APPENDIX P
REVIEW OF TARGETS ESTABLISHED FOR THE NATIONAL PERFORMANCE MEASURES

INTRODUCTION

To establish a consistent nationwide process for monitoring the effectiveness of Federal transportation investments, the Moving Ahead for Progress in the 21st Century (MAP-21), enacted in 2012, created a framework for a national performance management approach to transportation decision-making on investments with Federal highway and transit funding. In implementing the performance management approach, the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) have developed specific highway and transit performance measures, and requirements for States, transit operators, and metropolitan planning organizations (MPOs) in establishing and reporting short-term (two- to four-year) targets, along with monitoring achievement of the targets, for each performance measure. The performance measures established by FHWA and FTA can be found in Table P.1. The transit asset management (TAM) and highway safety targets are to be established annually, and the National Highway System (NHS) condition and reliability, freight reliability, and congestion mitigation and air quality improvement (CMAQ) performance measures are to be established every four years. Depending on the performance measure, the targets are required to be established for the Southeastern Wisconsin metropolitan planning area (MPA) or for a specific urbanized area—initially the Milwaukee urbanized area. Map P.1 shows the MPA and the urbanized areas in Southeastern Wisconsin.

As part of implementing the national framework, the Commission has established targets for nearly all performance measures for Southeastern Wisconsin, which were amended into VISION 2050 in June 2018 for the highway safety targets and June 2019 for the TAM, NHS condition and reliability, freight reliability, and CMAQ performance measures.[84] The remaining transit safety performance measures will be added to VISION 2050 following the establishment of transit safety targets by the Region's transit operators in coordination with the Commission and State. The Commission has also included in the current transportation improvement program (TIP)[85] a description of how the projects programmed in the TIP would promote the achievement of the performance targets.

[84] *The development of the highway safety targets is documented in a SEWRPC report entitled,* First Amendment to VISION 2050: A Regional Land Use and Transportation Plan for Southeastern Wisconsin, Establishing Targets for Federal Performance Measures: Highway Safety. *The remaining targets established to date are documented in a SEWRPC report entitled,* Third Amendment to VISION 2050: A Regional Land Use and Transportation Plan for Southeastern Wisconsin, Establishing Targets for Federal Performance Measures: Transit Asset Management, National Highway System Condition and Performance, Freight Performance, and Congestion Mitigation and Air Quality Improvement.

[85] *The current TIP is documented in a SEWRPC report entitled,* A Transportation Improvement Program for Southeastern Wisconsin: 2019-2022.

Table P.1
Transit Asset Management, Transit Safety, Highway Safety, National Highway System, Freight, and Congestion Mitigation and Air Quality Transportation Performance Measures Developed by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA)

Performance Measure Area	Performance Measure
FHWA Highway Safety Improvement Program (HSIP)	
Number of Fatalities and Serious Injuries	Number of Fatalities Number of Serious Injuries Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries
Rate of Fatalities and Serious Injuries	Rate of Fatalities per 100 Million Vehicle-Miles Traveled (MVMT) Rate of Serious Injuries per 100 MVMT
FHWA National Highway Performance Program (NHPP)	
Condition of Pavements on the Interstate System	Percentage of Pavement of the Interstate System in Good Condition Percentage of Pavement of the Interstate System in Poor Condition
Condition of Pavements on the National Highway System (NHS) Excluding the Interstate	Percentage of Pavement of the Non-Interstate NHS in Good Condition Percentage of Pavement of the Non-Interstate NHS in Poor condition
Condition of Bridges on the NHS	Percentage of NHS Bridges Classified as in Good Condition Percentage of NHS Bridges Classified as in Poor Condition
Performance of the Interstate System	Percentage of the Person-Miles Traveled on the Interstate that are Reliable
Performance of the NHS Excluding the Interstate	Percentage of the Person-Miles Traveled on the Non-interstate NHS that are Reliable
FHWA National Highway Freight Program (NHFP)	
Freight Movement on the Interstate System	Freight Reliability Index
FHWA Congestion Mitigation and Air Quality Improvement Program (CMAQ)	
On-Road Source Emissions	Estimate of Emission Reductions for Projects Funded by CMAQ
Traffic Congestion	Peak Hour Excessive Delay (PHED) Per Capita Percentage of Non-Single Occupancy Vehicles
FTA Section 53 Funding (including Sections 5307, 5310, 5311, 5337, and 5339)	
Transit Asset Management	Percentage of Revenue Vehicles At or Exceeding the Useful Life Benchmark (ULB) Percentage of Vehicles and Equipment At or Exceeding the ULB Percentage of Facilities Exceeding the Transit Economic Requirements Model (TERM) Scale Percentage of Track Segments Having Performance Restrictions
Transit Safety	Number of Reportable Fatalities Rate of Reportable Fatalities per Vehicle-Revenue Mile Number of Reportable Injuries Rate of Reportable Injuries per Vehicle-Revenue Mile Number of Reportable Events Rate of Reportable Events per Vehicle-Revenue Mile Mean Distance Between Major Mechanical Failures

Source: Federal Highway Administration, Federal Transit Administration, and SEWRPC

Given the requirement to include the short-range target-setting process into VISION 2050, a long-range plan, it was determined that long-term regional targets should be established, as appropriate, for the TAM, highway safety, NHS, freight, and CMAQ performance measures. The establishment of the short-term targets for the MPA, as required as part of the national performance measure framework, was based on the long-term regional targets.

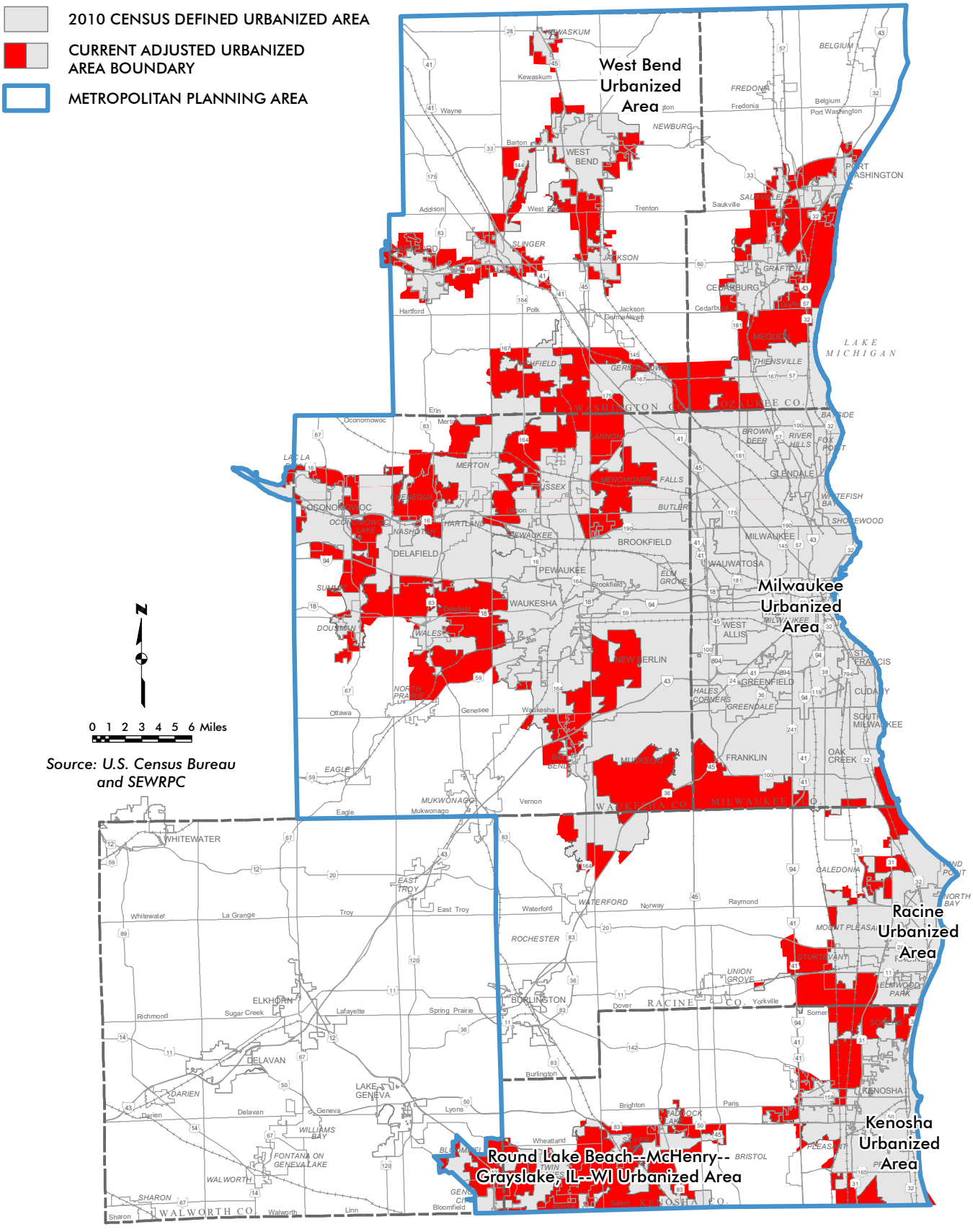
With respect to establishing long-term TAM, highway safety, NHS, freight, and CMAQ targets, the following process was used:

1. Baseline data for each of the measures was developed for the Region, plus those portions of Jefferson and Dodge Counties within the MPA.

2. The methodologies used by transit operators and WisDOT to establish their targets were reviewed.

3. Historical regional trends, as available, of the performance measures were reviewed.

Map P.1
The Southeastern Wisconsin Metropolitan Planning Area and Census Defined and Adjusted Urbanized Area Boundaries: 2010



Source: U.S. Census Bureau and SEWRPC

4. The relevant recommendations of VISION 2050 and other State and regional plans were reviewed to determine their potential effect on the performance measures in the Region.

5. Based on the evaluations of the historical trends and the review of relevant recommendations of VISION 2050 and other plans, preliminary recommended year 2050 targets for each performance measure were developed for inclusion in VISION 2050.

The remainder of this appendix summarizes the targets established for the each of the performance measures. In addition, this appendix compares the established targets to available data to determine whether progress is being made towards achieving the targets. While there may be consequences for the State for not making progress towards achieving targets or meeting minimum thresholds, as indicated in Federal Regulations, there are no such consequences for MPOs not doing so.

