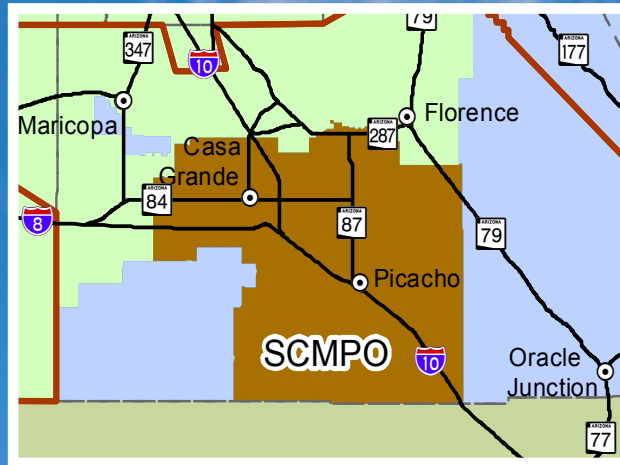


SUN CORRIDOR

METROPOLITAN PLANNING ORGANIZATION



DRAFT

2024 CONFORMITY ANALYSIS

May 2024

**DRAFT
JUNE 2024 SUN CORRIDOR MPO CONFORMITY
ANALYSIS**

FOR THE

**FY 2023-2027 SUN CORRIDOR MPO TRANSPORTATION
IMPROVEMENT PROGRAM**

AND THE

**SUN CORRIDOR MPO REGIONAL TRANSPORTATION
PLAN 2050 UPDATE**

May 2024

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EXECUTIVE SUMMARY

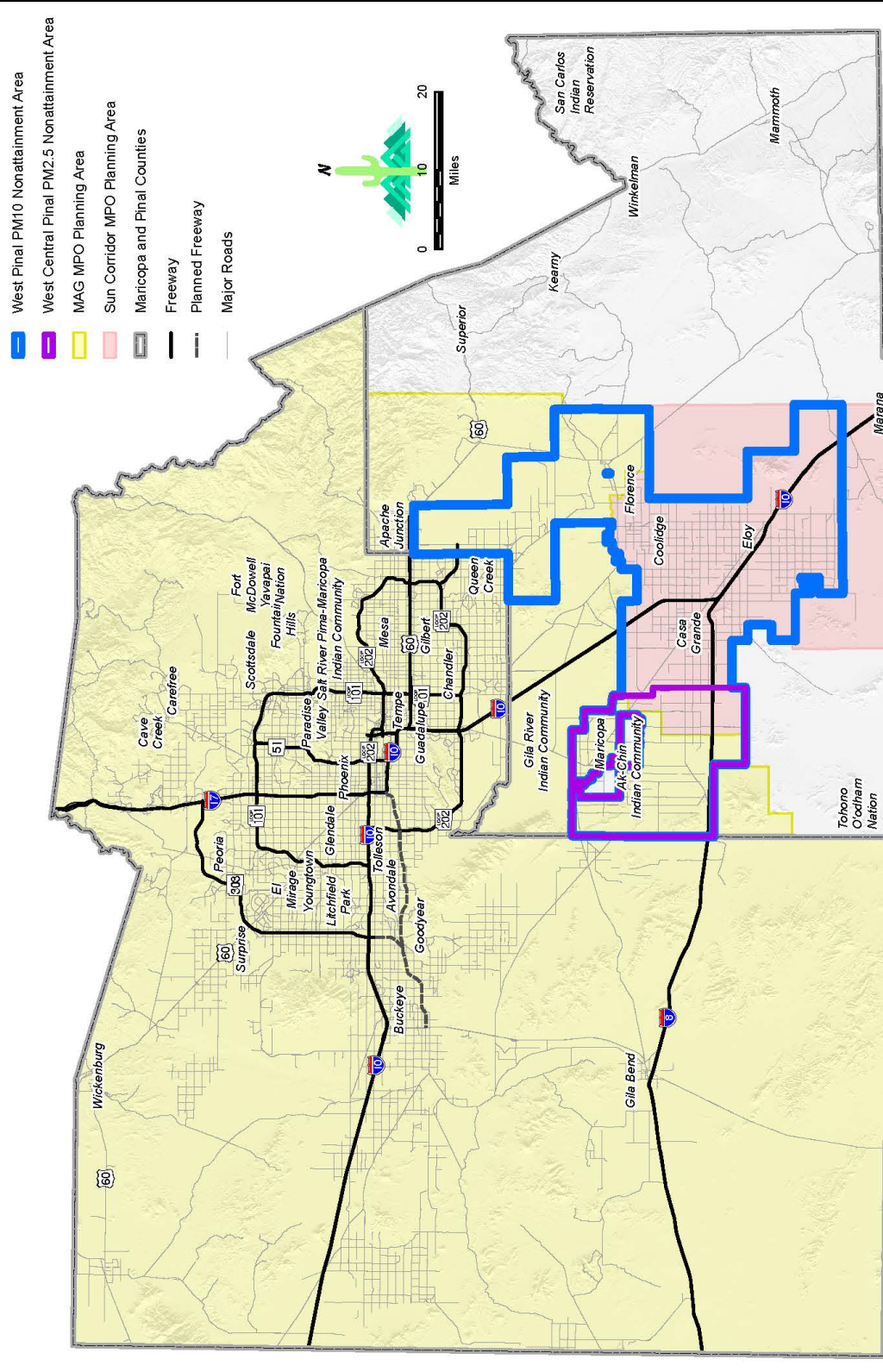
On May 6, 2013, the Sun Corridor Metropolitan Planning Organization (MPO) was designated in the Pinal County area. The Sun Corridor Metropolitan Planning Area Boundary includes the cities of Casa Grande, Eloy, Coolidge, and unincorporated areas of Pinal County. The results of the June 2024 Sun Corridor MPO Conformity Analysis supports a finding of conformity for the FY 2023-2027 Sun Corridor MPO Transportation Improvement Program and Sun Corridor MPO Regional Transportation Plan 2050 Update in the West Pinal PM-10 Nonattainment Area and West Central Pinal PM-2.5 Nonattainment Area.

On May 9, 2013, the MAG Metropolitan Planning Area Boundary was expanded due to the 2010 Census urbanized area updates. For transportation planning and programming purposes, the Federal Highway Administration regulations state that at a minimum, the Metropolitan Planning Area must encompass the entire existing urbanized area boundary as well as the contiguous geographic area(s) likely to become urbanized within the next 20 years. The updated urbanized area boundary for the MAG region included areas within Pinal County. Due to this expansion, the MAG Regional Council amended the MAG By-laws to recognize the new Metropolitan Planning Area Boundary and to provide for new members from Pinal County within the new boundary. The MAG Metropolitan Planning Area Boundary now includes the Town of Florence, City of Maricopa, the portion of the Gila River Indian Community within Pinal County, and unincorporated areas within Pinal County.

Both the MAG Metropolitan Planning Area Boundary and the Sun Corridor Metropolitan Planning Area Boundary include portions of the West Pinal PM-10 Nonattainment Area and West Central Pinal PM-2.5 Nonattainment Area. Both nonattainment areas are covered by the boundaries of the two metropolitan planning organizations. Consequently, transportation conformity is required to be demonstrated for both nonattainment areas by both metropolitan planning organizations. Please refer to Figure ES-1.

On July 1, 2013, the Federal Highway Administration notified the Governor of a transportation conformity lapse in the West Pinal PM-10 Nonattainment Area, effective July 2, 2013. The new West Pinal PM-10 Nonattainment Area had been designated by the Environmental Protection Agency, effective July 2, 2012. The Clean Air Act Section 176(c)(6) requires a metropolitan long range transportation plan and transportation improvement program conformity determination within twelve months of the effective date of an area being designated nonattainment. The twelve-month conformity grace period had lapsed.

Figure ES-1: MAG and Sun Corridor MPO Planning Areas and Air Quality Nonattainment Areas for the Pinal County Area, Arizona



While every effort has been made to ensure the accuracy of this information, the Maricopa Association of Governments does not warrant the accuracy or completeness of the information and expressly disclaims liability for the accuracy thereof.
 Source: U.S. Environmental Protection Agency
 Date: September 2023

To provide assistance to the Sun Corridor Metropolitan Planning Organization, MAG has offered to prepare conformity analyses for the PM-10 and PM-2.5 nonattainment areas in Pinal County, to enable transportation projects in both metropolitan planning organizations to proceed. At a June 17, 2013 meeting with the Arizona Department of Transportation, Sun Corridor Metropolitan Planning Organization, and MAG, there was general concurrence that MAG would prepare the initial conformity analysis. The Maricopa Association of Governments works through a cooperative effort with the Arizona Department of Transportation, Arizona Department of Environmental Quality, and Sun Corridor Metropolitan Planning Organization on the coordination of transportation planning activities and conformity analyses consistent with the Memorandum of Understanding among the agencies.

Summarized below are the applicable federal criteria or requirements for conformity determinations, the conformity tests applied, regional emissions analysis results, and an overview of the organization of this report. Figures presenting the conformity test results are provided at the end of the Executive Summary.

CONFORMITY REQUIREMENTS

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 Clean Air Act in 1990. The federal transportation conformity rule has been revised several times since its initial release to reflect both EPA rule changes and court opinions. The transportation conformity rule and court opinions are summarized in Chapter 1.

The conformity rule applies nationwide to “all nonattainment and maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan” (40 CFR 93.102). At this time, portions of Pinal County are designated as a nonattainment area with respect to federal air quality standards for particulate matter less than or equal to ten microns in diameter (PM-10), and particulate matter less than or equal to 2.5 microns in diameter (PM-2.5). Metropolitan transportation plans, programs, and projects in the nonattainment or maintenance areas of both counties must satisfy the requirements of the federal transportation conformity rule. Under the federal transportation conformity rule, the principal criteria for a determination of conformity for transportation plans and programs are:

- (1) the TIP and Regional Transportation Plan 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 latest planning assumptions and emission models in force at the time the conformity analysis begins must be employed;

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

Consultation generally occurs at the beginning of the conformity analysis process, on the proposed models, associated methods, and assumptions for the upcoming analysis and the projects to be assessed, and at the end of the process, on the draft conformity analysis report. The final determination of conformity for the TIP and RTP is the responsibility of the Federal Highway Administration and the Federal Transit Administration.

The conformity tests specified in the federal transportation conformity rule are: (1) the emissions budget test, and (2) interim emissions tests. For the emissions budget test, predicted emissions for the TIP and RTP must be less than or equal to the motor vehicle emissions budget 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.

PINAL COUNTY NONATTAINMENT AREAS

For the Pinal County nonattainment areas, there are no adequate or approved motor vehicle emissions budgets for conformity. Therefore, the conformity interim emissions tests were applied. The Action/Baseline tests were conducted for PM-10 for the West Pinal PM-10 Nonattainment Area and for PM-2.5 and nitrogen oxides (NOx) for the West Central Pinal PM-2.5 Nonattainment Area for the analysis years of 2025, 2030, 2040, and 2050. For each test, the required emissions estimates were developed using the transportation and emission modeling approaches required under the federal transportation conformity rule and summarized in this document.

For PM-10, for each analysis year the projected emissions for the Action scenario are not greater than the projected emissions for the Baseline scenario. Since the PM-10 emissions projected for the Action scenarios are not greater than the PM-10 emissions projected for the Baseline scenarios, the conformity interim emission test is satisfied. It is also reasonable to expect the action emissions would not exceed the baseline emissions for the time periods between the analysis years. The results of the regional emissions analysis for PM-10 are presented in Figure ES-2.

For PM-2.5, for each analysis year the projected emissions for the Action scenario are not greater than the projected emissions for the Baseline scenario. Since the PM-2.5 emissions projected for the Action scenarios are not greater than the PM-2.5 emissions projected for the Baseline scenarios, the conformity interim emission tests are satisfied. It is also reasonable to expect the action emissions would not exceed the baseline emissions for the time periods between the analysis years. The results of the regional emissions analysis for PM-2.5 are presented in Figure ES-3.

For NO_x, for each analysis year the projected emissions for the Action scenario are not greater than the projected emissions for the Baseline scenario. Since the NO_x emissions projected for the Action scenarios are not greater than the NO_x emissions projected for the Baseline scenarios, the conformity interim emission tests are satisfied. It is also reasonable to expect the action emissions would not exceed the baseline emissions for the time periods between the analysis years. The results of the regional emissions analysis for NO_x are presented in Figure ES-4.

Figure ES-2: PM-10 Results for Conformity Interim Emission (Action/Baseline) Test
 Pinal County PM-10 Nonattainment Area

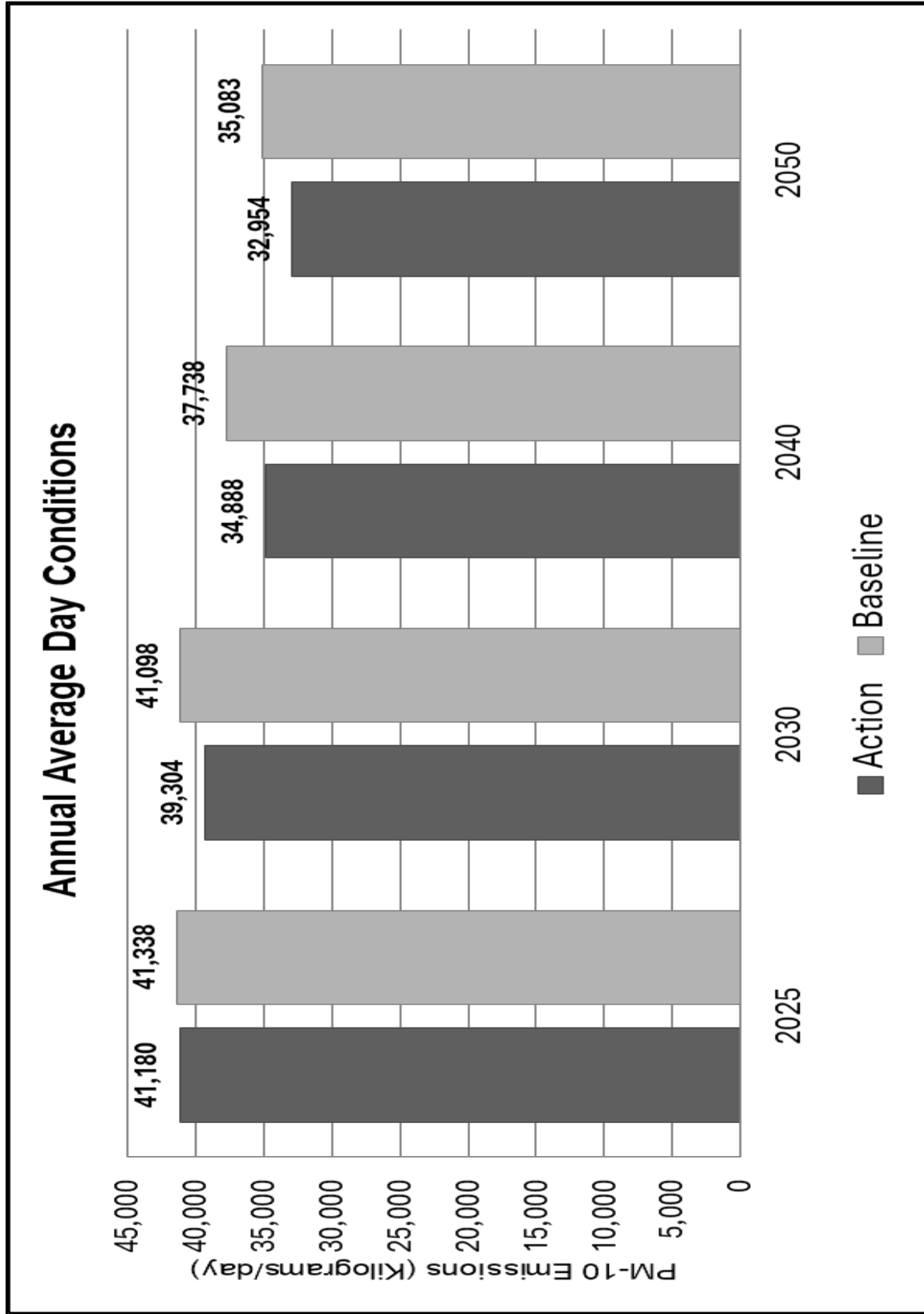


Figure ES-3: PM-2.5 Results for Conformity Interim Emission (Action/Baseline) Test
 Pinal County PM-2.5 Nonattainment Area

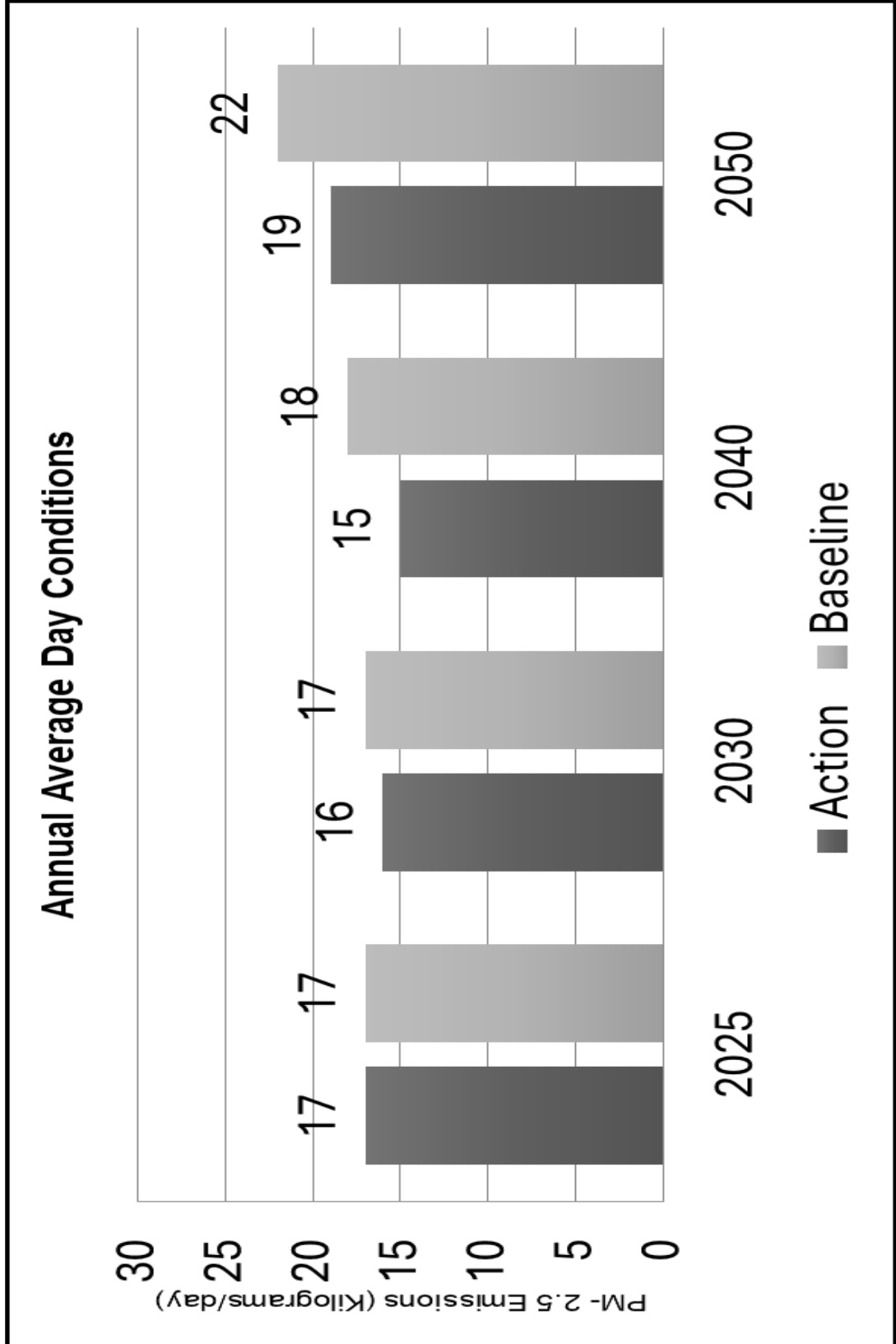
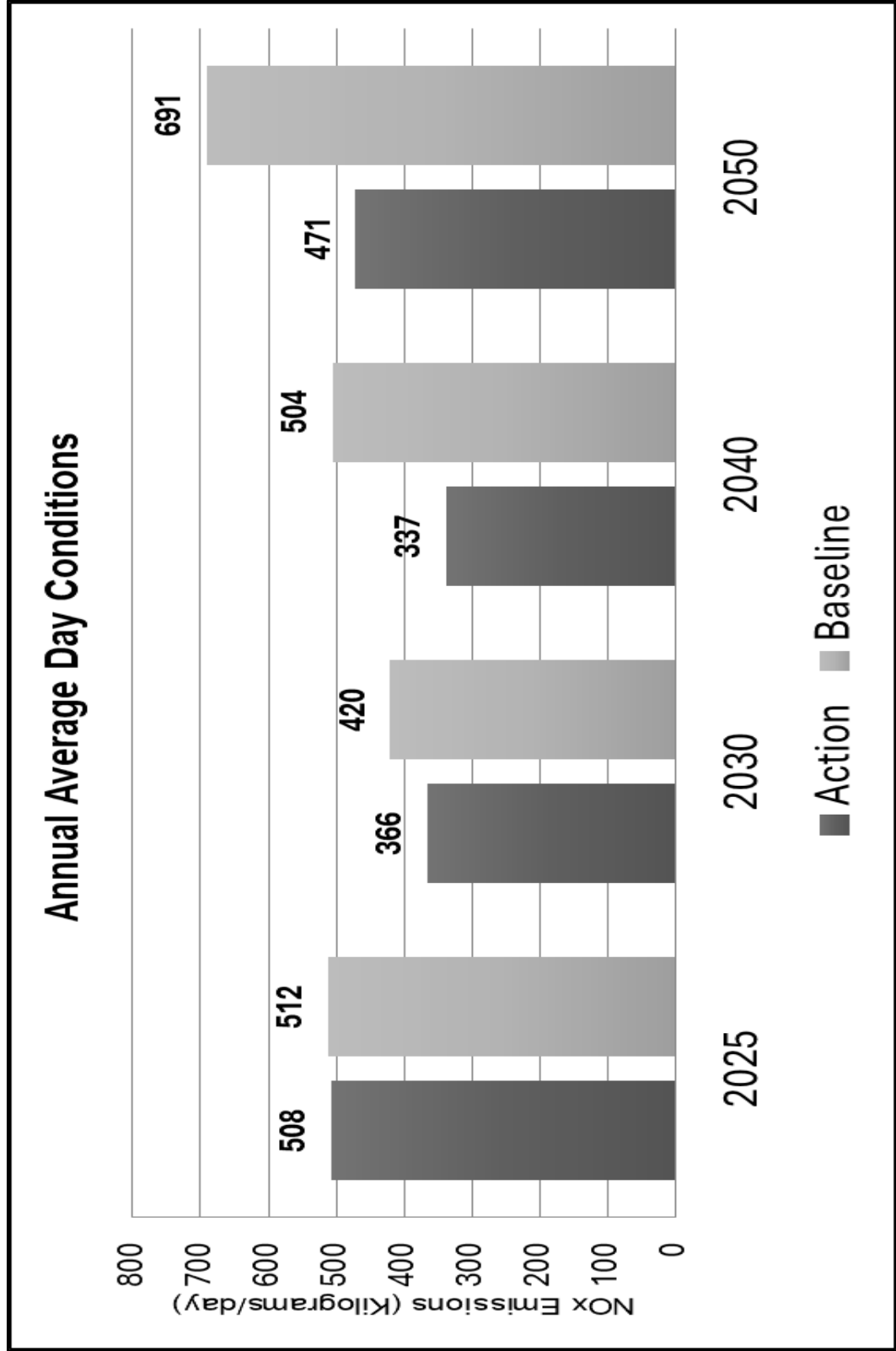


Figure ES-4: NOx Results for Conformity Interim Emission (Action/Baseline) Test
 Pinal County PM-2.5 Nonattainment Area



REPORT ORGANIZATION

The report is organized into five chapters. Chapter 1 provides an overview of the applicable federal and state conformity rules and requirements, air quality implementation plans, and conformity test requirements. Chapter 2 contains a discussion of the latest planning assumptions. Chapter 3 includes a summary of the transportation model characteristics, key socioeconomic data, and other data related to the land use and transportation system forecasts, and Chapter 4 describes the air quality modeling used to estimate emission factors and mobile source emissions. The results of the conformity analysis for the FY 2023-2027 Sun Corridor MPO Transportation Improvement Program and Sun Corridor Regional Transportation Plan 2050 Update are provided in Chapter 5.

