APPENDIX E.

Air Quality Conformity Analysis Technical Memorandum

YMPO
ARIZONA

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Acronyms and Abbreviations

Full Name	Acronym
Alternate Vehicles Fuels and Technologies	AVFT
Arizona Department of Environmental Quality	ADEQ
Clean Air Act	CAA
Environmental Protection Agency	EPA
Federal Highway Administration	FHWA
Federal Transit Administration	FTA
Fixing America's Surface Transportation	FAST
Grams per square meter	g/m^2
Grams per vehicle miles travelled	g/VMT
Highway Performance Monitoring System	HPMS
Long-Range Transportation Plan	LRTP
Metropolitan Planning Organization	MPO
Motor Vehicle Data	MVD
Motor Vehicle Emissions Budget	MVEB
Motor Vehicle Emissions program	MOVES
Moving Ahead for Progress in the 21st Century	MAP-21
National Ambient Air Quality Standards	NAAQS
Nitrogen oxides	NO_x
Nonattainment Area	NAA
Particulate Matter Standard for particulate matter less than 10 µm in aerodynamic diameter	PM_{10}
Parts per billion	ppb
Run Specification	RUNSPEC
State Implementation Plan	SIP
Tons per year	tpy
Traffic analysis zone	TAZ
Travel Demand Model	TDM
Transportation control measure	TCM
Transportation Improvement Program	TIP
Vehicle miles traveled	VMT
Vehicles per day	veh/day
Volatile organic compounds	VOC
Yuma Metropolitan Planning Organization	YMPO

1. Introduction

Air pollution from mobile sources has been identified as an important national health concern. Recognizing this connection, the 1990 Clean Air Act Amendments and the Arizona Transportation Conformity Rules require transportation improvement plans, programs, 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, exacerbate existing violations, or delay timely attainment of the national ambient air quality standards (NAAQS).

The Yuma Metropolitan Planning Organization (YMPO) is the designated Metropolitan Planning Organization (MPO) for the Yuma region. 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 Transportation Improvement Program (TIP) for FY 2026-2030 and the YMPO LRTP for FY 2026–2050 must be consistent with and conform to the NAAQS.

The YMPO is required to conduct an air quality conformity analysis to ensure that transportation projects, strategies, and programs included in the Long-Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP) are consistent with state and federal air quality plans and standards. This process confirms that neither the overall transportation system nor individual projects will cause new air quality violations or worsen existing conditions.

Air quality conformity establishes the critical link between transportation planning and emissions reductions from mobile sources. It ensures that transportation and air quality planning are coordinated in areas designated as Nonattainment or Maintenance Areas by the U.S. Environmental Protection Agency (EPA). As part of this process, a regional emissions analysis must be conducted to assess the impacts of transportation projects within the air quality planning area.

A Nonattainment Area (NAA) is an area that has violated one or more of a NAAQS. 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. A portion of the greater Yuma area is currently designated as a Moderate NAA for the 1987 Particulate Matter Standard for particulate matter less than 10 µm in aerodynamic diameter (PM_{10}). A smaller portion of the greater Yuma area is designated as a NAA (Marginal) for the 2015 8-hour Ozone Standard.

Because there are nonattainment areas within the YMPO planning boundary, the regional TIP and LRTP are subject to transportation conformity requirements. This report presents the conformity analysis for the YMPO FY 2026-2030 TIP and the FY 2026-2050 LRTP Update.

The purpose of this conformity analysis is to demonstrate that the Yuma nonattainment areas support the implementation of the financially constrained YMPO LRTP 2026-2050 and the YMPO FY 2026-2030 TIP by contributing to improved air quality and will therefore not jeopardize the Yuma NAA's attainment of the annual PM_{10} and 2015 8-hour ozone 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 (Arizona Administrative Code Title 18); and
- MPO Planning Regulations (23 CFR 450) implementing Infrastructure Investment and Jobs Act (IIJA), Fixing America's Surface Transportation (FAST) Act and Moving Ahead for Progress in the 21st Century Act (MAP-21) Act requirements.

1.1 Overview of Conformity Requirements

The transportation conformity requirement is based on Clean Air Act (CAA) Section 176(c), which prohibits the U.S. Department of Transportation and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to the SIP for attaining the NAAQS. Conformity requirements apply only in nonattainment and maintenance areas of the NAAQS.

The federal transportation conformity rule (40 Code of Federal Regulations Parts 51 and 93) specifies criteria and procedures for conformity determinations for transportation plans, programs, and projects and their respective amendments. The federal transportation conformity rule was first promulgated in 1993 by EPA, following the passage of amendments to the federal CAA in 1990. The federal transportation conformity rule has been revised several times since its initial release to reflect both EPA rule changes, court opinions, statutory and/or policy changes.

The principal requirements (EPA 40 CFR Parts 51 and 93) of the federal transportation conformity rule for TIP and RTP conformity determinations are:

(1) The TIP and RTP must pass an emissions budget test with a budget that has been found to be adequate or approved by EPA for transportation conformity purposes, or interim emissions tests;

(2) The conformity determinations must be based upon the most recent planning assumptions and emission estimation model available.

(3) 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.

(4) The TIP and RTP must provide for the timely implementation of transportation control measures (TCMs) specified in the applicable air quality implementation plans; and

(5) The conformity determination must comply with FAST Act, MAP-21, and MPO Planning Regulations.

1.2 YMPO Area Designations and Air Quality Plans

1.2.1 PM_{10} Nonattainment Area

A portion of the greater Yuma area was designated as Moderate NAA for PM_{10} on November 6th, 1991 (56 FR 56694) but EPA promulgated a Clean Data Finding for 1998-2001 and subsequent years on March 14, 2006 (71 FR 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. Unfortunately, the NAA has recorded PM_{10} that exceeds the NAAQS once again. Since the completion and conformity determination of the 2022-2026 YMPO TIP and 2022-2045 LRTP, EPA rescinded its previously issued clean data determination (CDD) for the Yuma, Arizona "Moderate" nonattainment area for the 1987 24-hour NAAQS for PM10. This was effective June 17, 2022. As a result, the proposed 2026-2050 LRTP determines conformity for PM10 using interim emission test as outlined in 40 CFR 93.119, instead of the past maintenance plan Motor Vehicle Emissions Budgets (MVEBs). EPA, state representatives, and the YMPO are currently developing a new SIP plan for future actions.

The PM_{10} Moderate NAA is geographically located in the far southwest portion of the Lower Colorado River Valley as shown in Figure 1. The blue area in Figure 1 represents the YMPO Regional Travel Demand Model Boundary and the hatched area is the NAA. The red hatched area represents the designated PM_{10} NAA. There is a portion of the PM_{10} NAA that is outside of the travel demand model boundary. This area is Federal Land and there are no regionally significant roads in this area. The PM_{10} NAA contains a total of 16 full and partial townships comprising approximately 456 square miles or 300,000 acres.

1.2.2 Ozone Nonattainment Area

In 2015, EPA revised the NAAQS for ozone by lowering the level of the standard to 70 parts per billion (ppb). A small portion of the greater Yuma area was designated as Marginal NAA for the 2015 8-hour ozone standard on June 4th, 2018 (83 FR 25786). The Yuma ozone nonattainment area is located in northwest Yuma County along the Arizona/California border, approximately 157 miles southwest of Phoenix. The total land area of the nonattainment area is 52 square miles, which comprises approximately 0.94 percent of the total land area of Yuma County. The portion of Yuma County that is in nonattainment for ozone is shown in Figure 2.

