

# Commuter Programs: Quantifying and Using Their Emission Benefits in SIPs and Conformity

*Guidance for State and Local Air and  
Transportation Agencies*



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Transportation and Climate Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency

### *NOTICE*

*This technical report does not necessarily represent final EPA decisions or positions. It is intended to present technical analysis of issues using data that are currently available. The purpose in the release of such reports is to facilitate the exchange of technical information and to inform the public of technical developments.*

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## Section 1: Background Information

### 1.1 What is the purpose of this guidance?

The purpose of this guidance is to help states or agencies<sup>1</sup> estimate the emission benefits of commuter programs and, under appropriate circumstances, take credit for them in SIPs and conformity determinations. “Commuter programs” are programs that provide incentives or support to employees to reduce the frequency that they drive alone to work, and are offered by private- and public-sector employers throughout the country. Through these commuter programs, the numbers of vehicle trips and miles, and hence, emissions of criteria pollutants, as well as greenhouse gases, are reduced in many communities. This has led to an interest on the part of planners in some areas to incorporate the criteria pollutant benefits into their state implementation plans (SIPs) or transportation conformity determinations.

Commuter programs can be incorporated into the SIP as mandatory measures, an Economic Incentive Program (EIP) or as a voluntary mobile source measure.<sup>2</sup> For each of these options, a different entity may administer and evaluate the commuter program’s measures. For example, a voluntary measure program may be entirely administered by individual employers. EPA has issued comprehensive guidance documents for each of these types of SIP measures, and you should consult the guidance for the type of SIP submission in which you are interested as this guidance does not reiterate all the requirements for each.

Quantifying the emissions benefits from commuter programs is covered in Section 2, which has information regarding the basic submission and quantification requirements for commuter programs in SIPs and conformity.

This guidance supersedes the 2007 document, “Guidance for Quantifying and Using Emission Reductions from Best Workplaces for Commuter Programs in State Implementation Plans and Transportation Conformity” (EPA420-B-07-015). In addition, with the release of EPA’s MOtor Vehicle Emissions Simulator (MOVES) model, the COMMUTER model described in the 2007 guidance can no longer be used, as it was based on MOBILE, the model that preceded MOVES. The 2007 guidance and the COMMUTER model have been removed from EPA’s website.

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<sup>1</sup> This document uses “state or agency” to refer to those entities that have authority to submit a SIP or conformity determination, such as a local or state government, regional transit authority, local or regional transportation planning agency or state or regional air quality agency.

<sup>2</sup> EPA’s Economic Incentive Program guidance and Mobile Source Voluntary Measures Policy can be found on EPA’s web site at: [http://www.epa.gov/otaq/stateresources/policy/pag\\_guidance.htm](http://www.epa.gov/otaq/stateresources/policy/pag_guidance.htm) and also at: <http://www.epa.gov/ttn/ecas/incentiv.html>.

## 1.2 What are commuter programs, and how do they work?

Commuter programs are those programs that reduce the frequency that employees drive alone to work. These programs are usually offered to employees by their employer, but other organizations, such as a business park, downtown district, developer, or property owner may provide them. These programs can consist of any of the following components:

- Free or reduced cost fares for public transportation (such as subway cards, bus tokens, or train tickets),
- Transit and vanpool vouchers and subsidies,
- Services to facilitate vanpools and carpools (such as providing vans, ride-matching, and guaranteed ride home services),
- Park and Ride subsidies,
- Telecommuting options (so employees can work at home more often),
- Proximate Commuting: a program that matches employees of multi-site employers (such as banks or chain stores) to the branch office nearest their home,
- Incentives to bike and walk, and
- Parking Cash Out: employees can trade employer-paid parking space for cash or other benefits.

**Commuter Choice program** means an organized program to encourage employers to offer flexible commuter benefit options to employees.

**Best Workplaces for Commuters<sup>SM</sup>** is a innovative membership program that provides qualified employers with national recognition for offering outstanding commuter benefits. BWC assists participating employers by offering public recognition and promotion, technical assistance, training, web-based tools, and forums for information exchange.

