2025 CMMPO System Performance Report

September 2024 – August 2025

Table of Contents

Introduction

The Central Massachusetts Metropolitan Planning Organization's (CMMPO) System Performance Report summarizes the planning area's performance on regionally meaningful indicators that reflect the condition of various aspects of the transportation network. It serves as a communication tool to a broad audience of interested stakeholders while also providing a transparent overview of how a range of transportation investments are made in the CMMPO region. The identification of representative measures and the selection of appropriate targets in this report originates from federal requirements as well as regionally customized priorities.

This document provides an overview of the CMMPO's progress towards meeting the federal requirements on Performance Management for both highway and transit and, in addition, provides a summary of the regionally customized significant indicators for performance.

Evolution of Performance-Based Planning and Programming

Performance-Based Planning and Programming (PBPP) refers to a transportation agency's application of performance management in their ongoing planning and programming processes. The requirements for PBPP were initially federally legislated through Moving Ahead for Progress in the 21st Century (MAP-21) and subsequently reaffirmed in the Fixing America's Surface Transportation Act (FAST Act) and, most recently, the Bipartisan Infrastructure Law (BIL). These Acts have transformed the federal-aid highway program by establishing requirements for performance management to ensure the most efficient investment of federal transportation funds that support the following seven National Goals:

1. Safety
2. Infrastructure Condition
3. Congestion Reduction
4. System Reliability
5. Freight Movement and Economic Activity
6. Environmental Sustainability
7. Reduced Project Delays

In addition to the federal requirements for MPOs to integrate PBPP into their transportation processes, MPOs are also required to adhere to the Continuing, Cooperative, and Comprehensive (3C) Metropolitan Transportation Planning Progress. For MPOs, this includes a range of activities and products that address numerous federal Planning Factors and Emphasis Areas undertaken by a transportation agency together with other agencies, interested stakeholders, and the public. The Planning Factors and Emphasis Areas included in this report

are – 1) Safety, 2) State of Good Repair, 3) Congestion, 4) Multimodal Transportation, 5) Economic Vitality, 6) Promoting Sustainability, 7) Stormwater Management, 8) Geographic Equity, and 9) Transportation Network Resiliency and Clean Energy. Although this report only includes these nine listed areas, staff considered all Planning Factors and Emphasis Areas when developing strategies, projects, plans, or initiatives including:

- Long-Range Transportation Plans (LRTPs)
- Other plans and processes including those that are federally required, such as Strategic Highway Safety Plans, Asset Management Plans, and the Congestion Management Process
- Transit Agency Asset Management Plans and Transit Agency Safety Plans, as well as others that are not required by statute
- Programming documents, including state and metropolitan Transportation Improvement Programs (STIPs and TIPs)

By fully considering and addressing the Planning Factors and Emphasis Areas in all aspects of the transportation planning process, the CMMPO has been able to create more balanced and holistic transportation investments for the region. Similarly, the goal of PBPP is to ensure that transportation investment decisions—both long-term planning and short-term programming—are based on the ability to meet the established objectives. This System Performance Report demonstrates how the CMMPO has blended the federal requirements for PBPP while concurrently addressing the federal Planning Factors and Emphasis Areas to develop an ongoing, regionally customized Performance Management Program that contributes to reaching the goals set for the multi-modal and intermodal transportation system on the regional, state and federal levels.

Putting it All Together: Meeting the National Goals

Figure 1 shows a depiction of the CMMPO's Performance Management Program. The CMMPO has followed MassDOT's guidance of developing goals, targets, and objectives for each of the federal Planning Factors and Emphasis Areas that are listed on the left side of the Figure. In the middle of the figure are six of the seven* National Goals of the US Department of Transportation. These National Goals are shown adjacent to related factors and emphasis areas that share the same objectives. The Federal Rules that establish an implementation strategy for specific measures, targets and goals that must be reached between the MPO and state DOT are located on the right of the Figure. The blank fields in the Figure show where there are no statutory requirements that require MPOs to measure specific data and collaborate on target setting. It is in these areas of Stormwater Management, Geographic Equity, and Transportation Network Resiliency and Clean Energy where the CMMPO continues

to work to develop locally meaningful performance measures to track progress towards specific, defined goals.

Figure 1 – CMMPO Performance Management Program

	PLANNING FACTOR / EMPHASIS AREA	US DOT NATIONAL GOAL	FHWA RULE
1	Safety	Safety	PM1: Safety
2	State of Good Repair	Infrastructure Condition	PM2: Pavement & Bridge
3	Congestion	System Reliability	PM3: System Performance, Freight, Air Quality & Emissions
4	Multimodal Options	Congestion Reduction	
5	Economic Vitality	Freight Movement & Economic Vitality	
6	Sustainability	Environmental Sustainability	Locally Derived Measures
7	Stormwater Management		Locally Derived Measures
8	Geographic Equity	Locally Derived Measures	
9	Transportation Network Resiliency & Clean Energy	Locally Derived Measures	

The seventh National Goal is Reduced Project Delivery Delays. This goal is to eliminate delays in the project development and delivery process, including reducing regulatory burdens and improving agency work practices.

Part 1: Federally Required Highway Performance Measures

This report addresses each Planning Factor and Emphasis Area, how they relate to Performance Management Goals, and describes progress towards each of the goals. The first section contains the highway federally required rules of Safety (PM1), State of Good Repair (PM2), and Congestion/System Performance (PM3). **Figure 2** shows the complete list of goals and measures for each FHWA rule. This information is also available through MassDOT's Performance Measures Tracker.

Figure 2 – Federally-Required Highway Performance Goals and Measures

PLANNING FACTOR / EMPHASIS AREA	GOALS	MEASURES
Safety (PM1)	Reduce # and rate of fatal and serious injury crashes in the region.	# of fatalities
		Rate of fatalities per 100 million VMT
		# of serious injuries
		Serious injury rate per 100 million VMT
		# of non-motorized fatalities and serious injuries
State of Good Repair (PM2)	To maintain the highway infrastructure asset system in a state of good repair.	% of Interstate NHS pavement in good condition
		% of non-Interstate NHS pavement in good condition
		% of Interstate NHS pavement in poor condition
		% of non-Interstate NHS pavement in poor condition
		% of NHS bridges by deck area classified as good condition
		% of NHS bridge by deck area classified as poor condition
Congestion / System Reliability / Emissions (PM3)	To achieve a significant reduction in congestion on the Nation Highway System and reduce emissions.	Level of travel time reliability (LOTTR) on both Interstate and non-Interstate NHS
		Level of truck travel time reliability (TTTR) on both Interstate and non-Interstate NHS
		% on non-single occupancy vehicle travel (SOV)
		Peak hour excessive delay (PHED)
		Emissions reduction

PLANNING EMPHASIS AREA	US DOT NATIONAL GOAL	FHWA RULE
Safety	Safety	(PM1) Highway Safety Performance Management

Safety Performance Measures Introduction

The CMMPO is supportive of the vision to eliminate fatalities and serious injuries on the National Highway System (NHS) by working collaboratively on strategies with local stakeholders, neighboring MPOs and MassDOT. Safety is a top priority on each of the federal, state, and regional levels. The Federal Safety Performance Management Measures regulation PM1 supports the Highway Safety Improvement Program (HSIP) and requires State Departments of Transportation and MPOs to set HSIP targets for five (5) safety performance measures.

Since inception, the CMMPO has consistently voted annually to adopt the statewide safety performance targets set by MassDOT. Most recently, the CMMPO voted to adopt MassDOT's calendar year (CY) 2025 highway safety targets for the five federally required highway safety performance measures at a meeting held on February 19, 2025. These safety performance measures are:

1. Number of fatalities

2. Rate of fatalities per 100 million vehicle-miles traveled (VMT)

3. Number of serious injuries

4. Rate of serious injuries per 100 million VMT

5. Number of non-motorized fatalities and non-motorized serious injuries

FHWA requires states to submit the five safety performance targets annually in an HSIP report by August 31st of each year. MPOs are required to establish targets that either support the state targets or, alternatively, set their own quantifiable targets by February 28th of the calendar year for which the targets apply. Should the MPO decide to set its own targets, they would need to submit methodologies and data that supports their targets to the state DOT.

Whereas state DOTs submit their targets to FHWA via the HSIP report, MPOs must include the safety measures and targets in the Long-Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP). The LRTP will describe the progress made since the baseline data was established while the TIP will provide a description of the anticipated effect of the TIP's programmed improvement projects toward achieving performance targets identified in the LRTP.

Massachusetts Highway Safety Performance Measures CY 2025

FHWA requires five-year rolling averages when setting safety performance targets. Due to higher rates of speeding caused, in part, by decreased vehicle miles traveled (VMT) amid pandemic shutdowns in 2020 and the lingering impacts in 2021 and 2022, roadway fatalities and serious injuries were increasing relative to previous years. However, Massachusetts began to see this trend reverse in 2023. In addition to the CY 2025 targets, MassDOT also developed a 2023-2027 projection to forecast current trends further into the future.

To estimate 2024 fatalities & serious injuries, MassDOT compared data from 2015-2023 to the data available at the time of target setting in July 2024. On average, 55% of annual fatalities & serious injuries occurred between January 1 – July 30 of each year. Therefore, to estimate 2024 fatalities & serious injuries, MassDOT divided the number to date by 55%. A 3% annual reduction in fatalities & serious injuries was then assumed to obtain an estimate for 2025. For non-motorized fatalities & serious injuries, a 5% annual reduction was used.

Although numeric targets have been established following federal guidelines, MassDOT's overarching goal of zero deaths will be pursued by implementing strategies from the Strategic Highway Safety Plan (SHSP). The Massachusetts SHSP and Vulnerable Road User Safety Assessment were both updated and finalized in 2023. These strategies help provide details on how the state will drive down fatalities and serious injuries.

Figure 3 is a list of the current statewide rolling averages for each performance measure for the CY 2025 targets. Also shown are the corresponding CMMPO CY 2025 targets for comparison.

Figure 3
**2025 Massachusetts Statewide and CMMPO Highway Safety Performance Targets**

PM1 Highway Safety Performance Measure	2025 Statewide Safety Measure Target (Expected 2021-25 Rolling Average)	2025 CMMPO Safety Measure Target (Expected 2021-25 Rolling Average)
Number of fatalities	365	38
Rate of fatalities per 100 million VMT	0.58	0.67
Number of serious injuries	2,622	279
Rate of serious injuries per 100 million VMT	4.17	4.82
Number of non-motorized fatalities and non-motorized serious injuries	497	38

CMMPO Highway Safety Performance Trends

MassDOT and the CMMPO will continue to cooperatively strategize planning and programming at the state and MPO levels to support improvements in highway safety outcomes. Further, the CMMPO continues to support the state's highway safety targets. The following six charts in **Figures 4 - 6** show the CMMPO's Safety Performance Trends compared to MassDOT's statewide Safety Performance Trends.

