



CPRG Tools and Technical Resources – Transportation Sector

This webpage provides a list of tools and resources that support CPRG Planning Grantees meet the sector-based requirements for the Priority Climate Action Plan (PCAP) and the Comprehensive Climate Action Plan (CCAP) if it includes the transportation sector as a priority sector. The requirements are laid out in the Program Guidance for [States, Municipalities, and Air Pollution Control Agencies](#) and [Federally Recognized Tribes, Tribal Consortia, and U.S. Territories](#).

EPA and other federal organizations publish and maintain a variety of resources that grantees may leverage to meet these requirements, including [Transportation Sector Emissions Data](#), [Transportation Sector Emissions Quantification Methods and Tools](#), and on [Understanding Transportation Sector Emission Reduction Opportunities](#). These resources are further described below.

Note: EPA does not require the usage of a specific dataset or tool, or the inclusion of any particular measure type.

Visit the [Greenhouse Gas \(GHG\) Inventory and Projections](#) webpage for more information on GHG inventory and projections data, methods, tools, and resources.

Where to get started?

The resources below broadly describe transportation sector GHG emissions and strategies to reduce them. They can help grantees begin to consider approaches to reducing emissions in their jurisdiction.

- The [U.S. National Blueprint for Transportation Decarbonization](#) is a strategy for cutting all GHG emissions from the transportation sector by 2050. The Blueprint was developed by the EPA, along with Department of Energy (DOE), Department of Transportation (DOT), and Housing and Urban Development (HUD). Section 4 of the Blueprint, titled “Strategies to Decarbonize Transportation,” discusses various strategies that can be implemented to achieve a clean, safe, secure, accessible, affordable, equitable, and decarbonized transportation system, which may be useful to grantees.
- The [Why We Need to Decarbonize Transportation](#) webpage details why the transportation sector is critical in the United States’ goal of a net-zero GHG economy by 2050.
- [Fast Facts on Transportation GHG Emissions](#) provides background information on emissions by sector, and could be a useful primer for state, local, and tribal governments in transportation planning.

- EPA's [State and Local Transportation Resources](#) includes two sections that may be of interest to grantees:
 - [Estimating GHG Emissions](#) contains resources for state and local planners interested in estimating GHG emissions from the on-road transportation sector with EPA's MOVES model as well as assessing the potential of on-road travel efficiency strategies for reducing both GHG and criteria pollutant emissions.
 - [Guidance on Control Strategies for State and Local Agencies](#) covers specific strategies for reducing on-road emissions, including commuter programs, diesel replacements (includes replacing diesel vehicles and equipment with electric vehicles and equipment), land use, locomotive idle reduction, transportation control measures, and transportation pricing.
- EPA's [Quantified Climate Action Measures Directory](#) presents information on the quantified greenhouse gas (GHG) emission reduction measures in state and local climate action plans published between January 2018 and August 2023. Grantees may use this tool to draw inspiration for PCAP and CCAP emissions reductions measures and understand how they were quantified by states, MSAs, and tribes of similar sizes, geographies, economic conditions, etc.
 - [Access the State Quantified Measures Directory](#).
 - [Access the Local Quantified Measures Directory](#).

Note: There are transportation sector training recordings and supplemental resources for CPRG Planning grantees located on the CPRG Technical Assistance Forum (TAF) Resource Library SharePoint site. If you are planning grantee, planning grantee partner, or TAF participant and would like access to the site, please contact cprg.epa@endyna.com.

Transportation Sector Emissions Data

This section can help equip grantees with critical information needed to meet PCAP and CCAP requirements. The emissions data resources below can help grantees identify emission reduction opportunities and build a solid data foundation for quantifying and assessing the impact of their GHG reduction measures.

- EPA's [Motor Vehicle Emission Simulator \(MOVES\)](#) is a state-of-the-science emission modeling system that can be used to estimate emissions for mobile sources at the national, county, and project level for GHGs, criteria air pollutants, and air toxics. MOVES can also estimate energy consumption. MOVES estimates emissions from on-road mobile sources (i.e., on-road vehicles such as cars, trucks, and buses) and from most nonroad emissions sources as well (with the exceptions of locomotives, marine vessels, and aircraft). MOVES can be used to estimate inventories for states, municipalities, and tribes. As MOVES can model through the year 2060, MOVES is the ideal tool to use for transportation sector emission projections for future years.
 - EPA's [MOVES website](#) provides guidance on mobile source emissions modeling:
 - Quantifying GHGs is covered in the MOVES Greenhouse Gas Guidance: Using MOVES for Estimating State and Local Inventories of Onroad and Nonroad Greenhouse Gas Emissions and Energy Consumption.

