

MARICOPA ASSOCIATION OF GOVERNMENTS INFORMATION SUMMARY... for your review

DATE:

October 4, 2011

SUBJECT:

Consultation on Proposed Transportation Conformity Processes for the 2012 MAG Conformity Analysis

SUMMARY:

Federal and State conformity regulations require that Metropolitan Planning Organizations consult with federal, state, and local air quality and transportation agencies on proposed processes for conformity analyses on transportation improvement programs and transportation plans. On October 4, 2011, MAG distributed for interagency consultation the conformity processes on the selection of proposed models, associated methods, and assumptions, identification of exempt projects, and ensuring the timely implementation of transportation control measures. The proposed processes will be applied beginning with the upcoming conformity analysis for an amendment to the FY 2011-2015 MAG Transportation Improvement Program (TIP) and the MAG Regional Transportation Plan 2010 Update. Comments regarding this material are requested by October 21, 2011.

PUBLIC INPUT:

Copies of the attached processes were distributed for consultation purposes to the Federal Transit Administration, Federal Highway Administration, Arizona Department of Transportation, Arizona Department of Environmental Quality, Regional Public Transportation Authority, City of Phoenix Public Transit Department, Valley Metro Rail, Maricopa County Air Quality Department, Central Arizona Association of Governments, Pinal County Air Quality Control District, U.S. Environmental Protection Agency, and other interested parties.

PROS & CONS:

PROS: Interagency consultation on the transportation conformity processes provides required notification to the planning agencies.

CONS: The consultation on transportation conformity requires additional time for the amendment to the FY 2011-2015 MAG Transportation Improvement Program and the MAG Regional Transportation Plan 2010 Update.

TECHNICAL & POLICY IMPLICATIONS:

TECHNICAL: The 2012 MAG Conformity Analysis will be based upon the latest planning assumptions and EPA-approved emissions models.

POLICY: The consultation for the conformity processes is being conducted in accordance with federal regulations and MAG Conformity Consultation Processes adopted by the Regional Council.

ACTION NEEDED:

Consultation.

PRIOR COMMITTEE ACTIONS:

None.

CONTACT PERSON:

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October 4, 2011

TO: Leslie Rogers, Federal Transit Administration
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Stephen Banta, Valley Metro Rail
William Wiley, Maricopa County Air Quality Department
Brian Tapp, Central Arizona Association of Governments
Donald Gabrielson, Pinal County Air Quality Control District
Gregory Nudd, U.S. Environmental Protection Agency, Region IX
Other Interested Parties

FROM: Dean Giles, Air Quality Planning Program Specialist

SUBJECT: CONSULTATION ON PROPOSED TRANSPORTATION CONFORMITY
PROCESSES FOR THE 2012 MAG CONFORMITY ANALYSIS

The Maricopa Association of Governments is distributing for interagency consultation the proposed transportation conformity processes to be applied beginning with the upcoming conformity analysis for a conformity redetermination on a major amendment to the FY 2011-2015 MAG Transportation Improvement Program and Regional Transportation Plan 2010 Update. Consultation on the proposed processes is required under MAG conformity consultation procedures that were developed to meet state and federal requirements. Please provide any comments regarding this material by October 21, 2011. Additional opportunities for comment on this consultation item are anticipated at the October 12, 2011 MAG Management Committee and October 26, 2011 MAG Regional Council meetings.

The following information is being transmitted for consultation:

- Attachment A documents the models, associated methods, and assumptions to be used in regional emissions analyses.
- Attachment B documents the process for ensuring timely implementation of transportation control measures.
- Attachment C documents the process for types of projects considered exempt from conformity requirements.

If you have any questions or comments, please contact me at (602) 254-6300.

Attachments

cc: Eric Massey, Arizona Department of Environmental Quality
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A Voluntary Association of Local Governments in Maricopa County

DRAFT

**MODELS, ASSOCIATED METHODS, AND ASSUMPTIONS FOR USE IN
REGIONAL EMISSIONS ANALYSES**

In accordance with the transportation conformity rule 40 CFR 93.105(c)(1)(i), the Maricopa Association of Governments (MAG) is conducting interagency consultation on the models, associated methods, and assumptions to be applied beginning with the 2012 MAG Conformity Analysis for a conformity determination on a major amendment to the FY 2011-2015 MAG Transportation Improvement Program (TIP) and Regional Transportation Plan 2010 Update (RTP). MAG conducts consultation on the models, associated methods, and assumptions for use in regional emissions analyses at the outset of the process to prepare a conformity analysis for a new TIP and RTP and when there are major changes to the models, methods, or assumptions used in preparing a conformity analysis for a major amendment to a conforming TIP and RTP.

In February 1996, the MAG Regional Council adopted conformity consultation processes in response to federal and state requirements (MAG, 1996a). The MAG process M-1 directly addresses the requirement for periodic consultation on models, associated methods, and assumptions to be used in hot-spot analyses and regional emissions analyses. The process indicates that regional emissions analyses are to use the latest United States Environmental Protection Agency (EPA) approved motor vehicle emissions models and that all model inputs use the latest planning assumptions as required in 40 CFR Sections 93.110-111.

Consultation on the 2012 MAG Conformity Analysis is being conducted with the Federal Transit Administration, Federal Highway Administration, Arizona Department of Transportation, Arizona Department of Environmental Quality, Regional Public Transportation Authority, Valley Metro Rail, City of Phoenix Public Transit Department, Maricopa County Air Quality Department, Central Arizona Association of Governments, Pinal County Air Quality Control District, United States Environmental Protection Agency, and MAG member agencies (e.g. Maricopa County, cities, towns, and Indian communities).

The following sections describe the proposed approach for regional emissions analyses, including the methodology, latest planning assumptions, transportation modeling, and air quality modeling to be applied for the 2012 MAG Conformity Analysis.

I. PROPOSED METHODOLOGY FOR THE 2012 MAG CONFORMITY ANALYSIS

The criteria for determining conformity of transportation programs and plans under the federal conformity rule (40 CFR Parts 51 and 93) and the applicable conformity tests for the Maricopa County nonattainment and maintenance areas are summarized in this section. The 2012 MAG Conformity Analysis will be 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 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/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, 1997a). 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, 2000a). 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 a 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, 2002b).

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, 2004a). 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 issued 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 are:

- 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 2012 MAG Conformity Analysis are described later in this section, and include the last year of the MAG Regional Transportation Plan 2010 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.

In addition, on April 5, 2006 EPA rules became effective for establishing criteria for determining which transportation projects must be analyzed for particulate emissions impacts in PM-2.5 and PM-10 nonattainment and maintenance areas.

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.

To date, 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 transportation conformity SIP has not yet been approved for this area.

The State rule specifies that MPOs (i.e., MAG, for this region) must develop specific conformity guidance and consultation procedures and processes. MAG has developed and adopted two conformity guidance documents to meet State requirements. MAG developed the “Transportation Conformity Guidance and Procedures” document, which was adopted initially on September 27, 1995 by the MAG Regional Council. The document was revised by the MAG Regional Council on March 27, 1996 (MAG, 1996b). This guidance document addresses both the determination of “regional significance” status for individual transportation projects, and the process by which regionally significant projects may be approved.

MAG also developed the “Conformity Consultation Processes” document, which was adopted on February 28, 1996 by the MAG Regional Council (MAG, 1996a). This guidance document details the public and interagency consultation processes to be used in the development of regional transportation plans, programs, and projects within the Maricopa County nonattainment area.

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 issued 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, 2000a). 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, 1999b). 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 A-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 issued in March 2010 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

TABLE A-1
CONFORMITY CRITERIA FROM THE FINAL RULE

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

Source: Adapted from (EPA, 2010), Section 93.109(b), "Table 1 - Conformity Criteria".

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.” (EPA, 2010) This section of the conformity rule also requires reasonable assumptions to be made regarding transit service and changes in projected fares. *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.
- 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:
 - MAG is required to provide reasonable opportunity for consultation with local air quality and transportation agencies, state air and transportation agencies, and the U.S. DOT and EPA (Section 93.105(c)(1)).
 - MAG 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)).

Under the interagency consultation procedures, the RTP is prepared by MAG staff with guidance from the MAG Transportation Policy Committee, the MAG Management Committee, and the MAG Regional Council. Copies of the final Draft are provided to MAG member agencies and others, including the Federal Transit Administration (FTA), Federal Highway Administration (FHWA), Arizona Department of Transportation (ADOT), ADEQ, Regional Public Transportation Authority (RPTA), Valley Metro Rail, City of Phoenix Public Transit Department, Pinal County Air Quality Control District (PCAQCD), Central Arizona Association of Governments (CAAG), Maricopa County Air Quality Department (MCAQD), and EPA. The RTP is required to be publicly available and an opportunity for public review and comment is provided.

The TIP is prepared by MAG staff with the assistance of the MAG modal committees, Transportation Review Committee, and Transportation Policy Committee. Copies of the Draft TIP are provided to MAG member agencies and others, including FTA, FHWA, ADOT, ADEQ, RPTA, Valley Metro Rail, City of Phoenix Public Transit Department, MCAQD, CAAG, PCAQCD, and EPA for review. As with the RTP, the TIP is required to be publicly available and an opportunity for public review and comment is provided.

AIR QUALITY PLANS AND DESIGNATIONS

Portions of Maricopa County are currently designated as nonattainment or maintenance for the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), eight-hour ozone, and particulate matter less than or equal to ten microns in diameter (PM-10). Air quality plans have been prepared to address carbon monoxide, one-hour ozone, eight-hour ozone, and PM-10:

- The Revised MAG 1999 Serious Area Carbon Monoxide Plan, reflecting the repeal of the remote sensing program by the Arizona Legislature in 2000, was submitted to EPA in March 2001 and approved by EPA effective April 8, 2005;
- The Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area was submitted to EPA in June 2003 and approved by EPA effective April 8, 2005;
- The EPA approved and promulgated a Revised 1998 15 Percent Rate of Progress Plan for Ozone (Revised ROP FIP) for the Maricopa County nonattainment area, effective August 5, 1999;
- The Serious Area Ozone State Implementation Plan for Maricopa County was prepared by ADEQ and submitted to EPA in December 2000 to meet the Serious Area requirements. No budget is contained in the Serious Area Ozone Plan. EPA approved the Serious Area Ozone Plan, effective June 14, 2005;
- The One-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area was submitted to EPA in May 2004 and approved by EPA effective June 14, 2005;
- The MAG Eight-Hour Ozone Plan for the Maricopa Nonattainment Area was submitted to EPA by June 15, 2007;
- The Revised MAG 1999 Serious Area Particulate Plan for PM-10 was submitted to EPA in February 2000 and approved by EPA effective August 26, 2002;
- The MAG 2007 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area was submitted to EPA by December 31, 2007. On September 9, 2010, EPA proposed to partially approve and partially disapprove the Five Percent Plan. On January 25, 2011, prior to any final EPA action, Arizona withdrew the Five Percent Plan from EPA consideration. On February 9, 2011, EPA published a notice of withdrawal of the May 30, 2008 adequacy finding on the PM-10 motor vehicle missions budget from the Five Percent Plan, effective January 31, 2011. On February 14, 2011, EPA made a finding that Arizona failed to submit the plan as required under the Clean Air Act, which triggered the sanctions clocks and obligation to impose a federal implementation plan if a new complete plan is not submitted. This EPA finding began an 18-month clock for

mandatory application of sanctions and a two-year clock for a Federal Implementation Plan. The EPA published a corrected notice of withdrawal on February 28, 2011; and

- The MAG Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area was submitted to EPA in March 2009.