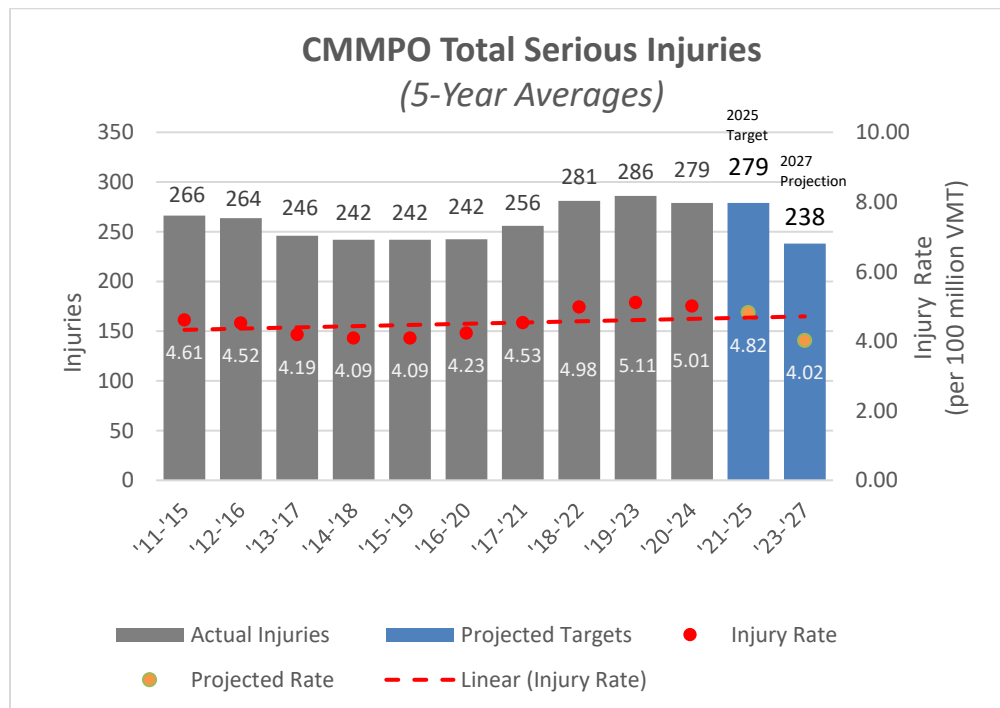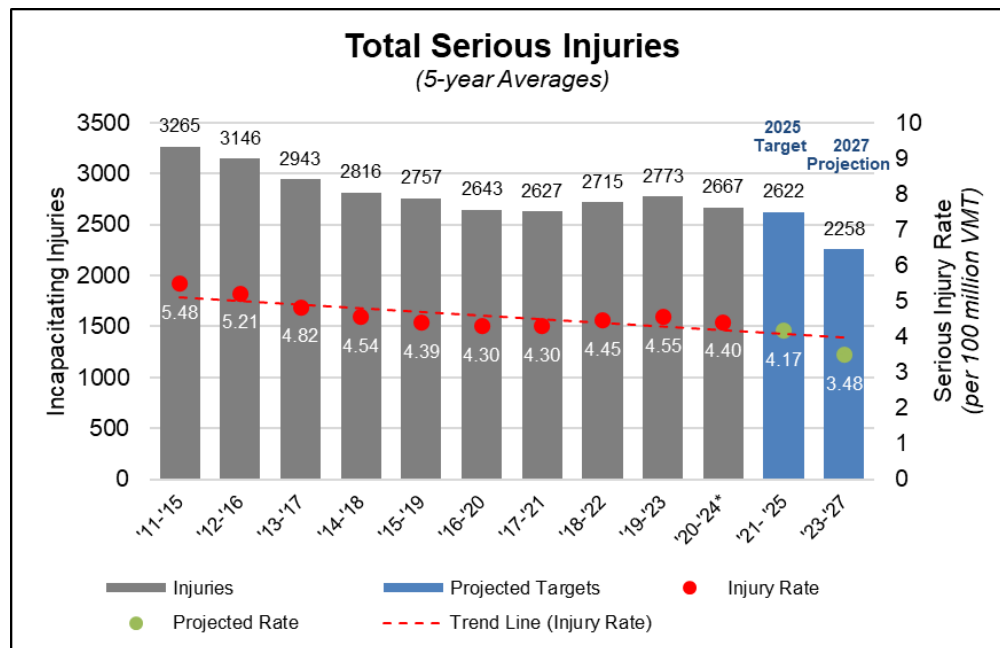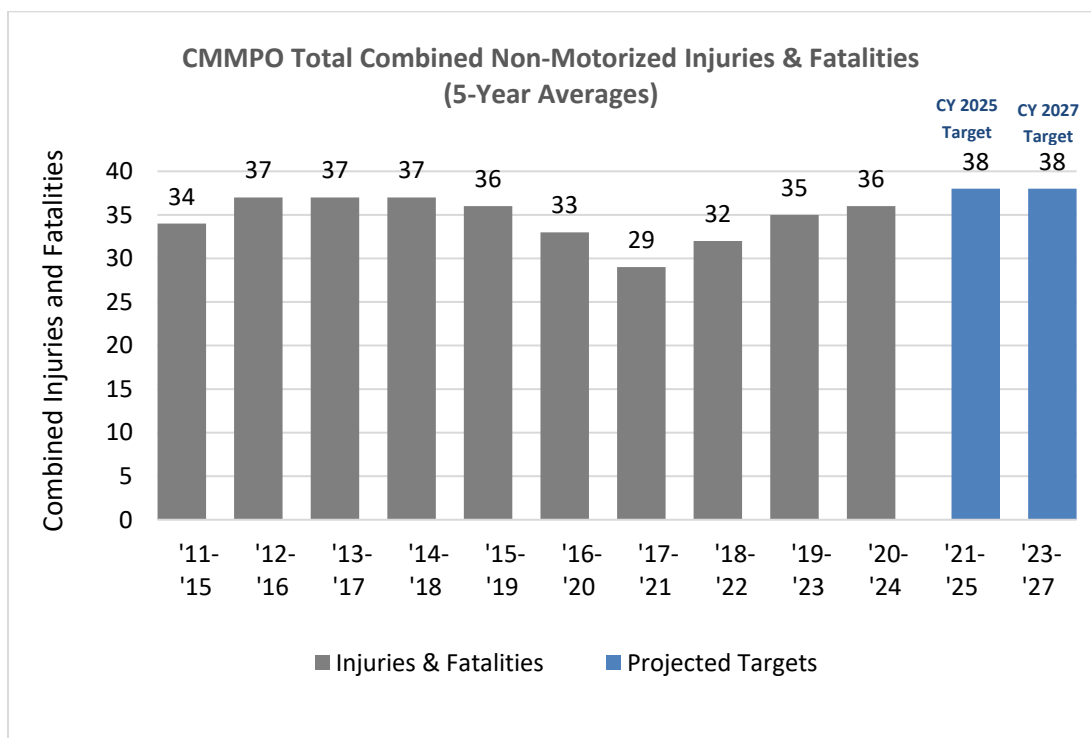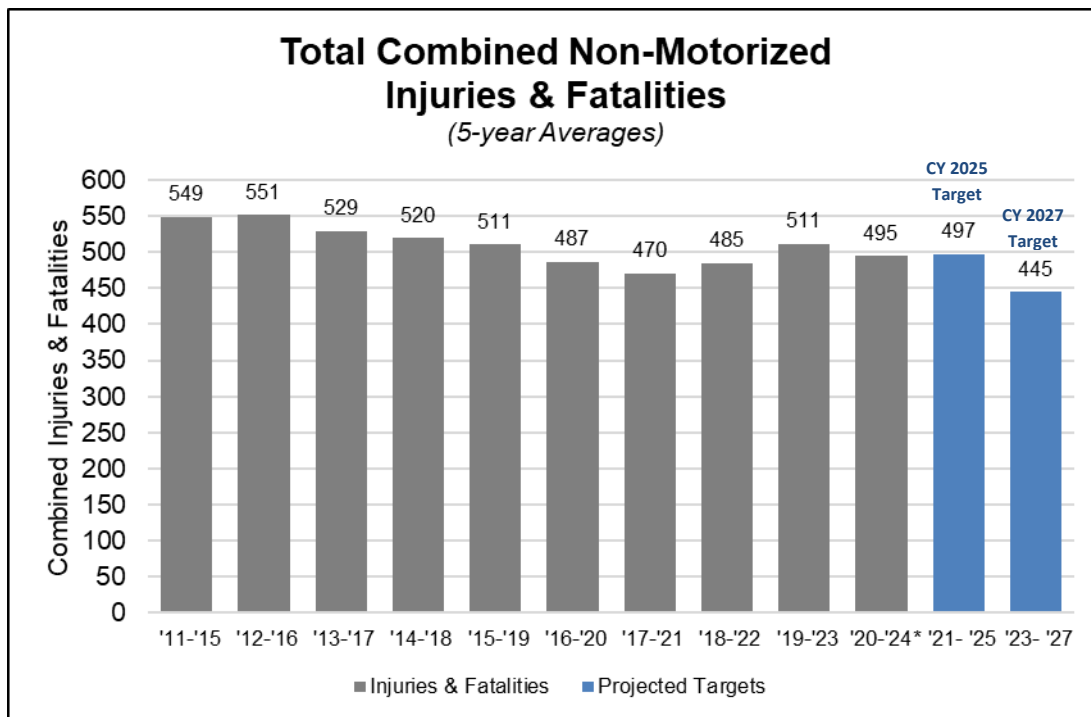**Figure 4 – MassDOT vs CMMPO Fatalities and Fatality Rate**
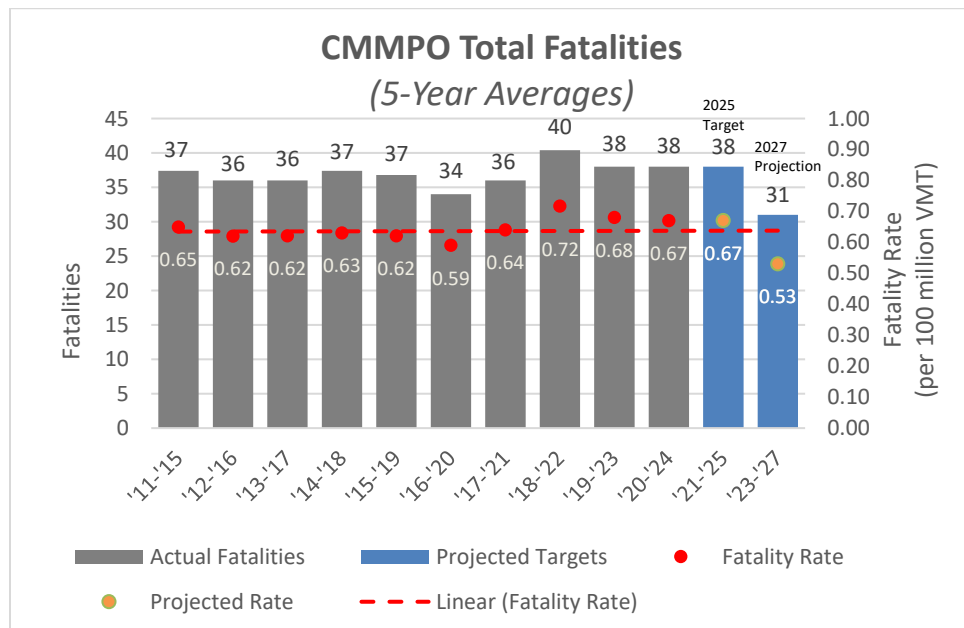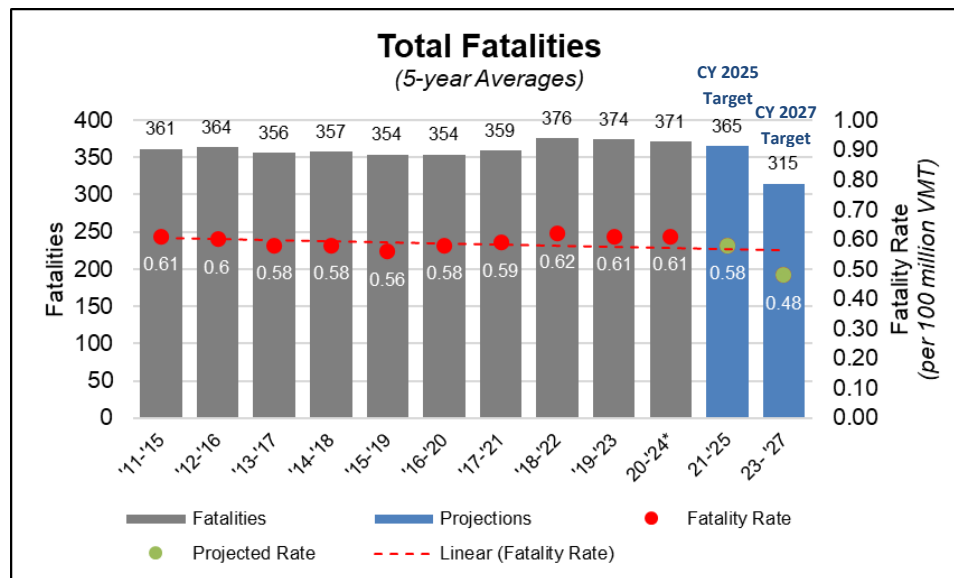
Figure 5 – MassDOT vs CMMPO Serious Injuries and Serious Injury Rate

Figure 6 – MassDOT vs CMMPO Total Combined Non-Motorized Injuries and Fatalities

CY 2025 Highway Safety Performance Targets (PM1)

In summary, **Figure 7** shows MassDOT's current safety targets for CY 2025, which were also formally adopted by the CMMPO. The safety targets are updated on an annual basis and the next update will be in 2026, which will include data from 2022 to 2026.

Figure 7 – CY 2025 Safety Targets

	MEASURE	CURRENT 5-YEAR ROLLING AVERAGE TARGET (2021-2025)	GOAL
SAFETY (PM1)	**Number of Fatalities**	**365 Fatalities**	*Reduce Number and Rate of Fatal and Serious Injury Crashes in the Region. Move Towards Vision of Zero Deaths.*
	Rate of Fatalities per 100 Million VMT	**0.58 Fatality Rate per 100 Million VMT**	
	Number of Serious Injuries	**2,622 Serious Injuries**	
	Serious Injury Rate per 100 Million VMT	**4.17 Serious Injury Rate per 100 Million VMT**	
	Number of Non-Motorized Fatalities and Serious Injuries	**497 Combined Non-Motorized Fatalities & Serious Injuries**	

PLANNING EMPHASIS AREA	US DOT NATIONAL GOAL	FHWA RULE
State of Good Repair	Infrastructure Condition	(PM2) Pavement & Bridge

State of Good Repair Introduction

The CMMPO has been assessing the infrastructure condition of the region's highways, sidewalks, ADA ramps and pavement in an ongoing manner for many years. Working with MassDOT, the CMMPO has agreed to support the state's targets for Pavement and Bridge Conditions to fully comply with FHWA Rule PM2. This section of the System Performance Report includes an update on the most current performance outcome of the federally required Bridge and Pavement measures.

Bridge and Pavement Performance Measures (PM2)

The FHWA Rule PM2 is only applicable for bridge and pavement assets on the NHS. At a meeting held 3/15/23, the CMMPO adopted the State DOTs 2-year (2024) and 4-year (2026) targets for the percentage of bridges and pavement in good and poor condition. To set these targets, MassDOT has followed FHWA guidelines by measuring bridge and pavement condition using the 9-point National Bridge Inventory Standard (NBIS); the International Roughness Index (IRI); the presence of pavement rutting; and the presence of pavement cracking. The 2-year and 4-year targets were set for six (6) individual performance measures: 1) percent of bridges in good condition; 2) percent of bridges in poor condition; 3) percent of Interstate pavement in good condition; 4) percent of Interstate pavement in poor condition; 5) percent of non-Interstate pavement in good condition; and 6) percent of non-Interstate pavement in poor condition. Each of the listed performance measures are tracked in greater detail in MassDOT's Transportation Asset Management Plan (TAMP).

Bridge Performance Measures

In Massachusetts, NHS bridges constitute 44% of the state's National Bridge Inventory (NBI) structures and 70% of the deck area. As shown in **Figure 8**, MassDOT is responsible for nearly all the NHS bridges in the state.

