The State of Ohio

Transportation System Performance

2020 REPORT

Ohio Department of Transportation

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Chapter 1

Introduction & Background

PERFORMANCE MANAGEMENT BACKGROUND

Transportation planners have long tracked performance data on their roadways, bridges, transit vehicles, sidewalks and other infrastructure in an effort to prioritize the need for repairs, replacement and expansion. Agencies could create custom performance measures that met their unique needs, and could adopt differing methodologies to obtain measurement data. The Ohio Department of Transportation (ODOT) has long implemented its own set of performance measures known as its Critical Success Factors.

In 2012, the federal transportation act known as MAP-21 introduced a set of national standards and requirements to the field of performance management (PM). These national standards were clarified and expanded upon in MAP-21's successor, the FAST Act, as well as in subsequent federal registers and rule makings.

Transportation performance management now adheres to a well-defined and easily repeatable process across all agencies, greatly enhancing the ability to track system performance over time and standardizing reporting for ease of reference.

TRANSPORTATION SYSTEM PERFORMANCE REPORT

Transportation Performance Management has quickly grown and its application has expanded well beyond the federally required measures. ODOT and most of Ohio's Metropolitan Planning Organizations (MPOs) have developed, or are in the process of developing, additional performance measures and targets for their mode-specific plans. Examples include the state's bicycle and pedestrian plan, Walk.Bike.Ohio and the statewide freight plan TransportOhio.

Among the most common questions the ODOT Office of Statewide Planning receives are in regard to system performance and target setting. Due to the annual availability of updated data and ever-expanding list of performance measures, ODOT has developed the Transportation System Performance Report (TSPR). The TSPR is intended to serve as a one-stop shop for the latest available performance data, metrics, targets and analysis. In addition to a stand-alone reference, it may be used by ODOT and its partners to pull data for use in other reports or to assist in any PM related decision making. Finally, the TSPR will provide an informational "dashboard" to serve as a quick reference for the state's progress toward any particular performance measure.

TARGET SETTING

A key component of the new federal PM process is the requirement to set local targets for each of the required performance measures. Previously, transportation agencies may have only tracked data for informational and decision-making purposes. Now, they must strive to meet pre-established targets and accountability is introduced at the national level.

Federal Context

FEDERAL REPORTING REQUIREMENTS

In order to track each state's performance, a series of Transportation Performance Management reports are required to be submitted to the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). These reports are as follows (per 23 CFR 490.107):

Baseline Performance Period Report - First submitted by state departments of transportation in 2018, and then every four years afterward. In this report, the baseline 5-year averages for each required measure are published. Perhaps most importantly, the 4-year targets (and 2-year targets for some measures) are set.

Mid Performance Period Progress Report First submittal was on October 1, 2020, and every four years afterward. Similar to the Baseline report, this report presents the most currently available data for each of the required performance measures and evaluates progress toward each of the targets. ODOT will have the opportunity to revise any of its 4-year targets within this report.

Full Performance Period Progress Report First submittal will be on October 1, 2022, and every four years afterward. This report is produced at the end of each four-year performance period and will evaluate the state's progress toward meeting each of the performance targets. Narrative must be included to explain circumstances where significant progress toward the achievement of any target was not made.

System Performance Report - must accompany any updates to the state's long-range transportation plan. This report is a summary of all of the state's performance measures, established targets and a snapshot of the progress the state is making toward

KEY PERFORMANCE MANAGEMENT TERMINOLOGY

The following terms are commonly used in the federal performance management process:

Baseline - The state's starting point for any particular performance measure which is used to determine a reasonable goal, or "Target", for that metric. The baseline is typically calculated by taking a rolling average of the five most recent calendar years for a specific metric. By using a five-year rolling average, unusual fluctuations and outliers in the data are smoothed out, resulting in a more typical measure.

Performance Measure/Metric - One of the many transportation-related statistics that are used to monitor the status of Ohio's transportation network and to determine whether pre-established targets have been met. Tracking these measures over time helps determine the progress being made by the state's transportation investments and helps identify where funding should be directed to achieve maximum benefit. These measures are set by federal regulations. An example would be "Number of Traffic Fatalities".

Target - Using the baseline for a particular performance measure, an agency sets a goal of where it would like to be in either 1, 2 or 4 years (depending on federal requirements). ODOT and its regional partners will strive to meet or exceed this target by focusing transportation investments where they are most likely to have a positive impact. Targets should be realistically attainable, yet aggressive enough to require careful planning and investment, resulting in a meaningful impact if the target is met. An example target might be "A 2% statewide reduction in automobile fatalities". Targets are then expressed as specific numbers, based on baseline averages. Example: "1,055 or fewer automobile fatalities on Ohio's roadways".

Chapter 2

Transportation Safety

Overview

Improving the safety of Ohio's transportation system is one of the top priorities of ODOT and its local transportation partners. Safety is an important focus in all of the state's planning efforts and is a key factor in prioritizing and funding projects throughout the state. Ohio has adopted a "Toward Zero Deaths" strategy, which champions the idea that even one death or serious injury on our roadways is too many. Ohio is committed to setting a high standard for itself and any proven measure that the state can take to reduce deaths and fatal injuries is counted as a victory.

It should be noted that this culture of improving statewide transportation safety extends far beyond just the state's roadways. ODOT, its partner agencies and other organizations work collaboratively to improve the safety of our pedestrians, bicyclists and the state's transit, aviation, freight and maritime networks.

ODOT continues to closely monitor the safety performance measures and targets detailed in this section of the report, and use this information to guide future investments toward the continuous improvement of the state's transportation system.

Transportation Measures & Targets

Performance Measures	2019 Performance	Targets[3]	Target Met?	Trend
Highway Measures				
Number of Fatalities*	1128.8	< 1055	◯	⬆
Fatality Rate*[1]	0.97	< 0.91	◯	⬆
Number of Serious Injuries*	8434.2	< 8348	◯	⬇
Serious Injury Rate*[1]	7.25	< 7.21	◯	⬇
Bike & Pedestrian Measures				
Non-Motorized Fatalities & Serious Injuries (all)*	844.8	824 3	◯	⬇
Level of Traffic Stress (LTS)[2]	44.2%	TBD	TBD	TBD

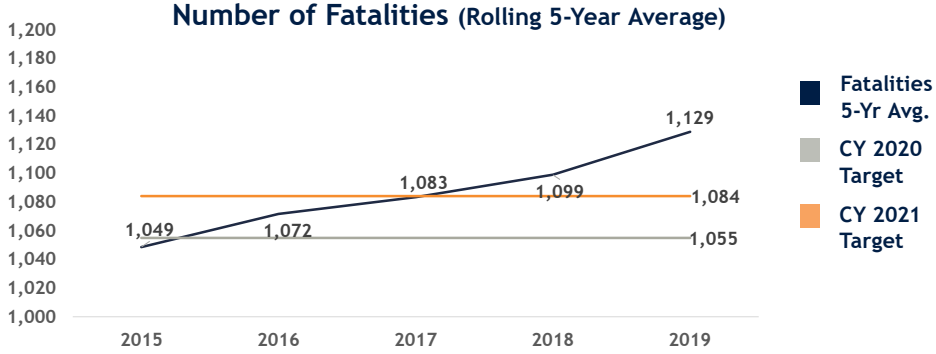
1 Rate is expressed as events per 100 million vehicle miles traveled (VMT)
2 Expressed as percentage of U.S. and state bike routes rated LTS 1 or 2
3 Target is a 2% annual reduction
*Federally Required

