


**Policy Guidance on the Use of
MOVES2010 and Subsequent Minor
Revisions for State Implementation Plan
Development, Transportation Conformity,
and Other Purposes**



Policy Guidance on the Use of MOVES2010 and Subsequent Minor Revisions for State Implementation Plan Development, Transportation Conformity, and Other Purposes

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INTRODUCTION

1. What is the purpose of this guidance?

This guidance describes how and when to use the MOtor Vehicle Emission Simulator (MOVES) emissions model for state implementation plan (SIP) development, transportation conformity determinations, and other purposes.

MOVES is U.S. Environmental Protection Agency's (EPA's) latest motor vehicle emissions model for state and local agencies to estimate volatile organic compounds (VOCs), nitrogen oxides (NOx), particulate matter (PM), carbon monoxide (CO), and other precursors from cars, trucks, buses, and motorcycles for SIP purposes and conformity determinations outside of California.¹ EPA announced the release of MOVES2010 in the Federal Register on March 2, 2010 (75 FR 9411). EPA subsequently released two minor revisions -- MOVES2010a in September 2010 and MOVES2010b in April 2012. Both of these minor revisions enhance model performance and do not significantly affect the criteria pollutant emissions results from MOVES2010. EPA notes that references to "MOVES" in this guidance relate to the approved versions of MOVES2010 and subsequent minor revisions (e.g., MOVES2010a and MOVES2010b). However, in some cases, EPA has specifically referred to MOVES2010, MOVES2010a, and MOVES2010b for clarification.

All states other than California should use MOVES2010b for future SIPs in order to take full advantage of the improvements incorporated in this version. However, state and local agencies that have already completed significant work on a SIP with MOVES2010 or MOVES2010a can continue to use it. See Questions 5-9 for further information on using MOVES in SIP development.

MOVES will be required for new regional emissions analyses for transportation conformity determinations ("regional conformity analyses") that begin after March 2, 2013 (77 FR 11394). In addition, MOVES will be required for new PM and CO hot-spot analyses for project-level conformity determinations that begin after December 20, 2012 (75 FR 79370). See Questions 10-13 for further information on using MOVES in transportation conformity determinations. In addition, see Question 14 for information on using MOVES in general conformity determinations.

EPA has also included information regarding the use of MOVES for estimating mobile source air toxic and greenhouse gas emissions. Although there are no SIP or conformity requirements for these emissions, MOVES is EPA's best tool for estimating air toxic and greenhouse gas emissions from on-road mobile sources. See Questions 15 and 16 for further information.

¹ In California, a different on-road emissions model, EMFAC, is used for regulatory purposes instead of MOVES.

This guidance applies to the current version of MOVES2010, MOVES2010a, and MOVES2010b, as well as any future MOVES2010 minor revisions.² This guidance supersedes the previous December 2009 version of the guidance (EPA-420-B-09-046) and the policy information included in the MOVES2010a Questions and Answer document (EPA-420-F-10-050).

EPA coordinated closely with the U.S. Department of Transportation (DOT) in the development of this guidance.

The following EPA contacts are available regarding this guidance:

- for general questions about the MOVES model, email mobile@epa.gov;
- for SIP questions, contact [Rudy Kapichak](#) at (734) 214-4574;
- for transportation conformity questions, contact [Meg Patulski](#) at (734) 214-4842;
- for general conformity questions, contact [Tom Coda](#) at (919) 541-3037, and
- for questions about the National Emissions Inventory, contact [Laurel Driver](#) at (919) 541-2859.

A copy of this policy guidance can be found at the following website:

<http://www.epa.gov/otaq/stateresources/transconf/policy.htm#models>

2. What is MOVES and how does it compare to MOBILE6.2?

MOVES is EPA's state-of-the-art tool for estimating emissions from on-road mobile sources. The model is based on analyses of millions of emission test results and considerable advances in the Agency's understanding of vehicle emissions. MOVES incorporates the latest emissions data, sophisticated calculation algorithms, increased user flexibility, new software design, and significant new capabilities. MOVES2010 was designed to replace the previous emissions model, MOBILE6.2, which was released in 2004 (69 FR 28830).

MOVES improves upon MOBILE6.2 in many respects. For example, MOVES is based on a review of the vast amount of in-use vehicle data collected and analyzed since the release of MOBILE6.2, including millions of emissions measurements from light-duty vehicles. Analysis of this in-use data has enhanced EPA's understanding of how on-road mobile sources contribute to emissions inventories, and has also improved the agency's understanding of the relative effectiveness of various control strategies. MOVES has a database-centered design that allows users much greater flexibility in organizing input and output data. This structure also allows EPA to update emissions data incorporated in MOVES more easily. MOVES estimates PM_{2.5} and PM₁₀ emissions at high resolution, to

² Details on MOVES2010, MOVES2010a, and MOVES2010b can be found at <http://www.epa.gov/otaq/models/moves/>.

account for speed and temperature variations, which allows users to incorporate a much wider array of activity data at the link and project level.

