1. 2018-2041 PM10 Non-attainment area and YMPO RTP Model Boundary**

In the Yuma area, the air quality violation was for PM<sub>10</sub> particulate matter, a mix of solid and liquid droplets 10 microns or less in diameter. The Yuma area was designated as non-attainment in 1991, but EPA promulgated a Clean Data Finding for 1998-2001 and subsequent years on March 14, 2006 [71 Federal Register 13021; effective May 16, 2006]. A request for redesignation to attainment status and a related Maintenance Plan were submitted to EPA on August 17, 2006 and the EPA did not take formal action on the plan.

The purpose of this conformity analysis is to demonstrate that the Yuma non-attainment area supports the implementation of the financially constrained *YMPO RTP Update 2018-2041* by contributing to improved air quality and will therefore not jeopardize the Yuma region's attainment of the annual PM<sub>10</sub> NAAQS. The conformity determination has been performed according to procedures prescribed by the following federal, state and local regulations: 69 FR 40004, 40 CFR Parts 51 and 93 (i.e. Transportation Conformity Rule Requirements); Arizona transportation conformity rules; and Metropolitan Planning Organization (MPO) Planning Regulations (23 CFR 450) implementing FAST Act and MAP-21 Requirements. Results of this conformity determination are found in **Table 10** of this report. For this transportation plan to be found to conform, the MPO and DOT must demonstrate that the applicable criteria and procedures have been satisfied (section §93.109-a). The following criteria for non-attainment areas are found to be applicable and are described as:

- 1) The TIP and RTP must pass an emissions budget test with a budget that has been found to be adequate by EPA for transportation conformity purposes, or an emission reduction test;
- 2) The conformity determinations must be based upon the most recent planning assumptions;
- 3) The conformity determinations must be based upon the latest emission estimation model available;
- 4) MPOs and state departments of transportation must provide reasonable opportunity for consultation with state air agencies, local air quality and transportation agencies, DOT, and the EPA;
- 5) Timely implementation of Transportation Control Measures (TCMs) in the applicable State Implementation Plan (SIP) must be provided for; and
- 6) The conformity determination must comply with FAST Act, MAP-21 and MPO Planning Regulations.

This report documents the process used by the Yuma MPO for the Conformity Determination for the *YMPO RTP Update 2018-2041*. EPA's MOVES2014a model was used to derive emissions as required by the EPA<sup>1</sup>. This conformity determination serves as an update to the YMPO's most recent conformity finding in 2014. The MOVES input files were created and modified as discussed in the interagency consultation process, with general assumptions and methodology outlined in this chapter. The modeled emissions are based on a number of inputs including temperature, relative humidity, and presence of inspection and maintenance programs, vehicle source type mix, vehicle age distribution, temporal distributions, average daily vehicle miles traveled (VMT), source type populations, hourly distribution, road type distribution, and average speed distribution

## **1.1 Latest Planning Assumption**

The 2012 Yuma MPO Travel Demand Model was updated with consultation and input from state and local transportation agencies and the USDOT to the year 2015. The 2041 RTP provides the appropriate level of detail required by 40 CFR 93.106 of the conformity regulations. The highway projects in the 2041 LRTP are financially constrained for the entire plan and for each horizon year in terms of capital,

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<sup>1</sup> MOVES2014 and MOVES2014a Technical Guidance: Using MOVES to Prepare Emission Inventories for State Implementation Plans and Transportation Conformity, November 2015.

operations and maintenance costs (See RTP Chapter 8). The conformity analysis is based on assumptions derived from estimates of current and future population, employment, travel, and congestion. As part of the 2041 RTP conformity determination, past assumptions have been discussed with various local, state and federal agencies for their continued validity and updated whenever necessary. Detailed planning assumptions are presented in Section 2 of this chapter.

## **1.2 Latest Emissions Estimation Model**

Mobile source emissions estimates for an average day (assumed for this analysis to occur in the month of April) to represent annual conditions were developed using EPA's Motor Vehicle Emission Simulator, MOVES2014a (November 2016), and travel estimates from the latest Yuma MPO Travel Demand Model. The Yuma MPO, Arizona Department of Transportation (ADOT), and Arizona Department of Environmental Quality (ADEQ) provided the most current data available for emissions calculations. The Federal Highway Administration (FHWA) provided guidance as well. The EPA's AP-42 guidance (<https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-Compilation-air-emission-factors>) as well as the region's previous conformity finding were referenced to calculate road dust emissions.

