2025

Performance Targets for Infrastructure Conditions, System Performance, Freight Movement, Congestion Mitigation, and Air Quality (CMAQ) Program Emission Reduction Performance Measure Targets for the Sheboygan Metropolitan Planing Area

Sheboygan Metropolitan Planning Organization

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Introduction

The purpose of this document is to provide an overview of the decision-making and analysis process leading to the approval of infrastructure condition, system performance, freight movement, and congestion mitigation and air quality (CMAQ) program emission reduction performance measure targets for the Sheboygan Metropolitan Planning Organization (MPO) area. This documentation aims to offer context and insights into whether the Sheboygan MPO should continue to support statewide targets in these areas, or establish its own transportation performance targets based on changing circumstances.

Background

The Sheboygan MPO is responsible for coordinating transportation planning efforts within its designated metropolitan area, ensuring the development of a comprehensive and integrated transportation system that meets the needs of the region. As part of this responsibility, the MPO is required to establish performance targets in accordance with federal regulations, particularly those originally outlined by the Fixing America's Surface Transportation (FAST) Act and continued in the Bipartisan Infrastructure Law (BIL).

Decision-Making Process

The decision-making process for establishing performance measure targets for infrastructure condition, system performance, freight movement, and CMAQ program emission reduction involved the following key steps:

- **Review of Federal Regulations**: The Sheboygan MPO reviewed the latest federal regulations, including guidance provided by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), to understand the requirements for establishing performance measure targets in the specified areas.
- **Data Analysis and Benchmarking:** The MPO conducted comprehensive data analysis and benchmarking exercises to assess the current state of infrastructure condition, system performance, freight movement, and air quality within the metropolitan area. This analysis involved evaluating key performance indicators, trends, and potential areas for improvement.
- **Goal Setting**: Based on the findings from stakeholder engagement, data analysis, and benchmarking, the Sheboygan MPO established specific, measurable, achievable, relevant, and time-bound (SMART) performance measure targets for infrastructure condition, system performance, freight movement, and CMAQ program emission reduction. These targets were developed in alignment with the MPO's overall transportation goals and objectives, as well as federal requirements.

Analysis of Establishing Local vs. Statewide Targets

In considering whether the Sheboygan MPO should establish its own transportation performance targets or support statewide targets, the following factors were taken into account:

- **Local Contex**t: The Sheboygan Metropolitan Planning Area (MPA) has unique transportation challenges, demographics, land use patterns, and economic characteristics that may warrant the development of tailored performance measure targets. Establishing local targets allows the MPO to address specific needs and priorities within its jurisdiction more effectively.
- **Consistency with Statewide Goals:** While local targets provide flexibility to address unique needs, they should align with statewide transportation goals and objectives to ensure coordination and consistency across jurisdictions. Supporting statewide targets can facilitate collaboration and resource allocation at the regional and state levels.
- **Resource Constraints**: Developing and implementing performance measure targets require financial, technical, and human resources. The Sheboygan MPO considered its capacity and capabilities in setting realistic targets that can be effectively monitored, evaluated, and achieved within available resources.
- **Federal Requirements**: Federal regulations mandate the establishment of performance measure targets by metropolitan planning organizations and state departments of transportation. The Sheboygan MPO ensured compliance with federal requirements while exercising flexibility in setting targets that reflect local priorities and conditions.

Sources: Federal Highway Administration (FHWA) regulations and guidance documents, Federal Transit Administration (FTA) regulations and guidance documents, Bay Lake Regional Planning Commission (BLRPC) and Sheboygan Metropolitan Planning Organization (MPO).

Pavement and Bridge Conditions

In accordance with federal regulations, the Wisconsin Department of Transportation (WisDOT) has established statewide targets for assessing pavement and bridge conditions on the National Highway System (NHS). These targets are based on federal performance measures outlined in the National Performance Management Measures Second Performance Rule (PM2). The PM2 utilizes a FHWA pavement condition rating system, allowing for national comparisons of NHS conditions using standardized data collection methods.