EPA performed a comparison of MOVES to MOBILE6.2 using local data for several different urban counties, varying the local data used by fleet age distribution, fraction of light- and heavy-duty vehicle miles travelled (VMT), local fuel specifications, meteorology, and other input factors. Actual results will vary based on local inputs in a given area, with local variations in fleet age distribution and composition having a significant influence on the final results. In general, VOC emissions are lower when using MOVES when compared to MOBILE6.2, while both NO_x and PM emissions are higher.³

MOVES includes the capability to estimate vehicle exhaust and evaporative emissions as well as brake wear and tire wear emissions for criteria pollutants and precursors. However, MOVES does not include the capability to estimate emissions of re-entrained road dust. To estimate emissions from re-entrained road dust, practitioners should continue to use the latest approved methodologies.⁴

3. What additional resources are available to assist in implementing MOVES?

In addition to this guidance document, EPA has developed several documents to assist in implementing MOVES, including the following:

- The MOVES User Guide (available at www.epa.gov/otaq/models/moves/ and in the MOVES Help menu) provides detailed instructions for using MOVES and has been updated for MOVES2010b.
- “Using MOVES to Prepare Emission Inventories in State Implementation Plans and Transportation Conformity: Technical Guidance for MOVES2010, MOVES2010a and MOVES2010b” (available at <http://www.epa.gov/otaq/models/moves/>) provides guidance on creating a RunSpec and adding local data using the County Data Manager for SIPs and regional transportation conformity analyses.
- “[Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas](http://www.epa.gov/otaq/stateresources/transconf/policy.htm#project)” (available at <http://www.epa.gov/otaq/stateresources/transconf/policy.htm#project>) explains

³ Further information about MOVES can be found on the following website: <http://www.epa.gov/otaq/models/moves/index.htm>.

⁴ See EPA’s notice of availability, “Official Release of the January 2011 AP-42 Method for Estimating Re-Entrained Road Dust from Paved Roads”, published in the *Federal Register* on February 4, 2011 (76 FR 6328) available on EPA’s website at: <http://www.epa.gov/otaq/stateresources/transconf/policy.htm#models>

how to use MOVES to complete hot-spot analyses required for projects of local air quality concern in PM_{2.5} and PM₁₀ nonattainment and maintenance areas.

- “[Using MOVES in Project-Level Carbon Monoxide Analyses](http://www.epa.gov/otaq/stateresources/transconf/policy.htm#project)” (available at <http://www.epa.gov/otaq/stateresources/transconf/policy.htm#project>) describes how to use the MOVES emissions model to estimate CO emissions from transportation projects.
- “[Using MOVES for Estimating State and Local Inventories of On-Road Greenhouse Gas Emissions and Energy Consumption – Draft](http://www.epa.gov/otaq/stateresources/ghgtravel.htm)” (available at <http://www.epa.gov/otaq/stateresources/ghgtravel.htm>) describes how to use MOVES to estimate greenhouse gas emissions and/or energy consumption from on-road vehicles in a state or metropolitan area.

Additional training materials, examples, and MOVES technical information are available at the MOVES website: <http://www.epa.gov/otaq/models/moves/index.htm> and at the Transportation Conformity Training and Presentations website: <http://www.epa.gov/otaq/stateresources/transconf/training.htm>.

MOVES users are urged to check the MOVES website regularly and subscribe to EPA’s mobile source emissions model listserver (subscription information on the MOVES website) to find any updates to MOVES or this guidance.

4. Does this guidance create new requirements?

The discussion in this document is intended solely as guidance. The statutory provisions and EPA regulations described in this document contain legally binding requirements. This document is not a regulation itself, nor does it change or substitute for those provisions and regulations. EPA retains the discretion to adopt approaches on a case-by-case basis that may differ from this document, but still comply with the statute and regulations. Any decisions regarding a particular SIP or conformity determination will be made based on the statute and regulations. This document may be revised periodically without public notice.

SIP DEVELOPMENT

5. How does the release of MOVES affect SIPs that have already been submitted and/or approved, or SIPs that are currently under development?

In general, EPA believes that MOVES should be used in ozone, CO, PM, and NO₂ SIP development as expeditiously as possible. The Clean Air Act requires that SIP inventories and control measures be based on the most current information and applicable

models that are available when a SIP is developed.⁵ However, it is also important to recognize the time and level of effort that certain states have already undertaken in SIP development. States should consult with their EPA Regional Office if they have questions about how MOVES affects SIPs under development in specific nonattainment or maintenance areas. Early consultation can facilitate EPA's adequacy finding or SIP approval process. The following paragraphs articulate EPA's policy for the use of MOVES in the development of SIPs.