## **1.3 Travel Demand Modeling**

The YMPO Travel Demand Model is the most recent and approved regional travel demand model for the study area. The travel demand model boundary is shown in **Figure 1**. Although model approval is a joint process between the MPO and the appropriate state review agencies, the Arizona Department of Transportation (ADOT) is the primary agency responsible for approval of the travel demand model for use in developing the Long-Range Transportation Plan (RTP) and other planning activities of the Yuma MPO.

The YMPO Travel Demand Model is a four-step model. Trip generation, trip distribution, mode choice, and trip assignment components are included in the model. The base year of the travel demand model is 2015. Socioeconomic data was forecasted to the year 2041 as a part of this model update effort. Traffic count data provided by Arizona Department of Transportation from their Transportation Data Management System for the year 2015 was used to validate the travel demand model<sup>2</sup>. Trip making characteristics, such as trip generation, average trip lengths, and travel mode were obtained from the 2001 National Household Travel Survey. A transit trip matrix estimated from the Yuma County Intergovernmental Public Transportation Agency (YCAT) in 2012 was used in the mode choice component of the travel demand model. These travel surveys appear to remain adequate based on comparison of available travel data in the region. Appendix E of the RTP contains the assumptions and methodology used to develop the travel demand model.

## **1.4 Interagency Consultation and Public Participation**

Interagency consultation is the central coordinating mechanism for public agency involvement and input to the conformity determination. The conformity determination must be made according to 40 CFR §93.105-(a)-(2) and (e) and the requirements of 23 CFR 450 (40 CFR §93.112, Criteria and Procedures).

The Yuma MPO coordinated its activities for this conformity determination with numerous stakeholders and review agencies, including ADOT, ADEQ, FHWA, EPA, and other necessary agencies. The Yuma MPO has held teleconference calls and email correspondence to discuss the issues pertinent to the YMPO Conformity Demonstration (e.g. latest planning assumptions).

The Yuma MPO's Public Participation Plan, adopted in 2016, specifies procedures to ensure public involvement in the planning process. All Executive Board meetings are open to the public for comments

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<sup>2</sup> <https://www.azdot.gov/planning/DataandAnalysis>

on any item. The public was notified of the opportunities to comment on this conformity demonstration. All comments received from the public, committee members, and review agencies were addressed appropriately. Specific information related to the public participation process for development of the RTP is provided in Chapter 3 of the RTP document.

### **1.5 Exempt Projects**

There are no projects in the transportation plan or program that require mitigation. 40 CFR § 93.126 Exempt Projects. The YMPO's Plan and Program include the following exempt projects by category: Safety Improvements; Traffic Control Devices; Pavement Preservation; Sweeping Paved Surfaces; Watering Canal Maintenance/service Roads; Lighting Improvements; Purchase of Federal Transit Administration (FTA) Section 5310 paratransit vans, Section 5307 public transportation vehicles; Bicycle and Pedestrian Facilities; and Planning, Engineering, and Environmental studies. All projects in the YMPO area are from a conforming Plan and conforming Program, as determined by YMPO in the proposed RTP February 2017. There are no projects where there are PM10 construction impacts and, at the same time, where the Yuma PM10 SIP also identifies construction-related fugitive PM10 as a contributor to the non-attainment.

### **1.6 Conformity Test**

The conformity tests specified in the federal transportation conformity rule are: (1) the emissions budget test, and (2) the emissions reduction test. For the emissions budget test, predicted emissions for the TIP/LRTP must be less than or equal to the motor vehicle emissions budget (MVEB) specified in the approved air quality implementation plan or the emissions budget found to be adequate for transportation conformity purposes. If there is no approved air quality plan for a pollutant for which the region is in non-attainment or no emission budget has been found to be adequate for transportation conformity purposes, the emissions reduction test applies.

