

CHAPTER 8

TRANSPORTATION PERFORMANCE MANAGEMENT

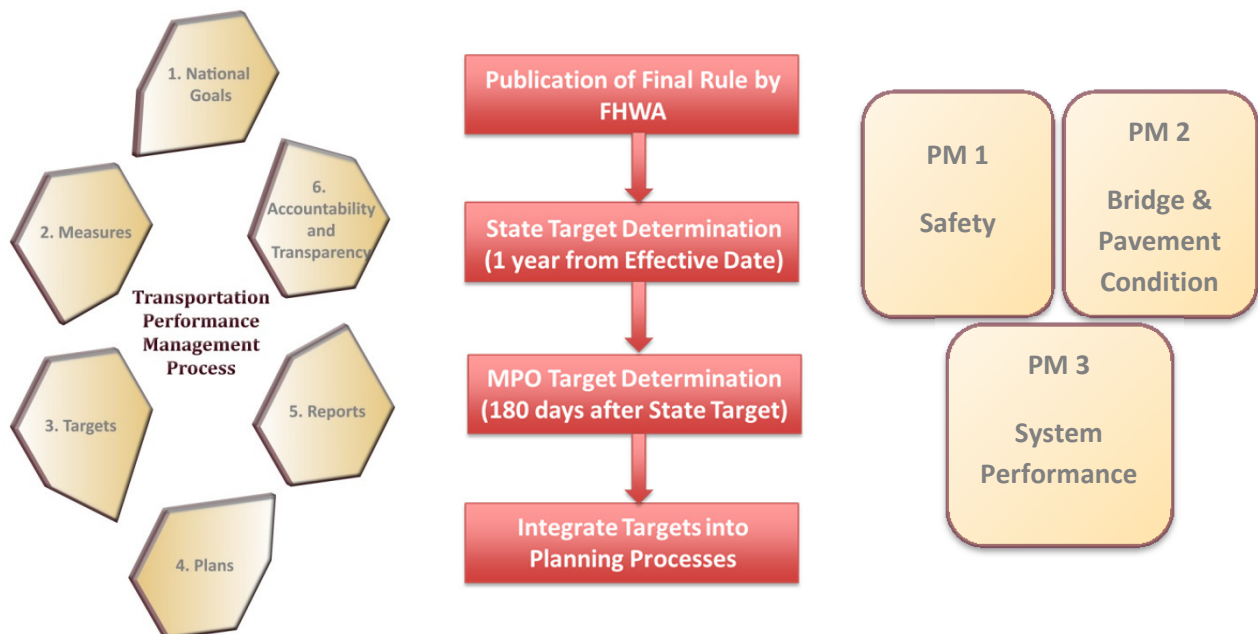
8.1 Overview

Transportation Performance Management (TPM) is a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. Figure 8.1 provides an overview of the planning rule framework for TPM, FHWA established target setting process, and required performance measures. This chapter serves the role of the **System Performance Report** for the MVRPC Long Range Transportation Plan.

Planning Rule Framework

The FAST Act requires state departments of transportation (DOTs), transit agencies, and metropolitan planning organizations (MPOs) to conduct performance-based planning by tracking performance measures and establishing data-driven targets to improve those measures in a coordinated process to ensure consistency.

Figure 8.1 — Transportation Performance Management Process



The Federal Highway Administration (FHWA) organized the many performance-related provisions within the FAST Act for recipients of federal-aid highway funding into six elements: National goals or programs to focus the federal-aid highway program on specific areas of performance; Establishment of measures by FHWA to

assess performance and condition in order to carry out performance-based federal-aid highway programs; Establishment of targets for each of the measures to document expectations of future performance; Development of strategic and/or tactical plans to identify strategies and investments that will address performance needs; Development of reports that would document progress toward the achievement of targets, including the effectiveness of federal-aid highway investments; and requirements developed by FHWA to use to achieve or make significant progress toward achieving targets established for performance.

The FAST Act also furthers several important goals with respect to public transportation, including safety, state of good repair, performance, and program efficiency. The FAST Act gives the Federal Transit Administration (FTA) significant new authority to strengthen the safety of public transportation systems throughout the United States. The FAST Act also put new emphasis on restoring and replacing aging public transportation infrastructure by establishing a new needs-based formula program and new asset management requirements.

Under this framework, FHWA and FTA have established a set of rulemakings for implementation of Performance-Based Planning and Programming (PBPP). FHWA published three Performance Measures (PM) rules that established performance measures to monitor the performance of safety (PM 1), bridge and pavement conditions (PM 2), and system performance (PM 3) while the FTA published rules to monitor Transit Asset Management (TAM) and develop Public Transportation Agency Safety Plans (PTASP). The rules indicate how State DOTs, MPOs, and transit agencies should set targets, report progress, and integrate performance management into their Long Range Transportation Plans (LRTPs) and Transportation Improvement Programs (TIPs).

The performance measures and standards are based on national goals and aligned to various program and policy areas including the National Highway Performance Program (NHPP), Highway Safety Improvement Program (HSIP), the Congestion Mitigation and Air Quality Improvement Program (CMAQ), and the National Freight Policy.

