



ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 51 and 93

[FRL-9917-26-OAR]

Official Release of the MOVES2014 Motor Vehicle Emissions Model for SIPs and Transportation Conformity.

AGENCY: Environmental Protection Agency.

ACTION: Notice of availability.

SUMMARY: The Environmental Protection Agency (EPA) is approving and announcing the availability of the Motor Vehicle Emissions Simulator model (MOVES2014) for official use outside of California. MOVES2014 is the latest state-of-the-art upgrade to EPA's modeling tools for estimating emissions from cars, trucks, buses, and motorcycles, based on the latest data and regulations. MOVES2014 is approved for use in state implementation plans (SIPs) and transportation conformity analyses outside of California. This notice starts a two-year grace period before the MOVES2014 emission model is required to be used in new regional emissions analyses and new hot-spot analyses for transportation conformity determinations outside of California.

DATES: EPA's approval of the MOVES2014 emissions model for SIPs and transportation conformity analyses in states other than California is effective **[insert date of publication in FEDERAL REGISTER.]** This approval also starts a two-year transportation conformity grace period that ends on **[insert date two years after**

publication in FEDERAL REGISTER], after which MOVES2014 is required to be used for new transportation conformity analyses outside of California.

FOR FURTHER INFORMATION CONTACT: For technical model questions regarding the official release or use of MOVES2014, please email EPA at mobile@epa.gov. For questions about SIPs, contact Rudy Kapichak at Kapichak.Rudolph@epa.gov or (734)214-4574. For transportation conformity questions, contact Astrid Larsen at larsen.astrid@epa.gov or (734)214-4812.

SUPPLEMENTARY INFORMATION:

The contents of this document are as follows:

- I. General Information
- II. What is MOVES2014?
- III. SIP Policy for MOVES2014
- IV. Transportation Conformity and MOVES2014

I. General Information

- A. Does this Action Apply to Me?

Entities potentially impacted by the approval of MOVES2014 are those that adopt, approve, or fund transportation plans, transportation improvement programs (TIPs), or projects under title 23 U.S.C. or title 49 U.S.C. Chapter 53 and those that develop and submit SIPs to EPA. Regulated categories and entities affected by this action include:

Category	Examples of regulated entities
Local government	Local transportation and air quality agencies, including metropolitan planning organizations (MPOs).
State government	State transportation and air quality agencies.
Federal government	Department of Transportation (Federal Highway Administration (FHWA) and Federal Transit Administration (FTA)).

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by the release of MOVES. Other entities not listed in the table could also be affected. To determine whether your organization is affected by this action, you should carefully examine the transportation conformity applicability requirements in 40 CFR 93.102. If you have questions regarding the applicability of this action to a particular entity, consult the persons listed in the preceding FOR FURTHER INFORMATION CONTACT section.

B. How Can I Get Copies of MOVES2014 and Other Related Information?

The official version of the MOVES2014 model, along with user guides and supporting documentation, are available on EPA’s MOVES website:

www.epa.gov/otaq/models/moves/index.htm.

Individuals who wish to receive EPA announcements related to the MOVES2014 model should subscribe to the EPA-MOBILENEWS e-mail listserv. To subscribe to the

EPA-MOBILENEWS listserv, send a blank email to EPA at join-EPA-MOBILENEWS@lists.epa.gov. Your email address will then be added to the list of subscribers and a confirmation message will be sent to your email address. For more information about the EPA-MOBILENEWS listserv, visit EPA's website at www.epa.gov/otaq/models/mobilelist.htm.

Available guidance on how to apply MOVES2014 for SIPs and transportation conformity purposes can be found on EPA's transportation conformity website, <http://www.epa.gov/otaq/stateresources/transconf/policy.htm>¹, including "Policy Guidance on the Use of MOVES2014 for State Implementation Plan Development, Transportation Conformity, and Other Purposes" (EPA-420-B-14-008, July 2014).

EPA will continue to update these websites as other MOVES support materials and guidance are developed or updated.

II. What is MOVES2014?

MOVES2014 is EPA's latest motor vehicle emissions model for state and local agencies to estimate volatile organic compounds (VOCs), nitrogen oxides (NOx), particulate matter (PM_{2.5} and PM₁₀), carbon monoxide (CO), and other precursors from cars, trucks, buses, and motorcycles for SIP purposes and conformity determinations outside of California.² The model is based on analyses of millions of emission test results and considerable advances in the Agency's understanding of vehicle emissions. The first model in the MOVES series, called MOVES2010, was released in December of 2009. MOVES2010 was followed by two minor updates, MOVES2010a and MOVES2010b.