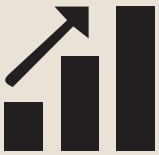
Pavement Condition Metrics

Four key metrics are utilized to evaluate pavement conditions under PM2:

1. **International Roughness Index (IRI)**: Measured in inches per mile, IRI provides an indication of the smoothness of the pavement surface.
2. **Average Rutting**:Measured in inches, rutting refers to the vertical displacement of the pavement surface caused by repeated traffic loading.
3. **Faulting**: Faulting measures the average vertical displacement (in inches) between adjacent jointed concrete panels, indicating potential pavement distress.
4. **Fatigue Cracking**: Fatigue cracking is measured as a percentage and represents the extent of cracking in the pavement surface due to repeated loading and thermal stresses.

Pavement in Good Condition

Interstate Target



State Goal
2-Year (2023): >60%
4-Year (2025): >60%

MPO Measure
2020: 84.0%
2022: 84.4%

Non-Interstate Target

State Goal
2-Year (2023): >30%
4-Year (2025): >30%

MPO Measure
2020: 25.1%
2022: 24.8%

Exclusions and Data Classification:

In analyzing pavement conditions in the Sheboygan MPA, WisDOT excluded certain data based on FHWA recommendations. These exclusions include:

- Pavement conditions on bridge structures (bridge data analyzed separately).
- Missing, invalid, or unresolved data.
- Pavement sections with surface types labeled as “unpaved” or “other.”

Remaining Interstate and non-Interstate NHS pavement sections were classified based on their performance on each metric.

NHS Coverage in Sheboygan MPA:

Map 1 identifies the NHS roads in Sheboygan County as provided by WisDOT in 2016.

