



MEMORANDUM

TO: TPB Technical Committee
FROM: Erin Morrow, TPB Transportation Engineer
Dusan Vuksan, TPB Transportation Engineer
SUBJECT: Overview of COG and MPO Greenhouse Gas Work Activities in the Metropolitan Washington Region
DATE: August 30, 2019

This memorandum provides an overview of current and completed work related to on-road transportation (mobile source) greenhouse gas (GHG) emissions in the metropolitan Washington region. The work activities are being conducted at the Metropolitan Washington Council of Governments (COG) through its Department of Transportation Planning (COG-DTP) and Department of Environmental Programs (COG-DEP).

Beginning

Concluding almost a yearlong effort by its staff and the staff of its member jurisdictions, the COG Board of Directors adopted the National Capital Region Climate Change Report in November 2008. The most notable outcome from this report was the adoption of non-sector-specific aspirational targets that the Climate Change Steering Committee chose for reducing greenhouse gas emissions (GHG) in the region. The targets adopted by the COG Board with the adoption of the report are:

- By 2012, GHG levels will be 10% below “business as usual” forecasts
- By 2020, GHG levels will be 20% below 2005 levels
- By 2050, GHG levels will be 80% below 2005 levels

Work Activities

Since the adoption of the National Capital Region Climate Change Report by the COG Board in 2008, there have been several study efforts and other work activities which either focused solely on or included greenhouse gases. Some of the GHG-related work activities are conducted under the purview of the COG Board and its relevant committees, while others are carried out by the independent metropolitan planning organization (MPO), the National Capital Region Transportation Planning Board (TPB).

Regardless of the project oversight, for most work activities, greenhouse gas emissions for mobile or on-road transportation are estimated by staff in COG-DTP using the federally recommended emissions model and regionally adopted set of transportation planning assumptions at the time of the analysis. Those emissions may be transmitted to COG-DEP staff for use in studies they support. In limited instances, local jurisdiction staff develop GHG emissions estimates from the transportation sector based on data provided by COG-DTP staff.

Table 1 lists the GHG related work activities completed within the transportation sector. Depending on the activity, the work was conducted under the auspices of the TPB with input from COG-DEP, as with the “What Would it Take?” Scenario Study, or completed as a joint effort of the TPB, COG-DEP and COG Board, as with the Multi-Sector Working Group.

Table 1: Completed Work Activities

Work Activity	Date Completed
National Capital Region Climate Change Report	November 12, 2008
“What Would it Take?” (WWIT) Scenario Study	May 19, 2010
Multi-Sector Working Group (MSWG)	January 18, 2017

Table 2 lists the current / ongoing work activities that COG-DTP staff are engaged in. The work activities are either directed by the TPB or related to providing data requested by COG-DEP.

Table 2: Current / Ongoing Work Activities

Work Activity	Last Updated
Performance Analysis of the TPB’s Long Range Plan	October 17, 2018
Climate, Energy, and Environment Policy Committee (CEEPC) Climate and Energy Action Plan	March 23, 2017
GHG Emissions Inventory Development (for local jurisdictions)	Varies

Work Activity Summaries

For each of the work activities listed in tables 1 and 2, above, the following section documents oversight or ownership of the work, completion date (for completed work) or most recent analysis (for current work), modeling and planning assumptions for emissions estimates, and any planned updates to the work.

It must be noted that there are considerable technical challenges associated with regularly developing and updating GHG emissions inventories for future years over an extended period time. The evolving nature of modeling tools, updates to the planning assumptions on the transportation demand and supply makes it a challenge to have a set of estimates that are developed based on consistent inputs and methods. The description of the work activities in the ongoing work section (pages 5 -8) bring out the specific challenges COG-DTP work has faced.

Any questions or comments on the matter are best directed to Erin Morrow at COG-DTP (emorrow@mwcog.org).

I. COMPLETED WORK ACTIVITIES

1. National Capital Region Climate Change Report

Oversight: COG

Date Completed: November 12, 2008

Documentation: <https://www.mwcog.org/documents/2008/11/12/national-capital-region-climate-change-report-climate-change/>

Study Purpose

On April 11, 2007, as part of its 50th anniversary year, the COG Board adopted Resolution R31-07, creating a climate change initiative. Part of the climate change initiative included a call for developing a greenhouse gas (GHG) inventory, setting regional goals, and identifying best practices for reducing GHG emissions. Beginning with a base year of 2005, the analysis looked at a “business as usual” future through 2050 where no actions beyond current policies and programs are implemented to reduce greenhouse gas emissions.

