



Chicago Metropolitan
Agency for Planning

CMAQ 2nd Performance Period Mid-Point Performance Plan

October 2024

CMAQ Mid-Point Performance Plan

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CMAQ Program Performance

This report summarizes the federal requirements for the Chicago Metropolitan Agency for Planning (CMAP) in the establishment and monitoring of performance measure targets associated with the Congestion Mitigation and Air Quality Improvement (CMAQ) program. In 2018 CMAP established the 2-year and 4-year targets for the 1st Performance Period with the adoption of ON TO 2050¹. With the adoption of the ON TO 2050 Update on October 12, 2022, CMAP established new 2-year and 4-year targets for the 2nd Performance Period. This report contains a 2-year progress assessment in achieving those performance targets.

The performance measure targets include unified urbanized targets for the performance measures of Peak Hour Excessive Delay (PHED) and Non-Single Occupancy Vehicle (SOV) travel in the area of traffic congestion, and a quantifiable target for Emissions Reduction for applicable pollutants and precursors for the nonattainment/maintenance areas within the CMAP planning area boundary. The targets describe in this report meet the Moving Ahead for Progress in the 21st Century Act (MAP-21)/ Fixing America’s Surface Transportation Act (FAST Act)/Infrastructure Investment and Jobs Act (IIJA) performance-based planning and programming requirements and are consistent with the target setting approaches of Illinois and Indiana.

See Appendix A for a background and overview of the federal performance measure targets for CMAQ and Appendix B for data requirements and sources.

Performance Plan

Baseline Performance

The CMAQ Performance Plan is required to report baseline performance for each CMAQ measure. For the PHED and Non-SOV measures, baseline performance is reported for calendar years 2017 and 2016 respectively. For the Total Emissions Reduction measure, baseline performance is reported for the applicable pollutants associated with CMAQ funded projects obligated in federal fiscal years 2014 through 2017.

Peak Hour Excessive Delay (PHED)

This measure is calculated using data from the Federal Highway Administration’s (FHWA) National Performance Management Research Data Set (NPMRDS). The NPMRDS provides travel time by road segment for the National Highway System (NHS) in 15-minute intervals. Travel times are provided for passenger, freight, and combined values. Along with the travel time information, a geographic file of the road segments is provided through the NPMRDS.

¹ <https://www.cmap.illinois.gov/2050>



The geographic file includes information for each road segment including length in miles, average annual daily traffic, functional classification, and other roadway attributes. A conflation process was used to assign a speed limit information to the NPMRDS data. The 4:00 p.m. – 8:00 p.m. afternoon peak is used to be consistent with CMAP’s travel model time periods.

The PHED is calculated for each 15-minute interval in the peak periods for all segments in the Chicago urban area. The 15-minute interval PHED is calculated in the following steps:

- Segment length divided by a segment’s speed threshold (larger of 20 miles per hour, or 60 percent of speed limit) times 3,600 where travel time less than or equal to 900 seconds.
- Segment travel time minus the result from above step
- If result from above step greater than 0, then result divided by 3600
- Result from above step multiplied by the 15-minute volume and the average vehicle occupancy for the segment
- The results from the above steps are summed for the urban area and divided by the urbanized area population

The total PHED is divided by the urbanized area population to calculate the peak hour excessive delay per capita. Illinois Department of Transportation (IDOT) provided access to the Regional Integrated Transportation Information System (RITIS)² tool that was used to calculate this measure.

Table 1. Baseline Performance Period PHED

CY 2017 Performance
14.8 hours

Non-SOV Travel

The baseline for the Non-SOV Travel is calculated using the most recent table DP03 from five-year estimated of the U.S. Census Bureau’s American Community Survey (ACS) dataset. 2016 is the most recent five-year data available. The percentage of commuters that predominantly do not commute by driving alone in a car, van or truck is used.