States should use the latest version of MOVES2010 that is available at the time that a SIP is developed. All states other than California should use MOVES2010b for future SIPs in order to take full advantage of the improvements incorporated in this version. However, state and local agencies that have already completed significant work on a SIP with MOVES2010 or MOVES2010a can continue to do so, although switching to MOVES2010b would allow additional performance enhancements to be used. States should no longer be using MOBILE6.2 for any new SIP development work, including the development of on-road mobile source inventories. EPA believes that sufficient time has passed since EPA officially released MOVES2010 and subsequent minor revisions (i.e., MOVES2010a and MOVES2010b).⁶

At this time, there are a limited number of cases, where a state used MOBILE6.2 in a reasonable further progress (RFP), attainment, or maintenance SIP that has already been submitted. In these cases, using MOBILE6.2 should not be an obstacle to EPA approval, assuming that such SIPs are otherwise approvable and significant SIP work has already occurred (e.g., attainment modeling for an attainment SIP has already been completed with MOBILE6.2). It would be unreasonable to require the states to revise these SIPs with MOVES since significant work has already occurred based on the latest information available at the time the SIP was developed, and EPA intends to act on these SIPs in a timely manner.

EPA believes that the Clean Air Act does not require states that have already submitted SIPs or will submit SIPs shortly after the release of a new model to revise these SIPs simply because a new motor vehicle emissions model is now available. EPA believes that this is supported by existing EPA policies and case law [*Sierra Club v. EPA*, 356 F.3d. 296, 307-08 (D.C. Cir. 2004)]. Of course, states can choose to use MOVES2010b in these SIPs, for example, if it is determined that it is appropriate to update motor vehicle emissions budgets ("budgets") with the model for future conformity determinations. However, as stated above, states should use MOVES2010b where SIP development is in its initial stages or has not progressed far enough along that switching from a previous model version would create a significant adverse impact on state resources.

⁵ See Clean Air Act section 172(c)(3) and 40 CFR 51.112(a)(1).

⁶ MOVES2010 and any subsequent minor revisions like MOVES2010a or MOVES2010b produce similar emissions results for criteria pollutants.

Incorporating MOVES into the SIP now could assist areas in mitigating possible transportation conformity difficulties in the future after the MOVES conformity grace period ends. New regional conformity analyses that are started after the grace period is over must be based on MOVES (40 CFR 93.111), so having MOVES-based SIP budgets in place at that time could provide more consistency with transportation conformity determinations. See Question 10 for more information on using MOVES for regional conformity analyses and transportation plan and transportation improvement program (TIP) conformity.

6. What emissions model must be used for preparing inventories for SIPs for areas designated nonattainment for the 2006 PM_{2.5} NAAQS?

EPA believes that MOVES is the emissions model that must be used for developing on-road mobile source inventories for the 2006 PM_{2.5} NAAQS SIPs (except those in California) because it reflects the latest available information.⁷ EPA designated nonattainment areas for this NAAQS on November 13, 2009 (74 FR 58688), which should give state and local agencies time to incorporate MOVES into SIP submissions for this NAAQS. Using MOVES to create SIP budgets may also help in the transition to using MOVES for transportation conformity purposes at the end of the conformity grace period (see Question 10).

7. When existing SIPs and budgets are revised with MOVES, what do states need to submit to show that a SIP continues to meet applicable requirements?

As stated in Question 5, a SIP revision would not be required solely due to the release of MOVES for SIPs that have been approved, submitted, or where significant development has already occurred. However, there may be cases where an existing SIP that was based on MOBILE6.2 or an earlier version of the MOBILE model is revised with MOVES. In addressing these cases, EPA is applying the same principles it has in the past when budgets have been revised using a new emissions model. States should consult with their EPA Regional Office prior to submitting MOVES SIP revisions. Early consultation can facilitate EPA's adequacy finding or SIP approval process.

Under the Clean Air Act, EPA has always required that revisions to existing SIPs and budgets continue to meet applicable requirements (e.g., RFP or attainment). For example, if a state revises a maintenance plan to add or delete control measures, the state needs to show in its revised SIP that maintenance continues to be demonstrated with the new mix of control measures. Similarly, states that revise existing SIPs with MOVES must show that the SIP continues to meet applicable requirements with the new level of motor vehicle emissions calculated by the new model.

⁷ See Clean Air Act section 172(c)(3) and 40 CFR 51.112(a)(1).