Figure 8

Distribution of Ownership of NHS Bridges in Massachusetts			
Owner	By Count	By Area (square feet)	% of Ownership
MassDOT	2178	28,619,606	97%
Municipality	72	894,270	3%
Totals	2250	29,513,876	100%

Historically, the primary MassDOT Highway Division measure for bridge performance has been the number of Structurally Deficient bridges (SD) within the state. Federal legislation required that states report the condition of NHS bridges by the percentage of deck area on structurally deficient structures compared with cumulative deck area of the full system, with a target not to exceed 10% of all deck area.

This measure incorporates structure size in the analysis of bridge performance and uses NBI condition ratings for Deck, Superstructure, Substructure, and Culvert. Condition is determined by the lowest rating of these items. If the lowest rating is greater than or equal to 7, the bridge is classified as Good; if it is less than or equal to 4, the bridge is classified as Poor. The following formula is how the percentage of good and poor bridge conditions is calculated:

$$\% \text{ Good/Poor Bridge Condition} = \frac{\text{Total bridge area in good/poor condition}}{\text{Total bridge area}}$$

Targets for bridge-related performance measures were determined by identifying which bridge projects are programmed as well as projecting at what rate bridge conditions deteriorate. The bridge-related performance measures calculate the percentage of deck area, rather than the total number of bridges. There are numerous bridge projects in the recently endorsed CMMPO 2026-2030 TIP. State DOTs are required to maintain an Asset Management Plan which includes the statewide condition of bridges.

Federal regulations state that the Poor condition threshold is 10%. Above that threshold, state DOTs must obligate a minimum amount of National Highway Performance Program (NHPP) funds to on-systems bridges. **Figure 9** shows the state's current 2-year (2024) and 4-year (2026) targets for NHS Bridge Condition.

Figure 9

NHS Bridge Condition State Targets		
Measure	**2024**	**2026**
% Good	16%	16%
% Poor	12%	12%

In the CMMPO region, there are 292 NBI structures on NHS roadways. As of August 2025, there are 38 bridges in good condition (16%) and 17 bridges in poor condition (6%). Additionally, there are 217 bridges in fair condition (76%) and 20 bridges that don't currently have a condition rating.

Pavement Performance Measures

This rule establishes measures for State DOTs and MPOs to follow when carrying out the NHPP to assess progress on achieving condition targets for NHS pavements. State DOTs and MPOs must use Highway Performance Monitoring System (HPMS) data used by FHWA to calculate Good/Poor metrics and measures. HPMS pavement data collection requirements were also revised to require an increased, comprehensive collection of data for NHS routes.

The NHS constitutes 14% statewide accepted lane mileage, with 69.9% under MassDOT jurisdiction, 25.7% under municipal jurisdiction, and the remaining percentage owned by the Massachusetts Department of Conservation and Recreation (DCR), the Massachusetts Port Authority (MassPort), and federal agencies. There are 469.57 lane miles of Interstate pavement within Central Massachusetts, which represents about 15% of the state's portion of the Interstate System. Additionally, there are 622.04 lane miles of non-Interstate pavement within Central Massachusetts, about 9% of the state's total. 201.46 of these total miles are owned by municipalities. MassDOT manages the necessary capital investments for state-owned portions of the NHS while also collecting condition data on the entire system.

This rule requires the state to set two and four-year targets for the percentage of pavement in Good and Poor conditions on both the Interstate and Non-Interstate NHS. The measure is aggregated by lane miles.

Performance targets for pavement-related performance measures for this period were based on a single year of data collection and thus were set to remain steady under FHWA guidance. These measures are to be revisited at the 2-year mark (2024), once three years of data are available, for more informed target setting. Also, while the previous period utilized only International Roughness Index (IRI) for non-Interstate NHS, this performance period utilized "full distress" condition measurement and conservative selected targets.

MassDOT continues to measure pavement quality and to set statewide short-term and long-term targets in the MassDOT Performance Management Tracker using the Pavement Serviceability Index (PSI), which differs from IRI. These measures and targets are used in conjunction with federal measures to inform program sizing and project selection. **Figure 10** and **Figure 11** show the state targets for both Interstate and Non-Interstate NHS pavement for the 2-year (2024) and 4-year (2026) pavement targets.

Figure 10

Interstate NHS Pavement State Targets		
Measure	**2024**	**2026**
% Good	70%	70%
% Poor	2%	2%

Figure 11

Non-Interstate NHS Pavement State Targets		
Measure	**2024**	**2026**
% Good	30%	30%
% Poor	5%	5%

According to MassDOT data in 2024, Interstate NHS pavement in the CMMPO region contains 3.2% in poor condition, 13.9% in fair condition, 13.7% in good condition, and 69.2% in excellent condition. For non-Interstate NHS pavement in the CMMPO region, there is 15.8% in poor condition, 28.3% in fair condition, 32.1% in good condition, and 23.8% in excellent condition.

State of Good Repair (PM2) Targets

In summary, **Figure 12** shows MassDOT's current bridge and pavement targets for 2026, which were also adopted by the CMMPO. A mid-point performance review of both the bridge and pavement targets was conducted in 2024, and the targets were not adjusted.

Figure 12 – State of Good Repair Targets

	MEASURE	TARGET (2026) - MID PERFORMANCE REVIEW IN 2024	GOAL
STATE OF GOOD REPAIR (PM2)	% of Interstate NHS Pavement in Good Condition	70% of Interstate NHS Pavement in Good Condition	*To Maintain the Highway Infrastructure Asset System in a State of Good Repair*
	% of Interstate NHS Pavement in Poor Condition	2% of Interstate NHS Pavement in Poor Condition	
	% of Non-Interstate NHS Pavement in Good Condition	30% of Non-Interstate NHS Pavement in Good Condtion	
	% of Non-Interstate NHS Pavement in Poor Condition	5% of Non-Interstate NHS Pavement in Poor Condtion	
	% of NHS Bridges by Deck Area Classified as Good Condition	16% of NHS Bridges by Deck Area in Good Condition	
	% of NHS Bridges by Deck Area Classified as Poor Condition	12% of NHS Bridges by Deck Area in Poor Condition	

PLANNING EMPHASIS AREA	US DOT NATIONAL GOAL	FHWA RULE
Congestion	System Reliability / Congestion Reduction	(PM3) System Performance / Freight / Air Quality

System Performance, Freight, Air Quality Introduction

When traffic demand approaches or exceeds the available capacity of the highway system, the result is congestion. Congestion is recognized as a problem of both local and national importance that adversely affects both the economy and quality of life. The CMMPO has been addressing congestion for nearly three decades by monitoring specific measures that are derived from the targets and goals in the planning region's Congestion Management Process (CMP), LRTP and TIP. On the national level, congestion is being addressed through FHWA Rule PM3 that was established to improve system performance, freight movement, and the reduction of traffic congestion and emissions.

System Performance Measures (PM3)

This rule aims to measure the performance of the entire Interstate System and remainder of the NHS by way of six measures that are linked to reliability, congestion, and emissions. For PM3, MassDOT is responsible for most of the NHS lane miles statewide; however, the CMMPO is responsible for almost 8% of NHS lane miles. At their 3/15/23 meeting, the CMMPO voted to adopt the five statewide targets for this rule. Below are the performance measures related to PM3.

Reliability

- Level of Travel Time Reliability (LOTTR) on both the Interstate System and non-Interstate NHS
- Level of Truck Travel Time Reliability (TTTR) on the Interstate System

Congestion

- Percentage of non-single occupancy vehicle (SOV) travel
- Peak hour excessive delay (PHED)

Emissions

- Total reduction of on-road mobile source emissions from projects funded from the Congestion Mitigation and Air Quality (CMAQ)

Level of Travel Time Reliability (LOTTR)

LOTTR is based on the amount of time it takes to drive the length of a highway segment and is defined as the ratio of the 80th percentile travel time of a reporting segment to a "normal"

travel time (50th percentile), using data from FHWA's free National Performance Management Research Data Set (NPMRDS) or equivalent. Data is collected in 15-minute segments during all time periods other than 8 PM-6 AM local time. The measures are the percentage of person-miles traveled on the relevant NHS segments that are reliable, and the metric is the percentage of person-miles traveled that are "reliable."

The following steps are used to calculate the LOTTR statewide for segments on the Interstate and Non-Interstate NHS:

1. Collect travel times from the National Performance Management Research Data Set (NPMRDS).
2. Find the 50th percentile and 80th percentile times for each time period and calculate the ratio.
3. Compute LOTTR by dividing the 80th percentile by the 50th percentile.
4. Repeat the above steps for all four time periods shown in **Figure 13**.
5. The LOTTR must be below 1.50 for all four time periods for the segment to be "reliable."

Figure 13

Level of Travel Time Reliability (LOTTR) (Single Segment, Interstate Highway System)		
Monday - Friday	6am – 10am	$LOTTR = \dfrac{44 \text{ sec}}{35 \text{ sec}} = 1.26$
	10am – 4pm	LOTTR = 1.39
	4pm – 8pm	LOTTR = **1.54**
Weekends	6am – 8pm	LOTTR = 1.31
Must exhibit LOTTR below 1.50 during <u>all</u> the time periods		**Segment is <u>not</u> reliable**

MassDOT LOTTR Targets and CMMPO Comparison

MassDOT followed FHWA regulation in measuring LOTTR on both the Interstate and non-Interstate NHS using the NPMRDS provided by FHWA. These performance measures aim to identify the predictability of travel times on the roadway network by comparing the average travel time on a given segment against longer travel times. **Figure 14** shows the annual results from 2017 to 2024 for the percentage of reliable segments statewide as well as the CMMPO region. The 2-year (2024) and 4-year (2026) LOTTR targets for Interstate and Non-Interstate NHS are also shown. The percentage in 2020 is moderately higher than other years due to the COVID-19 pandemic as people were either required to stay at home and/or work from home, which generated fewer vehicles on the major highways. The following statewide and CMMPO

Interstate and Non-Interstate percentages are from the Probe Data Analytics Suite of the Regional Integrated Transportation Information System (RITIS) website.

Figure 14 – Statewide and CMMPO Reliable Segment Percentages and Targets

Year	Statewide		CMMPO		Interstate Target		Non-Interstate Target	
	Interstate %	Non-Interstate %	Interstate %	Non-Interstate %	2024	2026	2024	2026
2017	70.4%	80.1%	89.7%	87.1%				
2018	69.8%	80.4%	87.3%	89.6%				
2019	69.1%	82.8%	84.6%	88.9%				
2020*	94.4%	91.3%	99.1%	94.1%	74%	76%	85%	87%
2021	84.2%	87.2%	96.4%	92.9%				
2022	78.4%	87.0%	95.9%	92.0%				
2023	74.4%	86.1%	93.4%	93.5%				
2024	73.8%	88.1%	90.8%	95.9%				

COVID-19 pandemic occurred during 2020

Truck Travel Time Reliability (TTTR)

TTTR is the amount of time it takes trucks to drive the length of a highway segment. This measure is *only* calculated for the Interstate System. The following steps are used to calculate the TTTR measure:

1. Collect travel times from the National Performance Management Research Data Set (NPMRDS).
2. Find the 50th and 95th percentile times for each time period.
3. Compute the TTTR by dividing the 95th percentile by the 50th percentile.
4. Repeat the above steps for all five time periods shown in **Figure 15**.
5. The TTTR Index is generated as a weighted average for the largest period for each segment and its weight.

Figure 15

Level of Truck Travel Time Reliability (TTTR) *(Single Segment, Interstate Highway System)*		
Monday - Friday	6am – 10am	$TTTR = \dfrac{55 \text{ sec}}{35 \text{ sec}} = 1.57$
	10am – 4pm	TTTR = 1.25
	4pm – 8pm	**TTTR = 2.52**
Weekends	6am – 8pm	TTTR = 1.2
All Days	8pm – 6am	TTTR = 1.05

MassDOT TTTR Targets and CMMPO Comparison

MassDOT followed FHWA regulation in measuring TTTR on the Interstate System using the NPMRDS provided by FHWA. These performance measures aim to identify the predictability of travel times on the major highway network by comparing the average travel time along a given segment against longer travel times. **Figure 16** shows the annual TTTR ratio results from 2017 to 2024 for both statewide and CMMPO regions. The 2-year (2024) and 4-year (2026) LOTTR targets for the Interstate system are also shown. The TTTR ratio in 2020 is well below the other years of data due to the COVID-19 pandemic as people were either required to stay at home and/or work from home, which generated far less vehicles on the Interstate System. The following statewide and CMMPO Interstate and Non-Interstate ratios are from the Probe Data Analytics Suite of the Regional Integrated Transportation Information System (RITIS) website.

Figure 16 – Statewide and CMMPO Interstate TTTR Ratios and Targets

Year	Statewide Interstate TTTR Ratio	CMMPO Interstate TTTR Ratio	Interstate TTTR Target	
			2024	**2026**
2017	1.81	1.71		
2018	1.88	1.79		
2019	1.84	1.77		
2020*	1.44	1.22		
2021	1.61	1.59	1.80	1.75
2022	1.71	1.61		
2023	1.74	1.70		
2024	1.80	1.79		

COVID-19 pandemic occurred during 2020

Peak Hour Excessive Delay (PHED)

This measure is only applicable for Urbanized Areas (UZA) of more than 1 million people with NHS mileage in nonattainment or maintenance areas for ozone, carbon monoxide, or particulate matter. The three (3) UZAs that are part of this measure are Boston (including parts of NH and RI), Springfield (including parts of CT), and Worcester (including parts of CT). The CMMPO is part of only the Boston and Worcester UZAs. The targets were developed in coordination with state Departments of Transportation and neighboring MPOs with planning responsibility for portions of the UZAs.