Table 2. Baseline Performance Period Non-SOV Travel

CY 2017 Performance
30.6% (2016)

² Regional Integrated Transportation Information System www.ritis.org

Total Emissions Reduction

Applicable criteria pollutants for the CMAP non-attainment area include ozone and particulate matter 10 microns (PM₁₀) as reported in Environmental Protection Agency’s Green Book.³ Primary precursors for ozone are volatile organic compounds (VOC) and nitrogen oxides (NO_x). For particulate matter 2.5 microns (PM_{2.5}) the region was unclassifiable for a period several years ago and while the region has been reclassified to unclassifiable/attainment, it has continued reporting for baseline performance and targets for PM 2.5 even though it is not required. The Primary PM_{2.5} annual national ambient air quality standards (NAAQS) was lowered in 2024. As a result, the region may have areas that will be classified as nonattainment. The process for making these determinations is underway. The Total Emissions Reduction measure for each of the criteria pollutants or applicable precursors for all projects reported to FHWA’s CMAQ Public Access System are calculated to the nearest one thousandth by using the daily kilograms of emission reductions. CMAP staff calculates the daily kilograms of emission reductions as part of the project evaluation and selection process and provides that information to IDOT staff for inclusion in the CMAQ Public Access System. Lyons Township in western Cook County is declared a maintenance area for PM₁₀. The maintenance area is not the result of mobile source emissions, but a point source problem related to quarry activities within the township. Because these emissions are unrelated to transportation and mobile sources the baseline performance and targets are reported as zero.

Table 3. Baseline Performance Period Total Emissions Reduction

Criteria Pollutants and Applicable Precursors	FFYs 2014-2017 Performance (kg/day)
Volatile Organic Compounds (VOC)	279.242
Nitrogen Oxides (NO _x)	1,271.470
Particulate Matter (PM _{2.5})	47.555
Particulate Matter (PM ₁₀)	0.000

Targets and Assessment of Progress

CMAP must establish both 2-year and 4-year targets for the Chicago metropolitan planning area for each CMAQ performance measure and assess the progress of those targets with each biannual update of this report.

³ <https://www.epa.gov/green-book>



Peak Hour Excessive Delay (PHED)

The 2017 baseline PHED of 14.8 hours was used to set the 2024 target. This target was set in coordination between CMAP and Northwestern Indiana Regional Planning Commission (NIRPC) staff using data from the RITIS platform. Trend data and other factors were considered in setting the target including construction and agency policies and goals of increasing transit ridership, transit supportive land uses, and improving traffic operations.

New 2-year and 4-year targets were set for 2024 and 2026, respectively, with an understanding that a return to pre COVID-19 mobility levels would occur. The same process was followed in setting this target of coordination with NIRPC staff, consideration of trend data, and achievement of agency policies and goals. The new targets were approved as part of the ON TO 2050 Update System Performance report appendix.⁴

Table 4. New PHED Performance Targets for 2nd Performance Period

Baseline	2-year Target (2024)	2-year Progress Assessment	4-year Target (2026)
14.8	15.6	11.6	15.9

As shown in Table 4 above, PHED has remained low since it decreased significantly in the Chicago urbanized area starting in 2020. While CMAP analyzes candidate projects for their potential to impact PHED, the magnitude of this decrease ultimately stems from shifting travel patterns from the COVID-19 pandemic.

Non-SOV Travel

The targets were set in coordination between CMAP and NIRPC staff based upon ACS trends between 2012 and 2016 and the ON TO 2050 goal of doubling transit ridership in the CMAP region by 2050 and the anticipated effects this would have on the non-SOV travel in the urbanized area.

New 2-year and 4-year targets for 2023 and 2025 were set with continued optimism for growth while also recognizing the shift back towards pre-COVID-19 mobility trends. The same process was followed in setting these targets with coordination of NIRPC staff and the use of ACS trends between 2017-2021. The new targets were approved as part of the ON TO 2050 Update System Performance report appendix.⁵

⁴ www.cmap.illinois.gov/2050/appendices

⁵ www.cmap.illinois.gov/2050/appendices

Table 5. New Non-SOV Travel Performance Targets for 2nd Performance Period

Baseline	2-year Target (2023)	2-year Progress Assessment	4-year Target (2025)
30.6% (2016)	32.4%	36.3%	32.7% ⁶

As shown in Table 5, the Non-SOV travel percentage is trending in the right direction at 4% above the established target. As with the PHED measure, CMAQ’s ability to impact Non-SOV to this magnitude is limited, and this significant change stems from changing travel patterns, such as the shift to remote work, that resulted from the COVID-19 pandemic.

Total Emissions Reduction

The combined total daily emissions for CMAP’s FFY 2018-2022 CMAQ program was used to develop an annual estimate to generate the 2-year and 4-year targets.