Pavement Condition Ratings

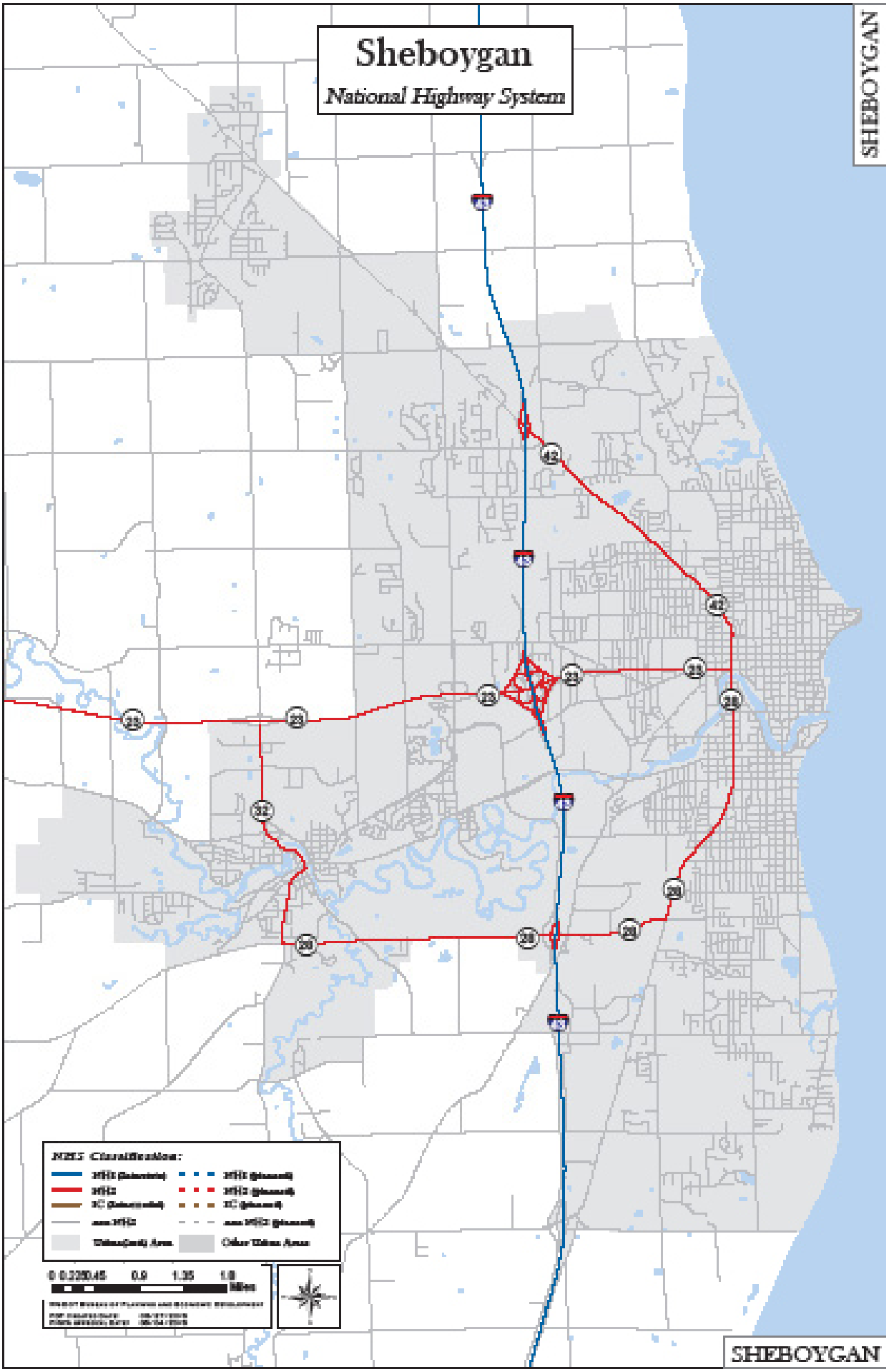
A pavement section was classified as “good” if all pertinent metrics fell into the “good” range. If two (2) or more metrics fell into the “poor” range, the section was classified as “fair.” . This classification system aids in targeted maintenance, resource allocation, and ongoing performance monitoring, facilitating effective management of the transportation infrastructure and ensuring optimal road conditions for users. Table 1, below, provides the numerical scoring criteria for each of the pertinent metrics.

Table 1: Pavement Condition Thresholds

Metric	Good	Fair	Poor
IRI (Inches / mile)	<95	95-170	>170
Rutting (Inches)	<0.20	0.20-0.40	>0.40
Faulting (Inches)	<0.10	0.10-0.15	>0.15
Cracking (%)	<5	5-20 (asphalt) 5-15 (JCP) 5-10 (CRCP)	>20 (asphalt) >15 (JCP) >10 (CRPC)

Source: U.S. Department of Transportation, Federal Highway Administration, 2018.

Map 1: Map of the National Highway System in Sheboygan County (from WisDOT)



Pavement in Poor Condition

Interstate Target

State Goal
2-Year (2023): <4%
4-Year (2025): <4%

MPO Measure
2020: 0.0%
2022: 0.0%

Non-Interstate Target

State Goal
2-Year (2023): <10%
4-Year (2025): <10%

MPO Measure
2020: 5.7%
2022: 5.7%

Pavement Condition Findings

Table 2 shows the Pavement Condition Ratings measures and targets for Interstate roads in "good" condition, Interstate roads in "poor" condition, Non-Interstate roads on the NHS in "good" condition, and Non-Interstate roads on the NHS in "poor" condition.