In addition, the transportation conformity rule (40 CFR 93.118(e)(4)(iv)) requires that “the motor vehicle emissions budget(s), when considered together with all other emissions sources, is consistent with applicable requirements for reasonable further progress, attainment, or maintenance (whichever is relevant to the given implementation plan submission).” This and other criteria must be satisfied before EPA can find submitted budgets adequate or approve them for use in the conformity process.

The following paragraphs describe how to meet applicable requirements for existing SIPs that are revised with MOVES, including ideas for how to streamline these revisions whenever possible.

Use of latest planning assumptions: When SIPs are revised with MOVES, base year, milestone year and attainment/maintenance year motor vehicle emissions inventories will need to be recalculated with the latest available planning assumptions. As required by Clean Air Act section 172(c)(3) and EPA’s regulation at 40 CFR 51.112(a), states must use the latest planning assumptions available at the time that the SIP is developed, including but not limited to the latest information for VMT, speeds, fleet mix, and SIP control measures.⁸ Base year and historical year inventories must use the latest data available for those years. Future year projection inventories must also be based on the latest data available. If planning assumptions have not changed since the original SIP was submitted, the state should document this in its new SIP submission.

In addition, states must consider whether growth and control strategy assumptions for non-motor vehicle sources (i.e., stationary, area and non-road mobile sources) are still accurate at the time that the MOVES SIP revision is developed. Such assumptions include population and economic assumptions and any allowable emissions relied upon for stationary or other sources. If these assumptions have not changed, the state can simply re-submit the original SIP with the revised motor vehicle emissions inventories and budgets and meet the remaining requirements as discussed below. The state may also in these cases simply provide summary emissions information for categories of sources and references to the applicable portions of the original SIP, as long as those portions continue to apply after the SIP revision with the MOVES budget is approved. States should consult with their EPA Regional Office to determine what should be included in the SIP revision. Otherwise, the emissions categories in the SIP that have changed must be brought up to date.

Milestone, attainment or maintenance demonstration: As discussed above, SIP revisions based on MOVES must continue to show that the SIP still meets applicable requirements (e.g., attainment or maintenance) when previous motor vehicle emissions inventories are replaced with MOVES inventories. The level of effort needed for this demonstration can vary depending upon how MOVES affects the level of motor vehicle emissions and whether non-motor vehicle inventories require updating. The method used to develop the original demonstration could also be a factor.

⁸ See EPA and DOT’s joint “Guidance for the Use of Latest Planning Assumptions in Transportation Conformity Determinations,” EPA420-B-08-901 (Dec. 2008). This guidance also addresses requirements for using the latest planning assumptions in SIP development.

Areas can revise their motor vehicle emissions inventories and budgets using MOVES without revising the entire SIP or completing additional modeling if:

- (1) The SIP continues to meet applicable requirements when the previous motor vehicle emissions inventories are replaced with MOVES base year and milestone, attainment, or maintenance year inventories; and,
- (2) The state can document that the growth and control strategy assumptions for non-motor vehicle sources continue to be valid and any minor updates do not change the overall conclusions of the SIP.

For example, consistent with EPA's SIP modeling guidance for various pollutants, if an ozone SIP relied on changes in emissions from the base year to an attainment or maintenance year inventory to estimate relative changes in monitored ozone levels, the first criterion could be satisfied by demonstrating that the relative emissions reductions between the base year and the attainment or maintenance year are the same or greater using MOVES than they were previously. Alternatively, if an ozone attainment SIP relied on absolute model predictions for the future attainment year, then the first criterion could be satisfied by demonstrating that the MOVES estimates are equal to or lower than the previous estimates for the future attainment year. Or, if a CO maintenance plan relied on either a relative or absolute demonstration, the first criterion could be satisfied by documenting that the relative emissions reductions between the base year and the maintenance year are the same or greater using MOVES. In any case, if using the latest planning assumptions for emissions estimates results in changes to other emissions categories (e.g., stationary or area emissions), the demonstration would apply to the entire inventory, rather than just the on-road mobile inventory.

If both of the above criteria are met, the state can simply re-submit the original SIP with the revised MOVES motor vehicle emissions inventories. The state may simply be able to provide summary emissions information for categories of sources and references to the applicable portions of the original SIP. States should consult with their EPA Regional Office to determine what should be included in the SIP revision. If either criterion is not met, the emissions categories in the SIP that have changed must be brought up to date. Any changes in control strategies, including stationary source inventories, must be factored in to both base and future year inventories to determine if they would indicate a nonattainment problem. However, a state would not necessarily have to revise a non-motor vehicle emissions inventory category just to account for a regulatory or permit change that *reduces* these emissions in an attainment or maintenance year relative to the existing SIP.