For the 2nd performance period the total emissions reduction targets were set based upon the program of CMAQ projects for FFY 2022 through 2026. The new targets were approved as part of the ON TO 2050 Update System Performance report appendix.⁷

Table 6. New Total Emissions Reduction Performance Targets for 2nd Performance Period

Criteria Pollutants and Applicable Precursors	Baseline	2-year Target (kg/day)	2-year Progress Assessment (kg/day)	4-year Target (kg/day)
Volatile Organic Compounds (VOC)	279.242	209.351	182.358	418.702
Nitrogen Oxides (NOx)	1,271.470	1102.103	702.612	2204.206
Particulate Matter (PM _{2.5})	47.555	42.332	0	84.664
Particulate Matter (PM ₁₀)	0.000	0.000	0	0.000

As shown in Table 6, the 2-year progress fell short of the estimated emissions reduction 2-year targets for projects with initial obligations over the past two years. VOC emissions were 27 kilograms per day below the 2-year target and NOx emissions were 399.5 kilograms per day

⁶ In the 2022 CMAQ Performance Plan the 4-year target was incorrectly listed as 32.9% for Non-SOV Travel. On To 2050 Update plan correctly listed the approved target of 32.7% on page 21 of the [System Performance Report Appendix](#).

⁷ www.cmap.illinois.gov/2050/appendices

below the 2-year target. This can be attributed to the way in which the targets were set and the fact that some of the larger impact projects did not obligate funds during the last two years. Diesel specific projects are major source for NOx emissions and as shown in Table 7 in the next section there were no obligations for Alternative Fuels and Vehicles plus Advance Technologies projects. CMAP anticipates that obligations over the next two years will include diesel specific projects that will a positive impact on NOx emissions.

Description of Projects

Included in the table below are the progress assessments by project type categories as identified in FHWA's CMAQ Public Access System along with if the category contributes to the PHED and/or Non-SOV Travel Benefit measures.

Table 7. 2-year Progress Assessment by Project Type

Project Category	2-year Progress Assessment of Total Emissions Reduction (kg/day)			PHED Benefit	Non-SOV Travel Benefit
	VOC	NOx	PM _{2.5}		
Alternative Fuels and Vehicles + Advance Diesel Technologies	0	0	0	No	No
Bicycle and Pedestrian Facilities and Programs	1.344	0.472	0	No	Yes
Congestion Reduction and Traffic Flow Improvements	32.136	5.797	0	Yes	No
Transit Improvements	148.777	696.313	0	No	Yes
Travel Demand Management	0.104	0.031	0	Yes	No
Total	182.361	702.613	0		

Entering the final two years of the 2nd Performance Period, Table 8 below shows the anticipated benefits that can be expected from CMAQ programmed projects that are scheduled to obligate funds in 2024 and 2025. These programmed projects will leave the region short of meeting the 4-year targets for both VOC and NOx. Efforts are underway to advance additional programmed CMAQ projects to achieve additional benefits.



Table 8. Anticipated Benefits of CMAQ Programmed Projects for the final two years of the 2nd Performance Period (2024 & 2025)

Project Category	2024 and 2025 Anticipated Total Emissions Reduction (kg/day)			PHED Benefit	Non-SOV Travel Benefit
	VOC	NOx	PM _{2.5}		
Alternative Fuels and Vehicles + Advance Diesel Technologies	44.140	599.050	23.360	No	No
Bicycle and Pedestrian Facilities and Programs	0.798	0.616	0	No	Yes
Congestion Reduction and Traffic Flow Improvements	90.827	102.647	0	Yes	No
Transit Improvements	6.237	3.499	0	No	Yes
Travel Demand Management	0	0	0	Yes	No
Total	142.002	705.812	23.360		



Appendix A: Background and Overview

The Moving Ahead for Progress in the 21st Century Act (MAP-21),⁸ signed into law on July 6, 2012, transformed the policy and programmatic framework for making investments that guide the growth and development of the Nation’s surface transportation program and created a performance-based surface transportation program. The Fixing America’s Surface Transportation Act (FAST Act),⁹ signed into law on December 4, 2015, and the Infrastructure Investment and Jobs Act (IIJA)¹⁰, signed into law on November 15, 2021, continued and refined these efforts. To examine the effectiveness of the Federal-aid Highway Program as a means to address surface transportation performance at a national level, the United States Department of Transportation (USDOT) established a set of national measures on which state DOTs must report performance.¹¹

For the purpose of carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program, MAP-21 required USDOT to establish measures for state DOTs to use to assess traffic congestion and on-road mobile source emissions.¹² To meet this requirement, FHWA finalized three CMAQ performance measures (two congestion measures and one on-road mobile source emission reduction measure), listed in Table 9.