The Build/No Build Test was applied to transportation projects in the Yuma PM10 nonattainment area until 2007. On June 12 2007, EPA found that the MVEB for PM10 in the 2006 Yuma PM10 Maintenance Plan is adequate for transportation conformity purposes, effective June 27, 2007. (72 FR 32295). As a result of EPA's adequacy finding, the applicable emissions budget for the YMPO nonattainment conformity determinations is 10,803 TPY for 2016 and all years thereafter.

## 2. METHODOLOGY

The emissions inventory development and emissions projection discussion below identifies procedures used by the Yuma MPO to obtain emissions for the PM10 non-attainment area protocol report was developed and discussed during the interagency consultation call. A copy of the protocol report can be found in **Appendix A**. The protocol report outlines the approach taken for data sources for the conformity demonstration.

### 2.1 Mobile Source Emissions

**Table 1** summarizes the settings used in the MOVES run specification file. **Table 2** lists the assumptions used in the MOVES County Data Manager. Further details on the use of MOVES are found in the following sections.

<b>Table 1 – MOVES Runspec Parameters</b>	
<b>MOVES Runspec Parameter</b>	<b>Settings</b>
<b>MOVES2014a Version 2016/11/17</b>	Database version 2015/12/01
<b>Scale</b>	County, Inventory
<b>Time Span</b>	Years: 2018, 2021, 2031, and 2041 Time aggregation: Hour 1 month representing average annual conditions (April) All hours of the day selected Weekdays only
<b>Geographic Bounds</b>	Arizona- Yuma County
<b>Vehicles/Equipment</b>	All available fuel types All available source types
<b>Road Type</b>	All road types including off-network
<b>Pollutants and Processes</b>	PM10 (exhaust, tirewear, brakewear), PM2.5 (tirewear and brakewear), total energy consumption. All Processes
<b>General Output</b>	Units : grams, joules, miles Activity: Distance Traveled
<b>Output Emissions</b>	Time = hour, location = county
<b>Advanced Performance</b>	None

Once all of the base parameters have been established for a given MOVES Runspec, the County Data Manager can be used to enter locally-specific data. Input provided in Excel spreadsheet format can be referenced using this tool, which converts the data to MySQL format and incorporates it into the MOVES analysis. For this analysis, locally-specific data could consist of data used for the entire region, statewide, or county-level data. **Table 2** provides more detail on the methodology and assumptions used to arrive at the information entered for each input value. Default data refers to data extracted from the most up to date available MOVES program (MOVES2014a) for each scenario being modeled. **Table 3** summarizes the source population for each analysis year determined from the county vehicle registration data and projected using a calculated growth rate from the YMPO Travel Demand Model VMT.

**Table 2 – MOVES County Data Manager Parameters**

<b>County Data Manager Input</b>	<b>Data Source</b>
<b>Age Distribution</b>	January 2016 vehicle registration data for the Yuma area was obtained from the MVD report generated January 2, 2016, furnished by ADOT, along with a conversion process spreadsheet to modify this data for use in the EPA converter spreadsheet. The same age distribution was used for all analysis years.
<b>Source Type Population</b>	January 2016 source type population information was obtained for the Yuma area from the MVD report generated January 2, 2016, furnished by ADOT. Future year growth was obtained by determining the annual growth rates in VMTs from the YMPO Travel Demand Model, and then applying those growth rates to the January 2016 source type population to obtain the model years source type population.
<b>Meteorology Data</b>	Default Values
<b>I/M Program</b>	No I/M program information will be applied
<b>Vehicle Type VMT (HPMS)</b>	Daily VMT is from the YMPO Travel Demand Model. This travel demand model's base year socioeconomic data is 2015 and was validated against 2015 traffic volumes.
<b>Monthly VMT Fraction</b>	Determined using EPA conversion tool for Annual Average Weekly VMT.
<b>Daily VMT Fraction</b>	Determined using EPA conversion tool for Annual Average Weekly VMT.
<b>Hourly VMT Fraction</b>	2014 Arizona Statewide Model data was obtained from ADOT for use in the data field. This data was used for all analysis years.
<b>Fuels</b>	Default data was obtained using MOVES Fuel Wizard
<b>Ramp Fraction</b>	Using local data obtained from YMPO Travel Demand Model. This travel demand model's base year socioeconomic data is 2015 and was validated against 2015 traffic volumes.
<b>Road Type Distribution</b>	2014 Arizona Statewide Model data was obtained from ADOT for use in this data field. This data was used for all analysis years.
<b>Average Speed Distribution</b>	Default data was used since more detailed data is not available at a regional or state level.