**Commuter benefit options** are any of a number of flexible commute benefits offered by employers. Basic Commuter Choice alternatives include transit benefits, vanpool benefits, cash, or parking.

With more options, commuters can be expected to use single-occupant vehicles less often. Reducing the frequency that commuters drive alone generates air quality benefits. Air quality improvements are due to the reduction of emissions associated with a reduction in vehicle miles traveled. The Clean Air Act acknowledges these types of programs at Section 108(f), which includes a list of categories of “transportation control measures.” Several of the categories on the Section 108(f) list could describe commuter programs, or the components of one, such as,

- “(iii) employer-based transportation management plans, including incentives;”
  - “(viii) programs for the provision of all forms of high-occupancy, shared-ride services;” and
  - “(x) programs for secure bicycle storage facilities and other facilities...”,
- among others.

### **1.3 Does this guidance create any new requirements?**

This guidance does not create any new requirements, but explains to state and local air agencies, transportation agencies, MPOs, and the general public how the air quality benefits of commuter programs could be included in a SIP or in a transportation conformity determination. The Clean Air Act (CAA) and implementing regulations contain legally binding requirements. SIP requirements can be found in Clean Air Act sections 110(a)(2) and 172(c). Transportation conformity requirements can be found in Clean Air Act section 176(c) and applicable regulations (40 CFR Parts 51 and 93). This guidance document does not substitute for those provisions or regulations, nor is it a regulation itself. Thus, it does not impose binding, enforceable requirements on any party, and may not be applicable in all situations. EPA and State decision makers retain the discretion to adopt approaches for approval of SIP measures that differ from this guidance where appropriate and consistent with applicable law and regulations. Any final decisions by EPA regarding a particular SIP measure will only be made based on the statute and regulations in the context of EPA notice and comment rulemaking on a submitted SIP revision. This guidance may be revised periodically without public notice.

### **1.4 Who should I contact if I have questions on this guidance?**

If you are interested in including the emission benefits of a commuter program into a SIP or transportation conformity determination, please contact the EPA Regional Office with responsibility for air quality planning in the relevant area. A contact list of EPA Regional Offices is available at the following web address:

<http://www.epa.gov/otaq/transp/conform/contacts.htm>

For general questions regarding this document, please contact Laura Berry at (734) 214-4858 or [berry.laura@epa.gov](mailto:berry.laura@epa.gov).

## **Section 2: Basic Requirements for Using Emissions Reductions from Commuter Programs**

### **2.1 What are the basic requirements for using emission reductions in SIPs?**

In order to be approved as a measure which provides additional emission reductions in a SIP, a control measure – in this case, a commuter program – cannot interfere with other requirements of the CAA, and would need to be consistent with SIP reasonable further progress, attainment, or maintenance requirements, as applicable. In addition, the control measure must provide emission reductions that meet the requirements described below.

(A) Quantifiable - The emission reductions from a control measure are quantifiable if they can be reliably measured or modeled, and the quantification can be replicated. Emission reductions must be calculated for the time period for which the reductions will be used in the SIP. See Section 2.5 for more information on quantifying emission reductions from commuter programs.

(B) Surplus - Emission reductions are generally surplus if they are not otherwise relied on to meet other applicable air quality attainment and maintenance requirements (i.e., no double-counting of emission reductions). In the event that the measure is used to meet such air quality-related program requirements, the measure is no longer surplus and may not be used for additional credit.

(C) Federally Enforceable - Depending on how the emission reductions are to be used, control measures must be enforceable through a SIP. Where the emission reductions are part of a rule or regulation for SIP purposes, they are considered federally enforceable if they meet all of the following requirements:

- They are independently verifiable.
- Violations are defined, as appropriate.
- The state or agency and EPA have the ability to enforce the measure if violations occur.
- Those liable for violations can be identified.
- Citizens have access to all the emissions-related information obtained from the responsible party.
- Citizens can file suits against the responsible party for violations.
- Violations are practicably enforceable in accordance with EPA guidance on practicable enforceability.
- A complete schedule to implement and enforce the measure has been adopted by the implementing agency or agencies.