Trending Upward – Negative ⬆
Trending Downward – Positive ⬇
Target Not Met ◯

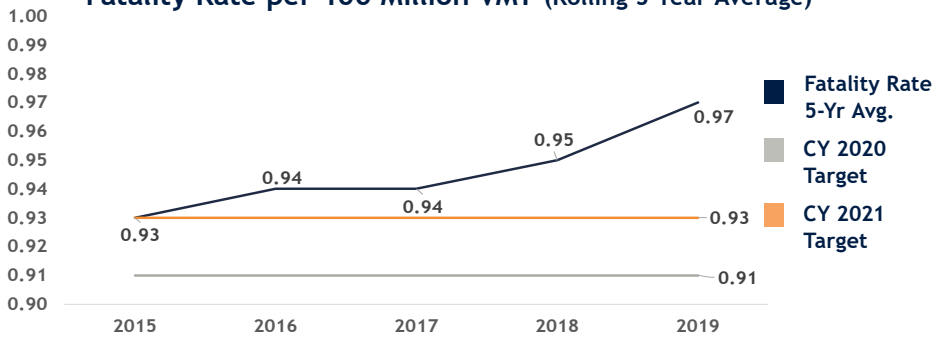
Fatalities

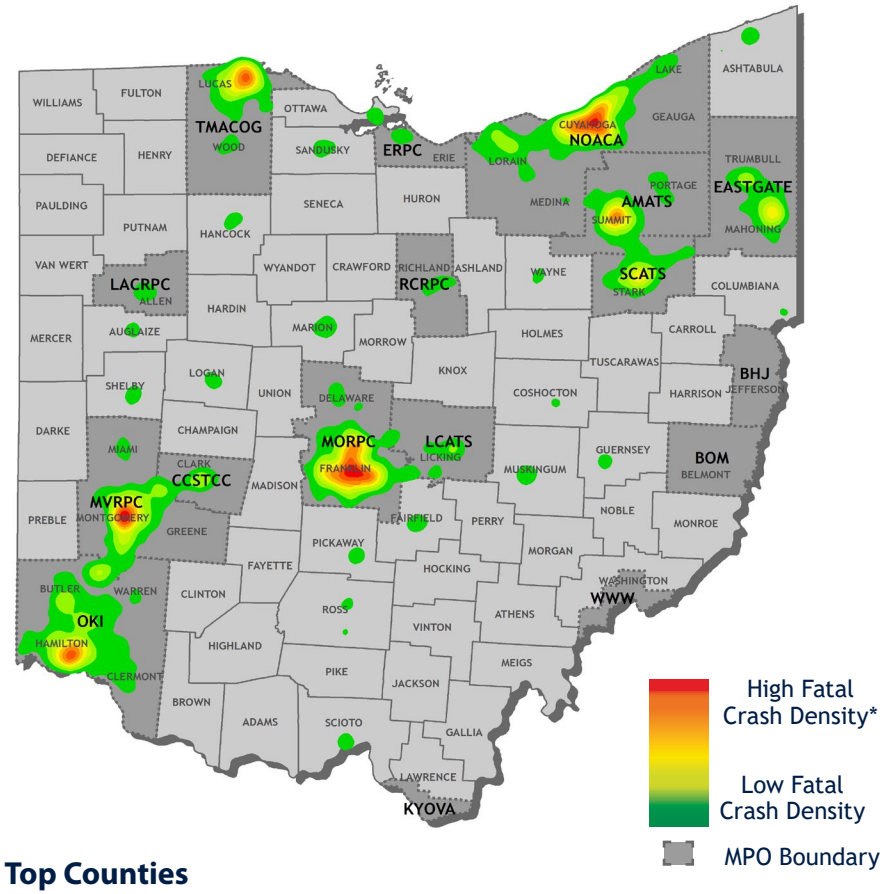
The number of fatal crashes on Ohio's roadways has slowly, but steadily, risen over the last five years. Even more daunting is that the largest recent year-to-year increase in the five-year average was between 2018 and 2019. The 2019 fatalities average did not meet the established goal. ODOT understands that it is critically important to bring the number of highway fatalities down. In fiscal year 2019 alone, ODOT funded 130 safety upgrade projects – at a cost of nearly $160 million – throughout the state. Continued investments will occur as the state works toward its ultimate goal of zero traffic deaths.

Number of Fatalities (Rolling 5-Year Average)



Fatality Rate per 100 Million VMT (Rolling 5-Year Average)





Top Counties

In 2019, 31.1% of fatalities occurred in just six counties. These counties are listed below along with their respective totals:

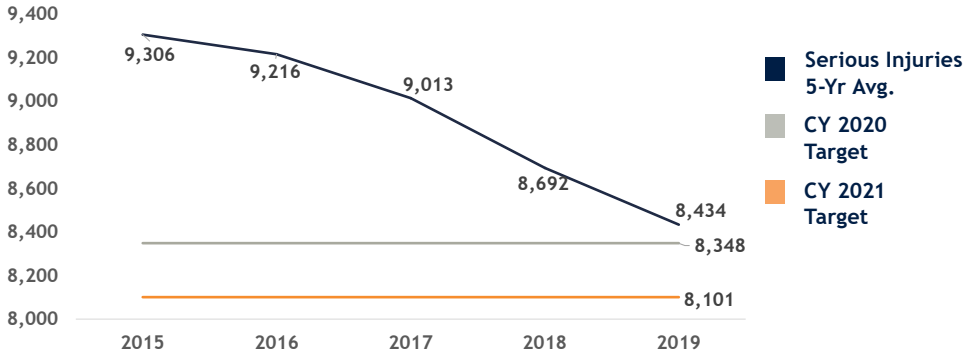
1. Franklin 9.4%
2. Cuyahoga 7.4%
3. Montgomery 4.6%
4. Hamilton 3.9%
5. Lucas 3.0%
6. Summit 2.8%

*Density clusters represent significant concentrations of fatal crashes

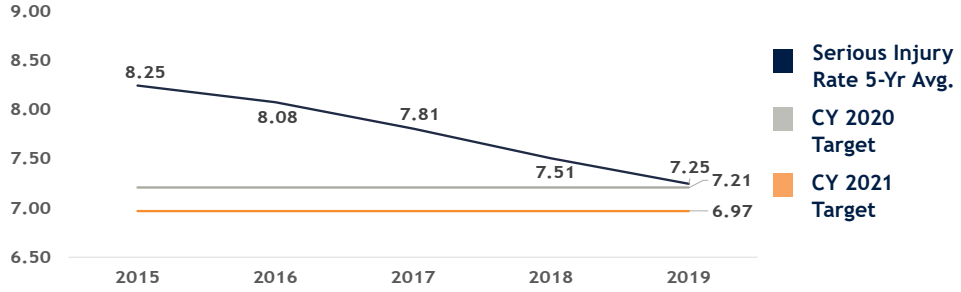
Serious Injuries

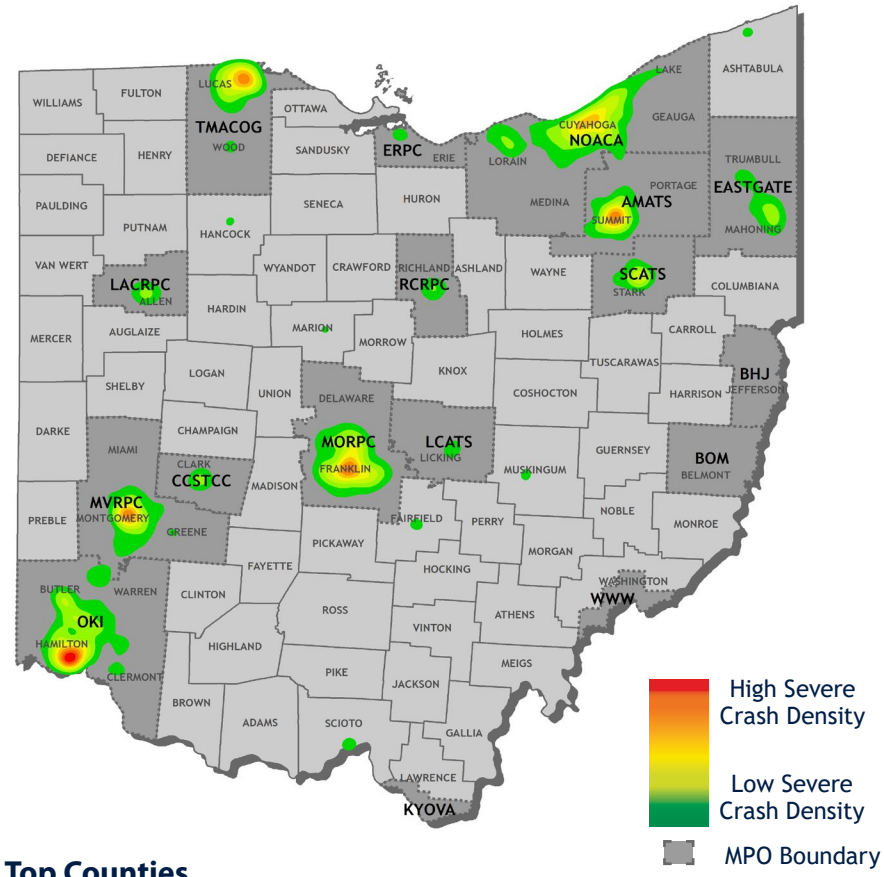
Serious injury crashes on Ohio's roadways have seen substantial decreases from year-to-year. In fact, the rolling 5-year average of serious injury crashes dropped 9.4% between 2015 and 2019. Ohio fell just short of meeting its most recent serious injury target. Safety improvements are an important consideration in any ODOT project, and although there is still progress to be made towards the aggressive targets Ohio has set for itself, sustained decreases in annual injuries are a positive sign that the state is on its way to meeting this goal.