TRANSIT ASSET MANAGEMENT TARGETS

As part of the National Performance Management Framework, FTA developed regulations for monitoring the condition of transit assets nationwide. Specifically, FTA developed four transit performance measures for target-setting purposes: 1) the percentage of revenue vehicles at or exceeding the Useful Life Benchmark (ULB), 2) the percentage of vehicles and equipment at or exceeding the ULB, 3) the percentage of facilities exceeding the Transit Economic Requirements Model (TERM) scale, and 4) the percentage of track segments having performance restrictions. The methodology for calculating these measures is shown in Figure P.1. The TAM performance measures are calculated based on the data that transit operators annually submit to FTA on their assets and system operation for inclusion in the National Transit Database (NTD). Transit operators are required, as part of the framework, to report asset inventory, condition, and performance information to the NTD beginning in 2019 for reporting year 2018. The 2017 NTD includes only the number and age of the transit rolling stock. Baseline performance of transit equipment, facilities, and infrastructure are addressed in TAM plans, to be submitted to FTA for reporting year 2019.

Table P.2 shows the year 2050 targets for each of the TAM performance measures. While current funding levels make it difficult for transit operators to maintain the desired replacement of buses every 12 years, the TAM targets were established based on the VISION 2050 recommendations for the more than doubling of transit service by the year 2050 and the associated substantial investment in transit assets that would occur if that doubling is achieved. Specifically, the year 2050 targets for the rolling stock (revenue and non-revenue vehicles) owned by the transit operators were based on a vehicle being replaced on average one year before exceeding its Federally defined maximum useful life. The targets for the remaining measures were set as 0 percent based on the assumption that investment levels needed to implement the VISION 2050 recommendations would be sufficient to achieve these targets. With respect to the short-term targets, more achievable targets were established for the year 2018 targets based on current State and Federal transit capital levels not being sufficient for achieving the long-term targets. The future short-term targets (beyond 2018) for the rolling stock-related measure are to be based on the year 2018 targets, as shown in Table P.2, until additional Federal and State funding becomes available for transit capital projects.

Figure P.1
Methodology for Calculating the Transit Asset Management Performance Measures

The following is the methodology developed by FTA for calculating the following four TAM performance measures:

- Percent of revenue vehicles that have either met or exceeded their useful life benchmarks (ULB)
- Percent of vehicles and equipment that have either met or exceeded their ULB
- Percent of segments that have performance restrictions
- Percent of facilities exceeding the Transit Economic Requirements Model (TERM) scale

1. As part of the national performance management framework, transit operators are required to conduct an inventory of their transit assets as outlined in the following table:

Transit Asset Category	Asset Class	Applicable Assets
Rolling Stock	All revenue vehicles used in the provision of public transit	Only revenue vehicles with direct capital responsibility
Equipment	All non-revenue service vehicles and equipment over $50,000 used in the provision of public transit, except third-party equipment assets	Only non-revenue service vehicles with direct capital responsibility
Infrastructure	All guideway infrastructure used in the provision of public transit	Only fixed-rail guideway with direct capital responsibility
Facilities	All passenger stations and all exclusive-use maintenance facilities used in the provision of public transit, excluding bus shelters	Maintenance and administrative facilities with direct capital responsibility. Passenger stations (buildings) and parking facilities with direct capital responsibility.

2. Calculate each performance measure, based on the number of assets under each transit asset category that are not in state-of-good repair. For rolling stock and non-revenue service vehicles, the state-of-good repair is identified based on the useful life benchmarks (ULB) from FTA's *Transit Database Asset Inventory Module*. The identification of the state-of-good repair for infrastructure and facilities is based on FTA's Transit Economic Requirements Model (TERM) scale, as provided in the *TAM Facility Performance Measure Reporting Guidebook: Condition Assessment Calculation*.

Source: Federal Transit Administration and SEWRPC

Table P.2
Years 2018 and 2050 Regional Transit Asset Management Targets[a]

Asset Class	Asset Examples	Performance Measure	Recommended Year 2050 Target	Year 2018 Target[a]
		Rolling Stock		
Buses, Other Passenger Vehicles, and Railcars	Bus, Cutaway, Van, Minivan, and Streetcars	Percent of revenue vehicles that have either met or exceeded their useful life benchmark	< 10	< 30
		Equipment		
Non-Revenue Service Vehicles and Equipment Over $50,000	Route Supervisor Vehicles, Maintenance Trucks, Pool Vehicles, DPF Cleaning System, Bus Wash Systems, Fare Collection Systems, Vehicle Lifts	Percent of vehicles and equipment that have either met or exceeded their useful life benchmark	< 20	< 30
		Facilities		
Support	Maintenance and Administrative Facilities	Percent of facilities within an asset class rated below 3 on condition reporting system	0	< 15
Passenger	Rail Terminals, Bus Transfer Stations	Percent of facilities within an asset class rated below 3 on condition reporting system	0	0
Parking	Park-Ride Lots with Direct Capital Responsibility	Percent of facilities within an asset class rated below 3 on condition reporting system	0	0
		Infrastructure		
Fixed Guideway	Track Segments, Exclusive Bus Rights-of-Way, Catenary Segments, and Bridges	Percent of segments that have performance restrictions	0	0

[a] *Future short-term targets (beyond 2018) for these performance measures will be based on the year 2018 target until additional Federal and State funding becomes available for transit capital projects.*

Source: SEWRPC

TRANSIT SAFETY TARGETS

FTA has developed regulations for the monitoring of transit safety for transit operators nationwide. Specifically, FTA established seven performance measures for target-setting purposes: 1) the total number of reportable fatalities, 2) the rate of reportable fatalities per total vehicle-revenue miles, 3) total number of reportable injuries, 4) the rate of reportable injuries per total vehicle-revenue miles, 5) the total number of reportable safety events (derailments, collisions, fires, and evacuations), 6) the rate of reportable events per total vehicle miles, and 7) the mean distance between major mechanical failures. Per the FTA regulations, the Commission will be establishing transit safety-related targets in 2021 following the development of transit safety plans by transit operators and WisDOT due to be completed by late 2020.

HIGHWAY SAFETY TARGETS

FHWA has developed five safety-related performance measures that are to be established annually for all public roadways: 1) the number of fatalities, 2) the rate of fatalities per one hundred million vehicle-miles traveled (HMVMT), 3) number of serious injuries, 4) the rate of serious injuries per HMVMT, and 5) the number of non-motorized fatalities and serious injuries.[86] The targets are set for each of the five performance measures as a rolling five-year average[87] ending the year after the reporting year. The methodology for calculating these measures is shown in Figure P.2. The targets are compared to a base rolling five-year average ending in the year previous to the reporting year. Table P.3 shows the years 2012-2016 five-year rolling average (representing the baseline) for the five safety performance measures for the Region, including the portions of Jefferson and Dodge Counties within the MPA.

Table P.3 shows the years 2046-2050 targets for each of the five safety performance measures. These targets were established based on an evaluation of short-term and long-term trends in the number of fatalities and serious injuries and consideration of the safety improvement recommendations of the State's 2017-2020 Strategic Highway Safety Plan (SHSP) and VISION 2050. Specifically, the targets were established based on a continuation of the overall trend of a long-term reduction of fatalities and serious injuries that have occurred over the last 20 to 40 years. Table P.4 shows the resulting short-term years 2014-2018 through years 2018-2022 safety targets for both the MPA and the seven-county Region.

Figure P.3 shows a comparison of the actual and target five-year averages from the baseline years of 2012-2016 through years 2046-2050 for the number and rate of fatalities, the number and rate of serious injuries, and the number of non-motorized fatalities and serious injuries. Table P.5 shows a comparison of the actual and target five-year 2014-2018 averages for both the MPA and the Region. As shown in these figures and table, none of the actual five-year averages met the established targets. In addition,

[86] *A non-motorized fatality or serious injury involves any vehicular crash that results in the death or serious injury of a pedestrian, bicyclist, or person utilizing a wheelchair (manual or motorized).*

[87] *Due to the somewhat random nature of crashes, the frequency of crashes from year-to-year can fluctuate, and it is possible that the number of crashes in one year may be lower or higher than a typical year. Thus, to avoid annual anomalies, the annual average of the number of crashes over a certain time period is commonly used (such as three or five years).*

Figure P.2
Methodology for Calculating the Highway Safety Performance Measures

The following is the methodology developed by FHWA for calculating the following five highway safety performance measures:

- Number of Fatalities
- Number of Serious Injuries
- Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries
- Rate of Fatalities per 100 Million Vehicle-Miles Traveled (HMVMT)
- Rate of Serious Injuries per HMVMT

1. Assemble fatality, serious injury, and vehicle-miles traveled (VMT) data for all public roadways over a five-year period from the following sources:

Data	Source
Fatalities	National Highway Transportation Safety Association (NHTSA) Fatality Analysis Reporting System (FARS)
Serious Injuries	State DOT-supplied Data Source
VMT	MPO-Documented VMT Methodology

2. Calculate the five-year average for each performance measure, based on the following formula:

$$Number\ of\ Fatalities = \frac{\sum(Number\ of\ Fatalities)_{Years\ 1-5}}{5\ Years}$$

$$Number\ of\ Serious\ Injuries = \frac{\sum(Number\ of\ Serious\ Injuries)_{Years\ 1-5}}{5\ Years}$$

$$Number\ of\ Non\text{-}Motorized\ Fatalities\ and\ Serious\ Injuries = \frac{\sum\left(_{Fatalities\ and\ Serious\ Injuries}^{Number\ of\ Non\text{-}Motorized}\right)_{Years\ 1-5}}{5\ Years}$$

$$Rate\ of\ Fatalities\ Per\ HMVMT = \frac{\sum\left(\frac{Number\ of\ Fatalities\ \mathrm{x}\ 100{,}000{,}000}{Annual\ VMT}\right)_{Years\ 1-5}}{5\ Years}$$

$$Rate\ of\ Serious\ Injuries\ Per\ HMVMT = \frac{\sum\left(\frac{Number\ of\ Serious\ Injuries\ \mathrm{x}\ 100{,}000{,}000}{Annual\ VMT}\right)_{Years\ 1-5}}{5\ Years}$$

