



**NORTH CAROLINA**  
Department of Transportation

# Transportation Performance Management (TPM) GHG Performance Target Coordination

Transportation Planning Division

January 18, 2024

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

# Webinar Purpose

- » Review new FHWA GHG Performance Measure
- » Discuss requirements and deadlines
- » Review NCDOT target setting activities
- » Review target range and get MPO input

# GHG Performance Measure - Overview

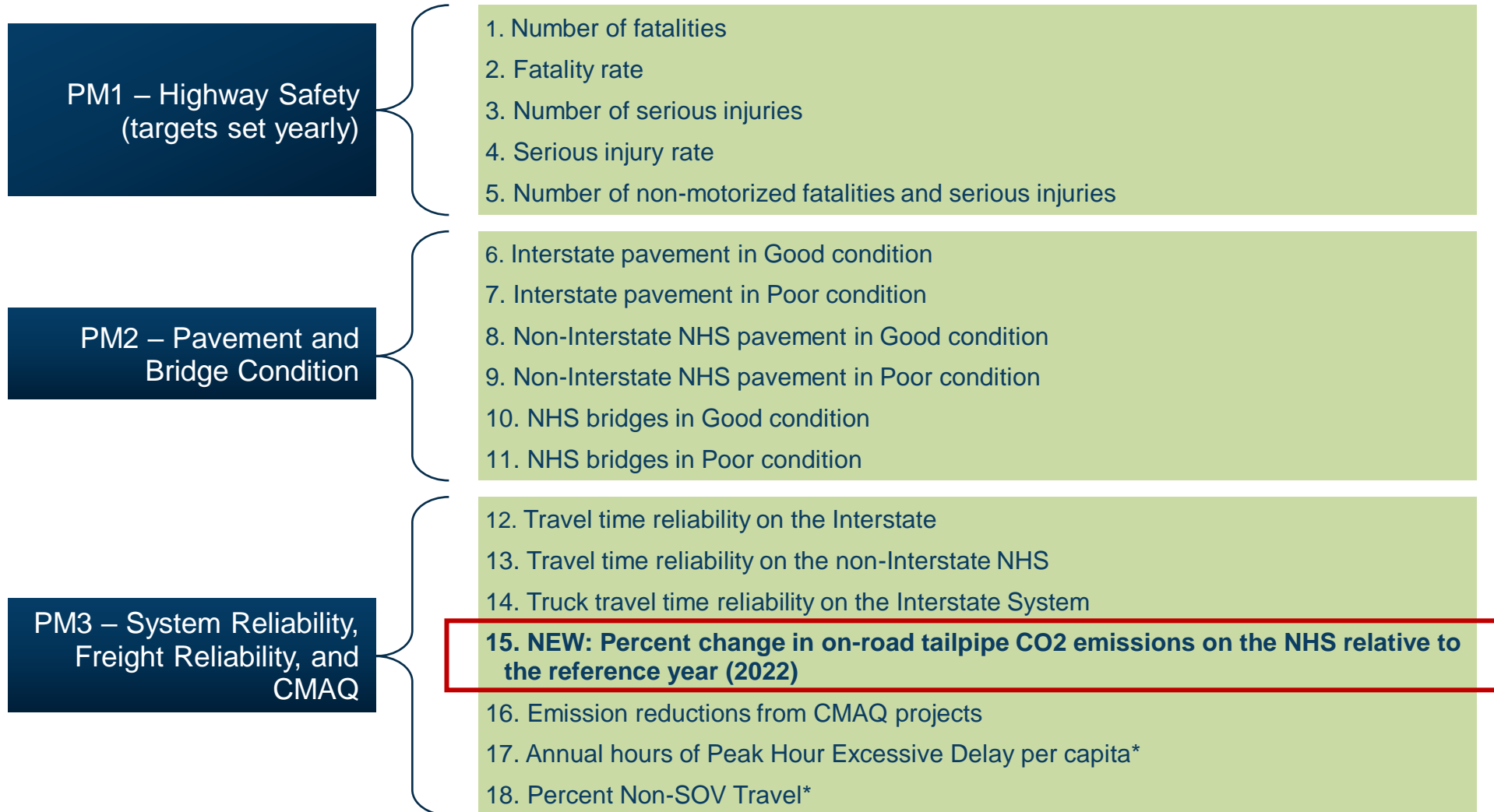
National Performance Management Measures; Assessing Performance of the National Highway System (NHS), Greenhouse Gas Emissions (GHG) Measure