Table 2: NHS Pavement Conditions in the Sheboygan MPA compared to Statewide Targets

Measure	State Baseline	MPO Measure 2022	2-Year Target (2023)	4-Year Target (2025)
Interstate – Percentage pavements in "Good" condition	65.9%	84.4%	≥ 60.0%	≥ 60.0%
Interstate – Percentage pavements in "Poor" condition	0.3%	0.0%	≤ 4.0%	≤ 4.0%
Non-Interstate NHS – Percentage pavements in "Good" condition	36.3%	24.8%	≥ 30.0%	≥ 30.0%
Non-Interstate NHS – Percentage pavements in "Poor" condition	4.2%	5.7%	≤ 10.0%	≤ 10.0%

Source: Wisconsin Department of Transportation 2023 - 2026 STIP; WisDOT Pavement Condition Data, 2022, and Bay-Lake Regional Planning Commission, 2024.

Bridge Condition Ratings

Bridges within the Sheboygan MPA on the NHS undergo separate evaluation using the National Bridge Inventory (NBI) condition rating scale, which assesses the bridge's deck, superstructure, substructure, and culvert conditions on a scale from 0 (failed condition) to 9 (excellent condition). A bridge is classified as "good" if its lowest NBI value is 7 or greater. Bridges with a lowest NBI value between 5 and 6 are deemed "fair," while those with a value of 4 or less are considered "poor." This classification system ensures systematic assessment and prioritization of bridge maintenance and rehabilitation efforts to uphold the safety and functionality of the transportation infrastructure within the region. Table 3 identifies the FHWA general ratings guidelines for NBI bridge inspections.

Table 3: FHWA General Rating Guidelines for NBI Inspections

Condition Rating	Description	Inspection Rating
9	EXCELLENT CONDITION	GOOD
8	VERY GOOD CONDITION – no problems noted.	
7	GOOD CONDITION – some minor problems.	
6	SATISFACTORY CONDITION – structural elements show some minor deterioration.	FAIR
5	FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour.	

Condition Rating	Description	Inspection Rating
4	POOR CONDITION – advanced section loss, deterioration, spalling, or scour.	POOR
3	SERIOUS CONDITION – loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.	
2	CRITICAL CONDITION – advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken	
1	"IMMINENT" FAILURE CONDITION – major deterioration or section loss present in critical structural components, or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put bridge back in light service.	
0	FAILED CONDITION – out of service, beyond corrective action	
N	NOT APPLICABLE	N/A

Source: Federal Highway Administration Bridge System Conditions, 2022

Bridge Condition Findings

Table 4 shows the Bridge Condition Ratings measures and targets for Sheboygan MPA bridges on the NHS in "good" condition and NHS bridges in "poor" condition.

Table 4: NHS Bridge Conditions in the Sheboygan MPA compared to Statewide Targets

Measure	State Baseline	MPO Measure 2022	2-Year Target (2023)	4-Year Target (2025)
Percentage of NHS bridges by deck area in "Good" condition	51.3%	24.3%	≥ 49.0%	≥ 48.0%
Percentage of NHS bridges by deck area in "Poor" condition	2.6%	0.0%	≤ 3.0%	≤ 3.0%

Source: Wisconsin Department of Transportation 2022 through 2024; Bay-Lake Regional Planning Commission, 2024.

Bridge Condition

In Good Condition

State Goal
2-Year (2023): >49.0%
4-Year (2025): >48.0%

MPO Measure
2020: 25.1%
2022: 24.3%

In Poor Condition

State Goal
2-Year (2023): <3.0%
4-Year (2025): <3.0%

MPO Measure
2020: 0.0%
2022: 0.0%

TRAVEL TIME RELIABILITY

Travel Time Reliability (TTR) is a critical aspect of transportation system performance, measuring the consistency and predictability of travel times experienced by motorists and freight operators. In the context of Federal Highway Administration's Performance Management Measures Third Performance Rule (FHWA PM3), TTR is a key metric used to evaluate the effectiveness and efficiency of the NHS.

Level of Travel Time Reliability Measures

Interstates

State Goal
2-Year (2023): >92.5%
4-Year (2025): >93.0%

MPO Measure
2021: 100.0%
2022: 100.0%

Non-Interstate NHS

State Goal
2-Year (2023): >91.0%
4-Year (2025): >89.5.0%

MPO Measure
2021: 86.9%
2022: 88.9%

What is FHWA PM3?