The metric for PHED indicates annual hours of excessive delay per capita on the NHS between 6am – 10am and 3pm – 7pm. For this measure, the threshold for excessive delay is based on the travel time at 20 miles per hour or 60% of the posted speed limit travel time, whichever is greater. In the Boston UZA, the 2-year (2024) target is set at a realistic 24, while the 4-year (2026) target of 22 is proposed to establish an improving target and one that is below pre-pandemic numbers. Similarly, in the Worcester UZA, the 2-year (2024) target is proposed at 7 to account for uncertainty, while the 4-year (2026) target of 5 is proposed to establish an improving target and one that is below pre-pandemic levels. The targets for both the Boston and Worcester UZAs can be found in **Figure 17**.

Figure 17 – Peak Hour Excessive Delay (PHED) UZA Targets

Performance Measures	2-year (2024)	4-year (2026)
PHED (Boston UZA)	24.0	22.0
PHED (Worcester UZA)	7.0	5.0

2018 – 2023 PHED data results are included for informational purposes in **Figure 18** for both the Boston and Worcester UZAs.

Figure 18 – Peak Hour Excessive Delay (PHED) UZA Per Capita

Year	Boston UZA	Worcester UZA
2018	22.87	10.62
2019	25.23	8.89
2020	12.74	5.14
2021	18.03	6.81
2022	20.03	7.37
2023	20.22	7.31

Percentage of Non-SOV Vehicle Travel

The metric for non-SOV travel is based on the percentage of people commuting to work using a mode other than a single occupancy vehicle (e.g., carpool, van, public transit, walking, bicycling or telecommuting). The percentage of non-SOV travel is approximated using the U.S. Census Bureau's American Community Survey (ACS) Journey-to-Work data.

Like the PHED measures, the percentage of non-SOV travel is only for urbanized areas (UZA), which includes the Boston, Springfield, and Worcester UZAs. The CMMPO is part of only the Boston and Worcester UZAs. In the Boston UZA, the proportion of non-SOV travel has been steadily increasing and is projected to continue increasing at a rate of 1.4% annually. In the Worcester UZA, the proportion of non-SOV travel has also been steadily increasing and is projected to continue increasing at a rate of 0.09% annually. The targets for both the Boston and Worcester UZAs can be found in **Figure 19**.

Figure 19 – Percentage of Non-SOV Vehicle Travel UZA Targets

Performance Measure	2-year (2024)	4-year (2026)
% non-SOV (Boston UZA)	38.8%	39.8%
% non-SOV (Worcester UZA)	25.4%	26.1%

In addition to the above figure that shows the non-SOV targets for both the Boston and Worcester UZAs, the figures below show previous years data for both UZAs. **Figure 20** shows the 5-year ACS estimates for the Boston UZA from 2016 to 2022 and the projections to 2025. Similarly, **Figure 21** shows the 5-year ACS estimates for the Worcester UZA as well as the projections.
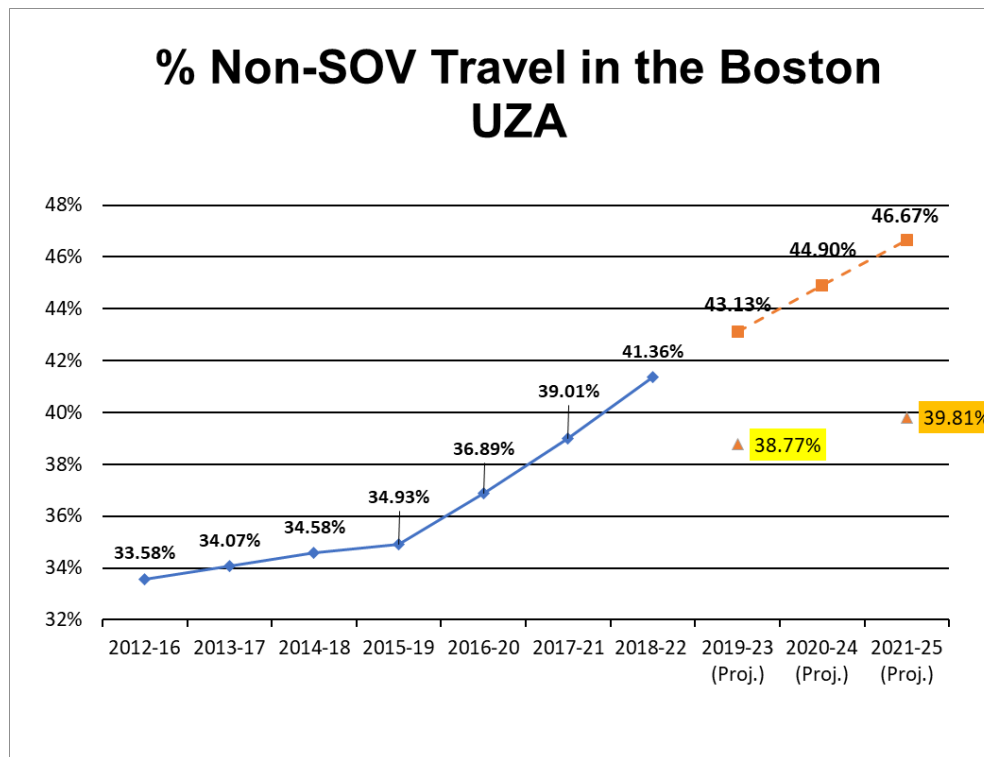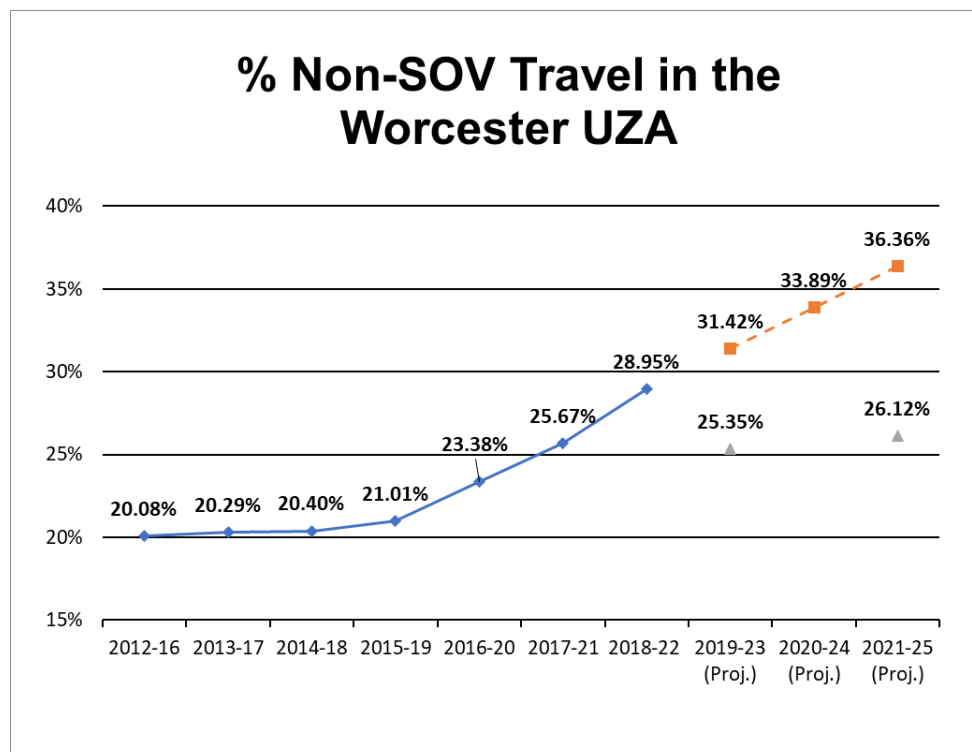
Figure 20 – % Non-SOV Travel in the Boston UZA

Figure 21 – % Non-SOV Travel in the Worcester UZA

Emissions Reductions

Emissions reduction targets are measured as the total of all emission reductions anticipated through CMAQ-funded projects in non-attainment or air quality maintenance areas (currently the Massachusetts cities of Lowell, Springfield, Waltham, and Worcester, and the town of Oak Bluffs) identified in the Statewide Transportation Improvement Program (STIP). This anticipated total emissions reduction is calculated using existing CMAQ processes. **Figure 22** shows the 2-year (2024) and 4-year (2026) emissions targets.

Figure 22 – Emission Reduction Targets from CMAQ-Funded Projects

Performance Measure	2-year (2024)	4-year (2026)
Emissions Reductions: NOx	0.000kg	0.000kg
Emissions Reductions: VOC	0.000kg	0.000kg
Emissions Reductions: CO	0.354kg	0.354kg

Congestion/System Reliability Targets

In summary, **Figure 23** shows MassDOT's current congestion and system reliability targets for 2026, which were also adopted by the CMMPO. A mid-point performance review of the congestion and system reliability targets was conducted in 2024, and the targets stayed the same.

Figure 23 – Congestion/System Reliability Targets

	MEASURE	TARGET (2026) - MID PERFORMANCE REVIEW IN 2024	GOAL
CONGESTION/SYSTEM RELIABILITY (PM3)	Level of Travel Time Reliability (LOTTR) on Interstate NHS	74% (2024) / 76% (2026)	*To Achieve a Significant Reduction in Congestion on the National Highay System (NHS)*
	Level of Travel Time Reliability (LOTTR) on Non-Interstate NHS	85% (2024) / 87% (2026)	
	Level of Truck Travel Time Reliability (TTTR) on Interstate NHS	1.80 (2024) / 1.75 (2026)	
	Peak Hour Excessive Delay (PHED) - Boston UZA	24.0 (2024) / 22.0 (2026)	
	Peak Hour Excessive Delay (PHED) - Worcester UZA	7.0 (2024) / 5.0 (2026)	
	% of Non-Single Occupancy Vehicle (SOV) Travel - Boston UZA	38.8% (2024) / 39.8% (2026)	
	% of Non-Single Occupancy Vehicle (SOV) Travel - Worcester UZA	25.4% (2024) / 26.1% (2026)	
	Emissions Reduction	0.354KG CO, 0.000kg VOC, 0.000kg NOx	

Part 2: Federally Required Transit Performance Measures

The second part of the System Performance Report includes performance management results for the federally required transit performance measures included in the Worcester Regional Transit Authority's (WRTA) Transit Asset Management (TAM) Plan and the Public Transportation Agency Safety Plan (PTASP). **Figure 24** shows the complete list of goals and measures included in both the TAM Plan and PTASP.

Figure 24 – Federally-Required Transit Performance Goals and Measures

EMPHASIS AREA	GOALS	MEASURES
Transit Assets	Maintain its facilities, ancillary components, and fleet in a state of good repair.	Useful Life Benchmark (ULB) of Rolling Stock (Buses & Vans)
		Useful Life Benchmark (ULB) of Equipment (Support/Service Vehicles)
		Useful Life Benchmark (ULB) of Facilities (Admin, Maintenance, Passenger, & Parking)
Safety	Provide management and labor a comprehensive, collaborative approach to managing safety for both Fixed-Route and Demand Response.	Total Fatalities
		Rate of Fatalities per 1,000,000 Vehicle Revenue Miles
		Total Injuries
		Rate of Injuries per 1,000,000 Vehicle Revenue Miles
		Total Safety Events
		Rate of Safety Events per 1,000,000 Vehicle Revenue Miles
		System Reliability (Miles between Failures)

WRTA Transit Asset Management (TAM) Plan

As a recipient of Federal Transit Administration (FTA) funds, the WRTA is required to develop and maintain a Transit Asset Management (TAM) Plan per FTA Final Rule of 49 CFR Part 625. As defined in the Final Rule, TAM is the strategic and systematic practice of processing, operating, inspecting, maintaining, rehabilitating, and replacing transit capital assets to manage their performance, risks, and costs over their life cycles to provide safe, cost effective, and reliable public transportation.

The WRTA TAM Plan identifies the assets that the WRTA owns and has direct capital responsibility. The performance measures included in the Final Rule correspond to these assets. The WRTA updated its TAM Plan and the WRTA Advisory Board adopted the current plan on September 22, 2022. The WRTA's new TAM Plan covers the period beginning on October 1, 2022, and ending on September 30, 2026. Based on new guidance from MassDOT, the WRTA finalized an update to the TAM Plan on February 20, 2025. The update was approved by the WRTA Advisory Board on March 20, 2025, and the CMMPO concurred with the updated targets at their April 16, 2025, meeting. The TAM Plan is amended during the FTA-specified four-year horizon period when the WRTA implements significant changes involving its assets and/or operations.

The WRTA's TAM Plan must contain the following elements:

1. An **Inventory of Assets Portfolio**: an inventory of the number of capital assets that include Rolling Stock, Facilities, and Equipment.
2. A **Condition Assessment of Inventoried Assets**: a condition assessment of those inventoried assets for which the WRTA has direct ownership and capital responsibility.
3. A **Description of a Decision Support Tool**: a description of the analytical process and decision support tool that the WRTA uses to assist in capital asset prioritization.
4. A **Prioritized List of Investments**: the prioritized list of projects that the WRTA will use to manage or improve the State of Good Repair (SGR) of capital assets.

The WRTA's SGR Policy is that a capital asset is in a State of Good Repair when each of the following objective standards is met:

1. If the asset is in a condition sufficient to operate at a full level of performance.
2. The asset can perform its function according to its manufacturer's design function.
3. The asset's use in its current condition does not pose an identified unacceptable safety risk and/or denies accessibility.
4. The asset's life cycle investment needs have been met or recovered, including all scheduled maintenance, rehabilitation, and replacements.

Performance Measures and Targets

Under the TAM Final Rule, FTA established three performance measures for transit providers to use when assessing SGR for three categories of capital assets. These measures are aiding the WRTA in setting targets that support funding prioritization and are included in **Figure 25**. In this updated TAM Plan, the WRTA made some adjustments to the performance targets. The WRTA separated the Rolling Stock vans into two classes and updated the target. Additionally, the equipment category was separated to include support and service vehicles, and the target was updated. In the February 20, 2025, update the vans ULB was changed to 8 years.