The most notable outcome from this report was the three targets that the Climate Change Steering Committee chose for reducing greenhouse gas emissions. Those reduction targets have been the framework for subsequent greenhouse gas and climate change work. The targets were adopted by the COG Board with the adoption of the report:

- By 2012, GHG emissions 10% below “business as usual”
- By 2020, GHG emissions 20% below 2005 levels
- By 2050, GHG emissions 80% below 2005 levels

The Climate, Energy, and Environment Policy Committee (CEEPC) was created by the COG Board on April 8, 2009 through Resolution R18-09 and is responsible for managing implementation of the *National Capital Region Climate Change Report*.

2. “What Would it Take?” (WWIT) Scenario Study

Date Completed: May 19, 2010

Oversight: TPB

Documentation: Final Report:
<https://www.mwcog.org/documents/2010/05/18/what-would-it-take-scenario-land-use-projects/>

Study Purpose

The “What Would it Take?” Scenario Study was one of two scenario studies that were undertaken under the purview of the Scenario Study Task Force that the TPB established in September 2007. The WWIT Scenario Study was the TPB’s first step toward answering some major questions about

climate change mitigation, specifically in the transportation sector in the Washington metropolitan region. The study examined what types of projects / programs / policies it would take in the transportation sector to meet the regional aspirational GHG reductions targets established in the National Capital Region Climate Change report and adopted by the COG Board in November 2008. The study developed the baseline GHG emissions in the transportation sector and tested the potential reductions in GHG emissions from various projects/programs/policies would generate in the transportation sector. The intent was to determine the nature and scope of actions that would be necessary to reduce GHG in the transportation sector in the target amounts noted below.

- By 2012, 10% below “business as usual” (of the transportation sector)
- By 2020, 20% below 2005 levels (of the transportation sector)
- By 2050, 80% below 2005 levels (of the transportation sector)

3. Multi-Sector Working Group (MSWG)

Date Completed: January 18, 2017

Oversight: TPB/MWAQC/CEEPC

Documentation: Final Technical Report:

<https://www.mwcog.org/documents/2016/08/01/multi-sector-approach-to-reducing-greenhouse-gas-emissions-in-the-metropolitan-washington-region-final-technical-report/>

Final Recommendations to the COG Board:

<https://www.mwcog.org/documents/2017/01/18/multi-sector-working-group-greenhouse-gas-emission-reducing-strategies-air-quality-climate-mitigation-greenhouse-gas-multi-sector-working-group/>

Purpose

In December 2014, the TPB and the Metropolitan Washington Air Quality Committee (MWAQC) affirmed COG’s adopted voluntary greenhouse gas reduction goal of 80% below 2005 levels by 2050, and committed staff and resources to support a multi-sector, multi-disciplinary professional working group to be convened by COG to:

- Identify viable, implementable local, regional, and state actions to reduce GHG emissions in four sectors (Energy, the Built Environment, Land Use, and Transportation);
- Quantify the benefits, costs and implementation timeframes of these actions;
- Explore specific GHG emission reduction targets in each of the four sectors; and
- Jointly develop an action plan for the region

The MSWG work was directly related to the greenhouse gas reduction targets laid out in the National Capital Region Climate Change Report. The base year (2005) emission estimate came directly from the Climate Change Report (estimated using Mobile6.2).

II. ON-GOING WORK ACTIVITIES

1. Performance Analysis of the TPB's Long Range Plan

Oversight: TPB

Most Recent Analysis: October 17, 2018

Documentation: Visualize 2045 Plan Documents (see Chapter 5, Page 58 for GHG):
<https://www.mwcog.org/visualize2045/document-library/>

Study Purpose

A federally-required conformity analysis is conducted every time the long-range plan is updated or amended. Therefore, a conformity analysis has been typically conducted every year. Since 2010, the TPB has voluntarily estimated greenhouse gas emissions for the constrained element of its long-range plan. Greenhouse gas emissions are estimated for the analysis years required for the conformity analysis and are calculated each time a conformity analysis is conducted. Historic greenhouse gas estimates for 2005 and 2012 are also typically included in the analysis.

Most Recent Mobile Source Emissions Estimates Development

CLRP: Visualize 2045
Emissions Model: MOVES2014a
Travel Demand Model: Version 2.3.75
Demographic Data: Round 9.1
Vehicle Registration Data: 2016
Inventory Analysis Years: 2005, 2012, 2019, 2021, 2025, 2030, 2040, and 2045 (2005 and 2012 are historic estimates)
Geography: TPB Planning Area

Update to Emissions Estimates

Greenhouse gas emissions estimates will be updated with the next major update to the long range plan and air quality conformity analysis.