Table 9. Performance Measures for the CMAQ Program

Measure	Description
Traffic Congestion	PHED: Annual hours of peak hour excessive delay (PHED) per capita
	Non-SOV: Percent of non-single occupancy vehicle (SOV) travel
On-Road Mobile Source Emissions	Total Emissions Reduction: 2-year and 4- year total emissions reductions for each applicable criteria pollutant and precursor for all projects funded with CMAQ funds (kg/day)
Source: 82 Fed. Reg. 5970 (Jan. 18, 2017) (codified at 23 CFR Part 490), available at https://www.gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00681.pdf	

The two traffic congestion performance measures are the PHED measure and the percent of non-SOV travel measure. The PHED measure is the annual hours of peak hour excessive delay per capita that occurs within an applicable urbanized area. The percent of non-SOV travel measure is the percentage of non-SOV trips within an applicable urbanized area. The traffic congestion measures apply to the Chicago, IL-IN urbanized area because it includes NHS

⁸ Pub. L. 112-141

⁹ Pub. L. 114-94

¹⁰ Pub. L. 117-58

¹¹ 23 U.S.C. 134, 135, and 150

¹² 23 U.S.C. 150(c)(5)

mileage and has a population over 1 million people.¹³ The on-road mobile source emissions performance measure is the total emissions reduction measure. The total emissions reduction measure is the estimated emission reductions, for all CMAQ funded projects, of particulate matter (PM₁₀) and volatile organic compounds (VOC) and oxides of nitrogen (NO_x) because these are the applicable criteria pollutants and precursors for which the Chicago area is designated nonattainment or maintenance.¹⁴

The target reporting deadline for all measures for the 1st performance period is October 1, 2018, and October 1, 2024, for the 2nd performance period.¹⁵ In establishing targets, CMAP staff coordinated with the IDOT, INDOT and NIRPC to ensure consistency to the maximum extent practicable. In addition to the reporting required by the regulation, 23 United States Code (U.S.C.) 149(l) requires each MPO serving a transportation management area (TMA) with a population over 1,000,000 that includes a nonattainment or maintenance area to develop a CMAQ Performance Plan to support the implementation of the CMAQ measures.¹⁶ In the CMAQ Performance Plan and its biennial updates, CMAP will report 2 and 4 year targets, describe how we plan to meet our targets, and detail our progress toward achieving the targets over the course of the performance period. The performance periods and reporting timeline for CMAQ measures are indicated in Figure 1 below.

