

ON-ROAD VOCS AND NOX EMISSIONS REDUCTIONS FROM CMAQ FUNDED PROJECTS

TPB Performance Measures and Targets

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TPB Technical Committee
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(Toni Genberg/Flickr)



National Capital Region
Transportation Planning Board

Agenda Item #5

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Joshua Roberts, International Monetary Fund/Flickr



TPB Goals and this Performance Measure

- TPB's Goals: Safety, Maintenance, Reliability, Affordable and Convenient, Efficient System Operations, **Environmental Protection**, Resilient Region, and Livable and Prosperous Communities
- The federally-required performance measure will help assess progress towards this goal:
 - **Environmental Protection:**
 - The on-road emissions reductions performance measure is Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NO_x) in kg/day *for projects receiving congestion mitigation and air quality (CMAQ) funding*



BeyondDC/Flickr



**TPB Goals
and
Federal
Performance
Measures**



Affordable and Convenient Mobility Options

Non-SOV Mode Share (%)
PHED per Capita



Travel Time Reliability

Interstate Travel Time Reliability (%)
Non-Interstate Travel Time Reliability (%)
Truck Travel Time Reliability



Environmental Protection

Total Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NO_x)
Emissions Reductions from Projects Receiving CMAQ Funding (kg/day)



Well-Maintained Infrastructure

Interstate/NHS Pavement Lane Miles in Poor Condition (%)
Interstate/NHS Pavement Lane Miles in Good Condition (%)
Non-Interstate/NHS Pavement Lane Miles in Poor Condition (%)
Non-Interstate/NHS Pavement Lane Miles in Good Condition (%)
Bridge Deck Area in Poor Condition (%)
Bridge Deck Area in Good Condition (%)
Service Vehicles exceeding Useful Life (%)
Revenue Vehicles exceeding Useful Life (%)



Safety

of Fatalities
Rate of Fatalities (per 100 million VMT)
of Serious Injuries
Rate of Serious Injuries (per 100 million VMT)
of Nonmotorized Fatalities & Serious Injuries
[Number/Rate/Transit Worker Rate (per Revenue Vehicle Mile)]
[Number/Rate/Transit Worker Rate (per Revenue Vehicle Mile)]
(Number/Rate per Revenue Vehicle Miles)
(Number/Rate per Revenue Vehicle Miles)
(Rate/Pedestrian Collision Rate/Vehicular Collision Rate)
(Mean Distance Between Failures)

We are here



**2026 Timeline for Setting
Targets by Performance Area**

Congestion Mitigation and

Air Quality

(May - Oct)



Maintenance

(Sept - Oct)



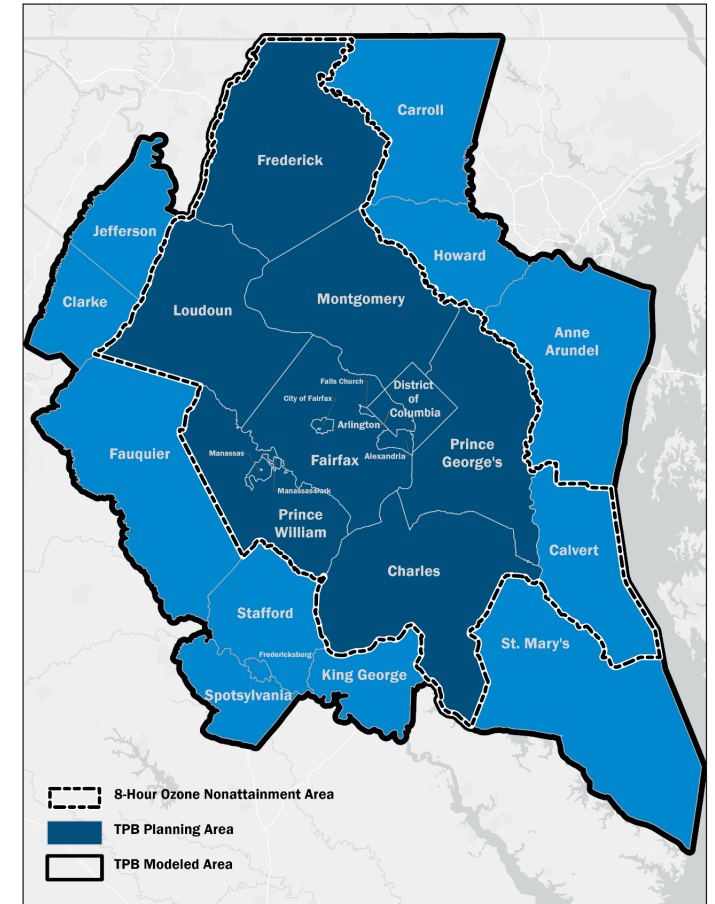
Safety

(Nov - Dec)