Source: Federal Highway Administration and SEWRPC

Table P.3
Years 2046-2050 Regional Targets for National Safety-Related Performance Measures

Performance Measure	2012-2016 Baseline Data	2046-2050 Target	Percent Change from 2012-2016 Base Year
Number of Fatalities	152.2	91.9	-39.6
Rate of Fatalities	0.962	0.488	-49.3
Number of Serious Injuries	798.2	144.1	-82.0
Rate of Serious Injuries	5.053	0.766	-84.8
Number of Non-Motorized Fatalities and Serious Injuries	167.2	45.7	-72.7

Source: Fatality Analysis Reporting System (FARS), Wisconsin Traffic Operations and Safety (TOPS) Laboratory, and SEWRPC

Table P.4
Years 2014-2018 through 2018-2022 Targets for the National Safety-Related Performance Measures for the Metropolitan Planning Area and Seven-County Region

Metropolitan Planning Area

Performance Measure	2012-2016 Baseline Data	2014-2018 Target	2015-2019 Target	2016-2020 Target	2017-2021 Target	2018-2022 Target
Number of Fatalities	137.2	133.2	131.2	129.3	127.4	125.5
Fatality Rate	0.923	0.884	0.862	0.843	0.827	0.811
Number of Serious Injuries	743.8	672.5	639.5	608.1	578.2	549.9
Serious Injury Rate	5.005	4.464	4.203	3.968	3.754	3.554
Number of Non-Motorized Fatalities and Serious Injuries	161.0	149.2	143.6	138.2	133.0	128.1

Seven-County Region

Performance Measure	2012-2016 Baseline Data	2014-2018 Target	2015-2019 Target	2016-2020 Target	2017-2021 Target	2018-2022 Target
Number of Fatalities	152.2	147.7	145.6	143.4	141.3	139.2
Fatality Rate	0.962	0.922	0.899	0.879	0.861	0.844
Number of Serious Injuries	798.2	729.7	686.3	652.6	620.5	590.1
Serious Injury Rate	5.053	4.504	4.241	4.002	3.784	3.579
Number of Non-Motorized Fatalities and Serious Injuries	167.2	154.9	149.1	143.5	138.2	133.0

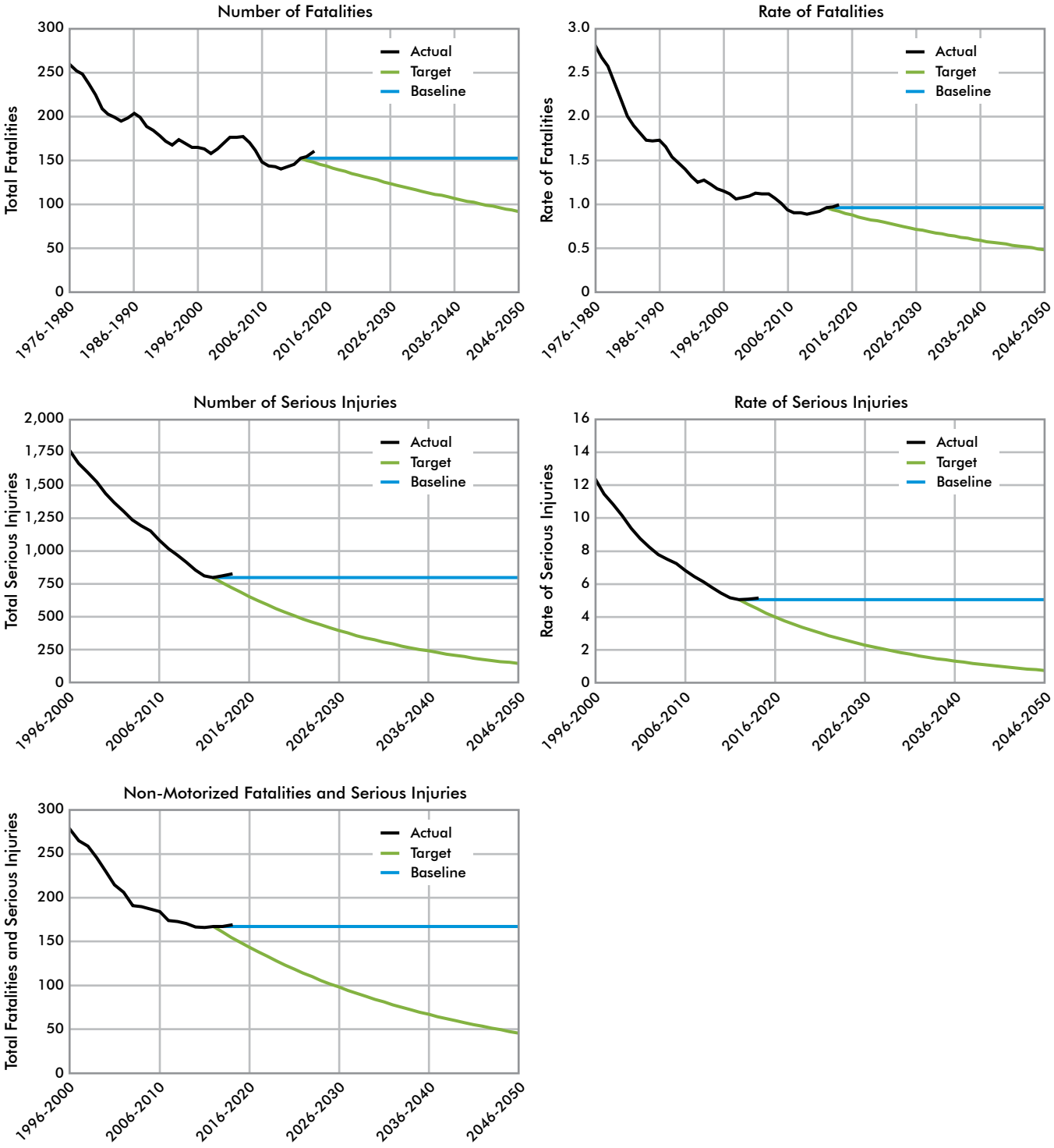
Source: Fatality Analysis Reporting System (FARS), Wisconsin Traffic Operations and Safety (TOPS) Laboratory, and SEWRPC

the actual five-year results for all five performance measures exceed the baseline levels. The increases in the five-year averages for the performance measures are a result of continuous increases in the number of fatalities and serious injuries that occurred following the achievement of their all-time lows of 2013 and 2015, respectively. Specifically, the annual number of fatalities increased from 125 fatalities in 2013 to a peak of 179 in 2016 (an 11-year high), and the annual number of serious injuries increased from 716 in 2015 to a peak of 955 in 2017 (an eight-year high). However, by 2018, there were slight drops in both fatalities and serious injuries, with 151 fatalities and 908 serious injuries occurring that year. Should these declines continue in subsequent years through efforts in implementing recommendations of statewide and regional safety recommendations, along with other efforts (such as improved vehicle technology), it is expected that the long-term decline in fatalities and serious injuries would resume.

NHS PAVEMENT CONDITION TARGETS

As part of the National Performance Management Framework, FHWA developed four performance measures to monitor pavement condition: 1) percentage of the Interstate system in good condition, 2) percentage of the Interstate system in poor condition, 3) percentage of the non-Interstate NHS in good condition, and 4) percentage of the non-Interstate NHS in poor condition. The methodology for calculating each of the four pavement condition performance measures is provided in Figure P.4. The data utilized to develop the performance measures are based on data submitted annually by WisDOT to FHWA through its Highway Performance Monitoring System (HPMS). Based on the methodology developed by FHWA, a rating of good, fair, or poor is determined based on the criteria established for various types of pavement. Then, the performance measures are calculated by dividing the lane-miles of good or poor pavement by the total lane-miles of evaluated pavement for both the Interstate system and the non-Interstate NHS. Map P.2 shows the base year 2017 pavement condition of each segment of highway for the NHS. Table P.6 shows the total lane-miles and percentage of NHS roadways in Southeastern Wisconsin that have a condition of good, fair, and poor in 2017.

Figure P.3
Comparison of Actual and Target Five-Year Averages for the National Highway Safety Performance Measures



Source: Fatality Analysis Reporting System (FARS), Wisconsin Traffic Operations and Safety (TOPS) Laboratory, and SEWRPC

Table P.5
Years 2014-2018 Actual Data and Targets for the National Safety-Related Performance Measures for the Metropolitan Planning Area and Seven-County Region

Metropolitan Planning Area

Performance Measure	2012-2016 Baseline Data	2014-2018 Target	2014-2018 Actual	Progress Made in Achieving Target
Number of Fatalities	137.2	133.2	144.4	No
Fatality Rate	0.923	0.884	0.957	No
Number of Serious Injuries	743.8	672.5	774.2	No
Serious Injury Rate	5.005	4.464	5.129	No
Number of Non-Motorized Fatalities and Serious Injuries	161.0	149.2	163.4	No

Seven-County Region

Performance Measure	2012-2016 Baseline Data	2014-2018 Target	2014-2018 Actual	Progress Made in Achieving Target
Number of Fatalities	152.2	147.7	159.8	No
Fatality Rate	0.962	0.922	0.996	No
Number of Serious Injuries	798.2	729.7	824.4	No
Serious Injury Rate	5.053	4.504	5.135	No
Number of Non-Motorized Fatalities and Serious Injuries	167.2	154.9	169.0	No

Note: Progress is made in achieving target by either meeting target outright or by improving upon baseline data.

Source: Fatality Analysis Reporting System (FARS), Wisconsin Traffic Operations and Safety (TOPS) Laboratory, and SEWRPC

Table P.7 shows the year 2050 pavement targets for the Interstate system and the non-Interstate NHS in the Region. These targets were established based on an evaluation of recent trends in the pavement condition on the Region's arterial roadways and the recommendation in VISION 2050 related to maintaining or improving the condition of Region's arterial roadways. Specifically, the targets for the NHS pavement performance measures were established based on the amount of existing lane-miles in good condition increasing by 10 percent and the amount of lane-miles in poor condition decreasing by 10 percent between 2017 (the base year of the data) and the design year 2050. Table P.8 shows the resulting year 2021 targets for the MPA and Region.

