Transportation Performance Management Webinar Series

Greenhouse Gas & Environmental Measures

Sponsored by AASHTO and FHWA





July 20, 2022 TPM Webinar 13

Transportation Performance Management Webinar Series

- Our TPM webinar series is held every two months, on topics such as communications, system performance management, data sources, and many more to come!
- Today is the 13th webinar in our bi-monthly series
- We welcome ideas for future webinar topics and presentations
- Use the webinar chat panel during the webinar
 - Submit questions for today's presenters
 - Submit ideas for future webinar topics





Find us on the AASHTO TPM Portal https://www.tpm-portal.com

AASHTO Welcome

Matthew H. Hardy, Ph.D.

Program Director for Planning and Performance Management, AASHTO mhardy@aashto.org







Webinar Agenda

- **2:00** Welcome and Introduction Matt Hardy, AASHTO.
- **2:05 GHG NPRM Commenting Schedule and AASHTO Information** Matt Hardy, AASHTO.
- **2:15** MnDOT's Approach to GHG Deanna Belden and Chris Berrens, Minnesota DOT.
- **2:30 Colorado's Greenhouse Gas Rule & GHG Mitigation Measures Policy** Theresa Takushi, Colorado DOT.
- **2:45 GHG Tracking and Reduction Efforts in the District of Columbia** Ting Ma, District DOT.
- 3:00 NCHRP Project 25-56/Web Resource 1: Reducing Greenhouse Gas Emissions: A Guide for State DOTs.
 - Gary McVoy, McVoy Associates.
- **3:15** Panel Q&A Moderated by Matt Hardy, AASHTO.

AASHTO Overview FHWA GHG NPRM

Matthew Hardy, Ph.D.

mhardy@aashto.org

1. FDA/Economics Staff. "Revocation of Methods of Analysis Regulation. Preliminary Regulatory Impact Analysis, Preliminary Regulatory Flexibility Analysis, Unfunded Mandates Reform Act Analysis," 2020. (Available at: https://www.fda.gov/AboutFDA/ ReportsManualsForms/Reports/ Economic Analyses/detault.htm)

List of Subjects in 21 CFR Part 2

Administrative practice and procedure, Cosmetics, Drugs, Foods, Therefore, under the Federal Food, Drug, and Cosmetic Act, and under authority delegated to the Commissioner of Food and Drugs, FDA proposes that 21 CFR part 2 be amended as follows:

PART 2-GENERAL ADMINISTRATIVE RULINGS AND DECISIONS

1. The authority citation for part 2 continues to read as follows:

Authority: 15 U.S.C. 402, 409, 21 U.S.C. 321, 331, 335, 342, 343, 346a, 348, 351, 352. 355, 360b, 361, 362, 371, 372, 374, 42 U.S.C. 7671 cf seq.

§ 2.19 [Removed] 2. Remove § 2.19.

Dated: July 11, 2022.

Robert M. Califf. Commissioner of Food and Drugs.

[FR Dos. 1022-15109 Filed 7-14-22; 8:45 am] BLLING CODE 4164-01-P

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

23 CFR Part 490

[Docket No. FHWA-2021-0004] RIN 2125-AF99

National Performance Management Measures: Assessing Performance of the National Highway System, Greenhouse Gas Emissions Measure

AGENCY: Federal Highway Administration (FHWA), U.S. Department of Transportation (DOT). ACTION: Notice of proposed rulemaking (NPRM); request for comments.

SURMARY: Extreme weather due to climate change threatens the safety and mobility of Americans and challenges the stability of supply chains. To help address the climate crisis, FHWA proposes to amend its regulations governing national performance management measures to require State departments of transportation (State DOTs) and metropolitan planning organizations (MPOs) to establish declining carbon dioxide (CO₂) targets

and to establish a method for the measurement and reporting of greenhouse gas (GHG) emissions associated with transportation under the Highway's title of the United States Code (U.S.C.). The proposed rule would not mandate the level of the targets. Rather, State DOTs and MPOs would have flexibility to set targets that are appropriate for their communities and that work for their respective climate change and other policy priorities, as long as the targets would reduce emissions over time. Specifically, the proposed rule would require State DOTs and MPOs that have National Highway System (NHS) mileage within their State geographic boundaries and metropolitan planning area boundaries, respectively, to establish declining CO2 emissions targets to reduce CO₂ emissions generated by on-road mobile sources relative to a reference year defined as calendar ymr 2021, that align with the Administration's net-zero targets as outlined in the national policy established under Executive orders entitled "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis" and "Tackling the Climate Crisis at Home and Abroad" and at the Leaders Summit on Climate. The proposed rule would require MPOs serving urbanized areas with multiple MPOs to establish additional joint targets. The proposed rule also would require State DOTs and MPOs to biennially report on their progress in meeting the targets and require FHWA to assess significant progress toward achieving the targets. DATES: Comments must be received on or before October 13, 2022. ADORESSES: To ensure that you do not duplicate your docket submissions, please submit comments by only one of the following means: · Federal eRulemaking Portal: Go to https://www.regulations.gov and follow

the online instructions for submitting comments Mail: Docket Management Facility.

U.S. Department of Transportation, 1200 New Jersey Avenue SE, Washington, DC 20590

· Hand Delivery: U.S. Department of Transportation, Docket Operations, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The telephone number is (202) 366-9329. All submissions should include the agency name and the docket number that appears in the heading of this

document or the Regulation Identifier Number (RIN) for the rulemaking. All

comments received will be posted without change to https:// www.regulations.gov, including any personal information provided.