Ozone and the DC-MD-VA Ozone Nonattainment Area

- There are six criteria pollutants identified in the Clean Air Act that the EPA is required to regulate.
- For the DC-MD-VA region, the only remaining pollutant of concern is ground-level ozone.
- Ozone is not directly emitted in large amounts; it is the result of VOCs and NO_x combining in the presence of sunlight to form ozone.
- Efforts, therefore, aim to reduce these ozone precursor pollutants.
- Calvert County, which is within the nonattainment but outside TPB planning area, is analyzed by Calvert-St Mary's MPO.



Map of DC-MD-VA Nonattainment Area, (COG)



Congestion Mitigation and Air Quality Improvement (CMAQ) Program

- The federal CMAQ program is intended to provide a flexible funding source to State and local governments for 1) transportation projects, 2) projects that reduce emissions, and 3) located in nonattainment or maintenance areas
- These performance measures (VOC and NO_x emissions reductions) only consider projects that receive CMAQ funds.
- CMAQ project emissions reductions are only a small fraction when compared to the total on-road emissions in the region (<1%).



(Pierre Gaunard, COG)



(Montgomery Parks, MNCPPC/Flickr)



Overview of PM and Requirements

Frequency: *Quadrennially (Two- and Four-year targets)*

Timeframe: TPB Review and approval of targets *June 2026 – July 2026*, State Adoption *September 2026*

TPB will produce two CMAQ Performance Reports for the Performance Management Forms (PMF) of the states.

Consequences: *Not achieving a target may require the states to more clearly demonstrate that CMAQ-funded investments are effectively contributing to emissions reductions.*



(Joe Flood/Flickr)



Overview of On-Road Emissions and Requirements

Performance Measure	What is it?	Data Source
Volatile Organic Compounds (VOCs) Reductions	Sum of the VOC emissions reductions for projects receiving CMAQ funding	FHWA CMAQ Public Access System
Nitrogen Oxides (NO _x) Reductions	Sum of the NO _x emissions reductions for projects receiving CMAQ funding	FHWA CMAQ Public Access System



CMAQ Public Access System

- Source of data for previous performance is the FHWA CMAQ Public Access system (CPAS).
- States enter CMAQ project information into the CPAS annually (March 1st)
- Methods vary for estimating the emissions benefits for projects recorded in the CPAS.
 - Small project benefits may be analyzed using sketch-level methods.
 - FHWA created the (optional) CMAQ Toolkit with various spreadsheets to help in the analysis of projects.
 - Some agencies have developed their own tools.
 - Projects with larger emissions reductions may have individual analyses.
 - E.g, Commuter Connections and goDCgo.

About Congestion Mitigation and Air Quality (CMAQ) System

All 50 states and the District of Columbia submit annual reports of their CMAQ project obligations in March of every year. The FHWA uses these yearly submissions to maintain an active database of CMAQ investments, air quality benefits, Project trends within the program, and other anecdotal information focusing on the program's performance.

This database of CMAQ Project information had been reserved for internal planning purposes by authorized FHWA personnel, for Congressional reporting and made available to state DOTs and MPOs on an individual request basis.

The release of the CMAQ Public Access System was the first opportunity that the general public could have full access to FHWA approved CMAQ Project data submitted through the annual reporting process. The CMAQ Public Access System makes available searchable, read only, project information from 1992 to present in various reporting formats.

CMAQ system support and guidance information are available through the [FHWA Air Quality CMAQ](#) website.

Disclaimer: Data present in the CMAQ Public Access System (PAS) is composed solely of projects from state DOT annual reports submitted and approved by FHWA, HQ Staff. Availability of project data for the previous fiscal year and subsequent years will be lagged and will be complete on September 30 of the succeeding calendar year.