¹ Interested parties can find these documents under either the "Emission Model and Conformity" or "Project-Level Conformity" topics on this website.

² Nonattainment and maintenance areas located in California use the latest approved version of the Emission FACtor (EMFAC) model.

Both of these minor MOVES2010 revisions enhanced model performance and did not significantly affect the criteria pollutant emissions results from MOVES2010.

MOVES2014 is a major revision to MOVES2010b and improves upon it in many respects. MOVES2014 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activity developed since the release of MOVES2010. These new emissions data are for light- and heavy-duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES2014 also adds updated vehicle sales, population, age distribution, and vehicle miles travelled (VMT) data.

MOVES2014 incorporates the effects of three new federal emissions standard rules not included in MOVES2010:

- Medium- and heavy-duty engine and vehicle greenhouse gas emission and fuel efficiency standards (promulgated September 2011, 76 FR 57106) began phasing in with the 2014 model year, and will result in lower medium- and heavy-duty engine and vehicle energy consumption rates and some reduction in criteria pollutant emissions as a result of improved aerodynamics and rolling resistance.
- Light-duty vehicle greenhouse gas emission and Corporate Average Fuel Economy standards (promulgated October 2012, 77 FR 62623) will begin phasing in with the 2017 model year, and will result in decreased energy consumption rates and decreased refueling emissions.
- Tier 3 vehicle emission and fuel standards (promulgated April 2014, 79 FR 23414) will begin phasing in with the 2017 model year, and will reduce both

tailpipe and evaporative emissions of VOC, NO_x, CO, and PM from light-duty cars and trucks, and some heavy-duty vehicles.

MOVES2014 also includes a number of new functional improvements and features. Some of these, such as the addition of multi-day diurnal events to evaporative emissions calculations, directly affect the estimation of criteria pollutant emissions. Others, such as new options for entering start and extended idle activity, make MOVES2014 more flexible and better able to incorporate local data where available.

EPA performed a comparison of MOVES2014 to MOVES2010b using local data for several different urban counties, varying the local data used by fleet age distribution, fraction of light- and heavy-duty VMT, local fuel specifications, meteorology, and other input factors. In general, VOC, NO_x, PM, and CO emissions show greater decreases over time compared to MOVES2010b. Differences in total emissions vary by calendar year and location, but in general, VOC and NO_x emissions are lower in MOVES2014. PM emissions may be higher in some areas and lower in others. 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.

MOVES2014 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.³

³ 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>.

MOVES2014 also incorporates the code and database for the NONROAD2008 model, which provides the option of calculating emissions of nonroad equipment. Because the nonroad capability in MOVES2014 is essentially the same as NONROAD2008, either MOVES2014, NONROAD2008, or the nonroad portion of NMIM2008 (which incorporates NONROAD2008) can be used in analyses to meet any regulatory requirements that call for the development of new nonroad inventories.⁴

III. SIP Policy for MOVES2014

EPA has articulated its policy regarding the use of MOVES2014 in SIP development in its [“Policy Guidance on the Use of MOVES2014 for State Implementation Plan Development, Transportation Conformity, and Other Purposes”](#) (EPA-420-B-14-008, July 2014). This document highlights certain aspects of the guidance, but state and local governments should refer to the guidance for more detailed information on how and when to use MOVES2014 in reasonable further progress SIPs, attainment demonstrations, maintenance plans, inventory updates, and other SIP submissions.

MOVES2014 should be used in ozone, CO, PM, and nitrogen dioxide (NO₂) SIP development as expeditiously as possible, as there is no grace period for the use of MOVES2014 in SIPs. The Clean Air Act requires that SIP inventories and control measures be based on the most current information and applicable models that are

In addition to the latest version of AP-42, EPA approved-alternative local methods can be used for estimating re-entrained road dust.