42401

FOR FURTHER INFORMATION CONTACT: Mr. John Davies, Office of Planning,

Environment, and Realty, (202) 366-6039, or via email at JohnG.Dovies dot.gov. or Mr. Lev Gabrilovich, Office of the Chief Counsel (HOC-30), (202) 366-3813, or via email at Lev. Gabrilovich@dot.gov. Office hours are from 8:00 a.m. to 4:30 p.m., E.T., Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION:

Electronic Access and Filing

This document and all comments received may be viewed online through the Federal eRulemaking portal at www.regulations.gov using the docket number listed above. Electronic retrieval help and guidelines are also available at www.regulations.gov. An electronic copy of this document may also be downloaded from the Office of the Federal Register's website at www.FederalRegister.gov and the Government Publishing Office's website at www.GovInfo.gov.

All comments received before the close of business on the comment closing date indicated above will be considered and will be available for examination in the docket at the above address. Comments received after the comment closing date will be filed in the docket and will be considered to the extent practicable. In addition to late comments, FHWA will also continue to file relevant information in the docket as it becomes available after the comment period closing date and interested persons should continue to examine the docket for new material. A final rule may be published at any time after close of the comment period and after DOT has had the opportunity to review the comments submitted.

Table of Contents for Supplementary Information

I Executive Summary II. Background and Regulatory History

- III. Statement of the Problem, Legal Authority, and Rationale
- A. Confronting the Climate Crisis B. Legal Authority for the Proposed GHG
- Moasure C. Additional Rationale for the Proposed
- GHG Moasure 1. Costs and Benefits
- 2. Duplication of Efforts
- D. Expected Schedule for Implementation
- IV Section by Section Discussion of the Proposed Changes
- A. Subpart A-General Information
- B. Subpart E-National Performance
- Management Measures to Assess



(Tailpipe CO: Emissions on NHS)cr - Total allpipe CO₂ emissions on the NHS in a calendar year (expressed in mmt, and rounded to the nearest hundredth):

definitions Greenhouse gas (Gride)

and "Reference year" in alphabetical

T = the total number of on-road fuel types: t = an on-road fuel type; (Fuel Consumed), - the quantity of total annual fuel consumed for on-road fuel type "t" (to the nearest thousand gallons); (CO2 Factor), - is the amount of CO2 released per unit of fuel consumed for on-road fuel type "t"; NHS VMT = annual total vehicle-miles traveled on NHS (to the nearest one

million vehicle-miles); and Total VMT = annual total vehicle-miles traveled on all public roads (to the nearest one million vehicle-miles).

(d) For the GHG measure specified in § 490.507(b), MPOs are granted additional flexibility in how they calculate the GHG metric, described in paragraph (a)(2) of this section. MPOs

estimates along with MOVES¹ DOT and the MPO.

9. Amena § 490.509 by adding

(f) Tailpipe CO2 emissions generated by on-road sources travelling on the NHS (the GHG metric), and generated by

¹ MOVES (Motor Vehicle Emission Simulator) is EPA's emission modeling system that estimates emissions for mobile sources at the national, county, and project level for criteria air pollutants greenhouse gases, and air toxics. See https:// www.epa.gov/moves. The EMission FACtor (EMFAC) model is used in California for emissions analysis.

roadways (the step in the calculation prior to computing the GHG metric) shall be calculated as specified in paragraph (c) of this section. The calculations shall be reported in the State Biennial Performance Reports, as required in § 490.107, and shall address the following time periods. (1) The reference year. as required in

(c) Tailpipe CO2 emissions on the

NHS VMT

Total VMT

(2) The 2 years preceding the reporting years, as required in § 490.107(b)(1)(ii)(H). (b)(2)(ii)(J). and (b)(3)(ii)(1). 10. Amend § 490.513 by adding paragraph (d) to read as follows:

§490.513 Calculation of National Highway System performance measures.

(d) The GHG measure specified in § 490.507(b) shall be computed to the nearest tenth of a percent as follows:

Federal Register/Vol. 87, No. 135/Friday, July 15, 2022/Proposed Rules 2422

(Tailpipe CO₂Emissions on NHS)_{CY} - (Tailpipe CO₂Emissions on NHS)_{reference year} x 100

(Tailpipe CO2Emissions on NHS)reference year

(Tailpipe CO, Emissions on NHS) = total

tailpipe CO2 emissions on the NHS in a calendar year (expressed in million metric tons (mmt), and rounded to the nevrest hundredthl: and

- (Tailpipe CO2 Emissions on NHS) = total tailpipe CO2 emissions on the NHS in calendar year 2021 (expressed in million metric tons (mmt), and rounded
- to the nearest hundredthl. [FR Doc. 2022-14679 Filed 7-14-22: 8:45 am]

BILLING CODE 4910-22-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

regulate these emission sources under the Clean Air Act (CAA or the Act). We are taking comments on this proposal and plan to follow with a final action. DATES: Comments must be received on or before August 15, 2022. ADDRESSES: Submit your comments, identified by Docket ID No. EPA-R09-

OAR-2021-0923 at https:// www.regulations.gov. For comments submitted at Regulations.gov, follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from Regulations.gov. The EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be

https://www.epa.gov/dockets/ commenting-epa-dockets. If you need assistance in a language other than English or if you are a person with disabilities who needs a reasonable accommodation at no cost to you. please contact the person identified in the FOR FURTHER INFORMATION CONTACT section.