Target Setting Options

According to the USDOT, all state DOTs and transit agencies must set targets for the established performance measures within one year of respective final rule implementation, and all MPOs including MVRPC must either: 1) establish their own quantifiable targets for their metropolitan planning, or 2) support the statewide/regional targets as established by the state DOT or transit agency, no later than 180 days after the state adopts its targets. To date, MVRPC has decided to support all applicable performance targets established by ODOT and the regional transit agencies. Table 8.1 provides a summary of all applicable performance measures in the MVRPC MPO region, established targets for those measures, and the most recent MVRPC Board of Directors resolution adoption date in support of those targets.

Assessment of Significant Progress

The assessment of significant progress is conducted by FHWA at the state level wherein the FHWA determines whether ODOT has met or made significant progress towards meeting the adopted targets. FHWA does not directly assess MPO progress towards meeting targets; however, FHWA will review MPO

Table 8.1 — Summary of MVRPC Supported ODOT Performance Targets

Target Areas		Performance Measures	Network	Target Adoption Date	Target Adopted
PM 1	Safety	Number of Fatalities	All Public Roads (Applicable to MPO)	November 2020	1,084
		Rate of Fatalities			0.93
		Number of Serious Injuries			8,101
		Rate of Serious Injuries			6.97
		Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries			811
PM 2	Pavement Condition	Percentage Interstate System in Good Condition	Interstate System (Applicable to MPO)	October 2018	50%
		Percentage Interstate System in Poor Condition			1%
		Percentage non-Interstate System in Good Condition	NHS Non-Interstate (Applicable to MPO)	October 2018	35%
		Percentage non-Interstate System in Poor Condition			3%
	Bridge Condition	Percentage of NHS bridges by deck area in Good condition	NHS (Applicable to MPO)	October 2018	50%
		Percentage of NHS bridges by deck area in Poor condition			5%
PM 3	NHS Travel Time Reliability	Percent of Person-Miles Traveled on the Interstate System that are Reliable	Interstate System (Applicable to MPO)	October 2018	85%
		Percent of Person-Miles Traveled on the Non-Interstate System that are Reliable	NHS Non-Interstate (Applicable to MPO)	October 2018	80%
	Freight	Truck Travel Time Reliability (TTTR) Index	Interstate System (Applicable to MPO)	October 2018	<1.5
	Total CMAQ Emissions	Total CMAQ Project Reductions for CO, VOC, Nox, PM2.5 & PM10	N/A (MVRPC and Specific MPOs)	October 2018	VOC: 69 kg/day Nox: 537 kg/day
TRANSIT	Transit Asset Management Plan	Transit – Capital State of Good Repair	N/A	June 2017	For specific targets see: https://www.mvrpc.org/sites/default/files/transit_asset_management_2017.pdf
	Public Transportation Agency Safety Plan	Fatalities	N/A	May 2020	For specific targets see: https://www.mvrpc.org/sites/default/files/ptasp_targets_2020.pdf
		Injuries			
		Safety Events			
		System Reliability (State of Good Repair)			

Source: Greene CATS, GDRTA, MCTS, ODOT and MVRPC

performance relative to targets as part of periodic transportation planning reviews, including MPO certification reviews, and reviews of adopted LRTPs and TIPs.

Project Evaluation System Update

In 2019, and in preparation for the Long Range Transportation Plan update, MVRPC staff worked with a committee of 15 MPO members to conduct a major review and update the Project Evaluation System (PES). One of main goals of the PES update was to better align the criteria with the performance management approach and to improve the condition of regional transportation assets, particularly those in the National Highway System (NHS). As a result the PES now includes criteria addressing pavement and bridge conditions and additional points are given to major arterials on the NHS.

8.2 PM 1 Safety

The first of the performance measure rules issued by FHWA became effective on April 14, 2016, establishing five measures to assess the condition of road safety:

- Number of Fatalities.
- Rate of Fatalities: fatalities per million vehicle miles traveled (MVMT).
- Number of Serious Injuries.
- Rate of Serious Injuries: serious injuries per MVMT.
- Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries.