Number of Serious Injuries (Rolling 5-Year Average)



Serious Injury Rate per 100 Million VMT (rolling 5-Year Average)





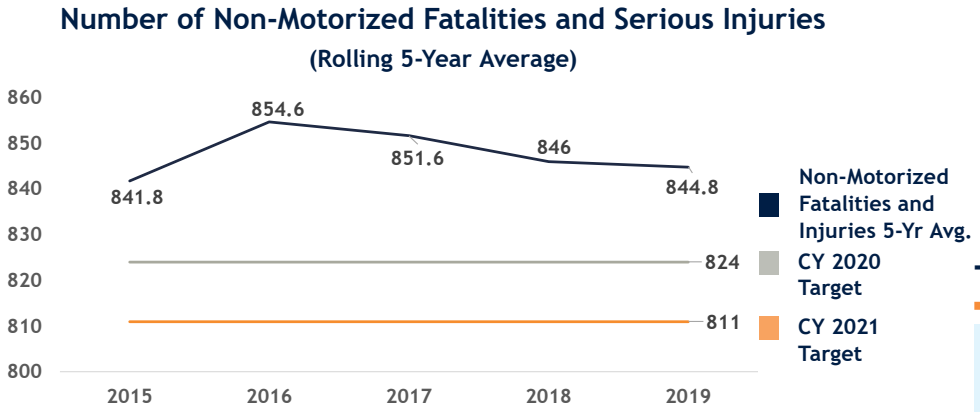
Top Counties

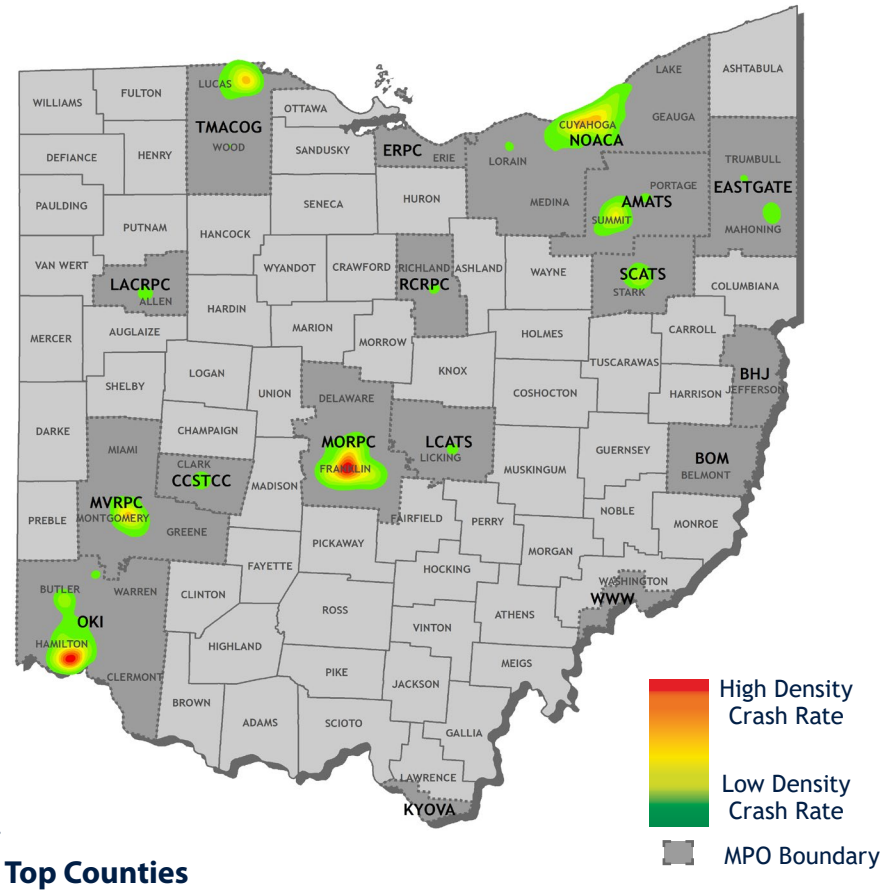
In 2019, 40% of serious injury crashes occurred in just six counties. These counties are listed below along with their respective totals:

1. Cuyahoga 11.9%
2. Franklin 9.5%
3. Hamilton 6.3%
4. Montgomery 4.8%
5. Summit 3.8%
6. Lucas 3.7%

Non-Motorized Fatalities & Serious Injuries

The number of non-motorized fatalities and serious injuries in Ohio has decreased slightly from year-to-year, with the five-year average remaining mostly flat during recent calendar years. At the current rate, it may take some time to meet Ohio's aggressive targets of a 2% annual reduction without an increased focus on bike and pedestrian safety at all levels of government. In fiscal year 2019, Ohio funded 22 standalone statewide bicycle or pedestrian projects at a cost of approximately $13.3 million. The state's MPOs and local communities have also made substantial investments in non-motorized transportation projects. It is expected that the rate of decline will accelerate as new projects are implemented, and that the targets will be met in the near future.