Regardless of the technique used, a more rigorous reassessment of the SIP's demonstration may be necessary if a state decides to reallocate the original SIP's excess emissions reductions to the motor vehicle emissions budget as a safety margin.⁹ In other

⁹ A "safety margin" is the amount by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for reasonable

words, the state will need to assess how its original demonstration is affected by using MOVES and confirm whether excess emissions exist prior to allocating them to the budget. This assessment would need to be sufficiently detailed to permit the recalculation with MOVES of any excess emissions. This assessment is critical to ensure that SIP budgets in the context of all other emissions sources continue to protect public health and meet the conformity rule's adequacy criteria (40 CFR 93.118(e)(4)).

8. How will MOVES affect the need for emissions reductions in the development of future attainment or maintenance SIPs?

The answer to this question depends upon the unique circumstances of each nonattainment or maintenance area. The emissions comparisons depend very heavily on the pollutants of concern, the dates of concern, and on existing local regulations, traffic patterns, fleet age, and mix of cars and trucks. In some cases, a change from MOBILE6.2 to MOVES may result in increased emissions estimates, while in other cases it may result in decreased emissions estimates for various time periods.

Moreover, because of the complex chemistry and meteorology involved in air pollution, the implications of changes in highway vehicle emissions may not be clear until multiple years are examined and the new emissions levels are applied to an air quality model. Relative differences in emissions over time from MOBILE6.2 to MOVES may be as important as, or more important than, differences between the two models in any one year. Therefore, MOVES users should not immediately assume that increases or decreases in emissions in any single year imply the need for more or fewer SIP control measures until those changes in emissions have been put in the complete SIP context.

An increase in emissions due to the use of MOVES may affect an area's ability to demonstrate conformity for its transportation plan and/or TIP. Areas are encouraged, to consider, through the interagency consultation process, if and how MOVES will impact their future conformity determinations and discuss any concerns with the appropriate EPA Regional Office.

9. What role will MOVES play in EPA's National Emissions Inventory?

The National Emissions Inventory (NEI) is updated with state, local, and tribal submissions once every three years. The most recent NEI, version 2 of the 2008 NEI, will be available in the spring of 2012 and is based on MOVES.¹⁰ EPA used data that state and local agencies submitted to the National Mobile Inventory Model (NMIM) National County Database, converted those data to create MOVES database inputs, added additional information for fuels and some other inputs, and then ran MOVES to develop emissions estimates for version 2 of the 2008 NEI. No state or local agency-submitted

further progress, attainment, or maintenance (40 CFR 93.101). See also 40 CFR 93.124(a) for its application.

¹⁰ Previous versions of the 2008 NEI were based on MOBILE6.2.

emissions estimates for on-road sources are used in the 2008 NEI, except for California, where California's EMFAC model estimates are used. EPA expects to collect inputs for the current version of MOVES from agencies to use in the 2011 NEI cycle for states other than California.

TRANSPORTATION CONFORMITY

10. When will the use of MOVES be required for transportation conformity determinations?

Section 176(c)(1) of the Clean Air Act and the transportation conformity rule (40 CFR 93.111) require conformity analyses to be based on the latest motor vehicle emissions model approved by EPA. When EPA approves a new emissions model, such as MOVES2010, we establish a grace period before the model is required to be used for conformity analyses (40 CFR 93.111(b)). In consultation with DOT, EPA must consider many factors when establishing a grace period for conformity determinations, including the degree of change in emissions models and the effects of the new model on the transportation planning process (40 CFR 93.111(b)(2)). EPA has completed several actions on the transition to MOVES for transportation conformity analyses as discussed further below.

Transportation conformity is a Clean Air Act requirement to ensure that federally supported highway and transit activities are consistent with ("conform to") the SIP. Conformity to a SIP means that a transportation activity will not cause or contribute to new air quality violations; worsen existing violations; or delay timely attainment of the national ambient air quality standards or an interim milestone.

MOVES will be required for new regional conformity analyses outside of California that begin after March 2, 2013.¹¹ However, MOVES will be required prior to the end of this grace period for any new regional conformity analyses once an area has MOVES-based SIP budgets that have been found adequate or approved for conformity purposes. The MOVES grace period for regional conformity analyses applies to the use of MOVES2010 and minor revisions (e.g., MOVES2010a, and MOVES2010b). See Questions 11 and 12 for further information on how the MOVES grace period for regional conformity analyses will be implemented.

For project-level PM and CO hot-spot analyses outside California, the two-year conformity grace period for using MOVES2010a ends December 20, 2012 (75 FR 79370). This grace period for PM or CO hot-spot analyses for project-level conformity determinations applies to the use of MOVES2010b as well. EPA notes that this conformity grace period is separate from and not affected by the MOVES grace for

¹¹ EPA promulgated a final rule on February 27, 2012 to provide an additional year before MOVES is required for regional conformity analyses (77 FR 11394).

regional conformity analyses. See Question 13 for further information on how the PM and CO hot-spot grace conformity period will be implemented.