Because commuter programs may rely on voluntary actions of individuals and other parties, these programs may be considered under EPA's "Guidance on Incorporating

Voluntary Mobile Source Emission Reduction Programs in State Implementation Plans (SIPs)” (the VMEP guidance).<sup>3</sup> The purpose of the VMEP guidance is to support innovative methods in achieving emission reductions for SIPs. If a SIP revision that relies on the VMEP guidance is approved, the state is responsible for assuring that the reductions credited in the SIP occur. The state would need to make an enforceable SIP commitment to monitor, assess and report on the emission reductions resulting from the voluntary measure and to remedy any shortfalls from forecasted emission reductions in a timely manner.

Under the VMEP guidance, the amount of emission reductions allowed for voluntary mobile source measures, including commuter programs, in a SIP is not expected to exceed three percent of the total reductions needed to meet any requirements for reasonable further progress, attainment or maintenance, as applicable.<sup>4</sup>

(D) Permanent - The emission reduction must be permanent throughout the time period that the reduction is used in the applicable SIP.

(E) Adequately Supported – The state must demonstrate that it has adequate funding, personnel, and other resources to implement the control measure on schedule.

## **2.2 What must a state submit to EPA to meet the requirements for incorporating a commuter program as a control measure in a SIP?**

The state must submit to EPA a document which:

- Identifies and describes the commuter program and its implementation schedule to reduce emissions within a specific time period;
- Contains estimates of emission reductions attributable to the commuter program, including the methodology and all other relevant technical support documentation for your estimates (you must rely on the most recent information available at the time the SIP is developed);
- Either contains federally enforceable requirements for the state to implement, track, and monitor the commuter program; or if the measure is developed under the VMEP guidance, the state includes an enforceable commitment to monitor, assess and report the resulting emission reductions of the commuter program;

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<sup>3</sup> This guidance is found at: [www.epa.gov/otaq/stateresources/policy/pag\\_guidance.htm](http://www.epa.gov/otaq/stateresources/policy/pag_guidance.htm) .

<sup>4</sup> EPA acknowledges that it may be possible to demonstrate that voluntary measures may achieve credible reductions higher than the three percent cap. In that case, EPA will re-evaluate that cap on a case-by-case basis and allow the cap to be exceeded if the cap hinders the implementation of effective voluntary control measures, subject to notice and comment during SIP approval. Interested parties should refer to the VMEP guidance for more information when a specific commuter program is under development.

- If the measure is developed under the VMEP guidance, includes an enforceable commitment to remedy any SIP emissions shortfall in a timely manner in the event that the commuter program does not achieve the estimated emission reductions; and
- Meets all other requirements for SIP revisions under sections 110 and 172 of the CAA.

### **2.3 How can the estimated emission reductions be used for SIP purposes?**

For a reasonable further progress, attainment or maintenance SIP, you can use the emission reductions produced from the commuter program by applying the following criteria:

(A) Where required, emission reductions must account for seasonality. For example, if your SIP credits only those reductions which take place during the summer ozone season, then only reductions which take place during that season may be credited.

(B) An appropriate baseline must be chosen, so that the reductions are estimated only from measures that are not already accounted for in the baseline estimates. For example, if commuter programs were already in effect when the SIP was developed and were accounted for in the SIP's baseline, the emission reductions associated with implementation or continuation of those same programs cannot be included as surplus emission reductions for the SIP.

(C) 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. In addition, the latest emissions model approved by EPA must be used in quantifying reductions from SIP control measures that are under development. State, local, and other interested agencies should consult with their EPA Regional Office on the latest approved MOVES model for use in quantifying motor vehicle emissions in most states and the latest approved Emission FACTor (EMFAC) model for use in California.