The boundaries of the nonattainment and maintenance areas are identified below, followed by a summary of the attainment status for each pollutant for the Maricopa County region.

Nonattainment and Maintenance Boundaries

Nonattainment and maintenance areas in Maricopa County are shown in Figure A-1. The carbon monoxide maintenance boundary, encompasses 1,814 square miles (approximately 20 percent) of the county. This boundary was originally specified in 1974.

On March 9, 2005, EPA published a final rule redesignating portions of Maricopa County to attainment for carbon monoxide and also removed the Gila River Indian Community from the Maricopa County maintenance area, effective April 8, 2005 (EPA, 2005a).

Portions of the Maricopa County area, including the Gila River Indian Community, were designated nonattainment for one-hour ozone in September 1979. On June 14, 2005, EPA redesignated the area to attainment for one-hour ozone. The associated designations and classifications for the one-hour standard were revoked on June 15, 2005. On November 10, 2005, EPA published a direct final rule to correct the boundary of the Phoenix metropolitan one-hour ozone nonattainment area to exclude a portion of the Gila River Indian Community, effective January 9, 2006.

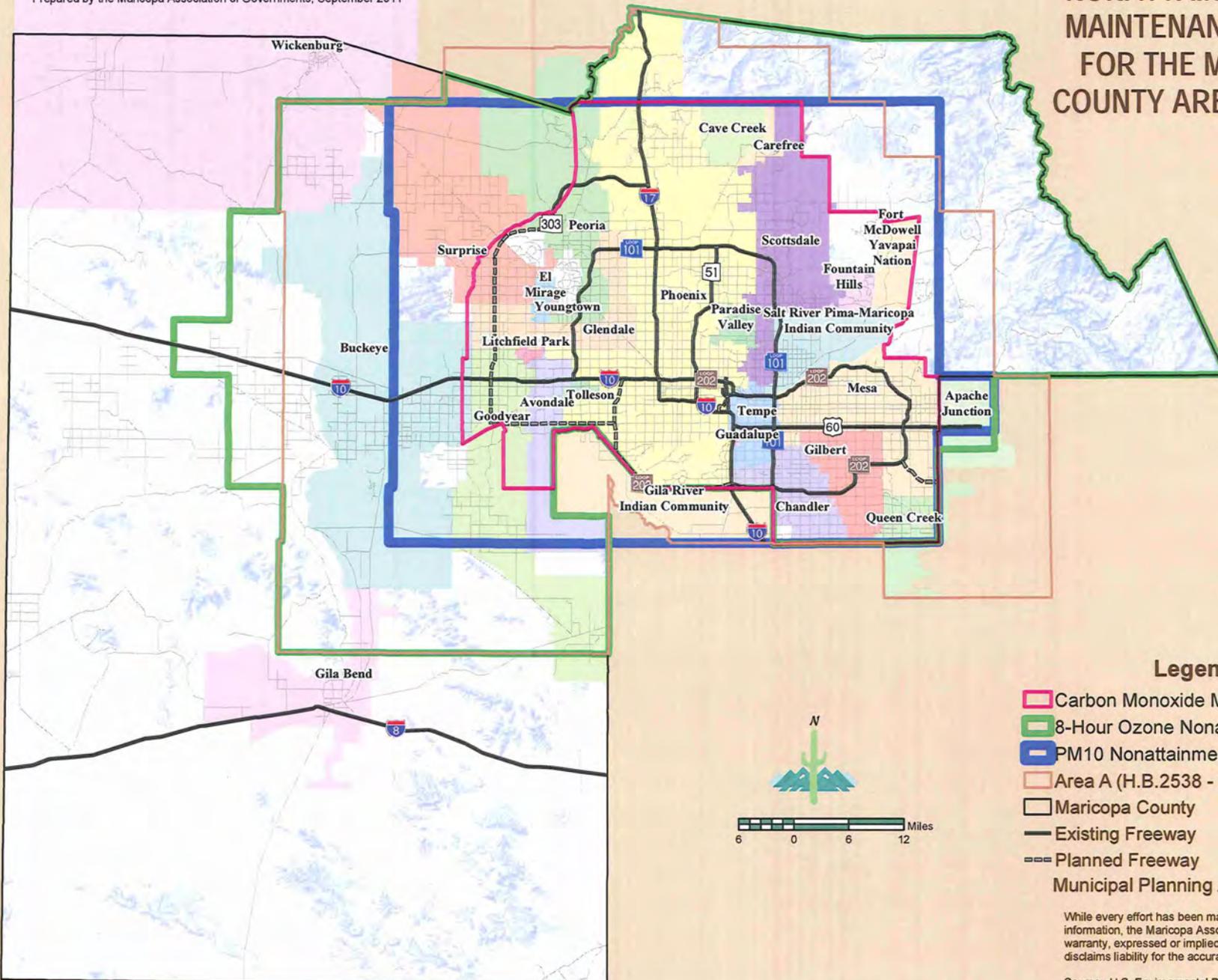
On April 15, 2004, EPA designated an eight-hour ozone nonattainment area located mainly in Maricopa County and Apache Junction in Pinal County. On April 30, 2004, EPA published the air quality designations and classifications for the eight-hour ozone standard that includes T1N, R8E and sections 1 through 12 of T1S, R8E in Pinal County (EPA, 2004b). As shown in Figure A-1, the eight-hour boundary excludes the Gila River Indian Community. The eight-hour ozone nonattainment area covers approximately 4,880 square miles.

Following promulgation of the PM-10 standard in 1987, EPA identified a larger PM-10 nonattainment area in 1990. The PM-10 nonattainment area encompasses 2,916 square miles, consisting of a 48 by 60 mile rectangular grid encompassing eastern Maricopa County, plus a six by six mile section that includes a portion of the City of Apache Junction in Pinal County.

Attainment Status

Following the requirements of the 1990 Clean Air Act Amendments, EPA initially classified the MAG region as a “Moderate” nonattainment area for the eight-hour CO standard, with a design value of 12.6 parts per million (ppm), exceeding the current NAAQS of 9.0 ppm. The standard was not

FIGURE A-1: AIR QUALITY NONATTAINMENT AND MAINTENANCE AREAS FOR THE MARICOPA COUNTY AREA, ARIZONA



Legend

- Carbon Monoxide Maintenance Area
 - 8-Hour Ozone Nonattainment Area
 - PM10 Nonattainment Area
 - Area A (H.B.2538 - 2001)
 - Maricopa County
 - Existing Freeway
 - Planned Freeway
- Municipal Planning Areas shaded

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, i:/projects/air_quality/maps/85x11/air_quality_bounds_with_AreaA_MPA.mxd

achieved by the Clean Air Act deadline of December 31, 1995. The area was reclassified to “Serious” by operation of law in July 1996, with an effective date of August 28, 1996 (EPA, 1996b). The new carbon monoxide attainment date was December 31, 2000. No violations of the carbon monoxide standard have occurred since 1996. The State, in a July 23, 1999 letter, requested a carbon monoxide attainment determination from the EPA.

In June 2003, the MAG Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area was submitted to EPA. The CO Maintenance Plan demonstrated that all Clean Air Act requirements had been met and requested that EPA redesignate the area to attainment for carbon monoxide. On September 22, 2003, EPA published a final attainment determination for the carbon monoxide standard (EPA, 2003). On March 9, 2005, EPA published the final rule in the *Federal Register* approving the Revised MAG 1999 Serious Area Carbon Monoxide Plan and the Carbon Monoxide Maintenance Plan and designating the carbon monoxide area to attainment, effective April 8, 2005 (EPA, 2005a).

Under the 1990 Clean Air Act Amendments, the Maricopa County nonattainment area was classified as “Moderate” for the one-hour ozone standard. The standard was not achieved by the deadline of November 19, 1996. On November 6, 1997, EPA reclassified the area to “Serious” for ozone (EPA, 1997b), effective February 13, 1998 (EPA, 1998). The new ozone attainment date was November 19, 1999. Prior to EPA’s revocation of the one-hour ozone standard in 2005, no violations of the standard had occurred since 1996. The State, in a February 21, 2000 letter, requested an ozone attainment determination. On May 30, 2001, the Environmental Protection Agency published a final attainment determination for the one-hour ozone standard (EPA, 2001a).

The MAG One-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area was submitted to EPA in May 2004. The MAG One-Hour Ozone Maintenance Plan demonstrated that all Clean Air Act requirements had been met and requested that EPA redesignate the area to attainment for one-hour ozone (MAG, 2004). On June 14, 2005, EPA published the final rule in the *Federal Register* approving the One-Hour Ozone Maintenance Plan and redesignating the one-hour ozone area to attainment (EPA, 2005b). EPA revoked the one-hour ozone standard on June 15, 2005.

On April 30, 2004, EPA published the final rule designating eight-hour ozone nonattainment areas, effective June 15, 2004. The eight-hour ozone nonattainment area in Maricopa and Pinal Counties is classified under Section D, Subpart 1, of the Clean Air Act referred to as “Basic” nonattainment, with an attainment date of June 15, 2009. The boundary of the eight-hour ozone nonattainment area is shown in Figure A-1. The MAG 2007 Eight-Hour Ozone Plan for the Maricopa Nonattainment Area was submitted to the EPA by June 15, 2007. The MAG Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area was submitted to EPA in March 2009.

Under Section 107(d)(4) of the 1990 Clean Air Act Amendments, the PM-10 nonattainment area was initially classified as “Moderate,” with an attainment deadline of December 31, 1994. The standard

was not achieved by this date. EPA reclassified the region to “Serious” in May 1996, with an effective date of June 10, 1996 (EPA, 1996a). The new attainment date for PM-10 was December 31, 2001 for Serious areas; however the Revised MAG 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area contained a request to extend the attainment date to December 31, 2006, as allowed in the Clean Air Act Amendments (MAG 2000a). In the July 25, 2002 *Federal Register*, the Environmental Protection Agency published the final approval of the Revised MAG 1999 Serious Area Particulate Plan for PM-10, including the request to extend the attainment date to December 31, 2006.