FOR FURTHER INFORMATION CONTACT: Elijah Gordon, EPA Region IX, 75

Hawthorne St. (AIR-3-2), San Francisco, CA 94105, By phone: (415) 972-3158 or by email at gordon.elijah epa.gov.

SUPPLEMENTARY INFORMATION:

Throughout this document, "we," "us" and "our" refer to the EPA.

may use the MPO share of the State's on-road sources travelling on al VMT as a proxy for the MPO share of CO2 emissions in the State, VMT emissions factors, FHWA's Energy and Emissions Reduction Policy Analysis Tool (EERPAT) model, or other method the MPO can demonstrate has valid and useful results for CO₂ measurement. The metric calculation method shall be mutually agreed upon by both the State § 490.107(b)(1)(ii)(H); and

Basic Information

- Who: State DOTs and MPOs
- What: Tailpipe CO₂ Emissions on the NHS
 - Function of Gallons of Fuel Sold, CO₂ Factor, ratio of NHS VMT to total VMT
 - MPOs can establish their own calculation process.
- When: October 1, 2022
- How: Establish declining targets to achieve net-zero emissions by 2050
 - Use the existing national performance management framework.
- Why: Transportation sector is a large producer of GHG emissions.

Tools and Resources

- Website: <u>http://www.tpm-portal.com/GHG-NPRM</u>
- Commenting Template
- AASHTO GHG NPRM Analysis Tool







July 18, 2022

Stephanie Pollack Deputy Administrator, Federal Highway Administration U.S. Department of Transportation 1200 New Jersey Avenue S.E. Washington, DC 20590

Re: Docket No. FHWA-2021-0004

Dear Deputy Administrator Pollack,

As states that are working to make smart infrastructure investments and cut greenhouse gas emissions, we thank FHWA for taking action to establish GHG targets for infrastructure investments that strengthen over time. While we plan to submit more extensive comments after studying all of the details of this proposal more fully, we feel it is important to immediately express our support and encouragement for a GHG performance standard. The transportation sector is the largest source of GHG emissions in the United States and we need action from the federal government to complement and support work states are already doing to reduce transit costs and traffic.

DEPARTMENT OF TRANSPORTATION

MnDOT's approach to GHG

TPM Webinar Deanna Belden & Chris Berrens MnDOT Performance, Risk & Investment Analysis Unit July 20, 2022

History

- The Next Generation Energy Act (216H.02 Greenhouse Gas Emissions Control) passed with near universal legislative support and was signed into law by Republican Gov. Tim Pawlenty in 2007.
- Mn Statute 174.01 created the Minnesota Department of Transportation. Includes 16 goals of the state transportation system.
 - Added in 2008, goal (15) to reduce greenhouse gas emissions from the state's transportation sector

Emissions reduction targets

Greenhouse Gas Emissions Reduction

In 2016, MnDOT voluntarily set ambitious greenhouse gas emissions reduction targets. The targets and 2018 results are summarized in Table 1.

Table 1. MnDOT Greenhouse Gas Emissions Reduction Targets

Metric	Target	Results
Sector Level Total annual GHG emissions generated by Minnesota's transportation system	29,500,000 tons CO ₂ e	41,842,898 tons CO ₂ e 2018
State Highway Construction Total annual GHG emissions from the fuel and materials used to construct MnDOT projects	252,500 metric tons CO ₂ e	228,245 metric tons CO ₂ e 2017
MnDOT GHG Emissions -		
Facilities Total annual GHG emissions generated from energy used by MnDOT-owned facilities	21,800 metric tons CO ₂ e	27,012 metric tons CO ₂ e 2018
Fleet Total annual GHG emissions generated from fuel used by the MnDOT-owned fleet	26,500 metric tons CO ₂ e	43,028 metric tons CO ₂ e 2018

Table 5-5: Healthy Communities performance measures

Measure	Target	Reporting
Annual greenhouse gas emissions from the transportation sector	29.5 million tons CO ₂ e by 2025	Report total and trend

GHG Emissions VMT Per Capita **Fuel Consumption**

The most recent greenhouse gas (GHG) emissions inventory from the Minnesota Pollution Control Agency (MPCA) showed that transportation overtook the electricity generation sector to become the number one source of GHG emissions in Minnesota starting in 2016. This is consistent with trends in other states, and changes in both sectors and trends (electricity decreasing, transportation increasing) are expected to continue. Transportation emissions decreased 8% from 2005 to 2016, with reductions credited to federal fuel efficiency standards. However, the trend towards larger trucks and SUVs and more miles traveled prevented more significant reductions with MnDOT predicting an increase in GHG emissions in 2017 and 2018 holding relatively steady.



2014

2015

2016

2017

2018

Transportation Sector

Metric	Target	Results	Trend		Analysis
Greenhouse Gas Emissions Annual total CO ₂ e emissions generated by the Minnesota transportation system	29.5 million tons CO ₂ e 2025	42.1 million tons CO₂e 2018	40.9 M	42.1 M	In 2018, tr increase in prices, inco and increa trucks and
Vehicle Miles Traveled (VMT) Total number of vehicle miles traveled in Minnesota each year	TBD - decrease	60.4 billion miles 2018	58.8	60.4	VMT conti last three emissions. higher hou and transit
Per Capita Vehicle Miles Traveled Total number of vehicle miles that the average Minnesotan travels per year	TBD - decrease	10,780 2018	10.6 К 16	10.7 K	Two key fa the distand the popula capita VM

ncrease in Minnesota. This is attributed to low gas rices, increased freight, people driving more miles, ind increased purchases of low-fuel efficiency pick-up rucks and SUVs.