The FHWA PM3 focuses on assessing the reliability of travel times and freight movement on the NHS. It encompasses two primary reliability metrics:

1. **Level of Travel Time Reliability (LOTTR)**: LOTTR reflects the difference between longer travel times and "average" travel times on NHS route sections. It quantifies the proportion of travel times that exceed a certain threshold, providing insights into the variability of travel conditions.
2. **Truck Travel Time Reliability (TTTR):** TTTR measures the reliability of travel times specifically for trucks on NHS sections. It evaluates the consistency of freight movement, which is crucial for economic productivity and supply chain efficiency.

Travel Time Reliability Findings

Table 5 shows the LOTTR measures and targets separated out by interstate and non-interstate NHS roadways. The actual measured data is from 2022. The 2- and 4-year performance targets vary slightly, and the identified target is the 2-year target set for 2023.

Table 5. Level of Travel Time Reliability in the Sheboygan MPA, 2022

Measure	State Baseline	MPO Measure (2022)	2-Year Target (2023)	4-Year Target (2025)
Travel Reliability				
Percent of person-miles traveled that are reliable on the Interstate	96.4%	100.0%	>92.5%	>93.0%
Percent of person-miles traveled that are reliable on Non-Interstate NHS	93.9%	89.5%	>91.0%	>89.5%
Freight Reliability				
Truck Travel Time Reliability Index on the Interstate	1.20	1.173	<1.30	<1.30
Peak Hour Excessive Delay				
Annual Hours of Peak Hour Excessive Delay per Capita on NHS routes in the Milwaukee Urbanized Area	5.7 Hr / Capita	N/A	8.6 Hr / Capita	8.4 Hr / Capita
Non-SOV Travel				
Percent of Non-SOV Travel on NHS routes in the Milwaukee Urbanized Area	21.6% (2020)	N/A	20.5%	20.5%

Source:WisDOT 2023 - 2026 Statewide Transportation Improvement Program; University of Wisconsin - Madison Traffic Operations and Safety Laboratory, 2022; Bay-Lake Regional Planning Commission, 2024

WisDOT's Cautionary Note on FHWA Performance Metrics

The Wisconsin Department of Transportation (WisDOT) emphasizes caution regarding the use of performance metrics developed by the FHWA for making broad comparisons between states. WisDOT highlights potential limitations in FHWA's metrics, particularly in contexts where variability in travel conditions may lead to misleading comparisons.

Contextual Example:

For instance, WisDOT provides an illustrative scenario where the 50th percentile travel time on a NHS section within one urbanized area (UZA) with recurring vehicle congestion may be significantly higher compared to another section in a different UZA with minimal congestion. Despite these differences in travel conditions, FHWA's metrics may assign similar reliability indices to both sections.

Reasoning:

WisDOT's caution stems from the inherent variability in travel conditions across different geographic areas and transportation corridors. FHWA's metrics may not fully account for localized factors such as congestion levels, road geometry, weather conditions, and land use patterns, which can significantly influence travel time reliability.

Truck Travel Time Reliability Measures

State Goal
2-Year (2023): <1.3
4-Year (2025): <1.3

MPO Measure
2021: 1.16
2022: 1.13

EMISSION REDUCTIONS

Responsibilities of the Sheboygan MPO:

The Sheboygan MPO is tasked with setting emission reduction targets within the Sheboygan MPA, which includes designated air quality maintenance and non-attainment areas for ground-level ozone. These targets are crucial for addressing air quality concerns and promoting sustainable transportation practices.