The final version of this report contains consultation documentation and other related information in the appendices. The appendices of the final version of this report also includes responses to comments made on the draft report.

1 FEDERAL AND STATE REGULATORY REQUIREMENTS

The Sun Corridor Metropolitan Planning Organization (MPO) has completed a new regional transportation plan extending the last year of the transportation plan's forecast period to 2050. In accordance with EPA transportation conformity regulations, each new transportation plan must be demonstrated to conform before the transportation plan is approved by the MPO or accepted by the U.S. Department of Transportation. The Maricopa Association of Governments has prepared a new conformity analysis and the results of the conformity analysis support a finding of conformity for the FY 2023-2027 Sun Corridor MPO Transportation Improvement Program and new Sun Corridor MPO Regional Transportation Plan 2050 Update in the West Pinal PM-10 Nonattainment Area and West Central Pinal PM-2.5 Nonattainment Area. The U.S. DOT made a conformity finding on the previous plan update on March 27, 2020. On May 6, 2013, the Sun Corridor Metropolitan Planning Organization was designated in the Pinal County area. The Sun Corridor Metropolitan Planning Area Boundary includes the cities of Casa Grande, Eloy, Coolidge, and unincorporated areas of Pinal County.

On May 9, 2013, the Maricopa Association of Governments (MAG) Metropolitan Planning Area Boundary was expanded due to the 2010 Census urbanized area updates. For transportation planning and programming purposes, the Federal Highway Administration regulations state that at a minimum, the Metropolitan Planning Area must encompass the entire existing urbanized area boundary as well as the contiguous geographic area(s) likely to become urbanized within the next 20 years. The updated urbanized area boundary for the MAG region included areas within Pinal County. Due to this expansion, the MAG Regional Council amended the MAG By-laws to recognize the new Metropolitan Planning Area Boundary and to provide for new members from Pinal County within the new boundary. The MAG Metropolitan Planning Area Boundary now includes the Town of Florence, City of Maricopa, the portion of the Gila River Indian Community within Pinal County, and unincorporated areas within Pinal County.

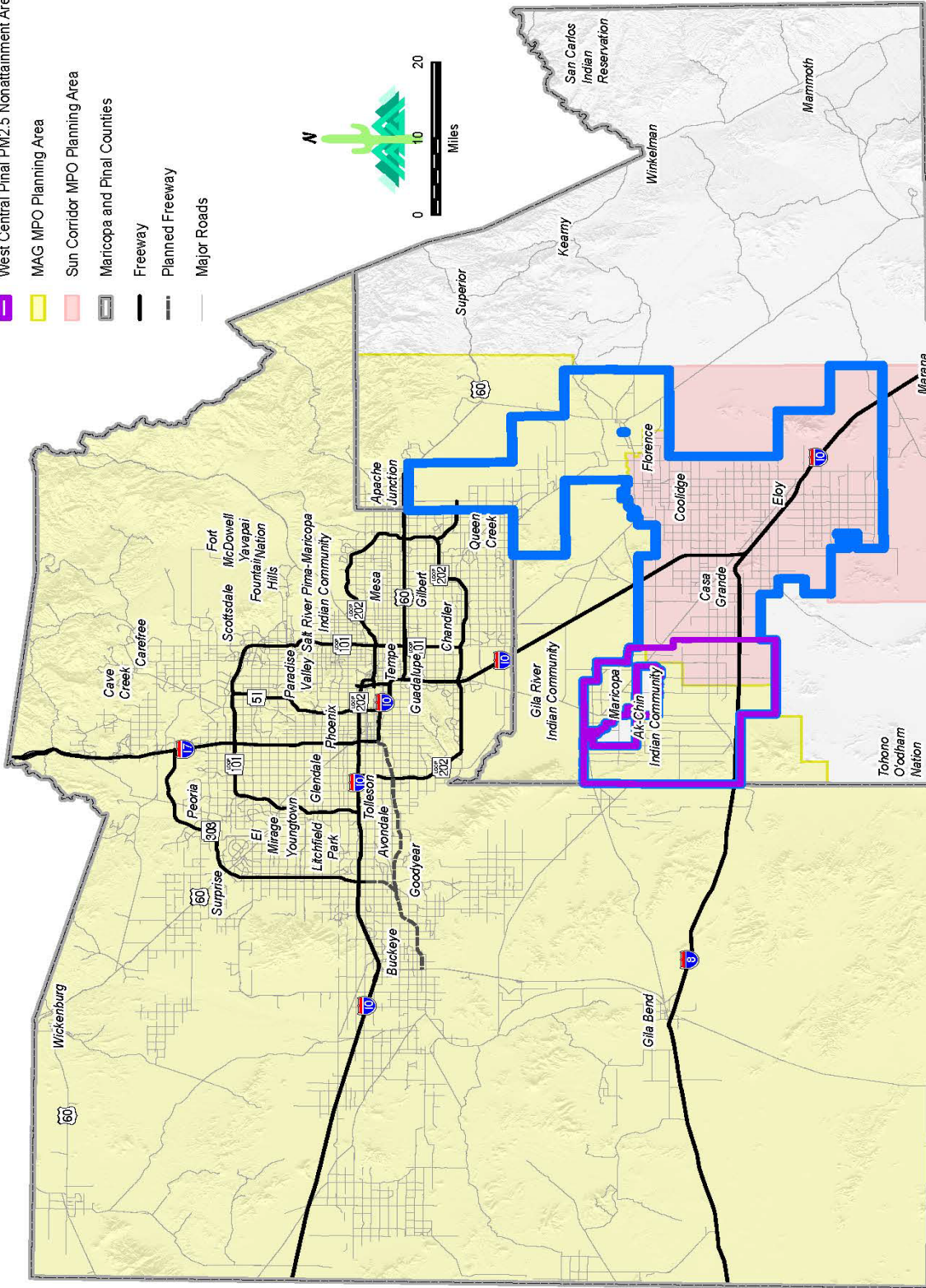
Both the Sun Corridor Metropolitan Planning Area Boundary and the MAG Metropolitan Planning Area Boundary include portions of the West Pinal PM-10 Nonattainment Area and West Central Pinal PM-2.5 Nonattainment Area. Both nonattainment areas are covered by the boundaries of the two metropolitan planning organizations. Consequently, transportation conformity is required to be demonstrated for both nonattainment areas by both metropolitan planning organizations. Please refer to Figure 1.

On July 1, 2013, the Federal Highway Administration notified the Governor of a transportation conformity lapse in the West Pinal PM-10 Nonattainment Area, effective July 2, 2013. The new West Pinal PM-10 Nonattainment Area had been designated by the Environmental Protection Agency, effective July 2, 2012. The Clean Air Act §176(c)(6)

Figure 1: MAG and Sun Corridor MPO Planning Areas and Air Quality Nonattainment Areas for the Pinal County Area, Arizona



- West Pinal PM10 Nonattainment Area
- West Central Pinal PM2.5 Nonattainment Area
- MAG MPO Planning Area
- Sun Corridor MPO Planning Area
- Maricopa and Pinal Counties
- Freeway
- - - Planned Freeway
- Major Roads



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 Date: September 2023

requires a metropolitan long range transportation plan and transportation improvement program conformity determination within twelve months of the effective date of an area being designated nonattainment. The twelve-month conformity grace period had lapsed.

To provide assistance to the Sun Corridor Metropolitan Planning Organization, MAG has offered to prepare the conformity analyses for the PM-10 and PM-2.5 nonattainment areas in Pinal County, to enable transportation projects in both metropolitan planning organizations to proceed. At a June 17, 2013 meeting with the Arizona Department of Transportation, Sun Corridor Metropolitan Planning Organization and MAG, there was general concurrence that MAG would prepare the initial conformity analysis. The Sun Corridor Metropolitan Planning Organization works through a cooperative effort with the Arizona Department of Transportation, Arizona Department of Environmental Quality, and Maricopa Association of Governments on the coordination of transportation planning activities and conformity analyses consistent with the Memorandum of Understanding among the agencies.

The criteria for determining conformity of transportation programs and plans under the federal transportation conformity rule (40 Code of Federal Regulations Parts 51 and 93) and the applicable conformity tests for the Pinal County nonattainment areas are summarized in this chapter. The June 2024 Sun Corridor MPO Conformity Analysis for the FY 2023-2027 Sun Corridor MPO Transportation Improvement Program (TIP) and the Sun Corridor MPO Regional Transportation Plan 2050 (RTP) Update was prepared based on these criteria and tests. Presented first is a review of the development of the applicable conformity rule and guidance procedures, followed by a summary of conformity rule requirements, air quality designation status, conformity test requirements, and analysis years.

FEDERAL AND STATE CONFORMITY RULES

Clean Air Act Amendments

Section 176(c) of the Clean Air Act (CAA, 1990) requires that Federal agencies and Metropolitan Planning Organizations (MPOs) not approve any transportation project, program, or plan which does not conform with the approved State Implementation Plan (SIP). The 1990 amendments to the Clean Air Act expanded Section 176(c) to more explicitly define conformity to an implementation plan to mean:

Conformity to the plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and that such activities will not (i) cause or contribute to any new violation of any standard in any area; (ii) increase the frequency or severity of any existing violation of any standard in any area; or (iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The expanded Section 176(c) also provided conditions for approval of transportation plans, programs, and projects; requirements that the Environmental Protection Agency (EPA) promulgate conformity determination criteria and procedures no later than November 15, 1991; and a requirement that States submit their conformity procedures to EPA by November 15, 1992. The initial November 15, 1991 deadline for conformity criteria and procedures was not met by EPA.

Federal Rule

Supplemental interim conformity guidance was issued on June 7, 1991 (EPA/U.S. DOT, 1991a and 1991b) for carbon monoxide, ozone, and particulate matter less than or equal to ten microns in diameter. The applicable period of this guidance was designated as Phase 1 of the interim period. EPA subsequently promulgated the Conformity Final Rule, in the November 24, 1993 *Federal Register* (EPA, 1993). The Rule became effective on December 27, 1993. The federal Transportation Conformity Final Rule has been revised several times since its initial release. The first set of amendments, finalized on August 7, 1995, (EPA, 1995a) aligned the dates of conformity lapses due to SIP failures with the application of Clean Air Act highway sanctions for certain ozone areas and all areas with disapproved SIPs with a protective finding.

The second set of amendments was finalized on November 14, 1995 (EPA, 1995b). This set allowed any transportation control measure (TCM) from an approved SIP to proceed during a conformity lapse and aligned the date of conformity lapses with the date of application of Clean Air Act highway sanctions for any failure to submit or submissions of an incomplete control strategy SIP. The second set also corrected the nitrogen oxides provisions of the transportation conformity rule consistent with the Clean Air Act and previous commitments made by EPA. Finally, the amendments extended the grace period for areas to determine conformity to a submitted control strategy SIP and established a grace period for determining conformity on transportation plans and programs in recently designated nonattainment areas. This grace period was later overturned in *Sierra Club v. EPA* in November 1997.

The third set of amendments was finalized August 15, 1997 (EPA, 1997). These amendments streamlined the conformity process by eliminating the reliance on the classification system of “Phase II interim period,” “transitional period,” “control strategy period,” and “maintenance period” to determine whether the budget test and/or emission reduction tests apply. The amendments also changed the time periods during which the budget test and the “Build/No Build” test are required.

To incorporate provisions from the *Sierra Club v. EPA* court decision, EPA promulgated an amendment to the transportation conformity rule on April 10, 2000 that eliminated a one-year grace period for new nonattainment areas before conformity applies (EPA, 2000). Then on August 6, 2002, the EPA promulgated an amendment to the transportation conformity rule which requires conformity to be determined within 18 months of the effective date of the EPA *Federal Register* notice on an budget adequacy finding in an initial SIP submission and established a one-year grace period before conformity is

required in areas that are designated nonattainment for a given air quality standard for the first time (EPA, 2002).

On July 1, 2004, EPA published the final rule, Transportation Conformity Rule Amendments for the New Eight-Hour Ozone and PM-2.5 National Ambient Air Quality Standards and Miscellaneous Revisions for Existing Areas; Transportation Conformity Rule Amendments - Response to Court Decision and Additional Rule Changes (EPA, 2004). The rule describes transportation conformity requirements for the new eight-hour ozone and fine particulate matter (PM-2.5) standards. The rule also incorporates existing EPA and United States Department of Transportation (U.S. DOT) guidance that implements the March 2, 1999, court decision and provides revisions that clarify the existing regulation and improve its implementation. On July 20, 2004, EPA published a *Federal Register* notice that corrects two errors in the preamble to the July 1, 2004 final rule.

On February 14, 2006, EPA and U.S. DOT jointly issued guidance on the implementation of the transportation conformity-related provisions from the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The transportation bill, which became law on August 10, 2005, made several changes to the transportation conformity provisions in Section 176(c) of the Clean Air Act. On January 24, 2008, EPA issued a final rule on the transportation conformity amendments to implement the conformity provisions contained in SAFETEA-LU (EPA, 2008a). A summary of the key conformity provisions is:

- Additional time is provided for areas to redetermine conformity of existing transportation plans and programs from 18 months to two years after the date that EPA finds a motor vehicle emissions budget to be adequate or approves an implementation plan that establishes a motor vehicle emissions budget, or when EPA promulgates an implementation plan that establishes or revises a motor vehicle emissions budget.
- The requirement for frequency of conformity determinations on updated transportation plans and programs is changed from three to four years, except when the MPO elects to update a transportation plan or program more frequently, or when the MPO is required to determine conformity after EPA finds a motor vehicle emissions budget to be adequate or approves an implementation plan that establishes a motor vehicle emissions budget, or when EPA promulgates an implementation plan that establishes or revises a motor vehicle emissions budget.

- Conformity determinations for transportation plans shall include the final year of the transportation plan as a horizon year, or optionally, after consultation with the air pollution control agency and the public and consideration of comments, the MPO may elect the longest of the following periods: the first 10-year period of the transportation plan; the latest year in the implementation plan that contains a motor vehicle emissions budget; the year after the completion date of a regionally significant project if the project is included in the transportation improvement program or the project requires approval before the subsequent conformity determination.

In addition, if the MPO elects to determine conformity for a period less than the last horizon year of the transportation plan, the conformity determination must include a regional emissions analysis for the last year of the transportation plan and for any year shown to exceed emission budgets from a previous conformity determination, for information only. The analysis years selected for the June 2024 Sun Corridor MPO Conformity Analysis are described later in this section and includes 2050 as the last year of the Sun Corridor MPO Regional Transportation Plan 2050 Update.

- Allows the substitution of transportation control measures in an implementation plan that achieve equivalent or greater emissions reductions than the control measure to be replaced and that are consistent with the schedule provided for control measures in the plan. The substitution or addition of a transportation control measure shall not require a new conformity determination for the transportation plan or a revision of the implementation plan.
- An additional 12-month grace period is provided after a missed deadline before conformity lapses on a transportation plan or program. This provision applies to two types of conformity determination deadlines: the deadline resulting from the requirement to determine conformity for the transportation plan and program at regular intervals and the deadlines resulting from the requirement for a conformity redetermination within two years of an EPA action approving or finding a motor vehicle emissions budget adequate.
- Requires a conformity SIP amendment addressing requirements from Title 40 CFR sections 93.105, 93.122(a)(4)(ii), and 93.125(c) of the federal transportation conformity regulations.

On March 14, 2012, EPA published the Transportation Conformity Rule Restructuring Amendments. This rule restructured sections 40 CFR 93.109 and 93.119 so that they apply to any new or revised federal air quality standard. The rule also allows any nonattainment area that EPA determines has clean air quality data to satisfy transportation conformity test requirements by using on-road emissions from the most recent year of clean data as the budgets for that standard rather than using the interim emissions tests per 40 CFR 93.119 (EPA, 2012a).

State Rule

State rules for transportation conformity were adopted on April 12, 1995, by the Arizona Department of Environmental Quality (ADEQ), in response to requirements in Section 176(c)(4)(C) of the Clean Air Act as amended in 1990 (ADEQ, 1995). These rules became effective upon their certification by the Arizona Attorney General on June 15, 1995 and, as required by the federal conformity rule, were submitted to EPA as a revision to the State transportation conformity SIP.

A State transportation conformity SIP has not received approval by EPA. Section 51.390(b) of the federal conformity rule states: "Following EPA approval of the State conformity provisions (or a portion thereof) in a revision to the applicable implementation plan, conformity determinations would be governed by the approved (or approved portion of the) State criteria and procedures." The federal transportation conformity rule therefore still governs, as a State transportation conformity SIP has not yet been approved for this State.

The State rule specifies that MPOs (i.e., Sun Corridor MPO, for this region) must develop specific conformity guidance and consultation procedures and processes. The guidance document should address both the determination of "regional significance" status for individual transportation projects, the process by which regionally significant projects may be approved, and procedures for the public and interagency consultation processes to be used in the development of regional transportation plans, programs, and projects within the Sun Corridor MPO portion of the Pinal County nonattainment areas.

Case Law

On November 14, 1997, the U.S. Court of Appeals for the District of Columbia issued an opinion in *Sierra Club v. EPA* involving the 1995 transportation conformity amendment that allowed new nonattainment areas a one-year grace period. Under this ruling, conformity applied as soon as an area was designated nonattainment. The EPA published a final rule on April 10, 2000 in the *Federal Register* deleting 40 CFR 93.102(d) that allowed the grace period for new nonattainment areas (EPA, 2000). Then, on October 27, 2000, the FY 2001 EPA Appropriations bill included an amendment to Section 176(c) of the Clean Air Act that adds the one-year grace period to the statutory language.

On March 2, 1999, the U.S. Court of Appeals for the District of Columbia issued an opinion in *Environmental Defense Fund v. EPA* involving the 1997 transportation conformity amendments. In general, the court struck down 40 CFR 93.120(a)(2) which permitted a 120-day grace period after disapproval of a SIP; determined that the EPA must approve a "safety margin" prior to its use for conformity in 40 CFR 93.124(b); concluded that a submitted SIP budget must be found by EPA to be adequate, based on criteria found in 40 CFR 93.118(e)(4) before it can be used in a conformity determination; and ended a provision that allowed "grandfathered" projects to proceed during a conformity lapse.

Following the court ruling, the EPA and U.S. DOT issued guidance to address implementation of conformity requirements based on the court findings. The EPA issued guidance contained in a May 14, 1999 memorandum (EPA, 1999).

In addition, the U.S. DOT issued guidance on June 18, 1999 that incorporates all U.S. DOT guidance in response to the court decision in a single document (U.S. DOT, 1999). On July 1, 2004, transportation conformity rule amendments were published in the *Federal Register* to incorporate provisions of the *Environmental Defense Fund v. EPA* court decision.