- FHWA final rule published December 7, 2023
  - Effective date is January 8, 2024
- » Measure: the percent change in on-road tailpipe CO<sub>2</sub> emissions on the NHS relative to the reference year (2022)
- Note: NHS only

$$\frac{(\text{Tailpipe CO}_2\text{Emissions on NHS})_{\text{CY}} - (\text{Tailpipe CO}_2\text{Emissions on NHS})_{\text{reference year}}}{(\text{Tailpipe CO}_2\text{Emissions on NHS})_{\text{reference year}}} \times 100$$

$$(\text{Tailpipe CO}_2\text{Emissions on NHS})_{\text{CY}} = \left( \sum_{t=1}^T (\text{Fuel Consumed})_t \times (\text{CO}_2\text{Factor})_t \right) \times \left( \frac{\text{NHS VMT}}{\text{Total VMT}} \right)$$

# GHG Performance Measure - Overview



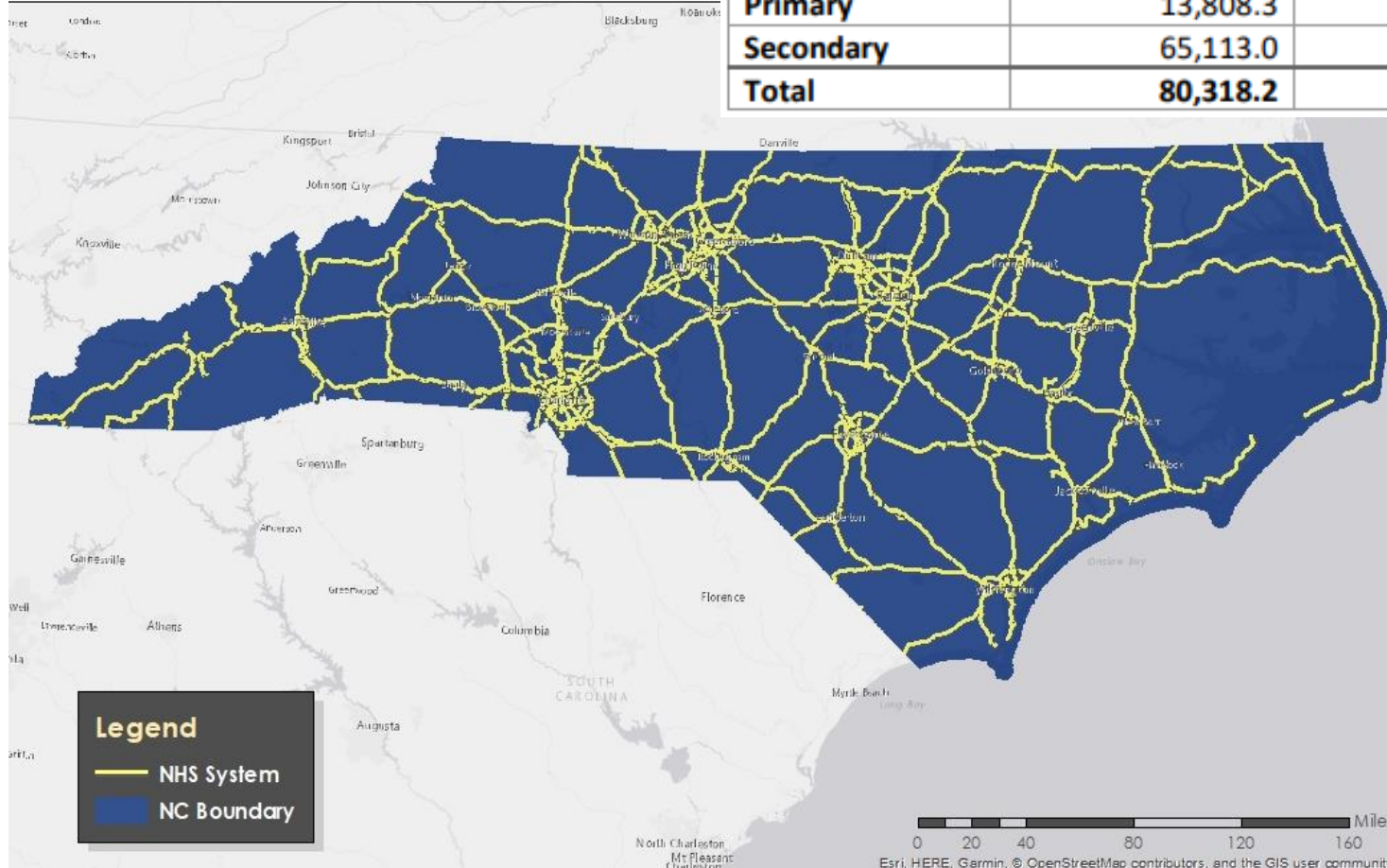
\*Applies only in the Charlotte and Concord Urbanized Areas<sub>4</sub>