- Quantifying co-pollutants (criteria pollutants/precursors and air toxics) is covered in the MOVES Technical Guidance: Using MOVES to Prepare Emission Inventories for State Implementation Plans and Transportation Conformity.
- EPA's [MOVES Training website](#) provides additional training resources.
- Bureau of Transportation Statistics' [Estimated U.S. Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline and Diesel](#) [↗](#) includes CO₂ and co-pollutant emission factors, and energy consumption rates for a variety of vehicle types, fuels, and calendar years as calculated in MOVES.
- EPA's [GHG Emission Factors Hub](#) lists CO₂, CH₄, and N₂O emission factors from mobile source combustion. Emission factors are provided for several fuel types, vehicle types, and years for both onroad and nonroad sources.

Transportation Sector Emissions Quantification Methods and Tools

The following resources provide tools and methods for quantifying GHG emission reductions for the transportation sector. These methods and tools can be used by states, local governments, Tribes, and territories to quantify GHG reduction measures in their PCAPs and CCAPs.

Quantification Methods

The following resource provides methodologies for quantifying GHG emission reductions for the transportation sector. These methods can be used to quantify GHG reduction measures in climate action plans.

- EPA's [Port Emissions Inventory Guidance](#) provides methodologies for developing port- and other goods movement related GHG emissions inventories that include criteria air pollutants and precursors, mobile source air toxics, and energy consumption and can also provide future year projections. This document describes the latest, state of the science methods for preparing an emissions inventory for the various sources of emissions at a port or other goods-movement facility, including ocean-going vessels, harbor craft, recreational marine vehicles, cargo handling equipment, on-road vehicles, and rail, and includes how to project a future year inventory for each of these sources.
 - The [Port Emission Inventory Guidance – Public Webinar Slides](#) cover the methodologies described in the guidance to prepare a port-related emissions inventory for landside and waterside emissions across six port-related sectors: ocean going vessels, harbor craft, recreational marine, cargo handling equipment, on-road vehicles, and rail. The webinar covers the data inputs, methods, and analysis approaches available for developing base year and future year inventories of varying levels of detail and geographic scopes based on user capacity, available resources, and intended end use of the inventory.
- EPA's [Travel Efficiency Assessment Method \(TEAM\)](#) uses transportation sketch modeling, readily available travel activity data sets, and EPA's MOVES emissions model to estimate the potential future GHG and criteria air pollutant emission reductions from combinations of travel efficiency strategies,

including employer-based transportation management programs, transit improvements, transportation pricing, land use changes, and bicycle and pedestrian programs.

- The [TEAM User Guide](#) provides a step-by-step guide for using TEAM to assess the potential of on-road travel efficiency strategies to change travel behavior and reduce criteria pollutant and GHG emissions. This document is intended for use by state, tribal, and local agencies, non-governmental organizations, and other interested in reducing transportation-related emissions. This document explores the process of selecting strategies of interest, estimating changes in vehicle miles traveled (VMT) using a sketch planning tool and off-model tools, and estimating the emissions benefits using EPA's MOVES model. See EPA's Travel Efficiency website for additional information on TEAM, supporting materials, and several case studies across the United States.
- The [Guidance for Estimating Emission Benefits of Replacing Diesel Vehicles and Engines with Electric Versions](#) provides information on quantifying and using emission reductions from highway and nonroad diesel vehicles, engines, and equipment that have been replaced with zero-emissions technologies.

Quantification Tools

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 - EPA's [MOVES Training website](#) provides additional training resources.
- EPA's [Diesel Emission Quantifier \(DEQ\)](#) is an interactive, web-based tool for users with little or no modeling experience to evaluate clean diesel projects, zero-emissions projects, and upgrade options for medium-heavy and heavy-heavy duty diesel engines. The DEQ provides estimates of the baseline emissions, reduced emissions, cost effectiveness for NO_x, PM_{2.5}, HC, CO and CO₂, and PM-related health benefits. The DEQ's emissions factors are based on EPA's MOVES model.
 - The [DEQ User Guide](#) provides instructions on using the tool.