### **2.4 How can the emission reductions be used for transportation conformity purposes?**

The transportation conformity regulation (40 CFR Part 93) describes the requirements for including emission reductions from on-road mobile control measures in a conformity determination for a transportation plan, transportation improvement program (TIP), or transportation project. The conformity rule requires a regional emissions analysis be

conducted for the transportation plan and TIP. In the regional emissions analysis, the emissions from the planned transportation system are estimated or modeled, just as they are when creating or revising a SIP's motor vehicle emissions budget. If credit is obtained for a commuter program in the SIP's motor vehicle emissions budget, transportation agencies should also include the credit in the regional emissions analysis of the transportation conformity determination to the extent the program is being or will be implemented and appropriate commitments have been made, as described below.

To include emission reductions from a commuter program in a regional emissions analysis, the appropriate jurisdictions must be committed to implementing the measure. The appropriate level of commitment varies according to the requirements outlined in 40 CFR 93.122(a), which are described as follows:

(A) If the measure does not require a regulatory action to be implemented, it can be included in an emissions analysis if it is included in the transportation plan and TIP with sufficient funding and other resources for its full implementation.

(B) If the measure requires a regulatory action to be implemented, it can be included in an emissions analysis if one of the following has occurred:

- (1) The regulatory action for the measure is already adopted by the enforcing jurisdiction (e.g., a state has adopted a rule to require a control measure);
- (2) The measure has been included in an approved SIP; or
- (3) There is a written commitment to implement the measure in a submitted SIP with a motor vehicle emissions budget that EPA has found adequate.

(C) If an on-road mobile measure is not included in the transportation plan and TIP or the SIP, and it does not require a regulatory action to be implemented, then it can be included in the regional emissions analysis if the conformity determination contains a written commitment from the appropriate entities to implement the measures. Section 93.101 of the conformity rule defines what is intended by a "written commitment."

Whatever the case, the emission reductions from a commuter program can only be applied in a conformity determination for the time period or years in which the measure will be implemented and in effect. Written commitments must come from the agency with the authority to implement the measure. The latest emissions model and planning assumptions that are available must be used when calculating emission reductions from the measure, according to 40 CFR 93.110 and 93.111.

Areas should utilize the conformity interagency consultation process to discuss the methods and assumptions used to quantify the reductions from the measure. The conformity determination should include documentation of the methodology, assumptions, and models that were used to calculate emission reductions from the commuter program as well any commitments that are necessary for implementation, as

described above.

## **2.5 What quantification methodologies are available to estimate emission reductions of commuter programs for SIPs and transportation conformity determinations?**

If a commuter program is considered to be regionally significant, then the travel impacts of the program should be considered in the context of a nonattainment or maintenance area's regional travel demand forecasting.<sup>5</sup> (See 40 CFR 93.122 for applicable procedures for determining regional transportation-related emissions.) The interagency consultation process should be used to determine which projects are considered regionally significant (see 40 CFR 93.105(c)(1)(ii)). An example of the regionally significant project may be a campaign to implement commuter programs for all employers of a certain size or number of employees throughout a metropolitan area. However, EPA expects that the majority of commuter programs would not be regionally significant, and therefore the emission reductions could be quantified using modeling techniques other than regional travel models (i.e., "off-model" techniques or methodologies). State, local, and federal air quality and transportation agencies should consult on what methods and data are appropriate for quantifying the impacts of commuter programs for SIPs and conformity determinations.

To estimate the emission reductions due to commuter programs, the recommended approach is to estimate the number of commuters who would change their mode of travel (i.e., single-occupant vehicle (SOV), carpool, vanpool, transit, bicycle, etc.) or trip-making behavior (e.g., telecommuters will no longer be making regular worktrips) in response to incentives, assistance, or support offered through a commuter program. From this, the resultant change in vehicle activity could be calculated. The next step would be to use this information with the latest emissions model approved by EPA (i.e., the latest version of MOVES or EMFAC in California) to estimate the emissions that the commuter program would reduce.<sup>6</sup>

Forecasting travel behavior impacts is typically the most challenging aspect of quantifying a commuter program. Commuter programs can have a wide range of effectiveness, based on the details of the particular programs and their implementation context. The following paragraphs describe currently available tools for quantifying the

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<sup>5</sup>Section 93.101 of the transportation conformity rule defines a "regionally significant project" as applying to a project that is on a facility that serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc. or transportation terminals as well as most terminals themselves) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.