# GHG Performance Measure - Overview

## NHS in NC

Route Class	Total State System		NHS	
	Miles	Lane-miles	Miles	Lane-miles
<b>Interstate</b>	1,396.9	6,684.1	1,395.2	6,677.0
<b>Primary</b>	13,808.3	35,191.7	4,075.0	14,221.1
<b>Secondary</b>	65,113.0	124,126.3	179.0	699.5
<b>Total</b>	<b>80,318.2</b>	<b>166,002.1</b>	<b>5,649.2</b>	<b>21,597.6</b>

Source: NCDOT Final 2022 TAMP



The NHS includes Interstate highways, Interstate business, US, NC and selected secondary routes and ramps connecting to an NHS route.

# GHG Performance Measure - Targets

## Targets

- States and MPOs are required to establish GHG performance targets
- Targets must show a decline in GHG emissions over time
  - Targets will be expressed as a negative percent value, e.g. -1.0%
- Target Deadlines
  - States must establish initial targets by February 1, 2024
  - MPOs must establish targets within 180 days of State (July 30, 2024)
- Initial targets will be for CY2025
- States and MPOs must coordinate when setting GHG targets

# GHG Performance Measure - Targets

## MPO Targets

- All MPOs must set a target for the MPO area
  - As with the other federal performance measures, MPOs set targets by either agreeing to support the State's target or setting their own target for the MPO area
- Joint Targets: In urbanized areas that are served by two or more MPOs, the MPOs must collectively establish a single joint target for the urbanized area
  - Joint target **is in addition to** each MPO's target for their MPA
  - Joint target must be a quantifiable target for the urbanized area
  - The state is not required to agree to joint targets
  - FHWA published a list of urbanized areas and MPOs where this applies
    - <https://www.regulations.gov/document/FHWA-2021-0004-39832>

# GHG Performance Measure – Joint Targets

Joint targets are required in these urbanized areas in NC:

Urbanized Area	MPOs that will set a Joint Target for the Urbanized Area
Burlington, NC	Burlington-Graham MPO Greensboro Urban Area MPO Durham-Chapel Hill-Carrboro MPO
Charlotte, NC-SC	Charlotte Regional TPO Cabarrus-Rowan MPO Rock Hill-Fort Mill ATS Gaston Cleveland Lincoln MPO Greater Hickory MPO
Concord, NC	Cabarrus-Rowan MPO High Point Urban Area MPO
Greensboro, NC	Greensboro Urban Area MPO High Point Urban Area MPO
High Point, NC	High Point Urban Area MPO Winston-Salem Urban Area MPO
Raleigh, NC	Capital Area MPO Durham-Chapel Hill-Carrboro MPO
Winston-Salem, NC	Winston-Salem Urban Area MPO High Point Urban Area MPO Greensboro Urban Area MPO



# GHG Performance Measure

## Consequences

- There are no penalties for State DOTs or MPOs that set GHG targets but do not meet their targets

## Calculations and Data

- States must use prescribed methodology to calculate the GHG measure and targets
- State calculations use data already tracked and reported
  - Fuel consumption: reported to "Fuels & FASH" system
  - VMT: States may use their best available VMT data
    - Should be consistent with VMT data submitted to HPMS
  - CO2 emission factors: provided by FHWA (by August 15th of each reporting year)

# GHG Performance Measure

## MPO GHG Calculation Flexibility

- MPOs have flexibility in how they calculate the GHG metric. MPOs may use:
  - The MPO share of the State's VMT as a proxy for the MPO share of CO2 emissions in the State
  - VMT estimates along with MOVES\* emissions factors
  - FHWA's Energy and Emissions Reduction Policy Analysis Tool (EERPAT) model
  - Or any other method the MPO can demonstrate has valid and useful results for CO2 measurement

\*EPA's Motor Vehicle Emissions Simulator

# GHG Performance Measure

## Reporting

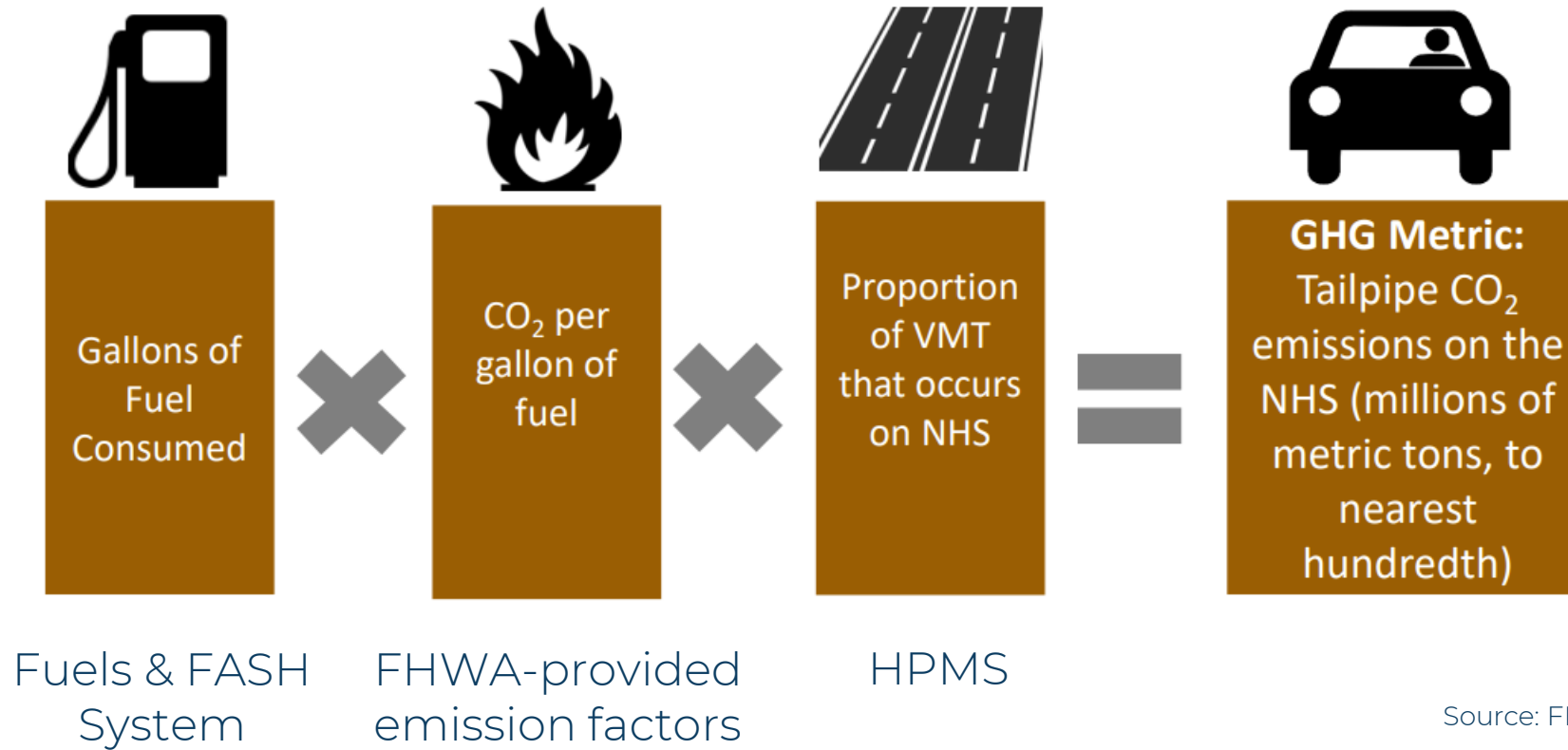
- Initial State report is due to FHWA by February 1, 2024
  - Report CY2025 target, basis for target, and all components of the calculation
- After that, States will report GHG targets and progress to FHWA every 2 years
  - Will follow the same schedule as the other PM2 and PM3 measures
- MPOs must include the GHG targets in their TIP, and report in their MTP System Performance Report:
  - GHG target(s)
  - Calculations and values used
  - Description of data sources and methodology
  - This information is required to be included two years after the effective date of the GHG final rule, so on or after January 8, 2026