Figure 25

WRTA ASSET CONDITION PERFORMANCE TARGETS		
Category	**Class**	**Performance Target**
Rolling Stock	Buses >30'	100% of fleet meets or exceeds ULB of 12 years
	Short Buses <30'	100% of fleet meets or exceeds ULB of 10 years
	Vans (A, E, E2)	100% of fleet meets or exceeds ULB of 8 years
	Vans (LF)	100% of fleet meets or exceeds ULB of 8 years
Equipment	Support Vehicles	100% of fleet meets or exceeds ULB of 7 years
	Service Vehicles	100% of fleet meets or exceeds ULB of 10 years
Facilities	Admin/Maintenance Facility	0% of facilities rated under 3.0 on TERM scale
	Passenger/Parking Facility	0% of facilities rated under 3.0 on TERM scale

In the above Figure, the Useful Life Benchmark (ULB) is defined as the expected life cycle or acceptable period of use in service for a capital asset as determined by a transit provider. The TERM Scale is a five-category rating system used in the FTA's Transit Economic Requirements Model (TERM) to describe an asset's condition: 5.0 – Excellent, 4.0 – Good, 3.0 – Adequate, 2.0 – Marginal, and 1.0 – Poor.

Within the TAM Plan, the WRTA provides the current condition of all of its Rolling Stock, Equipment, and Facilities. Also, for each vehicle, the current age, mileage, and eligible replacement date is included. The replacement date is determined based on the performance targets listed above for each vehicle class. In addition to the vehicles, the TAM Plan lists the current and previous TERM condition rating for both the WRTA Hub and the Maintenance Facility. The current and previous scores are shown in **Figure 26**.

Figure 26

Facilities Assessed Condition Rating			
Category	Class	Previous TERM Scale Rating	Current TERM Scale Rating
Facilities	Admin/Maintenance Facility (M&O)	4.8	5.0
	Passenger/Parking Facility (Hub)	4.7	4.9

TAM Plan Targets

In summary, **Figure 27** shows the WRTA's updated TAM Plan targets, agreed to by the CMMPO. The TAM Plan is in effect until September 2026, at which time a new plan will be developed for adoption.

Figure 27 – Current WRTA TAM Targets

	MEASURE	TARGET	GOAL
ASSET MANAGEMENT	Useful Life Benchmark (ULB) of Buses > 30'	100% of Fleet Meets or Exceeds ULB of 12 Years	Maintain Facilities, Ancillary Components, and Fleet in a State of Good Repair.
	Useful Life Benchmark (ULB) of Buses <= 30'	100% of Fleet Meets or Exceeds ULB of 10 Years	
	Useful Life Benchmark (ULB) of Vans (A,E,E2)	100% of Fleet Meets or Exceeds ULB of 8 Years	
	Useful Life Benchmark (ULB) of Vans (LF)	100% of Fleet Meets or Exceeds ULB of 8 Years	
	Useful Life Benchmark (ULB) of Support Vehicles	100% of Fleet Meets or Exceeds ULB of 7 Years	
	Useful Life Benchmark (ULB) of Service Vehicles	100% of Fleet Meets or Exceeds ULB of 10 Years	
	Condition of Admin/Maintenance Facility	0% of Facilities Rated Under 3.0 on TERM Scale	
	Condition of Passenger/Parking Facility	0% of Facilities Rated Under 3.0 on TERM Scale	

WRTA Public Transportation Agency Safety Plan (PTASP)

The Public Transportation Agency Safety Plan (PTASP) details the safety processes and procedures for the WRTA. The plan utilizes existing agency safety practices and best practices to be implemented to meet the regulation within 49 CFR Part 673 of the federal guidelines. The FTA required RTAs to develop an initial safety plan by July 20, 2020, but, due to the COVID-19 pandemic, the deadline was delayed until July 21, 2021. The first PTASP was eventually finalized and subsequently endorsed by the WRTA Advisory Board in November 2020 while the CMMPO endorsed the WRTA's adopted safety targets at their February 15, 2021, meeting. Since that time, the WRTA has updated the PTASP annually with new safety targets and the most recent were endorsed by the WRTA Advisory Board on July 18, 2024. The CMMPO concurred with the new safety targets at their September 18, 2024, meeting.

For the previous PTASP that was complete in December 2022, there were additional requirements from the Bipartisan Infrastructure Law (BIL). The new requirements called for the implementation of a Safety Committee. Within the Safety Committee, there should be equal representation between frontline employees and management. Further, the Committee is also responsible for carrying out the PTASP, relevant updates, and approval of the plan. The current PTASP completed in July 2024 has continued with those requirements.

The PTASP includes formal documentation to guide the agency in proactive safety management policy, safety risk management, safety assurance, and safety promotion. The goal is to provide both management and labor with a comprehensive, collaborative approach to managing safety. The plan includes the process and schedule for an annual review of the plan by the Safety Committee to review the safety performance measures and update processes that may be necessary to improve the organization's safety practices. The plan must be updated and certified by the transit agency on an annual basis.

Performance Measures and Targets

For comparison purposes, **Figure 28** shows the safety targets for both fixed routes and demand response vehicles from a five-year rolling average from 2018 to 2022. The rates are calculated per 1,000,000 vehicle revenue miles. The current 2019 to 2023 safety targets are shown in **Figure 29**.

Figure 28 – 2018-2022 PTASP Safety Targets

Mode of Transit Service	Fatalities (Total)	Fatalities (Rate)	Injuries (Total)	Injuries (Rate)	Safety Events (Total)	Safety Events (Rate)	System Reliability (Miles between Failures)
Fixed Route	0	0	26	2.8	14	1.5	9,500
Demand Response	0	0	6	1.2	8	1.6	125,000

Figure 29 – 2019-2023 PTASP Safety Targets

Mode of Transit Service	Fatalities (Total)	Fatalities (Rate)	Injuries (Total)	Injuries (Rate)	Safety Events (Total)	Safety Events (Rate)	System Reliability (Miles between Failures)
Fixed Route	0	0	20	2.1	14	1.5	9,500
Demand Response	0	0	4	0.8	8	1.5	125,000

PTASP Targets

In summary, **Figure 30** shows the WRTA's current PTASP targets, also agreed to by the CMMPO. Again, the PTASP will be updated on an annual basis. The 2020-2024 targets were not updated prior to this report being completed.

Figure 30 – Current WRTA PTASP Targets

	MEASURE	TARGET	GOAL
SAFETY	Total Fatalities (Fixed Route)	0 Fatalities	*Provide Management and Labor a Comprehensive, Collaborative Approach to Managing Safety for Both Fixed Route and Demand Response.*
	Total Fatalities (Demand Response)	0 Fatalities	
	Total Fatality Rate (Fixed Route)	0 Fatality Rate Per 1,000,000 Vehicle Revenue Miles	
	Total Fatality Rate (Demand Response)	0 Fatality Rate Per 1,000,000 Vehicle Revenue Miles	
	Total Injuries (Fixed Route)	20 Injuries	
	Total Injuries (Demand Response)	4 Injuries	
	Total Injury Rate (Fixed Route)	2.1 Injury Rate Per 1,000,000 Vehicle Revenue Miles	
	Total Injury Rate (Demand Response)	0.8 Injury Rate Per 1,000,000 Vehicle Revenue Miles	
	Total Safety Events (Fixed Route)	14 Safety Events	
	Total Safety Events (Demand Response)	8 Safety Events	
	Total Safety Events Rate (Fixed Route)	1.5 Safety Event Rate Per 1,000,000 Vehicle Revenue Miles	
	Total Safety Events Rate (Demand Response)	1.5 Safety Event Rate Per 1,000,000 Vehicle Revenue Miles	
	System Reliability (Fixed Route)	9,500 Miles Between Failures	
	System Reliability (Deman Response)	125,000 Miles Between Failures	

Part 3: Regionally Customized Performance Measures

The third part of the System Performance Report includes performance management results for the CMMPO's regionally customized measures for other national emphasis areas including Multimodal, Sustainability, Geographic Equity, Economic Vitality, Stormwater Management, and Transportation Network Resiliency and Clean Energy. **Figure 31** shows the complete list of goals and measures for each regionally customized performance measure.

Figure 31 – CMMPO Regionally Customized Transportation Goals and Measures

EMPHASIS AREA	GOALS	MEASURES
Multimodal	Improve and/or expand transportation accessibility for all modes (bicycle, pedestrian, transit) in the region.	Condition of sidewalks
		Condition of ADA ramps
		Miles of bicycle facilities
		WRTA ridership
Sustainability	Encourage compact and mixed-use development.	Jobs to housing ratio
Geographic Equity	Achieve geographic and population equity across the region.	% of disadvantaged populations intersecting WRTA fixed route bus service
		% of subregion costs per capita that benefit from a TIP project
Economic Vitality	To improve the accessibility to jobs in the CMMPO region.	Make employment opportunities accessible and available allowing for job expansion and reducing transportation costs
Stormwater Management	Create a transportation network that is resilient to the impacts of stormwater.	Number of culvert assessments on the federal-aid highway network
Transportation Network Resiliency/Clean Energy	Increase resilience to extreme weather/disasters & reduce greenhouse gases.	Number of electric vehicle (EV) charging stations in the CMMPO region

Planning Emphasis Area	US DOT National Goal	FHWA Rule
MULTIMODAL	CONGESTION / INFRASTRUCTURE CONDITION	(PM3) System Performance, Air Quality

Multimodal Introduction

The CMMPO's regionally customized measures developed for the Multimodal performance area contribute to improved system performance and improved air quality performance which are the basis of the federal rules under PM3. Although PM3 measures (detailed previously in Part 1) are not applied to this performance area, the supplemental CMMPO measures contribute to the region's overall performance for PM3. It is a goal of the CMMPO to expand and improve the respective bicycle, pedestrian, and transit networks within the planning region. The CMMPO envisions Central Massachusetts as a growing region of 40 well connected, livable communities with reduced congestion and improved multimodal mobility along with air quality. The four measures the CMMPO use for this performance area are:

1. Miles of sidewalks in good condition
2. Number of Americans with Disability Act (ADA) Ramps in good condition
3. Miles of bicycle facilities available for bicyclists to safely ride
4. Worcester Regional Transit Authority (WRTA) ridership

CMMPO Multimodal Performance Measures and Targets

Miles of Sidewalks in Good Condition

Sidewalks provide a location for pedestrians to travel safely and separately from vehicles. Individuals should be able to travel the length of a sidewalk without having to encounter various hazards. Sidewalks should be constructed to standards that are accommodating for all pedestrians including those with mobility challenges and visual impairments. Newly constructed sidewalks should be no less than 4 feet in width according to MassDOT and US Access Board specifications.

The CMMPO staff has been collecting sidewalk condition data on federal-aid roadways since 2015. Sidewalk conditions are surveyed and inventoried on a qualitative scale of *Poor*, *Fair*, *Good,* and *Excellent*. The following provides further description of these categories:

- **Poor Condition**: These sidewalks have an uneven surface that restricts safe usage along the length of the sidewalk. It has significant cracking and crumbling with sections of path completely missing. The surrounding vegetation is overgrown and/or water has settled in the area.

- **Fair Condition**: These sidewalks have an uneven surface that makes it slightly difficult for pedestrians to safely use. It has significant cracking but does not have large missing sections. There may be areas with settled water and vegetation, but they are less frequent and do not pose a major hazard to user safety.
- **Good Condition**: These sidewalks have a smooth surface that provides pedestrians, those with and without mobility challenges, the ease of traveling the length of the pathway. The sidewalk may have areas with few, but minimal cracking and no overgrown vegetation or settled water.
- **Excellent Condition**: An excellent sidewalk has a smooth and even surface that is free of any cracks, missing sections, vegetation, and settled water.

For this performance measure, the CMMPO aims for an increase in miles of sidewalk in good condition on a yearly basis. **Figure 32** shows the miles of sidewalk in good condition since 2015. Sidewalks in good and excellent condition were combined into the analysis. As the figure shows, miles of sidewalk in good condition increased in 2016 and 2017, then decreased in 2018 through 2020, then increasing again from 2021 to 2024.

Figure 32
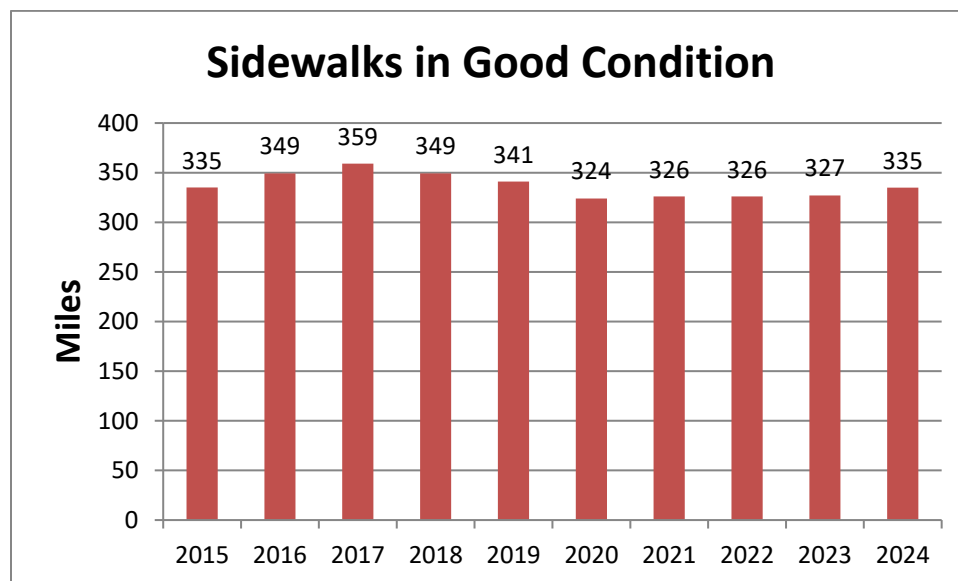
Number of ADA Ramps in Good Condition

Americans with Disability Act (ADA) ramps are vital to all pedestrians, especially those members of the community who have physical disabilities that include visual or hearing impairments, and/or require a wheelchair. There are multiple components that a ramp requires to be built to proper specifications including flares, slopes, Detectable Warning Panels, landing measurements, and sidewalk width. Improper construction of curb ramps impacts both the accessibility and the safety of individuals with physical disabilities.