Note that minor revisions to MOVES2010 (e.g., MOVES2010a and MOVES2010b) do not significantly change criteria pollution emissions compared to MOVES2010, and therefore we did not consider such revisions to be a new model for SIP and transportation conformity purposes under 40 CFR 93.111. The release of minor revisions to MOVES2010 do not restart the conformity grace periods for new emissions models.

EPA encourages state and local agencies to use the latest version of the MOVES model available at the time that any conformity modeling begins, since the model enhancements will optimize model performance. MOVES2010b is currently the latest version of MOVES available.

11. Under what circumstances will the MOVES grace period for regional conformity analyses be shorter than three years?

As stated above, the grace period for regional conformity analyses will end on March 2, 2013 unless new budgets become applicable sooner, in which case the grace period will end for specific areas once these new MOVES-based approved or adequate budgets become effective. MOVES will be required prior to the end of the extended grace period for a given pollutant if an area revises its SIP and budgets with MOVES, and such budgets become applicable for regional conformity purposes prior to the end of the grace period (77 FR 11396). In this case, the new regional emissions analysis for that pollutant must use MOVES if the conformity determination is based on a MOVES-based budget. The interagency consultation process must be used to develop any SIP revision based on MOVES (40 CFR 93.105(a)). Because MOVES2010 and the minor revisions produce the same emissions results, state and local agencies may choose to use any of the MOVES2010 or any minor revisions of the model for regional conformity analyses. For example, if the adequate budgets were created using MOVES2010, the regional conformity analysis may be completed using MOVES2010, MOVES2010a, or MOVES2010b to meet the requirements of 40 CFR 93.111 and 93.118. However, EPA encourages state and local agencies to use the latest version of the MOVES2010 model available at the time that regional emissions modeling begins, to take advantage of the latest version's performance.

Areas that are designated nonattainment or maintenance for multiple pollutants may rely on both MOVES and MOBILE6.2 to determine conformity for different pollutants during the grace period. For example, if an area revises a previously submitted (but not approved) MOBILE6.2-based PM₁₀ SIP with MOVES and EPA finds these revised MOVES budgets adequate for conformity, such budgets would apply for conformity on the effective date of the *Federal Register* notice announcing EPA's adequacy finding. In this example, if an area was in nonattainment for PM₁₀ and ozone, the MOVES grace period would end for PM₁₀ once EPA found the new MOVES-based SIP budgets adequate. However, MOBILE6.2 could continue to be used for ozone conformity

determinations until the end of the MOVES grace period.¹² In addition, the length of the grace period for hot-spot analyses would not be affected by an early submission of MOVES-based budgets. In this example, the two-year grace period for PM₁₀ hot-spot analyses would still apply even if the grace period is shortened for regional PM₁₀ conformity analyses, as explained in Question 13. EPA Regional Offices should be consulted for questions regarding other situations in multi-pollutant areas.

In addition, in most cases, if an area revises a previously approved MOBILE-based SIP budget with MOVES, the revised MOVES budgets would be used for conformity purposes once EPA approves the MOVES SIP revision. In general, submitted SIPs cannot supersede approved budgets until they are approved. However, 40 CFR 93.118(e)(1) allows an approved budget to be replaced by an adequate budget if EPA's approval of the initial budgets specifies that the budgets being approved may be replaced in the future by new adequate budgets. This flexibility has been used in limited situations in the past, such as during the transition from MOBILE5 to MOBILE6. In such cases, the MOVES-based budgets would be used for conformity purposes once they have been found adequate, if requested by the state in its SIP submission and if specified in EPA's SIP approval. States should consult with their EPA Regional Office to determine if this flexibility applies to their situation.

12. How will the MOVES grace period be implemented for regional conformity analyses?

During the conformity grace period, areas should use the interagency consultation process to examine how MOVES will impact their future transportation plan and TIP conformity determinations, including regional conformity analyses. Isolated rural areas should also consider how future regional conformity analyses will be affected when MOVES is required. Areas should carefully consider whether the SIP and budget(s) should be revised with MOVES or if transportation plans and TIPs should be revised before the end of the conformity grace period, since doing so may be necessary to ensure conformity in the future.

The conformity rule provides some flexibility for analyses that are started during the grace period. Regional conformity analyses that are started during the grace period can use either MOBILE6.2 or MOVES. The interagency consultation process should be used if it is unclear if a MOBILE6.2-based analysis was begun before the end of the grace period. When the grace period ends on March 2, 2013, MOVES will become the only approved motor vehicle emissions model for transportation conformity purposes in states outside California. In general, this means that all new regional conformity analyses started after March 2, 2013 must be based on MOVES, even if the SIP is based on

¹² In this example, such an area would use MOVES to develop a regional emissions analysis for comparison to the revised MOVES-based budgets (e.g., PM₁₀ and NO_x budgets). The regional emissions analysis for ozone could be based on MOBILE6.2 for the VOC and NO_x budgets in the ozone SIP for the remainder of the conformity grace period.