On October 20, 2006, the U.S. Court of Appeals for the District of Columbia filed an opinion vacating a provision of the transportation conformity rule at 40 CFR 93.109(e)(2)(v) that allowed areas to use the interim emission tests instead of the one-hour budgets. All other provisions regarding the use of the interim emissions tests remain unaffected by the court decision. Table 1 summarizes the criteria for conformity determinations for transportation projects, programs, and plans, as specified in amendments to the federal conformity rule.

CONFORMITY RULE REQUIREMENTS

The federal regulations identify general criteria and procedures that apply to all transportation conformity determinations, regardless of pollutant and implementation plan status. These include:

- 1) Conformity Tests - Sections 93.118 and 93.119 specify emission tests (budget and interim emissions) that the TIP and RTP must satisfy in order for a determination of conformity to be found. The final transportation conformity rule requires a submitted SIP motor vehicle emissions budget to be affirmed as adequate by EPA prior to use for making conformity determinations. The budget must be used on or after the effective date of EPA's finding of adequacy.
- 2) Methods / Modeling:

Latest Planning Assumptions - Section 93.110 specifies that conformity determinations must be based upon the most recent planning assumptions in force at the time the conformity analysis begins, which is "the point at which the MPO or other designated agency begins to model the impact of the proposed transportation plan or TIP on travel and/or emissions. New data that becomes available after an analysis begins is required to be used in the conformity determination only if a significant delay in the analysis has occurred, as determined through interagency consultation". This section of the conformity rule also requires reasonable assumptions to be made regarding transit service and changes in projected fares. All analyses were conducted using the latest planning assumptions and emissions models in force at the time the conformity analysis started on March 26, 2024.

Latest Emissions Models - Section 93.111 requires that the latest emission estimation models specified for use in SIPs must be used for the conformity analysis.

- 3) Timely Implementation of TCMs - Section 93.113 provides a detailed description of the steps necessary to demonstrate that the TIP and RTP are providing for the timely implementation of TCMs, as well as demonstrate that the plan and/or program is not interfering with this implementation. Since there are no applicable plans for the West Pinal PM-10 Nonattainment Area and West Central Pinal PM-2.5 Nonattainment Area, a review of Transportation Control Measure implementation has not been provided.
- 4) Consultation - Section 93.105 requires that the conformity determination be made in accordance with the consultation procedures outlined in the federal regulations. These include:
 - The Sun Corridor MPO is required to provide reasonable opportunity for consultation with local air quality and transportation agencies, state air and transportation agencies, the U.S. DOT and EPA (Section 93.105(c)(1)).
 - The Sun Corridor MPO is required to establish a proactive public involvement process which provides opportunity for public review and comment prior to taking formal action on a conformity determination (Section 93.105(e)).

TABLE 1.
CONFORMITY CRITERIA FROM THE FINAL RULE

Applicability	Pollutant	Section	Requirement
All Actions at All Times	CO, Ozone, PM-10 PM-2.5	93.110	Latest Planning Assumptions
		93.111	Latest Emissions Model
		93.112	Consultation
Transportation Plan (RTP)	CO, Ozone, PM-10 PM-2.5	93.113(b)	TCMs
		93.118 and/or 93.119	Emissions Budget and/or Interim Emissions
TIP	CO, Ozone, PM-10 PM-2.5	93.113(c)	TCMs
		93.118 and/or 93.119	Emissions Budget and/or Interim Emissions
Project (From a Conforming Plan and TIP)	CO, Ozone, PM-10 PM-2.5	93.114	Currently Conforming Plan and TIP
		93.115	Project From a Conforming Plan and TIP
	CO, PM-10, PM-2.5	93.116	CO, PM-10, and PM-2.5 Hot Spots
	PM-10, PM-2.5	93.117	PM-10 and PM-2.5 Control Measures
Project (Not From a Conforming Plan or TIP)	CO, Ozone, PM-10 PM-2.5	93.113(d)	TCMs
		93.114	Currently Conforming Plan and TIP
	CO, PM-10, PM-2.5	93.116	CO, PM-10, and PM-2.5 Hot Spots
	PM-10, PM-2.5	93.117	PM-10 and PM-2.5 Control Measures
	CO, Ozone, PM-10 PM-2.5	93.118 and/or 93.119	Emissions Budget and/or Interim Emissions

Source: Adapted from (EPA, 2012b), Section 93.109(b), "Table 1 - Conformity Criteria".

AIR QUALITY PLANS AND DESIGNATIONS

Pinal County Nonattainment Areas

On February 3, 2011, EPA published the final rule designating a portion of Pinal County as nonattainment for the 2006 24-hour PM-2.5 standard based on 2006-2008 data, effective March 7, 2011. The West Central Pinal PM-2.5 Nonattainment Area covers approximately 323 square miles in the west central part of Pinal County.

Also, on May 31, 2012, EPA published the final rule designating the West Pinal PM-10 Nonattainment Area, effective July 2, 2012. EPA classified the nonattainment area as Moderate. The West Pinal PM-10 Nonattainment Area covers approximately 1,326 square miles in the western half of Pinal County. On June 24, 2020, EPA published the final rule to determine that the West Pinal County PM-10 nonattainment area did not attain the PM-10 standard by the December 31, 2018 attainment date and to reclassify the nonattainment area as Serious, effective July 24, 2020 (EPA, 2020).

Nonattainment Boundaries

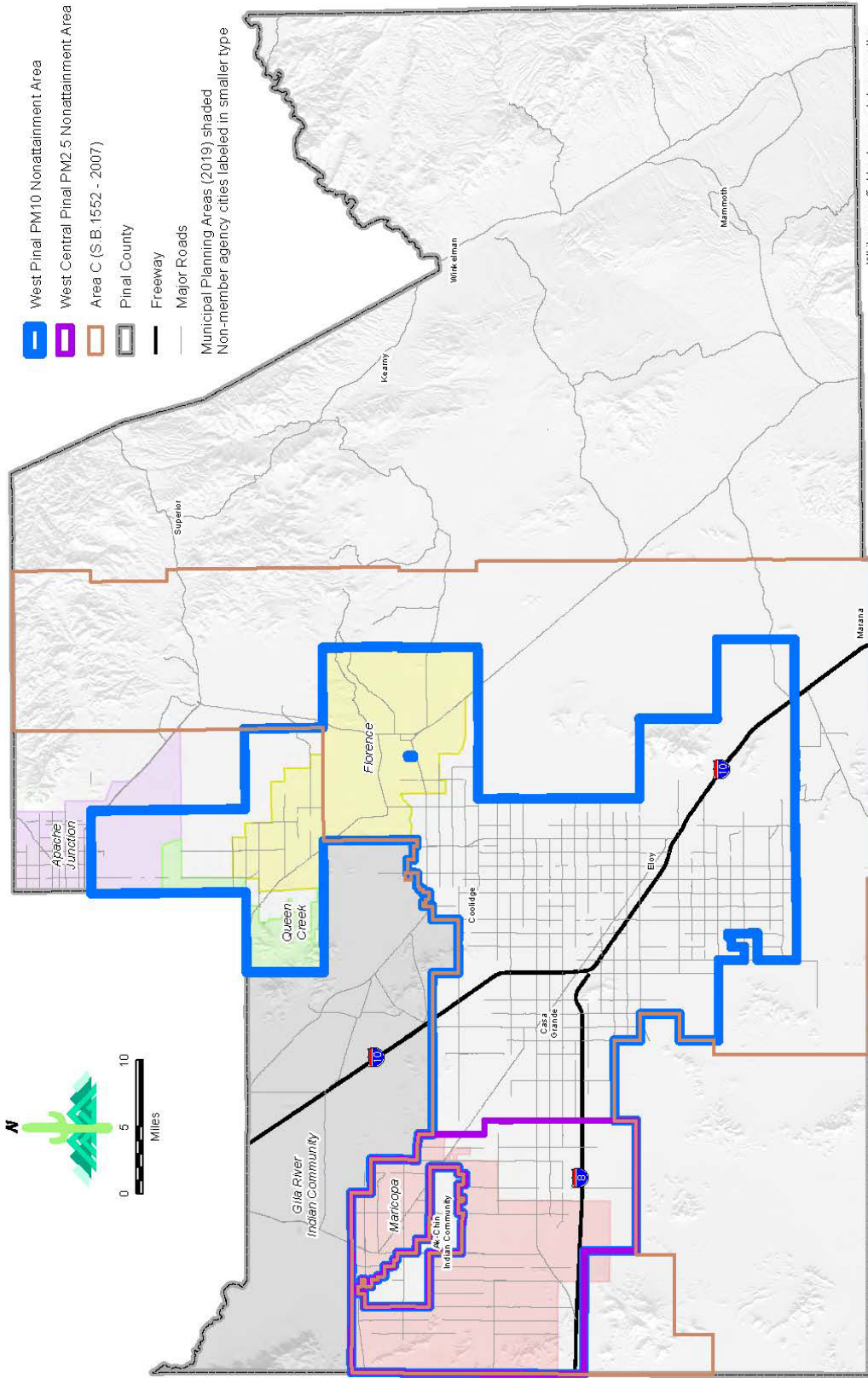
As shown in Figure 2, portions of the West Pinal PM-10 Nonattainment Area and West Central Pinal PM-2.5 Nonattainment Area are located within the metropolitan planning area boundaries of both the Sun Corridor Metropolitan Planning Organization and MAG.

Attainment Status

At the time of designation, EPA indicated that the State of Arizona is required to submit a SIP for the West Central Pinal PM-2.5 Nonattainment Area within three years following the March 7, 2011 effective date. On September 4, 2013, EPA published in the *Federal Register* a determination that the West Central Pinal PM-2.5 Nonattainment Area has attained the 2006 24-hour PM-2.5 standard based on clean data at the monitor during the 2010-2012 monitoring period and issued a clean data finding, effective October 4, 2013. On October 3, 2019, EPA published a final rule with a determination that the West Central Pinal PM-2.5 Nonattainment Area attained the 2006 24-hour PM-2.5 standard by the December 31, 2017 attainment date based on 2015-2017 data, effective November 4, 2019.

In the May 31, 2012 final rulemaking, EPA indicated that the State of Arizona is required to submit a revision to the SIP for the West Pinal PM-10 Nonattainment Area within 18 months following the July 2, 2012 effective date. On December 21, 2015, the Arizona Department of Environmental Quality submitted the 2015 West Pinal Moderate PM-10 Nonattainment Area SIP to EPA. Also, on May 1, 2017, EPA approved SIP revisions that concern particulate matter emissions from construction sites, agricultural activity, and other fugitive dust sources.

Figure 2: Air Quality Nonattainment Areas for the Pinal County Area, Arizona



While every effort has been made to ensure the accuracy of this information, the Maricopa Association of Governments makes no warranty, expressed or implied, as to its accuracy and expressly disclaims liability for the accuracy thereof.

Source: U.S. Environmental Protection Agency
Date: July 2019

On January 8, 2021, EPA published a proposed rule in the *Federal Register* to approve in part and disapprove in part the 2015 West Pinal Moderate PM-10 Nonattainment Area Plan prepared by the Arizona Department of Environmental Quality. In the notice, EPA proposed to approve the base year 2008 emissions inventory for direct PM-10 and to disapprove the remaining elements of the plan. On May 17, 2021, the Arizona Department of Environmental Quality withdrew the Moderate area attainment plan submission.

On July 23, 2021, EPA published a final rule making a finding that Arizona has not submitted a required revision to the Arizona State Implementation Plan for the West Pinal County nonattainment area addressing the Clean Air Act requirements for a Moderate area attainment plan, related rules, and other analyses needed to attain the 1987 24-hour particulate matter (PM-10) air quality standard by December 31, 2018 (EPA, 2021). The EPA Finding of Failure to Submit final rule was effective August 23, 2021. The finding established a deadline of 24 months after the effective date for EPA to promulgate a Federal Implementation Plan to address the Moderate area requirements, unless prior to the deadline, Arizona submits and EPA approves the State's Moderate area PM-10 attainment plan as meeting all of the requirements of the Clean Air Act. The Clean Air Act also provides for the imposition of the emissions offset sanctions 18 months from the effective date of this finding and highway sanctions 24 months from the effective date of this finding, if Arizona does not submit the required complete Moderate area PM-10 attainment plan before these deadlines. In the notice, EPA also indicated that the Clean Air Act does not require sanctions or a Federal Implementation Plan if the State and EPA take timely action to remedy this finding.

On June 1, 2022, the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area was submitted to EPA. On November 30, 2022, EPA issued a letter to ADEQ finding that the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area meets the minimum criteria for completeness terminating the sanction clocks started by EPA's July 23, 2021 finding of failure to submit.

Also, on July 21, 2023, EPA published a final rule to determine that the West Pinal PM-10 Nonattainment Area did not attain the PM-10 national ambient air quality standards by the December 31, 2022 attainment date, effective August 21, 2023. A state implementation plan (SIP) revision was required to be submitted to EPA no later than December 31, 2023 that among other elements, provides for expeditious attainment of the PM-10 standard and for a five percent annual reduction in PM-10 emissions in the nonattainment area. In December 2023, the Arizona Department of Environmental Quality officially submitted the 2023 Five Percent Particulate Plan for PM-10 for the West Pinal County Nonattainment Area.

CONFORMITY TEST REQUIREMENTS

Pinal County Nonattainment Areas

PM-10

On May 31, 2012, EPA designated the West Pinal PM-10 Nonattainment Area in Pinal County, effective July 2, 2012 (EPA, 2012c). EPA classified the nonattainment area as Moderate. The West Pinal PM-10 Nonattainment Area covers approximately 1,326 square miles in the western half of Pinal County. On June 24, 2020, EPA published the final rule to determine that the West Pinal County PM-10 nonattainment area did not attain the PM-10 standard by the December 31, 2018 attainment date and to reclassify the nonattainment area as Serious, effective July 24, 2020 (EPA, 2020).

On December 21, 2015, the Arizona Department of Environmental Quality submitted the 2015 West Pinal Moderate PM-10 Nonattainment Area SIP to EPA. On May 17, 2021, the Arizona Department of Environmental Quality withdrew the 2015 West Pinal Moderate PM-10 Nonattainment Area Plan prepared by the Arizona Department of Environmental Quality.

On June 1, 2022, the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area was submitted to EPA. On November 11, 2022, EPA issued a letter finding that the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area meets the minimum criteria for completeness terminating the sanction clocks started by EPA's July 23, 2021 finding of failure to submit. EPA has not approved or found adequate the motor vehicle emissions budget.

Also, on July 21, 2023, EPA published a final rule to determine that the West Pinal PM-10 Nonattainment Area did not attain the PM-10 national ambient air quality standards by the December 31, 2022 attainment date and required a new state implementation plan (SIP) revision that provides for expeditious attainment of the PM-10 standard and for a five percent annual reduction in PM-10 emissions in the nonattainment area, effective August 21, 2023 (EPA, 2023a). On December 15, 2023, the 2023 Five Percent Plan for PM-10 for the West Pinal County Nonattainment Area was submitted to EPA. At this time, EPA has not approved or found adequate the motor vehicle emissions budgets.

Since there are no PM-10 emission budgets that have been found to be adequate or approved by EPA, an Action/Baseline analysis was performed in accordance with the EPA transportation conformity rule (EPA, 2012b). The baseline network includes regionally significant highways open to traffic and transit service in operation by December 31, 2023. In accordance with Section 93.119(h) of EPA conformity regulations, the baseline network also includes all regionally significant projects, regardless of funding source, which are currently under construction or undergoing right-of-way acquisition, are MAG and Sun Corridor MPO TIP projects that were coded in the baseline traffic assignment for the previous conformity analysis conducted in June 2023, including any projects from the previous traffic assignment that have been deferred past the starting of the Conformity Analysis, or have completed the NEPA process. Each action network includes regionally significant highway and transit projects from the MAG and Sun Corridor MPO TIPs and RTPs in the West Pinal PM-10 Nonattainment Area, that are scheduled to be open to the public by 2025, 2030, 2040, and 2050, respectively.

Also, for information, MAG conducted a budget test using the 2026 budget established in the submitted 2023 Five Percent Particulate Plan for PM-10 for the West Pinal County Nonattainment Area. The 2023 Five Percent Particulate Plan for PM-10 establishes a 2026 budget of 42.5 metric tons per day for the attainment year. The budget includes PM-10 emissions from vehicle exhaust, tire wear and break wear, road construction, reentrained dust from vehicle travel on paved roads, and fugitive dust from vehicle travel on public and private (non-agricultural) unpaved roads.

PM-2.5

On February 3, 2011, EPA designated the West Central Pinal PM-2.5 Nonattainment Area in Pinal County, effective March 7, 2011 (EPA, 2011). On September 4, 2013, EPA published in the *Federal Register* a determination that the West Central Pinal nonattainment area has attained the 2006 24-hour PM-2.5 standard based on clean data at the monitor during the 2010-2012 period (EPA, 2013).

Conformity analyses must also be performed for the PM-2.5 nonattainment area, even if EPA issues a clean data finding. On October 3, 2019, EPA published a final rule with a determination that the West Central Pinal PM-2.5 Nonattainment Area attained the 2006 24-hour PM-2.5 standard by the December 31, 2017 attainment date based on 2015-2017 data, effective November 4, 2019 (EPA, 2019).

For the June 2024 Sun Corridor MPO Conformity Analysis, an Action/Baseline analysis was performed for the smaller West Central Pinal PM-2.5 Nonattainment Area. Since EPA or the Arizona Department of Environmental Quality have not determined that nitrogen oxide (NOx) emissions are an insignificant contributor to the PM-2.5 attainment problem, per Section 93.119(f)(9) of EPA conformity regulations, NOx, as well as PM-2.5 emissions from onroad mobile sources, were included in the Action/Baseline analysis for the Pinal PM-2.5 nonattainment area.

Since there is no emissions budget that has been found to be adequate or approved by EPA, an Action/Baseline analysis was performed in accordance with the latest EPA conformity guidance (EPA, 2012b). The baseline network includes regionally significant highways open to traffic and transit service in operation by December 31, 2023. In accordance with Section 93.119(h) of EPA conformity regulations, the baseline network also includes all regionally significant projects, regardless of funding source, which are currently under construction or undergoing right-of-way acquisition, are MAG and Sun Corridor MPO TIP projects that were coded in the baseline traffic assignment for the previous conformity analysis conducted in June 2023, including any projects from the previous traffic assignment that have been deferred past the starting of the Conformity Analysis, or have completed the NEPA process. Each action network includes regionally significant highway and transit projects from the MAG and Sun Corridor MPO TIPs and RTPs in the West Central Pinal PM-2.5 Nonattainment Area, that are scheduled to be open to the public by 2025, 2030, 2040, and 2050, respectively.

ANALYSIS YEARS

Pinal County Nonattainment Areas

In selecting Action/Baseline analysis years for the Pinal County nonattainment areas, which do not have approved or adequate mobile source emissions budgets, 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 plans (i.e., the MOMENTUM 2050 MAG Regional Transportation Plan and the Sun Corridor MPO Regional Transportation Plan 2050 Update, both of which contain projects in the Pinal nonattainment areas).

These three criteria are met by the years 2025, 2030, 2040, and 2050. For the June 2024 Sun Corridor MPO Conformity Analysis, onroad mobile source emissions were estimated for the Action/Baseline scenarios for 2025, 2030, 2040, and 2050. PM-10 emissions were estimated for the West Pinal PM-10 Nonattainment Area, while PM-2.5 and nitrogen oxide (NOx) emissions were estimated for the West Central Pinal PM-2.5 Nonattainment Area.

Also, for information, MAG conducted a conformity budget test using the budget established in the submitted 2023 Five Percent Particulate Plan for PM-10 for the West Pinal County Nonattainment Area. The analysis years include 2026, 2030, 2040, and 2050. The year 2026 was modeled since it is the attainment year in the 2023 Five Percent Particulate Plan for PM-10. The years 2030 and 2040 were modeled since these are intermediate years that meet the federal conformity requirement that analysis years be no more than ten years apart. The year 2050 was modeled since it is the last year of MOMENTUM 2050 MAG Regional Transportation Plan and the Sun Corridor MPO Regional Transportation Plan 2050.

2 LATEST PLANNING ASSUMPTIONS

The Clean Air Act states that “the determination of conformity shall be based on the most recent estimates of emissions, and such estimates shall be determined from the most recent population, employment, travel, and congestion estimates as determined by the MPO or other agency authorized to make such estimates.” On January 18, 2001, the U. S. DOT issued guidance developed jointly with EPA to provide additional clarification concerning the use of latest planning assumptions in conformity determinations (U.S. DOT, 2001). In December 2008, EPA published revisions to the 2001 guidance entitled, “Guidance for the Use of Latest Planning Assumptions in Transportation Conformity Determinations” (EPA, 2008b).

Key elements of this guidance are identified below:

- Areas are strongly encouraged to review and strive towards regular five-year updates of planning assumptions, especially population, employment, and vehicle registration assumptions.
- The latest planning assumptions must be derived from the population, employment, travel, and congestion estimates that have been most recently developed by the MPO (or other agency authorized to make such estimates) and approved by the MPO.
- Conformity determinations that are based on information that is older than five years should include written justification for not using more recent information. For areas where updates are appropriate, the conformity determination should include an anticipated schedule for updating assumptions.

The latest planning assumptions for Sun Corridor MPO conformity analyses for the MAG transportation modeling domain covering Maricopa and Pinal counties, are summarized in Table 2. The methodology and scheduled updates for the planning assumptions are discussed below.

The conformity regulations (EPA, 2012b) indicate that “the conformity determination...must be based upon the most recent planning assumptions in force at the time the conformity analysis begins...as determined through the interagency consultation process.” It has been determined through the consultation process that the “time that the conformity analysis begins” will be the day that the first traffic assignment is submitted for travel demand modeling for the June 2024 Sun Corridor MPO Conformity Analysis. For this conformity analysis, “time that the conformity analysis begins” was March 26, 2024.