1.2.3 SIP Status

PM_{10}

In 2006, EPA determined that the Yuma PM_{10} Nonattainment Area had met the 1987 PM_{10} NAAQS and issued a clean data determination. This suspended the need for CAA requirements related to nonattainment planning for as long as the greater Yuma area continued to meet the PM_{10} NAAQS (72 FR 32295). The clean data determination did not, however, remove the nonattainment status for the Yuma PM_{10} Nonattainment Area.

On May 17, 2022, EPA took final action to recall the clean data determination based on recent air quality monitoring data that showed the area violated the PM_{10} standard (87 FR 29830). In that same action, EPA also determined that the SIP was substantially inadequate to meet the standard in the Yuma PM_{10} Nonattainment Area and required that ADEQ submit a SIP revision meeting the applicable nonattainment plan requirements. EPA also set a new attainment date for the Yuma PM10 NAA. The area is to attain as expeditiously as practicable but not later than December 31, 2027.

Currently, the Arizona Department of Environmental Quality (ADEQ) is working with Yuma stakeholders to develop new rules to reduce PM_{10} emissions and bring the Yuma Nonattainment Area into compliance with NAAQS. At the time of this analysis, a revised SIP for Yuma PM_{10} NAA is being prepared and there is no EPA approved emissions budget for the Yuma PM_{10} NAA.

Ozone

CAA Section 110(a)(1) requires states to submit SIP revisions within three years following the promulgation of new or revised NAAQS that provide for implementation, maintenance, and enforcement of such standards. Each of these SIPs must address certain basic elements of the state's air quality management programs under CAA Section 110(a)(2)(A) through (M). These elements include, but are not limited to, legal authority to develop and adopt rules and SIP revisions to comply with CAA requirements, provisions for establishment and operation of an ambient monitoring network, public and local agency participation in air quality planning, and operation of permitting programs. ADEQ submitted Arizona SIP Revision under CAA Sections 110(a)(1) and 110(a)(2) for the 2015 Ozone NAAQS to EPA on September 24, 2018.

Under CAA section 182(a), Arizona was required to submit a revised SIP for the Yuma NAA for ozone within two years from the effective date of the nonattainment designation. ADEQ submitted this SIP revision to EPA on Dec. 22, 2020. On Oct. 7, 2022, EPA determined, in accordance with CAA section 181(b)(2)(A) and the provisions of the Ozone NAAQS SIP Requirements Rule (40 CFR 51.1303), that the greater Yuma area attained the 2015 ozone NAAQS by the marginal area attainment date of Aug. 3, 2021. The nonattainment designation remains until EPA determines that the planning area meets additional CAA provisions required for redesignation. ADEQ submitted a redesignation request and maintenance plan to EPA in December 2023. On Nov. 5, 2024, EPA proposed to approve the redesignation request and maintenance plan. (89 FR 87828). In that same proposal, EPA proposed to approve the 2020, 2030 and 2037 motor vehicle emissions budgets.

At the time of this conformity analysis, there is no EPA approved or adequate motor vehicle emissions budgets for the Yuma ozone NAA for Ozone.