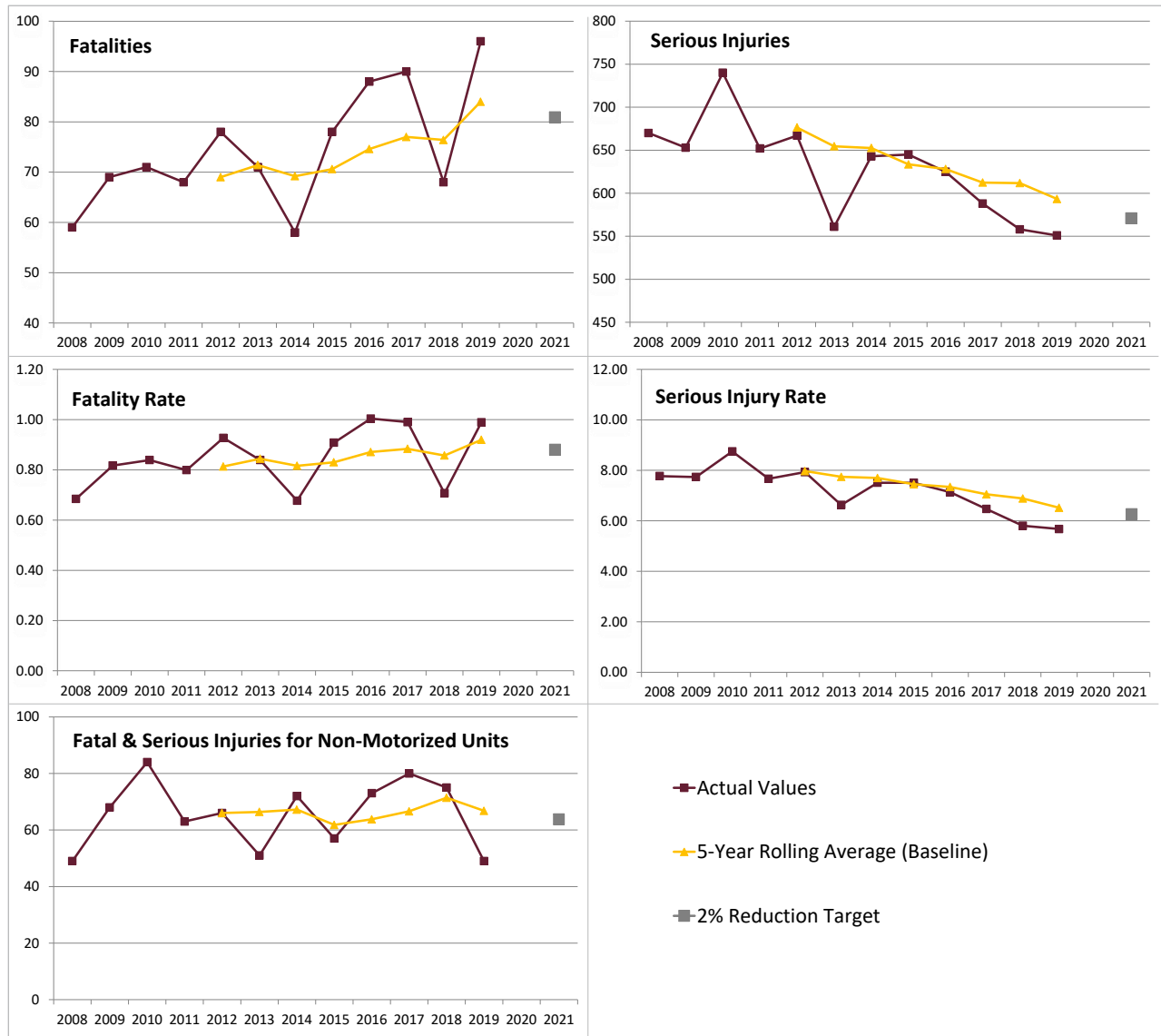
ODOT has established a 2% annual reduction goal for all five safety performance measures for 2021.

To date, MVRPC has supported all ODOT's safety performance targets. In November 2020, the MVRPC Board of Directors adopted a resolution to support ODOT's most recent 2% annual reduction goal for 2021 for all five performance measures. While a determination of progress is done at the state level only, Figure 8.2 shows the MPO safety trends and targets for 2021 assuming that MVRPC would have adopted a 2% annual reduction goal. Based on the preliminary data, MVRPC would have met three "targets for 2019" – number of serious injuries, serious injury rate, and the number of non-motorized fatalities and serious injuries.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

As per performance management requirements of the FAST Act, and in coordination with ODOT and the regional transit agencies, MVRPC staff analyzed the impact of pertinent SFY 2021-2024 TIP projects to help achieve adopted targets. There are 6 projects in the TIP that address a regional safety priority location. An additional 13 projects are expected to have a positive impact on safety. The total cost of safety improvement projects funded with STP, CMAQ, and TA funds is nearly \$74 million. An additional 10 projects with a construction cost of \$24.5 million are funded with ODOT HSIP funds.

Figure 8.2 — Summary of Safety Trends in the MVRPC MPO Region



Source: ODOT and MVRPC

Public Education Safety Campaigns

Recognizing that public education plays an important role in reducing crashes and making the Region's roads safer for all users, MVRPC develops safety materials and [educational campaigns](#) to encourage safe behavior and address trending/rising crash types or behaviors. Past materials and campaigns have included, Bike PSAs, Share the Road materials, Street Smart Campaign (aimed at pedestrian safety), seat belt usage, proper use of child restraints and distracted driving.



8.3 PM 2 Pavement and Bridge Conditions

The second of the performance measures rules issued by FHWA became effective on May 20, 2017, establishing measures to assess the condition of pavements and bridges on the National Highway System (NHS) that is further subdivided into the Interstate system and the non-Interstate NHS. States are required to establish 2-year and 4-year targets for PM2 measures over a four-year performance period. Two-year targets reflect the anticipated performance level at the midpoint of each performance period, while 4-year targets reflect it for the end of the performance period. MVRPC is only required to either establish or support ODOT's 4-year targets.

Pavement Conditions

There are four performance measures to evaluate pavement conditions on the NHS:

- Percentage of pavements on the Interstate system in *good* condition.
- Percentage of pavements on the Interstate system in *poor* condition.
- Percentage of pavements on the non-Interstate NHS in *good* condition.
- Percentage of pavements on the non-Interstate NHS in *poor* condition.