2. Climate, Energy, and Environment Policy Committee (CEEPC) Climate and Energy Action plan

Oversight: CEEPC

Most Recent Analysis: March 23, 2017

Documentation: Regional Climate and Energy Action Plan:
<https://www.mwcog.org/documents/2017/03/23/regional-climate-and-energy-action-plan-climate-energy-climate-change-energy/>

Study Purpose

The Climate, Energy and Environment Policy Committee (CEEPC) was created by the COG Board on April 8, 2009 through Resolution R18-09 as its principal policy adviser on climate change, energy, green building, alternate fuels, solid waste and recycling policy issues, and other environmental

issues as the board may assign. CEEPC is responsible for managing implementation of the National Capital Region Climate Change Report adopted by the COG Board of Directors in 2008. This responsibility includes development of a regional climate change strategy to meet the regional greenhouse gas reduction goals adopted by the board.

CEEPC updates its Climate and Energy Action Plan, which addresses all sectors, every three years. The plan includes a measurement of progress towards reaching the region’s greenhouse gas reduction goals. The most recent plan covers years 2017-2020. The 2017-2020 plan reports mobile source greenhouse gas emissions for 2005, 2012, 2015, and 2016. The emissions estimates for 2005 and 2012 were calculated with MOVES2010a. The emissions estimates for 2015 and 2016 came from the performance analysis of the respective CLRP and calculated with MOVES2014 and MOVES2014a respectively. Note: an updated 2012 inventory calculated with MOVES2014 was developed for the MSWG work. These data were recently transmitted to COG’s COG-DEP staff for future use.

On-road GHG inventory calculations are mainly developed by COG-DTP staff, with some post-processing conducted by COG-DEP staff. Regional inventories are documented in the final report, while jurisdiction-level inventories are not published by COG. COG-DEP provides COG members with their data and fact sheets and they share and utilize the data as they see fit. On-road transportation emissions calculations generally follow the U.S. Communities Protocol recommended methodology as outlined in Appendix D, TR.1.A from Version 1.1 of the Protocol. COG-DEP staff receives data from COG-DTP staff (on-road GHG emissions by pollutants and jurisdiction). MOVES2014a uses the most current Global Warming Potential (GWP) factors from the 2007 IPCC Fourth Assessment Report (AR4) – 25 for methane and 298 for nitrous oxide. COG-DEP staff can convert the data from the GWP factors incorporated into the MOVES model to the GWP factors used throughout the rest of the GHG inventory should the GWP factors be updated before they are integrated in a new version of the MOVES model. In the past, COG-DEP staff used this calculation to convert inventories developed with MOVES2010a which used factors from the Second Assessment Report (SAR). On-road emissions for small and medium cities are downscaled from the county-level by population. COG-DEP staff input the GHG emission data into ClearPath, a tool that allows them to keep track of past inventory calculations. COG-DEP staff has internal documentation for its greenhouse gas emissions inventories calculations.

Mobile Source Emissions Estimates Development

Analysis Year:	2005	2012	2015	2016**
CLRP:	2014	2014	2015	2016
Emissions Model:	MOVES2010a	MOVES2010a*	MOVES2014	MOVES2014a
Travel Demand Model:	Version 2.3.57	Version 2.3.57	Version 2.3.57a	Version2.3.66
Demographic Data:	Round 8.3	Round 8.3	Round 8.4	Round 9.0
Vehicle Registration Data:	2005	2011	2014	2014
Geography:	COG Member Jurisdictions	COG Member Jurisdictions	COG Member Jurisdictions	COG Member Jurisdictions

* 2012 estimate based on MOVES 2014 is available based on the MSWG work.

** 2016 estimates were shown in the Regional Climate and Energy Action Plan, but 2016 is otherwise not related to a major GHG inventory update.

Update to Emissions Estimates

COG-DTP staff has provided the MOVES2014a emissions estimates for 2012 that were developed for MSWG to COG-DEP staff. CEEPC has requested that COG staff update emissions inventories for all sectors for analysis years 2018 and 2020 when the data are available.

In the short term, COG-DTP staff has been asked to provide 2018 GHG mobile source emissions estimates in this calendar year. COG-DTP staff will complete this task using the current MOVES2014b model in conjunction with Visualize 2045 network and demographic assumptions. COG-DTP staff is also conducting a full-scale update of emissions estimates for 2005, 2012 and 2015 analysis years using the same set of tools and underlying assumptions.