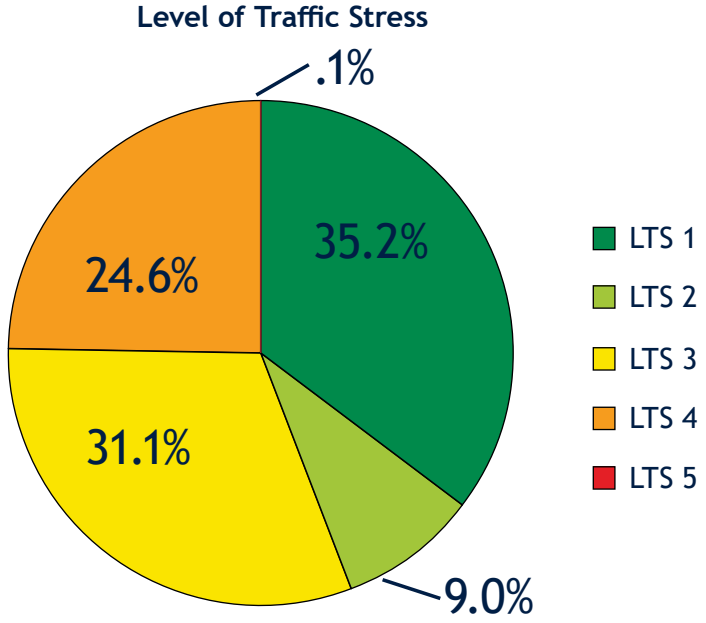
Top Counties

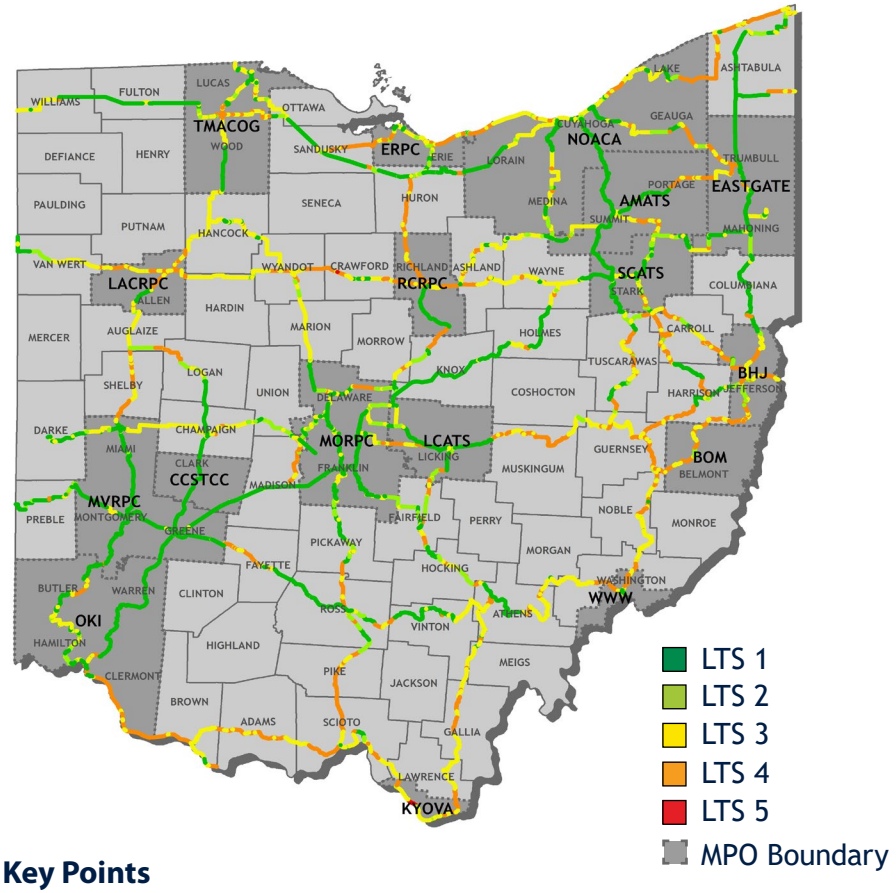
In 2019, 56.8% of non-motorized fatalities and injuries occurred in just six counties. These counties are listed below along with their respective totals:

1. Cuyahoga 16.7%
2. Franklin 16.4%
3. Hamilton 10.3%
4. Lucas 5.2%
5. Montgomery 4.3%
6. Summit 3.9%

Level of Traffic Stress (LTS)

An LTS analysis characterizes roadway facilities by their relative stress level to bicyclists based on the "Weakest Link Principle." In general, a separated bicycle facility, such as a trail or a separated bike lane, would qualify as a low-stress (LTS 1) bikeway, while roadways shared with motor vehicle traffic operating at high speeds would receive a higher-stress score. About half (44.2%) of State and US Bike Route System (SUSBR) is considered comfortable for the mainstream adult population (LTS 2 or better). As shown on the map displaying LTS scores on ODOT's bike routes, LTS scores tend to be lower in and around population centers and higher along rural roadways that act as connector routes between population centers. This is consistent with the roadway character. More information on the the SUSBR can be found in the walk.ohio.gov.





Key Points

- Many partners share ownership of Ohio's bike route system. The greatest number of miles fall under county ownership followed by cities and park departments. ODOT owns about 782.4 miles, or 23.3% of the system. This data can be explored on ODOT's Transportation Information Mapping Service (TIMS) online portal.

Chapter 3

Infrastructure Condition

Overview

Ohio has adopted a "Fix It First" approach to its transportation infrastructure, meaning that the state will prioritize repairing or rehabilitating its existing assets before building new ones. These transportation assets include our major roadways, bridges and transit-related assets.

ODOT and its transportation partners use federally approved methodologies to assess the overall condition of its interstate highways, major roadways and bridges on an annual basis. Transit assets, such as buses, service equipment and buildings are also examined on a regular basis to determine if they are still within their useful life or may need to be replaced in the near future.[3]

Maintaining the good condition of the state's transportation assets is a cost-effective way to ensure Ohio's safety, growth and prosperity for years to come.

Infrastructure Condition Measures & Targets

Performance Measures	2019 Performance	Targets	Target Met?	Trend
Highway Measures				
Interstate Pavement Condition				
% Good	69.4%	≥ 50%	✓	↑
% Poor	0.2%	≤ 1%	✓	↔
Non-Interstate NHS Pavement Condition				
% Good	46.9%	≥ 35%	✓	↑
% Poor	1.4%	≤ 3%	✓	↔
NHS Bridge Conditions				
% Good	59.2%	≥ 50%	✓	↑
% Poor	1.6%	≤ 5%	✓	↓
Bike and Pedestrian Measures				
Sidewalk Condition at ODOT Maintained Intersections[1]				
% Good	90%[2]	≥ 90%	✓	TBD
% Poor	TBA	≤ 10%	TBD	TBD

[1] Sidewalk condition within 200 feet of ODOT-maintained intersetion, per ODOT ADA Transition Plan asset inventory

[2] 2020 Data

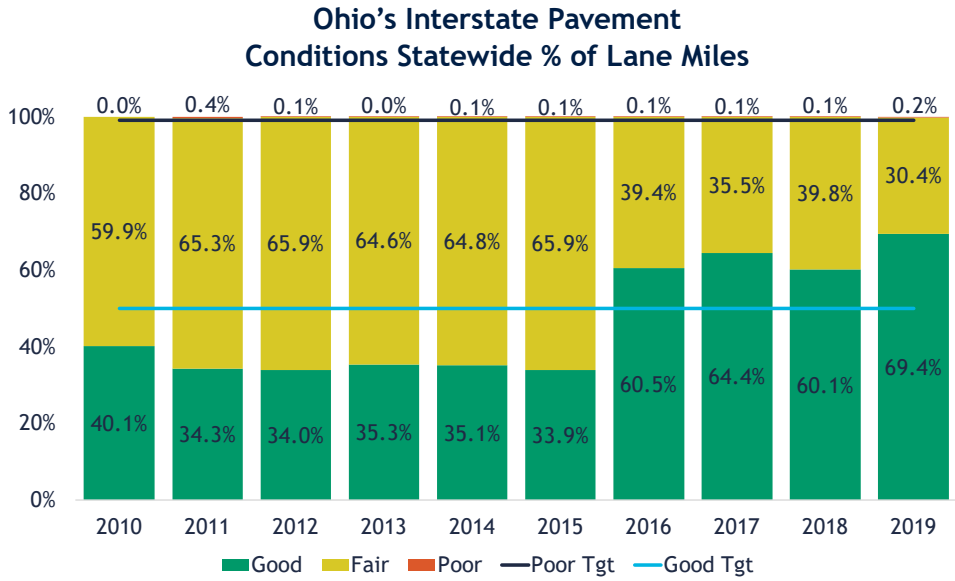
[3] With the national transit measures are still being finalized at the national level they weren't included here