District Of Columbia
or
Click a state on the map to view data

ACTIVE MPO LISTING 2026

MPO	ENTERED	REMOVED
Metropolitan Washington COG	2000	
No MPO Identified/State sponsored project	2003	
National Capital Region Transportation Planning Board	2015	

FHWA CMAQ Public Access System Website:
(<https://fhwaapps.fhwa.dot.gov/cmaq2p/>)



CMAQ Public Access System (cont.)

- The region has corrections pending for the CPAS.
 - This affects reported values.
- The CPAS has some idiosyncrasies in how data is recorded.
 - Some small projects may be coded as having qualitative benefits where quantification is difficult.
 - A continuing project (or subsequent project) refers to a previously approved transportation initiative that is receiving additional funding or continuing development in a new fiscal year.
 - Emissions reductions are only shown in the first year of the project.
 - In subsequent years, no emissions reductions are recorded.

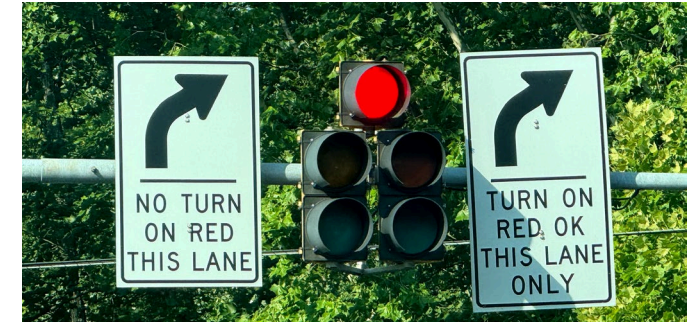


(Commuter Connections/COG)



Explanation of Past Performance

- The original CMAQ emissions reductions targets were based on the projects that were anticipated to occur in 2022-2025.
- Projects are subject to change and substitution over the course of the reporting period.
- During the last two performance periods, substituted projects had higher impacts.
 - For the 2018-2021 period, one new signal synchronization project, part of the MD CHART program, was responsible for approximately 80% of the total emissions reductions calculated.
 - For the 2022-2025 period, MD and DC funded Commuter Connections and (in DC) goDCgo using CMAQ funding, resulting in much larger emissions reductions than originally projected.



(Adam Fagen/Flickr)



(Commuter Connections/COG)



Explanation of Past Performance

- Travel Demand Management (TDM) projects, specifically Commuter Connections and goDCgo, have greater emissions reductions compared to other CMAQ Projects.