Establishing targets would have ideally been done with detailed information on where each segment of roadway is in its life cycle and an asset management model that would allow the evaluation of the effect on pavement condition of different pavement management programs. As part of future target setting, the Commission staff intends to work with WisDOT and county/local governments having portions of the NHS under their jurisdiction to assemble detailed historical information on each segment of roadway and to develop a long-range asset management model.

NHS BRIDGE CONDITION TARGETS

FHWA developed two performance measures to monitor bridge condition: 1) percentage of NHS bridges in good condition and 2) percentage of NHS bridges in poor condition. The methodology for calculating the two bridge condition performance measures is provided in Figure P.5. A rating of good, fair, or poor is determined based on the criteria established by FHWA for bridges and culverts. Then, the performance measures are calculated by dividing the total deck area of good or poor bridges by the total deck area of evaluated pavement for both the Interstate system and the non-Interstate NHS. Map P.3 shows the base year 2017 condition of each bridge on the NHS in Southeastern Wisconsin. Table P.9 shows the total bridge area

Figure P.4
Methodology for Calculating the National Pavement Performance Measures for the Interstate System and the Non-Interstate National Highway System (NHS)

The following is the methodology developed by FHWA for calculating the four pavement-related performance measures:

- Percent of Lane-Miles of Interstate Highway System with Good Pavement Condition
- Percent of Lane-Miles of Interstate Highway System with Poor Pavement Condition
- Percent of Lane-Miles of Non-Interstate NHS with Good Pavement Condition
- Percent of Lane-Miles of Non-Interstate NHS with Poor Pavement Condition

1. The following four criteria from data submitted by the State to the Highway Performance Management System (HPMS) are utilized for asphalt and concrete pavement, as follows:

Pavement Type	International Roughness Index (IRI)	Percent Cracking	Average Rutting	Average Faulting
Asphaltic Pavement (AP)	X	X	X	
Jointed Concrete Pavement (JCP)	X	X		X
Continuous Reinforced Concrete Pavement (CRCP)	X	X		

2. For every segment of the Interstate system or the Non-Interstate NHS having pavement condition data in the HPMS, identify the Good and Poor condition for each of the relevant criteria based on the following thresholds:

Measure Criteria	Good	Fair	Poor
IRI	<95	95-170	>170
Percent Cracking	<5	AP: 5-20 JCP: 5-15 CRCP: 5-10	AP: >20 JCP: >15 CRCP: >10
Average Rutting (Inches)	<0.20	0.20-0.40	>0.40
Average Faulting (Inches)	<0.10	0.10-0.15	>0.15

3. Determine the overall Good or Poor pavement condition for every segment of Interstate system or the Non-Interstate NHS, based on the following:

Good	AP and JCP: All Three Criteria Good CRCP: Both Criteria Good
Poor	AP and JCP: Two Criteria Poor CRCP: Both Criteria Poor
Fair	All Other Conditions

4. Calculate the respective performance measure by the following formula:

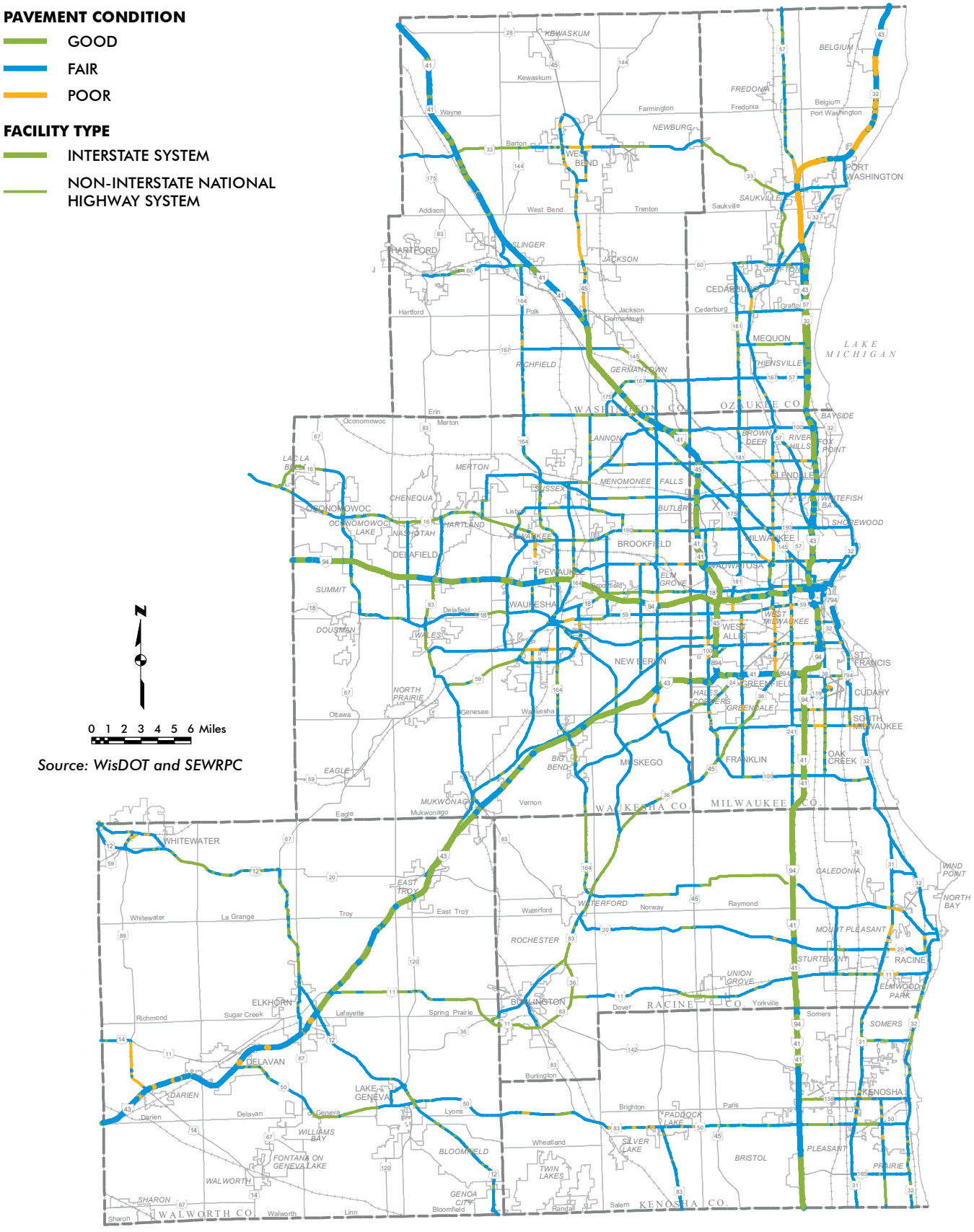
$$\underset{\text{Having Good or Poor Pavement}}{\text{Percent of Interstate or Non-Interstate NHS}} = \frac{\text{Lane-Miles of Good or Poor Pavement}}{\text{Total Lane Miles}}$$

Source: Federal Highway Administration and SEWRPC

and percentage of arterial bridges in Southeastern Wisconsin that have a condition of good, fair, or poor in 2017.

Table P.10 shows the year 2050 bridge targets for the NHS in the Region. These targets were established based on an evaluation of recent trends in bridge condition on the Region's arterial roadways and the recommendation in VISION 2050 related to maintaining or improving the condition of the Region's bridges on the arterial roadway system. Specifically, the targets for the NHS bridge performance measures were established based on the amount of existing bridge deck in good condition increase by 10 percent and the amount of deck area in poor condition decrease by 10 percent between 2017 (the base year of the data) and the design year 2050. Establishing targets would have ideally been done with detailed information on where bridges are in their life cycle and an asset management model that would

Map P.2
Pavement Condition of the National Highway System in the Region: 2017



Source: WisDOT and SEWRPC

Table P.6
Pavement Condition on Interstate System and Non-Interstate National Highway System: Base Year 2017

Rating	Interstate System		Non-Interstate National Highway System	
	Lane-Miles	Percent of Lane-Miles	Lane-Miles	Percent of Lane-Miles
Good	604	59.0	627	18.9
Fair	373	36.4	2,477	74.5
Poor	47	4.6	220	6.6
Total	1,024	100.0	3,324	100.0

Source: WisDOT and SEWRPC

Table P.7
Year 2050 Regional Targets for the National Highway System (NHS) Pavement Performance Measures

Performance Measure	Year 2017 Regional Baseline Data	Year 2050 Regional Target
Interstate NHS Pavement Condition		
Percentage of Lane-Miles in Good Condition	59.0	≥ 64.9
Percentage of Lane-Miles in Poor Condition	4.6	≤ 4.1
Non-Interstate NHS Pavement Condition		
Percentage of Lane-Miles in Good Condition	18.9	≥ 20.8
Percentage of Lane-Miles in Poor Condition	6.6	≤ 5.9

Source: WisDOT and SEWRPC

Table P.8
Year 2021 Targets for the National Highway System (NHS) Pavement Performance Measures for the Metropolitan Planning Area and Seven-County Region Based on the Year 2050 Regional Targets

Performance Measure	Metropolitan Planning Area		Seven-County Region	
	Year 2017 Baseline Data	Year 2021 Target	Year 2017 Baseline Data	Year 2021 Target
Interstate NHS Pavement Condition				
Percentage of Lane-Miles in Good Condition	61.1	≥ 61.8	59.0	≥ 59.7
Percentage of Lane-Miles in Poor Condition	4.4	≤ 4.3	4.6	≤ 4.5
Non-Interstate NHS Pavement Condition				
Percentage of Lane-Miles in Good Condition	17.6	≥ 17.8	18.9	≥ 19.1
Percentage of Lane-Miles in Poor Condition	6.8	≤ 6.7	6.6	≤ 6.5

Source: WisDOT and SEWRPC

allow the evaluation of the effect on bridge condition of different bridge management programs. However, such a model has not yet been developed for the NHS in the Region. As such, the Commission staff intends to work with WisDOT and county/local governments having portions of the NHS under their jurisdiction to assemble detailed historical information on each bridge and to develop an asset management model. Table P.11 shows the resulting year 2021 targets for the MPA and Region.