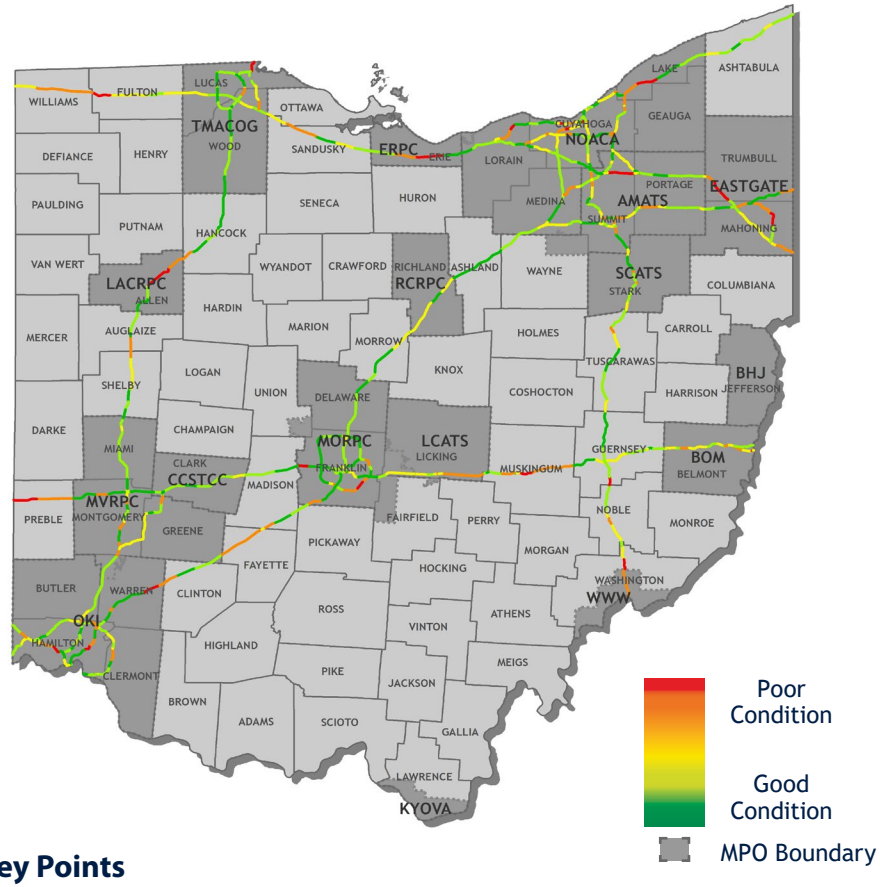
↑ Trending Upward – Positive
↓ Trending Downward – Positive
↔ No Significant Change
✓ Target Met

Interstate Pavement Condition

Overall, Ohio's interstate pavements are in good shape as of 2019. The percentage of pavements with a "Good" rating have been steadily increasing for the last four years, reaching a 10 year high of 69.4% in 2019. "Good' rated interstate pavements are greatly exceeding the established target of 50%. The percentage of Ohio's interstate pavement segments with a "Poor" rating are nearly non-existent, averaging only 0.1% over the last decade.

The state is well below its 1% target for "Poor" rated pavement. ODOT and its partners have invested heavily in interstate preservation projects and will continue to do so. These investments should keep the Ohio's interstate network in a state of good repair for years to come.





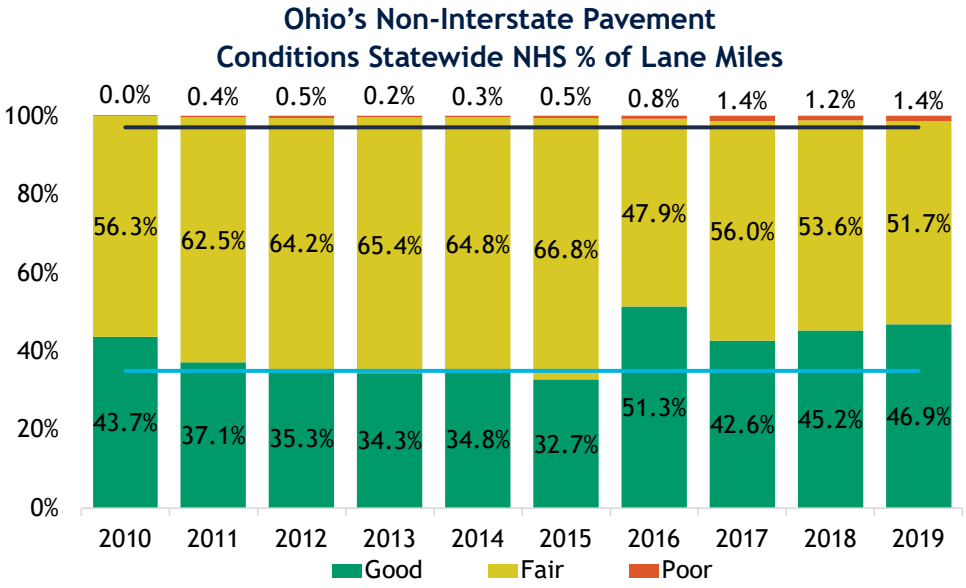
Key Points

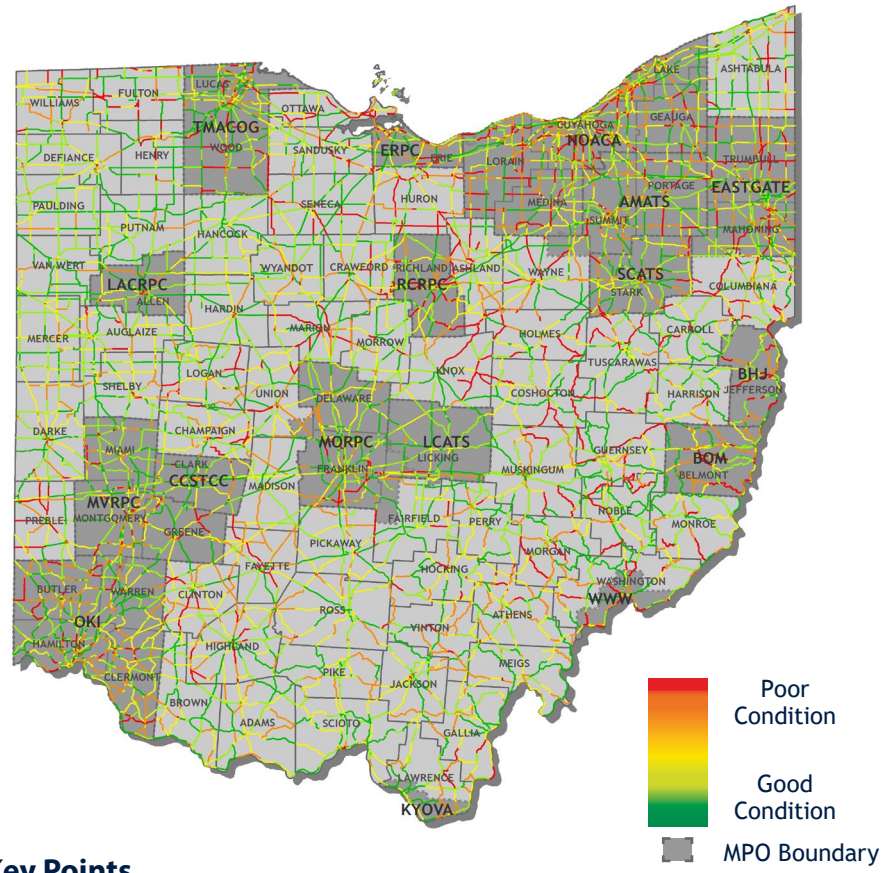
- In Fiscal Year 2019, ODOT completed 37 interstate paving projects, with a total cost of $126,238,363.
- In Fiscal Year 2019, ODOT resurfaced 1,014 lane miles of interstate highway pavement

Conditions of Non-Interstate NHS Pavement

Ohio has a vast network of non-interstate roadways that are included in the National Highway System (NHS). ODOT and its partner agencies have established a target of 35% of these roadway pavement miles rated as “Good”. For each of the last four years, Ohio has exceeded this target. In 2019, 46.9% of Non-Interstate NHS pavements were rated as “Good”.

The state’s target for roadway pavements in “Poor” condition is 3% or less. Although the percentage of “Poor” rated roadways has crept up over the last decade – tying a 10 year high of 1.4% in 2019 – Ohio is still comfortably below the target.