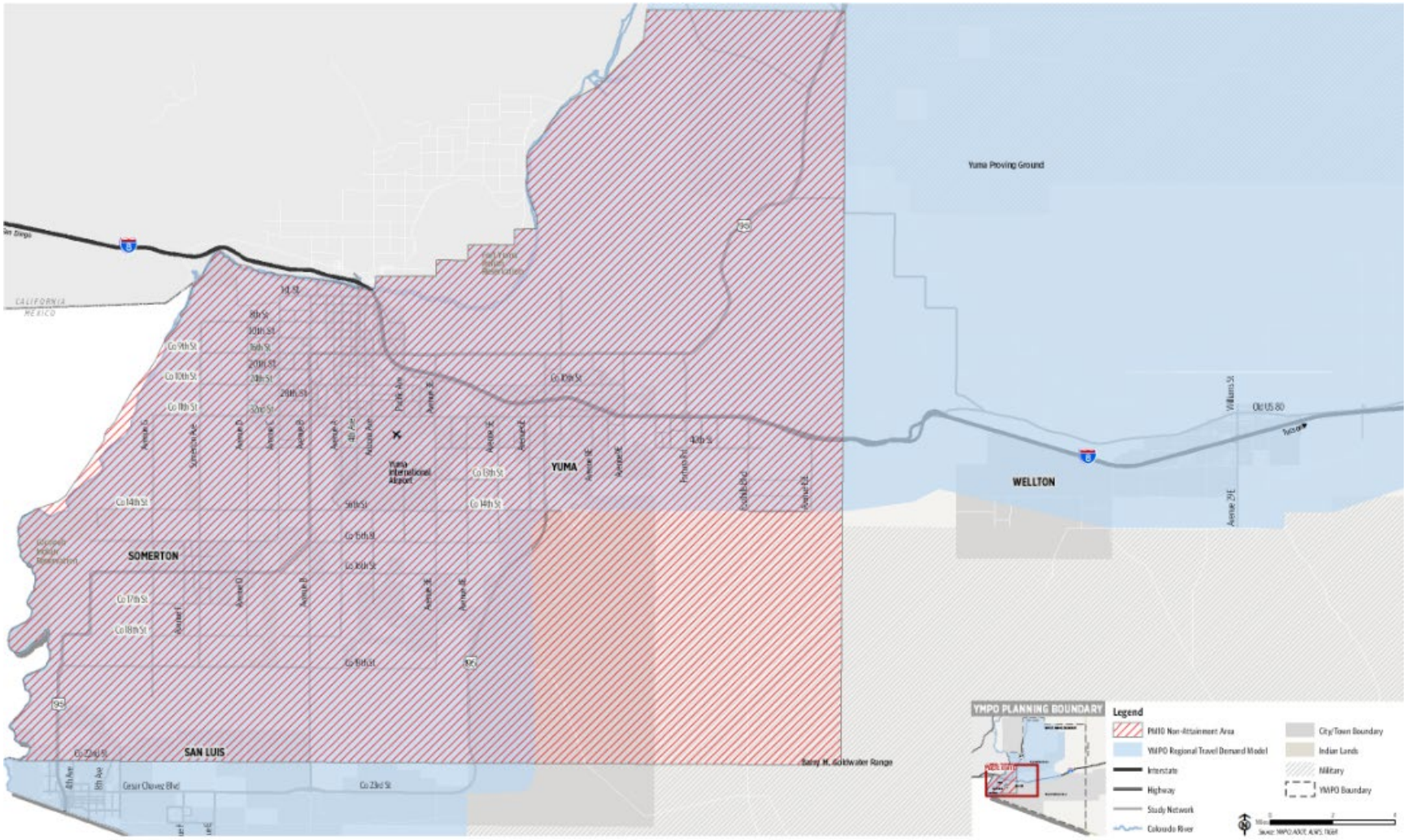

Figure 1. PM_{10} Nonattainment Area

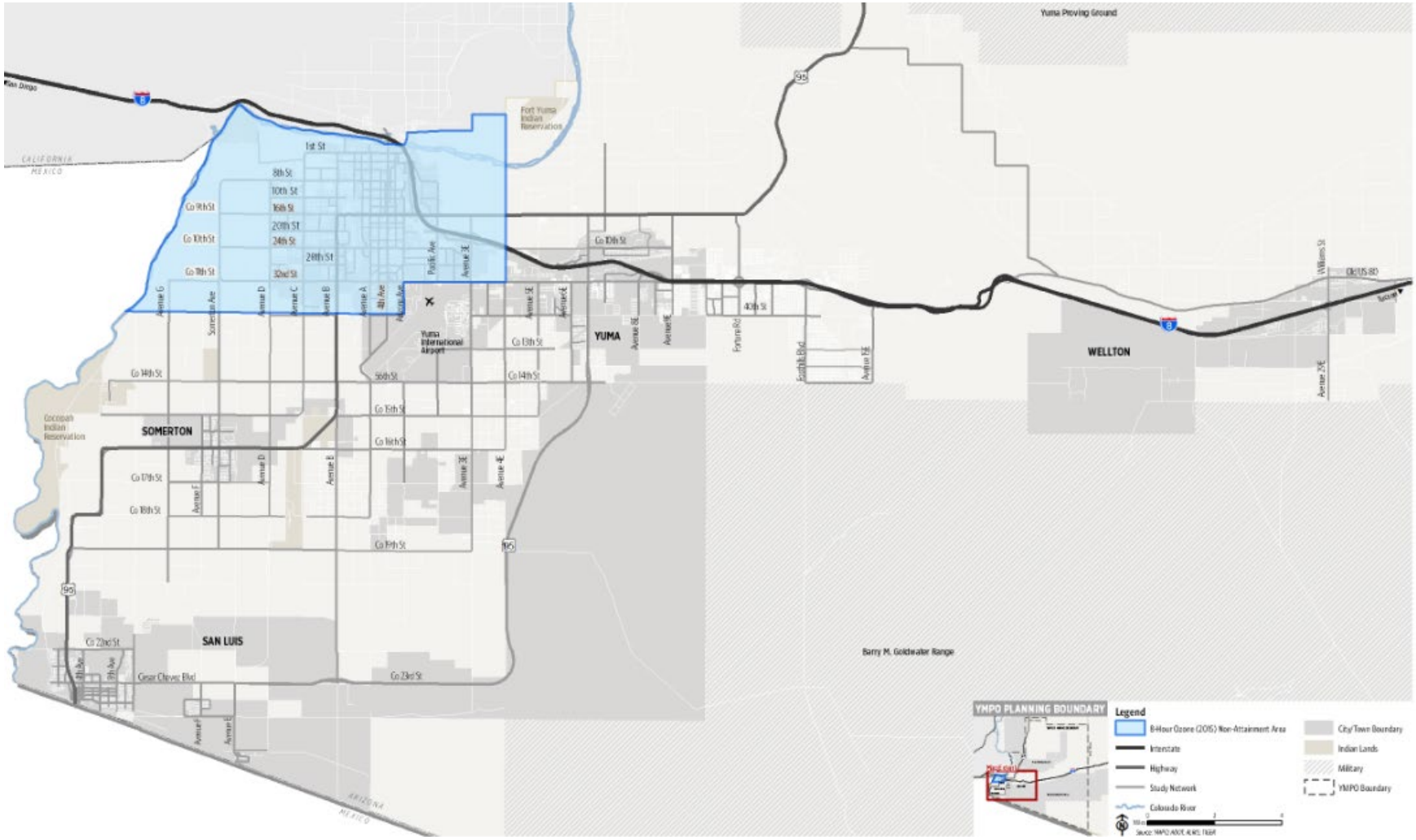

Figure 2. Ozone Nonattainment Area

1.3 Applicable Conformity Requirements

1.3.1 Analysis Years

The conformity rule (Section 93.119(g)) indicates that the years must be no more than ten years apart, the first year must be no more than five years beyond the year in which the conformity determination is being made, and the last year must be aligned with the transportation plan (i.e., YMPO 2026-2050 LRTP, and the YMPO 2026-2030 TIP, both of which contain projects in the greater Yuma nonattainment areas). The analysis years selected for this conformity analysis are 2024, 2030, 2040, and 2050 for PM_{10} and ozone, which meet the criteria in Section 93.119 (g).

1.3.2 Emission Tests

The conformity tests specified in the federal transportation conformity rule include the emissions budget test and the interim emissions tests. For the emissions budget test, predicted emissions for the TIP and 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 by EPA to be adequate for transportation conformity purposes. If there is no approved air quality plan for a pollutant for which the region is in nonattainment or no emissions budget found to be adequate for transportation conformity purposes, interim emissions tests apply.

PM_{10}

Historically, before 2007, YMPO has used the Build vs No Build Test for the Yuma PM_{10} nonattainment area. After the EPA made the determination that the MVEB for PM_{10} in the 2006 Yuma PM_{10} Maintenance Plan (ADEQ 2006) was adequate for transportation conformity purposes in 2007 (72 FR 32295), YMPO used the PM_{10} MVEB from the 2006 Yuma PM_{10} Maintenance Plan for the conformity analysis between 2007 and 2022.

On May 17, 2022, EPA rescinded the MVEB in the 2006 Yuma PM_{10} Maintenance Plan and a revised SIP for the Yuma NAA for PM_{10} is still being prepared. Currently there is no EPA-approved SIP or MVEB for PM_{10}. Therefore, an interim emission test, i.e. Build versus No Build analysis, was performed in accordance with the Transportation Conformity Regulations to ensure that LRTP and TIP do not negatively impact air quality goals. If the Build scenario emissions of PM_{10} are no greater than the No Build scenario emissions, the LRTP and TIP are deemed to meet the conformity requirements for PM_{10}.

Ozone

A maintenance plan for ozone was submitted to EPA in December 2023. Currently there is no EPA-approved SIP or MVEB for ozone. Therefore, an interim emission test, i.e. Build vs No Build analysis, was performed for nitrogen oxides (NO_x) and volatile organic compounds (VOC) emissions from the Yuma NAA for ozone. If the Build emissions of ozone precursors, NO_x and VOC are not greater than the No Build emissions, the project is deemed to meet the conformity requirements for ozone.

1.3.3 Implementation of TCM

TIP and LRTP are required to provide timely implementation of TCMs in applicable SIP, as well as demonstrate that the plan and/or program is not interfering with this implementation. TCM is defined as any measure that is specifically identified and committed to in the applicable SIP, including a substitute or additional TCM that is incorporated into the applicable SIP through the process established in CAA section 176(c)(8), that is either one of the types listed in CAA section 108, or any other measure for the purpose of reducing emissions or concentrations of air pollutants from transportation sources by reducing vehicle use or changing traffic flow or congestion conditions.

Currently, there are no applicable/EPA-approved SIP for the Yuma PM_{10} and ozone NAA. Discussion of implementation of TCM will be included in future analysis when SIP documents for Yuma NAA are approved.

2. Conformity Demonstration Methodology

This section documents the methodology used for the conformity determination for the YMPO LRTP 2026-2050 Update. The methodologies were developed through agency consultation on the proposed models, associated methods, and assumptions for the analysis and the projects to be assessed. The final determination of conformity for the TIP and RTP is the responsibility of the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA).

2.1 Latest Planning Assumptions

The Clean Air Act requires that conformity determinations be based on the most up-to-date emissions estimates, which are based on the latest data for population, employment, travel, and congestion. These estimates must be provided by the Metropolitan Planning Organization (MPO) or another authorized agency. On January 18, 2001, the U.S. Department of Transportation (DOT) and the Environmental Protection Agency (EPA) issued guidance to clarify how the most recent planning assumptions should be used in conformity determinations. Later, in December 2008, the EPA updated this guidance.

The guidance encourages areas to update their planning assumptions, particularly for population, employment, and vehicle registration, every five years. These updates should be based on the most recent data from the Metropolitan Planning Organization (MPO) or another authorized agency, and the data must be approved by the MPO. If conformity determinations rely on data older than five years, a written justification must explain why newer data wasn't used. Additionally, if updates are needed, the conformity determination should include a schedule for when those updates will be made. The planning assumptions and methodologies used in the FY 2026-2030 YMPO Air Quality Conformity Analysis are discussed in detail in this chapter.