ODOT reviewed 8 years of HPMS submitted NHS pavement data to establish targets for the pavement condition performance measures. MVRPC has chosen to support ODOT's 4-year targets. The table in Figure 8.3 summarizes Ohio's 4-year targets and compares them against MVRPC's 2017 baseline computed values. Figure 8.3 shows that while the majority of the interstate pavements in the MVRPC MPO region are in good condition, a significant portion of the non-interstate NHS pavements (especially locally owned non-interstate NHS) are classified as being in either fair or poor condition. As a result, MVRPC meets three out of four of ODOT's pavement condition "targets"; it does not meet the 35% target established by ODOT for percentage of non-interstate NHS pavements in good condition.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

MVRPC does not have any Interstate System pavement condition projects that use STP, CMAQ, or TA funds. There are 10 projects using ODOT controlled funds that improve 139 lane-miles of Interstate with a construction cost of \$67 million.

There are 4 projects in the SFY 2021-2024 TIP that address Non-Interstate NHS pavement conditions. The total cost of pavement condition projects funded with STP, CMAQ, or TA funds is \$21.3 million. There is an additional 19 projects using ODOT controlled funds that improve Non-interstate NHS pavement conditions with a construction cost of \$28.6 million.

Bridge Conditions

ODOT used the National Bridge Inventory (NBI) data to assess condition of bridges on the interstate and non-interstate NHS to establish targets against two performance measures:

- Percentage of bridges on the NHS in *good* condition.
- Percentage of bridges on the NHS in *poor* condition.

Figure 8.4 shows the NHS bridges in the MVRPC MPO region.

Figure 8.3 Pavement Conditions

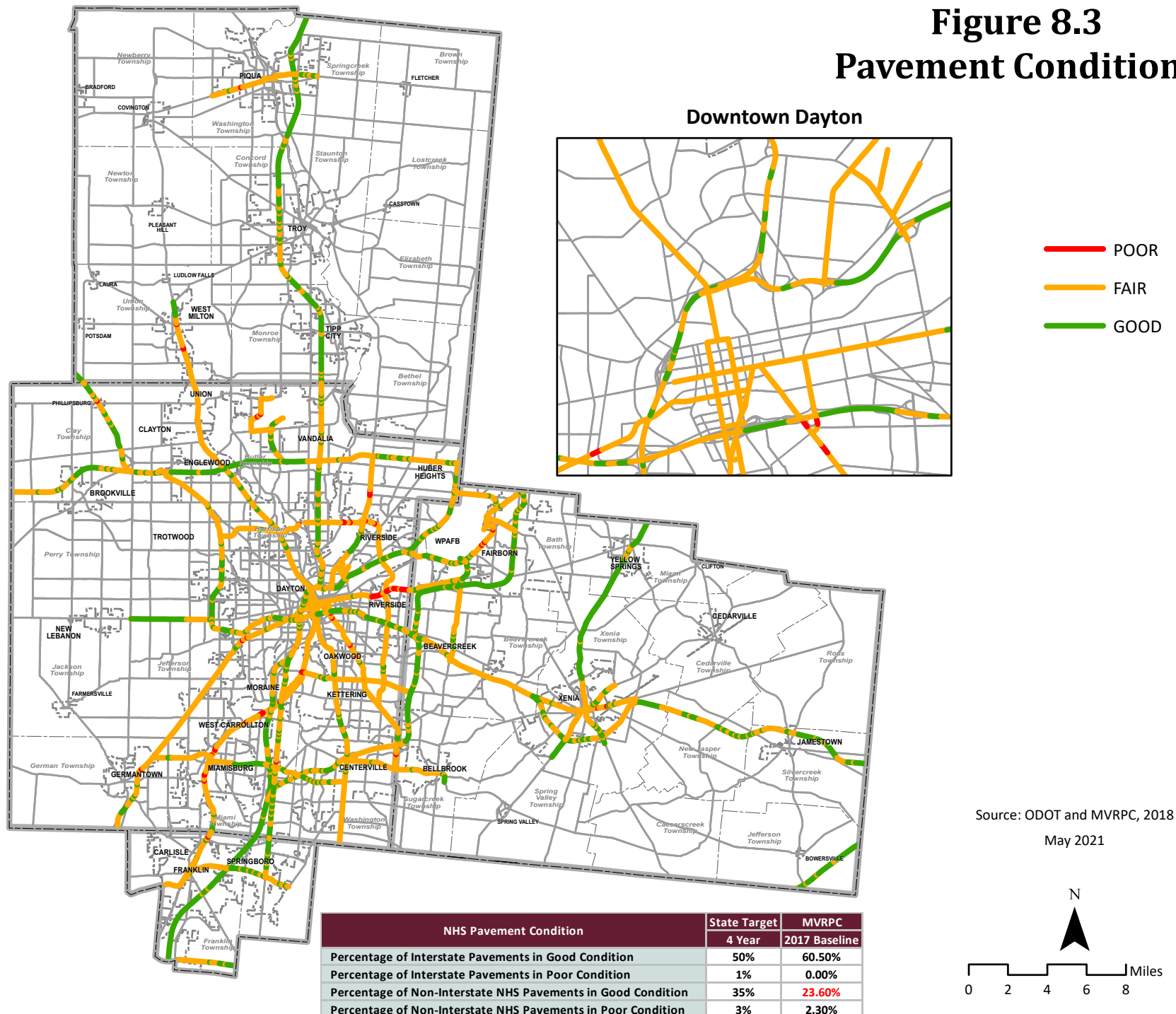
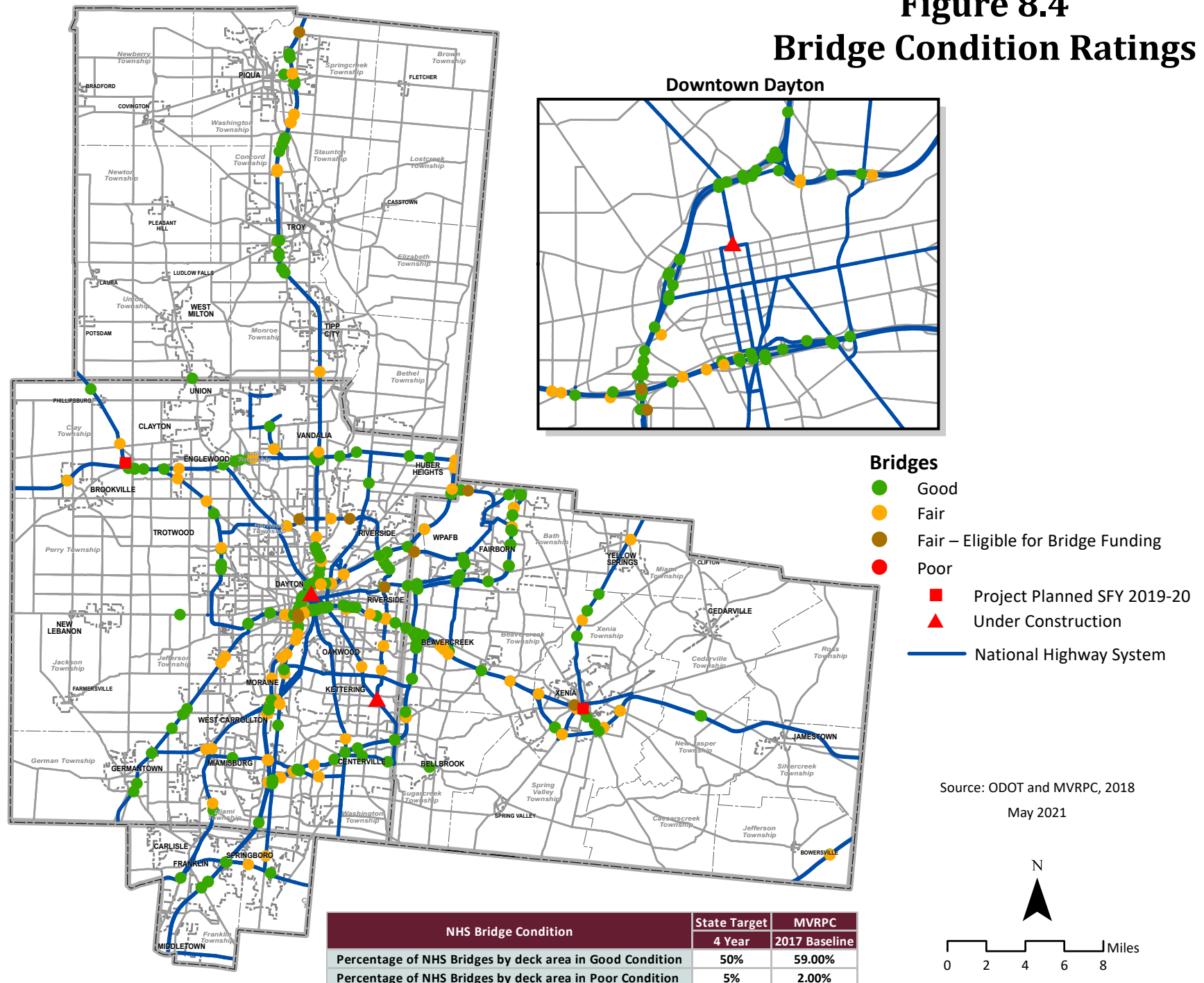