MOBILE6.2 or earlier versions of MOBILE. As discussed above, the grace period for new regional conformity analyses would be shorter for a given pollutant if an area revised its SIP and budgets with MOVES and such budgets were approved or found adequate for conformity purposes prior to the end of the grace period.

As noted above, MOVES2010 and the minor revisions produce the same emissions results so state and local agencies may choose to use MOVES2010 or any minor revisions of the model for regional conformity analyses. For example, if the adequate budgets were created using MOVES2010, the regional conformity analysis may be completed using MOVES2010, MOVES2010a, or MOVES2010b to meet the requirements of 40 CFR 93.111 and 93.118. However, EPA encourages state and local agencies to use the latest version of the MOVES2010 model available at the time that regional emissions modeling begins, since the model enhancements included in such versions will optimize model performance. If you have questions about which model should be used in your conformity determination, you can also consult with your EPA Regional Office.

As discussed in more detail in the MOVES Technical Guidance, MOVES allows for multiple approaches to develop a regional emissions inventory, which may result in small differences in results.¹³ EPA recommends that the same approach be used in any analysis that compares two or more cases (e.g., the SIP budget and the regional conformity analysis). The interagency consultation process should be used to agree upon a common approach. If different approaches are used for the SIP budget and the regional conformity analysis for practical reasons, the interagency consultation process should be used to determine how to address (and minimize) any differences in results. The methods used to develop inventories should be fully documented in the SIP and conformity determination.

13. How will the MOVES grace period be implemented for CO, PM₁₀ and PM_{2.5} quantitative hot-spot analyses?

EPA established a two-year grace period (75 FR 79370) before MOVES2010a will be required to be used when completing new CO, PM₁₀ and PM_{2.5} quantitative hot-spot analyses in areas outside of California. The MOVES2010a grace period also applies to the use of MOVES2010b as stated above. This grace period ends on December 20, 2012 (75 FR 79370). EPA notes that this conformity grace period is separate from and not affected by the MOVES grace period for regional conformity analyses. See Question 10 for more general information about the conformity grace period.

Sections 93.116 and 93.123 of the conformity rule contain the requirements for when a hot-spot analysis is required for project-level conformity determinations.¹⁴ The

¹³ See [MOVES Technical Guidance](#) (EPA-420-B-12-028), Section 3.2.2.

¹⁴ In CO nonattainment and maintenance areas, a hot-spot analysis is required for all non-exempt projects, with quantitative hot-spot analyses being required for larger, congested intersections and other projects (40

conformity rule provides some flexibility for analyses that are started before the end of the grace period. A conformity determination for a transportation project may be based on a previous model if the analysis was begun before or during the grace period, and if the final environmental document for the project is issued no more than three years after the issuance of the draft environmental document (40 CFR 93.111(c)). The interagency consultation process should be used if it is unclear if a previous analysis was begun before the end of the grace period. If you have questions about which model should be used in your project-level conformity determination, you can also consult with your EPA Regional Office.

Implementation of grace period for CO hot-spot analyses: For CO hot-spot analyses that are started during the two-year grace period, project sponsors can choose to use either MOBILE6.2, MOVES2010a, or MOVES2010b. EPA encourages sponsors to use the consultation process to determine which option may be most appropriate for a given situation. Any new quantitative CO hot-spot analyses for conformity purposes begun after the end of the grace period must be based on either MOVES2010a or MOVES2010b, but, as highlighted above, we encourage state and local agencies to use the latest version of MOVES when beginning analyses. EPA released guidance (EPA-420-B-10-040) on how to use MOVES for CO project level analyses in December 2010.

Implementation of grace period for PM₁₀ and PM_{2.5} hot-spot analyses: For PM₁₀ and PM_{2.5} hot-spot analyses, the conformity rule requires a *qualitative* analysis to be performed until EPA releases guidance on how to conduct *quantitative* hot-spot analyses for PM and announces in the *Federal Register* that such analyses are in effect (40 CFR 93.123(b)). EPA stated in the preamble to the March 10, 2006 final conformity rule that finalizing the MOVES emissions model was critical before quantitative PM hot-spot analyses are required, due to the limitations of applying MOBILE6.2 for PM at the project level.¹⁵