On May 25, 2007, EPA issued a final rule finding that the Maricopa County nonattainment area did not attain the PM-10 standard by December 31, 2006. In accordance with Section 189(d) of the Clean Air Act, MAG prepared a Five Percent Plan for PM-10 that was submitted to EPA by December 31, 2007 (MAG, 2007b). On September 9, 2010, EPA proposed to partially approve and partially disapprove the Five Percent Plan. On January 25, 2011, prior to any final EPA action, Arizona withdrew the Five Percent Plan from EPA consideration. On February 9, 2011, EPA published a notice of withdrawal of the May 30, 2008 adequacy finding on the PM-10 motor vehicle missions budget from the Five Percent Plan, effective January 31, 2011. On February 14, 2011, EPA made a finding that Arizona failed to submit the plan as required under the Clean Air Act, which triggered the sanctions clocks and obligation to impose a federal implementation plan if a new complete plan is not submitted. This EPA finding began an 18-month clock for mandatory application of sanctions and a two-year clock for a Federal Implementation Plan. The EPA published a corrected notice of withdrawal on February 28, 2011.

In addition, on July 18, 1997 EPA promulgated federal air quality standards for PM-2.5. On January 5, 2005, EPA published a notice designating the region as an attainment area for PM-2.5, effective April 5, 2005.

CONFORMITY TEST REQUIREMENTS

Specific conformity test requirements established for the carbon monoxide maintenance area and the eight-hour ozone and PM-10 nonattainment areas are summarized below. The Carbon Monoxide Redesignation Request and Maintenance Plan, submitted to EPA in June 2003, contained 2006 and 2015 emissions budgets for carbon monoxide. These carbon monoxide budgets were found to be adequate by EPA on September 29, 2003. On March 9, 2005, EPA published the final rule in the *Federal Register* approving the Carbon Monoxide Maintenance Plan, including the emissions budgets, effective April 8, 2005.

The MAG Eight-Hour Ozone Plan, submitted to EPA by June 15, 2007, contained 2008 conformity budgets for the ozone precursors, VOC and NOx. These emission budgets were found to be adequate by EPA, effective November 9, 2007.

The MAG Eight-Hour Ozone Redesignation Request and Maintenance Plan was submitted to EPA in March 2009. The maintenance plan established 2025 conformity budgets for VOC and NOx.

These budgets will be used, if EPA finds them to be adequate before the time that the 2012 MAG Conformity Analysis begins. In this case, the 2025 conformity budgets for ozone precursors will be utilized in addition to the 2008 budgets established by the MAG 2007 Eight-Hour Ozone Plan.

The MAG 2007 Five Percent Plan for PM-10 was submitted to EPA by December 31, 2007. This plan established a PM-10 conformity budget for the attainment year of 2010. The conformity budget was found to be adequate by EPA on July 1, 2008. On September 9, 2010, EPA proposed to partially approve and partially disapprove the Five Percent Plan. On January 25, 2011, prior to any final EPA action, Arizona withdrew the Five Percent Plan from EPA consideration. On February 9, 2011, EPA published a notice of withdrawal of the May 30, 2008 adequacy finding on the PM-10 motor vehicle emissions budget from the Five Percent Plan, effective January 31, 2011. On February 14, 2011, EPA made a finding that Arizona failed to submit the plan as required under the Clean Air Act, which triggered the sanctions clocks and obligation to impose a federal implementation plan if a new complete plan is not submitted. This EPA finding began an 18-month clock for mandatory application of sanctions and a two-year clock for a Federal Implementation Plan. The EPA published a corrected notice of withdrawal on February 28, 2011.

Until a new Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area is submitted to EPA and the motor vehicle emission budget in that Plan is found to be adequate or is approved by EPA, conformity determinations will be made using the motor vehicle emissions budget of 59.7 metric tons per day from the Revised MAG 1999 Serious Area Particulate Plan for PM-10, approved by EPA effective August 26, 2002.

The descriptions of the conformity tests that will be performed for carbon monoxide, eight-hour ozone, and PM-10, as part of the 2012 MAG Conformity Analysis, are detailed below.

Carbon Monoxide

The MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area was submitted to the EPA in July 1999 (MAG, 1999). The MAG 1999 Serious Area Carbon Monoxide Plan used the required EPA emissions model to assess the emission reduction measures required to demonstrate attainment and established a CO emissions budget of 411.6 metric tons per day for 2000 for the modeled area. The EPA issued a notice of adequacy effective December 14, 1999 in the *Federal Register* finding that the submitted CO motor vehicle emissions budget contained in the MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area was adequate for transportation conformity purposes (EPA, 1999a).

The Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area was submitted to the EPA in March 2001 (MAG, 2001a). The Revised Plan reflected the repeal of the Random Onroad Testing Requirements (Remote Sensing Program) from the Vehicle Emissions Inspection Program by the Arizona Legislature in 2000. The Revised Plan used the required EPA emissions model to assess the emission reduction measures required to demonstrate attainment and established a CO emissions budget of 412.2 metric tons per day for 2000

for the modeled area. The EPA issued a notice of adequacy in the *Federal Register* on October 17, 2001, finding that the submitted CO motor vehicle emissions budget contained in the Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area was adequate for transportation conformity purposes (EPA, 2001b). The new conformity budget for CO of 412.2 metric tons per day replaced the previous budget of 411.6 metric tons per day.

In June 2003, the Carbon Monoxide Redesignation Request and Maintenance Plan was submitted to EPA (MAG, 2003). The CO Maintenance Plan used the EPA-approved MOBILE6 emissions model to develop a 2006 emissions budget for carbon monoxide of 699.7 metric tons per day and a 2015 budget of 662.9 metric tons per day. EPA found the 2006 and 2015 budgets to be adequate for conformity purposes, effective October 14, 2003. The 2006 budget applies to horizon years from 2006 through 2014 and the 2015 budget, to horizon years after 2014. The regional emissions analysis projected for the TIP and RTP must be less than or equal to these budgets.

On September 22, 2003, EPA published a final attainment determination for the carbon monoxide standard (EPA, 2003). In addition, on March 9, 2005, EPA published the final rule in the *Federal Register* approving the Revised MAG 1999 Serious Area Carbon Monoxide Plan and the MAG Carbon Monoxide Redesignation Request and Maintenance Plan as part of the redesignation of Maricopa County to an attainment area for carbon monoxide, effective April 8, 2005 (EPA, 2005a).

Eight-Hour Ozone

This section discusses the conformity test requirements for the Maricopa nonattainment area for eight-hour ozone (EPA, 2010). Ozone is a secondary pollutant, generated by chemical reactions in the atmosphere involving volatile organic compounds (VOC) and nitrogen oxides (NOx). The Eight-Hour Ozone Plan for the Maricopa Nonattainment Area (MAG, 2007a) establishes conformity budgets for VOC and NOx in the modeled attainment year of 2008. The 2008 emissions budgets for the eight-hour ozone nonattainment area are 67.9 metric tons per day for VOC and 138.2 metric tons per day for NOx. EPA published a *Federal Register* notice finding these budgets to be adequate, effective November 9, 2007. The MAG Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area (MAG, 2009a) was submitted to EPA in March 2009. The Maintenance Plan establishes conformity budgets for VOC and NOx in the modeled maintenance year of 2025. The 2025 emissions budgets for the eight-hour ozone nonattainment area are 43.8 metric tons per day for VOC and 101.8 metric tons per day for NOx. If EPA publishes a *Federal Register* notice finding these new ozone precursor budgets to be adequate, prior to the time that the 2012 MAG Conformity Analysis begins, both the 2008 and 2025 budgets for VOC and NOx will be used.

PM-10

As required by Clean Air Act Section 189(d), the MAG 2007 Five Percent Plan for PM-10 was submitted to EPA by December 31, 2007. The Plan established a PM-10 emissions budget for

onroad mobile sources in the modeled attainment year of 2010. The 2010 conformity budget for PM-10 in the Plan is 103.3 metric tons per day for the PM-10 nonattainment area. EPA published a *Federal Register* notice finding the PM-10 budget to be adequate, effective July 1, 2008.

On September 9, 2010, EPA proposed to partially approve and partially disapprove the Five Percent Plan. On January 25, 2011, prior to any final EPA action, Arizona withdrew the Five Percent Plan from EPA consideration. On February 9, 2011, EPA published a notice of withdrawal of the May 30, 2008 adequacy finding on the PM-10 motor vehicle emissions budget from the Five Percent Plan, effective January 31, 2011. On February 28, 2011, EPA published a corrected notice of withdrawal.

Until a new Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area is submitted to EPA and the motor vehicle emission budget in that Plan is found to be adequate or is approved by EPA, conformity determinations will be made using the motor vehicle emissions budget of 59.7 metric tons per day from the Revised MAG 1999 Serious Area Particulate Plan for PM-10, approved by EPA effective August 26, 2002.

Section 93.122(e)(2) of the federal conformity rule requires that PM-10 from construction-related fugitive dust be included in the regional PM-10 emissions analysis, if it is identified as a contributor to the nonattainment problem in a PM-10 plan. The motor vehicle emissions budget established in the Revised MAG 1999 Serious Area PM-10 Plan includes vehicle exhaust, tire wear, brake wear, reentrained dust from travel on paved roads, travel on unpaved roads, and road construction. Therefore, emissions from road construction will be included in the PM-10 estimates developed for this conformity analysis.

ANALYSIS YEARS

In selecting analysis years, the conformity rule requires that: (1) if the attainment year is in the time frame of the transportation plan, it must be modeled; (2) the last year forecast in the transportation plan must be an analysis year; and (3) analysis years may not be more than ten years apart. For the 2012 MAG Conformity Analysis, onroad mobile source emissions of carbon monoxide (CO), volatile organic compounds (VOC), nitrogen oxides (NO_x), and PM-10 will be estimated for the analysis years 2010, 2015, 2025, and 2031.

The year 2010 will be modeled for CO, VOC, NO_x, and PM-10, because it is less than ten years from the most recent calibration year (2002) for the MAG transportation models. The year 2015 will be modeled for CO, because there is an EPA-approved emissions budget for the maintenance year of 2015 in the Carbon Monoxide Redesignation Request and Maintenance Plan (MAG, 2003). The year 2015 will also be modeled for VOC, NO_x, and PM-10, because it is an intermediate year that meets the federal conformity requirement that analysis years be no more than ten years apart. The year 2025 will be modeled for VOC and NO_x, because it is the maintenance year in the Eight-Hour Ozone Redesignation Request and Maintenance Plan (MAG, 2009a). The year 2025 will also be modeled for CO and PM-10, because it is an intermediate year that meets the federal conformity

requirement that analysis years be no more than ten years apart. The year 2031 will be modeled for all pollutants, since it is the last year of the Regional Transportation Plan.

II. 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, 2008c).

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 proposed for use in the 2012 MAG Conformity Analysis are summarized in Table A-3. The methodology and scheduled updates for the planning assumptions are discussed below.

The latest conformity regulations (EPA, 2008b) 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 is proposed that the “time that the conformity analysis begins” will be the day that the first traffic assignment (i.e., 2010, 2015, 2025, or 2031) has been submitted for travel demand modeling for the 2012 MAG Conformity Analysis. The latest planning assumptions and emissions models to be used are summarized in Table A-3.