MT continued to increase in Minnesota over the ast three years, which contributes to more GHG missions. Higher use of single occupancy vehicles, ligher housing costs, and a disconnect between jobs ind transit access are likely contributors.

wo key factors affect VMT: the number of drivers and he distance people drive. Between 2016 and 2018, he population in Minnesota increased by 1.7% and per apita VMT rose by 1.1%.

NHS greenhouse gas emissions in Minnesota



NHS Greenhouse Gas Emissions in Minnesota

2018 emissions: 14,526,000 tons of CO₂
2 Year target (2020): 11,240,000 tons of CO₂
4 year target (2022): 10,804,000 tons of CO₂

Targets based on existing state law that requires economy-wide 30% emissions reduction from 2005 emission levels by 2025.

GHG total NHS -----GHG Goal NHS



Addressing GHG by Giving People Options to Reduce VMT

Multiple strategies are needed to achieve GHG goals



Vehicles

• Electric vehicle (EV) incentives, EV charging infrastructure

Fuels

• Low carbon fuels, fuel efficiency

System Operations

• E-Z Pass, transit advantages

Vehicle Miles Traveled (VMT)

• Less time in personal vehicles, biking, walking and transit infrastructure, statewide broadband

Minnesota VMT Trends and Drivers



Close to 10% of total VMT in Minnesota is for trips under five miles and about 20% is for trips under 10 miles.

As our VMT increased 40%, our Minnesota population only grew 23%. VMT has increased almost twice as fast as our population.

Since 1994, total VMT in Minnesota has increased 40%, which includes an increase of 59% on urban roadways, and a 20% increase on rural roadways. **Urban highways and arterials account for the largest share of VMT growth.**

30-year VMT Draft Reduction Target

Reduction on MnDOT roadways and all roadways

- Articulate per capita and total targets
- Opportunities to adjust in interim years
- Future discussion: strategies differ by urban/sub/rural

-20% per capita, -7% statewide by 2050

In 2050, walking, biking and transit options improve. Road lanes are not expanded faster than the population is growing. There are some road pricing incentives. Broadband access allows for more telecommuting. Transportation and housing investments are more aligned.



Year	Per Capita⁺	Total	
2025	-4%	-2%	
2030	-8%	-3%	
2035	-11%	-4%	
2040	-14%	-5%	
2050	-20%	-7%	

+ Potential VMT Reduction from Current (2019)

Considerations – MnDOT's role

LEAD



For issues related to MnDOT owned/operated highways or MnDOT-led policies and/or programs, MnDOT is the leader. This is the agency's primary and traditional mission. Examples include building out the state trunk highway bicycle network and addressing congestion issues on the freeway. PARTNER



<u>Where MnDOT policies, plans,</u> <u>programs, and funding impacts</u> <u>local governments but MnDOT</u> <u>may not be the lead agency,</u> MnDOT is a partner with communities and other agencies. Examples include partnering to advance statewide broadband access or park-and-ride facilities.

SUPPORT



Where MnDOT <u>does not have</u> <u>decision-making authority or</u> <u>investments to contribute</u>, MnDOT can support. While MnDOT's primary mission and lever of influence is focused on transportation infrastructure, the agency can support partners in aligned efforts, like land use planning.

Priority Strategies based on VMT trends

Land Use	Influencers
Zoning changes and infill incentives	Local/regional
Growth management programs	Local
Reforming traffic impact assessments - move away from LOS metrics	State
Land use in transportation investments - account for local development patterns and land use policies in project prioritization and programming	State
Highway Spending	Influencers
Planning and modeling for VMT impacts	State/regional/

local

Transportation project prioritization	State/regional/
project evaluation criteria	
 Evaluate impact of VMT and include in 	local
Planning and modeling for VMT impacts	State/regional/

Transportation project prioritization

- Screening and scoring potential investments for accessibility or VMT impacts

Travel Options Influencers Transit enhancements State/regional/ - HOV and transit lane buildout local - Additional capital and operations support Walking and biking improvements State/regional/ - Bike and pedestrian network buildout local - Additional capital support - Complete streets guidance Influencers **Transportation Demand Management** Parking reform and pricing Local **Commuter benefit programs** State/local **Road pricing** State - Mileage-based pricing - Dynamic tolling - Congestion/cordon pricing - Transparency in pricing Broadband and remote work State²/local

Place Matters

	Proportion of MN Households	Average Household VMT
Urban Central MSP, Owatonna, Brainerd, Downtown St. Cloud, Downtown Duluth, Downtown Red Wing, Alexandria	33%	14,359
Suburban Suburban MSP (Golden Valley, Vadnais Heights), Suburban Duluth, Suburban Red Wing, Grand Rapids	27%	21,585
Rural/Exurban Hugo, Otsego, Farmington,	40%	25,350



Source: U.S. €ensus

Options for your community



- Tom drives daily for work and school
- Broadband isn't reliable
- Safe walking options are limited
- Broadband improvements allow teleworking
- New sidewalks and safer crossings give access to walk to school most days
- Jennifer drives daily to work every day and to run errands
- Interested in commuting by transit sometimes and walking for errands, but doesn't see options
- Improved transit provides convenient commuting option
- Broadband allows teleworking
 - *Safer crossings* give access to walk to the grocery store
- Abby owns a car but prefers using public transit or biking to fit in exercise and save money
- Routes between work, home, and school require travel on busy streets, doesn't feel the safest
- New BRT provides a reliable home to

0

<u>ດ</u>

New protected bike lanes offer a safe, convenient work commute₂option

school route



There are many ways to move people and goods around.