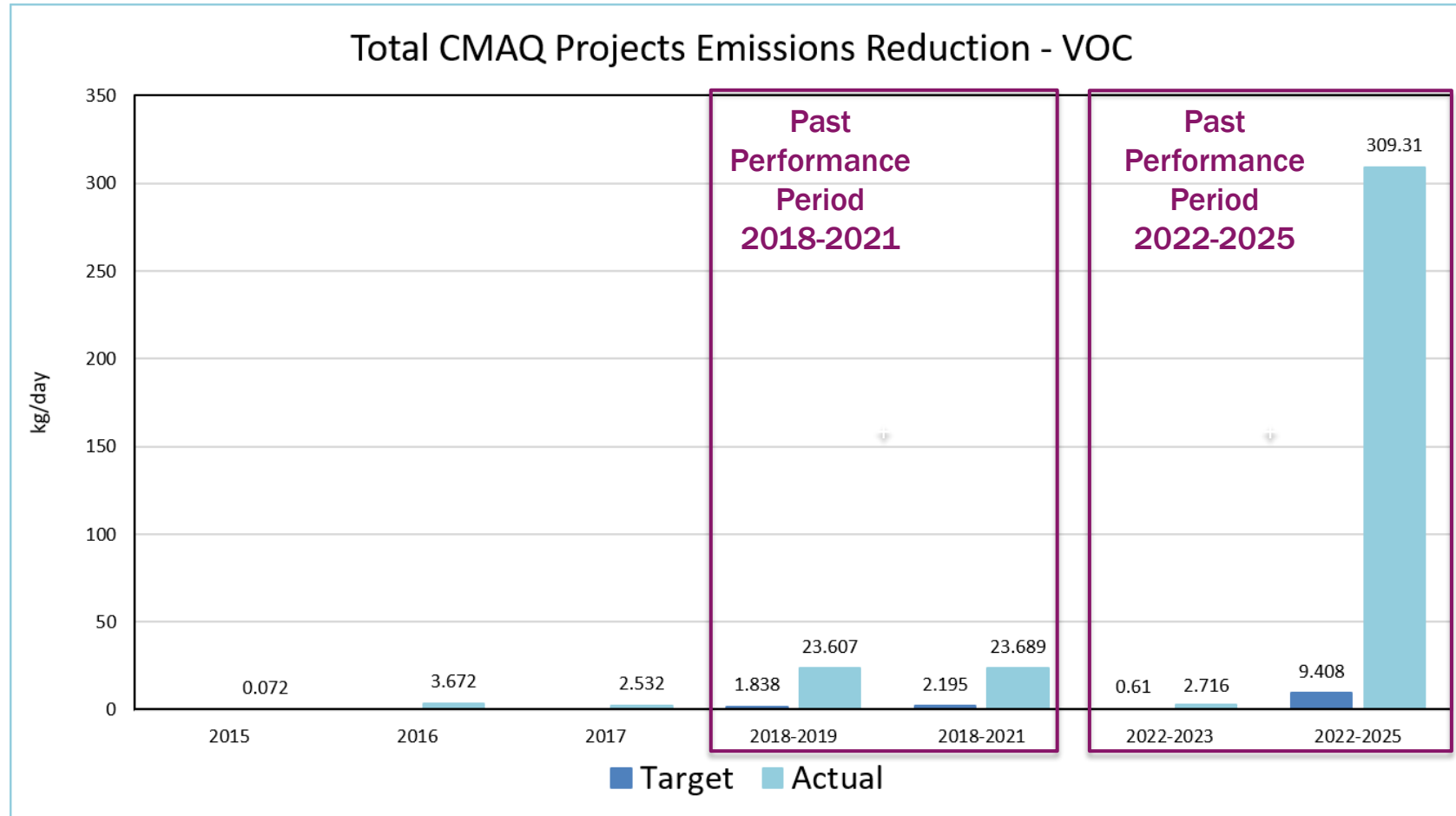
State	Year	Project Title	VOC kg/day	NO _x kg/day
MD	2025	Commuter Connection Program FY25	158.9	197.2
DC	2024	Commuter Connections	34.01	41.48
DC	2024	District TDM (goDCgo)	106	133
Total			299.0	371.7



- The average benefit of non-TDM projects recorded in the CPAS for the region in the last four years is 0.234 kg/day VOC and 0.651 kg/day NO_x reduced.