In the long term, staff will continue to assess emerging methods for estimating GHG emissions for subsequent updates. For the next update, staff will develop emissions inventories for 2020, which was identified as a major milestone year in the Climate Change Report (discussed in subsequent sections of this memorandum). This update is expected to take place in calendar year 2021.

3. GHG Emissions Inventory Development (for local jurisdictions)

Oversight: COG-DEP Staff

Most Recent Analysis: Varies

Documentation: N/A

Study Purpose

Local jurisdictions can request greenhouse gas related data, such as emissions inventories or vehicle-miles traveled, for their own climate change planning work. These requests typically come through COG-DEP staff and are often closely related to the CEEPC's Climate and Energy Action Plan activities.

COG-DTP staff responds to the request as written, generally asking only for clarification if necessary. If jurisdictions are comparing data to similar data that they have received from COG-DTP staff in the past, changes in modeling and planning assumptions could affect conclusions drawn from those comparisons.

COG-DTP staff rarely develops actual GHG inventories for member jurisdictions beyond those that were developed for long-range plan performance analysis and subsequently transmitted to COG-DEP staff for GHG planning activities. For development of individual jurisdiction inventories, COG-DTP staff typically develops VMT estimates for each jurisdiction using one of the following methods:

- 1.) Average weekday VMT from travel demand model, sometimes augmented with estimates of local VMT and specifically designed to fit the local needs

For instance, estimates of Arlington-related average weekday VMT from travel demand model were calculated and provided to the county (October 31, 2016). The VMT totals

included only those trips that either started or ended in Arlington County, with through trip VMT excluded from the totals.

2.) Annual VMT from MOVES

In certain cases, total annual VMT MOVES model estimates are provided to local jurisdictions. In other instances, more specific VMT breakdowns are requested, such as modeled annual VMT by Highway Performance Monitoring System (HPMS) vehicle and fuel type (as provided to DOEE on March 15, 2018).

In assisting local jurisdictions with GHG inventory development, COG-DEP staff typically works with jurisdiction-level MOVES model GHG estimates consistent with those used for the long-range plan performance analysis, as documented in the CEEPC's Climate and Energy Action Plan section of this memorandum. These jurisdiction-level estimates can then be further dissected and analyzed independently or in conjunction with data from other sectors. One tool that is being used by local jurisdictions is ICLEI's newly released GHG Contribution Analysis Toolkit. The tool allows jurisdictions to enter inventories for all sectors for two analysis years. Subsequently, "drivers of change", such as changes in weather, population, jobs, or economic data between the two years are estimated to illustrate what is contributing to an increase or decrease in emissions. ICLEI held a training at COG in July 2018, and approximately 10 COG members completed a model run. ICLEI and COG-DEP staff have run the model for all COG members. COG-DEP staff are not necessarily keeping track of all jurisdictions that are using the model. They are aware that the District of Columbia's consultants use portions of the model and that the City of Alexandria has expressed interest in running the GHG Contribution Analysis Toolkit every year. Other jurisdictions are interested in running the model as estimates from new inventories become available. Inventory updates are currently planned for analysis years 2018 and 2020 based on CEEPC's request.

COG recently signed contracts with ICF and Cadmus for support on a range of climate change topics including local and regional greenhouse gas inventories, mitigation, and adaptation/resiliency initiatives. The contract ends on June 30, 2020 with the possibility of a two-year extension. The contract allows for COG to issue task orders or team with local jurisdictions to support work of interest to them. As of this time, COG has not yet issued a task order. Both contracts have a rider clause which allows COG members to utilize the contract. Several COG members are interested in using the contract to support development of local plans, plan updates, and planning analyses.

Some of the COG members seek recognition by state and national sustainability programs such as Sustainable Maryland, Go Green Virginia, STAR Communities, and LEED for Cities and Communities. (Note: In 2019, STAR Communities is merging with LEED for Cities). These programs recognize local jurisdictions for comprehensively adopting and implementing sustainability practices that are complimentary to CEEPC's Climate and Energy Action Plan. The application and review process can be intensive, requiring a variety of data and documentation to be submitted. Upon request, COG-DEP supports COG members with data needs, which occasionally requires coordination with COG-DTP staff. Examples of data requests include greenhouse gas inventories, vehicle miles travelled (VMT), and VMT per capita.