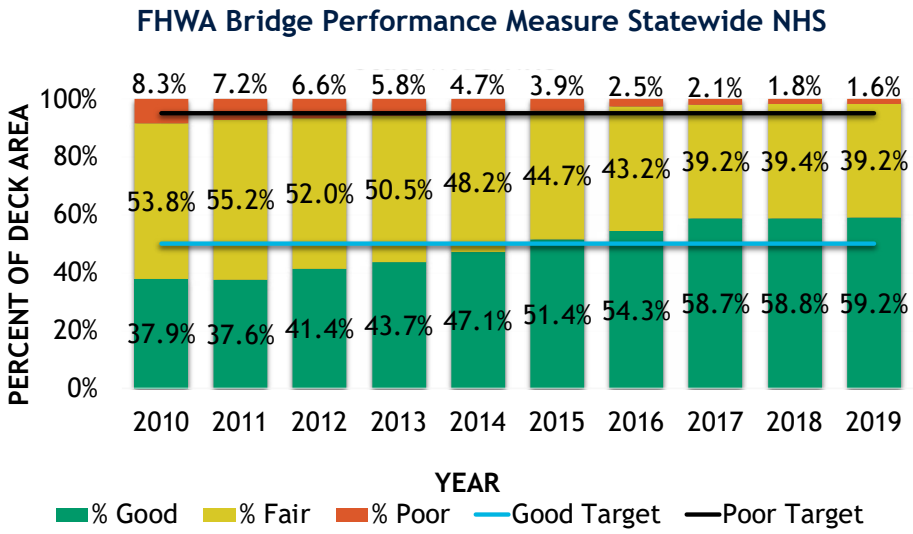
Key Points

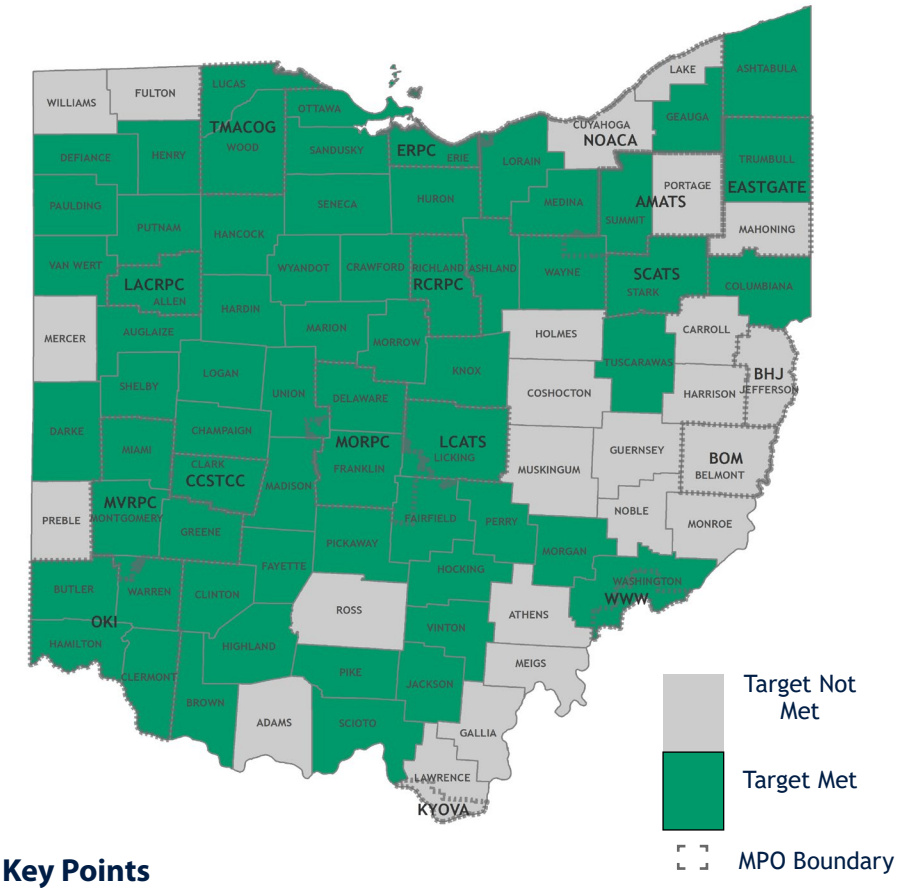
- In Fiscal Year 2019, ODOT completed 190 non-interstate resurfacing projects, with a total cost of $389,535,779.
- In Fiscal Year 2019, ODOT resurfaced 3,478 miles of non-interstate pavement.

Conditions of NHS Bridges

Ohio has one of the largest portfolios of bridges in the United States, many of which are on the National Highway System (NHS). For this particular performance measure, states are required to rate the percentage of NHS bridge deck area in "Good" or "Poor" condition. Federal regulations establish rating standards to make these determinations, and they do not distinguish between interstate and non-interstate bridges. The percentage of Ohio's bridges rated as "Good" has been steadily increasing over the past decade, achieving a 10-year high in 2019 of 59.2%.

The state is currently exceeding its target of 50% of NHS bridges rated as "Good". Conversely, the percentage of NHS bridges rated as "Poor" has steadily decreased over the last decade. In 2019, "Poor" rated bridges reached a 10-year low of 1.6%, well short of the state's target of 5% of these bridges with a "Poor" rating.





Key Points

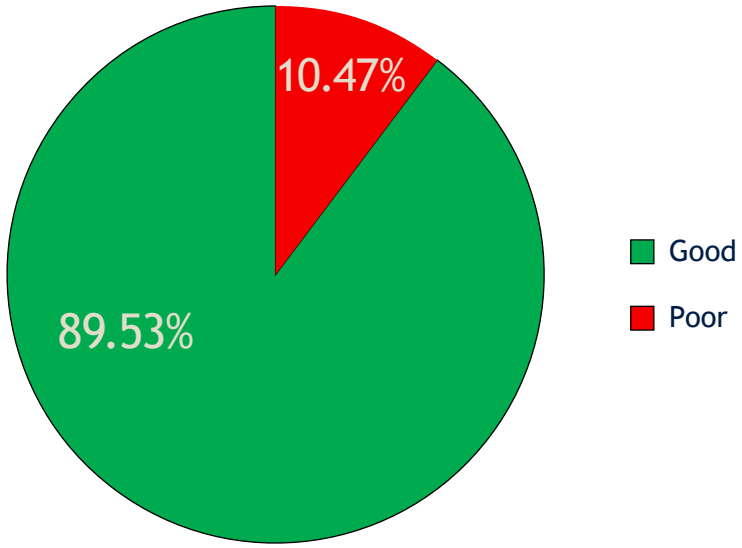
In FY 2019, ODOT completed 144 bridge repair/replacement projects totaling $226,298,067.