Past Performance: VOC



2018-2021



Target Met

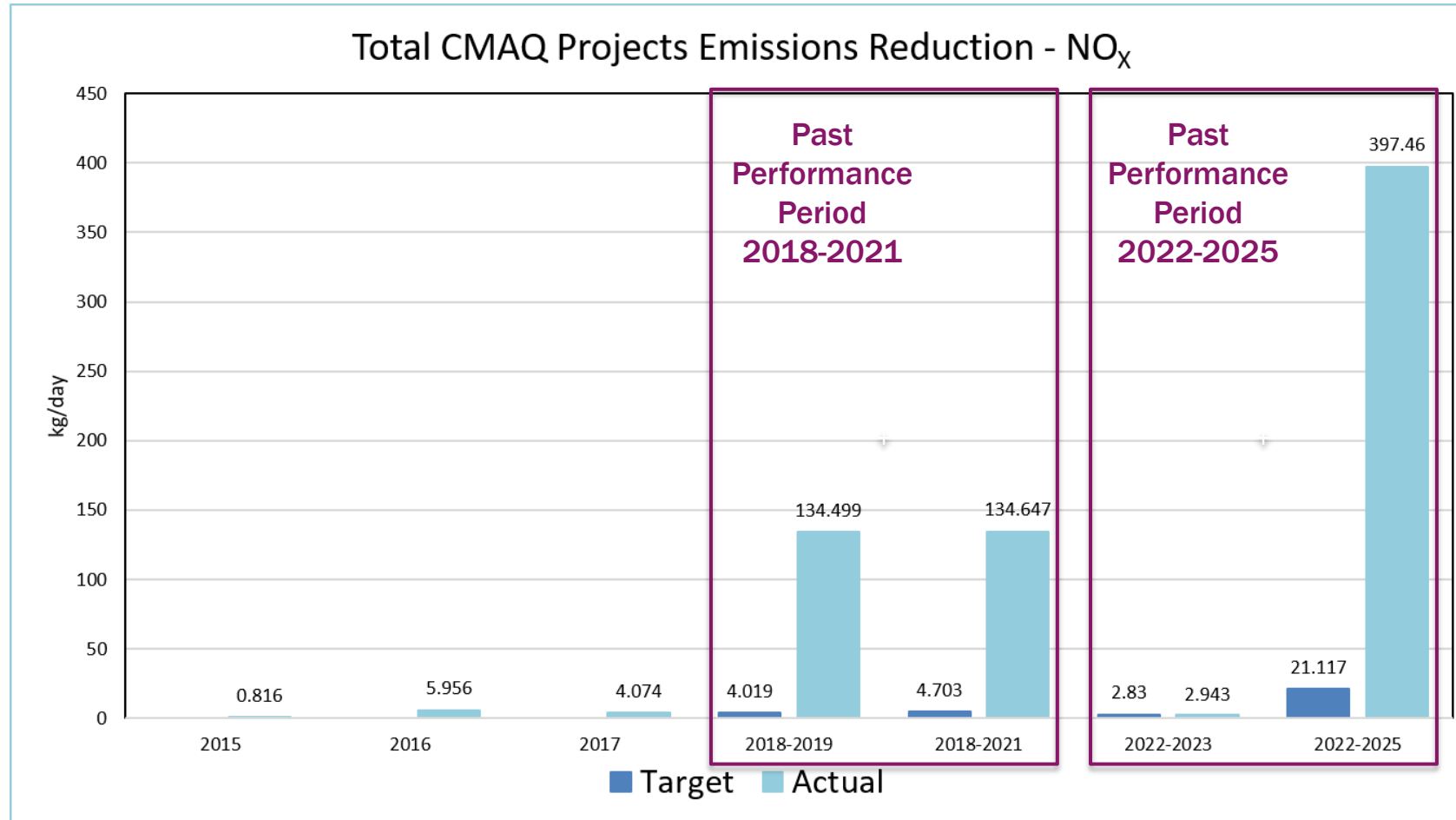
2022-2025



Target Met



Past Performance: NO_x



2018-2021



Target Met

2022-2025



Target Met



Development of Future Draft Targets 2026-2029

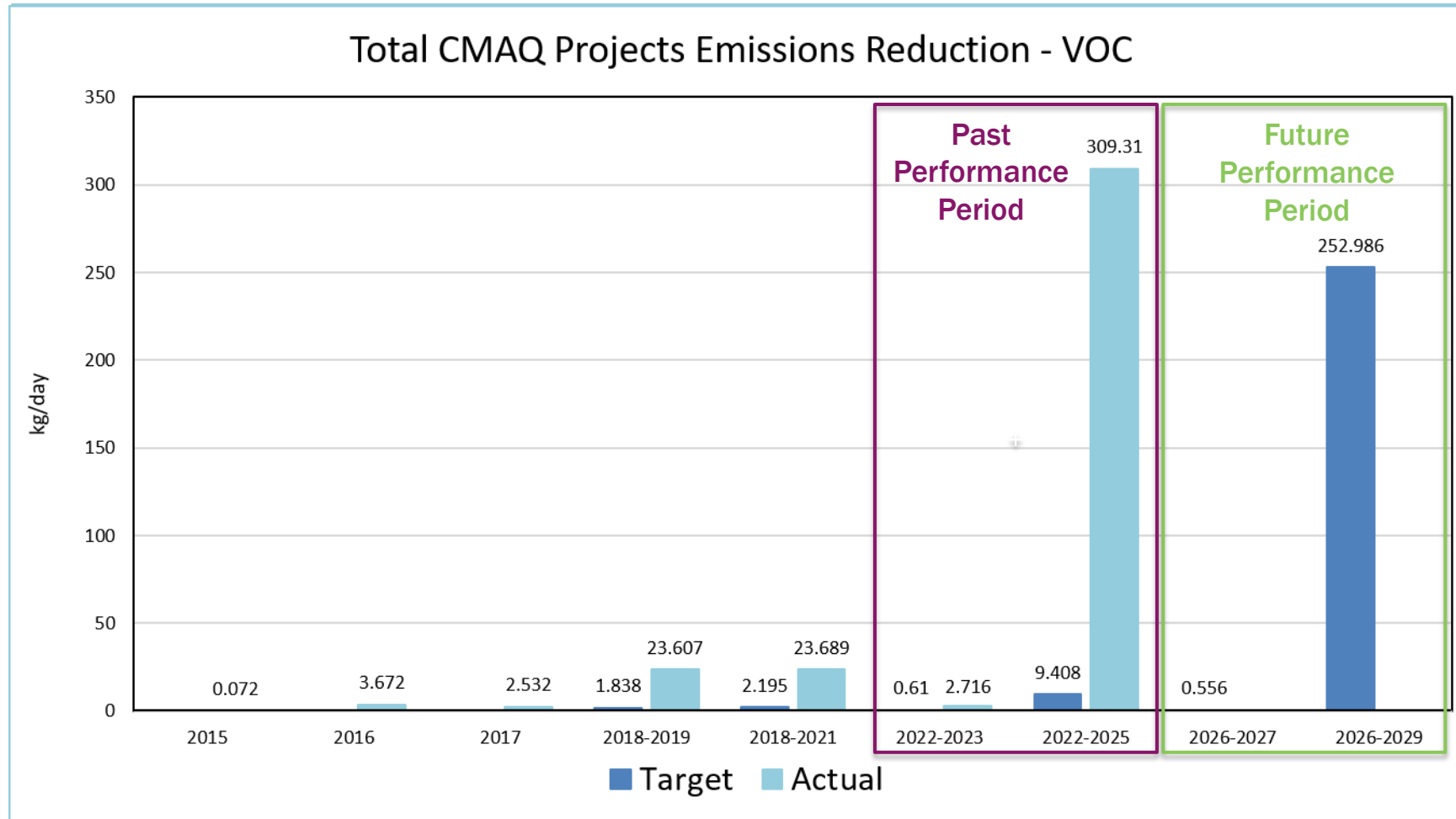
- Target emissions reductions are estimates based on projects anticipated to receive CMAQ funds.
- MD and VA provide estimated emissions reductions for projects four years into the future.