The CMMPO maintains an inventory of ADA ramps along federal-aid roadways that includes scoring the compliance of a ramp based on the presence of Detectable Warning Panels, flares, landing areas and the general condition of the ramp. This inventory allows for the region's communities to better determine the condition of their assets and compliance with ADA requirements. ADA ramp data has been collected since 2015. When data was first collected it was inventoried on a scale of *No Ramp*, *Non-Compliant*, *Historic*, and *Compliant*. In 2019, the categories were updated to *Good*, *Poor*, and *No Ramp* to provide better clarity to the communities on ramp condition. The following provides a description of the updated categories:

- **Good**: A scoring of good indicates that the ramp has no major physical imperfections, is accessible, and not littered with debris that hinders pedestrian use.
- **Poor**: A scoring of poor indicates that there are major physical imperfections such as deteriorating ramp components.
- **No Ramp**: A scoring of no ramp indicates the absence of a curb ramp at the end of a sidewalk or at a street crossing.

For this performance measure, an increase in the number of ADA ramps in good condition is preferred on a yearly basis. **Figure 33** shows the number of ADA ramps in good condition since 2015. The results show an increase from 2015 to 2017 followed by a small decline in 2018, before subsequent increases in 2019 through 2021. From 2022 to 2024 there was a decrease in the number of ADA ramps in good condition.

Figure 33
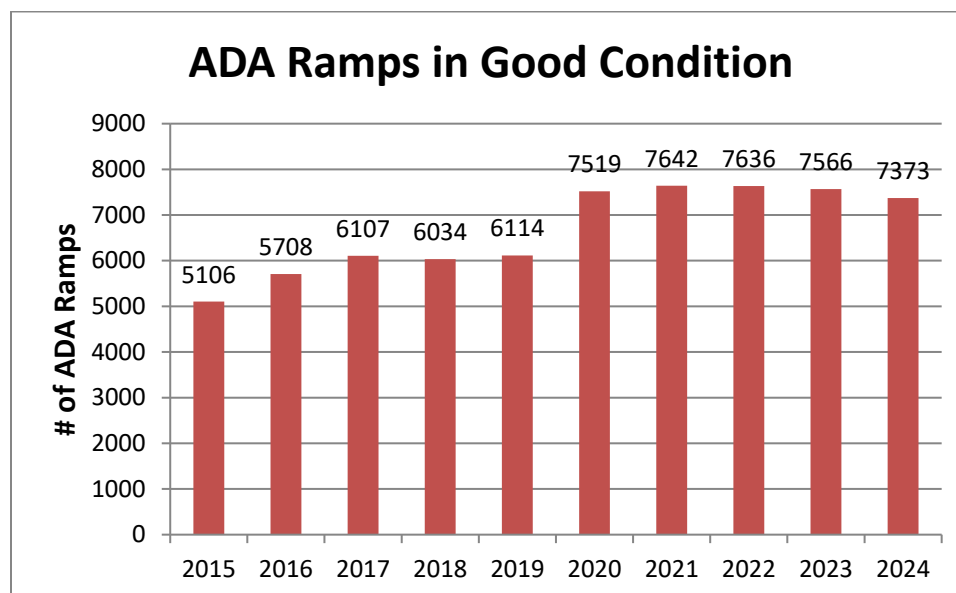
Miles of Bicycle Facilities Available for Bicyclists to Ride Safely

For this measure, staff changed the source used to collect the number of bicycle facility miles in the CMMPO region. As limited pavement data has been collected since 2019, staff decided to now use the Bicycle Facility Inventory from MassDOT's statewide database of existing and planned bikeways. 2023 is the base year for this data. The four facility types included in the data are shared use paths, bike lanes, separated bike lanes, and bicycle/pedestrian priority roadways. According to the data, there are 115.5 miles of bicycle facilities in the CMMPO region and 38.55 miles along federal-aid roadways. The target for this measure would be to increase the bicycle facility miles in the CMMPO region. **Figure 34** the bicycle facility miles in the CMMPO region in 2023 and 2024. As the figure shows, bicycle facilities have increased by ten miles.

Figure 34
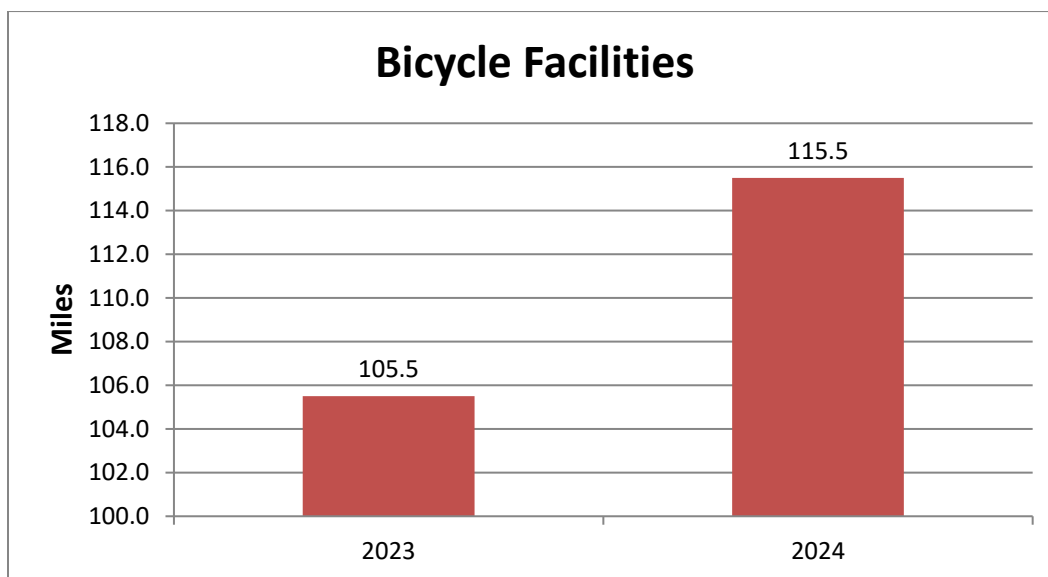
Worcester Regional Transit Authority (WRTA) Ridership

This performance measure pertains to the WRTA ridership totals for the entire system which includes fixed-route buses, ADA Paratransit, Councils on Aging (COAs) vans, VIA as well as Taxi service. The timeframe for the WRTA data is by Fiscal Year (FY), which is from July 1st to June 30th. **Figure 35** shows the WRTA ridership totals for FY2016 through FY 2024. The overall goal of this measure is to increase the WRTA's ridership each year. As the figure shows, total ridership declined every year from 2017 to 2021. The COVID-19 pandemic was the likely cause of the low ridership recorded in both 2020 and 2021. Since 2021, ridership has increased every year. Over 90% of the ridership totals represent fixed-route bus service.

Figure 35
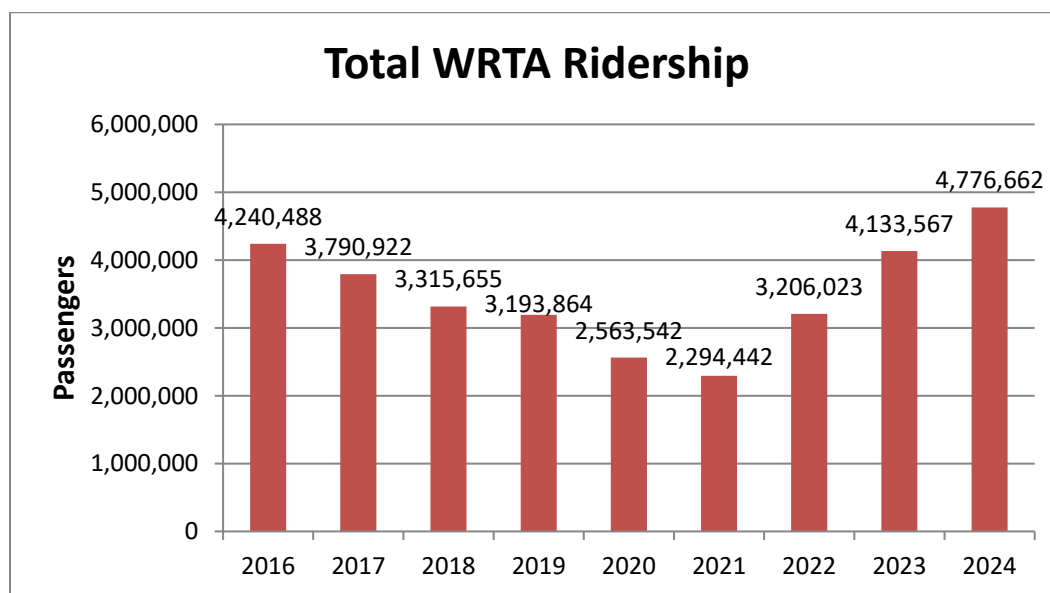
Multimodal Results

Figure 36 displays how the CMMPO is currently performing for the regionally customized multimodal targets along with the results from the prior year. As for the current results, the green light indicates that sidewalks are in good condition, bicycle facility miles, and WRTA ridership is increasing. The red light indicates that there was fewer ADA ramps in good condition compared to the prior year.

Figure 36 – CMMPO Multimodal Results

	MEASURE	PREVIOUS RESULTS	TARGET	CURRENT RESULTS	GOAL
MULTIMODAL	Condition of Sidewalks	🟢	Increase the Mileage of Sidewalks in Good Condition in the CMMPO Region	🟢	*Improve and/or Expand the Transportation Accessibility for all Modes (Bicycle, Pedestrian, and Transit) in the Region*
	Condition of ADA Ramps	🔴	Increase the Number of ADA Ramps in Good Condition in the CMMPO Region	🔴	
	Miles of Bicycle Facilities	⚪	Increase Bicycle Facility Miles in the CMMPO Region	🟢	
	WRTA Ridership	🟢	Increase Ridership on the WRTA System	🟢	

PLANNING EMPHASIS AREA	US DOT NATIONAL GOAL	FHWA RULE
Sustainability	Environmental Sustainability	None

Sustainability Introduction

Sustainability focuses on meeting the needs of the present without compromising the ability of future generations to meet their needs as well. There are many forms of sustainability such as economic, environmental, and social. Promoting sustainability through transportation planning can be accomplished through detailed TIP screening for improvement projects that serve to mitigate environmental impacts and are near CMRPC-identified Priority Development Areas (PDAs). Currently, the only performance measure for sustainability included in this report is the Jobs to Housing ratio. This is considered a regionally customized measure, exceeding the requirements of the FHWA rules.

CMMPO Sustainability Performance Measures and Targets

Jobs to Housing Ratio

Jobs to Housing ratio is one of a range of measures or variables used by city planners to examine the relative proportions of residents, jobs, and services in urban areas, thus serving as a guide for development planning for, as example, efficient city plans and public transit networks. A Jobs to Housing ratio in the range of 0.75 to 1.5 is considered beneficial for reducing Vehicle Miles Traveled (VMT). Ratios higher than 1.5 could indicate that there may be more workers commuting due to a surplus of potential employment. An imbalance in jobs and housing can create longer commute times, more single occupancy vehicle (SOV) commutes, loss of job opportunities for workers without vehicles, traffic congestion, and poor air quality.

Housing data is gathered using parcel counts from the Massachusetts Department of Revenue (DOR) based on single family, condominiums, miscellaneous residential, 2-family, 3-family, and apartments. The totals in each category are tabulated and an overall total of housing units is determined for all benchmark years. For employment data, the projections included in the CMMPO's most recent Long-Range Transportation Plan (LRTP), 2050 Connections, were used.

The CMMPO's target for this performance measure is to maintain a balance of jobs to housing with a ratio between 0.75 to 1.50. **Figure 37** shows the Jobs to Housing ratio for the Central Massachusetts planning region from 2015 – 2024, which has remained a consistent 1.07.

37 | P a g e

Figure 37 – Jobs to Housing Ratios

	Total Housing Units	Total Jobs	J to/H Ratio
2015	223,498	238,170	1.07
2016	224,498	239,406	1.07
2017	225,002	240,642	1.07
2018	226,055	241,878	1.07
2019	227,719	243,114	1.07
2020	229,458	244,350	1.07
2021	230,656	245,840	1.07
2022	231,979	247,330	1.07
2023	233,378	248,820	1.07
2024	235,046	250,310	1.07

Sustainability Results

Figure 38 displays the results showing how the Central Massachusetts planning region is faring in maintaining a balanced Jobs to Housing ratio. The green light indicates that the CMMPO is meeting the established target for this most recent year as well as the previous year.