# State Target Setting

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# GHG Performance Measure Calculation

## State GHG Calculation



Source: FHWA webinar 12/13/2023

# GHG Performance Measure Calculation

## 2022 Reference Year Calculation for NC:

- CY 2022 Gasoline Fuel Consumed = 4,535,028,000 gallons
- CY 2022 Special Fuels Consumed = 1,202,929,000 gallons
  
- CY 2022 Gasoline CO2 factor = 0.00000810 mmt/1000 gallons
- CY 2022 Special Fuels CO2 factor = 0.00001019 mmt/1000 gallons
  
- CY 2022 VMT all roads = 119,381 million vehicle miles
- CY 2022 VMT NHS roads = 55,918 million vehicle miles
  
- CY 2022 GHG all roads = 48.99 million metric tons (mmt)
- CY 2022 GHG NHS roads = 22.95 million metric tons (mmt)

$$(\text{Tailpipe CO}_2 \text{ Emissions on NHS})_{\text{CY}} = \left( \sum_{t=1}^T (\text{Fuel Consumed})_t \times (\text{CO}_2 \text{ Factor})_t \right) \times \left( \frac{\text{NHS VMT}}{\text{Total VMT}} \right)$$

# GHG Performance Measure – Targets

## Target Setting – Key Variables

Variable	Scenario Assumptions
VMT annual growth rate in NC	2021-2022 was 0.92%
EV adoption rate	# of registrations in 2025
Vehicle fleet mix	% of EV light trucks and buses
Fleet fuel efficiency	MPG increase for cars, trucks
Timeframe	2025