During the conformity grace period, project sponsors can continue to conduct qualitative PM₁₀ and PM_{2.5} hot-spot analyses for analyses that are started during the grace period.¹⁶ Section 93.111(c) of the conformity rule allows conformity determinations for projects based on the previous version of an emissions model to be completed after the end of the MOVES grace period, if the analysis was begun before the end of the grace period.¹⁷ Quantitative PM₁₀ and PM_{2.5} hot-spot analyses can also be completed for conformity purposes during the grace period, if desired. However, any quantitative PM₁₀ and PM_{2.5} hot-spot analyses conducted during the grace period must use MOVES2010a or MOVES2010b, since MOBILE6.2 does not have the capabilities to conduct project-level PM emissions analyses and is therefore not approved for this purpose, as described

CFR 93.123(a)(1)). In addition, the conformity rule requires that a quantitative PM₁₀ or PM_{2.5} hot-spot analysis be completed for certain projects of local air quality concern (40 CFR 93.123(b)(1)).

¹⁵ See EPA's March 10, 2006 final conformity rule for further information (71 FR 12498-12502).

¹⁶ See EPA and FHWA's joint "Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas," EPA420-B-06-902 (March 2006).

¹⁷ Since previous emissions models have not been approved in the past for quantitative PM hot-spot analyses, a qualitative PM hot-spot analysis is considered the previous version of the relevant emissions model for the purposes of 40 CFR 93.111(c).

above. Any quantitative PM₁₀ or PM_{2.5} hot-spot analysis for conformity purposes begun after the end of the grace period must use MOVES2010a or MOVES2010b. As highlighted above, we encourage state and local agencies to use the latest version of MOVES when beginning analyses. EPA released guidance on how to conduct quantitative PM_{2.5} and PM₁₀ hot-spot modeling for transportation conformity purposes in December 2010.¹⁸

USING MOVES FOR OTHER PURPOSES

14. When will the use of MOVES be required for general conformity?

The general conformity regulations in 40 CFR 93.159(b) require the most current version of the motor vehicle emissions model specified by EPA and available for use in the preparation or revision of SIPs in that State must be used for the general conformity analysis. Since EPA has announced the use of MOVES2010 and minor revisions (e.g., MOVES2010a and MOVES2010b) for SIP development and transportation conformity regional emissions analyses (75 FR 9411 and 77 FR 11394), the grace period that ends March 2, 2013 also applies for its use in general conformity analysis.¹⁹ EPA encourages state and local agencies to use the latest version of the MOVES model available at the time that any conformity modeling begins, since the model enhancements included will optimize model performance. The general conformity regulation, in this same section, does provide for a Federal agency to obtain written approval from the appropriate EPA Regional Administrator for a modification or substitution of other emission estimation techniques on a case-by-case basis, or on a generic basis if the vehicle emission model specified by EPA is inappropriate to use.

15. Can MOVES be used to estimate greenhouse gas emissions?

Yes, MOVES is currently the best tool EPA has for estimating greenhouse gas (GHG) emissions from the transportation sector, and is a significant improvement over MOBILE6.2. At this time, MOVES2010b is the latest version of MOVES that has been released, and it includes new car and light truck energy and GHG rates and a number of performance enhancements. EPA notes that there are no SIP and transportation conformity requirements for GHG emissions.

In addition, EPA has developed new technical guidance²⁰ that describes how to use MOVES to estimate GHG emissions and/or energy consumption from on-road vehicles in a state or metropolitan area. State and local agencies estimating GHG emissions in the

¹⁸ See EPA's guidance, "Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas," EPA-420-B-10-040, December 2010.

¹⁹ See EPA's Memo from Susan Bromm to Regional NEPA/309 Division Directors "Using the MOVES and EMFAC Emissions Models in NEPA Evaluations," February 8, 2011.

²⁰ EPA released a draft of this guidance document for public in January 2012. The latest version of "Using MOVES for Estimating State and Local Inventories of On-Road Greenhouse Gas Emissions and Energy Consumption" is available on the web at <http://www.epa.gov/otaq/stateresources/ghgtravel.htm>.

transportation planning process should consider using the latest version of MOVES in the future.

16. Can MOVES be used to estimate mobile source air toxics?

Yes, MOVES estimates emissions for mobile source air toxics (MSATs) such as benzene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein, naphthalene, ethanol, and MTBE. With the release of MOVES2010b, EPA included additional MSATs, which were previously available in NMIM.²¹ MOVES is EPA's best available tool for quantifying emissions of these MSATs. State and local agencies, academic institutions, and other interested parties who are interested in analyzing MSAT emissions from transportation projects are encouraged to use MOVES.

EPA notes that there are no SIP and transportation conformity requirements for air toxics. Regarding the analysis of MSAT emissions in the National Environmental Policy Act (NEPA) process, DOT has responsibility for implementing NEPA for federally-funded or approved transportation projects.

²¹ A complete list of pollutants is in the MOVES User Guide, available on the web at <http://www.epa.gov/otaq/models/moves/#user>