Colorado's Greenhouse Gas Rule & COLORADO GHG Mitigation Measures Policy Directive Department of Transportation July 20, 2022



On December 16, 2021 the Transportation Commission of Colorado approved a groundbreaking new rule that will reduce pollution and greenhouse gas emissions from the transportation sector, improve air quality and reduce smog, and provide more travel options for Coloradans.





Background GHG Rule

- 2019 State Legislature passed HB19-1261, "Climate Action Plan to Reduce Pollution"
 - Reduce GHG emissions 26% by 2025, 50% by 2030, and 90% by 2050
- ➤ Colorado Greenhouse Gas Roadmap
 - Transportation is the greatest source of emissions in Colorado
 - Create a GHG standard for transportation planning
- ➤ Senate Bill 21-260
 - Made the Roadmap recommendation for transportation planning a requirement.
- > Air Quality Conformity





Background GHG Rule

This proposed standard focuses on:

- > Transportation Planning
- Greenhouse Gas Emissions
- Government agencies and regional planning organizations
- > Passenger Cars (not trucks or airplanes)





- Instead of holding one hearing, the minimum required by law, CDOT held nine hearings around the state, hearings that were held in local community centers and that extended into the evening.
- Instead of the usual 30-day comment period, CDOT held a 60-day period. CDOT promoted attendance at these hearings through regional Facebook ads and via other social media channels as well as through blast emails to hundreds of stakeholders.

9 Initial Hybrid Hearings

- ✔ Grand Junction, 9/17
- ✓ Denver, 9/23
- ✓ CO Springs, 9/24
- ✓ Littleton, 9/27
- ✓ Limon, 9/29
- ✓ Fort Collins, 9/30
- ✔ Glenwood Springs, 10/4
- ✓ Firestone, 10/5
- ✓ Durango,10/7



- > 103 oral comments from public testimony at all of the 9 hearings
- > 121 written comments have been received
 - Posted on our <u>website</u>
 - 74% of comments supportive of the Rule
- These comments, which together include thousands of comments and suggested edits, ranged from broader statements on the rule itself to very specific line edits to requests for substantive changes.
- CDOT took this input and made hundreds of edits, both large and small, to provide clarity, improve implementation and intent, and find compromise amongst a diverse set of voices and suggestions.

Who is Impacted?

This rule affects the Colorado Department of Transportation and 5 "metropolitan planning organizations" that represent different regions of the state:

- **Denver:** Denver Regional Council of Governments (DRCOG)
- **Colorado Springs:** Pikes Peak Area Council of Governments (PPACG)
- **Ft Collins/Greeley:** North Front Range Metropolitan Planning Organization (NFRMPO)
- Pueblo: Pueblo Area Council of Governments (PACOG)
- **Grand Junction:** Grand Valley Metropolitan Planning Organization (GVMPO)



- Denver Regional Council of Governments (DRCOG)
- Grand Valley MPO (GVMPO)
- North Front Range MPO (NFRMPO
- Pikes Peak Area Council of Governments (PPACG)
- Pueblo Area Council of Governments (PACOG)



CDOT and each metropolitan planning organization must adopt long-range transportation plans that reduce GHGs to set reduction levels.

Each plan must be "modeled" to make this determination.

There is a specific GHG reduction level for each of four years:

- 2025
- 2030
- 2040
- 2050

Each agency has a GHG reduction level specific just to them.

How much will CDOT & MPOs need to reduce GHG emissions?



Table 1: GHG Transportation Planning Reduction Levels in MMT of CO2e

Regional Areas	2025 Reduction Level (MMT)	2030 Reduction Level (MMT)	2040 Reduction Level (MMT)	2050 Reduction Level (MMT)
DRCOG	0.27	0.82	0.63	0.37
NFRMPO	0.04	0.12	0.11	0.07
PPACG	N/A	0.15	0.12	0.07
GVMPO	N/A	0.02	0.02	0.01
PACOG	N/A	0.03	0.02	0.01
CDOT/Non-MPO	0.12	0.36	0.30	0.17
TOTAL	0.43	1.5	1.2	0.7



How Are Emissions Calculated?

CDOT TRAVEL MODEL EPA MOVES MODEL



Outputs: VMT, congestion/speed

Fleet Mix/Age & Fuel Type

Baseline = existing transportation plan. Compliance = updated plan.



- GHG mitigation strategies are a key concept within the GHG Rule providing another pathway toward meeting the GHG reduction levels in the Rule.
- GHG Mitigation Measures are those that can't be effectively modeled YET or are too small to be captured.
- The Transportation Commission adopted this as Policy Directive 1610.0.


Mitigation Categories - and some examples

Bike/Ped

- Build new bike lanes and sidewalks
- "Complete Streets" reconstruction

Transit

- New/expanded bus service
- Reduce transit fares

MD/HD Electrification

- Rebates/incentives for depot charging

Travel Demand Management

- Telework
- Commute Trip Reduction programs

Operations

-Retime/optimize arterial signals -Roundabouts Parking Management -Additional fee on parking -Unbundle residential parking Land Use -Increase residential density -Increase job density



Lessons Learned

Working with our Stakeholders early in the process

Collaborating with sister State Agencies and having strong leadership support

Having strong internal modeling capabilities proved very important

Being willing to adapt to what we learn over time



Thank you!