- The [Shore Power Emissions Calculator](#) is a Excel-based tool that calculates emissions of GHG and criteria air pollutants based on vessel and fuel inputs, and the regional electricity grid mix.
 - The [Shore Power Emissions Calculator User Guide](#) [↗](#) in Excel provides instructions on using the tool.
- The DOT [Congestion Mitigation and Air Quality \(CMAQ\) Improvement Program Toolkit](#) [↗](#) involves a series of spreadsheet tools to provide technical support and resources for the implementation of the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. The tools calculate emissions for CO, PM2.5, PM10, NOx, VOC, CO2, and CO2e, for a variety of measures including bike and pedestrian infrastructure improvement, increased transit frequency, freight modal shifting, carpooling, and EV charging. The toolkit's emissions factors are based on EPA's MOVES model.
 - The DOT provides brief (3–4-minute) [video trainings](#) [↗](#) for each tool or set of related tools.
- [GLIMPSE](#) is model-based tool designed to support coordinated air, climate, and energy planning. At the heart of GLIMPSE is the [Global Change Analysis Model \(GCAM-USA\)](#) [↗](#), an open-source human-Earth system model with state-level resolution. GLIMPSE simulates the co-evolution of the energy, agriculture, water, land, economic, and climate systems, tracking technology and fuel use, as well as the resulting GHG and air pollutant emissions. GLIMPSE has multi-sector, multi-pollutant coverage over the time period of 2015 through 2100 in 5-year increments. One of its strengths is in simulating the interactions among sectors; however, GLIMPSE has less sectoral detail than many sector-specific models. GLIMPSE may be useful for activities such as developing emission projections, identifying strategies for meeting specific GHG reduction targets, and quantifying the long-term emission impacts of specific mitigation measures or of bundles of measures. For transportation sector analyses, GLIMPSE allows users to specify measures such as electrification targets for light and heavy-duty vehicles, estimating their net impacts on GHG and air pollutant emissions, including changes in emissions from on road sources, power plants, refineries, and other sectors of the economy. GLIMPSE can also be used to explore the impacts of measures implemented in combination, such as pairing an electric vehicle sales target with a Clean Energy Standard.
 - The [GLIMPSE Users Guide](#) provides instructions and guidance for state, local, and tribal air and energy officials.
 - [The GLIMPSE webpage](#) will announce upcoming information sessions and training opportunities. Interested grantees may email glimpse@epa.gov to obtain a link to the GLIMPSE download folder, which also includes videos of training sessions.
- EPA's [AVoided Emissions and geneRation Tool \(AVERT\)](#) is a web or Excel-based tool used for evaluating scenarios of county, state, and regional changes in emissions from electric power plants and displaced fuel-burning vehicles resulting from energy policies and programs such as energy efficiency, renewable energy, and electric vehicles. AVERT is designed to be used for quantifying policies with GHG reduction contributions from a combination of covered sectors, rather than for standalone transportation measures.
 - [This webinar page](#) includes a recording and slides that outline the new features of the latest version of AVERT.


Understanding Transportation Sector Emission Reduction Opportunities

The resources below focus on areas of the transportation sector where opportunities for GHG emissions reductions might be found. The resources can help grantees refine emissions reduction strategies and select measures to implement their strategies in their PCAP and CCAP.

Transition to Clean Vehicles

Transitioning from conventional gasoline and diesel fuel vehicles to cleaner alternatives, such as electric or biofuel vehicles, and adopting more fuel-efficient vehicle standards can help reduce transportation sector emissions. The following resources provide information and tools related to clean vehicle transition activities that could be utilized as part of a PCAP or CCAP.