Population and Employment

In accordance with Executive Order 2011-04, population and employment estimates and forecasts developed by the Arizona Office of Economic Opportunity (AOEO) should be utilized by all government agencies for planning purposes. The State Demographer's Office, a part of AOEO, developed yearly population and employment estimates and 25-year population forecasts for the State of Arizona, counties, and cities. A Council of Technical Solutions, comprised of representatives from State universities, regional councils, and state agencies, provides technical guidance on the quality, methodology, standards, and analytical techniques.

Based on previous planning documents, local jurisdictions' General Plans, and input received from local officials, planned developments and potential timeframes were identified. Socioeconomic projections developed by the State Demographer's Office for the 2030, 2035, 2040, and 2050 horizon years were disaggregated at the YMPO regional travel demand model's Traffic Analysis Zone (TAZ) level to reflect the planned residential, commercial, and employment developments. TAZs are used to divide large regions, such as the entire YMPO region, into smaller geographies to group socioeconomic data particularly for use of traffic modeling purposes. TAZ boundaries often, but not always, align with major streets or physical boundaries, such as municipal boundaries, waterways, or political boundaries. The State Demographer's Office estimates that the YMPO region will have a population of 284,184 by 2050, a 33 percent increase from today's population. **Table 1** shows a tabular summary of the current population estimates and future population projections in the YMPO area.

Table 1. Population Projections

Jurisdiction	Y2023	Y2030	Y2035	Y2040	Y2050
San Luis	38,149	40,674	43,878	47,057	53,286
Somerton	14,723	16,553	17,622	18,680	20,748
Wellton	2,603	3,103	3,449	3,792	4,468
Yuma	101,018	112,533	119,799	126,993	141,047
Cocopah Indian Tribe	870	899	920	941	983
Unincorporated Yuma County	55,664	59,298	60,452	61,569	63,652
Yuma County Total	**213,027**	**233,060**	**246,120**	**259,032**	**284,184**

Population estimates and projections were obtained from AOEO

Year 2023 to year 2033 employment projections from the State Demographer's Office were prorated to determine preliminary employment projections for 2030, 2035, 2040, and 2050. Preliminary projections were then updated based on feedback from jurisdiction staff and readily available future development plans. The YMPO region is projected to have approximately 104,945 employees by the year 2050, a 25 percent increase from today. **Table 2** shows a tabular summary of the current employment estimates and future employment projections in the YMPO region.

Table 2. Employment Projections

Jurisdiction	Y2023	Y2030	Y2035	Y2040	Y2050
San Luis	7,127	7,592	7,924	8,256	8,920
Somerton	2,180	2,322	2,424	2,525	2,729
Wellton	1,174	1,250	1,305	1,360	1,469
Yuma	51,737	55,111	57,521	59,931	64,751
Cocopah Indian Tribe	922	983	1,025	1,068	1,154
Unincorporated Yuma County	20,711	22,062	23,027	23,992	25,921
Yuma County Total	**83,852**	**89,321**	**93,227**	**97,133**	**104,945**

Traffic Counts

In 2024, YMPO validated its travel demand model estimates for the 2023 base year using traffic count data from approximately 285 locations on interstates, arterials, collectors, and local roads. For interstates and highways, YMPO relied on data from ADOT's Traffic Data Management System (TDMS) portal. Additionally, YMPO analyzed data from ADOT's permanent traffic count stations to assess monthly traffic variations. Based on this analysis, April was determined to best represent typical yearly traffic conditions. YMPO also collected traffic counts during both peak and off-peak seasons for arterials, collectors, and local roads. The combined data from YMPO and ADOT was then used to calculate Annual Average Daily Traffic (AADT), which was essential in validating the traffic volumes from the 2024 Travel Demand Model.

Model validation is an ongoing process where data, program coefficients, parameters, and assumptions are refined through successive simulation runs until the model's traffic volumes and patterns closely match the known traffic counts within acceptable limits. To assess model performance, the following measures were reviewed:

- Percent assignment error
- Root Mean Square error
- Coefficient of Determination (R-squared, R^2)

The results of the model validation can be found in **Table 3.**

Table 3. Model Validation Statistics

FUNCTIONAL CLASS	SUM OF COUNTS	SUM OF ASSIGN	NUMBER OF COUNTS	PERCENT ERROR	PERCENT ERROR TARGET	PERCENT RMSE	RSQUARED
Interstate	53,356	54,409	3	1.97%	7.00%	7.02	0.98
Principal Arterial	1,398,435	1,474,605	80	5.45%	10.00%	14.17	0.93
Minor Arterial	966,732	976,388	67	1.00%	10.00%	15.82	0.88
Collector	656,837	572,306	132	-12.87%	25.00%	44.50	0.64
Local	23,862	21,615	3	-9.42%		35.09	0.99
Total	3,099,222	3,099,323	285	0.00%	5.00%	21.06	0.93

Source: YMPO 2024 Travel Demand Model

Vehicle Miles of Travel (VMT)

VMT for Model Network Roads

In 2024, YMPO recalibrated the regional transportation model, which simulates daily traffic volumes on over 2,000 roadway links across Yuma County. The model primarily focuses on paved roads, including interstates, arterials, collectors, and some key local roads. VMT for each road segment is calculated by assigning traffic volumes during the highway assignment process. These VMT estimates are summarized by roadway type and used as input for MOVES model conformity analyses.

The model covers primarily paved roads such as collectors, arterials, and interstates, with additional VMT data for select local roads. To ensure the model's accuracy, estimated traffic volumes are validated against actual traffic counts, as discussed in the previous section. Tables 5 through 8 provide detailed VMT by road type as derived from the travel demand model.

VMT for Off-Model Paved Roads

For local paved roads that are not part of the travel demand model, detailed traffic volume data (AADTs) are not readily available. However, the model includes some local roads, and count data for those roads was used to validate the model's VMT estimates. To estimate VMT for off-model local roads, an average AADT for local roads in the model was applied to the local road miles that fall outside the model.

The following outlines the calculation of VMT for off-model paved roads for 2024. Similar calculations were applied to all analysis years:

- Local Road Miles in Model: 22.24 miles
- VMT for Local Roads Within the Model: 38,277 miles
- Average AADT for Local Roads: 1,721 vehicles/day
- Yuma County Paved Local Road Miles Not in the Model: 716.63 miles
- VMT for Off-Model Paved Roads: 1,233,615 miles

VMT for Off-Model Unpaved Roads

As part of the FY 2026-2030 YMPO Long-Range Transportation Plan (LRTP) and Air Quality Conformity Analysis, an inventory of unpaved roads was conducted in April-May 2025. A total of 373.73 miles of unpaved roads and 716.63 miles of paved local roads were identified in the Yuma NAA.

Detailed traffic volume data for unpaved roads in Yuma County or the YMPO Travel Demand Model is not available. To address this, a peer agency evaluation was conducted, comparing methodologies used by other Arizona counties that are not in attainment for PM10. Maricopa and Pinal counties were considered for this evaluation. The average traffic count on an unpaved road in Maricopa County was 58 vehicles/day, while in Pinal County it was 157 vehicles/day. Given Pinal County's similarities to Yuma County, an average AADT of 157 vehicles/day was used to estimate VMT for unpaved roads in Yuma County, applying this value to the local unpaved road miles. While this approach likely overestimates off-model unpaved road VMT, the same assumptions were applied consistently across all analysis years.

Speeds

Speeds significantly affect emission rates, particularly for pollutants like NOx and VOCs. Link-specific speeds are derived from the traffic assignment step of the travel demand model and input into the MOVES model. These speeds reflect congested traffic conditions and not free-flow conditions. Model outputs account for average daily traffic conditions across different facility types.