# GHG Performance Measure

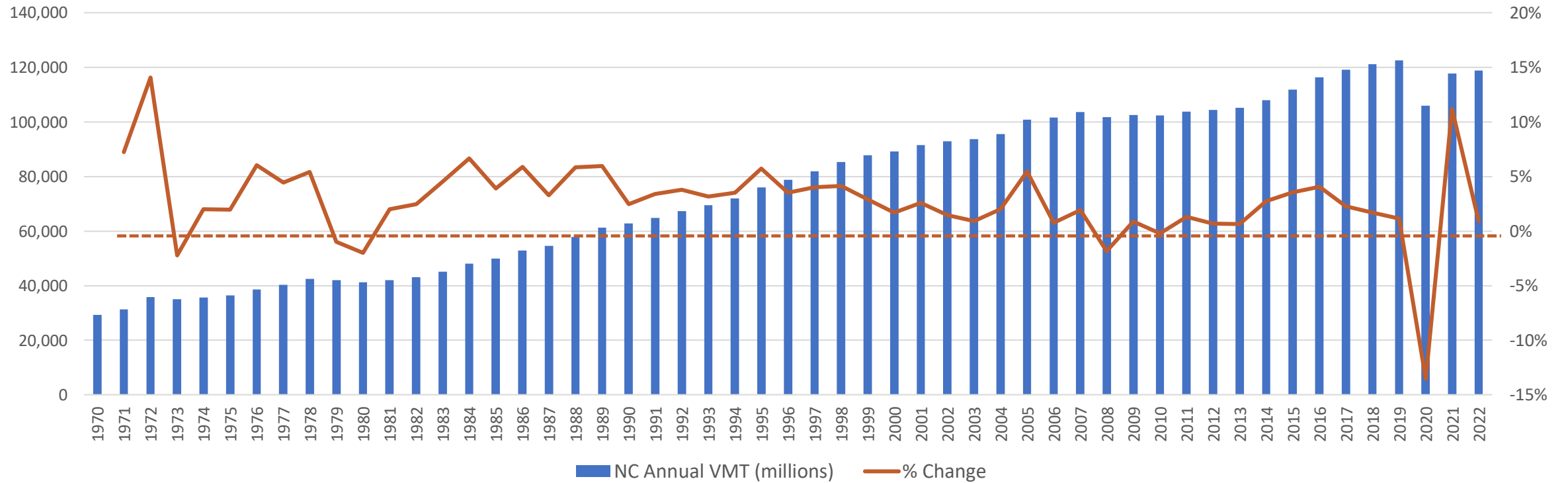
## Other Influencing Factors

- » Economy
- » Fuel prices
- » Commuting changes
- » Technology changes
- » Impact of Federal and State policies and plans
  - Federal vehicle CAFE standards
  - IIJA and IRA programs – Carbon Reduction Strategy, NEVI, EV incentives
  - NC Clean Transportation Plan
  - NC Executive Orders 80, 246, 271
  - NC ZEV Plan
  - NCDOT VMT Reduction Study