**Table 3 – Source Population and Daily VMT by Analysis Year**

Input Value	Analysis Year			
	2018	2021	2031	2041
Source Population	188,723	200,275	244,134	297,598
Daily VMT	3,571,121	3,848,713	4,776,257	5,677,186

## 2.2 Paved and Unpaved Road Dust

The primary contributor to PM10 emissions in the Yuma non-attainment area is road dust from paved and unpaved roads. Emissions for road dust are calculated using the AP-42<sup>3</sup>. The AP-42, *Compilation of Air Pollutant Emission Factors*, has been published since 1972 as the primary compilation of EPA's emission factor information. This document, currently in its fifth edition, contains guidance on how to determine PM10 road dust emissions from both paved and unpaved roads in chapter 13 sections 13.2.1 (updated January 2011) and 13.2.2 (updated November 2006) respectively. The methodology for estimating paved and unpaved road dust emissions was determined following consultation with the FHWA Resource Center and the Arizona Department of Environmental Quality in April 2017.

VMT from the YMPO Travel Demand Model was obtained for the model functional classes. VMT for off-network links had to be estimated to determine the local paved and unpaved values. Local streets and roadways are not represented in the Yuma MPO Travel Demand Model (TDM). To estimate Vehicle Miles Traveled (VMT) on these roadways, the methodology described in the Arizona Department of Environmental Quality's (AzDEQ) Yuma PM10 Maintenance Plan (August 2006) was used. The VMT per mile for each local link in an individual traffic analysis zone (TAZ) or group of TAZ's was estimated based on its length and the number of trip ends generated in the TAZ. The following equation was used to estimate VMT for local paved and unpaved roadways:

$$VMT_{i,n} = (T_n / \Sigma L) \times (L_{i,n})^2$$

where:

VMT<sub>i,n</sub> = daily vehicle miles traveled for link i within TAZ n

T<sub>n</sub> = total number of trip ends generated in TAZ n

L = total length of all links in TAZ n in miles

L<sub>i,n</sub> = length of link i within TAZ n in miles

Daily VMT and the number of trip ends generated in each TAZ and groups of TAZ's were obtained for the base year 2015 from the travel demand model. The length of paved and unpaved local roads in the non-attainment area was obtained from Yuma County, the City of Yuma, and the City of Somerton.

The aggregate future year VMT for local roads was estimated off-model using the following equation based on the base year and future year number of dwelling units. The methodology was also taken from the AzDEQ Yuma PM10 Maintenance Plan (August 2006).

$$VMT_f = (DU_f - DU_p) \times 1.22 + VMT_p$$

where:

VMT<sub>p</sub> = present year daily vehicle miles traveled

VMT<sub>f</sub> = future year daily vehicle miles traveled

DU<sub>p</sub> = present year dwelling units

<sup>3</sup> <https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emission-factors>

DU<sub>f</sub> = future year dwelling units

For this analysis, the increase in VMT will be applied to local paved roadways as the increase in the number of dwelling units would likely occur along roadways paved for the development and not on unpaved roadways. Silt loading factors for paved roadways contained in the previous conformity determination were also carried forward, as were emission factors for unpaved roads.

According to the AP-42, paved road dust can be determined using the following equation:

$$E = K (sL)^{0.91} \times (W)^{1.02}$$

where

E = particulate emission factor (having units matching the units of k),

k = particle size multiplier for particle size range and units of interest (1 for PM10 and units of g/VMT),

sL = road surface silt loading (grams per square meter) (g/m<sup>2</sup>), and

W = average weight (tons) of the vehicles traveling the road (determined by referencing the average value used by MAG in their most recent conformity finding).

This equation was applied to all paved road types to determine the associated emissions.

## 2.3 Total Emissions

After performing the analyses described above, emissions from all processes were combined to determine the overall impact of on-road mobile sources on PM10 levels in the Yuma non-attainment area. **Table 4** through **Table 7** show these emissions for all analysis years, along with the values needed to calculate paved road dust emissions.