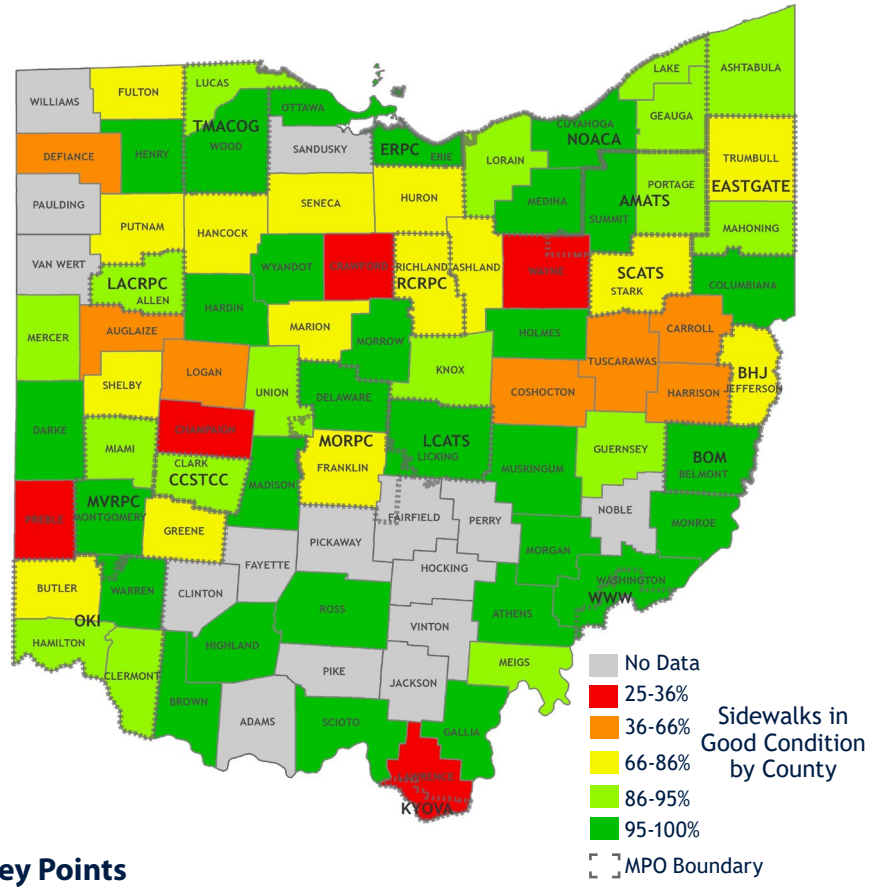
Conditions of Sidewalks

With sidewalk construction and maintenance being a shared responsibility within Ohio, ODOT, local municipalities, and even developers, must collaborate and work together to ensure safe, accessible pedestrian travel across borders. Current gaps in data do not allow for a comprehensive picture of the state of pedestrian facilities within Ohio, however ODOT does collect information on the condition of sidewalks near the intersections it maintains.

Walk.Bike.Ohio, Ohio's first statewide bike and pedestrian plan, introduced this performance measure at the statewide level. The plan also recommended a potential target of 90% of ODOT maintained sidewalks being in good condition. As of 2020, approximately 89.53% of ODOT's sidewalks assets are in good condition.

Conditions of Sidewalks





Key Points

- As part of a recent survey, ODOT found that 66% of respondents indicated that walking ***within*** their neighborhood is easy or moderately easy, while only 43% feel that walking ***to or from*** their neighborhood is easy or moderately easy.

Chapter 4

Congestion Reduction

Overview

Managing system congestion is one of the most critical functions of transportation planning. Not only does congestion lead to frustration, it can result in negative economic, safety and environmental impacts as well. Quantifying the level of congestion is important in determining where improvements need to be made to ensure smoother and more consistent traffic flow.

Although there are countless specific actions that can be taken to reduce traffic congestion, there are generally two high-level strategies to improve traffic flow. The first strategy is supply-side management. Using this strategy, if congestion is present in a specific area, it is addressed through increasing the supply of roadways, either by adding traffic lanes or building new roadways.

Although this has been the historic approach used by to relieve congestion, exponentially increasing materials, right-of-way and labor costs make this approach unfeasible in most circumstances.

The second overall strategy used to alleviate congestion is to improve the supply side of the traffic equation. This strategy includes actions that improve the assets that already exist. Examples include improving traffic signal timing, limiting access on roadways, improving access to non-automobile modes of travel and adopting technologies to provide real-time transportation alternatives. This is ODOT's preferred method of reducing congestion, as supply-based solutions are not only highly effective, they are significantly more cost-effective.

ODOT has coordinated with the state's three largest metropolitan areas to adopt congestion-related targets, and these efforts will expand to include additional regions in 2022. These partners will work together to identify areas of unacceptable congestion and to implement an effective response accordingly.

Congestion Reduction Measures & Targets

Performance Measures	2019 Performance	4-Year Targets	Target Met?	Trend
Highway Measures				
Annual Peak Hours of Excessive Delay (PHED)				
Cincinnati Region	8.6	< 12 Hours	✓	~
Cleveland Region	6.2	< 10 Hours	✓	~
Columbus Region	7.0	< 12 Hours	✓	~
Percent of Non-Single Occupancy Vehicle (Non-SOV) Travel				
Cincinnati Region	17.6%	> 17.4%	✓	~
Cleveland Region	18.1%	> 18.5%	○	↑
Columbus Region	17.5%	> 19.0%	○	↓
Bike and Pedestrian Measures				
Mode Share - % Commute to Work (Statewide)				
% Pedestrian	2.3%	TBD	TBD	TBD
% Bicycle	0.3%	TBD	TBD	TBD

Trending Upward – Positive ↑ Inconsistent ~ Target Met ✓
Trending Downward – Negative ↓ Target Not Met ○

Annual Peak Hours of Excessive Delays (PHED)

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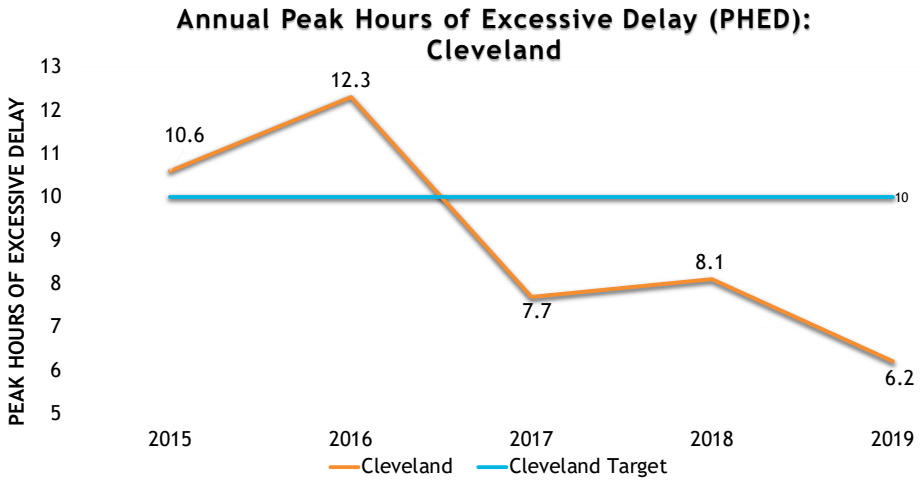
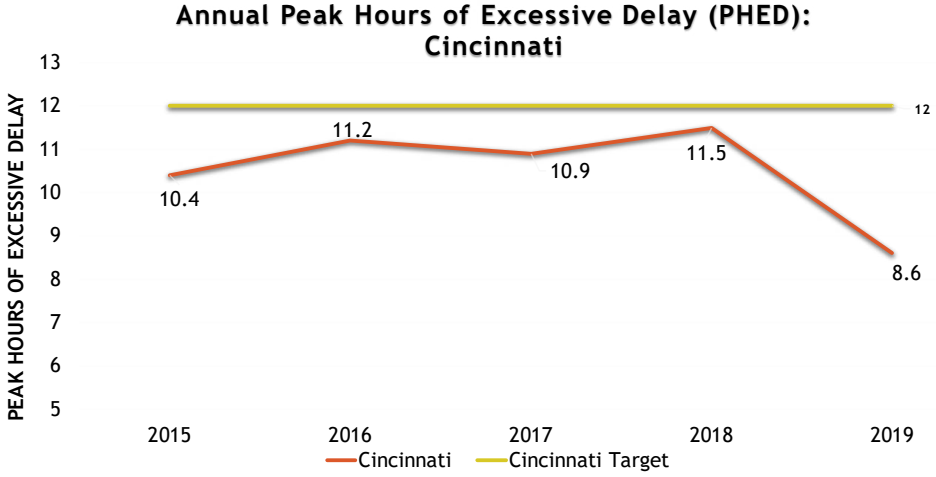
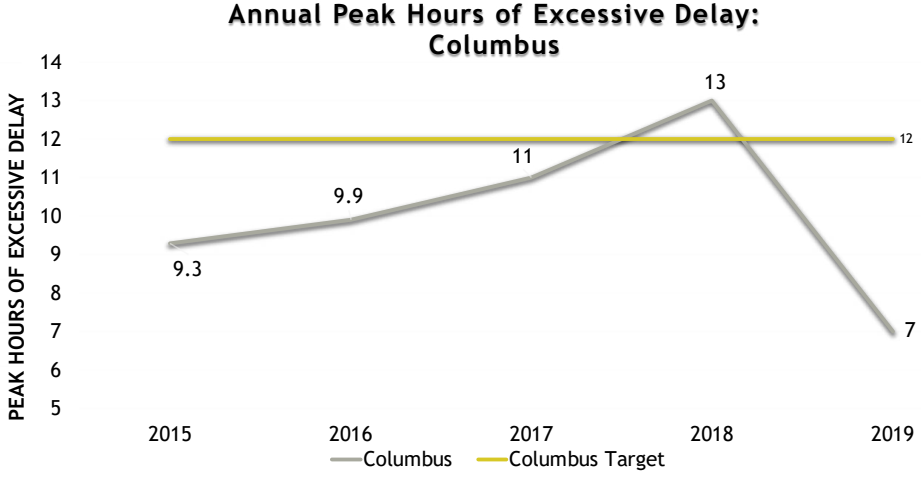
This performance measure is tracked for three metropolitan areas in Ohio: Cincinnati, Cleveland and Columbus. Each of these regions may set their own 4-year PHED targets. Cincinnati and Columbus set their target at 12 hours per year, whereas Cleveland set a slightly more aggressive target of 10 hours per year. The actual performance for all three areas has varied significantly over the last five years. However, all three regions saw a significant decrease in delay between 2018 and 2019, beating their respective targets and hopefully setting a positive trend for the future. Columbus saw the largest decrease over the past year dropping from 13 excess hours of delay to only 7. Cincinnati dropped from 11.5 hours of excess delay to 8.6 hours. The greater Cleveland region has seen the least excess delay of the three metro areas since 2017. It remains the lowest, having dropped from 8.1 hours of excess delay in 2018 to only 6.2 in 2019. As ODOT and its partners focus on transportation system investments and demand management, this downward trend in congestion could continue.