¹³ 23 CFR 490.703

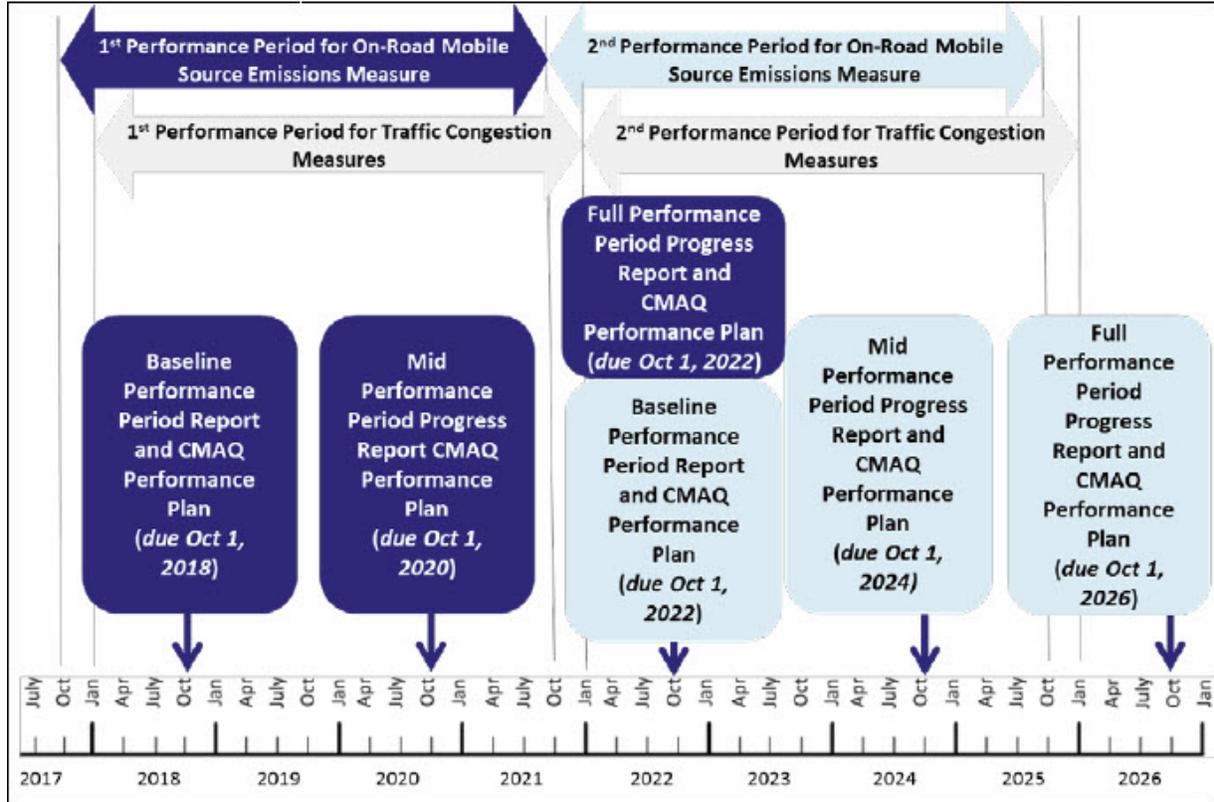
¹⁴ 23 CFR 490.807

¹⁵ 23 CFR 490.107(b)(1)(i)

¹⁶ 23 CFR 490.107(c)(3)



Figure 1. Performance Periods for CMAQ Measures and Reporting Timeline



Source: FHWA CMAQ Performance Plan Guidebook for MPOs

Appendix B: Data Requirements and Sources

Certain data sources are required by USDOT to calculate condition and performance for the traffic congestion and on-road mobile source emissions measures, as follows.

Peak Hour Excessive Delay (PHED)

IDOT, INDOT, CMAP and NIRPC are required to use the same travel time data set for calculating the PHED measure and must establish and report single, unified targets for the Chicago urbanized area.¹⁷ The data sets used to calculate the PHED were processed by CMAP staff and the RITIS¹⁸ MAP-21 PHED tool.

¹⁷ 23 CFR 490.103(e) and 23 CFR 490.105(f)(5)(iii)(B)

¹⁸ Regional Integrated Transportation Information System www.ritis.org

Table 10. Data Sources for PHED Measure

Data	Data Source
Urbanized Area Boundary	U.S. Decennial Census; FHWA's Highway Performance Monitoring System (HPMS) Filed Manual
Urbanized Area Population	5-year annual estimates of the total population of the urbanized area from the American Community Survey (Table DP05)
Reporting Segments	National Performance Management Research Data Set (NPMRDS)
Travel Times in 15-minute Intervals	NPMRDS
Hourly Traffic Volume	NPMRDS via HPMS. Hourly volume estimates follow the method described in "MAP-21 Proposed Measures for Congestion, Reliability, and Freight: Step-by-Step Calculations Procedures" (https://www.apta.com/gap/fedreg/Documents/MAP-21_Proposed_Measures_for_Congestion,_Reliability,_and_Freight.pdf)
Annual Vehicle Classification for Buses, Trucks, and Cars	NPMRDS via HPMS.
Annual Vehicle Occupancy for Buses, Trucks, and Cars	Values recommended by FHWA. https://www.fhwa.dot.gov/tpm/guidance/avo_factors.pdf
Speed Limits	Illinois Highway Information System (IHIS)



Non-SOV Travel

For the Chicago urbanized area, IDOT, INDOT, CMAP and NIRPC agreed upon a data source and method to calculate the Non-SOV travel measure.

Table 11. Data Sources for Non-SOV Travel Measure

Data	Data Source
Mode of Commuting to Work	5-year estimate for “Commuting to Work” totaled by mode from the U.S. Census Bureau’s American Community Survey dataset, table DP03, for Chicago urbanized area.

Total Emissions Reduction

FHWA’s CMAQ Public Access System is the required data source for calculating the Total Emissions Reduction measure.¹⁹ IDOT is responsible for submitting project information to the CMAQ Project Tracking System by March 1 of each federal fiscal year (FFY), along with the CMAQ Annual Report, for all projects obligated in the previous FFY.

Table 12. Data Sources for Total Emissions Reduction Measure

Data	Data Source
Emissions reduction estimated for each CMAQ funded project by pollutant and precursor (kg/day)	IDOT extracted data from the CMAQ Public Access System found at https://fhwaapps.fhwa.dot.gov/cmaq_pub/

¹⁹ 23 CFR 490.809(a)