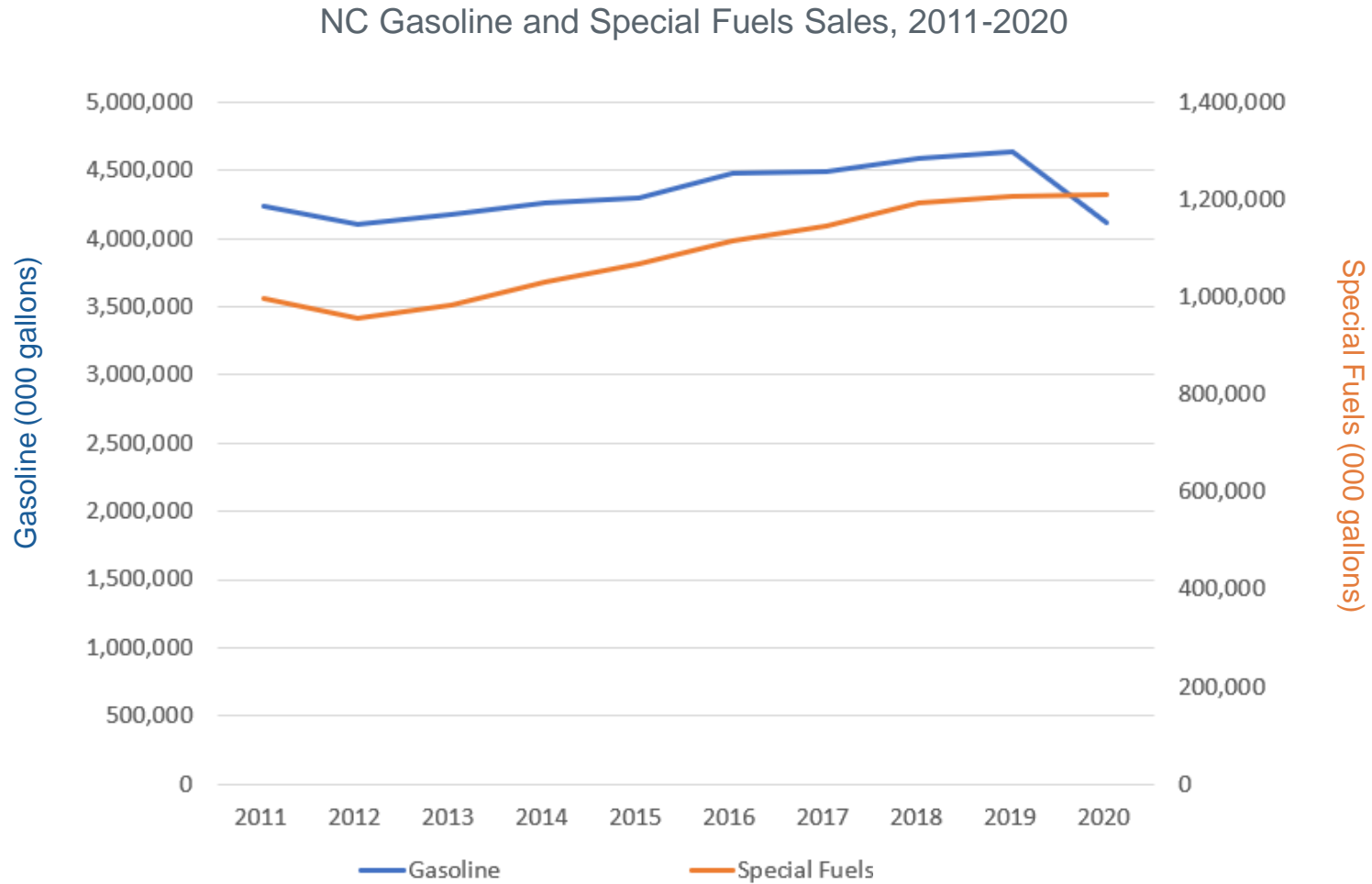


# GHG Performance Measure

## NC Annual VMT, 1970-2022

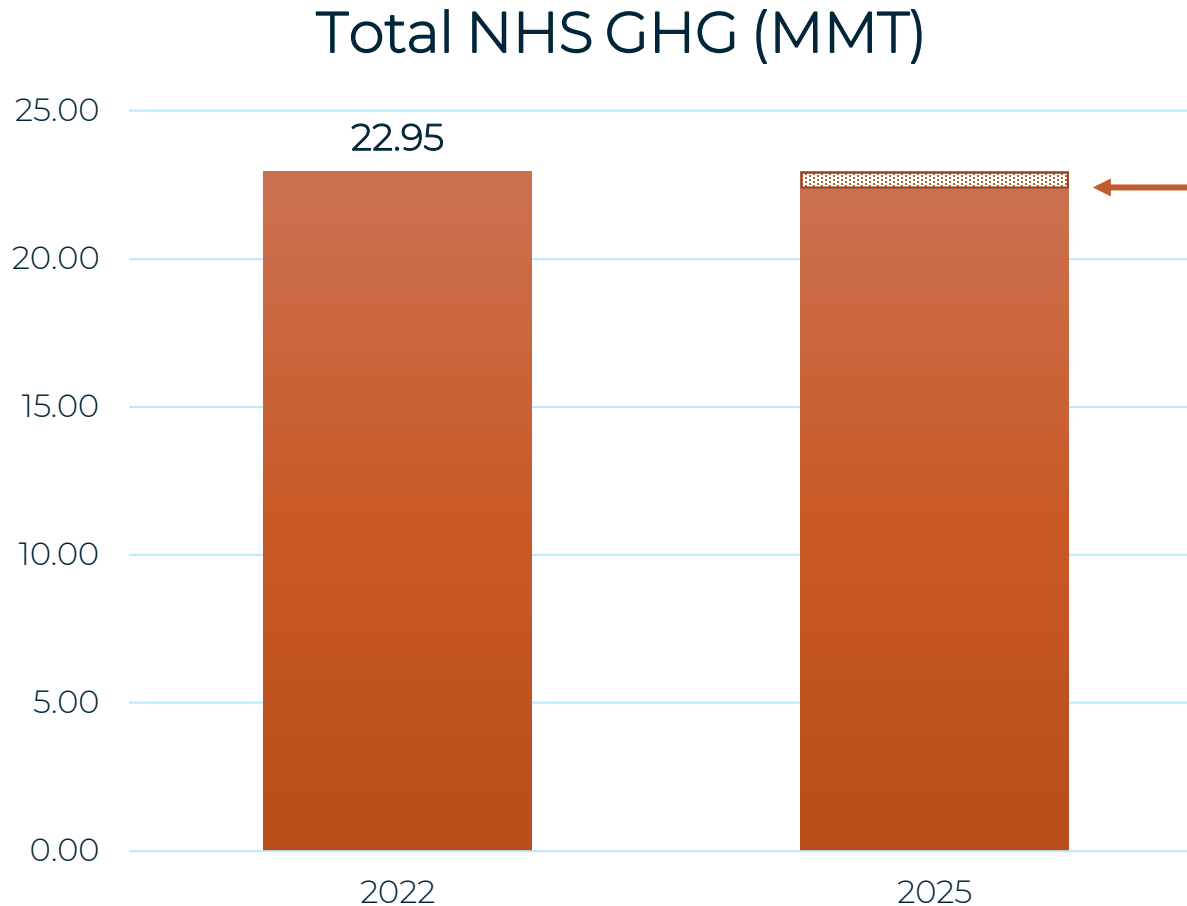


# GHG Performance Measure – Targets



# GHG Performance Measure – Targets

## 2025 Target Range



The target is expressed as the percent change in on-road tailpipe CO<sub>2</sub> emissions from 2022

Target must be a negative value and be reported to the nearest tenth of a percent

NCDOT is looking at a target range of -0.1% to -1.0%

# Next Steps

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# GHG Performance Measure

## MPO Data

- » NCDOT is working on providing VMT and NHS CO2 estimates at the MPO/RPO and county levels
  - NHS CO2 estimates for subareas are based on distributing the statewide NHS CO2 using the ratio of the subarea NHS AVMT to statewide NHS AVMT

# GHG Performance Measure

## Next Steps

### » NCDOT

- Finalize target and report to FHWA by February 1
- Share final State target with MPOs

### » MPOs

- Review requirements, decide on approach to targets
- Be prepared to support State targets (or set your own) by July 30, 2024\* (which is 180 days from Feb 1, 2024 deadline\*)
  - \*may be a couple of days earlier, depending upon NCDOT's exact submittal date
- Joint targets – in applicable urbanized areas, MPOs must coordinate to develop urbanized area targets
- Take action on targets through Board resolution: May-June 2024
- Inform NCDOT of MPO target actions

# GHG Performance Measure

## Discussion

- » What questions do MPOs have?
- » Do you have input on the proposed target range that NCDOT should consider?
- » What other data needs do you have to meet the MPO requirements?

# Contact Us

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**Thank you!**