TABLE A-3
LATEST PLANNING ASSUMPTIONS FOR MAG CONFORMITY DETERMINATIONS

<u>Assumption</u>	<u>Source</u>	<u>MAG Models</u>	<u>Next Scheduled Update</u>
Population and Employment	Under the Governor's Executive Order 95-2, official County projections were updated every 5 years after a census. These official projections were used by all agencies for planning purposes. Following the release of 2005 U.S. Census Survey data in June 2006, the Arizona Department of Economic Security (DES) prepared a new set of Maricopa County projections. MAG developed a set of employment projections for Maricopa County that were consistent with the DES population projections and also prepared subcounty population and employment projections. The MAG Regional Council approved the subcounty socioeconomic projections in May 2007.	DRAM/EMPAL SAM-IM	Under the Governor's Executive Order 2011-04, official county socioeconomic projections based on the 2010 U.S. Census will be developed by the Arizona Department of Administration (ADOA). It is anticipated that ADOA will complete the county level projections in 2012 and MAG will prepare subcounty socioeconomic projections for adoption by the MAG Regional Council within six months after receipt of the ADOA county level projections.
Traffic Counts	The highway models were validated in 2011 for the 2008 base year, using approximately 3,500 traffic counts collected in 2006-2010.	TransCAD	Region-wide traffic counts are typically collected by MAG every 2-4 years, if funds are available.
Vehicle Miles of Travel	The highway models were calibrated in 2006 using the 2001 home interview survey. The base year for the calibration was 2002. The transit models were re-calibrated in 2008-2009 based on data from the 2007 on-board bus survey. The MAG truck model and volume delay functions were recalibrated in 2008-2010 based on the 2007 Travel Time and Speed Study, 2007 Truck Survey and 2008 External Travel Survey.	TransCAD	The FY 2011 Unified Planning Work Program (UPWP) contained \$740,000 for the MAG model recalibration and update. MAG has collected new household travel data to supplement the 2008-2009 National Household Travel Survey and has also obtained 2010-2011 on-board transit survey data. This data will be used to recalibrate the transportation models in 2012-2013.
Speeds	The highway models were validated in 2010 and 2011 using data collected by the 2007 Travel Time and Speed Study.	TransCAD	Travel speed studies are conducted periodically to validate the transportation models. MAG has also purchased commercial speed data for future estimation and model calibration purposes.
Vehicle Registrations	July 2011 vehicle registrations were provided by ADOT.	MOBILE6.2	When newer data become available from ADOT in MOBILE6 format.
Implementation Measures	Latest implementation status of commitments in prior SIPs.	N/A	Updated for every conformity analysis.

POPULATION AND EMPLOYMENT

In accordance with the Arizona Governor's Executive Order 95-2, the population projections used for all State agency planning purposes were updated every five years after a decennial or mid-decennial census. Following the release of 2005 U.S. Census Survey data in June 2006, the Arizona Department of Economic Security (DES) prepared a new set of Maricopa County population projections. MAG allocated the DES projections for Maricopa County to TAZs using the DRAM/EMPAL and Subarea Allocation Model-Information Manager (SAM-IM) land use models. MAG has also used the DRAM/EMPAL and SAM-IM models to develop a set of employment projections for Maricopa County that are consistent with the DES population projections.

The travel and speed estimates produced by the MAG transportation models for the analysis years in the 2012 MAG Conformity Analysis will be based on the Maricopa County subcounty population and employment projections that are consistent with the 2005 U.S. Census Survey data. These subcounty socioeconomic projections were approved by the MAG Regional Council in May 2007.

Methodology

DES prepared the official Arizona population projections by county, using census data as the base. MAG used official DES population projections consistent with the 2005 U.S. Census Survey for Maricopa County. These population and employment projections for Maricopa County were distributed to smaller geographic areas by MAG using the latest available data and state-of-the-art land use models. The nationally-recognized DRAM/EMPAL model was used to allocate county projections of households and employment to regional analysis zones (RAZs) based upon the pre-existing location of these activities, land consumption, and transportation system accessibility. The allocation of population and employment from RAZs to one-acre grids was accomplished with a GIS-based model called SAM-IM which assesses the suitability of each grid for development based on measures such as adjacent land use, highway access, and proximity to other development.

Population and employment at the one-acre level is aggregated to TAZs using SAM-IM. The Maricopa County population and employment control totals were approved by the MAG Regional Council in December 2006. The subcounty socioeconomic projections developed with the DRAM/EMPAL and SAM-IM models were approved by the MAG Regional Council in May 2007.

Next Scheduled Update

In June 2011, the Arizona Department of Administration (ADOA) was designated as the State agency responsible for preparing official population estimates and projections for the State of Arizona. The next update of the TAZ socioeconomic projections will be based on the official Arizona Department of Administration county-level projections, required by Executive Order 2011-04. It is anticipated that ADOA will provide the next set of county level projections, based on the 2010 U.S. Census, to MAG in 2012 and the MAG will prepare the subcounty level projections for

approval by the MAG Regional Council within six months after receiving the county level projections from ADOA.

TRAFFIC COUNTS

The highway traffic volumes estimated by the MAG transportation models were validated in 2011 for the 2008 base year, using approximately 3,500 traffic counts collected in 2006-2010 by MAG and MAG member agencies. 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, 2008c).

Methodology

MAG uses TransCAD software to perform travel demand modeling. TransCAD provides a geographic information systems (GIS) interface that facilitates transportation modeling. The MAG transportation models follow a traditional four-step process: trip generation, trip distribution, mode choice, and traffic/transit assignment. Trip generation determines the number of person trips produced and attracted by traffic analysis zone. Trip distribution links the productions and attractions by TAZ. The nested logit mode choice model determines the number of person trips allocated to automobile and transit modes. 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 and trip distribution is utilized to achieve near-equilibrium highway speeds. The transportation models are documented in the MAG Travel Demand Model Documentation (MAG, 2011b).

Next Scheduled Update

Comprehensive traffic counts are typically collected by MAG every 2-4 years, if funding is available.

VEHICLE MILES OF TRAVEL

The MAG transportation models that estimate highway traffic were re-calibrated in 2006 based on a 2001 household travel survey. The base year for the model calibration was 2002. The models that estimate transit ridership were re-calibrated in 2008-2009, based on a 2007 on-board bus survey. The MAG truck model and volume delay functions were recalibrated in 2008-2010 based on the 2007 Travel Time and Speed Study, 2007 MAG Truck Survey, and 2008 External Travel 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. Vehicle miles of travel (VMT) by link, output by the highway assignment process, are input to the MAG M6Link model used to estimate onroad mobile source emissions for conformity analyses.

Transportation model estimates of vehicle volumes are validated using actual traffic counts. In early 2011, the MAG transportation models were validated against approximately 3,500 traffic counts collected in 2006-2010. Table A-4 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 2008 weekday traffic volumes and traffic count data collected in 2006-2010.

In previous MAG conformity analyses, transportation model estimates of VMT were reconciled with the VMT reported by the Highway Performance Monitoring System (HPMS) in order to comply with Section 93.122(b) of the Transportation Conformity Regulations (EPA, 2010). These 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.

TABLE A-4
AGGREGATED MODEL VALIDATION RESULTS
MODEL-ESTIMATED 2008 WEEKDAY VOLUMES VS. 2006-2010 TRAFFIC COUNTS

Area Type	Freeways and Arterials	
	R^2	% RMSE
CBD	0.978	20.9%
Outlying CBD	0.962	29.1%
Mixed Urban	0.940	33.9%
Suburban	0.917	38.3%
Rural	0.983	30.0%
All	0.954	32.8%

Since EPA approved the MAG Carbon Monoxide and One-Hour Ozone Redesignation Request and Maintenance Plans in 2005, the Maricopa area is no longer a Serious nonattainment area for carbon monoxide or one-hour ozone. In addition, the area is not currently classified as a serious, severe or extreme nonattainment area for the 1997 eight-hour ozone standard and has not violated this standard since 2005. In the future, if the Maricopa area is classified as serious, severe or extreme for a more stringent eight-hour ozone standard, the VMT estimated by the transportation models will be reconciled against HPMS VMT for the most recent model calibration year.

As indicated above, the requirements of Section 93.122(b) no longer apply to the Maricopa area and reconciliation of modeled VMT with HPMS is not required for the 2012 MAG Conformity Analysis. However, it is important to note that the most recent comparison of model-estimated and HPMS

VMT for the travel demand model calibration year of 2002 concluded that the model and HPMS VMT estimates for the PM-10 nonattainment area were nearly identical and factoring of the model outputs was not necessary (MAG, 2007c).

Next Scheduled Update

The MAG FY 2011 Unified Planning Work Program programmed \$740,000 for the MAG model recalibration and update. MAG has collected new household travel data (as an add-on to the 2008-2009 National Household Travel Survey) and obtained new 2010-2011 regional transit on-board survey data. MAG has also completed the 2008 External Travel Survey. The new travel survey data is being used for complete recalibration of the MAG regional travel demand forecasting model. The work is currently on-going and is scheduled to be completed in its entirety in 2013. Most of the major recalibration efforts are scheduled for completion in 2012.

SPEEDS

Speeds obtained from the capacity-restrained traffic assignments are “fed-back” in the travel demand modeling chain. The trip distribution, mode choice, and traffic assignment steps of the chain are executed until AM peak period trip tables and link volumes are in equilibrium (root mean square error of five percent or less). 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 to compare model-estimated speeds with empirical data. The FY 2007 MAG Unified Planning Work Program contained \$500,000 to conduct a Regional Travel Speed Study. Data from this 2007 speed study were used to update the speeds estimated by the MAG transportation models in 2010 and 2011, as discussed in the Methodology section below.

MAG has also purchased commercial speed data for future estimation and calibration efforts. The commercial data offers larger sample sizes at a substantially lower cost. The purchased data is currently being processed and will be applied in the upcoming scheduled model recalibration and validation efforts. The quality of this data was previously evaluated by MAG in collaboration with the Texas Transportation Institute. The data was determined to be suitable for analytical and modeling purposes. Results of the data evaluation were also presented at numerous national and regional professional forums (TRB, 2011).

Methodology

MAG used the 2007 Travel Speed Study and ADOT freeway detector data to improve the speed estimates produced by the transportation models. Comparisons of 2008 transportation model-estimated speeds with speeds obtained from the MAG 2007 Regional Travel Time and Speed Study (MAG, 2008) are illustrated in Figures A-2 through A-5. Estimated versus observed speeds by area type for the A.M. peak period (6 A.M. to 9 A.M.) are shown in Figures A-2 and A-3 for arterials and freeways, respectively. A similar comparison during the off-peak period (9 A.M. to 3 P.M.) is provided in Figures A-4 and A-5.