Facility Type	Particle Size Multiplier (g/VMT)	Silt Loading Factor (g/m <sup>2</sup> )	Average Vehicle Weight (tons)	Emission Factor (g/VMT)	Vehicle Miles Traveled (VMT)	Emissions (kg/day)	
<i>Interstate</i>	1	0.04	3.18	0.174	755,090	131.33	
<i>Principal Arterials</i>	1	0.3	3.18	1.088	936,795	1,019.30	
<i>Minor Arterials</i>	1	0.3	3.18	1.088	750,200	816.27	
<i>Rural Major Collectors</i>	1	0.7	3.18	2.352	333,240	783.92	
<i>Rural Minor Collectors</i>	1	0.7	3.18	2.352	159,819	375.96	
<i>Urban Collectors</i>	1	0.24	3.18	0.888	244,730	217.35	
<i>Local Roads</i>	1	0.85	3.18	2.807	39,256	110.19	
<i>Interstate Ramps</i>	1	0.04	3.18	0.174	34,314	5.97	
<i>Local paved</i>	1	0.85	3.18	2.807	2,132,053	5,984.73	
<i>Local unpaved</i>				107.611	112,887	12,147.88	
<i>MOVES Emissions</i>					Tireware (kg/day)	36.56	320.31
					Brakeware (kg/day)	113.12	
					Exhaust (kg/day)	170.63	
<i>PM<sub>10</sub> Emissions (kg/day)</i>						<b>21,913.21</b>	
<i>PM<sub>10</sub> Emissions (tons/day)</i>						<b>24.15</b>	
<i>PM<sub>10</sub> Emissions (tons/year)</i>						<b>8,816.64</b>	

**Table 5 - Yuma 2021 Particulate Matter (PM10) Conformity Analysis**

Facility Type	Particle Size Multiplier (g/VMT)	Silt Loading Factor (g/m2)	Average Vehicle Weight (tons)	Emission Factor (g/VMT)	Vehicle Miles Traveled (VMT)	Emissions (kg/day)	
<i>Interstate</i>	1	0.04	3.18	0.174	807,300	140.41	
<i>Principal Arterials</i>	1	0.3	3.18	1.088	1,000,350	1088.45	
<i>Minor Arterials</i>	1	0.3	3.18	1.088	782,172	851.06	
<i>Rural Major Collectors</i>	1	0.7	3.18	2.352	384,146	903.67	
<i>Rural Minor Collectors</i>	1	0.7	3.18	2.352	192,014	451.70	
<i>Urban Collectors</i>	1	0.24	3.18	0.888	268,760	238.69	
<i>Local Roads</i>	1	0.85	3.18	2.807	42,683	119.81	
<i>Interstate Ramps</i>	1	0.04	3.18	0.174	32,546	5.66	
<i>Local paved</i>	1	0.85	3.18	2.807	2,137,352	5,999.61	
<i>Local unpaved</i>				107.611	112,887	12,147.88	
<b>MOVES Emissions</b>					Tireware (kg/day)	39.39	287.86
					Brakeware (kg/day)	120.68	
					Exhaust (kg/day)	127.79	
<b>PM<sub>10</sub> Emissions (kg/day)</b>						<b>22,234.79</b>	
<b>PM<sub>10</sub> Emissions (tons/day)</b>						<b>24.51</b>	
<b>PM<sub>10</sub> Emissions (tons/year)</b>						<b>8,946.03</b>	