TABLE 2. LATEST PLANNING ASSUMPTIONS FOR SUN CORRIDOR MPO CONFORMITY DETERMINATIONS FOR THE MAG TRANSPORTATION MODELING DOMAIN COVERING MARICOPA AND PINAL COUNTIES

Assumption	Source	MAG Models	Next Scheduled Update
Population and Employment	Under Arizona Governor’s Executive Order 2011-04, official County projections are updated every 3 to 4 years. These official projections are used by all agencies for planning purposes. The Arizona State Demographer prepared a new set of Maricopa County projections based on the U.S. Census Bureau’s 2017-2021 American Community Survey. Employment projections were prepared by Dr. George Hammond at the University of Arizona’s Economic and Business Research Center in December 2022. MAG developed a set of subcounty population and employment projections for Maricopa County that are consistent with the State Demographer’s population projections. The MAG Regional Council approved the subcounty socioeconomic projections in June 2023. In addition, Central Arizona Governments (CAG) approved the Pinal County subcounty socioeconomic projections, based on the State’s Pinal County projections, in June 2023. The MAG Traffic Analysis Zone System was updated to reflect the latest socioeconomic changes in July 2023.	AZ-SMART (UrbanSim)	Under the Governor’s Executive Order 2011-04, official county socioeconomic projections will be developed by the Arizona State Demographer. According to the schedule set forth in the Executive Order, the State Demographer will produce county level projections of population by December 2025. Following that release, MAG will produce subcounty population and employment projections by June 2026.
Traffic Counts	The highway models were validated for the 2018 base year based on traffic count data from approximately 1,000 traffic count locations, collected by MAG in 2018-2019 during peak seasons.	MAG Travel Demand Models	Region-wide traffic counts are typically collected by MAG every 2-4 years, depending on available funds and model base year definition. MAG is planning to conduct new traffic count data collection in Fall 2023/Spring 2024.

TABLE 2 (CONTINUED). LATEST PLANNING ASSUMPTIONS FOR SUN CORRIDOR MPO CONFORMITY DETERMINATIONS FOR THE MAG TRANSPORTATION MODELING DOMAIN COVERING MARICOPA AND PINAL COUNTIES

Assumption	Source	MAG Models	Next Scheduled Update
Vehicle Miles of Travel	<p>MAG’s Activity Based Model is based on the Coordinated Travel Regional Activity Based Modeling Platform (CT-RAMP2) family of Activity Based Models for travel demand forecasting. The calibration work for the major components of the Activity Based Model has been completed. Datasets used in the model calibration process include 2017 Household and Establishment surveys and the 2019 transit on-board survey. In addition, 2013-2017 ACS PUMS and MAG socioeconomic data are also used to generate a synthetic population which is input to the Activity Based Model.</p> <p>Activity Based Model components such as long-term choice for mandatory activity (work and school) location models, day-level models for activity participation, tour formation, and other tour and trip detail models such as time-of-day choice and mode choice were recalibrated based on the 2017 Household Travel Survey and the 2019 transit on-board survey. The truck model was recalibrated based on the 2017 ATRI data, 2015 StreetLight data and 2013 Transearch data.</p> <p>The external travel model was recalibrated in 2014 based on regional growth projections for Arizona and neighboring states.</p> <p>Incremental updates and improvements were introduced to the model to reflect network changes, socioeconomic forecast changes, and changes in the traffic zone system.</p> <p>MAG conducted a comprehensive revalidation of the Activity Based Model using 2018-2019 traffic counts and 2018 speed</p>	MAG Travel Demand Models	MAG is in the process of conducting a new regional household travel survey to capture behavioral shifts triggered in the post-pandemic era that may impact activity and travel behavior in the region. The survey will be conducted until the end of the calendar year 2024. Updates to the MAG forecasting models will be initiated as soon as sufficient survey data is collected.

TABLE 2 (CONTINUED). LATEST PLANNING ASSUMPTIONS FOR SUN CORRIDOR MPO CONFORMITY DETERMINATIONS FOR THE MAG TRANSPORTATION MODELING DOMAIN COVERING MARICOPA AND PINAL COUNTIES

Assumption	Source	MAG Models	Next Scheduled Update
	data. The overall calibration year for the model is 2018 and the latest base year based on a comprehensive validation is 2018.		
Speeds	The highway models were validated using peak season average speed based on 50 million traffic speed records purchased from HERE for calendar year 2018 and also compared to a similar data set purchased in the same year.	MAG Travel Demand Models	Commercial travel speed data are acquired by MAG periodically to validate the transportation models. MAG also utilizes commercial speed data for future estimation and model calibration purposes. MAG is acquiring new speed data that will be required for the validation to the new base year processes. MAG has also collaborated with ADOT and capitalized on ADOT commercial speed data contracts.
Vehicle Registrations	For this conformity analysis, the January 2020 vehicle registration data provided by ADOT will be used as the input data. The January 2020 source type populations for passenger cars and light-duty trucks will be adjusted to reflect the MOVES3.1 default ratios.	MOVES3.1	MAG is in the process of developing a methodology for decoding and classifying the latest available vehicle identification number data available from ADOT for future conformity determinations.
Implementation Measures	Latest implementation status of commitments in prior SIPs.	N/A	Updated for every conformity analysis.

POPULATION AND EMPLOYMENT

In accordance with the Governor's Executive Order 2011-04, official county level population projections based on the 2017-2021 American Community Survey have been developed by the Arizona State Demographer. The State Demographer completed the county level projections in December 2022. MAG prepared subcounty socioeconomic projections for Maricopa County that were adopted by the MAG Regional Council in June 2023. The Central Arizona Governments (CAG) approved subcounty population projections for Pinal County in June 2023.

The travel and speed estimates produced by the MAG transportation models for the analysis years in the June 2024 Sun Corridor MPO Conformity Analysis are based on the MAG and CAG subcounty population and employment projections that are consistent with the 2017-2021 American Community Survey.

Methodology

The Arizona State Demographer prepared the official Arizona population projections by county, using 2017-2021 American Community Survey data as the base. MAG used those population projections consistent with the 2017-2021 American Community Survey. These projections for Maricopa County were distributed to smaller geographic areas by MAG using the latest available data and a state-of-the-art land use model system called AZ-SMART. The nationally recognized UrbanSim microsimulation model was integrated into AZ-SMART and used to allocate county projections of households and employment to land use parcels based on measures such as accessibility to employment, adjacent land uses, highway access, and proximity to other development.

Population and employment at the land use parcel level in the MAG planning area were aggregated to TAZs using AZ-SMART. The subcounty socioeconomic projections developed with the AZ-SMART model were approved by the MAG Regional Council in June 2023.

Since the MAG transportation modeling area includes Pinal County, in collaboration with the Central Arizona Governments (CAG), MAG has also prepared socioeconomic projections for Pinal County. MAG prepared the projections at the traffic analysis zone (TAZ) level by controlling to the County control totals approved by CAG. AZ-SMART, the MAG socioeconomic modeling system, was utilized to produce the MPA and TAZ projections for Pinal County. The TAZ projections were reviewed by the CAG Management Committee in June 2023.

Next Scheduled Update

Under the Governor's Executive Order 2011-04, official county socioeconomic projections will be developed by the Arizona State Demographer. According to the schedule set forth in the Executive Order, the State Demographer will develop new county level projections

of population by December 2025. MAG will then develop a set of subcounty population and employment projections for Maricopa County that are consistent with the State's population projections.

TRAFFIC COUNTS

The highway traffic volumes estimated by the MAG transportation models were validated in 2021 for the 2018 base year, using traffic counts from approximately 1,000 freeway and arterial locations. The traffic counts were collected by MAG during peak seasons of 2018-2019 in Maricopa and Pinal counties. MAG transportation models were recalibrated based on the travel surveys conducted in 2017. New model validations are based on the model runs with updated socioeconomic input files and recalibrated transportation models. Use of the most recent traffic counts to validate the models is consistent with the federal conformity guidance which strongly encourages areas to update the planning assumptions for network-based travel models at least every five years (EPA, 2008b).

Methodology

MAG uses TransCAD software, as well as custom developed programs, to perform travel demand modeling. TransCAD provides a geographic information systems (GIS) interface that facilitates transportation modeling. The MAG transportation models follow activity-based model procedure that includes accessibility calculation, population synthesis, long-term choice for mandatory activities such as work and school location, day-level models for activity participation, tour formation, and time allocation, and tour-level models such as time-of-day choice and mode choice, and traffic/transit assignment. The mode choice model is sensitive to highway and transit travel times, as well as pricing variables. Highway and transit route choice is determined in the assignment step, based on operating costs, travel times, and distances. Capacity-restrained traffic assignments are performed for the AM peak period, midday, the PM peak period, and nighttime. A feedback loop between traffic assignment for the current loop and accessibility calculation for the next loop is utilized to achieve near-equilibrium highway speeds.

Next Scheduled Update

Region-wide traffic counts are typically collected by MAG every 2-4 years. MAG has completed 2018-2019 regional traffic counts data collection. MAG conducts incremental updates, recalibration and validation of the regional model on an on-going basis in order to maintain relevancy of the regional forecast and as new data sets become available. Rapid changes in technology and transportation data field change the ways regional models are developed and maintained. MAG model development plans reflect these changes and capitalize on the most recent offerings in transportation data. MAG is planning to conduct new regional traffic counts data collection in Fall 2023/Spring 2024.

VEHICLE MILES OF TRAVEL

MAG travel forecasting model is calibrated based on data from the 2017 household travel survey and 2019 regional transit on-board survey.

The transportation models simulate peak and daily traffic volumes on more than 30,000 highway links, as well as the transit trips on bus and light rail routes in the MAG transportation modeling domain covering Maricopa and Pinal counties. Vehicle miles of travel (VMT) by link, output by the highway assignment process, are input to the MAG MOVESLink model used to estimate onroad mobile source emissions for conformity analyses.

Transportation model estimates of vehicle volumes are validated using actual traffic counts. The MAG transportation models were validated against over 1,000 count locations collected in 2018-2019 for the 2018 base year. Table 3 summarizes the validation results by area type for freeways and arterials. Both the R-squared (R^2) and Root Mean Square Error (RMSE) statistics indicate that there is a good fit between transportation model-estimated 2018 weekday traffic volumes and traffic count data.

TABLE 3.
AGGREGATED MODEL VALIDATION RESULTS
MODEL-ESTIMATED 2018 WEEKDAY VOLUMES VS. 2018 TRAFFIC COUNTS

	Freeways and Arterials	
Area Type	R^2	% RMSE
CBD	0.974	24.6%
Outlying CBD	0.967	23.0%
Mixed Urban	0.943	24.0%
Suburban	0.877	33.6%
Rural	0.895	36.0%
All	0.961	26.5%

R^2 : The coefficient of determination, or R^2 , is a measure that provides information about the goodness of fit of a model. In the context of regression, it is a statistical measure of how well the regression line approximates the actual data.

Percent RMSE: The root-mean-square error (RMSE) of a sample is the quadratic mean of the differences between the observed values and predicted ones. Percent RMSE is the ratio of "RMSE" over "mean of observed values" in percent form.

$$\text{RMSE} = \sqrt{\frac{\sum_{i=1}^N [(\text{Count}_i - \text{Model}_i)^2]}{N}}$$

and

$$\% \text{RMSE} = \frac{\text{RMSE}}{\left(\frac{\sum_{i=1}^N \text{Count}_i}{N} \right)} \times 100$$

where N is the number of observed values.

Typically, for a regional model comparable to the size of the MAG Activity-Based Model, an overall R² over 0.85 and an RMSE under 40% is considered a good fit. The MAG model validation statistics surpass these requirements with an overall R² of 0.961 and an RMSE of 26.5%. A more detailed validation statistics by Area Type is summarized in the table below.

Section 93.122(b) of the transportation conformity regulations require that regional emissions analyses in serious, severe, and extreme ozone nonattainment areas and serious carbon monoxide nonattainment areas, with urbanized area populations over 200,000, meet certain network-based modeling requirements, including reconciliation of modeled VMT with HPMS. As described in Section 93.122(b)(3), for areas with network-based travel models, a factor (or factors) may be developed to reconcile and calibrate the network-based travel model estimates of VMT in the base year of its validation to the HPMS estimates for the same period. In conformity analyses prior to 2005, transportation model estimates of VMT were reconciled with the VMT reported by the Highway Performance Monitoring System (HPMS) to comply with this requirement.

Also, Section 93.122(d), indicates that in all areas not otherwise subject to paragraph 93.122(b), regional emissions analyses must use those procedures described in paragraph (b) (i.e. reconcile network-based travel model estimates of VMT with the VMT reported by HPMS) if the use of those procedures has been the previous practice of the MPO.

A comparison of the MAG travel demand model vehicle miles of travel (VMT) for 2018 with the Highway Performance Monitoring System (HPMS) data reported for 2018 for the eight-hour ozone nonattainment area was completed in January 2024. The year 2018 was used since that is the year that the MAG Activity-Based Model was last validated. The analysis provided in Table 4 indicates that the difference between HPMS vehicle

miles of travel and the MAG travel demand model vehicle miles of travel in 2018 is less than one percent.

TABLE 4.
COMPARISON BETWEEN THE 2018 MAG TRAVEL DEMAND MODEL VEHICLE MILES OF TRAVEL (VMT) AND 2018 HPMS VMT FOR THE MARICOPA EIGHT-HOUR OZONE NONATTAINMENT AREA

	2018 Highway Performance Monitoring System VMT	2018 MAG Travel Demand Model VMT	Difference
Vehicle Miles of Travel for the Eight-Hour Ozone Nonattainment Area	74,781,245	74,166,912	-0.82%

Next Scheduled Update

MAG is in the process of conducting a new regional household travel survey to capture behavioral shifts triggered in the post-pandemic era that may impact activity and travel behavior in the region. The survey will be conducted until the end of the calendar year 2024. Updates to the MAG forecasting models will be initiated as soon as sufficient survey data is collected.

SPEEDS

Speeds obtained from the capacity-restrained traffic assignments are used to recompute link travel times that are then fed-back into the travel demand modeling chain. Accessibility calculation, long-term choice for mandatory activities such as work and school location, day-level models for activity participation, tour formation, and time allocation, and tour-level models such as time-of-day choice and mode choice of the chain are executed until PM peak period trip tables and link volumes are in equilibrium. In addition to vehicle miles of travel, the MAG transportation models calculate system performance measures such as vehicle hours of travel and volume to capacity ratios.

Periodically, MAG conducts speed studies or acquires commercial speed data to compare model-estimated speeds with empirical data. MAG purchased 2018 speed data from HERE that was used to update the speeds estimated by the MAG transportation models in 2021, as discussed in the Methodology section below.

Methodology

MAG used the 2018 HERE regionwide speed data to improve the speed estimates produced by the transportation models. The model-estimated speeds are in reasonable agreement with observed arterial and freeway speeds during the peak and off-peak periods.

Next Scheduled Update

MAG obtains commercial speed data on a regular basis, annually, if funding is available. The recalibrated model will be validated with new speed and traffic count data as appropriate.

VEHICLE REGISTRATIONS

For the June 2024 Sun Corridor MPO Conformity Analysis, the vehicle source type population is derived using the Arizona Department of Transportation January 2020 vehicle registration data, the transit bus data, and the MOVES3.1 default source type population data. In accordance with MOVES Technical Guidance, the January 2020 vehicle registration data is used up to model year 2019 since the model year 2019 is the latest model year with the full year data. While the 2020 vehicle registration data from ADOT are provided in five vehicle types (i.e., motorcycles, light-duty vehicles, light-duty trucks, heavy-duty vehicles, and buses), only two vehicle types (motorcycles and buses) exactly match with MOVES source types (Source Type 11 and Source Types 41-43, respectively). The motorcycle population is directly obtained from the vehicle registration data. The population of transit bus (Source Type 42) is directly obtained from the transit bus data. For the rest of the bus categories, the MOVES3.1 default splits between Source Types 41 and 43 are applied to the remainder of the bus population from the 2020 vehicle registration data. In consultation with EPA and FHWA on October 19, 2023, it was recommended that the SUV population be assigned appropriately by applying MOVES3.1 default split among the rest of Source Types (21, 32, 32, 51, 52, 53, 54, 61, and 62) to the combined population of light-duty vehicles, light-duty trucks, and heavy-duty vehicles in the 2020 vehicle registration data. In Chapter 4, Table 9 shows the MOVES3.1 default source type population for Pinal County in 2019 and the source type population adjusted with the 2020 vehicle registration data. Source type population is projected for each horizon year using the MOVES3.1 default source type population projection rate between 2019 and the horizon year for each source type as shown in Table 10.

Finally, source type population for the selected nonattainment area is extracted using a ratio of the population projections between the county and the nonattainment area. The population projections for future years are prepared by the MAG socioeconomic modeling staff and are from the socioeconomic projections approved by the MAG Regional Council in June 2023.

IMPLEMENTATION MEASURES

Pinal County Nonattainment Areas

For the Pinal County nonattainment areas, emission reduction credit was assumed for the committed measures in the SIPs including the measures in Table 5 for performing the conformity analysis. The West Pinal PM-10 Nonattainment Area includes a small portion of Area A, where participation in the Vehicle Inspection/Maintenance Program is required for all vehicles registered in Area A. These control measures reduce tailpipe emissions of PM-10 as well as ozone precursor emissions volatile organic compounds and nitrogen oxides.

TABLE 5.
COMMITTED MEASURES IN THE WEST PINAL
PM-10 NONATTAINMENT AREA USED FOR EMISSION REDUCTION CREDIT

Measure #	Reference	Measure Description	Pollutant(s)
4	Eight-Hour Ozone Maintenance Plan ¹	Tougher Enforcement of Vehicle Registration and Emission Test Compliance	PM-10
6	Eight-Hour Ozone Maintenance Plan	Expansion of Area A Boundaries	PM-10

¹MAG 2009 *Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*, February 2009 (MAG, 2009).

3 TRANSPORTATION MODELING

The transportation modeling performed for the June 2024 Sun Corridor MPO Conformity Analysis for the FY 2023-2027 Sun Corridor MPO Transportation Improvement Program and Sun Corridor MPO Regional Transportation Plan 2050 Update is based on the latest planning assumptions, as required in the federal conformity rule (40 CFR 93.110) and documented in Chapter 2. A summary of the transportation model characteristics, key socioeconomic data, and other data related to the land use and transportation system forecasts is provided in this chapter.

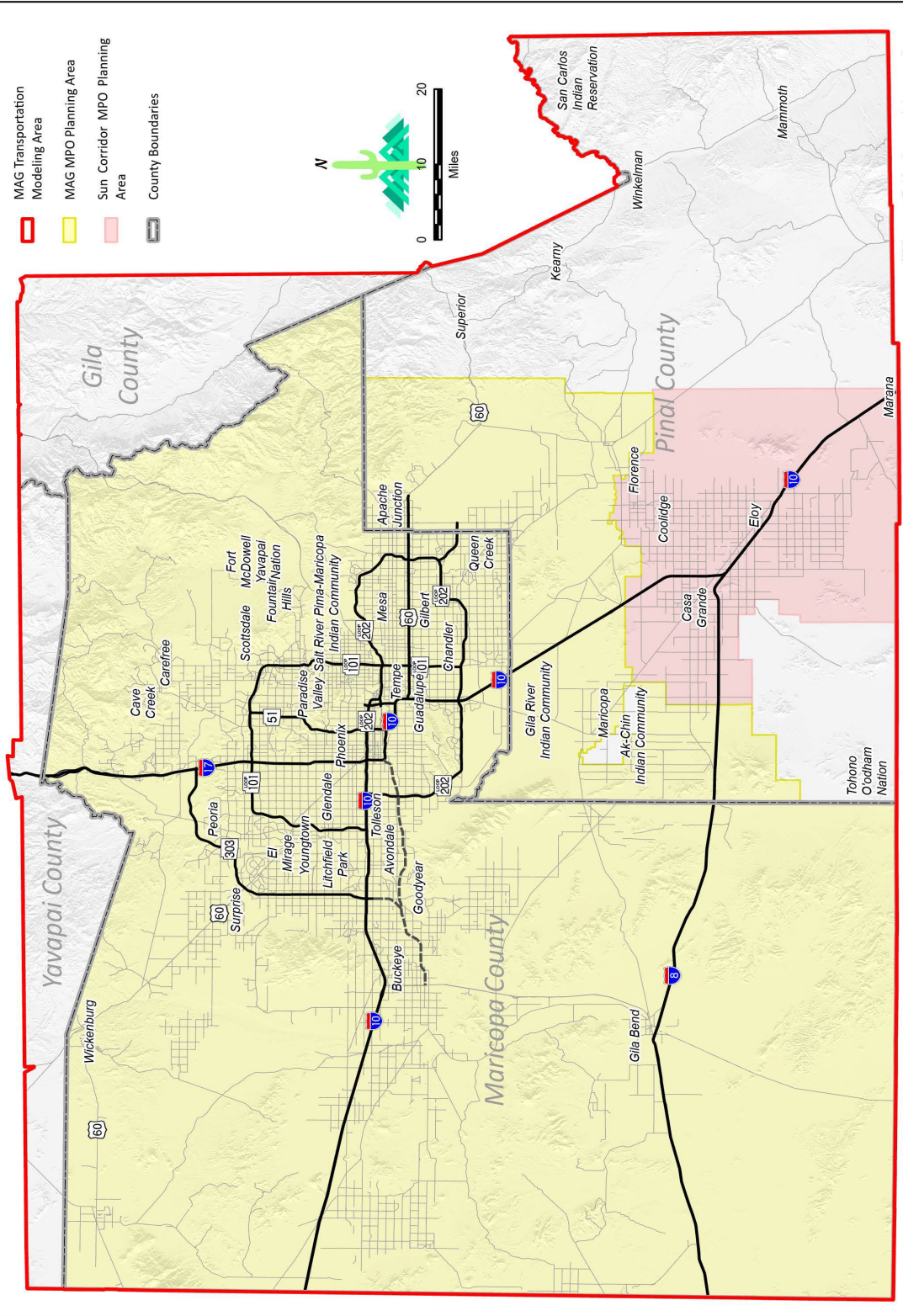
TRANSPORTATION MODELS

MAG regional transportation modeling is performed using TransCAD software for both highway and transit network assignments. The transportation models forecast AM peak period, midday, PM peak period, and nighttime vehicle traffic, as well as daily transit ridership, for the MAG transportation modeling area. The transportation model utilized for the June 2024 Sun Corridor MPO Conformity Analysis contains approximately 3,600 traffic analysis zones and covers an area of approximately 16,000 square miles in Maricopa and Pinal counties. A map of the transportation modeling domain is provided in Figure 3. The current official model was comprehensively validated for 2018 traffic data. The base year for the most recent validations is 2018 and traffic counts from approximately 1,000 freeway and arterial locations were used. MAG recalibrated the travel demand model using the 2017 Household Travel Survey and the 2019 transit on-board survey. Several other datasets were used in the recalibration process to update various components of the model. MAG conducted speed data validations with the 2018 commercial speed data from HERE. MAG utilized 2013 TRANSEARCH data, 2015 Streetlight data, and 2017 ATRI data to recalibrate the truck models.