Federal regulations do not require a comparison of the actual and target information on bridge condition until year 2021 data are available. However, Commission staff will monitor the progress of achieving these targets as data become available. Table P.12 compares actual year 2018 NHS bridge condition to year 2018 targets that would result from the established year 2050 targets. As expected, there has not been a significant change in bridge condition since 2017—the baseline year.

Figure P.5
Methodology for Calculating the National Bridge Performance Measures for the National Highway System (NHS)

The following is the methodology developed by FHWA for calculating the two bridge-related performance measures:

- Percent of Deck Area of NHS Bridges in Good Condition
- Percent of Deck Area of NHS Bridges in Poor Condition

1. Identify the Good and Poor condition for each of the relevant criteria based on the following thresholds for the ratings as reported to the National Bridge Inventory:

Measure Criteria	Good	Fair	Poor
Deck	≥7	5 or 6	≤4
Superstructure	≥7	5 or 6	≤4
Substation	≥7	5 or 6	≤4
Culvert	≥7	5 or 6	≤4

2. Calculate overall bridge condition based on the lowest condition of the three criteria for bridges—Deck, Superstructure, and Substation—and the Culvert criteria for culverts.

3. Calculate the respective performance measure by the following formula:

$$\begin{matrix} Percent\ of\ NHS\ Bridges \\ Having\ Good\ or\ Poor\ Pavement \end{matrix} = \frac{Deck\ Area\ of\ Good\ or\ Poor\ Pavement}{Total\ Deck\ Area}$$

Source: Federal Highway Administration and SEWRPC

NHS SYSTEM RELIABILITY AND FREIGHT RELIABILITY TARGETS

As part of the National Performance Management Framework, FHWA developed three reliability-based performance measures[88]: 1) percent of the Interstate system that is reliable, 2) percent of the non-Interstate NHS that is reliable, and 3) freight reliability ratio. Figures P.6 and P.7 show the methodology that is to be utilized to calculate the three performance measures. The travel time data that are to be used to calculate these performance measures come from a data set provided by FHWA, called the National Performance Management Research Data Set (NPMRDS). These data are based on probe data that are collected from a third-party and geo-referenced to segments of the NHS. For the year 2017, NPMRDS data are available for nearly the entire Interstate System in Southeastern Wisconsin. However, NPMRDS data are only available for about 80 percent of the non-Interstate NHS. As these data are updated annually, it is expected that the quality and quantity of NPMRDS data will increase. Map P.4 shows the segments of the NHS in 2017 that are reliable and unreliable in the Region under the NHS reliability measures, and Map P.5 shows the freight reliability index for each segment of the Interstate system in 2017. Table P.13 shows the regional base year 2017 performance for the three performance measures.

[88] *Transportation system reliability reflects the degree to which travelers are able to reach their destinations on time. Travelers using a less reliable transportation system would be more likely to experience unexpected delays that can result in negative impacts, such as increased total travel time delay for personal vehicles and public transit, increased vehicle emissions, increased energy use, and increased freight shipping travel time and costs. Improving the ability of travelers to reach their destinations on time depends on a variety of factors, including: 1) reducing overall congestion; 2) reducing the frequency of vehicular crashes on arterial streets and highways, which can cause non-recurring congestion; 3) improving alternative routes and modes that can provide an opportunity for travelers to avoid congestion; and 4) expanding transportation options (such as commuter rail, light rail, and bus rapid transit) that are less impacted by inclement weather and crashes.*

Map P.3
Bridge Condition of the National Highway System in the Region: 2017

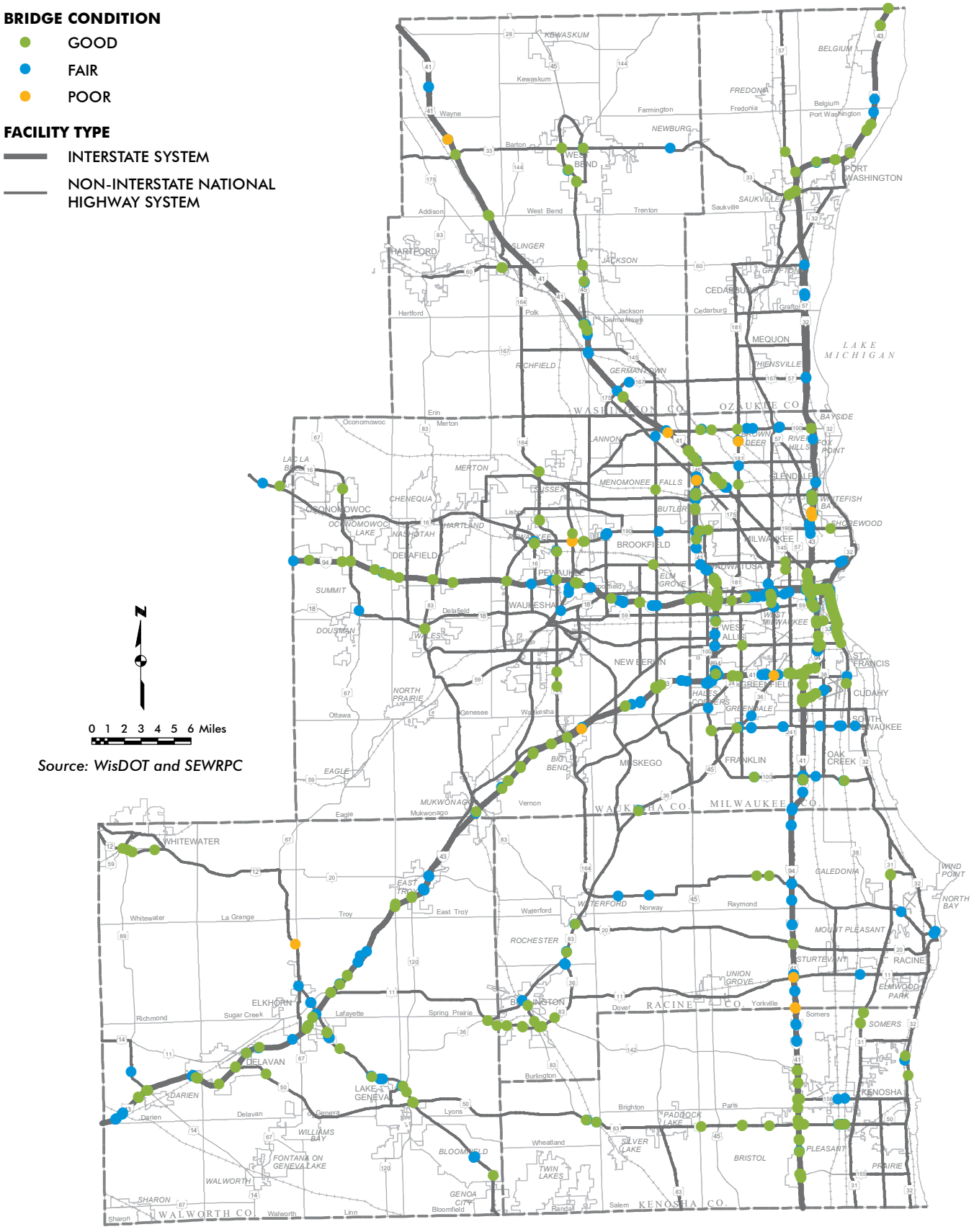


Table P.9
Condition of Bridges on the National Highway System: Base Year 2017

Rating	Number of Bridges	Total Deck Area (square feet)	Percent of Total Deck Area
Good	422	607,406	58.0
Fair	334	426,379	40.7
Poor	15	13,468	1.3
Total	771	1,047,257	100.0

Source: WisDOT and SEWRPC

Table P.10
Year 2050 Regional Targets for National Highway System (NHS) Bridge Performance Measures

Performance Measure	Year 2017 Regional Baseline Data	Year 2050 Regional Target
Percentage of NHS Bridge Deck Area in Good Condition	58.0	≥ 63.8
Percentage of NHS Bridge Deck Area in Poor Condition	1.3	≤ 1.2

Source: WisDOT and SEWRPC

Table P.11
Year 2021 Target for the National Highway System (NHS) Bridge Performance Measures for the Metropolitan Planning Area and Seven-County Region Based on the Year 2050 Regional Targets

	Metropolitan Planning Area		Seven-County Region	
Performance Measure	Year 2017 Baseline Data	Year 2021 Target	Year 2017 Baseline Data	Year 2021 Target
Percentage of NHS Bridge Deck Area in Good Condition	58.3	≥ 59.0	58.0	≥ 58.7
Percentage of NHS Bridge Deck Area in Poor Condition	1.3	≤ 1.3	1.3	≤ 1.3

Source: WisDOT and SEWRPC

Table P.13 shows the year 2050 targets for the three reliability-based targets. These targets were established based on an evaluation of recent trends and the recommendations of VISION 2050 expected to assist in improving the reliability of the NHS, such as the planned improvement and expansion of transit, expansion of bicycle/pedestrian facilities, expansion of transportation systems and demand management measures, widening of existing arterials, and construction of new arterials. Specifically, the year 2050 regional reliability targets are based on a modest 5 percent improvement over the short-term average. For the two NHS performance measures, this would result in an improvement over the year 2017 levels. With respect to the freight measure, the preliminary target would result in a decline from 2017 levels. However, this may be reasonable given how much lower the 2017 level was compared to the short-term average. Table P.13 shows the resulting year 2021 reliability targets for the MPA and Region. Initially, the short-term targets for the MPA and Region are the same. As more years of NPMRDS data become available, the Commission staff will study the effect certain measures have on system reliability within the Region for consideration when these targets are reviewed and improved.