**Table 6 - Yuma 2031 Particulate Matter (PM10) Conformity Analysis**

Facility Type	Particle Size Multiplier (g/VMT)	Silt Loading Factor (g/m2)	Average Vehicle Weight (tons)	Emission Factor (g/VMT)	Vehicle Miles Traveled (VMT)	Emissions (kg/day)	
<i>Interstate</i>	1	0.04	3.18	0.174	1,004,870	174.77	
<i>Principal Arterials</i>	1	0.3	3.18	1.088	1,212,302	1,319.07	
<i>Minor Arterials</i>	1	0.3	3.18	1.088	938,939	1,021.63	
<i>Rural Major Collectors</i>	1	0.7	3.18	2.352	487,074	1,145.80	
<i>Rural Minor Collectors</i>	1	0.7	3.18	2.352	221,083	520.08	
<i>Urban Collectors</i>	1	0.24	3.18	0.888	356,952	317.01	
<i>Local Roads</i>	1	0.85	3.18	2.807	57,581	161.63	
<i>Interstate Ramps</i>	1	0.04	3.18	0.174	37,025	6.44	
<i>Local paved</i>	1	0.85	3.18	2.807	2,166,095	6,080.29	
<i>Local unpaved</i>				107.611	112,887	12,147.88	
<b>MOVES Emissions</b>					Tireware (kg/day)	48.53	258.91
					Brakeware (kg/day)	149.01	
					Exhaust (kg/day)	61.37	
<b>PM<sub>10</sub> Emissions (kg/day)</b>						<b>23,153.51</b>	
<b>PM<sub>10</sub> Emissions (tons/day)</b>						<b>25.52</b>	
<b>PM<sub>10</sub> Emissions (tons/year)</b>						<b>9,315.67</b>	

**Table 7 - Yuma 2041 Particulate Matter (PM10) Conformity Analysis**

<b>Facility Type</b>	<b>Particle Size Multiplier (g/VMT)</b>	<b>Silt Loading Factor (g/m2)</b>	<b>Average Vehicle Weight (tons)</b>	<b>Emission Factor (g/VMT)</b>	<b>Vehicle Miles Traveled (VMT)</b>	<b>Emissions (kg/day)</b>	
<i>Interstate</i>	1	0.04	3.18	0.174	1,194,709	207.78	
<i>Principal Arterials</i>	1	0.3	3.18	1.088	1,446,654	1,574.06	
<i>Minor Arterials</i>	1	0.3	3.18	1.088	1,061,003	1,154.44	
<i>Rural Major Collectors</i>	1	0.7	3.18	2.352	644,348	1,515.78	
<i>Rural Minor Collectors</i>	1	0.7	3.18	2.352	259,665	610.84	
<i>Urban Collectors</i>	1	0.24	3.18	0.888	429,025	381.02	
<i>Local Roads</i>	1	0.85	3.18	2.807	74,692	209.66	
<i>Interstate Ramps</i>	1	0.04	3.18	0.174	42,163	7.33	
<i>Local paved</i>	1	0.85	3.18	2.807	2,205,080	6,189.72	
<i>Local unpaved</i>				107.611	112,887	12,147.88	
<b>MOVES Emissions</b>					Tireware (kg/day)	58.03	285.18
					Brakeware (kg/day)	176.56	
					Exhaust (kg/day)	50.60	
<b>PM<sub>10</sub> Emissions (kg/day)</b>						<b>24,283.71</b>	
<b>PM<sub>10</sub> Emissions (tons/day)</b>						<b>26.77</b>	
<b>PM<sub>10</sub> Emissions (tons/year)</b>						<b>9,770.40</b>	

### 3. REASONABLE AVAILABLE CONTROL MEASURES

In 1992, Transportation Control Measures (TCMs) were established for the Yuma non-attainment area. These TCMs were transportation improvements planned and implemented for the purpose of reducing pollutant emissions and improving air quality. At the same time, local governments adopted, implemented and enforced Reasonable Available Control Measures (RACMs). Some of the RACMs implemented included:

- paving, stabilizing, and/or reducing travel on unpaved streets, roads, and unpaved areas;
- watering unpaved streets, alleys, shoulders, and canal and levee roads;
- sweeping paved streets;
- reducing travel on canal roads; and
- constructing improvements such as parking lots and landscaped areas to minimize the amount of undeveloped desert in developed areas that was exposed to the elements.

The conformity demonstration inventoried the recent RACMs implemented by jurisdictions within the Yuma non-attainment area. For the updated conformity, updated mileage data was gathered from these jurisdictions and emissions were calculated as shown in **Table 8**. The length in centerline miles was provided from the jurisdictions along with the number of days of operation. The number of days of operation refers to the number of days throughout the year that the RACM was conducted. The vehicle per day (veh/day) estimation was obtained from local paved road traffic counts and adjusted by taking 10% for paved RACM and 10% of the paved veh/day for the unpaved RACM. This assumption was made to provide a conservative estimation that could be applied to all jurisdictions. To quantify the RACMs for each jurisdiction the guidelines provided by the FHWA for Multi-Pollutant Emissions Benefits of Transportation Strategies were followed<sup>4</sup>.