The MAG transportation models exhibit the following characteristics, which are consistent with the federal transportation conformity rule (Section 93.122(b)):

- The current traffic volumes simulated by the MAG transportation models were validated to traffic counts from approximately 1,000 freeway and arterial locations. This validation demonstrated a good statistical fit between actual and model-estimated daily traffic volumes.

Figure 3: MAG and Sun Corridor MPO Planning Areas and MAG Transportation Modeling Area



While every effort has been made to ensure the accuracy of this information, the Maricopa Association of Governments makes no warranty, expressed or implied, as to its accuracy and expressly disclaims liability for the accuracy thereof.
 Source: U.S. Environmental Protection Agency
 Date: February 2024

- The population, households, and employment inputs to the travel demand models are based on the official Maricopa County socioeconomic projections which were approved by the MAG Regional Council in June 2023. These projections were prepared using the AZ-SMART land use model system and UrbanSim.
- The population and employment projections used in the conformity analysis are consistent with the transportation system alternatives considered. In the MAG land use models, transportation system accessibility influences the allocation of population and employment to smaller geographic areas. The UrbanSim model was integrated into AZ-SMART and used to allocate county projections of households and employment to regional market areas based upon the pre-existing location of these activities, land consumption, and transportation system accessibility. These congested travel times are derived from an appropriate capacity-restrained traffic assignment for each forecast year. UrbanSim uses transportation system accessibility measures, such as proximity to the closest highway, in determining the likelihood that a land use parcel will develop during a given forecast interval. AZ-SMART also aggregates population, households, and employment projections by land use parcel to the TAZ-level for input to the transportation models. Congested travel times output by the transportation models are fed-back into the land use models to ensure that there is consistency between the transportation system assumptions and the land use projections.
- The transportation models perform capacity-restrained traffic assignments. Restrained assignments are produced for the AM peak period, mid-day, PM peak period, and nighttime, with volumes and congestion estimated for each period.
- Speeds obtained from the capacity-restrained traffic assignments are used to recompute link travel times that are then fed back in the travel demand modeling chain. The various submodels within the Activity-Based Model (ABM) are executed until convergence criteria are met. MAG convergence criteria are based on the recommendations produced by the Federal Transit Administration.
- The travel impedances used in the traffic assignment as well as the accessibilities that serve as inputs to multiple submodels in the ABM such as car ownership, daily activity pattern (DAP), and tour frequency models include a composite function of highway travel times and costs. The mode choice logit model is sensitive to highway and transit travel times, as well as pricing variables.
- As a result of the feedback loop in the MAG travel demand modeling process, the final peak and off-peak speeds are sensitive to the capacity-restrained

volumes on each highway segment represented in the network. MAG routinely validates model outputs with commercial speed data by time period. MAG has purchased and utilized 2018 HERE data for the validation of the base year 2018.

SOCIOECONOMIC PROJECTIONS

Section 93.110 of the federal conformity rule requires that the population and employment projections used in the conformity analysis be the most recent estimates that have been officially approved by the Metropolitan Planning Organization (i.e. MAG, for the Maricopa nonattainment and maintenance areas). The June 2024 Sun Corridor MPO Conformity Analysis is based on socioeconomic projections that were approved by the MAG Regional Council in June 2023 and Central Arizona Governments (CAG) in June 2023.

In accordance with the Arizona Governor's Executive Order 2011-04, the population projections used for all State agency planning purposes were updated by the Arizona State Demographer consistent with the 2017-2021 American Community Survey. MAG then prepared socioeconomic projections by traffic analysis zone (TAZ), based on the State's county-level population projections. MAG allocated the projections for Maricopa County to traffic analysis zones (TAZs) using the AZ-SMART model system. The official Maricopa County socioeconomic projections based on State Demographer county projections, were approved by the MAG Regional Council in June 2023.

In addition, socioeconomic projections for Pinal County were prepared by MAG utilizing AZ-SMART and were approved in collaboration with Central Arizona Governments (CAG). The projections by Municipal Planning Area (MPA) for Pinal County were approved by the CAG Regional Council in June 2023 and the TAZ projections are based upon the approved MPA projections.

The TAZ population, households and employment projections take into account the transportation improvements contained in the conforming TIP (FY 2022-2025) and RTP (including amendments through December 2022) in effect at the time the projections were approved. For the June 2024 Sun Corridor MPO Conformity Analysis, the projections of population, households, and employment by TAZ were input to the MAG transportation models to estimate auto and transit trips, VMT, and speeds for each analysis year.

TRAFFIC ESTIMATES

This section describes the development of the highway and transit networks that were used to perform the June 2024 Sun Corridor MPO Conformity Analysis for the FY 2023-2027 Sun Corridor MPO Transportation Improvement Program and Sun Corridor MPO Regional Transportation Plan 2050 Update. A summary of the population, employment, and travel characteristics for the MAG transportation modeling area for each Action scenario in the conformity analysis is presented in Table 6. The vehicle miles of travel forecasts for each of the pollutant specific modeling areas for the Pinal PM-10 and PM-2.5 nonattainment areas are presented in Chapter 4.

TABLE 6.
TRAFFIC NETWORK COMPARISON FOR ACTION SCENARIOS EVALUATED FOR
THE CONFORMITY ANALYSIS

Year	Total Population^a (thousands)	Total Employment^a (thousands)	Average Weekday VMT^b (millions)	Average PM Peak Period Speed^c	Freeway Lane Miles^d
2025	5,345	2,553	137.9	32.3	4,393
2030	5,788	2,787	153.1	32.1	4,722
2040	6,542	3,173	179.1	31.4	4,908
2050	7,180	3,463	201.7	30.8	5,140

- ^a Population and employment estimates are for the 16,000 square mile transportation modeling area in Maricopa and Pinal Counties. Total population includes resident population in households and group quarters, transient population, and seasonal population. Total employment includes the number of workers in public, retail, office, industrial, work-at-home, construction, non-site based and other land use employees.
- ^b Vehicle miles of travel (VMT) is obtained from the summation of VMTs in the AM peak, Mid-Day, PM peak, and Nighttime from the action traffic assignments for the transportation modeling area.
- ^c Average speed on freeways, HOV lanes, expressways, arterials, ramps and collector-distributor roads in the transportation modeling area during the P.M. peak period.
- ^d Freeways, expressways, ramps, HOV lanes are included in the lane miles reported for freeways in the transportation modeling area.

Transportation Network Assumptions

Not all of the street and freeway projects included in the TIP qualify for inclusion in the highway network. Projects which call for study, design, right-of-way acquisition, or non-capacity improvements are not included in the networks. When these projects result in actual facility construction projects, the associated capacity changes are coded into the network, as appropriate. Since the networks define capacity in terms of the number of through traffic lanes, only construction projects that increase the lane-miles of through traffic are included. Generally, MAG highway networks include only the one-mile grid system of streets, plus freeways. This includes all streets classified as arterials, expressways, collector-distributor roads, ramps, as well as some collectors.

Traffic on collectors and local streets not explicitly coded on the highway network are simulated in the models by use of abstract links called centroid connectors. These represent collectors, local streets and driveways which connect a neighborhood to a regionally significant roadway. Centroid connectors also include travel occurring on public and private unpaved roads and alleys.

Highway Networks

The networks used in the 2025, 2030, 2040, and 2050 Baseline scenarios for the Pinal County nonattainment areas contain regionally significant highways open to traffic by December 31, 2023. In addition, the baseline network includes regionally significant projects in the Pinal County PM-10 nonattainment area, regardless of funding source, that meet one of the following criteria: are under construction, undergoing right of way acquisition, was included in the baseline scenario for the previous conformity analysis, or have completed the National Environmental Policy Act (NEPA) process. These criteria are required under Section 93.119(h) of the EPA conformity regulations.

The 2025, 2030, 2040, and 2050 networks used in the Action scenarios for the Pinal County nonattainment areas conformity budget test assume implementation of all qualifying highway and transit projects in the FY 2022-2025 MAG Transportation Improvement Program (TIP) and MOMENTUM 2050 MAG Regional Transportation Plan (RTP), as well as other qualifying highway and transit projects to be implemented in the Pinal County nonattainment areas from the Sun Corridor MPO FY 2023-2027 TIP and Regional Transportation Plan 2050 Update.

Coding Conventions

Specific coding conventions or criteria are applied to determine whether a project qualifies for highway network coding. This results in coding of all arterial streets and some collectors. The coding conventions are:

- 1) Capacity-related projects on existing links or extensions of existing links on the base highway network are coded in future networks. This includes projects on freeways, the mile-street grid, and half-mile streets already on the base network.
- 2) Capacity-related projects which are not on links or extensions of links in the base network are coded, if the street is considered a logical part of the one-mile street grid system. If the project is on a half-mile street, it is considered for inclusion on a case-by-case basis. The key factors considered in making this assessment include:
 - the density of current and future development and travel in the area of the project;
 - whether the change may be accommodated without increasing the number of zones; and
 - whether the change is consistent with standard network coding practices.

Transit Networks and Operations

Transit networks are a necessary part of the MAG transportation models and are required for producing a coherent regional multimodal transportation forecast that includes transit ridership. For all analysis years, the bus and rail networks reflect the latest planning information available at the time the conformity analysis began.

In the Pinal County nonattainment areas, the cities of Coolidge and Maricopa operate transit service. The City of Coolidge operates the Cotton Express that provides deviated flex route bus service and curb-to-curb paratransit service in Coolidge. The Cotton Express is a local circulator that provides bus service between neighborhoods and business, schools, and government offices. Fares range from \$1.00 for one-way, \$2.00 for daily, and \$30.00 for monthly fare for age 12 to adult.

The City of Coolidge also operates the Central Arizona Regional Transit (CART) bus system that provides regional transportation services in central Pinal County between Coolidge, Casa Grande, Florence, and Central Arizona College. Fares range from \$2.00 for one-way, \$4.00 for daily, \$60.00 for monthly, and \$90.00 for local and regional monthly fare for ages 13 to 54. Table 7 provides a summary of the transit fares for the Cotton Express and the Central Arizona Regional Transit bus system.

The City of Maricopa operates a local circulator transit service, Maricopa Express Transit, within the city at no charge. The fixed route service operates Monday through Friday from 8 a.m. to 4 p.m. Also, local Dial-a-Ride is available at a fare of \$1.00 per one-way trip.

The MAG transportation models and the highway and transit networks described above are utilized to estimate daily vehicle travel and transit ridership in the MAG transportation modeling area. The primary input to the air quality modeling process is transportation

model estimates of daily vehicle traffic and speeds on each highway link, along with the attendant link lengths and coordinate data, for each nonattainment and maintenance area. A detailed description of the emissions models utilized for the conformity analysis is provided in Chapter 4.

TABLE 7.
SUMMARY OF TRANSIT FARES FOR
COTTON EXPRESS AND CENTRAL ARIZONA REGIONAL TRANSIT SERVICES

Fixed Route Transit Services in Pinal County	Fares
Cotton Express	
One-way	\$1.00
Daily	\$2.00
Monthly	\$30.00
Central Arizona Regional Transit	
One-way	\$2.00
Daily	\$4.00
Monthly	\$60.00
Local & Regional Monthly	\$90.00

Note: Demand and deviated route fares are available for the Cotton Express. For the Central Arizona Regional Transit service, lower fares apply to children 12 and under or students.

4 AIR QUALITY MODELING

For the June 2024 Sun Corridor MPO Conformity Analysis, air quality modeling was performed for the Action/Baseline interim conformity tests for analysis years 2025, 2030, 2040, and 2050 for particulate matter PM-10 for the West Pinal PM-10 Nonattainment Area and PM-2.5 and nitrogen oxides (NO_x) for the West Central Pinal PM-2.5 Nonattainment Area.

Also, for information, MAG performed the conformity budget test comparing the emissions for analysis years 2026, 2030, 2040, and 2050 with the 2026 motor vehicle emissions budget established in the submitted 2023 Five Percent Particulate Plan for PM-10 for the West Pinal County Nonattainment Area. The 2023 Five Percent Particulate Plan for PM-10 was submitted to EPA in December 2023.

The models which have been used to estimate PM-10, PM-2.5, and NO_x are the EPA Motor Vehicle Emission Simulator 3.1 (MOVES) model to derive motor vehicle emission factors, MOVESLink3 for the calculation of spatially and temporally allocated onroad vehicle emissions using the emission factors from the above models and travel and speed data from the MAG Activity-Based transportation model, and AP-42 to derive paved and unpaved road PM-10 emissions.

On September 12, 2023, EPA published in the *Federal Register* the availability of the latest emissions model MOVES4 for use in state implementation plans and transportation conformity (EPA, 2023b). The announcement started a two-year transportation conformity grace period that ends on September 12, 2025. For the June 2024 Conformity Analysis, MAG will continue to use MOVES3.1 in accordance with the EPA two-year grace period. After the two-year grace period, MOVES4 will be required to be used for conformity analyses.

For the Pinal County PM-10 and PM-2.5 nonattainment areas, there are no adequate or approved motor vehicle emissions budgets for conformity. Therefore, the Action/Baseline interim conformity tests were applied. The Action/Baseline test involves the comparison of the Action and Baseline scenario emissions for analysis years 2025, 2030, 2040, and 2050 for the West Pinal PM-10 Nonattainment Area and West Central Pinal PM-2.5 Nonattainment Area. The conformity rule requirements for the selection of the analysis years are summarized in Chapter 1.

The inputs to MOVES3.1, MOVESLink3, and AP-42 models used in estimating onroad vehicle emissions for the Pinal County PM-10 and PM-2.5 nonattainment areas are described below.

MOVES3.1

MOVES3.1 is the onroad emissions model developed by EPA for the purpose of estimating motor vehicle emission factors in unit of gram per vehicle mile of travel. MOVES requires local data such as the Inspection and Maintenance (I/M) program, meteorological data, vehicle populations, source type age distribution, annual average daily vehicle miles of travel (VMT), VMT fractions, road type distribution, average speed distribution, fuel data, and Alternative Vehicle and Fuel Technologies (AVFT). This model is used to estimate particulate (exhaust, tire wear, and brake wear) emission factors for the Pinal County PM-10 and PM-2.5 nonattainment areas and NOx exhaust emission factors for the Pinal PM-2.5 nonattainment area. The output from the MOVES3.1 model includes emission factors by hour, roadway facility type, pollutant, vehicle class, and area type.

I/M Programs

MOVES3.1 has a table for Inspection and Maintenance (I/M) programs that reflects the actual proportion of vehicles subject to the specified levels of inspection. The term “I/M vehicles” denotes vehicles which are required to undergo an emission test and/or inspection under the Vehicle Inspection/Maintenance Program administered by the Arizona Department of Environmental Quality (ADEQ). The MOVES table was developed using the I/M program data provided by ADEQ. It is important to note that participation in the I/M program is required for all vehicles registered in Area A, except for certain model years and vehicle classes.

Inspection and Maintenance program benefits were assumed for the portion of Area A in the Pinal PM-10 nonattainment area. The I/M runs reflect the provisions of the enhanced inspection program which was implemented in January 1995 and the measure “Phased-in Emission Test Cutpoints”, implemented in January 2000. The cutpoint values used are the MOVES3.1 default Phase 2 cutpoints. For the four horizon years modeled in this analysis, it was assumed that the onboard diagnostic (OBD) test would be used for the model year 1996 and newer vehicles with an exemption for all vehicles of the current plus four model years.

MOVES3.1 outputs were weighted to account for vehicles driving in the Pinal County PM-10 nonattainment area that do not participate in the I/M programs. Therefore, each modeled scenario required runs with and without the I/M program benefits. For this analysis, it was assumed that 91.6 percent of eligible onroad vehicles participate in the I/M programs within the Area A portion of the Pinal County PM-10 nonattainment area. This fraction reflects an increase in the participation in the I/M programs due to implementation of the measure, “Tougher Enforcement of Vehicle Registration and Emission Test Compliance”. For all scenarios modeled for this analysis, the inputs for each run included oxygenated gasoline with an assumed market share of 100 percent ethanol. The gasoline Reid Vapor Pressure (RVP) values were based on the Arizona regulatory monthly RVP data provided to MAG by the Arizona Department of Agriculture (AZDA) Weights and Measures Services Division for Area A and Area C, respectively.

The MOVES3.1 runs that reflected the I/M programs in Area A assumed vehicle waiver rates of 1.3 percent or 1.0 percent, depending on model year. These fractions reflected the lower waiver rates resulting from the implementation of “One Time Waiver from Vehicle Emissions Test”.

Meteorological Data

MOVES3.1 requires hourly temperature and relative humidity data by specific month of the year. The 2017 meteorological data used in the MAG 2023 Five Percent Plan for PM-10 were used for the conformity analysis for the Pinal nonattainment areas. Meteorological data for Casa Grande in 2017 were obtained from the National Centers for Environmental Information (<https://www.ncdc.noaa.gov/IPS/lcd/lcd.html>). Specifically, average temperature and relative humidity from three individual seasons were utilized in Pinal County. The same hourly average temperature and relative humidity data for three seasons were applied for Pinal County and the West Pinal PM-10 Nonattainment Area. The meteorological data for Pinal County conformity analyses is provided in Table 8.

TABLE 8.
METEOROLOGICAL DATA FROM THREE SEASONS FOR PINAL COUNTY
CONFORMITY ANALYSES

HourID	Winter (Nov-Mar)		Summer (May-Sep)		Transitional (Apr, Oct)	
	Temperature (F)	Relative Humidity (%)	Temperature (F)	Relative Humidity (%)	Temperature (F)	Relative Humidity (%)
1	50.2	54.2	80.6	37.6	64.5	32.0
2	48.8	55.8	79.0	39.4	63.0	34.0
3	47.8	57.2	77.6	40.8	61.5	36.0
4	47.4	58.8	75.8	42.6	60.5	37.5
5	46.4	59.8	74.8	44.4	59.0	38.5
6	45.6	61.0	74.2	45.8	58.5	40.0
7	45.4	61.6	77.6	43.6	60.5	39.0
8	47.2	59.8	81.4	39.6	65.5	34.5
9	52.0	53.0	84.8	35.2	70.0	30.5
10	56.4	46.4	88.6	31.2	75.0	27.0
11	60.0	41.0	91.2	28.0	78.0	23.5
12	63.4	36.8	93.6	25.2	81.0	20.5
13	65.6	33.6	95.4	23.2	83.0	19.0
14	67.2	31.2	97.0	21.4	84.5	17.0
15	68.0	30.2	97.2	20.8	85.5	16.5
16	68.0	29.8	98.0	20.6	86.0	16.0
17	67.4	30.4	97.4	20.2	85.0	16.5
18	64.2	34.2	95.8	22.0	83.0	17.0
19	60.6	38.6	93.6	24.0	79.0	19.5

HourID	Winter (Nov-Mar)		Summer (May-Sep)		Transitional (Apr, Oct)	
	Temperature (F)	Relative Humidity (%)	Temperature (F)	Relative Humidity (%)	Temperature (F)	Relative Humidity (%)
20	58.2	41.8	90.2	26.8	76.0	22.0
21	56.4	44.0	88.0	29.0	73.0	24.0
22	54.4	46.8	85.8	31.2	71.5	25.5
23	52.8	49.6	84.0	32.8	68.5	28.0
24	51.0	52.2	81.6	35.4	67.0	30.0

Vehicle Source Type Population

For the June 2024 Sun Corridor MPO Conformity Analysis, the vehicle source type population is derived using the Arizona Department of Transportation January 2020 vehicle registration data, the transit bus data (see Table 19), and the MOVES3.1 default source type population data. In accordance with MOVES Technical Guidance, the January 2020 vehicle registration data is used up to model year 2019 since the model year 2019 is the latest model year with the full year data. While the 2020 vehicle registration data from ADOT are provided in five vehicle types (i.e., motorcycles, light-duty vehicles, light-duty trucks, heavy-duty vehicles, and buses), only two vehicle types (motorcycles and buses) exactly match with MOVES source types (Source Type 11 and Source Types 41-43, respectively). The motorcycle population is directly obtained from the vehicle registration data. The population of transit bus (Source Type 42) is directly obtained from the transit bus data. For the rest of the bus categories, the MOVES3.1 default splits between Source Types 41 and 43 are applied to the remainder of the bus population from the 2020 vehicle registration data. In consultation with EPA and FHWA on October 19, 2023, it was recommended that the SUV population be assigned appropriately by applying MOVES3.1 default split among the rest of Source Types (21, 32, 32, 51, 52, 53, 54, 61, and 62) to the combined population of light-duty vehicles, light-duty trucks, and heavy-duty vehicles in the 2020 vehicle registration data. Table 9 shows the MOVES3.1 default source type population for Pinal County in 2019 and the source type population adjusted with the 2020 vehicle registration data. Source type population is projected for each horizon year using the MOVES3.1 default source type population projection rate between 2019 and the horizon year for each source type as shown in Table 10.