<sup>6</sup> The latest version of EPA's Motor Vehicle Emission Simulator (MOVES) model, as well as model guidance, the user guide, and other documentation can be found on EPA's website at: <http://www.epa.gov/otaq/models/moves/index.htm>. The latest version of California's EMFAC model and model documentation can be found on the California Air Resources Board website at: <http://www.arb.ca.gov/msei/modeling.htm>.

travel impacts of non-regionally significant commuter programs.

#### Available Tools for Non-regionally Significant Measures

For commuter programs that are not regionally significant, EPA may accept the use of other methodologies and analytic tools, in combination with the latest emissions model approved by EPA, to estimate the emission reductions of commuter programs for SIPs and conformity purposes. As mentioned above, EPA expects that the majority of commuter programs would not be regionally significant.

For example, the Center for Urban Transportation Research TRIMMS (Trip Reduction Impacts of Mobility Management Strategies) is one such tool that can estimate the change in vehicle activity from a commuter program, and others are also available.

#### Considerations for Data for Quantification of All Commuter Programs

When quantifying the impacts of commuter programs, a state or agency should carefully consider the underlying data utilized to estimate travel behavior, especially if using off-model and sketch planning techniques. The interagency consultation process should be used when deciding the appropriate inputs and methods for quantifying the emissions reductions associated with commuter programs. The following items should be considered when quantifying the travel impacts of any commuter program.

(A) Reasonable assumptions for employee participation. A state or agency should assume a reasonable level of participation from eligible employees, since not every eligible employee may be expected to take advantage of a commuter program. Survey methods can be used to capture the level of employee participation, both before and after a measure has been implemented. For example, a survey of employees at an employment site may be performed to determine how many people expect to use or have actually used employer-subsidized transit passes. Pre- and post-implementation surveys of actual travel behavior are often both feasible and necessary if the effectiveness of a commuter program is to be evaluated retrospectively.

(B) Experience from other areas. In some cases, a state or agency may be able to use input information from other nonattainment or maintenance areas when an area does not have such local information. For example, a study may have found in another area that five percent of office workers will telecommute one day a week if provided the opportunity. It is important to consider whether information from another area is appropriate to apply to your area.

(C) Elasticities. Finally, a state or agency should use the most appropriate elasticity assumptions for travel decisions when quantifying commuter programs. An elasticity says that an X percent change of an input variable (e.g., the cost of parking) produces a Y percent change of an output variable (e.g., drive-alone mode share). Elasticities may be developed from direct observation or from coefficients of a model such as a

mode choice model. While such elasticities can account for different levels of the input variable, they are not necessarily valid outside the range for which they were developed. For example, an increase in the cost of parking from \$0.00 to \$1.00 is an infinite percentage change, producing meaningless results. Also, elasticities developed in one setting cannot necessarily be assumed accurate in another setting. For example, the elasticity describing how driving alone varies with the percentage change in the cost of parking developed from a dense urban area with extensive transit alternatives would be different from that same elasticity developed in a suburban area with limited transit.

Another important consideration is interaction among strategies. Some strategies may complement each other (e.g., parking management and ridesharing incentives), leading to cumulative effects greater than the sum of the effects of the strategies if applied individually. Conversely, in some cases the effects of multiple programs may be smaller than the sum of their individual effects.

## **2.6 What types of penalties can be assessed for not complying with CAA requirements?**

Use of this guidance does not relieve you of any obligation to comply with all otherwise applicable CAA requirements, including those pertaining to the crediting of emission reductions for your SIP, such as for your attainment demonstration or maintenance plan. Violations of CAA requirements are subject to administrative, civil, and/or criminal enforcement under Section 113 of the CAA, as well as to citizen suits under Section 304 of the CAA. The full range of penalty and injunctive relief options would be available to the federal or state government (or citizens) bringing the enforcement action.