Figure 8.4 Bridge Condition Ratings



The majority of the bridges can be classified as being in either good or fair condition. In 2018, four bridges were rated as being in poor condition. All four have since been addressed as TIP programmed projects or through reconstruction/replacement. MVRPC is supporting ODOT's 4-year targets for bridge condition measures and MVRPC's 2017 baselines shows that it met both those targets as shown in Figure 8.4.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

MVRPC does not have any NHS Bridge Condition projects that use STP, CMAQ, or TA funds. There are 228 bridges in the NHS that are being improved with ODOT controlled funds with a total construction cost of \$54.7 million.

8.4 PM 3 System Performance

The third of the three performance measures rules issued by FHWA became effective on May, 20 2017, establishing measures to assess the performance of the NHS, freight movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program (CMAQ). States are required to establish 2-year and 4-year targets for PM 3 measures for a four-year performance period. MVRPC has chosen to support ODOT's 4-year targets for all applicable PM3 measures.

Travel Time Reliability on the NHS

FHWA established two performance measures to assess travel time reliability on the NHS:

- Percent of Person-Miles Traveled on the Interstate that are Reliable.
- Percent of Person-Miles Traveled on the non-Interstate NHS that are Reliable.

These measures seek to assess how reliable the NHS network is by calculating a ratio called the Level Of Travel Time Reliability (LOTTR). The data to compute LOTTR is sourced from FHWA's National Performance Management Research Data Set (NPMRDS). Ohio MPOs are able to access the computed metrics for their region through an ODOT subscription to a toolset provided by a private contractor that assists in calculating these metrics for the NHS. The top graph in Figure 8.5 shows the trend lines for the auto travel time reliability measures on the Interstate and non-Interstate NHS in the MVRPC Region. Based on the 2017 baseline values⁴, MVRPC would meet both of the 4-year targets as established by ODOT and summarized in Table 8.1.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

At this time MVRPC does not have any Interstate System NHS Travel Time Reliability projects that use STP, CMAQ, or TA funds. There are no Interstate System travel time reliability projects using ODOT controlled funds either. There is 1 project funded with STP, CMAQ, or TA funds that addresses NHS Non-Interstate Travel Time Reliability with a total cost of \$3.3 million. There is 1 additional project funded with ODOT funds that addresses NHS Non-Interstate Travel Time Reliability with a construction cost of \$9.7 million.

⁴ The data for auto travel time reliability on the interstate shows an acceptable trend while that for the non-Interstate NHS shows an unexplained increase from 2017 to 2018. However, in the absence of other data alternatives to evaluate travel time reliability, MVRPC continued to use the existing data to study regional trends.

Freight Travel Time Reliability on the Interstate System

FHWA established the following freight reliability performance measure:

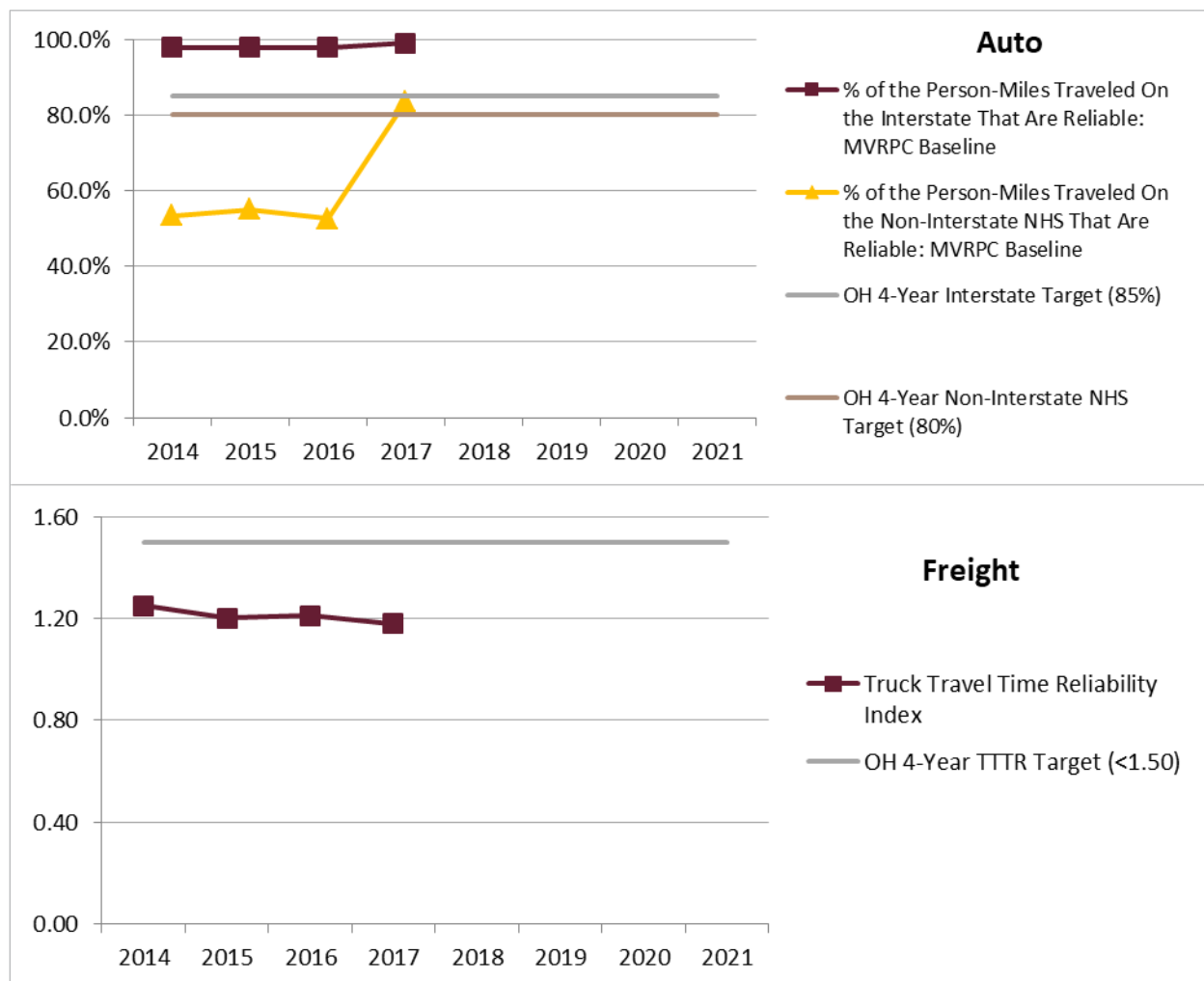
- Truck Travel Time Reliability (TTTR) Index.