And finally, when applicable, COG-DEP staff compares jurisdiction-level inventories calculated internally at COG by COG-DTP staff using the MOVES model with inventories calculated by local jurisdictions to ensure consistency in reporting.

UPDATE ON GREENHOUSE GAS PLANNING ACTIVITIES

Recent Policy and Technical Developments

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TPB Technical Committee
September 6, 2019

Agenda Item 8



National Capital Region
Transportation Planning Board

Presentation Outline

- Federal Mandates for MPOs
- Criteria Pollutants versus Greenhouse Gases (GHG)
- National Capital Region Greenhouse Gas Initiatives
- Visualize 2045 Aspirational Initiatives
- Greenhouse Gas Inventory Update
- Regional GHG Initiative: Transportation and Climate Initiative



Federal Mandates for MPOs

- Carry out a “continuing, cooperative, comprehensive” planning process among local, state, regional, and federal transportation partners
- Develop and approve a financially constrained Long-Range Transportation Plan (LRTP) and short term Transportation Improvement Program (TIP)
- Collect and report data about the regional transportation system related to congestion mitigation, air quality, safety, freight, and more
- Demonstrate conformance to air quality plans (in Non-Attainment or Maintenance areas):
 - Coordinate the development of the LRTP with the State Implementation Plan (SIP; Motor Vehicle emissions)
 - Approve only those transportation plans or programs which conform with the SIP and/or develop transportation control measures for the SIP, as needed
- Currently there are no national greenhouse gas (GHG) emissions standards with respect to transportation conformity



Air Quality: Criteria Pollutants versus Greenhouse Gases

- In transportation planning, criteria pollutants are typically associated with federally mandated activities such as air quality conformity
- Criteria pollutants include nitrogen oxides (NOx) and volatile organic compounds (VOC), which are ozone precursors, particulate matter 2.5 (PM2.5) and winter time carbon monoxide (CO)
- Big improvements have been made in air quality in metropolitan Washington:
 - Based on the air quality monitor readings in the region, we are now “in attainment” of PM2.5 and winter CO air quality standards
 - The region still has some work to do to attain the 2015 National Ambient Air Quality standard for ozone, although tremendous improvements in air quality with respect to ozone have been made (32% reduction in “design value” for ozone between late 90s and now)*

* Source: “Ozone Season Summary,” Sunil Kumar, COG/DEP. Presentation to MWAQC, July 25, 2019

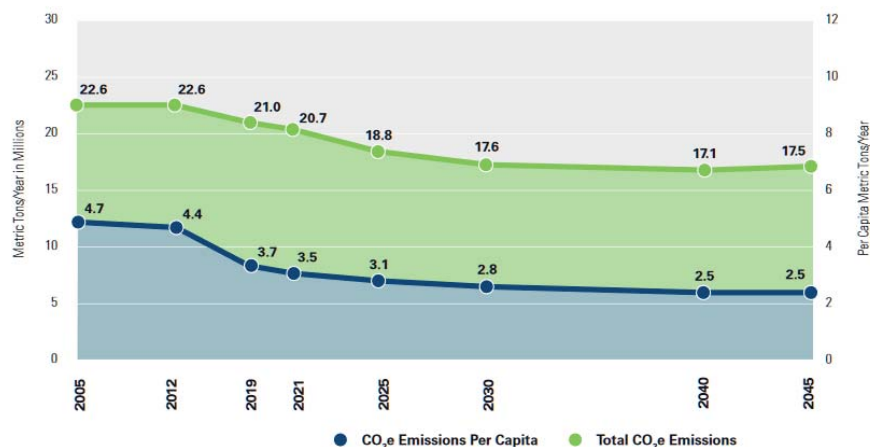


Air Quality: Criteria Pollutants versus Greenhouse Gases (continued)

- Greenhouse gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases
- CO₂ is most prevalent, with GHG emissions often expressed in “million metric tons in CO₂ equivalent (CO₂e)”
- Although there are currently no associated federal requirements regarding GHG emissions, TPB has recognized the importance of addressing the issues related to GHGs
- TPB began estimating GHG emissions from the region’s transportation system (present and future) in 2010
- TPB has supported systemwide measures to reduce GHG emissions from transportation system (recently wrote in opposition to the proposed roll-backs of federal emissions standards, i.e., SAFE rule)

Mobile Source Greenhouse Gas Emissions (Visualize 2045 Constrained Element)

Total and per capita CO₂e emissions are forecast to drop 16% and 32%, respectively, between 2019 and 2045



- A significant amount of the greenhouse gas reductions are due to new tougher federal fuel efficiency standards. In addition changes in development patterns and investments in transit and other travel options will contribute to reductions.
- Currently no federal standards exist for greenhouse gas emissions. These emissions estimates are not a required part of the transportation Air Quality Conformity Analysis.