Vehicle Registrations

Accurate vehicle registration data is essential for ensuring the MOVES model accurately reflects the characteristics of the fleet operating in the region. This includes information on vehicle types, fuel types (gasoline, diesel, electric, hybrid), vehicle age, and engine size. For the year 2024, raw vehicle registration data from ADOT's Department of Motor Vehicles was processed by the Maricopa Association of Governments (MAG) to format the data for input into the MOVES model. MAG processed this data for Yuma County.

Implementation Measures

In 1992, Transportation Control Measures (TCMs) were introduced for the Yuma PM10 NAA to reduce pollutant emissions and improve air quality. These TCMs included transportation improvements specifically designed to address air pollution. The 2006 State Implementation Plan (SIP) proposed by the Arizona Department of Environmental Quality (ADEQ) for the PM10 NAA also included Reasonably Available Control Measures (RACMs) as a control strategy. However, to date, the EPA has not taken formal action on SIP controls for the greater Yuma area and all prior Yuma SIPs have been withdrawn by ADEQ. ADEQ is in the process of preparing a new SIP.

Local governments in the greater Yuma area have adopted and implemented various control measures to reduce PM10 emissions, including:

- Paving, stabilizing, or limiting travel on unpaved streets, roads, and open areas.
- Watering unpaved streets, alleys, shoulders, and canal or levee roads.
- Sweeping paved streets.
- Reducing travel on canal roads.
- Building improvements like parking lots and landscaped areas to minimize exposed desert in developed regions.
- Adopted and applied speed limit reductions on some key transportation corridors.

Recent control measures within the Yuma nonattainment area were reviewed for this conformity determination. The impacts and benefits of these measures were directly incorporated into the calculation of emissions from unpaved roads, with assistance from ADEQ in this process.

2.2 Travel Demand Modeling

Transportation Models

This air quality conformity determination uses the YMPO 2024 regional travel demand model, which is a validated, comprehensive tool that simulates both current and future travel behavior based on projected demographic, land use, and network conditions.

The YMPO 2024 travel demand model is a traditional four-step model, which includes:

- Trip Generation – Estimates the number of trips produced and attracted by each Traffic Analysis Zone (TAZ), based on factors like land use, household characteristics, and employment data.
- Trip Distribution – Uses gravity models or destination choice models to assign origin-destination pairs and simulate regional travel patterns.
- Mode Choice – Although the model includes a mode choice option, the share of trips made by transit, walking, or biking is minimal in the YMPO region and was not modeled. As a result, the emissions estimates in this document represent a more conservative estimate.
- Traffic Assignment – Allocates vehicle trips to the road network based on factors such as travel time, congestion, and roadway characteristics.

The model provides annual average daily traffic (AADT) conditions, distinguishing between different trip purposes like home-based work, home-based shopping, and non-home-based trips. The model has been

calibrated and validated using observed traffic data, as described in the Traffic Counts section above. The model validation process and results are also detailed in that section, with further information available in the YMPO 2024 Travel Demand Model documentation.

Traffic Estimates and Forecasts

Traffic forecasts are generated for key analysis years, including the base year (2024) and future years (2030, 2035, 2040, and 2050), for both no-build (without transportation improvements) and build (with all local and regional projects included in the LRTP and TIP) scenarios.

The model outputs are formatted in a way that is compatible with the MOVES model for air quality conformity analysis

2.3 Air Emissions Modeling – PM_{10}

The EPA's Motor Vehicle Emissions (MOVES) program, MOVES4 model, was used to estimate emissions as required by the EPA. MOVES4 was used because the ADEQ has developed their emissions budget using this version of MOVES. The MOVES4 input files were created following the methodologies as discussed in the interagency consultation process, with general assumptions and methodology outlined in this section. The modeled emissions are based on a number of inputs including temperature, relative humidity, inspection and maintenance program, vehicle source type mix, vehicle age distribution, average daily vehicle miles traveled (VMT), source type populations, hourly distribution, road type distribution, and average speed distributions.

In addition to the PM_{10} emissions from the MOVES4 modeling which include PM_{10} emissions from vehicle exhaust emissions, brake wear, and tire wear, PM_{10} emissions due to re-entrained road dust from paved and unpaved roads were also included in the PM_{10} emissions analysis.

2.3.1 MOVES4 Modeling Methodology – PM_{10}

Options and parameters used for the PM_{10} MOVES4 modeling are in **Tables 4 and 5.**

Table 4. MOVES Runspec Parameters – PM10

RUNSPEC PARAMETER	DETAILS
MOVES4.0.2 Version	MOVES4 model, released in August 2023; includes the MOVES4 database and patch released in January 2025 (MOVES4.0.2)
Scale	County, Inventory
Time Spans	Years: 2024, 2030, 2040, 2050 Months: Using April data to represent average conditions Days: Weekdays Hours: All hours
Geographic Bounds	Arizona - Yuma County
Vehicles/Equipment	All available fuel types All available source types
Road Type	All road types, including off-network
Pollutants and Processes	PM_{10}: Primary Exhaust, Brake wear, Tire wear $PM_{2.5}$: Primary Exhaust, Species, brake wear, Tire wear All Processes
General Output	Units: grams (mass), joules (energy), miles (distance) Activity: Distance Traveled, Population
Output Emissions	Time Aggregation: 24-Hour Day Location: County
Advanced Features	None

Notes:
[a] VMT data from the YMPO Travel Demand Model are based on travel conditions in the month of April, which serves as a proxy for average annual conditions. This approach is supported by an analysis of traffic count data from two permanent monitoring stations, which showed that April traffic volumes closely align with annual averages.

Table 5. MOVES County Data Manager Parameters – PM10

COUNTY DATA MANAGER INPUT	DATA SOURCE
Age Distribution	This data was derived using the latest Motor Vehicle Data (MVD) reports furnished by ADOT, with future analysis years' data projected using the EPA Age Distribution Projection Tool for MOVES4 released in August 2023.
Source Type Population	This data was derived using the latest MVD reports furnished by ADOT, with future growth years rates linearly interpolated using the YMPO Travel Demand Model.
Meteorology Data	Meteorological data was derived from AZDEQ-developed air dispersion modeling meteorological data files.
I/M Program	No I/M program information was applied.
Vehicle Type VMT (HPMS)	Daily VMT is from the YMPO Travel Demand Model. The HPMS data are specific to each NAA and are unique for the ozone and PM10 NAA. HPMS vehicle type distribution was obtained from ADOT for all analysis years, consistent with previous modeling.
Hourly VMT Fraction	The MOVES4 default approach was used.
Fuels	AVFT data was derived from ADOT 2024 vehicle registration data and Yuma County transit bus data. The MOVES4 default approach was used for Fuel Supply, Fuel Formulation, and Fuel Usage Fraction.
Road Type Distribution	This data was derived from the December 2017 approved air quality analysis from ADOT for all analysis years, consistent with previous modeling.
Average Speed Distribution	The MOVES4 default approach was used.