Table P.12
Year 2018 Actual Data and Targets for the National Highway System (NHS) Bridge Performance Measures for the Metropolitan Planning Area and Seven-County Region

Performance Measure	Metropolitan Planning Area			Seven-County Region		
	Year 2017 Baseline Data	Year 2018 Target	Year 2018 Actual	Year 2017 Baseline Data	Year 2018 Target	Year 2018 Actual
Percentage of NHS Bridge Deck Area in Good Condition	58.3	≥ 58.5	57.3	58.0	≥ 58.2	57.6
Percentage of NHS Bridge Deck Area in Poor Condition	1.3	≤ 1.3	1.6	1.3	≤ 1.3	1.7

Source: WisDOT and SEWRPC

Figure P.6
Methodology for Calculating the Travel Time Reliability Performance Measures for the Intestate System and the Non-Interstate National Highway System (NHS)

The following is the methodology developed by FHWA for calculating the two NHS reliability performance measures:

- Percent of Person-Miles on Interstate System that is Reliable
- Percent of Person-Miles on Non-Interstate NHS that is Reliable

1. Utilizing travel time data from the National Performance Management Research Data Set (NPMRDS), calculate the 80th percentile and the 50th percentile highest travel time for every segment of the Interstate system or the Non-Interstate NHS for each of the following four time periods from January 1st through December 31st of a given year:

   a. 6 a.m. – 10 a.m. (Monday through Friday)
   b. 10 a.m. – 4 p.m. (Monday through Friday)
   c. 4 p.m. – 8 p.m. (Monday through Friday)
   d. 6 a.m. – 8 p.m. (Saturday and Sunday)

2. For each time period, calculate the level of travel time reliability (LOTTR) for every reporting segment of Interstate system or Non-Interstate NHS for by the following formula:

$$Segment\ Level\ of\ Travel\ Time\ Reliability = \frac{80th\ Percentile\ Travel Time\ of\ Segment}{50th\ Percentile\ Travel Time\ of\ Segment}$$

3. Identify as reliable any reporting segment of the Interstate system or the Non-Interstate NHS that has an LOTTR of below a threshold of 1.50 for all four time periods.

4. Calculate for each reporting segment of the Interstate system or Non-Interstate NHS the annual person-miles of travel (APMT) based on the Annual Average Daily Traffic (AADT) volumes provided by the State for the national Highway Performance Monitoring System (HPMS) by the following formula:

$$Segment\ APMT = Segment\ Length \times AADT \times Directional\ Factor \times Occupancy\ Factor$$

   With the directional factor based on data provided to the HPMS and the occupancy factor provided by the State or MPO.

5. Calculate each of the performance measures by the following formula:

$$Percent\ of\ System\ APMT\ that\ is\ Reliable = 100 \times \frac{Total\ APMT\ of\ Reliable\ Segments}{Total\ System\ APMT}$$

Source: Federal Highway Administration and SEWRPC

Figure P.7
Methodology for Calculating the Freight Travel Time Reliability Performance Measure for the Interstate System

The following is the methodology developed by FHWA for calculating the Freight reliability performance measure—the Freight reliability ratio.

1. Utilizing travel time data from the National Performance Management Research Data Set (NPMRDS), calculate the 95th percentile and the 50th percentile highest truck travel time for every reporting segment of the Interstate system for each of the following five time periods from January 1st through December 31st of a given year:

   a. 6 a.m. – 10 a.m. (Monday through Friday)
   b. 10 a.m. – 4 p.m. (Monday through Friday)
   c. 4 p.m. – 8 p.m. (Monday through Friday)
   d. 6 a.m. – 8 p.m. (Saturday and Sunday)
   e. 8 p.m. – 6 a.m. (Monday through Sunday)

2. For each time period, compute the truck travel time reliability (TTTR) for each reporting segment by the following formula:

$$TTTR = \frac{95th\ Percentile\ Travel\ Time\ of\ Reporting\ Segment}{50th\ Percentile\ Travel\ Time\ of\ Reporting\ Segment}$$

3. Identify for each reporting segment the maximum TTTR of all of the five time periods.

4. Calculate each of the performance measures for the reporting segments by the following formula:

$$Freight\ Reliability\ Ratio = \frac{\sum(Segment\ Length \times Segment\ maxTTTR)}{Total\ System\ Length}$$

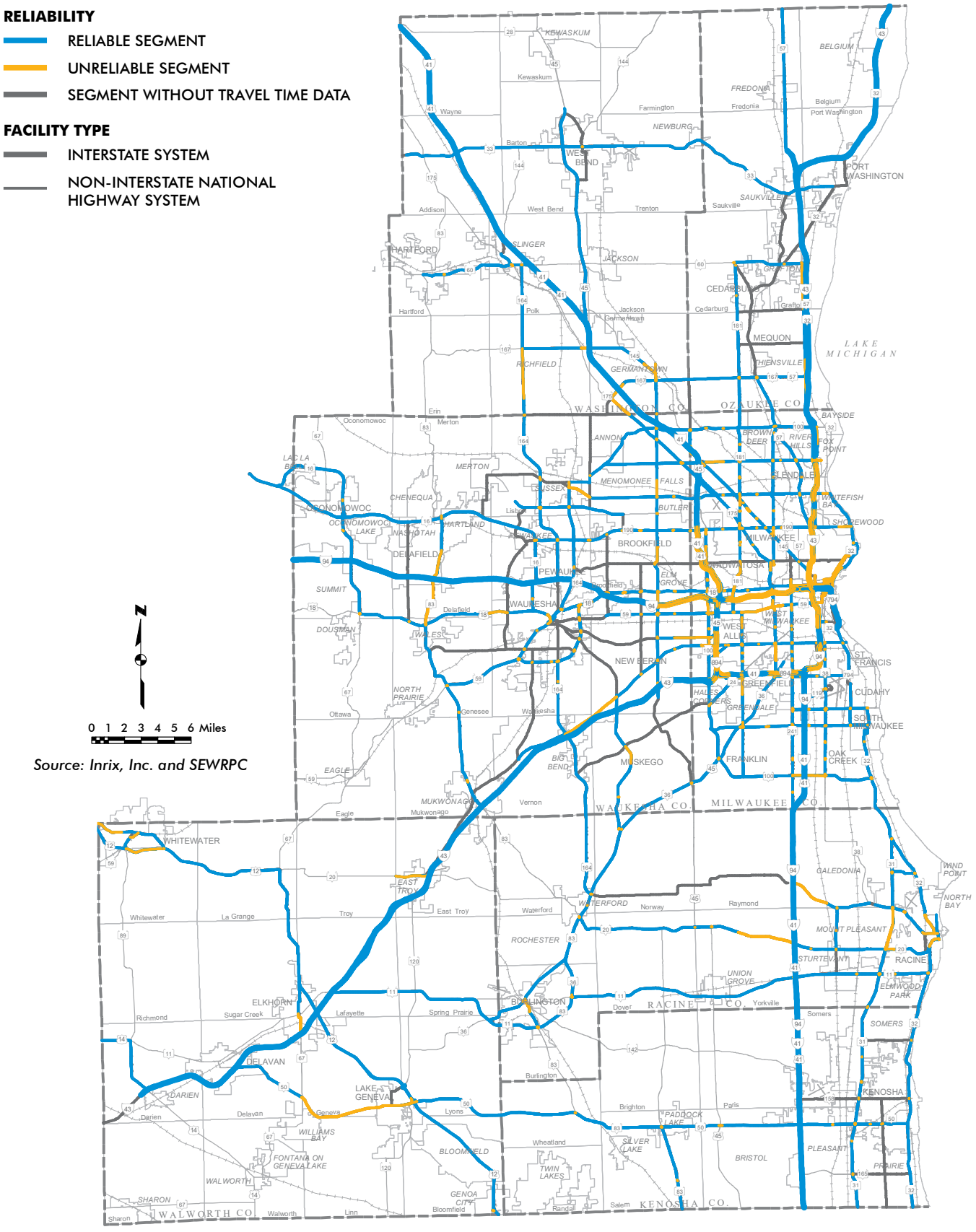
Source: Federal Highway Administration and SEWRPC

CONGESTION MITIGATION AND AIR QUALITY

As part of the National Performance Management Framework, FHWA developed three CMAQ-related performance measures:[89] 1) annual peak hour excessive delay per capita (PHED) measure, 2) the percent of travel occurring via non-single occupancy vehicles (non-SOV) measure, and 3) the on-road mobile source (i.e., vehicle) emissions measure. Per the regulations, applicability of these measures is dependent upon whether the geographic areas subject to the performance measures contained a nonattainment area or maintenance area under the 2008 ozone standard and the 2016 fine particulate standards on October 1, 2017. For the two capacity-related measures (the PHED and non-SOV measures), the geographic area is only for large urbanized areas (having a population over 1 million). For the emissions-based measure, the geographic area is the MPA. As shown on Map P.6, both the Milwaukee urbanized area and the MPA contain 2008 ozone or 2016 fine particulate nonattainment and maintenance areas. Thus, targets for all three CMAQ-related performance measures are required to be established for Southeastern Wisconsin—PHED and non-SOV targets for the Milwaukee urbanized area and emission reduction targets for the MPA.