- Since DC programs its CMAQ funding annually, estimates of future project benefits are not available.
 - Targets are instead based on past performance.
- TPB targets reflect the anticipated cumulative emissions reduction to be reported by MDOT, VDOT, and DDOT for the region




(Pierre Gaunard/COG)



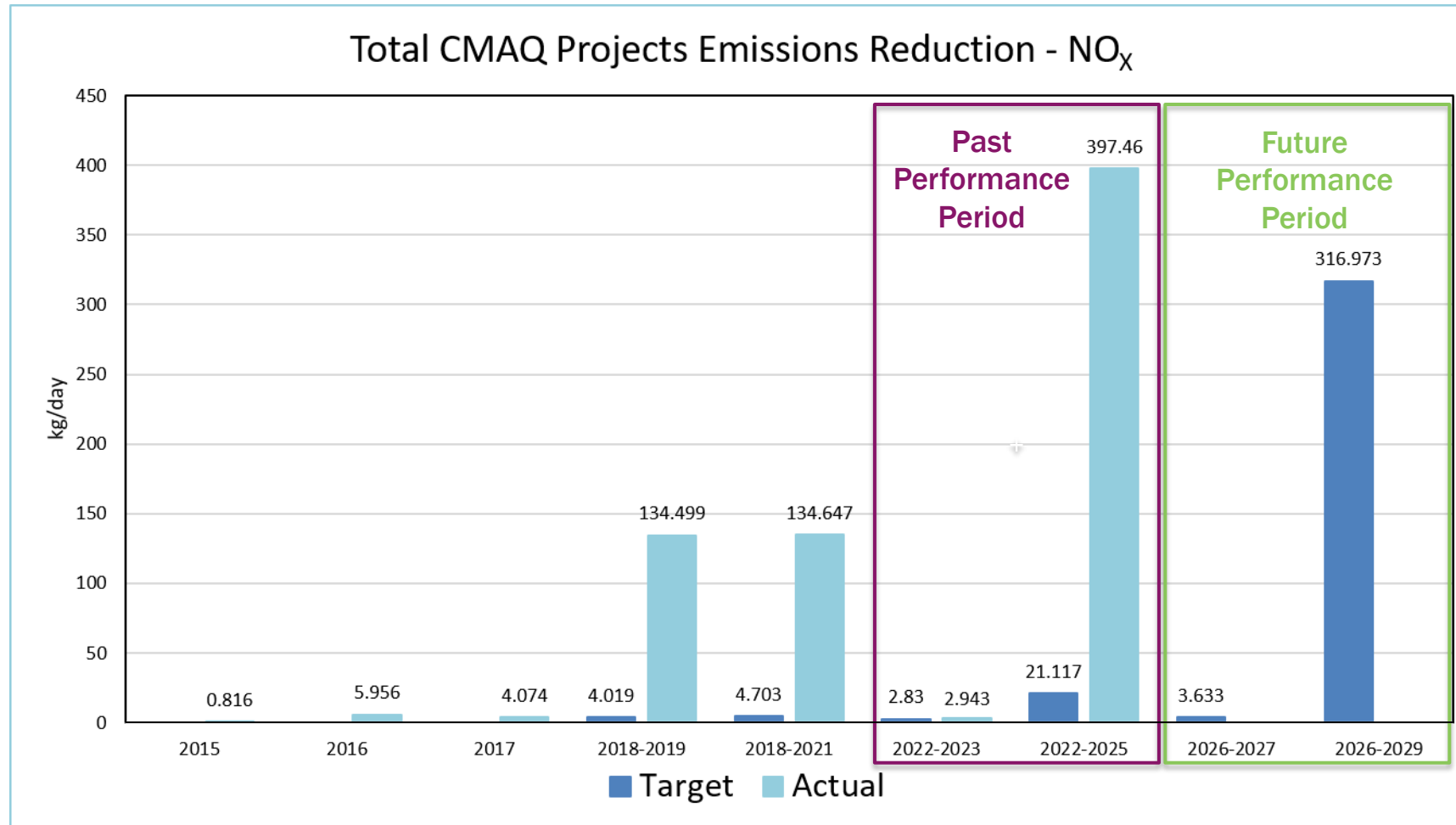
Emissions Reductions **Draft** Targets: VOC