2.3.2 Re-Entrained Dust From Paved and Unpaved Roads

The primary contributor to PM_{10} emissions in the Yuma PM_{10} NAA is road dust from paved and unpaved roads. Emissions for road dust are calculated using the method provided in AP-42[1], *Compilation of Air Pollutant Emission Factors*. AP-42 contains guidance on how to determine PM_{10} 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 promulgated in AP-42 for paved road dust is shown in Equation 1:

$$E = k(sL)^{0.91} \times (W)^{1.02} \times (1-P/4N) \qquad [1]$$

Where:
E = particulate emission factor (gVMT)
k = particle size multiplier for particle size range and units of interest
sL = road surface silt loading (grams per square meter) (g/m^2)
W = average weight (tons) of the vehicles traveling the road
P = days with 0.01 inches precipitation or more (three year average)
N = number of days in averaging period

Equation 2 shows the defined method for unpaved roads for vehicles traveling on publicly accessible roads as defined in AP-42[2], dominated by light duty vehicles:

$$E = [(k(s/12)^{a}S/30)^{d}) / (M/0.5)^{c})] - C \qquad [2]$$

[1] https://www.epa.gov/sites/default/files/2020-10/documents/13.2.1_paved_roads.pdf

[2] AP42, Section 13.2.2 Unpaved Roads - Updated November 2006 (epa.gov)

Where:
E = size-specific emission factor (lb/VMT)
k, a, b, c and d are empirical constants
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
C = emission factor for 1980's vehicle fleet exhaust, brake, and tire wear

AP-42 further indicates that the Equation 1 and 2 emission factors can be extrapolated to annual average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual average emissions are inversely proportional to the number of days with measurable (more than 0.254 mm [0.01 inch]) precipitation:

$E_{ext} = E * [(365-P)/365]$ [3]

Where:
E_{ext} *= annual size-specific emission factor extrapolated for natural mitigation (lb/VMT)*
E = emission factor from Equation 1 or Equation 2 (lb/VMT)
P = number of days in a year with at least 0.01 of precipitation

The resulting factor (E_{ext}) is multiplied by Vehicle Miles Traveled (VMT) to determine emissions in pounds. Process to determine off-model paved and unpaved roads VMT is discussed in the Vehicle Miles Traveled section.

For unpaved roads, excluding private agricultural roads, ADEQ, in its draft emissions inventory for the Yuma PM-10 State Implementation Plan (SIP) dated June 3, 2025, established two emission factors. These factors were developed based on an inventory of unpaved roads and the dust control measures implemented by jurisdictions within the Yuma nonattainment area. One emission factor applies to well-maintained gravel roads that are chemically stabilized and regularly watered; the other applies to untreated dirt roads. Both factors are derived from Equations 1b and 2 in Section 13.2.2.2 of EPA's AP-42 guidance.

For graded and compacted gravel roads treated with magnesium chloride ($MgCl_2$), ADEQ assumed a silt content of 8.2%, a control efficiency of 50%, and an average vehicle speed of 17 mph. Based on these inputs, the PM-10 emission factors were calculated to be 100.3 grams per vehicle mile traveled (g/VMT) when wet and 225.4 g/VMT when dry. According to local agency staff, these roads are typically watered just once every 90 days, or about four days per year. As a result, the average annual emission factor for these stabilized gravel roads was estimated at 224.0 g/VMT.

For untreated dirt roads, ADEQ assumed that no chemical or gravel stabilization measures were in place. Applying a simplified 50% control efficiency to the baseline emission factor yielded a final PM-10 emission factor of 896.15 g/VMT.

Vehicle miles traveled (VMT) on graded and compacted gravel roads account for 80% of total unpaved road VMT, while untreated dirt roads account for the remaining 20%. Based on this distribution, the weighted average PM-10 emission factor for unpaved roads in the Yuma nonattainment area is calculated to be 359 g/VMT.

2.3.3 Total PM_{10} Emissions

After performing the analyses described above, emissions from all processes (AP-42 and MOVES4) were combined to determine the overall impact of on-road mobile sources on PM_{10} levels in the Yuma NAA.

2.4 Air Emissions Modeling – Ozone

Ozone is not a pollutant released directly into the air by any source but is rather a secondary pollutant formed from a complex process involving a reaction between precursor pollutants and sunlight. Nitrogen oxides (NO_x) and volatile organic compounds (VOCs) are the main precursor pollutants that lead to the formation of ozone. Therefore, conformity of ozone is demonstrated through evaluations of NO_x and VOC emissions.

2.4.1 MOVES4 Modeling Methodology – Ozone Precursors

Table **6** presents the options and parameters used for the MOVES4 modeling for NO_x and VOC. MOVES4 County Data Manager Inputs used for NO_x and VOC are the same as those presented in Table **7**.

Table 6. MOVES Runspec Parameters – Ozone

RUNSPEC PARAMETER	DETAILS
MOVES4.0.2 Version	MOVES4 model, released in August 2023; includes the MOVES4 database and patch released in January 2025 (MOVES4.0.2)
Scale	County, Inventory
Time Span	Years: 2024, 2030, 2040, 2050 Months: Using July data to represent average conditions Days: Weekdays Hours: All hours
Geographic Bounds	Arizona - Yuma County
Vehicles/Equipment	All available fuel types All available source types
Road Type	All road types, including off-network
Pollutants and Processes	Oxides of Nitrogen (NO_x), Volatile Organic Compounds (VOCs), Non-Methane Hydrocarbons, Total Gaseous Hydrocarbons, All Processes
General Output	Units: grams (mass), joules (energy), miles (distance) Activity: Distance Traveled, Population
Output Emissions	Time Aggregation: 24-Hour Day Location: County
Advanced Features	None

Notes:
[a] VMT data from the YMPO Travel Demand Model represent average annual conditions (month of July).

Table 7. MOVES County Data Manager Parameters – Ozone

COUNTY DATA MANAGER INPUT	DATA SOURCE
Age Distribution	This data was derived using the latest Motor Vehicle Data (MVD) reports furnished by ADOT, with future analysis years' data projected using the EPA Age Distribution Projection Tool for MOVES4 released in August 2023.
Source Type Population	This data was derived using the latest MVD reports furnished by ADOT, with future growth years rates linearly interpolated using the YMPO Travel Demand Model.
Meteorology Data	Meteorological data was derived from AZDEQ-developed air dispersion modeling meteorological data files.
I/M Program	No I/M program information was applied.
Vehicle Type VMT (HPMS)	Daily VMT is from the YMPO Travel Demand Model. The HPMS data are specific to each NAA and are unique for the ozone and PM10 NAA. HPMS vehicle type distribution was derived from the December 2017 approved air quality analysis from ADOT for all analysis years, consistent with previous modeling.
Hourly VMT Fraction	The MOVES4 default approach was used.
Fuels	AVFT data was derived from ADOT 2024 vehicle registration data and Yuma County transit bus data. The MOVES4 default approach was used for Fuel Supply, Fuel Formulation, and Fuel Usage Fraction.
Road Type Distribution	This data was derived from the December 2017 approved air quality analysis from ADOT for all analysis years, consistent with previous modeling.
Average Speed Distribution	The MOVES4 default approach was used.

2.4.2 Emission Reductions

NO_x and VOC emissions are expected to decrease in future years due to implementation of stringent emission standards, improvements of vehicle technologies, and fleet turnover. In addition, emission control measures such as reducing idling, diesel exhaust retrofits, traffic flow improvements, park and ride facilities, and rideshare/carpooling program would help on further reducing NO_x and VOC emissions.

MOVES4 incorporates the emission standards and implementation of regulations that would affect vehicle emission levels. Other emission reduction measures were not specifically modeled, because some of the reductions would be difficult to quantify, and selection of emission reduction measures to be implemented will be based upon cost effectiveness, emission reduction potential, economic and social considerations, ease and timing of implementation, and other appropriate factors.

3. Air Emissions and Conformity Test Results

The Build vs No Build interim emission tests were conducted for the PM_{10} and ozone conformity analysis. The No Build scenario includes all existing regionally significant highway and transit projects and all projects which are undergoing right-of-way acquisition, are currently under construction, have completed the NEPA process, or are in the first year of the previously conforming TIP. The "Build" scenario is generally defined as all LRTP and TIP projects and the future transportation networks that will result from full implementation of the 2026-2050 LRTP Update.