Finally, source type population for the selected nonattainment area is extracted using a ratio of the population projections between the county and the nonattainment area. The population projections for future years are prepared by the MAG socioeconomic modeling staff and are from the socioeconomic projections approved by the MAG Regional Council in June 2023 and also described under Population and Employment in Chapter 2.

TABLE 9.
SOURCE TYPE POPULATION FOR PINAL COUNTY

Source Type	Pinal County	
	MOVES3.1 Default for 2019	Adjusted Population with 2020 Vehicle Registration Data
11	10,386	14,573
21	123,934	130,861
31	150,296	158,697
32	16,375	17,290
41	429	455
42	135	19
43	633	672
51	77	82
52	10,978	11,591
53	476	503
54	1,124	1,186
61	1,568	1,655
62	3,178	3,356
Total	319,588	340,941

TABLE 10.
PROJECTION RATIOS OF SOURCE TYPE POPULATION FOR PINAL COUNTY

Source Type	Pinal County		
	MOVES 3.1 Default Source Type Population		Projection Ratio to 2019
	2019	2050	2050
11	10,386	13,891	1.3374
21	123,934	165,755	1.3374
31	150,296	147,405	0.9808
32	16,375	16,060	0.9808
41	429	627	1.4614
42	135	197	1.4614
43	633	925	1.4614
51	77	138	1.7838
52	10,978	19,582	1.7838
53	476	849	1.7838
54	1,124	2,004	1.7838
61	1,568	1,622	1.0343
62	3,178	3,287	1.0343

Vehicle Source Type Age Distribution

Age distribution for each source type is developed using the MOVES Age Distribution Projection Tool based on the January 2020 vehicle registration data and the transit bus data from ADOT (see Table 19). According to MOVES Technical Guidance, the January 2020 vehicle registration data will be used up to model year 2019 since the model year 2019 is the latest model year with the full year data.

The age distribution data are developed using the 2020 vehicle registration data up to model year 2019. The age distribution for 2019 is projected to the intermediate year 2022 using the MOVES Age Distribution Projection Tool. The projected age distribution for 2022 is updated with the transit bus’s age distribution based on the 2022 transit bus data. Finally, the revised age distribution for 2022 is projected for the horizon years using the MOVES Age Distribution Projection Tool. In accordance with the MOVES Technical Guidance, age distribution for single unit long-haul and combination long-haul trucks (Source Types 53 and 62) are replaced with the MOVES3.1 default age distribution.

Vehicle Miles of Travel

Vehicle Miles of Travel (VMT) is used to estimate onroad exhaust, brake wear, and tire wear emissions. Annual average daily VMT for the West Pinal PM-10 Nonattainment Area and the West Central Pinal PM-2.5 Nonattainment Area were derived from traffic assignment data output from the MAG Activity-Based transportation model. The VMT is shown in Table 11 for each of the analysis years for the Action/Baseline conformity test. The annual average daily VMTs were multiplied by number of days in each horizon year to obtain the annual VMTs. The transportation modeling performed for the June 2024 Sun Corridor MPO Conformity Analysis began on March 26, 2024. Additional information on the transportation modeling performed for the conformity analysis is provided in Chapter 3.

TABLE 11.
TOTAL VMT USED IN THE CONFORMITY ANALYSIS FOR THE PINAL COUNTY
NONATTAINMENT AREAS
(Daily Vehicle Miles of Travel for Pollutant-Specific Areas)

YEAR	PM-10 NONATTAINMENT AREA		PM-2.5 NONATTAINMENT AREA	
	Action	Baseline	Action	Baseline
2025	6,412,167	6,369,994	765,239	734,511
2030	7,957,167	7,726,367	952,719	944,627
2040	11,454,795	10,845,815	1,315,970	1,395,878
2050	15,688,158	14,513,736	1,750,355	1,852,329

VMT Fraction

Since VMT varies by month, day of week, and hour, MOVES3 requires month/day/hour VMT fractions and the VMT adjustment factor as a local input to derive specific weekday, monthly, seasonal and yearly average VMT from the annual average weekday transportation assignment data from the MAG Activity-Based transportation model for freeways and arterials.

The 2022 ADOT Transportation Data Management System data for Pinal County were collected from the website, <https://adot.public.ms2soft.com/tcds/>. Data from five permanent traffic count stations for freeways in Pinal County were used to develop the VMT adjustment factors for freeways, and data from four stations for arterials in Pinal County were used to develop the VMT adjustment factors for arterials. The VMT adjustment factors derived from the 2022 traffic count data were used in developing the annual average daily VMTs for freeways and arterials from the annual average weekday transportation network data for the Pinal County PM-10 and PM-2.5 nonattainment areas. The VMT adjustment factors used in the Pinal County PM-10 and PM-2.5 nonattainment areas for the conformity analysis are 1.01 for freeways and 0.93 for arterials.

Road Type Distribution

The local road type distributions were derived from the MAG Activity-Based Model (ABM) transportation network assignment data that provided VMTs for local road types and ABM vehicle classes. MAG ABM network assignment data provide all road type distributions for the MOVES runs for the conformity analysis so that there is no missing road type distribution. The matchup methods used in mapping the ABM vehicle classes to the MOVES source types are provided in Table 12. The same road type distribution is used for the source types within a given transportation model vehicle class. The road type distributions to the MOVES source types used in the Pinal County conformity analyses in 2025 are provided in Table 13 as an example. For Table 13, road type distributions are identified as Off-network (ID=1), Rural Restricted Access (ID=2), Rural Unrestricted Access (ID=3), Urban Restricted Access (ID=4), and Urban Unrestricted Access (ID=5).

TABLE 12.
MATCHUP TABLE FOR ABM VEHICLE CLASSES AND
MOVES SOURCE TYPES

MAG Activity-Based Model (ABM) Vehicle Class	Source Type
MC (Motorcycle)	11. Motorcycle
LDV (Light Duty Vehicle)	21. Passenger Car 31. Passenger Truck
LGT (Light Commercial Truck)	32. Light Commercial Truck
BUS (Transit Bus)	42. Transit Bus

MAG Activity-Based Model (ABM) Vehicle Class	Source Type
MED (Medium Duty Vehicle)	51. Refuge Truck 52. Single Unit Short-haul Truck 53. Single Unit Long-haul Truck 54. Motor Home
HVY (Heavy Duty Vehicle)	41. Other Buses 43. School Bus 61. Combination Short-haul Truck 62. Combination Long-haul Truck

TABLE 13.
ROAD TYPE DISTRIBUTION FOR PINAL COUNTY CONFORMITY ANALYSES
IN 2025

ABM Vehicle Class	sourceTypeID	roadTypeID	roadTypeVMTFraction	
			PM-10 Conformity	PM2.5 Conformity
MC	11	1	0.00000	0.00000
		2	0.17856	0.04196
		3	0.33115	0.33681
		4	0.02085	0.00000
		5	0.46944	0.62123
LDV	21 31	1	0.00000	0.00000
		2	0.22348	0.06427
		3	0.31297	0.29084
		4	0.02630	0.00000
		5	0.43725	0.64489
LGT	32	1	0.00000	0.00000
		2	0.17508	0.05410
		3	0.41047	0.48912
		4	0.06422	0.00000
		5	0.35023	0.45677
BUS	42	1	0.00000	0.00000
		2	0.00000	0.00000
		3	0.36250	0.00000
		4	0.00000	0.00000
		5	0.63750	1.00000
MED	51 52 53 54	1	0.00000	0.00000
		2	0.52725	0.41966
		3	0.20852	0.29499
		4	0.08720	0.00000

ABM Vehicle Class	sourceTypeID	roadTypeID	roadTypeVMTFraction	
			PM-10 Conformity	PM2.5 Conformity
		5	0.17704	0.28535
HVY	41 43	1	0.00000	0.00000
		2	0.65561	0.65930
		3	0.09034	0.14728
		4	0.15206	0.00000
		5	0.10199	0.19342
	61 62	1	0.00000	0.00000
		2	0.82556	0.86400
		3	0.04943	0.08386
		4	0.09859	0.00000
		5	0.02642	0.05214

Average Speed Distribution

In MOVES, vehicle power, speed, and acceleration have a significant effect on vehicle emissions for all pollutants. The speed distribution is required for the MOVES inventory mode runs, while the MOVES emission rate mode runs use the link-specific speed instead of the speed distribution. Since MAG uses the emission rate mode to calculate onroad emissions based on link-specific speeds and VMTs for road types 2 to 5, the speed distribution input was not used in the conformity analysis.

The MAG Activity-Based Model transportation network assignment data provide link-specific data in the four time periods: AM peak (6:00-8:59), Mid-day (9:00-13:59), PM peak (14:00-17:59), Nighttime (0:00-5:59 and 18:00-23:59).

Fuel Data

In consultation with FHWA, the fuel formulation data are developed based on the MOVES3.1 default fuel parameters, the local gasoline Reid Vapor Pressure regulatory values from the Arizona Department of Agriculture (AZDA), and the MOVES3.1 Fuel Wizard. The MOVES3.1 default gasoline fuel parameters for Pinal County are derived using the MOVES3.1 County Data Manager and are provided in Table 14. (Note: The MOVES3.1 default RVP parameters listed in Table 14 are for informational purposes only. Pinal County regulatory RVP values are used in place of MOVES3.1 defaults as described further below).

TABLE 14.
PINAL COUNTY MOVES3.1 DEFAULT GASOLINE FUEL PARAMETERS BY MONTH

Fuel Parameter	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
fuelFormulationID	9022	9022	9022	9023	9021	9021	9021	9021	9021	9023	9022	9022
fuelSubtypeID	12	12	12	12	12	12	12	12	12	12	12	12
RVP	10.5	10.5	10.5	10.5	10	10	10	10	10	10.5	10.5	10.5
sulfurLevel	10	10	10	10	10	10	10	10	10	10	10	10
ETOHVolume	10	10	10	10	10	10	10	10	10	10	10	10
MTBEVolume	0	0	0	0	0	0	0	0	0	0	0	0
ETBEVolume	0	0	0	0	0	0	0	0	0	0	0	0
TAMEVolume	0	0	0	0	0	0	0	0	0	0	0	0
aromaticContent	24.45	24.45	24.45	24.95	23.68	23.68	23.68	23.68	23.68	24.95	24.45	24.45
olefinContent	9.39	9.39	9.39	9.59	7.78	7.78	7.78	7.78	7.78	9.59	9.39	9.39
benzeneContent	0.72	0.72	0.72	0.72	0.71	0.71	0.71	0.71	0.71	0.72	0.72	0.72
e200	44.51	44.51	44.51	44.75	42.47	42.47	42.47	42.47	42.47	44.75	44.51	44.51
e300	83.52	83.52	83.52	83.81	83.20	83.20	83.20	83.20	83.20	83.81	83.52	83.52
BioDieselEsterVolume	0	0	0	0	0	0	0	0	0	0	0	0
CetaneIndex	0	0	0	0	0	0	0	0	0	0	0	0
PAHContent	0	0	0	0	0	0	0	0	0	0	0	0
T50	230.03	230.03	230.03	228.68	241.77	241.77	241.77	241.77	241.77	228.68	230.03	230.03
T90	327.50	327.50	327.50	326.26	328.83	328.83	328.83	328.83	328.83	326.26	327.50	327.50

The MOVES3.1 default gasoline fuel parameters for Pinal County are set for three distinct seasons: winter period (January, February, March, November, December), summer period (May, June, July, August, September), and transitional period (April and October). These are provided in Table 15.

TABLE 15.
PINAL COUNTY MOVES3.1 DEFAULT GASOLINE FUEL PARAMETERS AVERAGED FOR THREE DISTINCT SEASONS

Fuel Parameter	Winter (Nov-Mar)	Summer (May-Sep)	Transitional (Apr and Oct)
fuelFormulationID	9022	9021	9023
fuelSubtypeID	12	12	12
RVP	10.5	10	10.5
sulfurLevel	10	10	10
ETOHVolume	10	10	10
MTBEVolume	0	0	0
ETBEVolume	0	0	0
TAMEVolume	0	0	0

Fuel Parameter	Winter (Nov-Mar)	Summer (May-Sep)	Transitional (Apr and Oct)
aromaticContent	24.45	23.68	24.95
olefinContent	9.39	7.78	9.59
benzeneContent	0.72	0.71	0.72
e200	44.51	42.47	44.75
e300	83.52	83.20	83.81
BioDieselEsterVolume	0	0	0
CetaneIndex	0	0	0
PAHContent	0	0	0
T50	230.03	241.77	228.68
T90	327.50	328.83	326.26

Within Pinal County, specific geographic areas designated as Area A and Area C have been created to implement different fuel parameter regulations. Area A includes wintertime and summertime RVP limits, while Area C only includes summertime RVP limits. A map showing Area A and Area C is included in Figure 4 below.

In Pinal County, a small portion of the West Pinal PM-10 Nonattainment Area is situated within Area A. Area C encompasses the entirety of the West Central Pinal PM-2.5 Nonattainment Area and the majority of the Pinal County PM-10 nonattainment area. The regulatory monthly RVP data for gasoline provided by AZDA Weights and Measures are averaged for the three distinct seasons in both Area A and Area C, respectively. Specifically, the regulatory RVP values from January, February, March, November, and December were averaged to characterize the winter period. RVP values from May, June, July, August, and September are averaged to represent the summer period, while the mean for RVP readings from April and October was computed for the transitional period. As a result, in Area A, the RVPs for the winter, summer, and transitional periods are set at 9 psi, 7.4 psi, and 9.5 psi, respectively. In Area C, the corresponding values for these three seasons are 12.7 psi, 7.6 psi, and 10 psi. The MOVES3.1 Fuel Wizard adjusts the averaged MOVES3.1 default gasoline fuel parameters for each season using the aforementioned values for both Area A and Area C. Given in Table 16, the final six sets of gasoline fuel parameters adjusted by the MOVES3.1 Fuel Wizard with the regulatory RVPs for the three distinct seasons are used for the Pinal County PM-10 and PM-2.5 conformity tests.

Figure 4: Area A and Area C in Maricopa and Pinal Counties

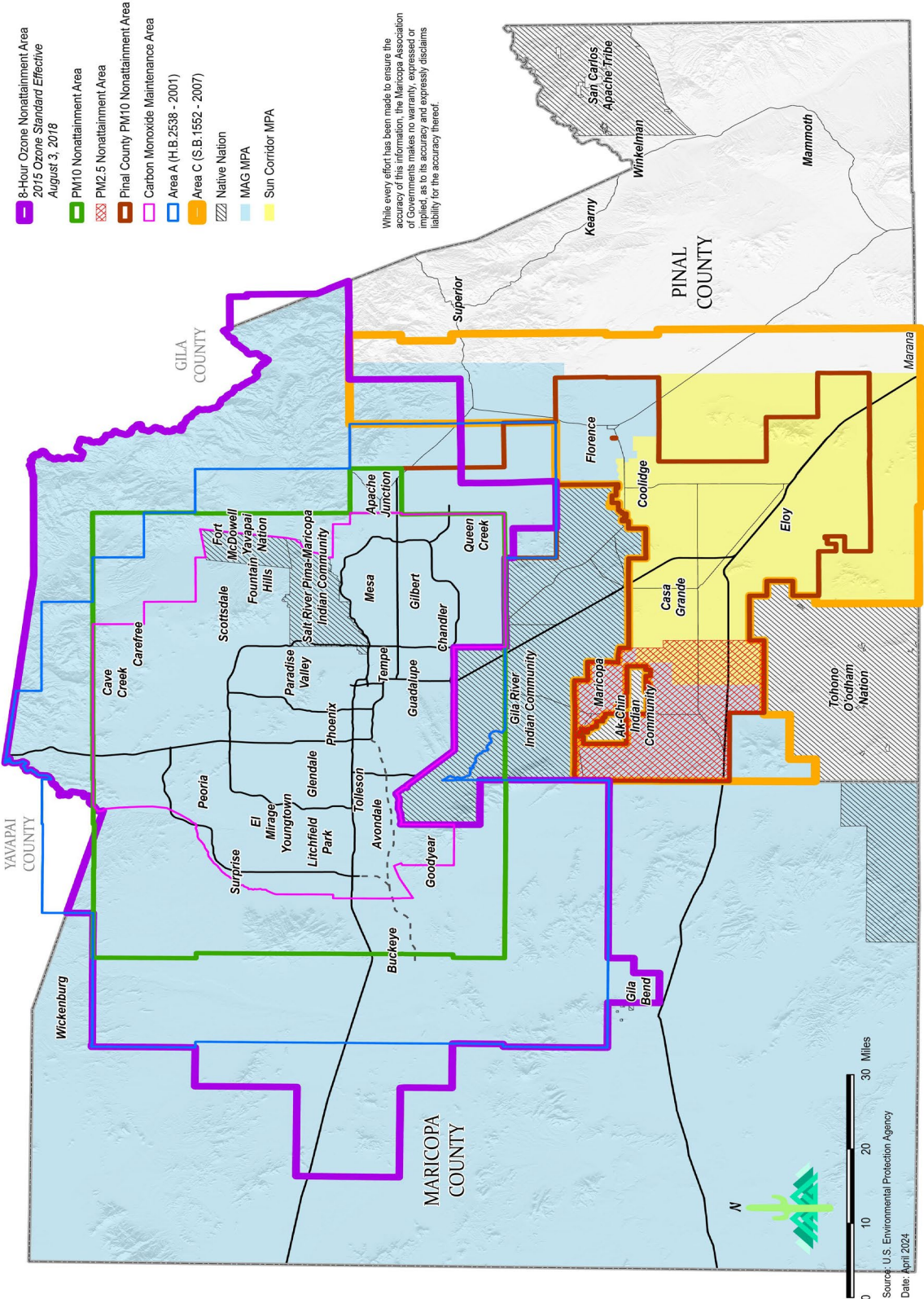


TABLE 16.
SIX SETS OF PINAL COUNTY GASOLINE PARAMETERS FOR PM-10 AND PM-2.5
CONFORMITY TESTS IN BOTH AREA A and AREA C

Fuel Parameter	Area A			Area C		
	Winter (Nov-Mar)	Summer (May-Sep)	Transitional (Apr and Oct)	Winter (Nov-Mar)	Summer (May-Sep)	Transitional (Apr and Oct)
fuelFormulationID	9022	9021	9023	9022	9021	9023
fuelSubtypeID	12	12	12	12	12	12
RVP	9	7.4	9.5	12.7	7.6	10
sulfurLevel	10	10	10	10	10	10
ETOHVolume	10	10	10	10	10	10
MTBEVolume	0	0	0	0	0	0
ETBEVolume	0	0	0	0	0	0
TAMEVolume	0	0	0	0	0	0
aromaticContent	24.45	23.68	24.95	24.45	23.68	24.95
olefinContent	9.39	7.78	9.59	9.39	7.78	9.59
benzeneContent	0.72	0.71	0.72	0.72	0.71	0.72
e200	31.76	23.48	33.56	40.24	23.94	34.71
e300	82.72	81.92	83.23	84.44	82.01	83.46
BioDieselEsterVolume	0	0	0	0	0	0
CetaneIndex	0	0	0	0	0	0
PAHContent	0	0	0	0	0	0
T50	237.05	253.94	233.36	219.73	253.00	231.02
T90	330.66	334.31	328.36	322.86	333.89	327.31

Alternative Vehicle Fuel and Technologies (AVFT) Data

The AVFT table is used to adjust fuel type distributions to reflect local information, such as vehicle registration data. MAG used the January 2020 vehicle registration data and Pinal County 2023 transit bus data obtained from the Arizona Department of Transportation in February 2024 to adjust fuel type distributions for the conformity analysis.

The January 2020 vehicle registration data has fuel type distribution information for light-duty vehicles, light-duty trucks, and heavy-duty vehicles by model year from 1974 to 2020. Since the January 2020 vehicle registration data does not have such information for CNG, ethanol, and electricity by vehicle category, MAG uses the January 2020 vehicle registration data to adjust gasoline and diesel distribution only. The fuel engine fractions for CNG, ethanol, and electricity maintain the MOVES default values. The vehicle registration data for model year 2020 is not used due to incompleteness of data. The fuel engine fractions for model year 2020 and newer also maintain the MOVES default values. The vehicle registration data for light-duty vehicles and light-duty trucks are used to adjust

fuel engine fractions for Source Type 21, and Source Types 31 and 32, respectively. As shown in Tables 17 and 18 as an example, the fuel fraction between gasoline and diesel for a given model year is derived by number of vehicle information in the vehicle registration data. The fuel fraction is applied to the total fuel engine fraction of gasoline and diesel in MOVES default AVFT for the given model year. MOVES default AVFT is updated with the adjusted fuel engine fractions.