FIGURE A-2
ESTIMATED VS. OBSERVED A.M. PEAK SPEEDS ON ARTERIALS

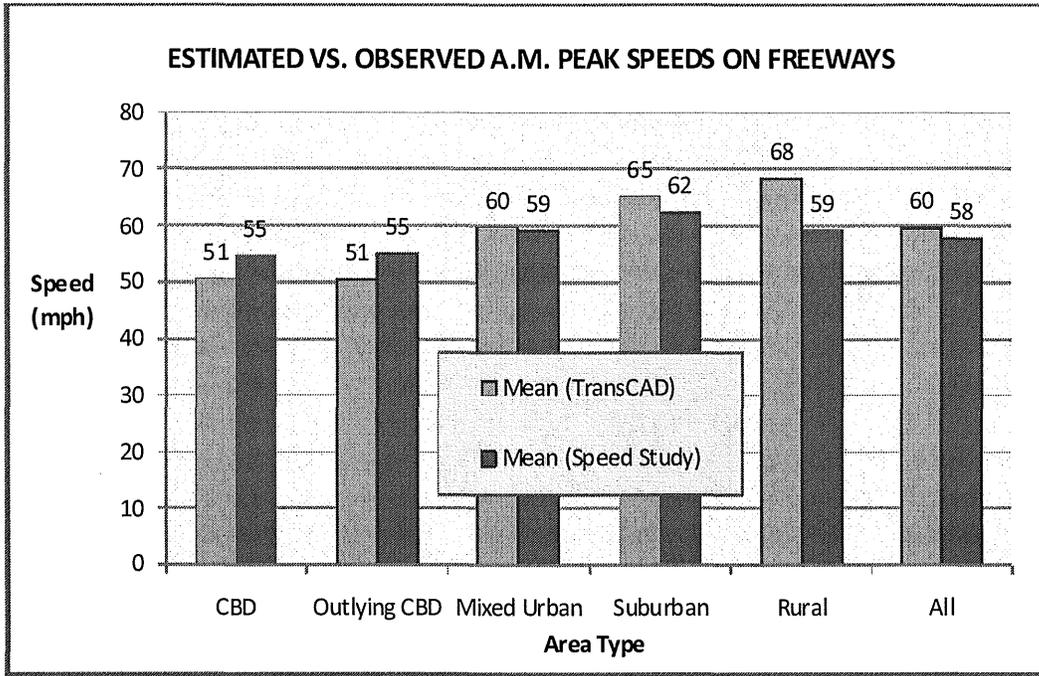


FIGURE A-3
ESTIMATED VS. OBSERVED A.M. PEAK SPEEDS ON FREEWAYS

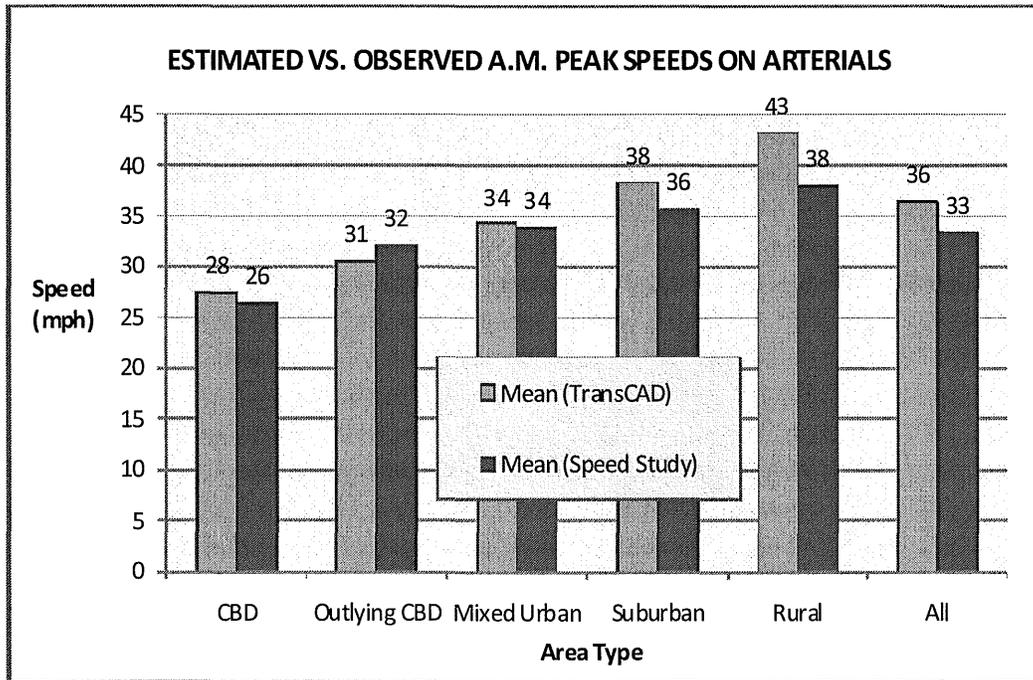


FIGURE A-4
ESTIMATED VS. OBSERVED OFF-PEAK SPEEDS ON ARTERIALS

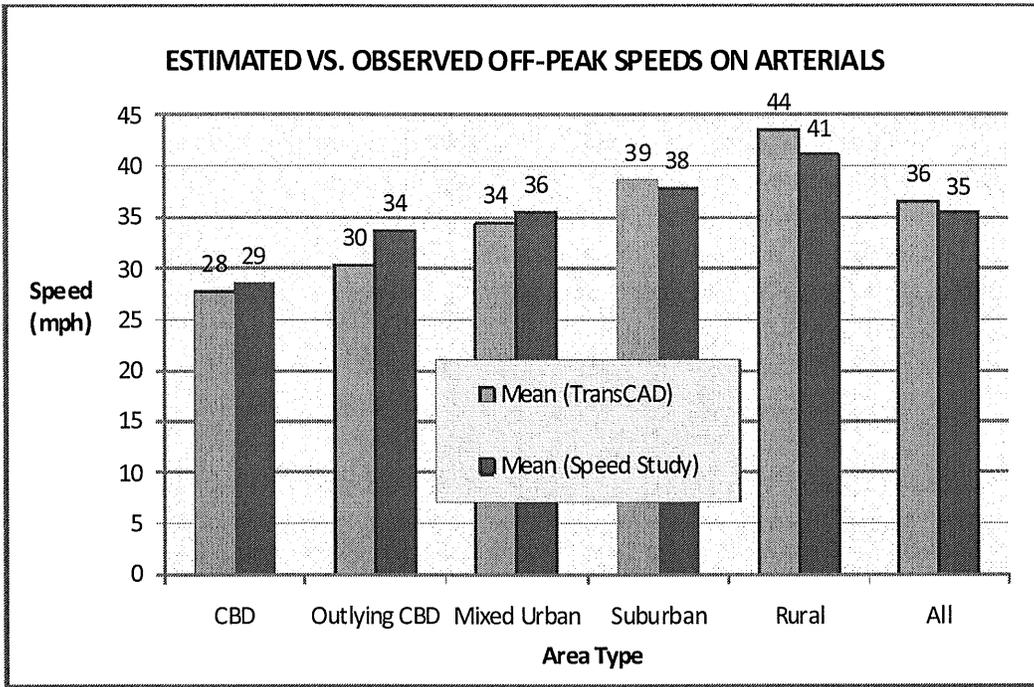
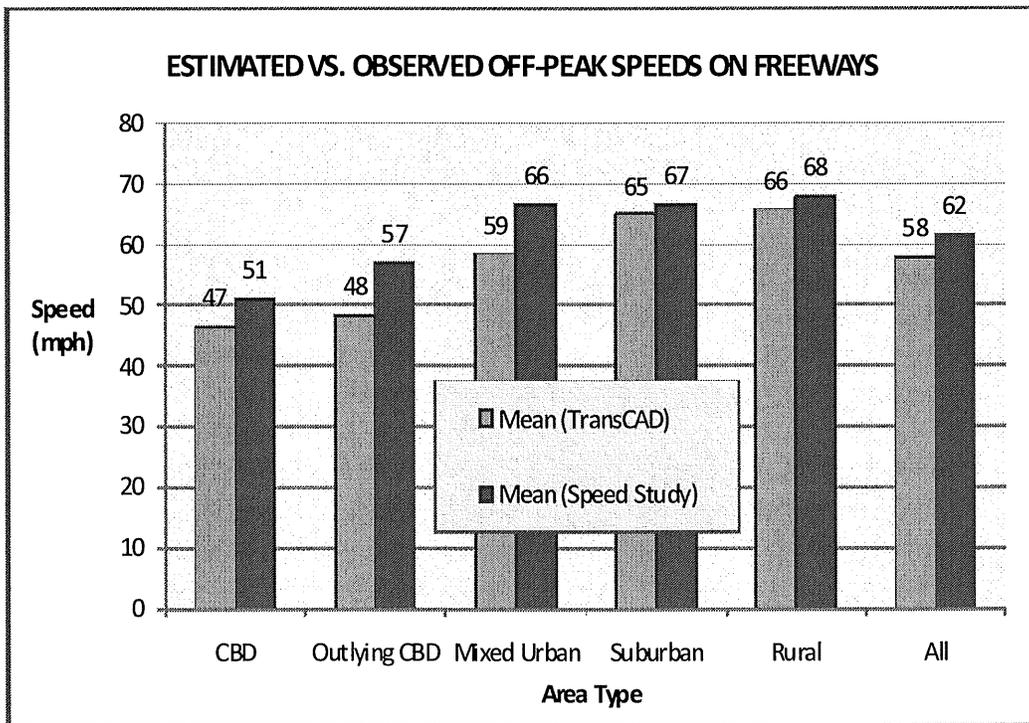


FIGURE A-5
ESTIMATED VS. OBSERVED OFF-PEAK SPEEDS ON FREEWAYS



In the transportation modeling area, the TransCAD-estimated speeds for arterials and freeways are within thirteen percent of the observed peak and off-peak speeds for all areas types, with the exception of freeways in the Outlying CBD during the off-peak period and rural freeways during the A.M. peak period, where the differences are less than 16 percent. It should be noted that these segments had a relatively low number of observations from the survey. The differences in speed by time period, functional class, and area type, shown in Figures A-2 through A-5, demonstrate that the model-estimated speeds are in reasonable agreement with observed arterial and freeway speeds during the peak and off-peak periods.

Next Scheduled Update

Typically, MAG conducts travel speed studies every five years, if funding is available. MAG has purchased private-sector speed data. The data is being processed and will be used in future model updates.

VEHICLE REGISTRATIONS

Vehicle registrations for July 2011 are the latest provided to MAG by the Motor Vehicle Division of the Arizona Department of Transportation (ADOT). In the 2012 MAG Conformity Analysis, the July 2011 registrations will be input to MOBILE6.2 to estimate VOC, NO_x, and PM-10 emissions. MOBILE6 will derive the registrations for estimating wintertime CO emissions from the July 2011 registrations. The vehicle registration data provided by ADOT has been converted to MOBILE6 format. MAG will use newer vehicle registration data when provided by ADOT in the format required by the MOBILE6 emissions model.