⁴ This is an available option although not explicitly mentioned in the [“Policy Guidance on the Use of MOVES2014 for State Implementation Plan Development, Transportation Conformity, and Other Purposes”](#) (EPA-420-B-14-008, July 2014).

available when a SIP is developed.⁵ However, EPA also recognizes the time and level of effort that certain states may have already undertaken in SIP development using a version of MOVES2010. States should consult with their EPA Regional Office if they have questions about how MOVES2014 affects SIPs under development in specific nonattainment or maintenance areas. Early consultation can facilitate EPA's adequacy finding for SIP motor vehicle emissions budgets or EPA's SIP approval.

States should use the latest version of MOVES that is available at the time that a SIP is developed, which is currently MOVES2014 to develop the most accurate estimates of emissions possible. However, state and local agencies that have already completed significant work on a SIP with a version of MOVES2010 (e.g., attainment modeling has already been completed with MOVES2010) can continue to do so. It would be unreasonable to require the states to revise these SIPs with MOVES2014 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.

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. 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 MOVES2014 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 MOVES2014 where SIP development is in its initial stages or has not

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

progressed far enough along that switching from a previous model version would create a significant adverse impact on state resources.

Incorporating MOVES2014 into the SIP now could assist areas in mitigating possible transportation conformity difficulties in the future after the MOVES2014 conformity grace period ends. New regional conformity analyses that are started after the grace period is over must be based on MOVES2014 (40 CFR 93.111), so having MOVES2014-based SIP budgets in place at that time could provide more consistency with transportation conformity determinations.

IV. Transportation Conformity and MOVES2014

In this document, EPA is approving MOVES2014 for use in transportation conformity analyses outside of California. EPA is also establishing a two-year conformity grace period before the use of MOVES2014 is required in these transportation conformity determinations. The MOVES2014 grace period for regional conformity and hot-spot analyses applies to the use of MOVES2014 and any future minor revisions that occur during the grace period.⁶

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 national ambient air quality standards or any interim milestones. Transportation conformity applies in nonattainment and maintenance areas for transportation-related pollutants: ozone, CO, PM_{2.5}, PM₁₀ and NO₂. EPA’s transportation conformity

⁶ A minor revision would be one that is made to improve performance but does not change results.

regulations (40 CFR parts 51.390 and 93 subpart A) describe how federally funded and approved highway and transit projects meet these statutory requirements.

The remainder of this section describes how the transportation conformity grace period was determined and summarizes how it will be implemented, including those circumstances when the grace period could be shorter than two years. However, for complete explanations of how MOVES2014 is to be implemented for transportation conformity, including details about using MOVES2014 during the grace period, refer to [“Policy Guidance on the Use of MOVES2014 for State Implementation Plan Development, Transportation Conformity, and Other Purposes”](#) (EPA-420-B-14-008).

A. Why is EPA Establishing a Two-Year Conformity Grace Period?

The transportation conformity regulation at 40 CFR 93.111 requires that conformity determinations be based on the latest motor vehicle emissions model approved by EPA. Section 176(c)(1) of the Clean Air Act states that “...[t]he 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....” When EPA approves a new emissions model such as MOVES2014, a grace period is established before the model is required for conformity analyses. The transportation conformity rule provides for a grace period for new emissions models of between three and 24 months (40 CFR 93.111(b)(1)), depending on the degree of change in the model and the transportation re-planning by the MPO likely to be necessary.

EPA articulated its intentions for establishing the length of a conformity grace period in the preamble to the 1993 transportation conformity rule (November 24, 1993, 58 FR 62211):

“EPA and DOT [the Department of Transportation] will consider extending the grace period if the effects of the new emissions model are so significant that previous SIP demonstrations of what emission levels are consistent with attainment would be substantially affected. In such cases, States should have an opportunity to revise their SIPs before MPOs must use the model's new emissions factors.”

In consultation with DOT, EPA considered many factors in establishing the length of the grace period, including the degree of change in emissions models and the effects of the new model on the transportation planning process (40 CFR 93.111).

EPA considered the time it will take state and local transportation and air quality agencies to conduct and provide technical support for analyses. State and local agencies will need to become familiar with the MOVES2014 emissions model, and to convert existing data for use in MOVES2014. Since 1993, the fundamental purpose of § 93.111(b) of the transportation conformity rule has been to provide a sufficient amount of time for MPOs and other state and local agencies to learn and employ new emissions models. The transition to a new emissions model for conformity involves more than learning to use the new model and preparing input data and model output. After model start-up is complete, state and local agencies also need to consider how the model affects regional conformity analysis results and whether SIP and/or transportation plan/TIP changes are necessary to assure future conformity determinations.