TABLE 17.
SAMPLE REDISTRIBUTION OF FUEL ENGINE FRACTION BETWEEN GASOLINE AND DIESEL FOR SOURCE TYPE 21 IN PINAL COUNTY

Model Year	Fuel Type	Light-Duty Vehicle		Source Type 21	
		Number of Vehicle (Registration Data)	Fuel Fraction	fuelEngFraction (MOVES Default AVFT)	Adjusted fuelEngFraction
2019	Gas	10,576	0.99633	0.96679	0.96657
	Diesel	39	0.00367	0.00334	0.00356
Total		10,615	1	0.97013	0.97013

TABLE 18.
SAMPLE REDISTRIBUTION OF FUEL ENGINE FRACTION BETWEEN GASOLINE AND DIESEL FOR SOURCE TYPES 31 AND 32 IN PINAL COUNTY

Model Year	Fuel Type	Light-Duty Truck		Source Types 31 & 32	
		Number of Vehicle (Registration Data)	Fuel Fraction	fuelEngFraction (MOVES Default AVFT)	Adjusted fuelEngFraction
2019	Gas	2,588	0.90967	0.82756	0.80296
	Diesel	257	0.09033	0.05514	0.07974
Total		2,845	1	0.88270	0.88270

The Pinal County 2023 transit bus data from the Arizona Department of Transportation include the number of buses by model year and fuel type, as shown in Table 19.

TABLE 19.
PINAL COUNTY TRANSIT BUS DATA

Model Year	2023 Transit Bus Data	
	Gasoline	Diesel
2007	1	0
2008	0	0
2009	0	3
2010	0	0
2011	0	0
2012	0	0
2013	0	0
2014	2	1
2015	6	0
2016	0	0
2017	0	0
2018	4	1
2019	1	0
2020	3	0
2021	0	2
2022	0	0
2023	0	0
TOTAL	24	

MOVES3.1 AVFT input requires fuel engine fraction (e.g. gasoline or diesel) by source type and model year. Fuel engine fraction for transit bus was calculated based on transit bus population by fuel type for each model year. Table 20 shows the MOVES AVFT 2023 inputs for the conformity analysis for the Pinal County PM-10 and PM-2.5 nonattainment areas.

TABLE 20.
ADJUSTED MOVES AVFT INPUTS FOR TRANSIT BUS IN PINAL COUNTY

Model Year	2023 Transit Bus Data	
	Gasoline	Diesel
2007	1	0
2008	0	0
2009	0	1
2010	0	0
2011	0	0
2012	0	0
2013	0	0
2014	0.667	0.333

Model Year	2023 Transit Bus Data	
	Gasoline	Diesel
2015	1	0
2016	0	0
2017	0	0
2018	0.8	0.2
2019	1	0
2020	1	0
2021	0	1
2022	0	0
2023	0	0

MOVESLink3

MOVESLink3 software processes link data files output by the MAG transportation models. The program calculates emissions for roadway links in the MAG highway networks, which include all of Maricopa and Pinal counties. Traffic volumes for four time periods (AM peak, mid-day, PM peak, and nighttime) for each link are converted into hourly volumes based upon traffic count data collected in Maricopa and Pinal counties. Hourly emission factors are developed by running MOVES3.1 for each facility type, area type, and vehicle class using link speeds by time of day.

The transportation model inputs to MOVESLink3 consist of database formatted files that contain link-specific data and a node coordinate definitions file. MOVESLink3 also requires as input:

- A table containing adjustment factors used to allocate traffic volumes for four time periods to hourly traffic volumes.
- A matrix of emission factors for a range of hours, facility types, area types, vehicle classes, and vehicle ages (generated by the MOVES model).
- The ratio of vehicles participating in the I/M program.
- The year being modeled.
- The regulatory fuel RVP values and MOVES default fuel parameters adjusted by MOVES Fuel Wizard.
- The annual transit bus data for natural gas, gasoline, and diesel fuels.

For the June 2024 Sun Corridor MPO Conformity Analysis, the applicable conformity tests for PM-10 in the West Pinal PM-10 Nonattainment Area and PM-2.5 and NOx in the West Central Pinal PM-2.5 Nonattainment Area are the Action/Baseline scenario analyses for 2025, 2030, 2040, and 2050 as discussed in Chapter 1. MOVES3.1 and MOVESLink3 were applied to estimate vehicle emissions for PM-10, PM-2.5, and NOx.

Traffic data (vehicle miles of travel and speeds by link) were generated with the MAG transportation models. GIS was used to derive VMT and vehicle speed by link for the Pinal PM-10 and PM-2.5 nonattainment areas. The MOVESLink3 model was used to calculate vehicle exhaust, tire wear and brake wear emissions for each nonattainment area using MOVES3.1 emission factors and the traffic data. The analysis for both the Pinal County PM-10 and PM-2.5 nonattainment areas reflects data on an annual average day.

AP-42

PM-10 emission factors for reentrained dust from vehicles traveling on unpaved and paved roads in the Pinal County PM-10 nonattainment area are calculated using the latest equations found in Sections 13.2.2 and 13.2.1.3, respectively, of AP-42, EPA Compilation of Air Pollutant Emission Factors. The AP-42 equation for paved roads was revised by EPA in January 2011. The unpaved and paved road emission factors are multiplied by vehicle miles of travel to estimate unpaved and paved road emissions. The last two sections discuss the assumptions used to calculate particulate emissions from unpaved and paved roads in the Pinal County PM-10 nonattainment area.

Paved and unpaved road emissions were not estimated for the Pinal County PM-2.5 nonattainment area, because Section 93.119(f)(8) of the EPA Conformity Regulations indicates that reentrained road dust only needs to be included in the conformity analysis for PM-2.5 nonattainment areas if EPA or the Arizona Department of Environmental Quality have made a finding and notified MAG and the U.S. Department of Transportation that these sources are a significant contributor to the PM-2.5 problem.

PM-10 Emissions from Public and Private Unpaved Roads

The AP-42 equation calculates PM-10 emission factors for unpaved road fugitive dust and requires as input the road surface material silt content, road surface moisture content, average vehicle speed, and the annual number of wet days. For public and private unpaved roads in the West Pinal PM-10 Nonattainment Area the values for these inputs are consistent with the values used in the 2023 Five Percent Particulate Plan for PM-10 for the West Pinal County Nonattainment Area and are shown below in tables 21 and 22. Average vehicle speeds are available for five classes of public unpaved roads (Classes A-E) and are identical to the average speeds used in the 2017 Base Year PM-10 Emissions Inventory for the West Pinal County Serious PM-10 Nonattainment Area, December 2023. The 2017 Base Year PM-10 Emissions Inventory was used in the development of the 2023 Five Percent Particulate Plan for PM-10 for the West Pinal County Nonattainment Area. For the five classes, Class A represents the lowest average daily traffic (ADT) roads and Class E represents the highest ADT roads.

TABLE 21.
 PINAL PM-10 NONATTAINMENT AREA PUBLIC UNPAVED ROADS (2017 BASE
 YEAR INVENTORY DATA)

	k	s	S	M	C	P	ADT	Miles
	lb/mi	%	mph	%	lb/mi	wet days		
Class A	1.8	7.1	29	0.3	0.00047	25	15	7.22
Class B	1.8	7.1	44	0.3	0.00047	25	53	324.10
Class C	1.8	7.1	37	0.3	0.00047	25	104	14.63
Class D	1.8	7.1	47	0.3	0.00047	25	160	21.3
Class E	1.8	7.1	40	0.3	0.00047	25	485	7.18

TABLE 22.
 PINAL PM-10 NONATTAINMENT AREA PRIVATE UNPAVED ROADS (2017 BASE
 YEAR INVENTORY DATA)

	k	s	S	M	C	P	ADT	Miles
	lb/mi	%	mph	%	lb/mi	wet days		
Non-Irrigation Roads	1.8	14.4	25	0.3	0.00047	25	29	1,027.54
Alleys	1.8	14.4	10	0.3	0.00047	25	4	51.88

PCAQCD provided a GIS shapefile in 2021 that contained the lengths and ADT for all public unpaved roads within the nonattainment area. Using the data from this shapefile and the AP-42 equation values, 2017 base year emissions for all public unpaved roads were calculated. To be consistent with the 2023 Five Percent Particulate Plan for PM-10, for the Action/Baseline analysis years, the same values used to calculate 2017 base year emissions are used, with the exception of grown ADT values. Consistent with assumptions in the 2023 Five Percent Particulate Plan for PM-10, 2025, 2030, 2040 and 2050 ADT on each public unpaved road is grown from 2017 ADT by using the VMT growth rate observed on paved low-ADT arterials from the Action and Baseline scenarios as a surrogate.

In addition to growing ADT of public unpaved roads by the growth rate described above, unpaved public roads that have been paved since 2017 have been removed. In the committed controls for the 2023 Five Percent Particulate Plan for PM-10, beginning in 2023, all unpaved public roads with ADT above 26 are required to be either paved or stabilized. The 2023 Five Percent Particulate Plan for PM-10 assumes that beginning in 2024, implementation of these committed controls will result in combined emission reduction benefits equivalent to the paving of 15 miles per year and the stabilization of 15 miles per year as documented in the Technical Support Document for the 2023 Five Percent Particulate Plan for PM-10. This assumption is carried forward into future years until all unpaved roads with ADT above 26 are paved or stabilized.

For the Action scenario, the control assumptions for public unpaved roads from the 2023 Five Percent Particulate Plan for PM-10 are applied without any modification. For the Baseline scenario, the control assumptions are reduced in the future, as under a Baseline

scenario less funds are allocated for the paving and stabilizing of unpaved roads, and less new paved roads are being built, which increases and forces increased traffic onto existing unpaved roads. To account for this, under a Baseline scenario, it is assumed that emissions reductions equivalent to the paving and stabilizing of 10 miles per year are occurring, instead of the 15 miles per year assumed in the 2023 Five Percent Particulate Plan for PM-10.

The ADT is multiplied by the miles to calculate VMT. The VMT is multiplied by the AP-42 emission factor to obtain the PM-10 unpaved road emissions for each of the five road type classifications (Classes A-E).

As described in the 2023 Five Percent Particulate Plan for PM-10 motor vehicle emissions budgets, private unpaved roads include non-irrigation roads and alleys. Consistent with the assumptions in the 2023 Five Percent Particulate Plan for PM-10, it is assumed that there is no growth in VMT from private unpaved roads from the 2017 base year PM-10 emissions for either the Action scenario or the Baseline scenario. To calculate 2025, 2030, 2040, and 2050 PM-10 emissions from private unpaved roads, 2017 base year PM-10 emissions are held constant. The 2023 Five Percent Particulate Plan for PM-10 assumes that the committed control measures for unpaved roads will only be applied to public unpaved roads due to the financial difficulties in using public funds on private roads. If a private unpaved road becomes paved, or becomes a public unpaved road, those emissions are removed from the private unpaved road inventory. After accounting for known paving, private unpaved road emissions in 2025, 2030, 2040 and 2050 are identical for the Action and Baseline scenarios.

For this updated methodology, PM-10 emissions from unpaved agricultural roads (e.g. irrigation canal roads, harvest roads, etc.) are no longer included in the Action/Baseline scenarios as these roads have not been included in the motor vehicle emissions budget in the 2023 Five Percent Particulate Plan for PM-10.

PM-10 Emissions for Reentrained Dust from Paved Roads

The estimation of PM-10 emissions for reentrained dust from paved roads are based on the AP-42 equation released by EPA in January 2011 and are consistent with the data inputs and control assumptions described in the 2023 Five Percent Particulate Plan for PM-10.

The AP-42 equation that calculates PM-10 emission factors for paved road fugitive dust requires as input the road surface silt loading, the average weight of vehicles traveling on paved roads, and the number of wet days (with at least 0.01 inch of precipitation). These values are shown in Table 23 below for the Action scenarios and Table 24 for the Baseline scenarios.

The silt loadings were derived from the MAG 2012 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area and were used in the development of the motor vehicle emissions budgets in the 2023 Five Percent Particulate Plan for PM-10. Since the

silt loadings are stratified by road type, vehicle weights are estimated separately for freeways and arterials for each conformity year. The average vehicle weights for freeways and arterials were calculated using MOVES3 Source Type (i.e., vehicle class) output, based on January 2020 vehicle registrations for Pinal County and the latest traffic assignment data for each year for the Action and Baseline scenarios. The average vehicle weights for freeways and arterials in units of tons, are shown in Table 23 below for the Action scenarios and in Table 24 for the Baseline scenarios.

TABLE 23.
PAVED ROAD REENTRAINED PM-10 EMISSIONS IN PINAL PM-10
NONATTAINMENT AREA (ACTION SCENARIO)

Year	Facility Type	k	sL	W	P*	N	E	VMT
		g/mi	g/m2	tons	wet days	days in yr	g/vmt	mile/day
2025	Freeway	1.00	0.02	8.02	25	365	0.23	2,174,021
	High ADT Arterial	1.00	0.07	2.66	25	365	0.23	1,594,857
	Low ADT Arterial	1.00	0.23	2.66	25	365	0.70	2,643,289
2030	Freeway	1.00	0.02	8.22	25	365	0.24	2,446,691
	High ADT Arterial	1.00	0.07	2.65	25	365	0.23	2,271,573
	Low ADT Arterial	1.00	0.23	2.65	25	365	0.70	3,238,903
2040	Freeway	1.00	0.02	8.55	25	366	0.25	3,280,626
	High ADT Arterial	1.00	0.07	2.68	25	366	0.23	4,177,886
	Low ADT Arterial	1.00	0.23	2.68	25	366	0.71	3,996,283
2050	Freeway	1.00	0.02	9.10	25	365	0.27	4,369,466
	High ADT Arterial	1.00	0.07	2.69	25	365	0.23	6,720,317
	Low ADT Arterial	1.00	0.23	2.69	25	365	0.71	4,598,375

TABLE 24.
PAVED ROAD REENTRAINED PM-10 EMISSIONS IN PINAL PM-10
NONATTAINMENT AREA (BASELINE SCENARIO)

Year	Facility Type	k	sL	W	P*	N	E	VMT
		g/mi	g/m2	Tons	wet days	days in yr	g/vmt	mile/day
2025	Freeway	1.00	0.02	8.01	25	365	0.23	2,213,221
	High ADT Arterial	1.00	0.07	2.61	25	365	0.22	1,717,941
	Low ADT Arterial	1.00	0.23	2.61	25	365	0.69	2,438,832
2030	Freeway	1.00	0.02	8.26	25	365	0.24	2,525,972
	High ADT Arterial	1.00	0.07	2.57	25	365	0.22	2,322,285
	Low ADT Arterial	1.00	0.23	2.57	25	365	0.67	2,878,110
2040	Freeway	1.00	0.02	8.71	25	366	0.25	3,469,801
	High ADT Arterial	1.00	0.07	2.50	25	366	0.21	3,975,412
	Low ADT Arterial	1.00	0.23	2.50	25	366	0.66	3,400,602
2050	Freeway	1.00	0.02	9.08	25	365	0.27	4,761,577
	High ADT Arterial	1.00	0.07	2.47	25	365	0.21	5,758,655
	Low ADT Arterial	1.00	0.23	2.47	25	365	0.65	3,993,504

A control factor based upon the control effectiveness assumptions in the 2023 Five Percent Plan is equally applied to both the resulting Action and Baseline AP-42 emission factors to reflect the adopted controls in the 2023 Five Percent Particulate Plan for PM-10.

In addition to AP-42 emission factors for freeways, high ADT arterials, and low ADT arterials, the 2023 Five Percent Plan for PM-10 also includes paved road reentrained dust PM-10 emissions from asphalt rock dust palliative (ARDP, often referred to as “chip-sealed” roads) roads. Consistent with the 2023 Five Percent Particulate Plan for PM-10, ARDP roads are assumed to emit reentrained road dust at a rate 10 percent higher than traditionally paved roads, since ARDP roads require more upkeep to maintain. ARDP roads are assumed to have the same silt loading content as low ADT arterials. The same paved road control factors applied to traditionally paved roads are also applied to ARDP roads, consistent with the assumptions in the 2023 Five Percent Particulate Plan for PM-10.

The Action and Baseline AP-42 emission factors for paved roads are multiplied by the VMT for freeways, high traffic arterials, low traffic arterials and ARDP roads to obtain total paved road emissions. The VMTs for freeways and high and low traffic arterials for the Action and Baseline scenarios are derived from the MAG transportation model traffic assignments. All centroid connectors are considered low traffic arterials. VMT on ARDP roads is grown from the 2017 base year inventory data based upon the growth rate of low ADT arterials from 2017 to the analysis years, as the ABM network assignments do not provide VMT estimates for ARDP roads.

Road Construction

Since PM-10 emissions from road construction in the West Pinal PM-10 Nonattainment Area have been included in the motor vehicle emission budgets established in the 2023 Five Percent Particulate Plan for PM-10 for the West Pinal County Nonattainment Area, the Action scenario for the West Pinal PM-10 Nonattainment Area includes PM-10 emission estimates for road construction. For the Baseline scenario, road construction emissions are assumed to be zero, as no new construction is assumed to occur in future analyses years.

Road construction emissions for the West Central Pinal PM-2.5 Nonattainment Area were not included in the Action/Baseline scenarios per 40 CFR 93.122(f), as there is no implementation plan that identifies construction-related PM-2.5 emissions as a significant contributor to PM-2.5 nonattainment problem.

5 TIP AND REGIONAL TRANSPORTATION PLAN CONFORMITY

The principal requirements of the federal transportation conformity rule for TIP and Regional Transportation Plan assessments are: (1) the TIP and Regional Transportation Plan (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 latest planning assumptions and emission models in force at the time the conformity analysis begins must be employed; (3) the TIP and RTP must provide for the timely implementation of transportation control measures (TCMs) specified in the applicable air quality implementation plans; and (4) consultation. Consultation generally occurs both at the beginning of the process of preparing the conformity analysis, on the proposed models, associated methods, and assumptions for the upcoming analysis and the projects to be assessed, and at the end of the process, on the draft conformity analysis report. The final determination of conformity for the TIP and Regional Transportation Plan is the responsibility of the Federal Highway Administration and the Federal Transit Administration.

The previous chapters and the appendices present the documentation for all of the requirements listed above for conformity determinations, except for the conformity test results. Prior chapters have also addressed the updated documentation required under the federal transportation conformity rule for the latest planning assumptions. A status report on transportation control measures is not necessary since there are no applicable plans for the West Pinal PM-10 Nonattainment Area and West Central Pinal PM-2.5 Nonattainment Area. The Appendix will include the public notice, consultation correspondence, and any comments received and responses made as part of the public comment process.

This chapter presents the results of the conformity tests, satisfying the remaining requirement of the federal transportation conformity rule. Conformity interim emissions Action/Baseline tests were performed for the Pinal County nonattainment areas. The results of the Pinal County conformity analyses are described below.

PINAL COUNTY NONATTAINMENT AREAS

For the Pinal County nonattainment areas, Action/Baseline tests were conducted for particulate matter (PM-10) for the West Pinal PM-10 Nonattainment Area and particulate matter (PM-2.5) and nitrogen oxides (NO_x) for the West Central Pinal PM-2.5 Nonattainment Area. Also, for information, MAG conducted a budget test using the 2026 budget established in the submitted 2023 Five Percent Particulate Plan for PM-10 for the West Pinal County Nonattainment Area. For each test, the required emissions estimates were developed using the transportation and emission modeling approaches required under the federal transportation conformity rule and summarized in Chapters 3 and 4.

The applicable conformity tests were reviewed in Chapter 1. The results are summarized below. Table 25 and figures 5 through 7 present the conformity results for the PM-10 and PM-2.5 nonattainment areas for each of the analysis years tested.

Conformity Test Results for the West Pinal PM-10 Nonattainment Area

The conformity modeling results for PM-10 are listed in Table 25 and graphed in Figure 5. The PM-10 emissions were calculated for the PM-10 nonattainment area for an annual average day.

The projected PM-10 emissions in 2025, 2030, 2040, and 2050 for the action scenarios are 41,180, 39,304, 34,888, and 32,954 kilograms per day, respectively. The projected PM-10 emissions in 2025, 2030, 2040, and 2050 for the baseline scenarios are 41,338, 41,098, 37,738, and 35,083 kilograms per day, respectively.

Since the PM-10 emissions projected for the action scenarios are not greater than the PM-10 emissions projected for the baseline scenarios in all conformity analysis years, it is also reasonable to expect the build emissions would not exceed the baseline emissions for the time periods between the analysis years.¹ These results support a finding of conformity.

Also, for information, MAG conducted the budget test using the 2026 budget of 42.5 metric tons per day established in the submitted 2023 Five Percent Particulate Plan for PM-10 for the West Pinal County Nonattainment Area. The conformity modeling results are provided in Table 26. The PM-10 emissions were calculated for the West Pinal PM-10 Nonattainment Area for an annual average day. The projected emissions in 2026, 2030, 2040, and 2050 are 41.1, 39.3, 34.9, and 33.0 metric tons per day, respectively, which are all less than the 2026 motor vehicle emissions budget of 42.5 metric tons per day.

Conformity Test Results for the West Central Pinal PM-2.5 Nonattainment Area

The conformity modeling results for PM-2.5 and NO_x are listed in Table 25 and graphed in figures 6 and 7. The PM-2.5 and NO_x emissions were calculated for the West Central Pinal PM-2.5 Nonattainment Area for an annual average day.

The projected PM-2.5 emissions in 2025, 2030, 2040, and 2050 for the Action scenario are 17, 16, 15, and 19 kilograms per day, respectively. The projected PM-2.5 emissions in 2025, 2030, 2040, and 2050 for the Baseline scenario are 17, 17, 18, and 22 kilograms per day, respectively.

¹Section 93.119(d)(1) of the Transportation Conformity Regulations (EPA, 2012c), refers to “build” as the “Action” scenario and the “no-build” as the “Baseline” scenario.

The projected NOx emissions in 2025, 2030, 2040, and 2050 for the Action scenario are 508, 366, 337, and 471 kilograms per day, respectively. The projected NOx emissions in 2025, 2030, 2040, and 2050 for the Baseline scenario are 512, 420, 504, and 691 kilograms per day, respectively.