Questions?

GHG Tracking and Reduction Efforts in the District of Columbia

Ting Ma July 20, 2022

Regional Efforts









Regional GHG Goal & Tracking





Note: Process & Fugitive Emissions refer to emissions associated with the release of Hydrofluorocarbons, and emissions resulting from local natural gas system losses within the community. Emissions from Agriculture is included under AFOLU.



The District's GHG Tracking & Reduction Efforts



District of Columbia Office of Planning







OF GEN

Government of the District of Columbia Department of For-Hire Vehicles





CITYWIDE EMISSIONS AND TARGETS



2019 EMISSIONS BY SECTOR

BUILDINGS & ENERGY 71%

TRANSPORTATION 24%

WASTE 6%

BUILDINGS & ENERGY



TRANSPORTATION

PASSENGER VEHICLES 83% TRUCKS & BUSES 10% TRANSIT 7%

WASTE

LANDFILL 55% INCINERATION 37% WASTEWATER 8%

Greenhouse Gas Reduction Planning

2013 – Sustainable DC – Envisioned a 20-year citywide plan for sustainability
2014 – moveDC – Set a 25-year vision for the District's transportation system
2016 – Climate Ready DC – Identified resilience strategies to address ley climate risks
2018 – Clean Energy DC – Outlines a roadmap to achieve 50% GHG reduction by 2032
2019 – Sustainable DC 2.0 – Updated the 2013 plan, recommitting to innovative and
inclusive ways to meet sustainability goals by 2032
2020 – Carbon Free DC – To chart the District's pathway to be carbon neutral by 2050
2021 – moveDC – Updated the 2014 plan and adopted an equity lens

The Clean Energy DC Omnibus Amendment Act of 2018

Estimated GHG Savings



CEDC Plan Action Area	Percent GHGs Reduced from Total 2032 BAU	Addressed in CEDC <u>ACT</u>
Federal Fuel Economy Standards	7.1%	CAFE
New Construction Policies	4.6%	codes
Existing Building Policies	9.0%	
District Government Buildings	0.5%	
Renewable Portfolio Standard	9.5%	
RPS Local Solar Requirement	1.9%	
PPA for Standard Offer Service	6.6%	PSC
Neighborhood-Scale Energy	0.6%	
Mode Share Change	3.6%	moveDC
Electric Vehicle Adoption	0.9%	
Transit Bus Fleet Electrification	2.6%	
Total GHGs Avoided vs. 2032 BAU	47.0%	
Total GHGs Reduced vs. 2006 Baseline	55.7%	47

STRATEGIES FOR TRANSPORTATION





moveDC 2021 Update



- Strategy #21: Install more protected bicycle lanes
- Strategy #29: Increase access to shared mobility
- Strategy #33: Update DDOT fleet and DC buses fleet to be electric
- Strategy #35: Update the State Rail Plan



Mode Shift

Green Infrastructure

322-4800

AP 1-16 18 2

17 201

Vehicle Electrification

#0 EMISSION

Working on now

- Bipartisan Infrastructure Law
 - National Electric Vehicle Infrastructure (NEVI) program: ~\$16 million for DC
 - Carbon Reduction Program
- DDOT's Electric Vehicle charging station guidelines





Thank you!

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Matthew Gaskin Air Quality Coordinator <u>matthew.gaskin@dc.gov</u>

Reference

[1] Austina Casey & Matthew Gaskins. A Marriage of Convenience: Managing Air Quality and Greenhouse

Gases in the District of Columbia. TRB Annual Conference. 2021.

[2] moveDC. <u>https://movedc.dc.gov/</u>

[3] Carbon Free DC 2050.

https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/Carbon%20Free%2 0DC%202050 Transportation%20Overview.pdf.

[4] Clean Energy DC.

<u>https://doee.dc.gov/sites/default/files/dc/sites/ddoe/page_content/attachments/CEDC%20Informational%20W</u>ebinar.pdf

[5] MWCOG GHG Inventory: <u>https://www.mwcog.org/documents/2018/02/08/metropolitan-washington-community-wide-greenhouse-gas-emissions-inventory-summary--featured-publications-greenhouse-gas/</u>
 [6]





District Department of Transportation

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Reducing Greenhouse Gas Emissions: A Guide for State DOTs

NCHRP Project 25-56/ WebResource 1

presented to

TPM Webinar

presented by

Gary McVoy, McVoy Associates, LLC

Teamed with: Chris Porter, PI, Cambridge Systematics, Inc. Josh Proudfoot, Good Company, LLC John Zamurs, ZAMURS AND ASSOCIATES, LC

Purpose of the Guide

- Identify and describe tools, methods, and data sources that State DOTs can use to estimate GHG emissions from the transportation system and evaluate and implement GHG reduction opportunities
- Help State DOTs understand how they can address GHGs through all stages of their activities
- Help State DOTs respond to and support State, local, and/or Federal GHG requirements or initiatives