- [DOE's webpage on Electric Vehicle Charging Stations](#) [↗](#) has information on planning for EV charging infrastructure, considerations for procurement, installation, operation and maintenance, and resources for charging at multifamily housing and the workplace.
- [DOT's National Electric Vehicle Infrastructure \(NEVI\) page](#) [↗](#) contains information on EV charging infrastructure and resources on NEVI formula funding.
- The [Joint Office of Energy and Transportation website](#) [↗](#) contains resources and information on electric vehicles (EVs), including the [Public Electric Vehicle Charging Infrastructure Playbook](#) [↗](#) page, which includes information about how to site, install, and fund EV chargers, and the [Publications](#) [↗](#) page, which includes reports affiliated with the Joint Office of Energy and Transportation and its mission to support the deployment of zero-emission, convenient, accessible, and equitable transportation infrastructure.
- The [Green Vehicle Guide website](#) contains resources and information on vehicles that are more efficient and are lower polluting, including the [GHG Emissions from a Typical Passenger Vehicle](#) page, which includes information about how to calculate CO2 emissions from a passenger vehicle.
- The [Automotive Trends Report](#) provides public information about new light-duty vehicle GHG emissions, fuel economy, technology data, and auto manufacturers' performance in meeting the agency's GHG emissions standards.
- [Fuel Economy](#) [↗](#) is a jointly managed DOE/EPA website. It provides fuel economy estimates, energy and environmental impact ratings, fuel-savings tips, and other useful information, including mile per gallon (MPG) ratings for passenger cars, light duty trucks, and SUVs from 1984 to the present, EPA smog and ratings, links to fuel prices and safety ratings, and tax incentives for electric vehicles. The website also provides calculators and other tools which may be of interest to state, local, and tribal governments in PCAP/CCAP development, such as the Fuel Savings Calculator, GHG Emissions Calculator, and My Plug-in Hybrid Calculator. Information available at this site can help quantify GHG emission reductions from electric and other alternative fuel vehicles.
- [EPA's Automotive Trends Report](#) shares information about passenger vehicle's GHG emissions, fuel economy, and auto manufacturers' performance meeting EPA's GHG standards.

- The [Technical Assistance and Resources for Tribal Nations](#)  webpage offers general information about electric vehicles (EVs), access to technical assistance through the Joint Office of Energy and Transportation and the U.S. DOE Office of Indian Energy Policy and Programs, and current funding opportunities available to tribal nations for electrified transportation.

Sustainable Communities

Development and conservation strategies can help reduce transportation sector GHG emissions by supporting low-emission transportation modes, such as transit, walking, and biking, and more sustainable land use practices. The following resources provide information and tools related to sustainable community measures that could be adopted as part of a PCAP or CCAP.

- EPA's [Smart Growth Resources](#) cover a range of development and conservation strategies that help protect health and the environment, with the aim of making communities more attractive, economically stronger, and more socially diverse. Development guided by smart growth principles can minimize air and water pollution, reduce GHG emissions, encourage cleanup and reuse of contaminated properties, and preserve natural lands.
- [Recommendations for Constructing Roadside Vegetation Barriers to Improve Near-Road Air Quality](#) report summarizes research on the best practices for building roadside vegetative barriers to improve air quality, which could be useful for any plan considering CO₂ sequestration and methane removal. This resource can ensure the plantings provide GHG and air quality benefits and avoid the unintended consequences that improperly designed and planted vegetation can create.
- EPA's [Travel Efficiency Assessment Method \(TEAM\)](#) uses transportation sketch modeling, readily available travel activity data sets, and EPA's MOVES emissions model to estimate the potential future GHG and criteria air pollutant emission reductions from combinations of travel efficiency strategies, including employer-based transportation management programs, transit improvements, transportation pricing, land use changes, and bicycle and pedestrian programs.

Reducing Emissions from Ports and Freight Corridors

Technical and operational improvements can help reduce GHG emissions for port and freight corridors. The following resources provide information related to port and freight corridors that could be adopted as part of a PCAP or CCAP.

- EPA's [National Port Strategy Assessment](#) examines current and future emissions in port areas; explores available strategies to reduce GHG, criteria air pollutant, and air toxic emissions from port-related trucks, locomotives, cargo handling equipment, harbor craft, and ocean-going vessels port-related vehicles; and provides an assessment tool for state and local governments, ports and port operators, Tribes, communities, and other stakeholders.
- The 2022 Update to the [Shore Power Technology Assessment at U.S. Ports](#) assesses the technical and operational aspects of shore power systems in the U.S.

Improve Freight Operational Efficiency

Operational strategies to support improved efficiency for different freight modes can reduce fuel use, resulting in lower GHG emissions. The following resources provide information and tools on operational approaches to reduce freight GHG emissions that could be adopted as part of a PCAP or CCAP.

- EPA's [SmartWay and Sustainable Transportation Supply Chains](#) program helps freight shippers, carriers, logistics companies and other stakeholders, partner with EPA to measure, benchmark and improve logistics operations so they can reduce their environmental footprint, including reducing emissions of GHG and other pollutants. SmartWay has developed a list of [verified technologies](#) and strategies to improve performance that save fuel and reduce emissions, which may be of use to state, local, and tribal governments.

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