Since the PM-2.5 and NOx emissions projected for the Action scenarios are not greater than the PM-2.5 and NOx emissions projected for the Baseline scenarios in all conformity analysis years, it is also reasonable to expect the build emissions would not exceed the baseline emissions for the time periods between the analysis years.¹ These results support a finding of conformity.

TABLE 25.
CONFORMITY INTERIM EMISSION (ACTION/BASELINE) TEST RESULTS
(KILOGRAMS/DAY) PINAL COUNTY NONATTAINMENT AREAS

Pollutant	PM-10	PM-2.5	NOx
2025			
- Action	41,180	17	508
- Baseline	41,338	17	512
2030			
- Action	39,304	16	366
- Baseline	41,098	17	420
2040			
- Action	34,888	15	337
- Baseline	37,738	18	504
2050			
- Action	32,954	19	471
- Baseline	35,083	22	691

TABLE 26.
 CONFORMITY TEST RESULTS USING THE SUBMITTED BUDGET
 FROM THE 2023 FIVE PERCENT PLAN FOR PM-10 FOR THE PINAL PM-10
 NONATTAINMENT AREA FOR INFORMATION PURPOSES
 (METRIC TONS/DAY)

Pollutant	PM-10
Budget Test	42.5
2026	41.1
2030	39.3
2040	34.9
2050	33.0

The submitted 2023 Five Percent Particulate Plan for PM-10 for the Pinal County Nonattainment Area establishes a 2026 PM-10 budget of 42.5 metric tons/day. EPA has advised that MAG should include the budgets from submitted plans so that an adequacy finding on a submitted SIP does not interfere with the conformity process.

Figure 5: PM-10 Results for Conformity Interim Emission (Action/Baseline) Test
 Pinal County PM-10 Nonattainment Area

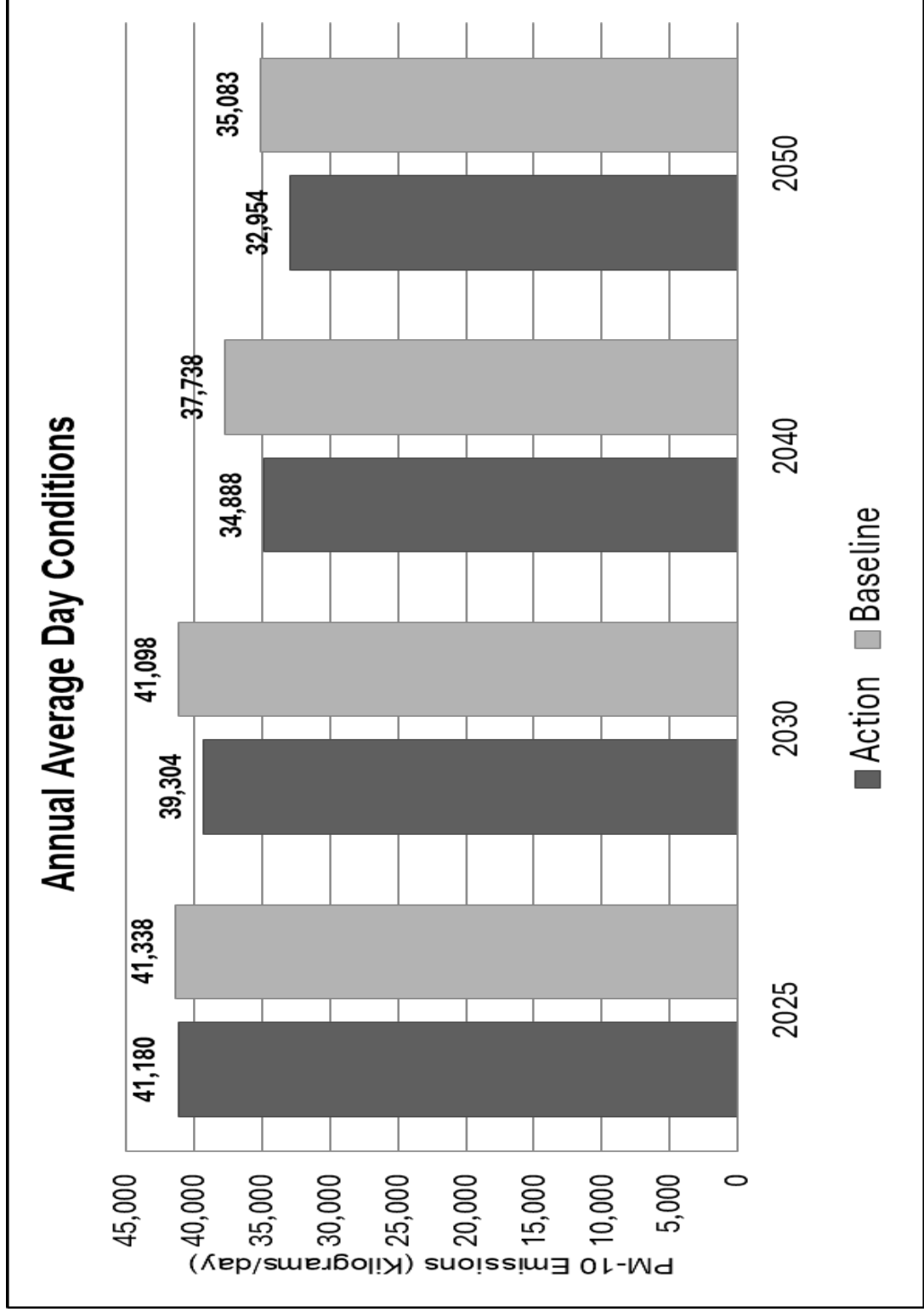


Figure 6: PM-2.5 Results for Conformity Interim Emission (Action/Baseline) Test
 Pinal County PM-2.5 Nonattainment Area

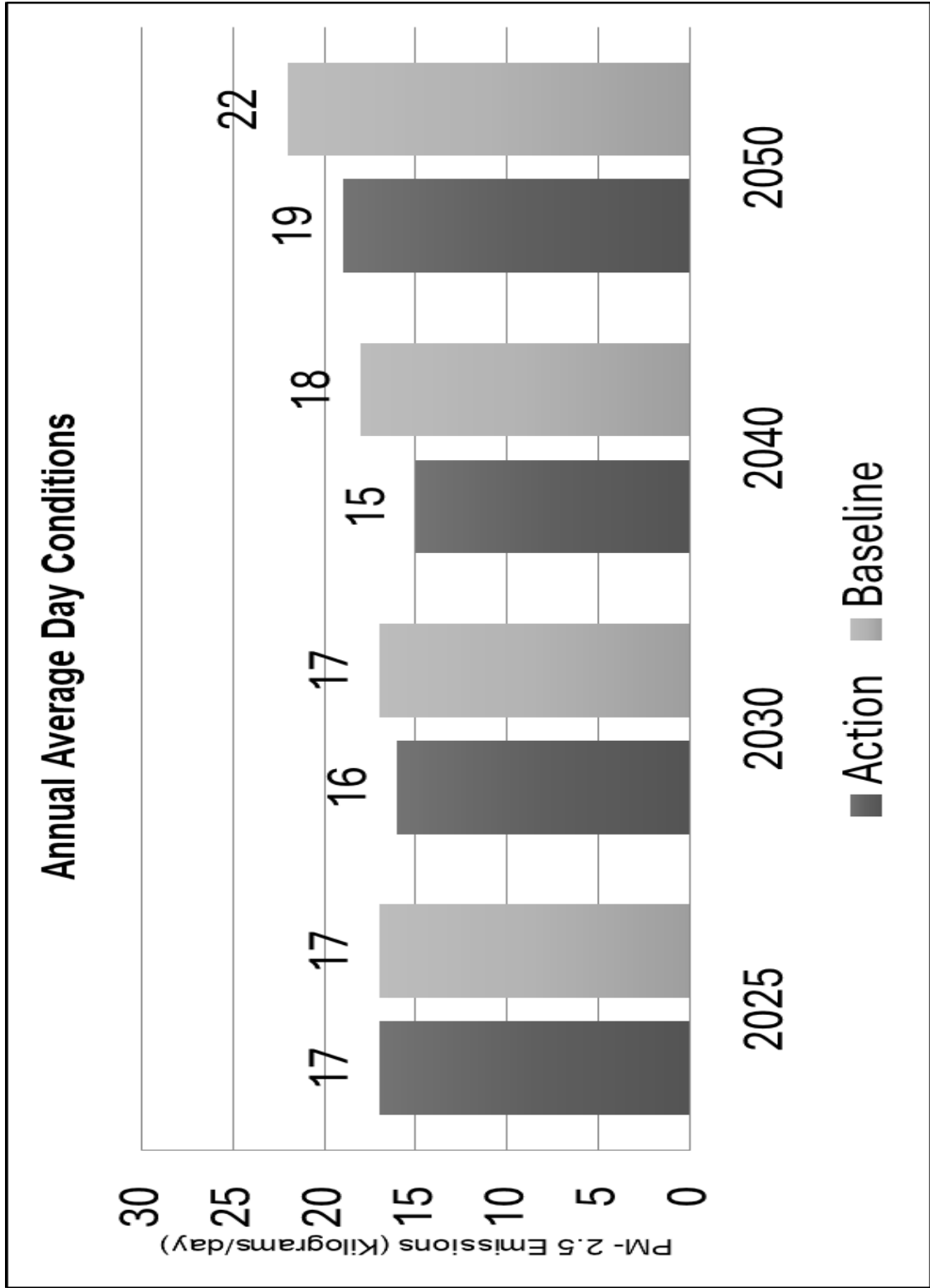
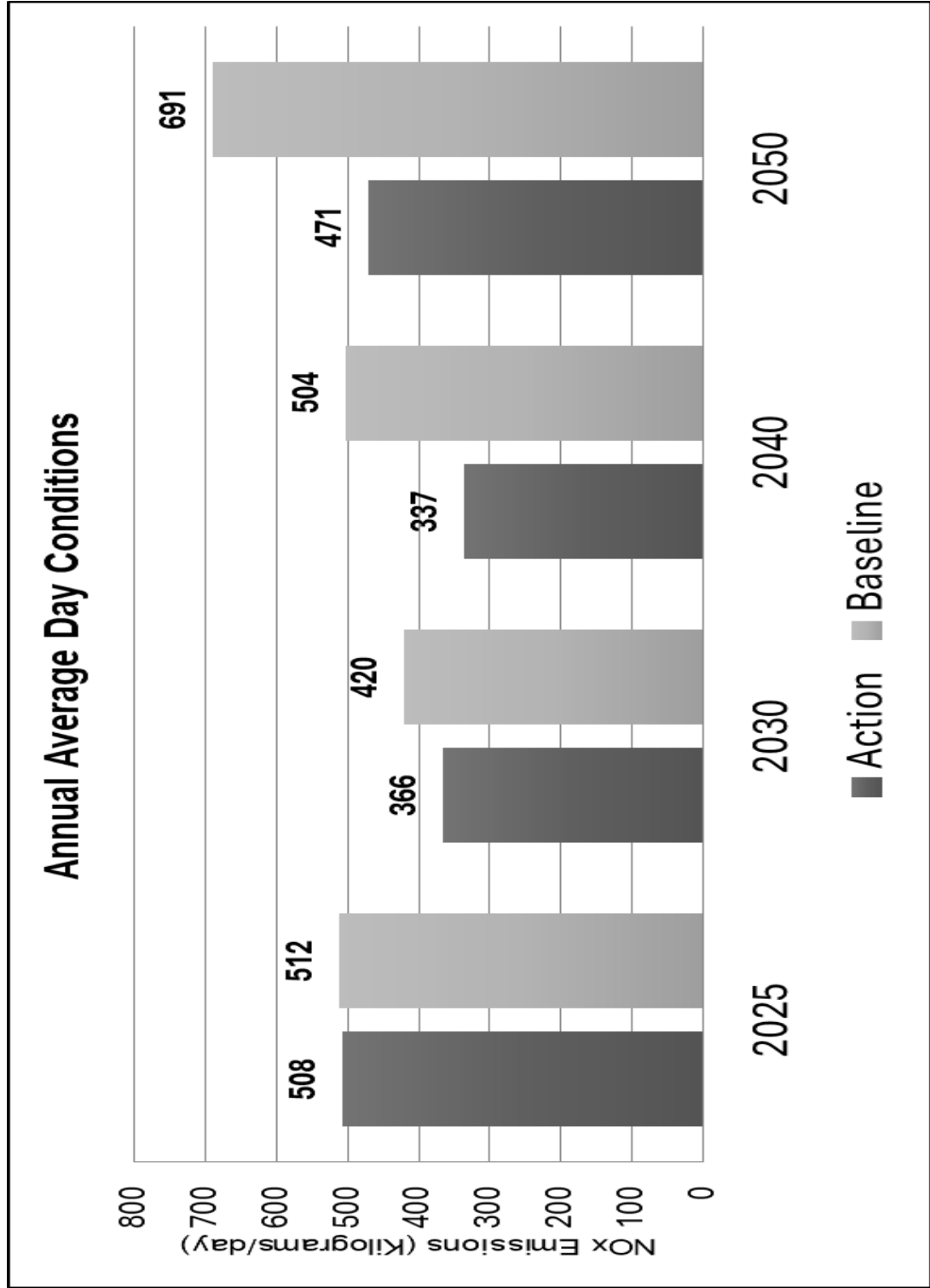


Figure 7: NOx Results for Conformity Interim Emission (Action/Baseline) Test
 Pinal County PM-2.5 Nonattainment Area



GLOSSARY

40 CFR Parts 51 and 93	Sections 51 and 93 from Title 40 of the Code of Federal Regulations describing the transportation conformity rule.
ADEQ	Arizona Department of Environmental Quality.
ADOT	Arizona Department of Transportation.
AP-42	AP-42, Fifth Edition, provides PM-10 emission factors. Common name for the EPA Compilation of Air Pollutant Emission Factors.
Applicable Plan	An air quality plan that has been approved by EPA for a specific air pollutant.
A.R.S.	Arizona Revised Statutes. The codified laws of the State of Arizona.
Arterial Roadway	A major urban street serving through traffic and also providing access to adjacent land.
Attainment	The status of having air quality that is below (i.e., cleaner air) the allowable national standard for a particular pollutant.
AZ-SMART	Arizona Socioeconomic Modeling, Analysis, and Reporting Toolbox is the MAG socioeconomic model used to develop population and employment projections.
Action/Baseline	Action or Build refers to the action scenario which assumes the Baseline or No-Build scenario and the implementation of the proposed action (included in the TIP or RTP) for each of the years to be analyzed. The Baseline scenario assumes the future transportation network without implementation of the proposed action (included in the TIP or RTP) for the years to be analyzed.

CAA	The U.S. Clean Air Act, referring to the Air Pollution Control Act of 1955, as subsequently amended in 1963, 1967, 1970, 1974, 1977, and 1990.
Capacity	The maximum number of vehicles that a roadway can carry in a given time period under prevailing roadway, traffic, and control conditions.
Centroid Connector	An abstract representation of the local street system, as used in MAG travel demand models. These links connect the centroids of zones, where trips begin or end, to arterial or collector roadways on the modeled road network.
CO	Carbon monoxide. A colorless, odorless, poisonous gas that results from the incomplete combustion of carbon-based fuels, such as gasoline.
Collector Roadway	A minor urban street providing access to and from local streets and serving adjacent land use.
Concentration	The relative content of a pollutant in the air, expressed as a volume unit to volume unit often expressed as an average for a specified time interval. For example, the national standard for ambient carbon monoxide concentration is an eight-hour average of 9.0 parts per million.
Conformity	An analysis which demonstrates that a transportation plan, program, or project conforms with the State Implementation Plan purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and that such activities will not cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

Congestion	Traffic congestion is a condition in which vehicles experience undue delay. It is quantified in the MAG travel demand models by the ratio of traffic volume to capacity (V/C). A V/C ratio of 1.00 or more is considered severe congestion.
Emission Factor	The rate at which a pollutant is emitted from a given source (example: grams per mile) for given conditions (e.g., vehicle type and model year, vehicle speed, fuel type, and ambient air temperature).
Episode Day	A day selected to represent conditions (meteorology, etc.) under which violations of the air quality standard for a particular pollutant are likely to occur.
EPA	United States Environmental Protection Agency.
Exceedance	A term used to refer to an episode during which ambient concentrations of an air pollutant in a region are higher than the allowable national standard.
FHWA	Federal Highway Administration.
FIP	Federal Implementation Plan.
FMS	Freeway Management System. Infrastructure such as cameras, variable message signs, and ramp metering systems to improve the flow of people and goods on limited access facilities.
FTA	Federal Transit Administration.
Freeway	A divided highway with two or more lanes for the exclusive use of traffic in each direction, and with full control of access and egress.
FY	Fiscal Year. The federal fiscal year extends from October 1 to September 30. For example, FY 2024 began on October 1, 2023.
Hot Spot	Localized area with the potential to cause or contribute to a violation of an air quality standard. For example, a busy intersection where vehicular traffic may cause or contribute to increased emissions of carbon monoxide may attribute to a violation of the standard.

HOV	High Occupancy Vehicle. Multi-occupant vehicles such as a carpool, vanpool, or bus.
HOV Lane	A roadway lane available for use by High Occupancy Vehicles.
HPMS	Highway Performance Monitoring System. Summary information for urbanized areas provides detailed data for a sample of the arterial and collector functional systems to assess highway condition, performance, air quality trends, and future investment requirements.
I/M	Vehicle Inspection/Maintenance Program.
ITS	Intelligent Transportation System. The deployment of advanced electronics and information technologies to improve the performance of freeways and arterial roadways.
Link	A computer record describing a section of roadway in the MAG transportation models.
Local Roadway	A road, usually with low traffic volume, designed solely to serve adjacent development rather than through traffic.
MAG	Maricopa Association of Governments. The Maricopa Association of Governments was designated the metropolitan planning agency for Maricopa County, Arizona, by Governor Jack Williams on December 14, 1973.
Metric Ton	A unit of mass equal to 1000 kilograms, or approximately 2203 pounds.
Mode Choice Model	A computer model which determines mode choice, such as transit, auto driver, and auto passenger, based on variables such as travel times, costs, and income of travelers.
MOVES3	MOVES3 is a currently approved EPA model for estimating onroad vehicle emission factors. This model is used to estimate the emission factors for CO, VOC, NOx, and PM-10 exhaust, tire wear, and brake wear emissions.

MOVESLink	A MAG software program that combines emission factors (such as from MOVES3) with link-level transportation data to produce onroad mobile emission inventories.
MPO	Metropolitan Planning Organization. A body of elected public officials responsible for regional transportation decision-making, as required under federal transportation planning regulations.
NAAQS, or National Standard	Refers to the National Ambient Air Quality Standards (NAAQS) which are the maximum pollutant levels which may not be exceeded in the ambient air to protect the public from adverse health effects.
Network	A computer readable representation of a specific urban street and highway system.
Nonattainment Area	An area designated by the U.S. Environmental Protection Agency as not being in attainment of the national standard for a specified pollutant.
Node	A point identifying one end of a link in the MAG transportation models.
NO _x	Nitrogen Oxides includes nitric oxide (NO) and nitrogen dioxide (NO ₂). These gaseous air pollutants combine with volatile organic compounds (i.e. hydrocarbons) in the presence of sunlight to produce ozone.
O ₃	Ozone is a secondary pollutant formed by the combination of VOCs and NO _x in the presence of sunlight.
OBD	On-Board Diagnostics. A computer based system built into all model year 1996 and newer light-duty cars and trucks. OBD monitors the performance of some of the engines= major components, including individual emission controls.
Phased in I/M Cutpoints	Cutpoints are the maximum emission level, by pollutant, used to determine if a vehicle passes or fails the emissions test administered through the vehicle inspection and maintenance program. The phased-in I/M cutpoints are the cutpoints currently enacted into legislation for vehicles subject to the enhanced emissions test.

PCAQCD	Pinal County Air Quality Control District.
PM-10	Particulate Matter less than or equal to ten microns in diameter.
ppm	Parts per million, a measure of pollution concentration.
psi	Pounds per square inch, a measure of pressure.
Reentrained Dust	Dust deposited on the roadway that is subsequently projected into the air by the passage of motor vehicles.
RTP	Regional Transportation Plan.
SIP	State Implementation Plan. Mandated by the Clean Air Act, SIPs contain details to monitor, control, maintain, and enforce compliance with National Ambient Air Quality Standards.
Socioeconomic Data	Data consists primarily of TAZ-level household projections of population and employment by type which are input to the MAG travel demand models.
Sun Corridor MPO	Sun Corridor Metropolitan Planning Organization was designated on May 6, 2013 and includes the cities of Casa Grande, Coolidge, Eloy and unincorporated areas of Pinal County.
TAZ	Traffic Analysis Zone. A small geographic area for which socioeconomic data is estimated in the MAG travel demand models.
TCM	Transportation Control Measure. A TCM as defined in CAA Section 108(f)(1)(A) includes any measure in an applicable implementation plan which is intended to reduce emissions from transportation sources by reducing vehicle use or changing traffic flow or congestion conditions (e.g., transit improvements).
TIP	Transportation Improvement Program. An annual or biennial document listing transportation projects to be funded in upcoming years.

TransCAD	Software programs which are used to perform the MAG travel demand modeling.
U.S. DOT	United States Department of Transportation.
V/C Ratio	Volume to Capacity Ratio. A parameter used to measure congestion. For a given roadway link, it is calculated as total traffic volume divided by capacity.
Violation	A term used to define the number of exceedances that result in noncompliance with the national standard.
VMT	Vehicle Miles of Travel. A measure of total vehicle travel within a specified area and time frame.

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