IMPLEMENTATION MEASURES

In the 2012 MAG Conformity Analysis, emission reduction credit will be assumed for the committed measures in the applicable SIPs, including the measures shown in Table A-5. The emission reductions assumed for these committed measures will reflect the latest implementation status of all measures for which emission reduction credits were assumed in the applicable SIPs.

Emission reduction credit will be applied for committed control measures and committed contingency measures contained in the applicable MAG air quality plans. Credit may also be taken for Congestion Mitigation and Air Quality Improvement (CMAQ) projects in the MAG Transportation Improvement Program, if credit for these measures was not quantified in the air quality plans. The equations, methods, and assumptions to be used in calculating emission reductions attributable to CMAQ projects are described in the Methodologies for Evaluating Congestion Mitigation and Air Quality Improvement Projects (MAG, 2011a). In addition, emission reduction credit for the strengthening of existing control measures or implementation of new control measures, specifically identified in the Transportation Improvement Program and Regional Transportation Plan, will be incorporated into the analysis, where appropriate.

Table A-5 does not include committed measures in the MAG 2007 Five Percent Plan for PM-10, because the Plan was withdrawn from EPA in January 2011. However, PM-10 reduction credit will be taken for projects completed between January 1, 2008 and September 30, 2011 that paved or

stabilized unpaved roads or alleys, paved unpaved shoulders, or reduced speed limits on unpaved roads or alleys.

The 2012 MAG Conformity Analysis will assume credit for arterials swept with PM-10 certified sweepers that were purchased with MAG Congestion Mitigation and Air Quality Improvement (CMAQ) funds by December 31, 2009. PM-10 emission reduction credit will also be taken for freeways, ramps, and frontage roads that are being swept with PM-10 certified units, in compliance with an ADOT contract executed in February 2010 and highways that have been re-paved with rubberized asphalt by ADOT.

In addition, uncontrolled road construction emissions for all analysis years will be reduced by a rule effectiveness rate of 94 percent, calculated by MCAQD, using actual 2010 construction site inspection data and a methodology developed in coordination with EPA Region IX staff. The assumptions to be used in calculating the benefit of measures that have been implemented to reduce paved and unpaved road emissions are described below.

TABLE A-5
COMMITTED MEASURES ASSUMED IN THE 2012 MAG CONFORMITY ANALYSIS

Measure #	Reference	Measure Description	Pollutant(s)
1	CO Maintenance Plan ¹	CARB Phase 2 with 3.5 Percent Oxygenate in Winter	CO
1	Eight-Hour Ozone Maintenance Plan ²	Summer Fuel Reformulation with 7 psi from May 1 through September 30	VOC, NOx
2 2	CO Maintenance Plan Eight-Hour Ozone Maintenance Plan	Phased-In Emission Test Cutpoints	CO, VOC, NOx
3 3	CO Maintenance Plan Eight-Hour Ozone Maintenance Plan	One-Time Waiver from Vehicle Emissions Test	CO, VOC, NOx
5 4C 16	CO Maintenance Plan Eight-Hour Ozone Maintenance Plan Serious Area PM-10 Plan ³	Coordinate Traffic Signal Systems	CO, VOC, NOx, PM-10
6 5C	CO Maintenance Plan Eight-Hour Ozone Maintenance Plan	Develop Intelligent Transportation Systems	CO, VOC, NOx
7 4	CO Maintenance Plan Eight-Hour Ozone Maintenance Plan	Tougher Enforcement of Vehicle Registration and Emission Test Compliance	CO, VOC, NOx
1C 6	CO Maintenance Plan Eight-Hour Ozone Maintenance Plan	Expansion of Area A Boundaries (HB 2538)	CO, VOC, NOx
2C 1C	CO Maintenance Plan Eight-Hour Ozone Maintenance Plan	Gross Polluter Option for I/M Program Waivers	CO, VOC, NOx
3C 2C	CO Maintenance Plan Eight-Hour Ozone Maintenance Plan	Increase Waiver Repair Limit Options	CO, VOC, NOx
3C	Eight-Hour Ozone Maintenance Plan	Federal Heavy Duty Diesel Vehicle Emissions Standards	VOC, NOx
6C	Eight-Hour Ozone Maintenance Plan	Liquid Leaker Test as Part of VEI Program	VOC, NOx

¹Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area, May 2003 (MAG, 2003).

²Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area, February 2009 (MAG, 2009a).

³Revised MAG 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area, February 2000 (MAG, 2000a).

Shoulder Paving Projects

In the conformity analysis year of 2010, credit for shoulder paving projects that were implemented in 2008-2010 will be applied to reduce PM-10 emissions from paved roads. For conformity analysis years after 2010, additional reduction credit for shoulder projects completed in 2011 will be applied to paved road emissions. The emission reductions (in grams per VMT) assumed for shoulder paving projects will be derived from the latest CMAQ Methodologies (MAG, 2011a).

PM-10 Certified Street Sweepers

A new ADOT contract, effective February 20, 2010, identifies the specific roads in the PM-10 nonattainment area that are being swept with PM-10 certified street sweepers and the required sweeping frequency. In the regional emissions analysis, the PM-10 reduction represents the benefit of sweeping the freeways, ramps and frontage roads identified in the ADOT contract. In 2010, the credit is reduced by 13.7 percent to reflect the contract start date of February 20, 2010. In future conformity analysis years, credit will be increased proportionally to the growth in VMT on the roads in the PM-10 nonattainment area that are being swept by the ADOT contractor.

In addition, 123 PM-10 certified street sweepers were purchased with MAG CMAQ funds by December 31, 2009. A sweeper inventory conducted by MAG for the period ending June 30, 2010 indicates that 19 of the 123 sweepers were no longer in service, as of December 31, 2009. Therefore, emission reduction credit for these 19 sweepers will be removed from the credit taken for the CMAQ sweepers in 2010. In conformity analysis years after 2010, the benefit of the CMAQ sweepers will be increased in direct proportion to the growth in VMT on arterials in the PM-10 nonattainment area.

Unpaved Road and Alley Projects

In the conformity analysis year of 2010, credit for paving, stabilization and lower speed limit projects completed in 2008-2010 will be applied to reduce PM-10 emissions from public unpaved roads and alleys. For conformity analysis years after 2010, additional reduction credit for paving projects completed in 2011 will be applied to public unpaved road and alley emissions.

In addition, the regional emissions analysis will take credit for paving and stabilization projects programmed in fiscal years 2010 through 2014 of the FY 2011-2015 MAG Transportation Improvement Program (TIP). These TIP projects are scheduled to be open to traffic between 2011 and 2015. Credit will be taken in 2015 and held constant in all subsequent conformity analysis years.

Chapter 9 of the Regional Transportation Plan 2010 Update (RTP) indicates that ten miles of unpaved roads will be paved each year. The 2012 MAG Conformity Analysis will assume that ten miles of public unpaved roads will be paved each year beginning in 2016 (the year after the TIP) and continuing until the inventory of public unpaved roads carrying 50 ADT or more (based on the 2009 MAG Unpaved Road Inventory) is depleted.

III. TRANSPORTATION MODELING

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 modeling area contains 1,995 traffic analysis zones and covers an area of approximately 6,500 square miles. The latest calibration of the highway models was completed in 2006, using data from the 2001 household travel survey. The base year for the calibration was 2002. The latest validation of the highway models was completed in 2011, using approximately 3,500 traffic counts collected in 2006-2010. The transit models were re-calibrated in 2008-2009 based on data from the 2007 on-board bus survey. The MAG truck model and volume delay functions were recalibrated in 2008-2010 based on the 2007 Travel Time and Speed Study, 2007 Truck Survey and 2008 External Travel Survey.

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

- The traffic volumes simulated by the MAG transportation models were validated in 2011 against approximately 3,500 traffic counts collected in 2006-2010. This validation demonstrated a good statistical fit between actual and model-estimated daily traffic volumes, as measured by an overall percent root mean square error of 32.8 percent. The transportation models are documented in the latest MAG Travel Demand Model Documentation (MAG, 2011b).
- The population, households, and employment inputs to the travel demand models are based on DES population projections consistent with the 2005 U.S. Census Survey. Official Maricopa County socioeconomic projections based on DES county projections were approved by the MAG Regional Council in May 2007. These projections were prepared using the DRAM/EMPAL land use model and the MAG Subarea Allocation Model-Information Manager (SAM-IM).
- The population and employment projections to be 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 DRAM/EMPAL model distributes County-level projections of households and employment to regional analysis zones (RAZs) based upon the pre-existing location of these activities, land use consumption rates, and transportation system accessibility, expressed in terms of PM peak travel times. These congested travel times are derived from an appropriate capacity-restrained traffic assignment for each forecast year. The allocation of population, households and employment from RAZs to one-acre grid cells is accomplished with SAM-IM. SAM-IM uses transportation system accessibility measures, such as proximity to the closest highway, in determining the likelihood that a one-acre grid will develop during a given forecast interval. SAM also aggregates population, households, and employment projections by one-acre grid 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, midday, PM peak period, and nighttime, with volumes and congestion estimated for each period. A peak spreading model is used to derive AM and PM peak hour traffic volumes.
- Speeds obtained from the capacity-restrained traffic assignments are “fed-back” in the travel demand modeling chain. The trip distribution, mode choice, and traffic assignment steps of the chain are executed until AM peak period trip tables and link volumes are in equilibrium (root mean square error of five percent or less). The travel impedances used in the mode choice model include travel times and costs associated with each of the following modes: auto-drivers, carpools (2 and 3+ persons), and transit (e.g., shuttle bus, local bus, express bus, light rail, commuter rail).
- The travel impedances used in the trip distribution and traffic assignment steps of the MAG travel demand modeling are a composite function of highway travel times and costs. The nested logit mode choice 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. Data from the MAG 2007 Regional Travel Time and Speed Study (MAG, 2008) were used to ensure that the capacity-restrained speeds and delays output by the transportation models are consistent with empirical data. Figures A-2 through A-5 provide a comparison of observed and model-estimated speeds for the peak and off-peak periods. For both freeways and arterials, the TransCAD-estimated speeds are within sixteen percent of the observed speeds for all area types and the difference in overall speeds is four miles per hour or less. This indicates the capacity-restrained speeds produced by the transportation models are in reasonable agreement with the most recently-collected empirical data.

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 this region). The 2012 MAG Conformity Analysis will be based on socioeconomic projections that were approved by the MAG Regional Council in May 2007.

In accordance with the Arizona Governor’s Executive Order 95-2, the population projections used for all State agency planning purposes were updated by the Arizona Department of Economic Security (DES) consistent with the 2005 U.S. Census Survey for Maricopa County. MAG then prepared socioeconomic projections by traffic analysis zone (TAZ), based on the DES county-level population projections. MAG allocated the projections for Maricopa County to TAZs using the DRAM/EMPAL and Subarea Allocation Model - Information Manager (SAM-IM) land use models. Official Maricopa County socioeconomic projections based on DES county projections were approved by the MAG Regional Council in May 2007.