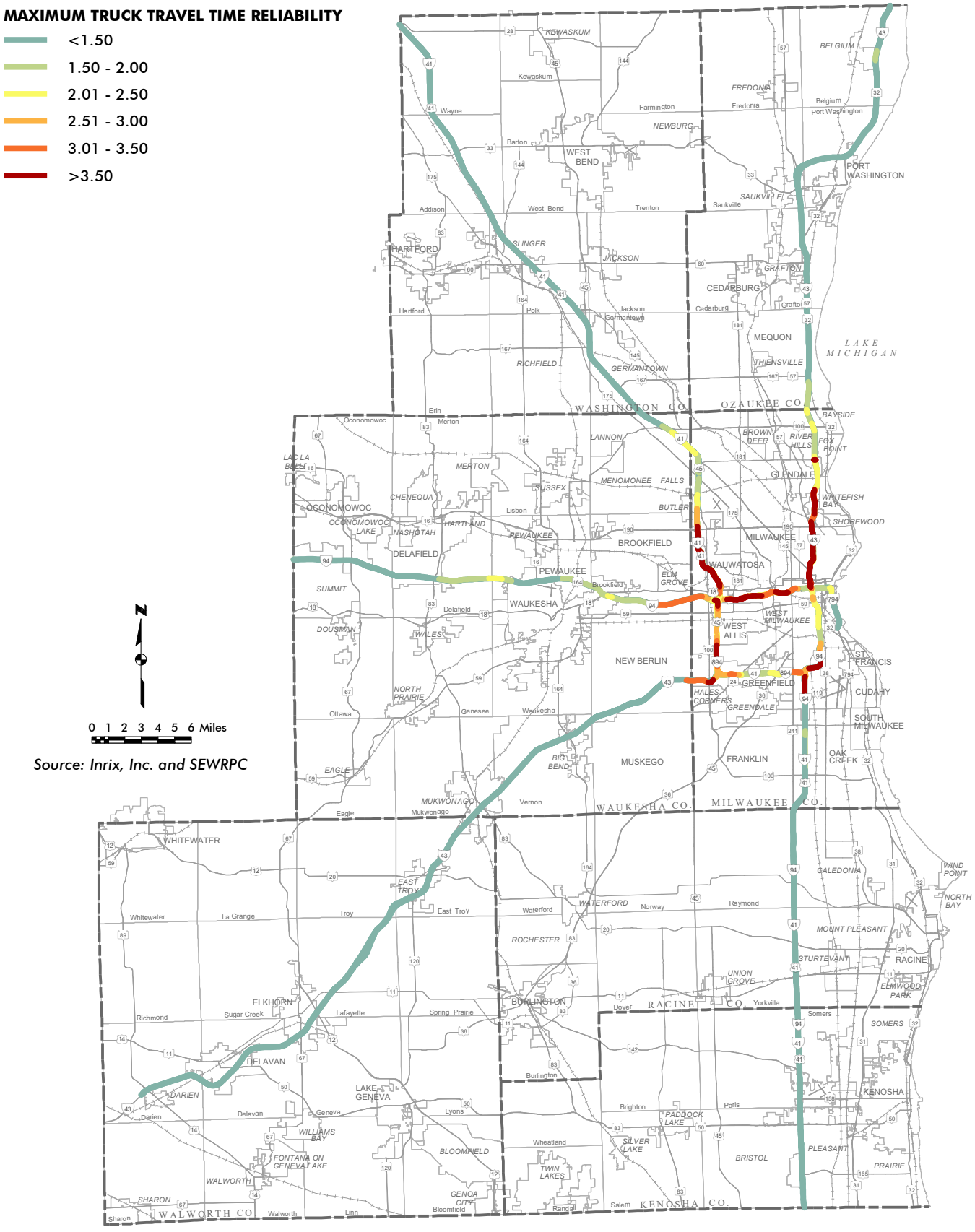
[89] *The Congestion Mitigation and Air Quality Improvement (CMAQ) Program was created by the Intermodal Surface Transportation Efficiency Act (ISTEA), enacted in 1991, with a primary goal of directing Federal funding towards transportation programs and projects that help improve air quality and reduce traffic congestion in areas designated by the U.S. Environmental Protection Agency (EPA) as nonattainment or in maintenance of the National Ambient Air Quality Standards (NAAQS). CMAQ projects generally fall into one of three categories: 1) projects that reduce the number of vehicle trips and/or vehicle-miles traveled (VMT), 2) projects that reduce emissions by improving traffic congestion, and 3) projects that reduce emissions through improved vehicle and fuel technologies. Currently, projects in counties that have historically been included in designated nonattainment or maintenance areas are eligible for funding. Thus, as all seven counties in Southeastern Wisconsin are currently, or have previously been, in nonattainment of either the ozone or $PM_{2.5}$ standards, projects located in any of these counties are eligible for funding.*

Map P.4
Interstate System and Non-Interstate National Highway System Reliability in the Region: 2017



Source: Inrix, Inc. and SEWRPC

Map P.5
Freight Reliability Index for the Interstate System in the Region: 2017



Source: Inrix, Inc. and SEWRPC

Table P.13
Year 2050 and Year 2021 Regional Targets for National Highway System (NHS) and Freight Reliability Performance Measures

Performance Measure	Year 2017 Baseline Data: Metropolitan Planning Area	Year 2017 Baseline Data: Seven-County Region	Year 2050 Targets[a]	Year 2021 Targets[a]
Travel Time Reliability				
Percent of Person-Miles Traveled on the Interstate NHS that are Reliable	83.9	84.5	≥ 85.5	≥ 81.9
Percent of Person-Miles Traveled on the Non-Interstate NHS that are Reliable	90.9	90.8	≥ 95.2	≥ 91.2
Freight Reliability				
Freight Reliability Index	1.54	1.49	≤ 1.64	≤ 1.72

[a] *Initially, the Regional and MPA targets will be the same.*

Source: Inrix, Inc., WisDOT, and SEWRPC

Per the regulations, WisDOT and the Commission are required to jointly establish identical targets for the two congestion-related performance measures. With respect to the emission reduction-related measure, WisDOT establishes a target for the State and the Commission establishes a target for the MPA.

The following sections describe the establishing of the targets for the three CMAQ-related performance measures. As the three targets are vastly different in their subject and data needs, they are addressed separately.

CMAQ – Peak Hourly Excessive Delay

Figure P.8 shows how the PHED measure is to be calculated for the Milwaukee urbanized area. WisDOT and the Commission, per the Federal regulations, must jointly calculate baseline data and establish two-year and four-year targets for the PHED measure for the Milwaukee urbanized area every four years. WisDOT, the Commission staff, and the Traffic Operations and Safety (TOPS) Laboratory based at the University of Wisconsin-Madison collaborated on developing the baseline data for the PHED measure.

The baseline data and the four-year target[90] for the PHED measure are shown in Table P.14. To develop the four-year target, Commission staff and WisDOT developed a methodology to estimate growth rates between the base year 2017 and future year 2021 (four-year target year) utilizing the Commission's fifth-generation travel demand model to estimate changes in total annual average delay per capita during the AM and PM peak hours as a proxy for PHED per capita. By utilizing the travel demand model, the impact of added roadway capacity and anticipated population growth on the PHED measure could be estimated. The modeled results indicated that projects completed between 2017 and 2021—principally the Zoo Interchange reconstruction project and the resurfacing and restriping of IH 94/IH 894 between the Hale and Zoo Interchanges—would positively impact travel in the Milwaukee urbanized area by reducing PHED by approximately 8 percent. Given the uncertainty in forecasting the future, Commission and WisDOT staffs agreed that half of the modeled reduction (4 percent) in PHED would be applied to the base year PHED per capita to estimate the four-year target PHED per capita. WisDOT formally approved the four-year target on May 18, 2018. The Commission approved the target on November 16, 2018.

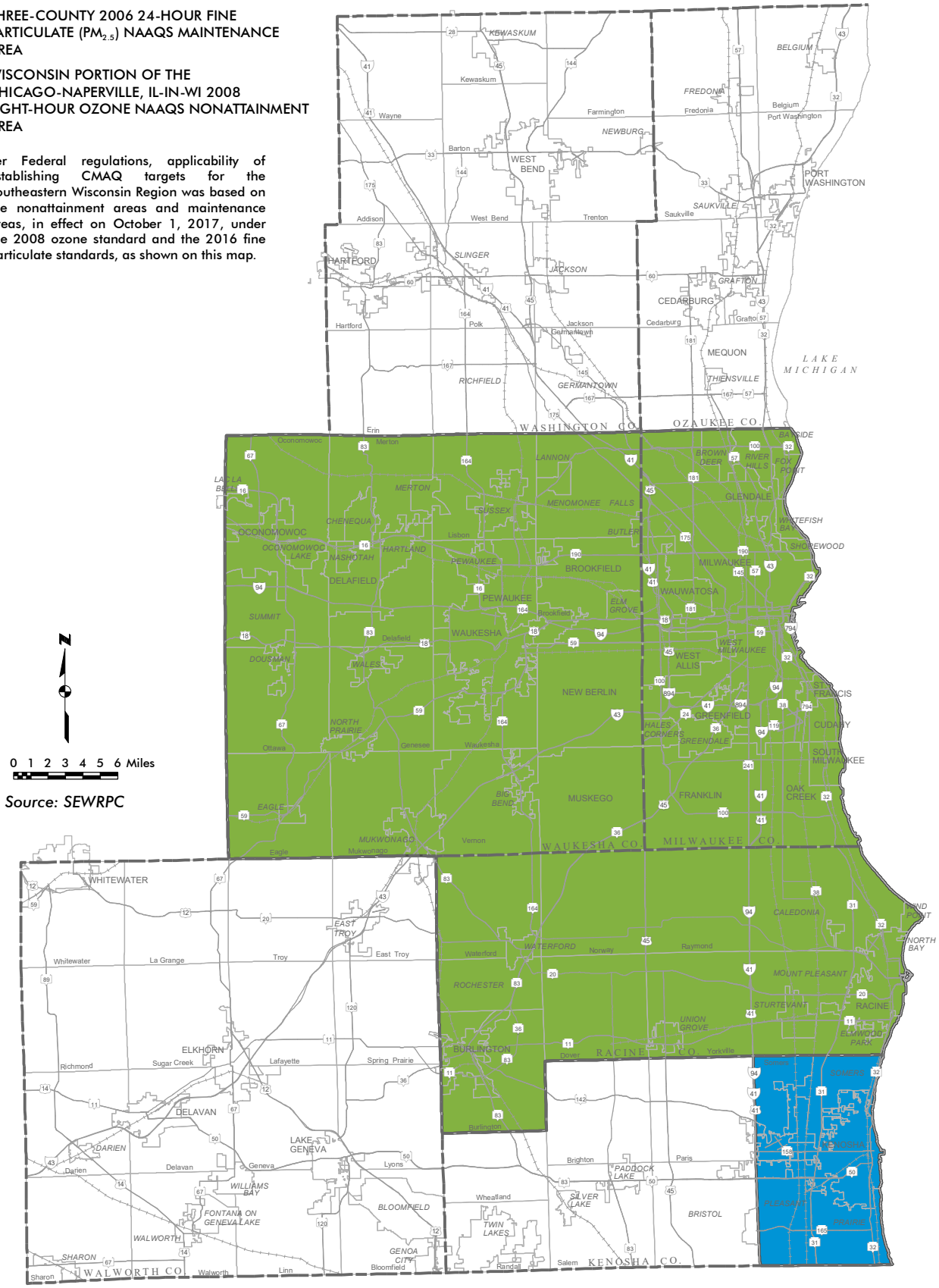
[90] *Per Federal regulations, WisDOT and Commission staffs were not required to establish a two-year target for the PHED measure in the initial round of target setting. However, the two agencies will be required to establish a two-year target during the second CMAQ Performance Plan cycle starting in 2022.*

Map P.6
NAAQS Nonattainment and Maintenance Areas in the Region

THREE-COUNTY 2006 24-HOUR FINE PARTICULATE ($PM_{2.5}$) NAAQS MAINTENANCE AREA

WISCONSIN PORTION OF THE CHICAGO-NAPERVILLE, IL-IN-WI 2008 EIGHT-HOUR OZONE NAAQS NONATTAINMENT AREA

Note: Per Federal regulations, applicability of establishing CMAQ targets for the Southeastern Wisconsin Region was based on the nonattainment areas and maintenance areas, in effect on October 1, 2017, under the 2008 ozone standard and the 2016 fine particulate standards, as shown on this map.