Setting Emission Reduction Targets:

The Sheboygan MPO has the responsibility to establish total emission reduction targets within the MPA or to support statewide targets set by WisDOT. These targets encompass reductions in three criteria pollutants: Volatile Organic Compounds (VOC), Nitrogen Oxides (NOx), and Particulate Matter 2.5 (PM2.5), which are significant contributors to air pollution and public health concerns.

Description of Pollutants:

- **PM2.5 (Particulate Matter 2.5):** PM2.5 refers to fine particles in the air that are 2.5 micrometers in diameter or smaller. These particles can come from various sources such as vehicle emissions, industrial processes, construction activities, and natural sources like wildfires. PM2.5 poses a significant health risk as it can penetrate deep into the lungs and enter the bloodstream, causing respiratory and cardiovascular problems. The Environmental Protection Agency (EPA) provides comprehensive information on PM2.5, its sources, health effects, and regulatory measures. You can find more details on the EPA's website: EPA - Particulate Matter (PM) Pollution.
- **NOx (Nitrogen Oxides)**: NOx refers to a group of highly reactive gases composed of nitrogen and oxygen, primarily nitric oxide (NO) and nitrogen dioxide (NO2). These gases are produced during combustion processes in vehicles, power plants, and industrial facilities. NOx emissions contribute to the formation of ground-level ozone and fine particulate matter, leading to air quality degradation and health problems. The EPA provides detailed information on NOx pollution, its sources, health effects, and regulatory

efforts. You can learn more on the EPA's website: EPA - Nitrogen Dioxide (NO2) Pollution.

- **VOCs (Volatile Organic Compounds)**: VOCs are organic chemicals that can easily evaporate into the air at room temperature. They come from various sources such as vehicle exhaust, industrial processes, and household products. VOCs play a significant role in the formation of ground-level ozone and contribute to air pollution. Exposure to VOCs can lead to respiratory irritation, headaches, and long-term health effects. The EPA provides comprehensive information on VOCs, their sources, health effects, and control measures. You can find more details on the EPA's website: EPA - Volatile Organic Compounds' Impact on Indoor Air Quality.

Basis for Targets:

- **Two-Year Statewide Targets**: These targets are derived from actual projected emission reductions resulting from scheduled projects. The anticipated benefits of CMAQ (Congestion Mitigation and Air Quality) projects, which aim to improve transportation efficiency and reduce emissions, are summed up to establish the two-year targets.
- **Four-Year Statewide Targets**: These targets are based on the anticipated benefits of projects scheduled for the calendar years 2022 through 2025. These projections provide a longer-term perspective on emission reduction efforts and guide planning and investment decisions.

Considerations for Setting Targets:

- **Project Benefits**: Projects programmed in the Sheboygan MPA Transportation Improvement Program (TIP) are expected to yield significant emission reduction benefits. For example, signalization projects with favorable reduction estimate calculations and bike lane projects are anticipated to contribute to overall emission reductions.
- **Data Limitations**: The Sheboygan MPO faces challenges in accurately estimating emission reductions for CMAQ projects due to limitations in the CMAQ Public Access System, which lacks a comprehensive list of projects for the metropolitan planning area. This hinders the MPO's ability to reliably forecast emission reduction outcomes for individual projects.

Supporting Statewide Targets:

At this time, actual emission reductions data within the Sheboygan MPA are not available. The current models look at all pollution reducing projects identified in the Wisconsin State Transportation Improvement Program (STIP) and determines an overall emissions reduction for the entire state. The statewide models do not currently have the ability to break down those targets at the small MPO level and the Sheboygan MPO staff does not have the resources or data to identify that information in-house. Table 6 identifies the total statewide emission reduction estimates for each type of pollution based on current STIP Information.

For this and various other reasons, including data limitations and reliance on the CMAQ Public Access System, the Sheboygan MPO intends to support WisDOT's statewide targets for emission reductions. By aligning with statewide targets, the MPO ensures consistency and coordination in emission reduction efforts across the state.