3.1 PM_{10} Results and Conclusions

The PM_{10} emissions are shown in **Tables 8 to 11** for 2024 and the Build and No Build scenarios in 2030, 2040, and 2050, respectfully. Comparisons of the total PM_{10} emissions are summarized in **Table 12**. The total PM_{10} emissions from the PM_{10} NAA for the Build scenario are less than the emissions of the No Build scenario. Therefore, the LRTP and TIP passed the interim emission test and demonstrated conformity for the 1987 PM_{10} NAAQS.

Table 8. Yuma 2024 PM_{10} Conformity Analysis

Facility Type	Particle Size Multiplier	Silt Loading Factor	Average Vehicle Weight	Number of Wet Days in a Year	Number of Days in the Averaging Period	Emission Factor	Vehicle Miles Traveled per Day	Emissions
	k (g/VMT)	sL (g/m^2)	W (tons)	P (days)	N (days)	E (g/VMT)	VMT	kg/day
Fugitive Dust Emissions								
Interstate	1	0.04	3.18	18.1	365.1	0.172	550,838	94.6
Expressway	1	0.04	3.18	18.1	365.1	0.172	128,825	22.1
Principal Arterials	1	0.30	3.18	18.1	365.1	1.075	910,115	978.0
Minor Arterials	1	0.30	3.18	18.1	365.1	1.075	614,620	660.5
Rural Major Collectors	1	0.70	3.18	18.1	365.1	2.323	411,614	956.3
Rural Minor Collectors	1	0.70	3.18	18.1	365.1	2.323	109,351	254.1
Urban Collectors	1	0.24	3.18	18.1	365.1	0.877	315,773	277.0
Local Roads	1	0.85	3.18	18.1	365.1	2.772	38,277	106.1
Interstate Ramps	1	0.04	3.18	18.1	365.1	0.172	35,638	6.1
Local Paved	1	0.85	3.18	18.1	365.1	2.772	1,233,615	3,419.9
Local Unpaved						359.000	58,676	21,064.6
MOVES Modeled Emissions								184.8
							PM_{10} Emissions (kg/day)	**28,024.0**
							PM_{10} Emissions (tons/day)	**30.9**
							PM_{10} Emissions (tons/year)	**11,275.3**
							Less Local Unpaved Road PM_{10} Emissions on Wet Days (tons/year)	**-420.3**
							Total PM_{10} Emissions (tons/year)	**10,855.0**

Table 9. Yuma 2030 PM_{10} Conformity Analysis

Facility Type	Particle Size Multiplier	Silt Loading Factor	Average Vehicle Weight	Number of Wet Days in a Year	Number of Days in the Averaging Period	Emission Factor	No Build Vehicle Miles Traveled per Day	Build Vehicle Miles Traveled per Day	No Build Emissions	Build Emissions
	k (g/VMT)	sL (g/m^2)	W (tons)	P (days)	N (days)	E (g/VMT)	VMT	VMT	kg/day	kg/day
Fugitive Dust Emissions										
Interstate	1	0.04	3.18	18.1	365.1	0.172	662,511	617,712	113.8	106.1
Expressway	1	0.04	3.18	18.1	365.1	0.172	152,305	125,826	26.2	21.6
Principal Arterials	1	0.30	3.18	18.1	365.1	1.075	977,322	940,308	1,050.2	1,010.4
Minor Arterials	1	0.30	3.18	18.1	365.1	1.075	626,712	718,809	673.5	772.4
Rural Major Collectors	1	0.70	3.18	18.1	365.1	2.323	464,260	434,519	1,078.6	1,009.5
Rural Minor Collectors	1	0.70	3.18	18.1	365.1	2.323	129,158	157,936	300.1	366.9
Urban Collectors	1	0.24	3.18	18.1	365.1	0.877	344,806	330,597	302.4	290.0
Local Roads	1	0.85	3.18	18.1	365.1	2.772	45,909	42,677	127.3	118.3
Interstate Ramps	1	0.04	3.18	18.1	365.1	0.172	43,510	38,755	7.5	6.7
Local Paved	1	0.85	3.18	18.1	365.1	2.772	1,390,121	1,440,588	3,853.7	3,993.7
Local Unpaved						359.000	58,676	57,993	21,064.6	20,819.4
MOVES Modeled Emissions									169.3	167.4
								PM_{10} Emissions (kg/day)	**28,767.2**	**28,682.4**
								PM_{10} Emissions (tons/day)	**31.7**	**31.6**
								PM_{10} Emissions (tons/year)	**11,574.3**	**11,540.2**
								Less Local Unpaved Road PM_{10} Emissions on Wet Days (tons/year)	**-420.3**	**-415.4**
								Total PM_{10} Emissions (tons/year)	**11,154.0**	**11,124.8**

Table 10. Yuma 2040 PM_{10} Conformity Analysis

Facility Type	Particle Size Multiplier	Silt Loading Factor	Average Vehicle Weight	Number of Wet Days in a Year	Number of Days in the Averaging Period	Emission Factor	No Build Vehicle Miles Traveled per Day	Build Vehicle Miles Traveled per Day	No Build Emissions	Build Emissions
	k (g/VMT)	sL (g/m^2)	W (tons)	P (days)	N (days)	E (g/VMT)	VMT	VMT	kg/day	kg/day
Fugitive Dust Emissions										
Interstate	1	0.04	3.18	18.1	365.1	0.172	731,006	667,432	125.6	114.6
Expressway	1	0.04	3.18	18.1	365.1	0.172	179,009	153,435	30.7	26.4
Principal Arterials	1	0.30	3.18	18.1	365.1	1.075	1,086,169	1,006,129	1,167.2	1,081.2
Minor Arterials	1	0.30	3.18	18.1	365.1	1.075	705,377	881,245	758.0	947.0
Rural Major Collectors	1	0.70	3.18	18.1	365.1	2.323	534,938	282,771	1,242.8	657.0
Rural Minor Collectors	1	0.70	3.18	18.1	365.1	2.323	151,868	75,359	352.8	175.1
Urban Collectors	1	0.24	3.18	18.1	365.1	0.877	392,962	701,964	344.7	615.7
Local Roads	1	0.85	3.18	18.1	365.1	2.772	56,701	46,666	157.2	129.4
Interstate Ramps	1	0.04	3.18	18.1	365.1	0.172	48,452	40,571	8.3	7.0
Local Paved	1	0.85	3.18	18.1	365.1	2.772	1,716,903	1,575,239	4,759.7	4,366.9
Local Unpaved						359.000	58,676	57,993	21,064.6	20,819.4
MOVES Modeled Emissions									168.3	166.9
								PM_{10} Emissions (kg/day)	**30,179.9**	**29,106.5**
								PM_{10} Emissions (tons/day)	**33.3**	**32.1**
								PM_{10} Emissions (tons/year)	**12,142.7**	**11,710.8**
								Less Local Unpaved Road PM_{10} Emissions on Wet Days (tons/year)	**-420.3**	**-415.4**
								Total PM_{10} Emissions (tons/year)	**11,722.4**	**11,295.4**