The GHG Action Spectrum

	Functional Area									
	Execs and Whole		Program-	Env		Construc-	Mainten-	Opera-	Admin-	
GHG Step	Agency	Planning	ming	Analysis	Design	tion	ance	tions	istration	Districts
Policy	\checkmark	\checkmark		\checkmark						
Institutional Alignment	\checkmark	✓		~			~	✓	\checkmark	\checkmark
Partnerships	\checkmark	\checkmark		\checkmark			\checkmark	\checkmark	\checkmark	\checkmark
Inventory	\checkmark	\checkmark		\checkmark		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Communication &	\checkmark	\checkmark		\checkmark	\checkmark					\checkmark
Public Engagement		1	,	1	1			1	1	1
Strategy Identification	✓	\checkmark	V	\checkmark	V	V	V	\checkmark	V	\checkmark
Strategy Assessment	\checkmark	\checkmark	\checkmark	\checkmark	√	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Implementation	\checkmark		\checkmark							
Monitoring and Evaluation	\checkmark	\checkmark		\checkmark			\checkmark	\checkmark	\checkmark	\checkmark

Levels of Engagement

Level	Policy	Practice – Internal	Practice - System	Data & Analysis					
Level 1	New to the topic; few or no formal actions to address GHG.								
Level 2	Has established general policies, goals, and/or objectives related to GHG.	Agency emissions considered.	No formal consideration of transportation system emission reduction.	No or limited/partial GHG inventory.					
Level 3	Has established specific policies, goals, and/or objectives related to GHG.	Applies quantitative project or program evaluation criteria to agency emissions.	Qualitative project or program evaluation criteria.	Has developed GHG inventory and/or forecast.					
Level 4	Serious multiagency effort.	Strategic planning: has a strategies, linked strategies programs, and conducted assessment.	evaluated GHG reduction gies to plans and ed quantitative	Has developed inventory, forecast, specific data and tracking methods, and established specific policies and goals related to targeted GHG reductions.					

Survey results...



5

Guide Contents

Background

- Purpose of Guide (1.0)
- GHG Basics (2.0)
- Planning for Uncertainty (3.0)
- GHGs Across the Agency (4.0)

Institutional Alignment and Framework

- Policy (5.0)
- Institutional Considerations and Alignment (6.0)
- Partnerships (7.0)
- Communications (8.0)
- Performance Monitoring, Evaluation, and Reporting (18.0)
- Putting it All Together (19.0)

Functional Areas

- Internal Assessment and Planning (9.0)
- Transportation Systems Planning (10.0)
- Programming (11.0)
- Project Development and Preliminary Design (12.0)
- Environmental Review (13.0)
- Final Design and Construction (14.0)
- Maintenance (15.0)
- System Management and Operations (16.0)
- Regions/Districts (17.0)

Data and Tools

- References (Appendix A)
- GHG Analysis Tools (Appendix B)
- Examples (Appendix C)
- Electrification Resources (Appendix D)

Section-by-Section Contents

- What's included?
- Why address GHGs at this level?
- Level of effort
- Complementarity/consistency with other transportation goals
- Who—roles and responsibilities

- Inventory development and forecasting
- Goal and target setting
- Strategy identification
- Strategy evaluation
- Implementation
- Monitoring, evaluation, and reporting
- Self-assessment tool

63

The Guide – NCHRP WebResource 1

(<u>https://crp.trb.org/nchrpwebresource1/9-0central-administration/</u>)

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		ABOUT NCHRP N	ICHRP WEBRESOURCES CONTACT
TRB's COOPERATIVE RESEARCH PROGRAMS		HRP WebResources An e	electronic product line of TRB's operative Research Programs
Reducing Greenhouse Gas Emission	ns: A Guide for	State DOTs	
OVERVIEW \checkmark BACKGROUND \checkmark FRAMEWORK \checkmark FUNCTIONAL AREAS \checkmark IMPL		Search the Website	Q
9.0 Central Administration	APPENDIX A. ANNOTATED BIBLIOGRAPHY		
 9.1 What Is Included? 9.2 Why Address Agency GHG Emissions? 9.3 Level of Effort 	APPENDIX B. GREENHOUSE GAS EVALUATION TOOLS		
 9.4 Complementarity/Consistency with Other Transportation Goals 9.5 Who—Roles and Responsibilities 	APPENDIX C. BRIDGE REPLACEMENT EXAMPLE		
 9.6 Inventory Development 9.7 Goal and Target Setting 9.8 Strategy Identification 	APPENDIX D. ZERO- EMISSION VEHICLE RESOURCES		
9.9 Strategy Evaluation9.10 Implementation	SELF-ASSESSMENTS		
 9.11 Monitoring, Evaluation, and Reporting 9.12 Self-Assessment: Central Administration 			

9.1 What Is Included?

The Guide – NCHRP WebResource 1

(<u>https://crp.trb.org/nchrpwebresource1/9-0central-administration/</u>)

GHG Estimation and Reduction Strategies

(Self assessment excerpt)

Identify specific strategies your unit/functional area is undertaking now and which ones you might want to be undertaking in a few years. The table indicates what "level of engagement" (1–4) the strategy may be associated with. More advanced strategies indicate higher levels of engagement that also require more effort.