This measure seeks to assess how reliable the interstate network is for trucks by calculating a ratio called TTTR. Similar to the computation of LOTTR, the data to compute TTTR is also sourced from the NPMRDS. The bottom graph in Figure 8.5 shows the trend lines for the TTTR Index on the Interstate system in the MVRPC Region. Based on the 2017 baseline value of 1.18, MVRPC would meet the 4-year target as established by ODOT (<1.50 TTTR Index).

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

At this time MVRPC does not have any Interstate System Freight projects that use STP, CMAQ, or TA funds. There is no Interstate System Freight projects using ODOT controlled funds either.

Figure 8.5 — Travel Time Reliability: MVRPC Regional Trends



Source: FHWA, ODOT and MVRPC

CMAQ Program

The PM₃ rule also contains performance measures to assess the Congestion Mitigation and Air Quality Improvement (CMAQ) program through measurement of total emissions reduction of on-road mobile source emissions. States whose geographic boundaries include any part of a nonattainment or maintenance area for ozone, carbon monoxide, or particulate matter need to establish targets for each of these applicable criteria pollutants and precursors. Since Warren County is designated as non-attainment for 8-hour ozone (2015), MVRPC is required to either establish targets or support ODOT's targets for VOC and NO_x.

ODOT established emissions reduction targets in 2018 for three mobile-source pollutants (VOC, NO_x and PM_{2.5}) based on 2013-2016 project emissions data recorded in FHWA's CMAQ Public Access Database. MVRPC is supporting the applicable 4-year VOC and NO_x targets as established by ODOT and summarized in Table 8.1.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

There are 17 projects in the SFY2021-2024 TIP that address CMAQ Emission reductions for our region. The total cost of MPO funded CMAQ emissions reduction projects is nearly \$31 million.

8.5 Transit Asset Management

FTA's Transit Asset Management (TAM) rule became effective on October 1, 2016. This rule applies to all recipients and subrecipients of federal transit funding that own, operate, or manage public transportation capital assets. The purpose of the TAM is to help achieve and maintain a state of good repair (SGR) for the nation's public transportation assets. It requires transit agencies to establish a system to monitor and manage public transportation assets to improve safety and increase reliability and performance, and to establish performance targets for four national performance measures:

- Rolling Stock: % of vehicles that have met or exceeded their Useful Life Benchmark (ULB).
- Equipment: % of vehicles that have met or exceeded their ULB.
- Infrastructure: % of track segments with performance restriction.
- Facilities: % of facilities in an asset class, rated <3 on the Transit Economic Requirements Model (TERM) scale.

In coordination with ODOT's Office of Transit and the three regional transit agencies, GDRTA, Greene CATS Public Transit, and Miami County Transit System, the MVRPC Board of Directors adopted a resolution in June 2017 in support of the targets established in the TAM Plan. A summary of the initial targets established by each transit agency by asset class in relation to a 2017 baseline can be viewed on the MVRPC website at: https://www.mvrpc.org/sites/default/files/transit_asset_management_2017.pdf.

Section 5310 Transit Asset Management Plan

MVRPC is the Designated Recipient for FTA Section 5310 funds (See Chapter 6 for more information about the program) and is therefore the Sponsor Agency for the various Tier II agencies that have received and operated 5310 funded vehicles. The group plan sponsor is responsible for setting unified targets for the

plan participants. Tier II providers may only participate in one group plan and must provide written notification to MVRPC if they choose to opt-out and develop their own plan. Greater Dayton RTA, Greene CATS Public Transit, and Miami County Transit System have all opted to develop their own plans.

MVRPC has developed this regional Transit Asset Management (TAM) Group Plan in accordance with the guidelines established by the FTA. Specifically, CFR 625.25 requires that all TAM plans include:

- An inventory of the number and type of capital assets.
- A condition assessment of those inventoried assets for which a provider has direct capital responsibility.
- A description of analytical processes or decision-support tools used to estimate capital investment needs over time.
- A project-based prioritization of investments.

Following the above process, MVRPC developed 2 targets following FTA guidance based on 2018 baseline inventory data: Useful Life Benchmark (USB) and State of Good Repair (SGR). Two separate targets were chosen because while many vehicles exceed their FTA recommended life benchmarks due to low mileage and good maintenance practices, the vehicles are generally within a state of good repair. Table 8.2 shows those targets. The Transit Asset Management Plan and Targets were adopted by the MVRPC Board of Directors at its October 4th, 2018 meeting.

Table 8.2 — Section 5310 Transit Asset Management Plan Targets

Measure	2018 Baseline	2019 Targets
Useful Life Benchmark	51 %	No more than 45 % of vehicles exceed their useful life
State of Good Repair	33 %	No more than 25 % of vehicles have an SGR < 2.5

Source: MVRPC

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

There are 39 projects in the TIP that address transit assets. The total cost of transit asset projects funded in the SFY 2021-2024 TIP is \$148 million.

8.6 Public Transportation Agency Safety Plans

In July 2018, FTA published the Public Transit Agency Safety Plan (PTASP) Final Rule, which requires certain operators of public transportation systems that receive federal funds under FTA's Urbanized Area Formula Grants and all rail transit systems to develop safety plans that include the processes and procedures to implement Safety Management Systems (SMS). Its purpose is to improve public transportation safety by guiding transit agencies to more effectively and proactively manage safety risks in their systems. Transit agencies are required to set performance targets for each of the performance measures as identified in the most recent National Public Transportation Safety Plan (NSP):

- System reliability: mean distance between major mechanical failures.
- Safety events: number and rate per total vehicle revenue miles by mode.
- Fatalities: number and rate per total vehicle revenue miles by mode.
- Injuries: number and rate per total vehicle revenue miles by mode.