The TAZ population, households and employment projections take into account the transportation improvements contained in the conforming TIP (FY 2007-2011) and RTP (2006 Update) in effect at the time the projections were approved. For the 2012 MAG Conformity Analysis, the projections of population, households, and employment by TAZ will be input to the MAG transportation models to estimate auto and transit trips, VMT, and speeds for each analysis year.

TRANSPORTATION NETWORK ASSUMPTIONS

This section describes the development of the highway and transit networks that will be used to perform the 2012 MAG Conformity Analysis for a major amendment to the FY 2011-2015 Transportation Improvement Program and Regional Transportation Plan 2010 Update. Criteria for identification of “qualifying” projects are defined below. The choice of analysis years is reviewed in Section I, *Proposed Methodology for the 2012 MAG Conformity Analysis*.

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

Traffic on collectors and local streets not explicitly coded on the highway network will be 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 will also include travel occurring on public and private unpaved roads.

Highway Networks. The 2010 base network will include all qualifying facilities, including freeways, which will be open to traffic by December 31, 2010. The 2015 network will assume implementation of all qualifying highway projects scheduled in the FY 2011-2015 MAG Transportation Improvement Program (TIP). The 2025 network will assume implementation of all projects in the Regional Transportation Plan 2010 Update (RTP) through the year 2025, as well as all qualifying highway projects in the TIP. The 2031 network will assume implementation of all projects in the RTP, as well as all qualifying projects in the TIP. It is important to note that regionally significant projects in the Apache Junction portion of Pinal County are included in the MAG TIP.

Coding Conventions. Specific coding conventions or criteria will be applied to determine whether a project qualifies for highway network coding. This will result in coding of all arterial streets and some collectors. The coding conventions will be:

- (1) Capacity-related projects on existing links or extensions of existing links on the base highway network will be coded in future networks. This will include 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 will be 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 will be considered for inclusion on a case-by-case basis. The key factors to be considered in making this assessment will 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. Transit networks will be input to the mode choice step of the MAG transportation models to determine the number of person trips made by transit, which in turn, removes vehicle trips from the highways. For all analysis years, the bus and rail networks will reflect the latest transit planning information available at the time the conformity analysis begins.

EMISSIONS MODEL INPUT

The MAG transportation models and the highway and transit networks described above will be utilized to estimate daily vehicle travel and transit ridership in the MAG transportation modeling area. The primary input to the air quality modeling process will be transportation model estimates of vehicle traffic and speeds for four time periods (AM peak, midday, PM peak, and nighttime) on each highway link, along with the attendant link lengths and coordinate data. A detailed description of the MAG emission models is provided below in Section IV, *Air Quality Modeling*.

IV. AIR QUALITY MODELING

The models that will be used to estimate emissions for the 2012 MAG Conformity Analysis will be: (1) the latest version of MOBILE6.2, to derive motor vehicle emission factors for CO, VOC, NOx, and PM-10, and (2) M6Link, to apply MOBILE6.2 emission factors to vehicle miles of travel output by the MAG transportation models, allocate the emissions temporally (by hour) and geographically (to the appropriate nonattainment or maintenance area), and add paved and unpaved road PM-10 emissions based on the latest AP-42 equations.

A brief description of the emission models is provided below, along with a summary of the principal input and output data. For the 2012 MAG Conformity Analysis, model inputs not dependent on the TIP or RTP are generally derived from the Carbon Monoxide Maintenance Plan (MAG, 2003) for CO; the Eight-Hour Ozone Redesignation Request and Maintenance Plan (MAG, 2009a) for VOC and NOx; and the Revised MAG 1999 Serious Area Plan (MAG, 2001) for PM-10.

MOBILE6

Description. MOBILE6 is a model developed by EPA for the purpose of estimating motor vehicle emission factors, in units of grams per mile, for specified vehicle fleet, fuel, temperature, and speed conditions. This model estimates carbon monoxide, ozone precursor, and PM-10 (exhaust, tire wear and brake wear) motor vehicle emission factors.

On January 18, 2002, EPA issued policy guidance on the use of MOBILE6 for transportation conformity, indicating that there would be a two-year grace period before MOBILE6 would be required for new conformity determinations (EPA, 2002a). In the January 29, 2002 *Federal Register*, EPA announced the release of MOBILE6, which triggered the start of a grace period that ended on January 29, 2004. On May 19, 2004, EPA issued a *Federal Register* notice recommending the use

of MOBILE6.2 in SIPs and conformity determinations (EPA, 2004c). On March 2, 2010, EPA issued a *Federal Register* notice approving the new Motor Vehicle Emissions Simulator (MOVES2010) model and initiating a two-year grace period after which MOVES2010 is required to be used for transportation conformity. Conformity analyses that begin after March 2, 2012 are required to use MOVES2010 for new transportation plan and TIP conformity determinations and regional emissions analyses. EPA will allow MOBILE6.2 to be used for conformity analyses that begin during the MOVES grace period. Since the 2012 MAG Conformity Analysis will begin in October 2011, MOBILE6.2 may be used to estimate motor vehicle emission factors.

Inputs. There are a variety of inputs to MOBILE6.2. The use of a locally-derived motor vehicle registration distribution (by model year) of 25 years is recommended. For the conformity analysis, July 2011 vehicle registration data obtained from ADOT will be used as input to MOBILE6.2 for VOC, NO_x, and PM-10. MOBILE6.2 will derive the January data to be used in obtaining wintertime emissions rates for CO from the July 2011 vehicle registration data. The July 2011 data represents the most recent vehicle registrations that have been transmitted to MAG by ADOT.

In addition, each modeled scenario may require several runs to reflect an I/M program and no I/M program. The results from these runs are weighted to reflect the fraction of vehicles participating in the I/M program. Fuel parameters, which include fuel volatility and the use of oxygenated fuels (market share and oxygen content), are also input. The model is executed with hourly domain temperatures and an array of speeds by link as estimated by the transportation model. The detailed temperatures and speed data are more accurate than average values, since the relationship between emission factors and temperature/speed is not linear.

Output. The output from the MOBILE6 model includes emission factors by hour, roadway facility type, pollutant, and area type. These emission factors will be utilized by the M6Link program in estimating motor vehicle emissions for the MAG region. The emission factors for the 2012 MAG Conformity Analysis will be calculated for the pollutants: CO, VOC, NO_x, and PM-10.

AP-42

Description. PM-10 emission factors for reentrained dust for unpaved and paved roads will be 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.

Inputs. The AP-42 equation that calculates PM-10 emission factors for unpaved road fugitive dust requires as input: the road surface material silt content (11.9%), soil moisture content (0.5%), fleet average vehicle weight (3 tons), and mean vehicle speed (25 mph for public unpaved roads and 15 mph for alleys). These inputs to the AP-42 equations for unpaved roads are consistent with those used in the Revised 2008 Periodic Emission Inventory for PM-10 (MCAQD, 2011). The mean speed for vehicles traveling on private unpaved roads will be derived from the MAG Inventory of Private Unpaved Roads completed in September 2011.

The AP-42 equation that calculates PM-10 emission factors for reentrained paved road dust requires as input: the road surface silt loading, the fleet average vehicle weight, and the number of days with at least 0.01 inch of precipitation. The silt loadings were derived from the Revised MAG 1999 Serious Area PM-10 Plan and represent three classes of paved roads: freeways, with a silt loading of 0.02 grams per square meter; high traffic arterials (i.e., non-freeways carrying 10,000 vehicles or more per average weekday), with a silt loading of 0.067 grams per square meter; and low traffic arterials (i.e., non-freeways carrying less than 10,000 vehicles per average weekday), with a silt loading of 0.23 grams per square meter (MAG, 2001).

Since the silt loadings are stratified by road type, vehicle weights are also estimated separately for freeways and arterials. The average vehicle weights of 3.91 tons for freeways and 2.72 tons for arterials were developed using 2011 vehicle registrations, 2011 VMT estimates for trucks and all vehicle types on freeways and arterials in the PM-10 nonattainment area, and an average vehicle weight of 3.18 tons for all road types. In 2008 (a leap year with 366 days), there were 39 days on which precipitation was at least 0.01 inch.

The silt loadings and other input assumptions to the AP-42 equations for estimating paved road fugitive dust emissions are consistent with the Revised 2008 Periodic Emissions Inventory (MCAQD, 2011), with one exception: the average vehicle weight for all road types has been increased from 3.0 to 3.18 tons, where 3.18 is the default value provided by the EPA Emissions Inventory Improvement Program (<http://www.epa.gov/ttn/chief/eiip/techreportlvolum09/pavrd3.pdf>).

Output. The AP-42 equations for unpaved and paved roads estimate PM-10 emission factors in grams per vehicle mile of travel (VMT). Based on the input assumptions discussed above, the PM-10 emission rates obtained from the AP-42 equation for unpaved roads are 660.16 grams per VMT for public unpaved roads and 417.45 grams per VMT for unpaved alleys. The emission rate for private unpaved roads will be calculated on the basis of the average speed derived from the MAG Private Unpaved Road Inventory completed in September 2011. The PM-10 emission rates obtained from the new AP-42 equation for paved roads are 0.71 grams per VMT for low volume arterials, 0.23 grams per VMT for high volume arterials, and 0.11 grams per VMT for freeways. These PM-10 emission factors are input to M6Link to calculate fugitive dust PM-10 emissions on unpaved and paved roads.

M6Link

The M6Link system processes emissions for all pollutants in the conformity analysis. M6Link multiplies emission factors by the traffic volumes and the length of each link to produce motor vehicle emissions for each pollutant and PM-10 emissions from unpaved and paved roads.

Unpaved Roads. M6Link multiplies the AP-42 emission factors for unpaved roads by the total VMT on public and private unpaved roads and alleys in the PM-10 nonattainment area. The miles of public and private unpaved roads are derived from the 2009 MAG Unpaved Road Inventory (URI) (MAG, 2010a). According to the URI, there were 613.4 miles of public unpaved road and 1,270.6 miles of private unpaved roads in the PM-10 nonattainment area in 2009. MAG utilized traffic counts on unpaved roads, supplemented by Geographic Information Systems (GIS) image recognition

techniques, to estimate the daily vehicle miles of travel (VMT) on public and private unpaved roads in 2009.

In February 2011, MAG conducted additional traffic counts on a random sample of unpaved roads and alleys in the PM-10 nonattainment area. MAG also conducted a comprehensive inventory of private unpaved roads in the PM-10 nonattainment area that was completed in September 2011. Data from these 2011 studies is being analyzed and the results will be applied to calculate the PM-10 emissions from unpaved public and private roads and alleys for the 2012 MAG Conformity Analysis.

Using GIS, MAG has determined the historical rate at which new private unpaved roads have been created due to lot splits is 1.46 percent per year. Due to the economic recession's deleterious impact on construction, the 2012 MAG Conformity Analysis will assume no growth in private unpaved road VMT between 2009 and 2012. After 2012, it will be assumed that the recession has ended and VMT on private unpaved roads will be increased by 1.46 percent per year.