Table 11. Yuma 2050 PM_{10} Conformity Analysis

Facility Type	Particle Size Multiplier	Silt Loading Factor	Average Vehicle Weight	Number of Wet Days in a Year	Number of Days in the Averaging Period	Emission Factor	No Build Vehicle Miles Traveled per Day	Build Vehicle Miles Traveled per Day	No Build Emissions	Build Emissions
	k (g/VMT)	sL (g/m^2)	W (tons)	P (days)	N (days)	E (g/VMT)	VMT	VMT	kg/day	kg/day
Fugitive Dust Emissions										
Interstate	1	0.04	3.18	18.1	365.1	0.172	797,689	870,915	137.0	149.6
Expressway	1	0.04	3.18	18.1	365.1	0.172	209,394	203,856	36.0	35.0
Principal Arterials	1	0.30	3.18	18.1	365.1	1.075	1,213,296	1,060,368	1,303.8	1,139.5
Minor Arterials	1	0.30	3.18	18.1	365.1	1.075	793,701	872,525	852.9	937.6
Rural Major Collectors	1	0.70	3.18	18.1	365.1	2.323	613,827	639,875	1,426.1	1,486.6
Rural Minor Collectors	1	0.70	3.18	18.1	365.1	2.323	177,465	226,348	412.3	525.9
Urban Collectors	1	0.24	3.18	18.1	365.1	0.877	463,558	377,513	406.6	331.1
Local Roads	1	0.85	3.18	18.1	365.1	2.772	69,128	38,169	191.6	105.8
Interstate Ramps	1	0.04	3.18	18.1	365.1	0.172	54,640	55,023	9.4	9.5
Local Paved	1	0.85	3.18	18.1	365.1	2.772	2,087,499	1,445,836	5,787.0	4,008.2
Local Unpaved						359.000	58,676	57,631	21,064.6	20,689.5
MOVES Modeled Emissions									187.5	185.4
								PM_{10} Emissions (kg/day)	**31,814.8**	**29,603.6**
								PM_{10} Emissions (tons/day)	**35.1**	**32.6**
								PM_{10} Emissions (tons/year)	**12,800.5**	**11,910.8**
								Less Local Unpaved Road PM_{10} Emissions on Wet Days (tons/year)	**-420.3**	**-412.8**
								Total PM_{10} Emissions (tons/year)	**12,380.2**	**11,498.0**

Table 12. Motor Vehicle Emissions Comparison for PM_{10}

Budget Year	PM_{10} Tons per Year Without Dust Mitigation (tpy)
2024	10,855.0
2030 No Build	11,154.0
2030 Build	11,124.8
2040 No Build	11,722.4
2040 Build	11,295.4
2050 No Build	12,380.2
2050 Build	11,498.0

3.2 Ozone Results and Conclusions

Emissions of ozone precursors, NO_x and VOC, for each of the analysis year and by vehicle types for the Build and No Build scenarios are shown in Tables 13 and 14, respectively. Comparisons of the total NO_x and VOC emissions from the ozone NAA are summarized in Table 15.

As shown in Table 13, NOx and VOC emissions from the Build scenarios in future years are less than the emissions from the No Build scenario. Therefore, the projected emissions of NO_x and VOC from projects contained in the YMPO LRTP 2026-2050 Update and 2024-2028 TIP passed the interim emission test and demonstrated conformity for the 2015 8-hour ozone NAAQS.

Table 13. Mobile Source Results for Oxides of Nitrogen (NO_x)

Source Type	Source Type ID	Unit	2024	2030 No Build	2030 Build	2040 No Build	2040 Build	2050 No Build	2050 Build
Motorcycle	11	grams/day	3,890	4,101	4,047	4,502	4,320	5,063	4,832
Passenger Car	21	grams/day	169,751	96,588	95,446	47,858	47,376	48,525	47,924
Passenger Truck	31	grams/day	670,528	311,865	308,129	120,242	118,922	114,188	112,697
Light Commercial Truck	32	grams/day	53,609	29,830	29,466	9,185	9,072	8,230	8,115
Other Buses	41	grams/day	21,998	10,541	10,378	5,760	5,562	4,915	4,739
Transit Bus	42	grams/day	394	355	355	264	259	227	209
School Bus	43	grams/day	11,507	5,796	5,739	2,597	2,524	2,256	2,192
Refuse Truck	51	grams/day	342	250	250	154	150	134	122
Single Unit Short-haul Truck	52	grams/day	68,068	51,445	50,831	39,574	39,045	40,801	40,159
Single Unit Long-haul Truck	53	grams/day	1,703	1,050	1,037	460	445	428	411
Motor Home	54	grams/day	22,264	12,851	12,689	5,640	5,530	5,124	5,013
Combination Short-haul Truck	61	grams/day	117,179	68,332	67,469	40,553	38,986	40,640	38,869
Combination Long-haul Truck	62	grams/day	192,156	127,377	125,652	69,730	66,876	62,607	59,731
Total		**grams/day**	**1,333,387**	**720,380**	**711,484**	**346,518**	**339,065**	**333,139**	**325,014**
Total		**tons/day**	**1.470**	**0.794**	**0.784**	**0.382**	**0.374**	**0.367**	**0.358**
Total		**tons/year**	**536**	**290**	**286**	**139**	**136**	**134**	**131**

Table 14. Mobile Source Results for Volatile Organic Compounds (VOC)

Source Type	Source Type ID	Unit	2024	2030 No Build	2030 Build	2040 No Build	2040 Build	2050 No Build	2050 Build
Motorcycle	11	grams/day	127,349	123,941	122,495	128,993	127,591	142,794	140,768
Passenger Car	21	grams/day	1,123,570	739,314	730,817	434,572	430,526	338,929	334,652
Passenger Truck	31	grams/day	1,920,530	1,030,370	1,018,500	669,154	662,746	590,218	582,649
Light Commercial Truck	32	grams/day	73,568	37,743	37,304	30,538	30,237	26,934	26,584
Other Buses	41	grams/day	4,997	3,740	3,684	2,267	2,218	2,253	2,200
Transit Bus	42	grams/day	346	304	304	208	205	153	142
School Bus	43	grams/day	2,781	1,567	1,553	519	188	625	611
Refuse Truck	51	grams/day	11	10	10	10	10	15	13
Single Unit Short-haul Truck	52	grams/day	42,986	28,378	28,047	27,936	9,208	31,134	31,650
Single Unit Long-haul Truck	53	grams/day	1,240	731	722	600	537	554	587
Motor Home	54	grams/day	82,595	37,107	36,681	25,223	20,061	14,619	15,293
Combination Short-haul Truck	61	grams/day	5,763	3,475	3,431	2,687	2,538	2,850	2,713
Combination Long-haul Truck	62	grams/day	9,294	6,210	6,126	4,414	4,215	4,584	4,367
Total		**grams/day**	**3,395,030**	**2,012,889**	**1,989,672**	**1,327,121**	**1,290,279**	**1,155,661**	**1,142,228**
Total		**tons/day**	**3.742**	**2.219**	**2.193**	**1.463**	**1.422**	**1.274**	**1.259**
Total		**tons/year**	**1,366**	**810**	**801**	**534**	**519**	**465**	**460**

Table 15. NO_x and VOC Emissions Build vs No Build Comparisons

Budget Year	NO_x Tons per Year (tpy)	VOC Tons per Year (tpy)
2024	536	1,366
2030 No Build	290	810
2030 Build	286	801
2040 No Build	139	534
2040 Build	136	519
2050 No Build	134	465
2050 Build	131	460

4. Implementation of Transportation Control Measures

Currently, there are no TCMs from approved air quality implementation plan for the Yuma PM_{10} and ozone NAA. However, the local jurisdictions and YMPO, through the LRTP process, have made the commitment to fund control measures such as

- 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.
- 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.

Based on existing and planned commitments, the air quality analysis conducted in this analysis demonstrates that the required air quality conformity determination can be made and the LRTP and TIP shown to be in conformance with federal air quality regulations.

Because the Yuma PM_{10} and ozone NAAs do not have approved SIP at the time of this study, specific TCMs from SIP are not yet available. Compliance and implementation to TCMs will be addressed in the future when the SIPs are approved and more information become available.

5. References

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