Figure 38 CMMPO Sustainability Results

	MEASURE	PREVIOUS RESULTS	TARGET	CURRENT RESULTS	GOAL
SUSTAINABILITY	Jobs to Housing Ratio	🟢	Maintain a Jobs to Housing Balance Between 0.75 to 1.50	🟢	*Encourage Compact and Mixed Use Development*

PLANNING EMPHASIS AREA	US DOT NATIONAL GOAL	FHWA RULE
Geographic Equity	None	None

Geographic Equity Introduction

The CMMPO's goal for this transportation focus area is to achieve geographic and population equity across the region. Ideally, all six subregions and respective citizens will equally benefit from a TIP project and all transportation disadvantaged populations have access to fixed route bus service. The two measures for this area are:

- Percent of disadvantaged Populations that intersect WRTA fixed route bus service
- Percent of subregion costs per capita that benefit from a TIP project

CMMPO Geographic Equity Performance Measures and Targets

Access to WRTA Fixed Route Bus Service for Disadvantaged Populations

The CMMPO is committed to ensuring that traditionally underserved and underrepresented populations receive a fair share of the regional transportation system's benefits and are not subject to undue burdens. Access to essential services such as employment opportunities can be challenging disadvantaged populations. This measure evaluates how much of the disadvantaged populations have access to frequent WRTA fixed route bus routes within ¼ mile. The target is to ensure that the same or greater percentage of the disadvantaged populations intersect with a frequent WRTA bus route every year.

Figure 39 shows that the percentages of disadvantaged populations intersecting WRTA fixed route bus routes decreased in 2020, remained the same in 2021, increased in 2022, remained the same in 2023, and increased in 2024.

Figure 39 – Percentage of Disadvantaged Populations Intersecting WRTA Routes

	2019	2020	2021	2022	2023	2024
Total Disadvantaged Block Group Populations Intersecting WRTA Routes:	413,154	399,580	399,580	173,815	173,815	179,150
Total Disadvantaged Block Group Populations:	510,057	510,057	510,057	216,118	216,118	216,118
% of Disadvantaged Block Group Populations Intersecting WRTA Routes:	81.0%	78.3%	78.3%	80.4%	80.4%	82.9%

Regional Distribution for TIP Projects

The CMMPO intends to ensure that transportation improvements are geographically equitable throughout the entire planning region. The CMMPO Region is made up of six transportation planning subregions: North, Northeast, Southeast, Southwest, West, and Central/Worcester. This measure evaluates the geographic equity of TIP projects, making sure that all subregions have equal opportunity to benefit from a TIP project. The target for this measure is to ensure that no subregion's TIP project costs per capita calculation be more than 33% below the average total project costs per capita calculation of the CMMPO region. If the TIP project costs per capita remain below 33% of the CMMPO region's average project costs per capita for all six subregions, it will be considered meeting the target of this goal.

All TIP projects that are currently programmed in the region between the years 2025-2029 were counted to establish a project cost per capita for the entire CMMPO region. The average project cost per capita for the entire CMMPO region is 732. The project cost per capita for each subregion is then compared against the average project cost per capita of 732 for the entire region from 2025-2029. **Figure 40** shows the breakdown of each subregion that includes population and the total costs of TIP projects that are currently programmed by the CMMPO from 2025-2029. As the table shows, the West, North, and Southwest subregions are over the threshold.

Figure 40 – Percent from the CMMPO Total Cost Per Capita Average by Subregion

Subregion	Total Cost of Projects in each Subregion	Subregion Population	Total Cost Per Capita in Subregions	Percent away from CMMPO Average
West	$56,289,000	45,948	1,225	67%
North	$23,272,000	52,711	442	-40%
Northeast	$65,792,000	83,640	787	8%
Southeast	$82,958,000	114,959	722	-1%
Southwest	$100,654,000	100,855	998	36%
Central/Worcester	$113,701,000	206,518	551	-25%
CMMPO Totals	$442,666,000	604,631	Avg = 732	

Geographic Equity Results

Figure 41 displays the results on how the CMMPO is performing in providing both geographic equity and access to public transportation equity within the Central Massachusetts planning region. The green light indicates that the percentage of disadvantaged populations is either maintaining or increasing. The red light means that all subregions are not below the per capita threshold target of 33%.

Figure 41 CMMPO Geographic Equity Results

	MEASURE	PREVIOUS RESULTS	TARGET	CURRENT RESULTS	GOAL
GEOGRAPHIC EQUITY	**Percent of Disadvantaged Populations Intersecting WRTA Fixed Route Buses**	🟢	**To Maintain or Increase the % of Disadvantaged Populations that Intersect WRTA Fixed Route Buses**	🟢	*Achieve Geographic and Population Equity Across the Region*
	Percent of Subregion Costs Per Capita that Benefits from a TIP Project	🔴	**Maintain an Average % of People that Benefit from a TIP Project**	🔴	

PLANNING EMPHASIS AREA	US DOT NATIONAL GOAL	FHWA RULE
Economic Vitality	Freight Movement & Economic Vitality	System Performance / Freight / Air Quality (PM3)

Economic Vitality Introduction

Regional economic vitality through transportation planning is an important characteristic to incorporate into the aspects of performance-based planning. The CMMPO has attempted to derive a measure for the region that answers the question: How can transportation support or be consistent with strategies for economic vitality, both strengthening the existing economy and creating new opportunities?

One measure that is indicative of economic vitality is reliability of freight movement. This measure has been previously covered and discussed under the Federal PM3 for Congestion and System Reliability. A supplemental, regionally customized measure that the CMMPO decided to use pertains to the accessibility to jobs.

CMMPO Economic Vitality Performance Measures and Targets

Access to Jobs

Accessibility to jobs is an important factor associated with the economic vitality of the CMMPO region. Being able to travel to/from a job within a reasonable amount of time should be available for all populations and all modes of travel. There is a higher number of jobs in the urban area so one would expect a greater number of the population to navigate in that direction. Congestion plays a prominent role in allowing this to happen. The more congestion there is, the less likely a person will travel a greater distance to find a job. Other factors considered are income and the cost of housing.

Ideally, TIP projects that improve mobility on the overall roadway network will create more job opportunities. These improvements will often also address the modes of bicycling and walking, as required, in addition to automobile and trucking mobility. If these types of improvements reduce congestion along the roadways, people can travel further for jobs in the same amount of time it currently takes, especially during the peak commute periods.

For this Performance Measure, the CMMPO compared how many jobs residents lose access to within a 45-minute travel time, by automobile, during the peak AM travel period (8 AM) compared to free-flow conditions (2 AM). The data is provided by MassDOT through the University of Minnesota (UMN). Accordingly, the goal of this measure is to reduce the number of jobs lost that residents have potential access to within the 45-minute travel time. Currently, staff use data from 2015, 2017, 2018, 2019, and 2021. However, the reports that MassDOT

receive from UMN contain data from two years prior. Notably, the 2023 data that was received this year contains 2021 data. **Figure 42** shows the job loss percentage in each transportation planning subregion as well as the overall job loss percentage for the entire CMMPO region.

Figure 42 – Job Loss Comparison in the CMMPO Region

CMMPO Subregion	Percent Job Loss (2015)	Percent Job Loss (2017)	Percent Job Loss (2018)	Percent Job Loss (2019)	Percent Job Loss (2021)
North	31%	41%	40%	27%	39%
Northeast	63%	69%	68%	15%	61%
Southeast	46%	53%	53%	25%	47%
Southwest	41%	48%	47%	26%	37%
West	26%	31%	31%	22%	29%
Central	51%	61%	62%	36%	56%
Region Total:	49%	57%	56%	26%	50%

Congestion on the region's roadways results in significant delays for people traveling to their workplace. It perhaps even prevents people from pursuing higher paying jobs because the travel times are simply too lengthy. As the data shows, the percentage of jobs lost increased in 2017 while decreasing slightly in 2018, significantly decreasing in 2019, and increasing in 2021. For the 2021 data, the Northeast subregion had the most jobs lost while the West subregion had the least number of jobs lost. Overall, the CMMPO region lost 49% of available jobs in 2015, 57% in 2017, 56% in 2018, 26% in 2019, and 50% in 2021. The target of this performance measure is to reduce the loss of jobs percentage in the CMMPO region on an annual basis.

Economic Vitality Results

Figure 43 shows the results of the region's Economic Vitality using the previously explained performance measure. The green light indicates that the percentage of jobs lost in the region is decreasing while and the red light indicates an increase in jobs lost in the region.

Figure 43 – CMMPO Economic Vitality Results

	MEASURE	PREVIOUS RESULTS	TARGET	CURRENT RESULTS	GOAL
ECONOMIC VITALITY	Make Employment Opportunities Accessible and Available Allowing for Job Expansion and Reducing Transportation Costs	🟢	Reduce the Amount of Jobs Lost	🔴	To Improve the Accessibility to Jobs in the CMMPO Region

PLANNING EMPHASIS AREA	US DOT NATIONAL GOAL	FHWA RULE
Stormwater Management	Environmental Sustainability	None

Stormwater Management Introduction

Extreme and more frequent rainfall affect transportation infrastructure by disrupting public travel safety, the commercial transport of goods and services, and adversely impacting natural resources including water quality.

Each of the 40 communities in the CMMPO planning region have and will continue to be confronted with various decisions concerning the most effective ways to handle stormwater. Transportation impacts from stormwater can range from traffic disruptions to flooded evacuation routes to weather-related mass transit delays. Communities also need to consider the structural, operational and safety impacts to highways, bridges, and culverts as well as the overall impact on transportation system capacity.

In 2018, the CMMPO developed a Nature-Based Solutions (NBS) Toolkit to introduce and encourage communities to integrate NBS that both consider and address stormwater management at the early stages of the transportation planning process. In the Toolkit, the user will find information culled from numerous local, state, and federal resources that describes how NBS can be located as well as integrated with the roadway network to realize the full potential of managing stormwater runoff, improving multi-modal mobility, enhancing street aesthetics, and achieving the full performative value of a "living" infrastructure. The Toolkit provides definitions, analysis, and examples of NBS so that community decision makers can select those strategies which will likely provide the most benefit for their roadway network, helping their community prepare against the threat of extreme weather events. The NBS Toolkit serves to reduce the negative impacts of and increase resilience against extreme weather. Further, NBS also supports the CMMPO's Performance Management goals that are related to promoting sustainability, stormwater management and infrastructure resiliency. As such, the CMMPO encourages all 40 communities in the planning region to incorporate NBS in their local ordinances.

In addition to the NBS Toolkit, the CMMPO established a formal Culvert Assessment Program in 2021. Since that time, several staff have been trained to identify and assess stream crossing structures by the Massachusetts Division of Ecological Restoration (MassDER), which partners with the North Atlantic Aquatic Connectivity Collaborative (NAACC). The Non-Tidal Aquatic Connectivity Protocol and Scoring System is used by staff to assess both the stream crossing and the structure itself as it relates to non-tidal crossings. Notably, the CMMPO program focuses only on culverts located along federal-aid eligible highways in the planning region. Ultimately, the overall goal of the program is to help communities build resiliency through flood

risk protection and mitigation by identifying culvert locations and prioritizing those that need either repair/restoration or replacement.

CMMPO Stormwater Management Performance Measures and Targets

Culvert Assessments

With the evolution of stronger and more frequent storms, it is important to assess the current stormwater infrastructure in the region. By using the NAACC Protocol and Scoring System, culverts in the region are assessed to determine which structures are barriers to fish and wildlife passage, particularly those culverts that are increasingly vulnerable to damage or failure during a storm event that causes flooding. By identifying both "severe" and "significant" culvert barriers, the host communities can prioritize which culverts need to be repaired or replaced, improving resiliency. When the culverts are replaced, they must meet the Massachusetts Stream Crossing Standards. By meeting these standards, the properly sized culverts allow streams and rivers to flow unrestrictedly, thus minimizing the risk of flood damage. Other benefits include public safety, improved habitat and ecosystem function, reduced maintenance and repair costs, improved water quality, and improved fish and wildlife passage.