The two-year conformity grace period is also necessary to provide sufficient time for state and local agencies to learn and apply new technical guidance and training courses that reflect MOVES2014. EPA is working diligently to update these guidance documents and training courses as quickly as possible. EPA will notify MOVES2014 users when these important materials are available, and subsequently, EPA will also work with DOT to provide training for current and new users of the model. Training courses are anticipated to be provided in the form of webinars, other web-based courses, conference seminars, or in-person training. Courses will be developed to address different levels of State and local expertise.

In addition, many agencies will be implementing the transition to PM and CO hot-spot analyses with MOVES2014 for applicable projects in those nonattainment and maintenance areas, with each analysis potentially involving multiple state and local agencies. States with previously approved CO hot-spot protocols (40 CFR 93.123(a)(1)) that are based on a previous model will need time to revise them. As stated above, additional time is necessary to revise previously approved SIPs, and the SIP revision process and state requirements can vary. Finally, EPA considered the general time and monetary resource constraints in which state and local agencies currently operate. These agencies need to participate in EPA and DOT training and possibly provide training to other individuals in their offices.

Upon considerations of all these factors, EPA is establishing a two-year grace period, which begins [insert date of publication in the Federal Register] and ends on **[insert date two years after publication in the FEDERAL REGISTER]**, before

MOVES2014 is required to be used for new transportation conformity analyses, outside of California.

B. Circumstances When Grace Period Will Be Shorter Than Two Years

The grace period for regional conformity analyses will be shorter than two years for a given pollutant if an area revises its SIP and motor vehicle emissions budgets with MOVES2014, and such budgets have been found adequate or approved into the SIP prior to the end of the two-year grace period. In this case, the new regional emissions analysis must use MOVES2014 if the conformity determination is based on a MOVES2014-based budget (40 CFR 93.111).

Areas that are designated nonattainment or maintenance for multiple pollutants may rely on both MOVES2014 and MOVES2010⁷ to determine conformity for different pollutants during the grace period. For example, if an area revises a previously submitted (but not approved) MOVES2010-based PM₁₀ SIP with MOVES2014 and EPA finds these revised MOVES2014 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 the area is nonattainment for PM₁₀ and ozone, the MOVES2014 grace period would end for PM₁₀ regional conformity analyses once EPA found the new MOVES2014-based SIP budgets adequate for PM₁₀ regional conformity analyses begun after the effective date of adequacy finding. However, MOVES2010 could continue to be used for ozone regional emissions analysis begun before the end of the MOVES2014 grace period.⁸ In addition, the length of the grace period for hot-spot

⁷ In the remainder of this notice, "MOVES2010" refers to all of the MOVES2010 models: MOVES2010, MOVES2010a, and MOVES2010b.

⁸ In this example, such an area would use MOVES2014 to develop a regional emissions analysis for

analyses would not be affected by an early submission of MOVES2014-based budgets. In this example, the two-year grace period for PM10 hot-spot analyses would continue to apply even if the grace period is shortened for regional PM10 conformity analyses. EPA Regional Offices should be consulted for questions regarding such situations in multi-pollutant areas.

In addition, in most cases, if an area revises previously approved MOBILE or MOVES2010-based SIP budgets using MOVES2014, the revised MOVES2014 budgets would be used for conformity purposes once EPA approves the SIP revision. In general, EPA will not make adequacy findings for these SIPs because 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 MOVES2014-based budgets would be used for conformity purposes once they have been found adequate, if requested by the state in its SIP submission and specified in EPA's SIP approval. States should consult with their EPA Regional Office to determine if this flexibility applies to their situation.

C. Use of MOVES2014 for Regional Conformity Analyses During the Grace Period

During the conformity grace period, areas should use interagency consultation to examine how MOVES2014 will impact their future transportation plan and TIP

comparison to the revised MOVES2014-based budgets (e.g., PM₁₀ budgets). The regional emissions analysis for ozone could be based on MOVES2010 for the VOC and NO_x budgets in the ozone SIP for the remainder of the conformity grace period.

conformity determinations, including regional emissions analyses. Isolated rural areas should also consider how future regional conformity analyses will be affected when MOVES2014 is required. Areas should carefully consider whether the SIP and budgets should be revised with MOVES2014 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.