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<sup>4</sup> [https://www.fhwa.dot.gov/ENVIRONMENT/air\\_quality/conformity/research/mpe\\_benefits/mpe07.cfm](https://www.fhwa.dot.gov/ENVIRONMENT/air_quality/conformity/research/mpe_benefits/mpe07.cfm)

<b>Table 8- Reasonable Available Control Measures Emission Reductions</b>					
<b>Categories=Watering/Street Sweeping; Paving, Stabilizing, Reduced Travel; Ground Improvements</b>					
<b>Entity</b>	<b>Category</b>	<b>Length in Lane Miles</b>	<b>Veh/Day</b>	<b>Total Days of Operation</b>	<b>Emission Reductions (tons/year)</b>
<b>City of Somerton</b>	Watering	4.84	10	305	8.81
	Street Sweeping	42.75	90	52	0.04
				Total	8.85
<b>City of Yuma</b>	Watering	0.028	10	208	0.02
	Street Sweeping	39.6	90	208	0.20
				Total	0.22
<b>Yuma County</b>	Paving	2	90	-	41
	Watering	19.3	10	208	15.80
	Street Sweeping	3.9	90	208	0.02
	Stabilizing	0.08	10	208	0.07
				Total	56.89
<b>MCAS</b>	Street Sweeping	8.6	90	146	0.03
				Total	0.03
<b>San Luis</b>	Watering	0.17	10	208	0.14
	Street Sweeping	4	90	208	0.02
				Total	0.16
<b>Grand Total</b>					<b>66.15</b>

### 3.1 Newly Paved Roads

In addition to the emissions reductions sources described above, there will be emissions reductions gained because of newly paved roads and widened roads that are included as fiscally constrained projects list in the 2018-2041 RTP. These emissions reductions shown in **Table 9** were estimated by analysis year for these paving improvements. The reduction in tons/year were estimated using the same methodology used in the RACMs.

<b>Table 9– Emissions Reductions from RTP Paving Improvements</b>		
<b>Analysis Year</b>	<b>Miles of Improvements</b>	<b>Emission Reductions (tons/year)</b>
<b>2018</b>	0	0
<b>2021</b>	11.20	337
<b>2031</b>	33.26	688
<b>2041</b>	51.87	1,073

## 4. SUMMARY RESULTS AND CONCLUSIONS

Results from this analysis are summarized in **Table 10** and compared with the established motor vehicle emission budgets (MVEBs). Estimated emissions are representative of the combination of MOVES and AP-42 results. The annual reductions are from the RACMs and the newly paved roads. The difference in the estimated emissions and reduction provides the total adjusted PM10 levels in the YMPO nonattainment area for the maintenance plan budget years 2018, 2021, 2031, 2041.

<b>Budget Year</b>	<b>PM10 Tons per Year (TPY)</b>	<b>Maintenance Plan Budget TPY*</b>	<b>Annual Reduction TPY</b>	<b>Total Adjusted PM10 TPY</b>
<b>2018</b>	8,816.64	10,803	66.15	8,750.49
<b>2021</b>	8,946.03	10,803	403.15	8,542.88
<b>2031</b>	9,315.67	10,803	754.15	8,561.52
<b>2041</b>	9,770.40	10,803	1,139.15	8,631.25

\*Motor Vehicle Emissions Budgets were found adequate for use in conformity (75 FR 32295; effective June 27, 2007)

On June 12, 2007 EPA found the MVEB to be adequate for transportation conformity purposes (75 FR 32295; effective June 27, 2007). EPA did not take formal action on the Yuma PM10 Maintenance Plan that was submitted on August 17, 2006. The MVEB for all analysis years is 10,803 tpy. The modeled emissions total each analysis year is shown in **Table 10**.

This air quality analysis documentation demonstrates conformity between the 2018-2022 Transportation Improvement Program, the 2018-2041 Regional Transportation Plan, and the State Implementation Plan. The analysis indicates that the projected emissions levels based on projects contained in the *YMPO RTP Update 2018-2041* meet the applicable conformity tests. Therefore, it is the determination of this analysis that this plan conforms under the PM<sub>10</sub> National Ambient Air Quality Standards.