Table 6: Total Statewide $PM_{2.5}$ Emission Reduction Estimates for CMAQ Projects

Measure	State Baseline	MPO Measure (2023)	2-Year Target (2023)	2-Year Reported values (2023)	4-Year Target (2025)
Emission Reductions					
Total Emissions Reductions in non-attainment or maintenance areas for:					
VOC (Kg/day)	18.941 Kgs	N/A	8.848 Kgs	4.408	17.501 Kgs
NOx (Kg/day)	75.659 Kgs	N/A	22.767 Kgs	17.858	38.902 Kgs
PM2.5 (Kg/day)	8.276 Kgs	N/A	3.962 Kgs	1.924	4.434 Kgs

Source: FHWA State Performance Dashboard - Wisconsin, 2021 - 2025; Wisconsin Department of Transportation, 2022 - 2024; and Bay-Lake Regional Planning Commission, 2025.

CONCLUSION

Due to the better performance measure statistics in comparison to statewide benchmarks, coupled with insufficient data to establish MPO-specific targets, the Bay-Lake Regional Planning Commission staff recommend endorsing WisDOT's performance targets instead of setting independent ones.

Approval of the Infrastructure Condition, System Performance, Freight Movement, and CMAQ Program Emission Reduction Performance Measure Targets for the Sheboygan Metropolitan Planning Area (and specifically supporting WisDOT's performance targets in these areas) was recommended by the Sheboygan MPO Technical and Policy Advisory Committees at their joint meeting on March 6, 2025.

This plan is updated annually to look at new data coming in to identify if continued use of the state's targets is still warranted. Staff recommends the continued use of the state's goals. Consequently, the Bay-Lake Regional Planning Commission, acting as the MPO for the Sheboygan Metropolitan Planning Area, commits to aligning its planning and project programming efforts with WisDOT's Statewide Infrastructure Condition, System Performance, Freight Movement, and CMAQ Program Emission Reduction Performance Measure Targets.

These targets, outlined in Table 7, serve as guiding benchmarks for the Sheboygan MPA's transportation planning initiatives, ensuring coordination and coherence with statewide objectives and strategies.

Table 7. WisDOT Statewide Infrastructure Condition, System Performance, Freight Movement, and CMAQ Program Emission Reduction Performance Measure Targets

Measure	2-Year Target (2023)	4-Year Target (2025)
Interstate – Percentage pavements in "Good" condition	≥ 60.0%	≥ 60.0%
Interstate – Percentage pavements in "Poor" condition	≤ 4.0%	≤ 4.0%
Non-Interstate NHS – Percentage pavements in "Good" condition	≥ 30.0%	≥ 30.0%
Non-Interstate NHS – Percentage pavements in "Poor" condition	≤ 10.0%	≤ 10.0%
Percentage of NHS bridges by deck area in "Good" condition	≥ 49.0%	≥ 48.0%
Percentage of NHS bridges by deck area in "Poor" condition	≤ 3.0%	≤ 3.0%
Percent of person-miles traveled that are reliable on the Interstate	>92.5%	>93.0%
Percent of person-miles traveled that are reliable on Non-Interstate NHS	>91.0%	>89.5%
Truck Travel Time Reliability Index on the Interstate	<1.30	<1.30
Total Emissions Reductions in non-attainment or maintenance areas for:		
VOC	8.848 Kgs	17.501Kgs
NOx	22.767 Kgs	38.902 Kgs
PM2.5	3.962 Kgs	4.434 Kgs

Source: FHWA State Performance Dashboard - Wisconsin, 2021 - 2025; Wisconsin Department of Transportation, 2022 - 2024; and Bay-Lake Regional Planning Commission, 2025.

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The Bay-Lake Regional Planning Commission is a multi-service planning agency within Wisconsin that delivers a variety of federal, state, and local programs. It provides planning and technical assistance to member governments in northeast Wisconsin. It is accountable to its members. The Commission also serves as an effective partner for state and federal governments.

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