Finally, the transportation conformity rule provides some flexibility for completing conformity determinations based on regional emissions analyses that use MOVES2010 that are started before the end of the grace period. Regional emissions analyses that are started during the grace period can use either MOVES2010 or MOVES2014. The interagency consultation process should be used if it is unclear if a MOVES2010-based analysis was begun before the end of the grace period. If you have questions about which model should be used in your conformity determination, you can also consult with your EPA Regional Office.

When the grace period ends on **[insert date two years after publication in the FEDERAL REGISTER]**, MOVES2014 will become the only approved motor vehicle emissions model for regional emissions analyses for transportation conformity in states other than California. In general, this means that all new transportation plan and TIP conformity determinations started after the end of the grace period must be based on MOVES2014, even if the SIP is based on MOVES2010, MOBILE6.2, or an older version of the MOBILE model.

D. Use of MOVES2014 for Project-level Hot-spot Analyses During the Conformity Grace Period

The MOVES2014 grace period also applies to the use of MOVES2014 for CO, PM₁₀ and PM_{2.5} hot-spot analyses. Sections 93.116 and 93.123 of the transportation conformity rule contain the requirements for when a hot-spot analysis is required for project-level conformity determinations.⁹ The transportation 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)). Interagency consultation should be used if it is unclear if a previous analysis was begun before the end of the grace period. For CO, PM₁₀ and PM_{2.5} hot-spot analyses that start during the grace period, project sponsors can choose to use MOVES2010 or MOVES2014.

EPA encourages sponsors to use the consultation process to determine which option may be most appropriate for a given situation. Any new CO, PM₁₀ or PM_{2.5} hot-spot analyses for conformity purposes begun after the end of the grace period must be based on MOVES2014. EPA released guidance on how to conduct quantitative PM_{2.5} and PM₁₀ hot-spot modeling for transportation conformity purposes and will update it to include MOVES2014. See EPA's Project-level [web page](#)¹⁰ for latest information and guidance documents on how to conduct CO, PM₁₀ and PM_{2.5} hot-spot modeling for transportation conformity purposes.

⁹ 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 CFR 93.123(a)(1)). In addition, the transportation 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)).

¹⁰See <http://www.epa.gov/otaq/stateresources/transconf/projectlevel-hotspot.htm>

Any quantitative new CO, PM₁₀ or PM_{2.5} hot-spot analysis for conformity purposes begun after the end of the grace period must use MOVES2014. The interagency consultation process should be used if it is unclear whether these conditions are met. For questions about which model should be used in a project-level conformity determination, consult with your EPA Regional Office.

E. FHWA's CO Categorical Hot-spot Finding

Since FHWA's February 2014 CO categorical hot-spot finding¹¹ for projects affecting intersections is based on MOVES2010b, a project sponsor can continue to rely on this categorical finding during the grace period, as long as the project's parameters fall within the acceptable range of modeled parameters of the categorical hot-spot finding. See <http://www.epa.gov/otaq/stateresources/transconf/projectlevel-hotspot.htm#fhwa> for additional details. Any new CO hot-spot analyses for conformity purposes begun after the end of the grace period may no longer rely on the February 2014 CO categorical hot-spot finding because the finding was based on MOVES2010b.

F. Previously Approved CO SIP Hot-spot Protocols

Section 93.123(a)(1) of the transportation conformity rule allows areas to develop alternate procedures for determining localized CO hot-spot analyses, when developed through interagency consultation and approved by the EPA Regional Administrator. Some states have chosen in the past to develop such procedures based on previously approved EPA emissions models.

During the MOVES2014 grace period, areas with previously approved CO hot-spot protocols based on MOVES2010 may continue to rely on these protocols. Areas

¹¹Section 93.123(a)(3) of the transportation conformity rule allows DOT, in consultation with EPA, to make a categorical hot-spot finding for certain projects based on appropriate modeling.

with previously approved CO hot-spot protocols based on MOBILE6.2 or earlier MOBILE versions can no longer be used, and should have been discontinued at the end of the previous MOVES2010 grace period. Once the MOVES2014 grace period ends, any new CO hot-spot analyses for conformity purposes begun after the end of the grace period may no longer use their previously approved CO hot-spot protocols that were based on MOVES2010.

Dated: September 22, 2014.

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