National Capital Region Climate Change Report (2008)

- In November 2008, the COG Board adopted aspirational regional goals for GHG reduction established in the National Capital Regional Climate Change Report
 - By 2012, GHG levels will be 10% below “business as usual” forecasts
 - By 2020, GHG levels will be 20% below 2005 levels
 - By 2050, GHG levels will be 80% below 2005 levels
- TPB has also conducted and participated in a number of voluntary studies that are discussed in this presentation that aim to find ways to reduce GHG emissions
- The region met its first 2012 goal but there needs to be an immense undertaking to meet the 2020 and 2050 goals (from the Regional Climate and Energy Action Plan)

National Capital Region Greenhouse Gas Initiatives

- 2008:** National Capital Region Climate Change Report adopted (COG)
- 2009:** Climate, Energy & Environment Policy Committee created (COG)
- 2010:** Regional Climate and Energy Work Plan (CEEPC; 2013, 2017 Update)
- 2010:** “**What Would it Take?**” Scenario: Transportation sector local/regional/state strategies (TPB); TPB begins voluntarily reporting GHG emissions in Performance Analysis of LRTP (TPB)
- 2012:** Region Forward Report and Compact adopted: incorporates regional greenhouse gas emission reduction goals
- 2014:** TPB and MWAQC resolutions: affirm greenhouse gas emission reduction goals and support for Multi-Sector Working Group
- 2015:** **Multi-Sector Working Group (MSWG) Convened** (COG, TPB, MWAQC, CEEPC)
- 2017:** Resolution endorsing voluntary multi-sector GHG reduction (COG)

Visualize 2045 Aspirational Initiatives

- Bring Jobs and Housing Closer Together
- Expand Bus Rapid Transit Regionwide
- Move More People on Metrorail
- Provide More Telecommuting and Other Options for Commuting
- Expand Express Highway Network
- Improve Walk and Bike Access to Transit
- Complete the National Capital Trail

GHG Inventory Update: Background

- Department of Environmental Programs (DEP) staff periodically compile GHG emissions inventories for all sectors for certain milestone years to measure the progress toward achieving the goals stated in the National Capital Regional Climate Change Report
- TPB staff are asked to provide the mobile source GHG emissions estimates
- Major Milestone Years (from Climate Change Report): 2005, 2012, 2020 and 2050
- “Intermediate” Reporting Years (so far): 2015 and 2018
- Regional GHG inventories developed for analysis years 2005, 2012 and 2015 *

* Source: [Metropolitan Washington Community-Wide Greenhouse Gas Emissions Inventory Summary, July 2018](#).

GHG Inventory Update: Current Activities

- Current effort: 2018 Regional GHG Inventory Update
- Analysis years: 2005, 2012, 2015 and 2018
- Transportation emissions estimates for 2005, 2012 and 2015 are being updated using the current set of tools and methods
- GHG emissions inventories for 2018 are being estimated for the first time
- Goal: Use consistent tools and methods for all four analysis years

GHG Inventory Update: Tools and Methods

- Cooperative Forecasts: Round 9.1*
- Long Range Transportation Plan / Networks: Visualize 2045
- Regional Travel Demand Model: Version 2.3.75
- Emissions Model: MOVES2014b
- Vehicle Registration Data (“VIN Data”) MOVES Input: Varies for each analysis year

* Round 9.1 Cooperative Forecasts were used for analysis years 2012, 2015 and 2018. Data based on the Round 8.3 Cooperative Forecasts were used for 2005, which was the last time that 2005 estimates / adjustment factors were updated.

GHG Inventory Update: Next Steps

- Regional transportation GHG inventories will be developed by the end of this calendar year and provided to DEP staff for regional GHG inventory update
- Development of GHG inventories is still a relatively new and evolving field
- TPB staff will continue to monitor innovations in methodology and tools for estimation of GHG emissions for the upcoming 2020 milestone year

Transportation and Climate Initiative (TCI)

- Regional collaboration of twelve Mid-Atlantic and Northeastern states and the District of Columbia working to reduce carbon emissions from the transportation sector
- In December 2018, announced intention to design a regional cap-and-invest program or other pricing mechanism
- Plans to complete policy design process within one year
- Holding public workshops and webinars
- COGs and MPOs convening to learn more about TCI
- www.transportationandclimate.org

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