Doing Now?	Within 3 Years?	Programmatic Strategy	Level of Engagemen t
		Require Energy Star appliances or electronics rated by the Electronic Product Environmental Assessment Tool (EPEAT) (Green Electronics Council).	1
		Conduct energy efficiency assessment of all office buildings.	2
		Implement life-cycle-based procurement of efficient/clean appliances, devices, or vehicles.	2
		Encourage employee carpooling and EV use.	2
		Purchase green power through negotiated procurement.	3
		Default to EVs for fleet vehicles, with plug-in hybrids for longer distance travel needs.	3
		Engage an ESCO to deliver facility-wide energy efficiency upgrades for every cost-effective appliance.	4
		Purchase offsets for emissions from natural gas consumption.	4

Strategies for GHG Reduction



Transportation Sources – Sample State



Construction & Maintenance Mitigation Strategies – Illustrative Impacts



Tools and Data Sources: Systems Planning & Policies

Tool	Emission Rates/Factors	GHG Inventory Development	Construction and Maint. Activities	Highway Network and Operations	Transit Investment and Operations	Nonmotorized Improvements	Pricing Policies	Land Use and Smart Growth	TDM and Public Education	Shared Mobility	Freight Rail and Marine Strategies	Clean Vehicle and Fuel Strategies
MOVES/EMFAC	•	•										•
GREET	•											•
FHWA ICE		•	•									
VISION	•											•
MA3T	•											•
Travel Demand Model		•		•	•		•	•				
VisionEval/EERPAT		•		•	•	•	•	•	•	•	•	•
Impacts 2050					•		٠	•		٠		
TRIMMS					•	•	•	•	•			
Transit GHG Emissions Est			•		•							
Land Use Scenario Tools						•		•				60

Implementing GHG Reduction Strategies



Common Climate Change Partners

- Environmental/air quality agency
- Energy agency
- Utility regulators
- Commerce/economic development agency
- Agriculture agency
- Health agency
- Governmental services agency
- Housing agency
- State budget office

- MPOs and regional planning agencies
- Transit agencies
- Cities and counties
- NGOs
- Academics/universities
- Private sector/trade groups

The GHG Action Spectrum

	Functional Area									
	Execs and Whole		Program-	Env		Construc-	Mainten-	Opera-	Admin-	
GHG Step	Agency	Planning	ming	Analysis	Design	tion	ance	tions	istration	Districts
Policy	\checkmark	\checkmark		\checkmark						
Institutional Alignment	\checkmark	\checkmark		\checkmark			\checkmark	\checkmark	√	\checkmark
Partnerships	\checkmark	\checkmark		\checkmark			\checkmark	\checkmark	\checkmark	\checkmark
Inventory	\checkmark	\checkmark		\checkmark		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Communication &	\checkmark	\checkmark		\checkmark	\checkmark					\checkmark
Strategy	✓	✓	✓	✓	~	✓	√	√	✓	✓
Strategy Assessment	✓	✓	✓	\checkmark	\checkmark	✓	✓	✓	✓	✓
Implementation	\checkmark		\checkmark							
Monitoring and Evaluation	\checkmark	\checkmark		\checkmark			\checkmark	\checkmark	\checkmark	\checkmark
Charter and Task Force

GHG Task Force Charter

- Date
- Purpose
- Membership
- Meetings
- Reporting
- Deliverables

Model GHG Task Force Kickoff Meeting Agenda

- Introductions/orientation
- GHG executive charter
- Interim GHG policy
- Discussion
- Unit by unit reaction
- Initial assignments
- Unit self-assessments
- Housekeeping
- Concluding remarks

Self-Assessment Worksheets

- Staff Responsibilities
 - » Who is responsible for what topics?
- Level of Engagement
 - » How engaged is your agency now, and how engaged you might want to be in the next few years?

GHG Strategies

» Which strategies your agency is undertaking now, and which ones you might want to be undertaking in a few years?

Action Plan

» What actions will you take to implement the strategies you identified above to advance your agency's practice on GHG issues?

Management Cycle



Plan	Set policy	Establish targets	Make assignments
Do	Develop procedures	Train staff	Implement
Check	Report	Consolidate reports	Evaluate performance
Act (Improve)	Check-in with partners	Explore alternatives	Revise procedures

Contacts and Further Information

- Guide (WebResource 1): <u>https://crp.trb.org/nchrpwebresource1/</u>
- Project report (Web-Only Document 308): <u>https://nap.nationalacademies.org/catalog/26523/methods-for-state-dots-to-reduce-greenhouse-gas-emissions-from-the-transportation-sector</u>
- Gary R. McVoy, Ph.D. Presenter, <u>GMcVoyLLC@gmail.com</u>
- Chris Porter, Principal Investigator, <u>cporter@camsys.com</u>
- Funding to assist with implementation may be available from NCHRP. If interested, contact Ann Hartell, NCHRP Senior Program Officer, <u>ahartell@nas.edu</u>

How to Use the Guide

I want to know more about climate change, GHG emissions, and why a DOT should care

I want to see some examples of how DOTs have considered GHG reduction potential from transportation

I'm charged with implementing a sustainability or climate change program and want to know how to get all the parts of our DOT working on this **Start with Section 2.0, GHG Basics**

See Section 3.0 for overall scenario analysis examples; Sections 9.0–15.0 also include some topic-specific examples

Start with Section 6.0 (Institutional Considerations); also see Sections 5.0 and 7.0 (Policy, Partnerships) and 18.0 (Putting it All Together)

How to Use the Guide (continued)

I work in a specific functional unit (planning, construction, etc.) and want to know what our unit can be doing to reduce GHGs

See the section for your functional unit in Sections 9.0–16.0, including self-assessment tools at the end of each section

See the references in Appendix A and the table of GHG analysis tools and description of tools in Appendix B; or the functional unit sections (9.0–16.0) for specific topics

See Section 8.0 (Communications) and 17.0 (Performance Monitoring)

I want to learn what tools and resources are available to support GHG inventory and strategy analysis

I want to know more about how we can track emissions and communicate progress and successes to the public



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