In coordination with ODOT’s Office of Transit and the three regional transit agencies, GDRTA, Greene CATS Public Transit, and Miami County Transit System, the MVRPC Board of Directors adopted a resolution in May 2020 in support of the public transportation safety targets established by each regional transit agency by mode in relation to a historical baseline. A summary of the public transportation safety targets can be viewed on the MVRPC website at: https://www.mvrpc.org/sites/default/files/ptasp_targets_2020.pdf.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program
There are 35 projects in the SFY 2021-2024 TIP that address transit system reliability. The total cost of these projects in the TIP is \$129 million. Fatalities, injuries, and safety events are addressed by each transit agency, through policies, risk management practices, safety assurances and promotion including but not limited to: communications, reporting, hazard identification, and training programs.

8.7 Regional Report Card

In addition to the federal performance measures described in the previous sections, MVRPC researches and tracks other regional transportation measures related to system performance, safety, transportation system conditions, and accessibility to gain insight into how well the transportation system is doing and what areas need improvement. It also expands the geographic scope beyond the federal requirements (for example, considering all functionally classified roads versus roads in the NHS only) and provides an indication of future needs. These trends are published in a **Regional Report Card**.

The Regional Report Card is shown in Table 8.3. It documents and describes the various measures that are tracked under each category, the data source used to evaluate the measures, two historical data points for comparison, and a trend analysis based on this historical comparison. The trend analysis shows the goal for that measure (for example, the Region would like to see a downward trend for the number of fatalities) against the actual performance. All measures where the actual performance is worse than the desired trend are identified by shading the table cell red.

Table 8.3 — Regional Report Card

	Measure	Description	Data		Goal	Actual	Trend
System Performance	Average Freeway Speed (mph)	Source: INRIX	60.2 (2013)	63.1 (2018)	—	↑	4.8%
	Congested System	Congested Lane-Miles Source: Texas Transportation Institute (TTI)	24.0% (2011)	8.4% (2017) ¹	↓	NA	■
	Annual Freeway Vehicle Hours of	In hours; Source: INRIX	696,167 (2013)	844,980 (2018)	↓	↑	21.4%
	Annual Cost of Vehicle Delay on	In millions; Source: INRIX	\$24.33 (2013)	\$30.14 (2018)	↓	↑	23.9%
	Annual Cost of Truck Delay on Freeways	In millions; Source: INRIX	\$12.82 (2013)	\$14.44 (2018)	↓	↑	12.6%
Safety	Incident Response	Average duration of major freeway incidents In minutes; Source: INRIX	98 (2013)	101 (2018)	↓	—	■
	Mean Distance Between Calls	Miles between service calls Source: GDRTA	15,813 (2013)	26,831 (2018)	↑	↑	69.7%
	Rate of Fatalities	Total fatalities per 100 million Daily VMT Source: ODPS	0.88 (2011-)	0.89 (2014-16)	↓	↑	1.0%
	Rate of Serious Injuries	Total incapacitating injuries per 100 MDVMT Source: ODPS	7.88 (2011-)	7.57 (2014-16)	↓	↓	-3.9%
	Transit Incidents	Transit incidents per 100,000 trips Source: NTD	0.27 (2011-)	0.47 (2016-)	↓	↑	74.0%
	Bike/Pedestrian Safety	Number of Nonmotorized Fatalities and Serious Injuries	852.8 (2013-)	858.4 (2014-17)	↓	↑	0.7%
System Conditions	Pavement Condition Rating (PCR)	% Road Mileage in Poor Condition based on PCR	2.8% (2015)	4.3% (2018)	↓	↑	53.6%
	Bridge Rating	% of Bridges in Fair / Poor Condition Source: ODOT	12.7% (2014)	13.4% (2018)	↓	↑	5.5%
Accessibility	Miles of Regional Bikeway	Additions to Regional Bikeway System In miles; Source: MVRPC	198 (2014)	220 (2018)	↑	↑	11.0%
	Population Served by Bikeway	Population within ½ mile of a Regional Bikeway	28.8% (2010)	32.3% (2018)	↑	↑	3.5%
	Employment Served by Bikeway	Employment within ½ mile of a Regional Bikeway	43.8% (2010)	46.8% (2018)	↑	↑	3.0%
	Population Served by Transit	Population within ½ mile of a GDRTA Bus Route	79.5% (2010)	83.0% (2018)	↑	↑	3.5%
	Employment Served	Employment within ½ mile of a GDRTA Bus	89.3%	89.5%	↑	—	■
	Work trips by Biking	Work trips in the Region by biking and walking	2.79%	2.58%	↑	—	■
	Population Living in Mixed Land Use	Population living in districts integrated with residential and employment land uses	26.5% (2010)	NA	↑	—	■

¹ The previous and current data points cannot be compared because TTI changed the methodology for computing congested lane-miles.

² Additional incidents included in 2018 data based on reporting of smaller incidents.

³ Using 2010 population and employment and 2010 or 2018 transit/bike routes.