For this Performance Measure, the target is to increase the number of culverts assessed in the CMMPO region. As part of the ongoing Culvert Assessment Program, staff will focus on collecting assessment data for culverts on the federal-aid highway network. Additional culverts will be assessed if needed or requested. The total number of culverts in the CMMPO region is 5,150, of which 1,862 are on federal-aid eligible highways. **Figure 44** shows the location of all known culverts in the planning region as well as the current "barrier type" status for each survey. Following the map, **Figure 45** summarizes the number of culverts assessed to date that have been determined to be within each defined barrier type scoring category.
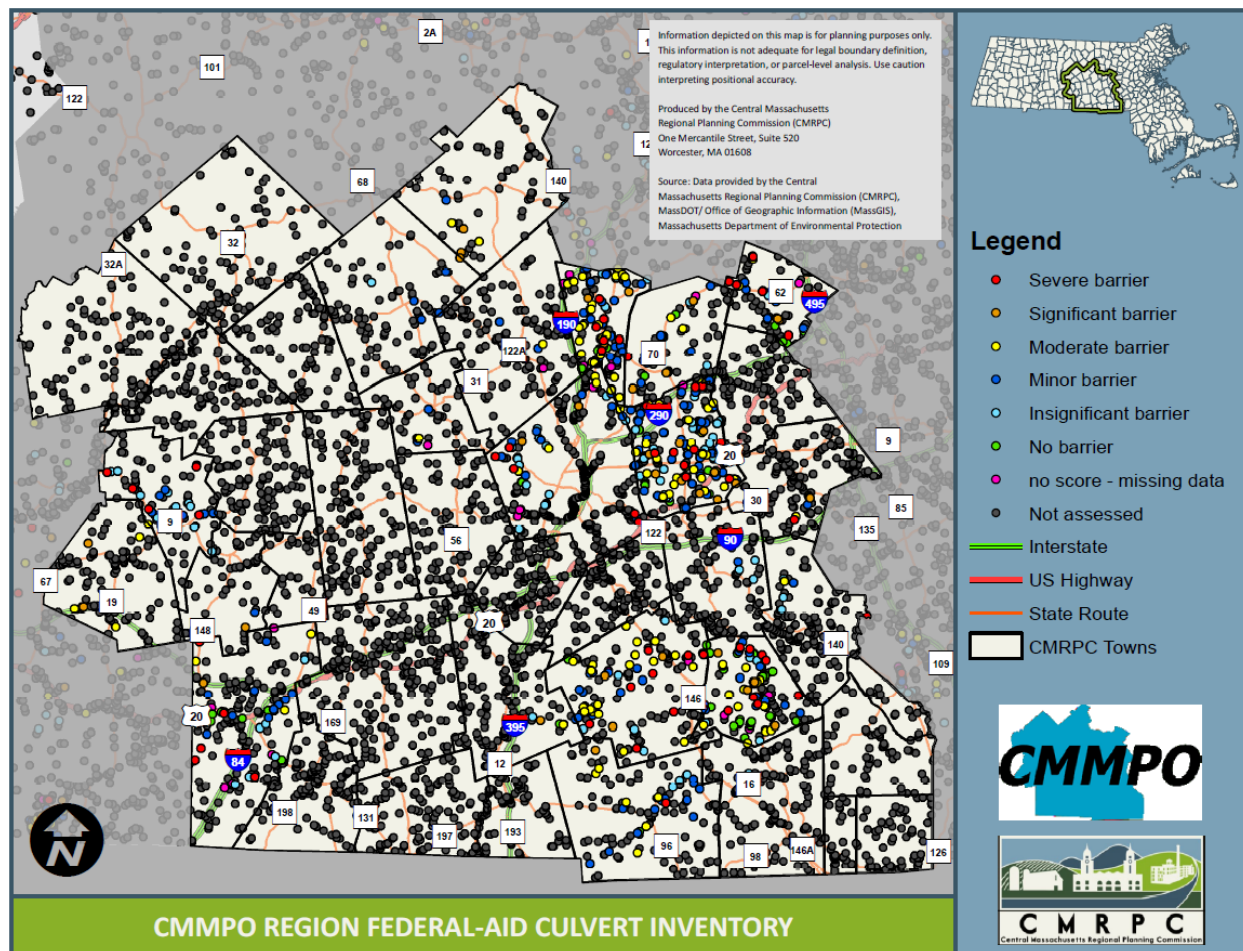
Figure 44 CMMPO Culvert Inventory

Figure 45 NAACC Culvert Aquatic Passability Scoring Results

Aquatic Passability Score	Barrier Type	# of Culverts (2021)	# of Culverts (2022)	# of Culverts (2023)	# of Culverts (2024)
N/A	No Score/Missing Data	8	12	26	39
1.0	No Barrier	2	10	70	91
0.80 – 0.99	Insignificant Barrier	29	70	113	128
0.60 – 0.79	Minor Barrier	35	99	154	194
0.40 – 0.59	Moderate Barrier	15	56	99	130
0.20 – 0.39	Significant Barrier	5	19	29	38
0.00 – 0.19	Severe Barrier	16	29	49	57
Total		**102**	**295**	**540**	**677**

As shown in **Figure 45**, a total of 540 culverts were assessed by the end of 2023 and included in the previous Annual System Performance Report in 2024. The most recent 2024 data show there are now 677 assessed culverts within the planning region. The data was collected by CMRPC staff and other agencies or community staff that are trained in the NAACC scoring system. Most of the assessed culverts were determined to have either "insignificant" or "minor" barriers. There are currently 91 culverts found to have had "no" identified barriers. However, a total of 95 culverts were determined to have either "significant" or "severe" barriers. These 95 identified structures need to be addressed in some manner to be determined by the host communities and/or MassDOT. Also, the table shows that there were 39 culverts that were attempted to be assessed but either have no score or have missing data.

Stormwater Management Results

Figure 46 shows the results of the region's Stormwater Management efforts using the above detailed performance measures. The green light indicates that the number of assessed culverts increased last year as well as this year.

Figure 46 CMMPO Stormwater Management Results

	MEASURE	PREVIOUS RESULTS	TARGET	CURRENT RESULTS	GOAL
STORMWATER MANAGEMENT	Culvert Assessments on the Highway Network in the CMMPO Region	🟢	Increase the # of Culverts Assessed in the CMMPO Region	🟢	*Create a Transportation Network that is Resilient to the Impacts of Stormwater*

PLANNING EMPHASIS AREA	US DOT NATIONAL GOAL	FHWA RULE
Transportation Network Resiliency & Clean Energy	None	None

Transportation Network Resiliency and Clean Energy Introduction

Greenhouse gas (GHG) emissions from human activities are the most significant and lead to many changes in the atmosphere, on land, and in the oceans. Transportation is the largest source of GHG emissions in the United States. Network resiliency presents many challenges, from intense heat waves and droughts, poor air quality, storms and flooding, and insect-related diseases. Reducing emissions is the primary and most important way to prevent significant threats to the transportation network. To help achieve this the CMMPO is exploring ways to expand electric vehicle (EV) charging infrastructure in the region and continue efforts to implement the Congestion Mitigation Air Quality (CMAQ) Program throughout the region. The resulting goal is to work towards decarbonizing the multimodal transportation network in the CMMPO region. According to the Massachusetts 2050 Decarbonization Roadmap, decarbonization is the process by which countries or other entities aim to achieve a low-carbon economy, or by which individuals aim to reduce their consumption of carbon. This includes a variety of strategies, including the transition of cars, trucks, and buses to electricity and other alternative fuels. It also includes a healthy public transit system, bike lanes, sidewalks, and transit-oriented development to help reduce congestion.

CMMPO Transportation Network Resiliency and Clean Energy Performance Measures and Targets

Transportation makes up the majority of GHGs produced by any economic sector in the nation as well as in the Commonwealth. Reducing emissions from the transportation sector is vital to combat the climate crisis and improve air quality and public health.

While there are many approaches to significantly lower emissions from the transportation sector, the transition from internal combustion engine vehicles (ICEVs) to zero-emission vehicles (ZEVs) is a critical component. ZEVs include battery electric vehicles (BEVs) and plugin electric vehicles (PHEVs). EVs operate with a battery which needs to be charged relative to the usage of the vehicle. Therefore, a sustainable network of EV charging infrastructure is necessary to support the transition from ICEVs to EVs across the CMMPO region, Commonwealth, and nation. The currently existing charging infrastructure lacks the ability to support the envisioned widespread adoption of EVs. To help spur EV adoption and charging infrastructure needs, efforts at both the national and state level are presently ongoing and evolving.

The target for this performance measure is to increase the number of EV charging stations in the CMMPO region. To understand the status of the EV charging infrastructure in the planning region, staff used data from the U.S. Department of Energy Efficiency and Renewable Energy (EERE) Alternative Fuel Data Center (AFDC). Current data shows a total of 248 public and private EV charging stations in the CMMPO region, which is a decrease of one (1) from last year. Although new charging stations were installed in the region, some of the current charging stations that are identified as no longer operational and were removed from the database within the last year. **Figure 47** shows the locations of the known EV charging stations. Staff recently updated the EV Charging Dashboard to version 2.0. It is a useful tool to help identify and find information regarding both public and private EV charging station locations in the CMMPO region, Massachusetts, and the United States. In addition, the Dashboard also shows Federal Highway Administration (FHWA) Alternative Fuel Corridors (AFCs) as well as available resources for grants and funding opportunities. Other resources include Alternative Fueling Station Locations and various documents related to EVs.

Due to the increasing adoption of EVs and the corresponding need for additional EV charging stations, it is important to also consider how this envisioned growth requires vast increases in electrical supply capacity to accommodate the projected vehicle charging needs. The consideration of electric infrastructure needs is vital to ensure that the growth in the EV market and EV charging stations does not outpace the power infrastructure capacity needed to charge these vehicles. Power upgrades to the electrical grid need to commence to be properly prepared for the increasing demand for EVs and electric trucks.

In 2022, staff sent a survey regarding EV charging stations to all CMMPO communities. The survey was an excellent way to reach out and develop an understanding concerning the outlook and experience that the communities have had thus far with EV charging stations. Staff intend to continue working with the planning region's communities and continue helping as they seek to expand the available EV charging infrastructure.

Figure 47 – EV Charging Stations Locations
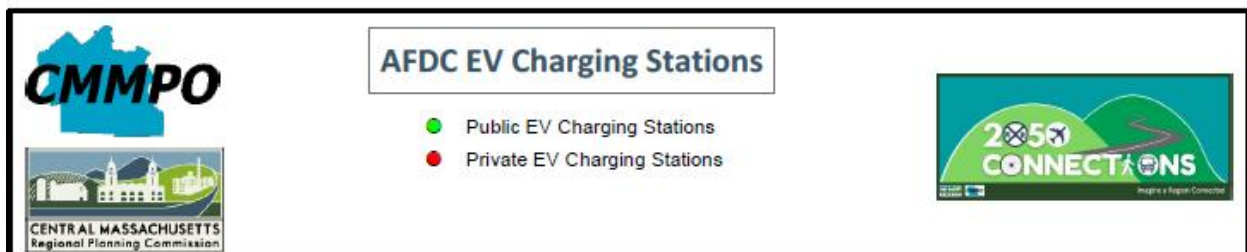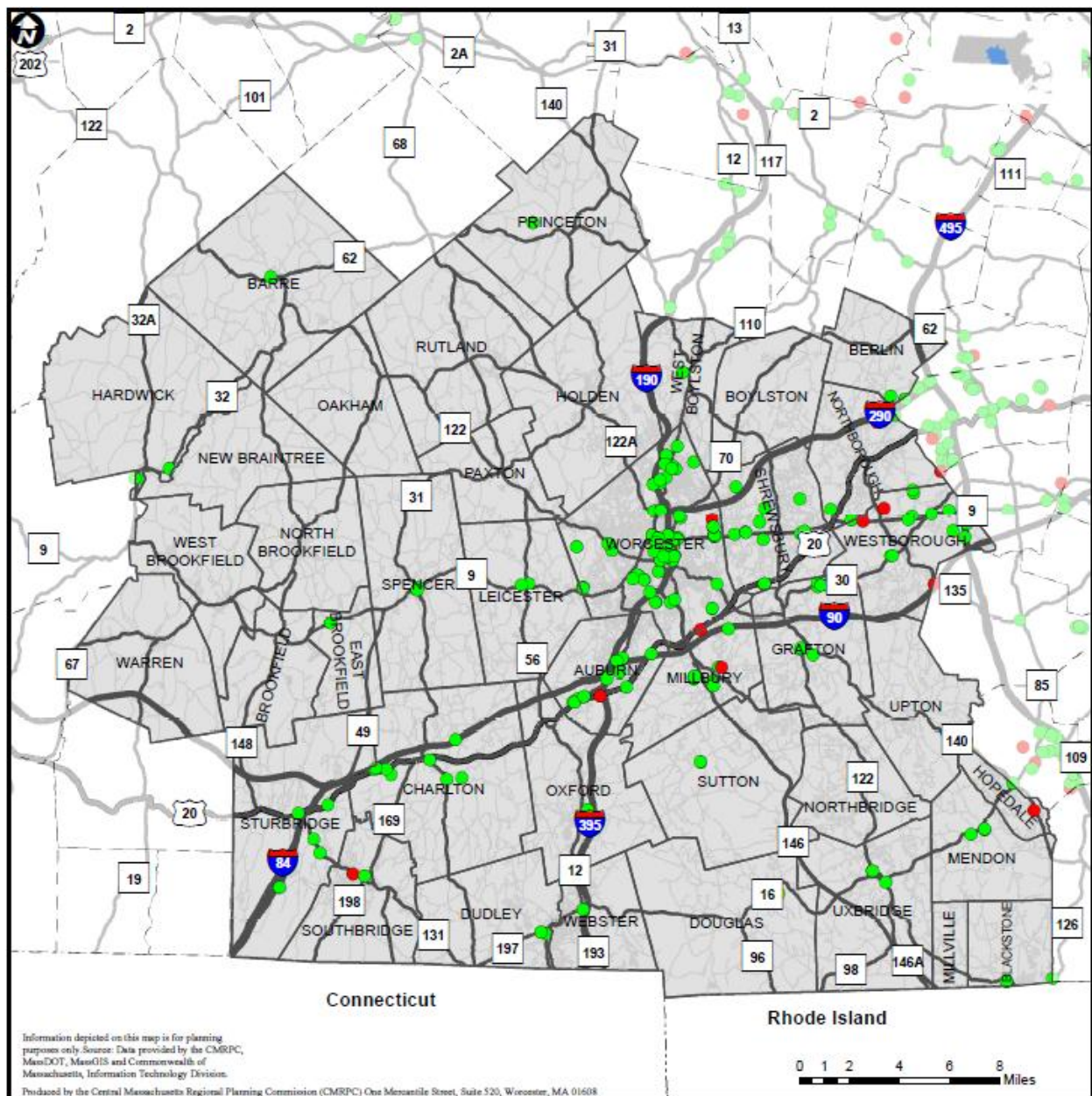
Transportation Network Resiliency and Clean Energy Results

Figure 48 shows the results of the planning region's Transportation Network Resiliency and Clean Energy efforts using the above explained performance measures. The green light under the previous results indicates that the number of EV chargers increased in 2024. The red light under the current results indicates that the target was not met in 2025.

Figure 48 CMMPO Transportation Network Resiliency and Clean Energy Results

	MEASURE	PREVIOUS RESULTS	TARGET	CURRENT RESULTS	GOAL
TRANSPORTATION NETWORK RESILIENCY / CLEAN ENGERY	Expansion of EV Charging Infrastructure	🟢	Increase the # of Electric Vehicle (EV) Charging Stations in the CMMPO Region	🔴	*Increase Resilience to Extreme Weather & Disasters and help Reduce Greenhouse Gases*