 **Desired Trend**
 **Expected Trend**



Emissions Reductions **Draft** Targets: NO_x



↑
Desired Trend

↓
Expected Trend



Future Draft Targets

- As in the past performance period, MD and VA have provided a list of anticipated CMAQ projects with calculated emissions reductions.
 - DC has proposed that their targets would be the same as the previous period's reported performance (and include Commuter Connections and goDCgo).
 - MD projects include the Commuter Connections Program, a local ridesharing program, and some sidewalk improvements/shared-use facilities (multiple projects).
 - For the MD Commuter Connections Program, to account for potential changes in program participation as well as the increasing efficiency of personal vehicles, emissions benefits were reduced by 31% from the baseline calculation.



Microsoft stock image



Future Draft Targets

Two-Year Targets

State	VOC kg/day	NO _x kg/day
DC	0.094	0.128
MD	0.080	0.080
VA	0.382	3.425
Total	0.556	3.633

Four-Year Targets

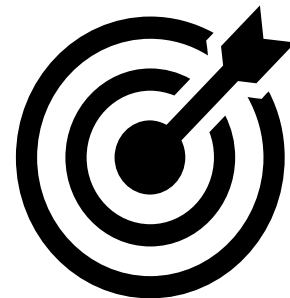
State	VOC kg/day	NO _x kg/day
DC	140.104	174.608
MD	112.440	138.870
VA	0.442	3.495
Total	252.986	316.973

- Note: VA anticipates using CMAQ funds for projects with smaller cumulative benefits, along with a number of continuing/subsequent projects where emissions reductions are not recorded.



Future **Draft** Targets for TPB Approval

Performance Measure	DRAFT Two-Year Targets 2026–2027	DRAFT Four-Year Targets 2026–2029
Emissions Reduction for CMAQ-Funded Projects – VOC	0.556 kg/day	252.986 kg/day
Emissions Reduction for CMAQ-Funded Projects – NO _x	3.633 kg/day	316.973 kg/day



Next Steps

- June 2026: TPB staff present draft measures and new targets to TPB.
- July 2026: TPB staff present final measures and targets to the TPB and Technical Committee. **TPB approves new targets.**
- July - September 2026: Three states to adopt targets no later than September. TPB finalizes the region's 2022-2025 and 2026-2029 MPO CMAQ Performance Reports for inclusion in the state PMFs. All three states notify TPB that the PMF is complete.



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