MAG also used GIS to estimate that there were 650 miles of unpaved alleys in the PM-10 nonattainment area in 2009. The VMT on unpaved alleys is obtained by multiplying the miles of unpaved alleys by the annual average daily traffic (AADT). The AADT for unpaved alleys, obtained from 2011 traffic counts, is four vehicles per day. The VMT on unpaved alleys is held constant for all conformity analysis years.

The VMT on public unpaved roads will also be held constant for all conformity analysis years. The PM-10 emissions produced by public unpaved roads with 150 ADT or more will be reduced by 50 percent to reflect the Maricopa County Rule 310.01 requirement that these roads needed to be paved or stabilized by June 10, 2004. It is assumed that these high volume dirt roads are being stabilized with dust suppressants that have a control efficiency of 50 percent.

Paved Roads. M6Link multiplies the AP-42 emission factors for paved roads by the VMT for freeways, high traffic arterials, and low traffic arterials to obtain total paved road emissions. The VMTs for freeways and high and low traffic arterials are derived from the MAG TransCAD transportation models. All centroid connectors are considered to be low traffic arterials.

To account for the economic recession since 2008, paved road emissions for the conformity analysis year of 2010 will be projected from 2008 using the baseline population projections for the Phoenix/Mesa Metro Area published by Marshall Vest of the University of Arizona, Economic and Business Research Center during the third quarter of 2011. Vest's population projections will also be used to increase emissions between 2010 and 2012; after 2012, it will be assumed that the recession ends. For the conformity analysis years after 2012, paved road emissions will be increased on the basis of growth in VMT in the PM-10 nonattainment area, as estimated by the MAG transportation models, using the population projections adopted by the MAG Regional Council in May 2007.

Onroad Vehicles. M6Link processes link data files output by the MAG transportation model, TransCAD. The program calculates emissions for roadway links in the MAG highway networks. Traffic volumes for four time periods (AM peak, midday, PM peak, and nighttime) for each link are

converted into hourly volumes based upon local survey data (MAG, 2000b). Hourly emission factors are developed by running MOBILE6.2 for each facility type, area type, and vehicle class using link speeds by time of day. Emissions for each hour are distributed geographically in the modeling domain based on the grid in which each link is located.

The transportation models are designed to model average weekday traffic patterns, which typically do not represent conditions on the specific episode day used to demonstrate attainment or maintenance and establish the conformity budget. As a result, M6Link applies day of the week and month of the year conversion factors that are consistent with the CO Maintenance Plan for CO and the Eight-Hour Ozone Redesignation Request and Maintenance Plan for VOC and NOx. PM-10 emissions are assumed to represent an annual average day.

Inputs. The transportation model input to M6Link consists of database formatted files that contain link-specific data and a node coordinate definitions file. M6Link also requires as input:

- Fugitive dust emission factors (output by the AP-42 equations) and unpaved road VMT.
- 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 MOBILE6.2 model).
- The ratio of vehicles participating in the I/M program.
- The year being modeled.

Outputs. The outputs from M6Link include an hourly, gridded onroad mobile source emissions file and several summary files containing emissions and traffic data in the modeling domain. The summary files include estimates of fugitive dust emissions on paved and unpaved roads in the PM-10 nonattainment area.

CALCULATION OF PM-10 EMISSIONS FROM ROAD CONSTRUCTION

As required by Section 93.122(e) of the federal transportation conformity rule, PM-10 emissions from road construction will be estimated for each conformity analysis year. Road construction emissions will be based on the Revised 2008 Periodic Emission Inventory for PM-10 (MCAQD, 2011). The 2008 road construction emissions will be projected to 2010, 2015, 2025 and 2031 using the baseline construction employment projections for the Phoenix/Mesa Metro Area published by Marshall Vest of the University of Arizona, Economic and Business Research Center, during the third quarter of 2011.

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ATTACHMENT B

DRAFT

PROCESS FOR ENSURING TIMELY IMPLEMENTATION OF TRANSPORTATION CONTROL MEASURES

Section 93.105(c)(1)(iv) of the federal conformity rule requires a consultation process to be established for making a determination of whether past obstacles to implementation of transportation control measures which are behind the schedule established in the applicable air quality plan have been identified and are being overcome. A determination also is required as to whether State and local agencies with influence over approvals or funding for transportation control measures (TCMs) are giving maximum priority to approval or funding for TCMs. In addition, the process is required to consider whether delays in transportation control measure implementation necessitate revisions to the air quality plan to remove or substitute TCMs or other emission reduction measures.

In February 1996, the MAG Regional Council adopted conformity consultation processes (MAG 1996b) in response to federal and state requirements. The following text from the process M-6 directly addresses the requirement for consultation on the timely implementation of TCMs:

“A consultation process is required for the determination of whether past obstacles to implementation of transportation control measures which are behind schedule have been identified and are being overcome. Also, a determination is required whether State and local agencies with influence over approvals or funding for TCMs are giving maximum priority to approval or funding of TCMs. These determinations are part of the criteria for TIP conformity determinations, specified in the federal conformity regulation 40 CFR 51.418(c)(2) (*now 93.113(c)(2)*).”

For the 2012 MAG Conformity Analysis, the anticipated approach will be to conduct a review of projects and funds allocated in the TIP which implement adopted pollution control measures. This will be used together with any TCM implementation annual reports described above that are available, as the basis for assessing whether or not implementing agencies are giving maximum priority to approval or funding of transportation control measures.

The TCM findings required under federal conformity regulations will be incorporated as part of the 2012 MAG Conformity Analysis, which will be made available for interagency and public review, including a public hearing, prior to a Finding of Conformity by the MAG Regional Council.

ATTACHMENT C

DRAFT

TYPES OF PROJECTS CONSIDERED EXEMPT FROM CONFORMITY REQUIREMENTS

Under U.S. Environmental Protection Agency regulations, a conformity determination is required before a regionally significant road or transit project (regardless of funding source) can be approved by any agency which is a recipient of federal road or transit funds. As part of this conformity determination, regional emissions analyses are required. However, the regulations also identify various types of projects which are exempted from the analytical requirements due to their presumed negligible air quality impacts. Interagency consultation is required to determine whether any of these normally exempted projects “should be treated as nonexempt in cases where potential adverse emissions impacts may exist for any reason.”

In February 1996, the MAG Regional Council adopted conformity consultation processes (MAG, 1996b) in response to federal and state requirements. The following text from the process M-5 directly addresses the requirement for consultation on exempt projects:

“...the Metropolitan Planning Organization (i.e. MAG, for this region) shall initiate consultation for evaluating whether projects listed as exempt from conformity in the conformity regulation should be treated as nonexempt projects where potential adverse emission impacts may exist for any reason. In this consultation process, MAG provides for the participation of the transportation and air quality agencies, as well as the public.”

MAG consults on the designation of exempt status for a specific project proposal at the time the project in question is proposed for addition to the TIP and RTP. This consultation process is described in MAG process M-8.

For the 2012 MAG Conformity Analysis, the anticipated approach includes the exempt projects which are contained in the EPA conformity regulations, as listed in the three tables which follow. Table C-1 identifies the specific types of projects which require no conformity determination of any kind, by any agency. These project types include specific actions involving safety, mass transit, air quality, and other actions likely to have no adverse air quality impacts. Table C-2 lists projects for which a regional emissions analysis is not required. These projects are, however, not exempt from other conformity requirements. In addition, Table C-3 lists traffic signal synchronization projects which are exempt from conformity determinations prior to being funded, approved, or implemented.

TABLE C-1.
PROJECTS NORMALLY EXEMPT FROM CONFORMITY DETERMINATIONS
(From 40 CFR 93.126)

Safety

Railroad/highway crossing.
Projects that correct, improve, or eliminate a hazardous location or feature.
Safer non-Federal-aid system roads.
Shoulder improvements.
Increasing sight distance.
Highway Safety Improvement Program implementation.
Traffic control devices and operating assistance other than signalization projects.
Railroad/highway crossing warning devices.
Guardrails, median barriers, crash cushions.
Pavement resurfacing and/or rehabilitation.
Pavement marking.
Emergency relief (23 U.S.C. 125).
Fencing.
Skid treatments.
Safety roadside rest areas.
Adding medians.
Truck climbing lanes outside the urbanized area.
Lighting improvements.
Widening narrow pavements or reconstructing bridges (no additional travel lanes).
Emergency truck pullovers.

Mass Transit

Operating assistance to transit agencies.
Purchase of support vehicles.
*Rehabilitation of transit vehicles.
Purchase of office, shop, and operating equipment for existing facilities.
Purchase of operating equipment for vehicles (e.g., radios, fareboxes, lifts, etc.).
Construction or renovation of power, signal, and communications systems.
Construction of small passenger shelters and information kiosks.
Reconstruction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals, and ancillary structures).
Rehabilitation or reconstruction of track structures, track, and trackbed in existing rights-of-way.

*Purchase of new buses and rail cars to replace existing vehicles or for minor expansions of the fleet.
Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR part 771.

TABLE C-1. (continued)
PROJECTS NORMALLY EXEMPT FROM CONFORMITY DETERMINATIONS
(From 40 CFR 93.126)

Air Quality

Continuation of ride-sharing and van-pooling promotion activities at current levels.
Bicycle and pedestrian facilities.

Other

Specific activities which do not involve or lead directly to construction, such as:

Planning and technical studies.

Grants for training and research programs.

Planning activities conducted pursuant to titles 23 and 49 U.S.C.

Federal-aid systems revisions.

Engineering to assess social, economic, and environmental effects of the proposed action or alternatives to that action.

Noise attenuation.

Emergency or hardship advance land acquisitions (23 CFR 710.503).

Acquisition of scenic easements.

Plantings, landscaping, etc.

Sign removal.

Directional and informational signs.

Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures, or facilities).

Repair of damage caused by natural disasters, civil unrest, or terrorist acts, except projects involving substantial functional, locational or capacity changes.

* In PM-10 nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.

TABLE C-2.
PROJECTS NORMALLY EXEMPT FROM REGIONAL EMISSIONS ANALYSIS, BUT NOT
FROM OTHER CONFORMITY REQUIREMENTS
(From 40 CFR 93.127)

Intersection channelization projects.
Intersection signalization projects at individual intersections.
Interchange reconfiguration projects.
Changes in vertical and horizontal alignment.
Truck size and weight inspection stations.
Bus terminals and transfer points.

TABLE C-3
TRAFFIC SIGNAL SYNCHRONIZATION PROJECTS
(From 40 CFR 93.128)

Traffic signal synchronization projects may be approved, funded, and implemented without satisfying the requirements of this subpart. However, all subsequent regional emissions analyses required by sections 93.118 and 93.119 for transportation plans, TIPs, or projects not from a conforming plan and TIP must include such regionally significant traffic signal synchronization projects.