Source: SEWRPC

Figure P.8
Methodology for Calculating the Annual Hours of Peak Hour Excessive Delay (PHED) per Capita Performance Measure

The following is the methodology developed by FHWA for calculating the CMAQ performance measure related to annual hours of PHED per capita.

1. Determine the Excessive Delay Threshold Travel Time (EDTTT) for each reporting segment of the National Highway System (NHS) by the following formula:

$$EDTTT\ (in\ seconds) = 3{,}600 \times \frac{Segment\ Length}{\begin{matrix} Higher\ of\ 20\ mph\ or \\ 0.6 \times Speed\ Limit \end{matrix}}$$

2. Utilizing travel time data from the National Performance Management Research Data Set (NPMRDS), calculate for each NHS reporting segment the travel time segment delay (RSD) for every 15-minute time bin within the following time periods:

   a. 6 a.m. – 10 a.m. (Monday through Friday)
   b. 3 p.m. – 7 p.m. or 4 p.m. – 8 p.m. (Monday through Friday)

$$RSD\ (in\ seconds) = Average\ Travel\ Time\ - EDTTT$$

3. Calculate Excessive Delay (ED) for every 15-minute bin within both time periods with the following formula:

$$ED\ (in\ hours) = \begin{cases} \dfrac{RSD}{3{,}600}\ when\ RSD\ \geq 0 \\ or \\ 0\ when\ RSD < 0 \end{cases}$$

4. Calculate the Average Vehicle Occupancy (AVO) for each segment with the following formula:

$$AVO_{total} = (Percent\ Cars \times\ AVO_{cars}) + (Percent\ Buses \times AVO_{buses}) + (Percent\ Trucks + AVO_{trucks})$$

   Where the percentage for each vehicle can be provided by the State/MPO or by bus, truck, car traffic volume data provided for the HPMS, and the AVO for each vehicle type can be provided by the State and/or MPO.

5. Calculate the Total Excessive Delay (TED) for each NHS report segment to the nearest hundredth for the entire year by the following formula:

$$Segment\ TED\ (in\ person-hours) = \sum \left(AVO_{total} \times ED \times \frac{hourly\ volume}{4} \right)$$

   Where the hourly volume is estimated by the State and/or MPO for all days and for all reporting segments where ED is measured.

6. Calculate the performance measure by the following formula:

$$Annual\ Hours\ of\ PHED\ per\ Capita = \frac{\sum Segment\ TED}{Total\ Population}$$

   Where the Total Population is the total population in the urbanized area from the most recent annual population published by the U.S. Census.

Source: Federal Highway Administration and SEWRPC

Table P.14
Years 2021 and 2050 Peak Hourly Excessive Delay Targets for the Milwaukee Urbanized Area Within Southeastern Wisconsin

Performance Measure	Year 2017 Baseline Data	Year 2021 Target	Year 2050 Target
Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita	8.96	≤ 8.60[a]	≤ 7.84

[a] *Per regulations, this target was established jointly by the Wisconsin Department of Transportation and the Commission.*

Source: Inrix, Inc., Wisconsin Transportation Operations and Safety (TOPS) Laboratory, WisDOT, and SEWRPC

In addition to the year 2021 PHED target established with WisDOT for the Milwaukee urbanized area, the Commission also established a year 2050 PHED target based on the methodology developed by the Commission staff, as shown in Table P.14. The year 2050 target, and the methodology for establishing the target, will guide Commission staff as they collaborate with WisDOT on future short-term targets for the urbanized area.

Early in 2020, WisDOT and Commission staffs began a joint review of actual PHED data that occurred following 2017—the base year—to determine whether adjustments should be made to the year 2021 targets.

CMAQ – Non-Single Occupancy Vehicle Travel

Figure P.9 shows how the non-SOV measure is to be calculated for the Milwaukee urbanized area. Federal regulations require the Commission and WisDOT to use the same travel time data set for calculating the non-SOV measure, and the two agencies are required to establish and report unified non-SOV baseline and two-year and four-year target values for the Milwaukee urbanized area. As shown in Figure P.9, there are three sources of data that are permitted to be utilized for this measure. Based on data being readily available, WisDOT and Commission staffs calculated the non-SOV measure using the five-year estimate for "Commuting to Work" totaled by mode from the U.S. Census Bureau's American Community Survey (ACS) data set for the Milwaukee urbanized area.

The base year data, the year 2019 (two-year) target, and the year 2021 (four-year) target for the non-SOV measure for the Milwaukee urbanized area are shown in Table P.15. To establish the targets for the non-SOV measure, WisDOT and Commission staffs considered three alternative methodologies to estimate years 2019 (two-year) and 2021 (four-year) targets: 1) based on the historical non-SOV travel trend, 2) based on the VISION 2050 modeled non-SOV travel, and 3) based on the fiscally constrained transportation system (FCTS) modeled non-SOV travel. The three methodologies and potential targets were presented and discussed at a meeting between WisDOT and Commission staffs on March 15, 2018. It was agreed that an averaging of the potential targets based on historical trends and the FCTS model would be used to set the two-year and four-year targets for non-SOV travel. WisDOT formally approved the four-year target on May 18, 2018. The Commission approved the targets on November 16, 2018.

In addition to the years 2019 and 2021 non-SOV targets established jointly by WisDOT and Commission staffs for the Milwaukee urbanized area, the Commission staff established year 2050 targets based on the methodology developed by the Commission staff, as shown in Table P.15. The year 2050 target, and the methodology used for establishing the target, will guide Commission staff as they collaborate with WisDOT on future short-term targets for the urbanized area.

Early in 2020, WisDOT and Commission staffs began a joint review of actual non-SOV data available for years following 2017—the base year—to determine whether adjustments should be made to the year 2021 targets.

CMAQ – Emission Reductions

The methodology for calculating the emission reduction measure is shown in Figure P.10. Unlike the two congestion-related CMAQ measures, this measure is to be calculated separately by the State for a statewide target and the Commission for the MPA. The data to be utilized for this measure are the emission reduction estimates for projects implemented using CMAQ

Figure P.9
Methodology for Calculating the Non-Single Occupancy Vehicle (Non-SOV) Performance Measure

FHWA provided three methodologies that can be utilized to calculate the CMAQ performance measure related to percent of non-SOV travel in an urbanized area. The following describe the three methodologies:

1. Utilize SOV travel data that are available from the U.S. Census American Community Survey to calculate the performance measures with the following formula:

   $$Percent\ of\ non\text{-}SOV\ Travel = 100\ percent - percent\ of\ SOV\ Travel$$

2. Utilize the percent of non-SOV travel, as calculated using data derived from a local survey that was conducted within the last two years.

3. Calculate the percent of non-SOV travel based on system monitoring data of the actual use of the transportation system. Sample or continuous measurements may be utilized to count the number of travelers using different modes of transportation. The results of the measurements would need to be factored to represent the travel on the entire transportation system and be representative of annual travel. Additionally, the percent of non-SOV travel would need to be updated at least every two years.

Source: Federal Highway Administration and SEWRPC

Table P.15
Years 2019, 2021, and 2050 Non-Single Occupancy Vehicle (Non-SOV) Performance Targets for the Milwaukee Urbanized Area Within Southeastern Wisconsin

Performance Measure	Year 2017 Baseline Data	Year 2019 Target	Year 2021 Target	Year 2050 Target
Percent of Non-SOV Travel	20.3[a]	≥ 20.2[b]	≥ 20.1[b]	≥ 21.2

[a] *Data are from 2016*

[b] *Per regulations, this target was established jointly by the Wisconsin Department of Transportation and the Commission.*

Source: U.S. Census American Community Survey, WisDOT, and SEWRPC

Figure P.10
Methodology for Calculating the Total Emission Reductions Performance Measures

The following describes the methodology that FHWA developed for calculating the CMAQ performance measures related to total emission reductions. The performance measures are calculated for each criteria pollutant that a portion of the State or metropolitan planning area is in non-attainment or maintenance for. In Southeastern Wisconsin, the three criteria pollutants that an emission reduction measure is to be calculated are for Fine Particulate Matter ($PM_{2.5}$), Volatile Organic Compound (VOC), and Nitrogen Oxide (NO_x).

1. Calculate the performance measures for each relevant criteria pollutant by totaling over a two- or four-year period the total estimated emission reduction estimated to have occurred from projects previously implemented with CMAQ funding (for baseline data and monitoring progress) or estimated to occur through implementation of CMAQ projects.

Source: Federal Highway Administration and SEWRPC

funding, as entered by WisDOT into the CMAQ Public Access System. Thus, this measure is the only performance measure established by FHWA that is linked entirely to the implementation of projects funded by a particular funding source. The baseline data for the emission reduction measure for the Region is shown in Table P.16. For this measure, the baseline data consist of the emission reductions estimated for all the projects implemented with CMAQ funding over the four-year time period of 2014 through 2017.

The two-year and four-year emission reduction targets for the State are shown in Table P.16. While not required by Federal regulations, WisDOT and the Commission jointly developed the targets for the State. In developing the targets, WisDOT and Commission staffs considered the estimated emission reductions attributable to CMAQ-funded projects that were previously

Table P.16
Emission Reduction Targets for the Seven-County Region

Performance Measure	2014-2017 Baseline Data	2018-2019 Target	2018-2022 Target
Reduction in VOC (kg/day)	41.268	≥ 10.860	≥ 27.032
Reduction in NOx (kg/day)	109.545	≥ 83.316	≥ 137.350
Reduction in $PM_{2.5}$ (kg/day)	3.291	≥ 7.797	≥ 12.096

Source: WisDOT and SEWRPC

implemented and CMAQ projects that would be implemented within the next two to four years. The Commission established two-year and four-year emissions reduction targets based on the share of CMAQ projects expected to be implemented within the MPA and the Region.