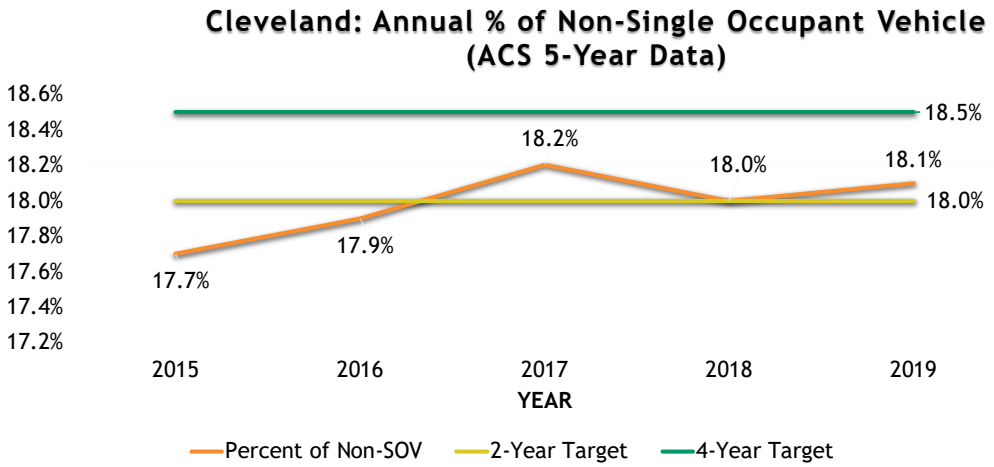


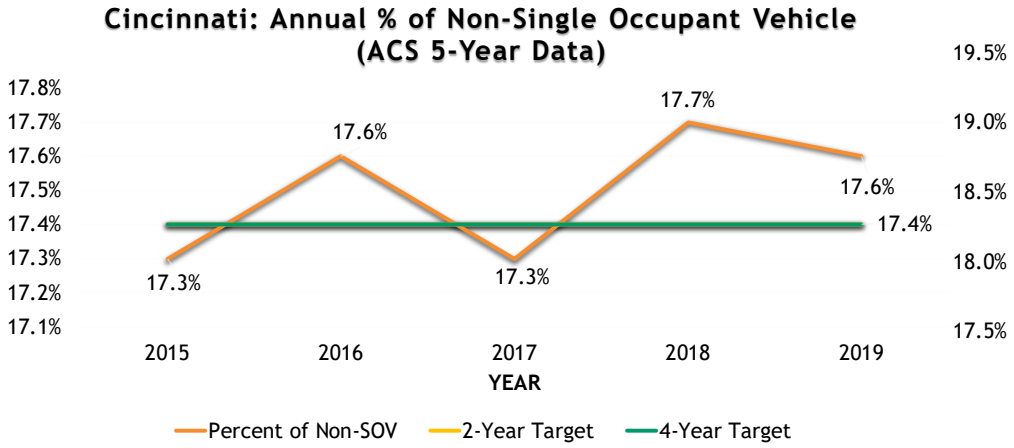


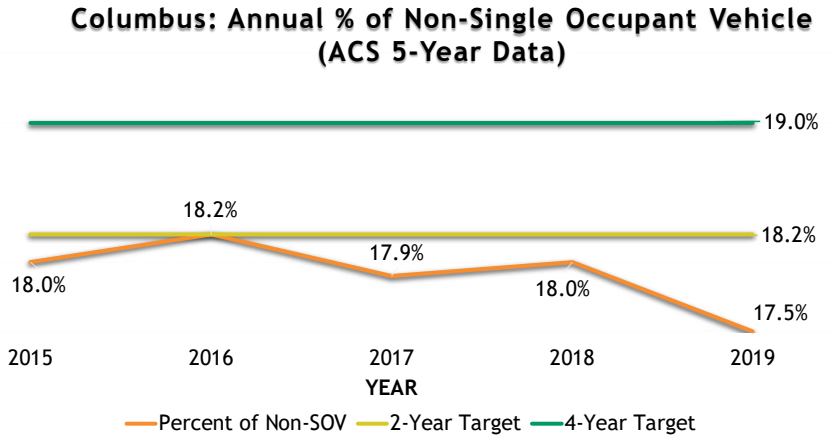


Percent of Non Single Occupancy Vehicle Travel

The percentage of non-single occupancy vehicle travel in Ohio's three largest metropolitan regions – Cincinnati, Cleveland and Columbus – has held fairly steady over between 2015 and 2019. The Cincinnati region has maintained a non-SOV share in the mid 17% range, beating its 17.4% target in three of the last five years. Cleveland, the state's largest metropolitan area, has shown a steady increase in non-SOV travel over the same time period. For the last three years, the Cleveland area has met or exceeded its 18% 2-year target. However, above average increases will be necessary to achieve the 4-year target of 18.5%. Unlike the other two metropolitan areas, Columbus has shown a steady decrease in non-SOV travel. As of 2019, Columbus is 1.5% short of reaching its 4-year goal of 19.0%.







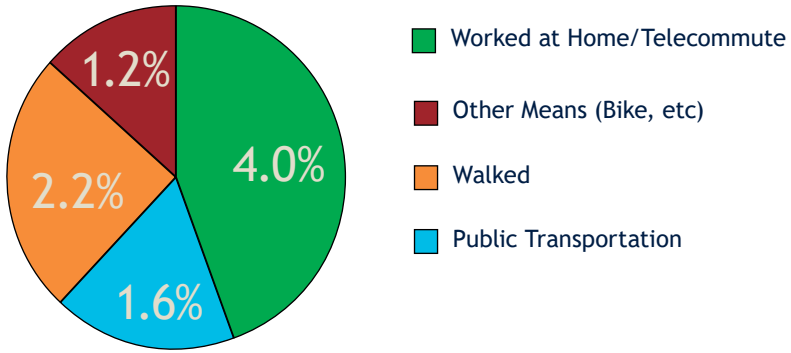
Mode Share

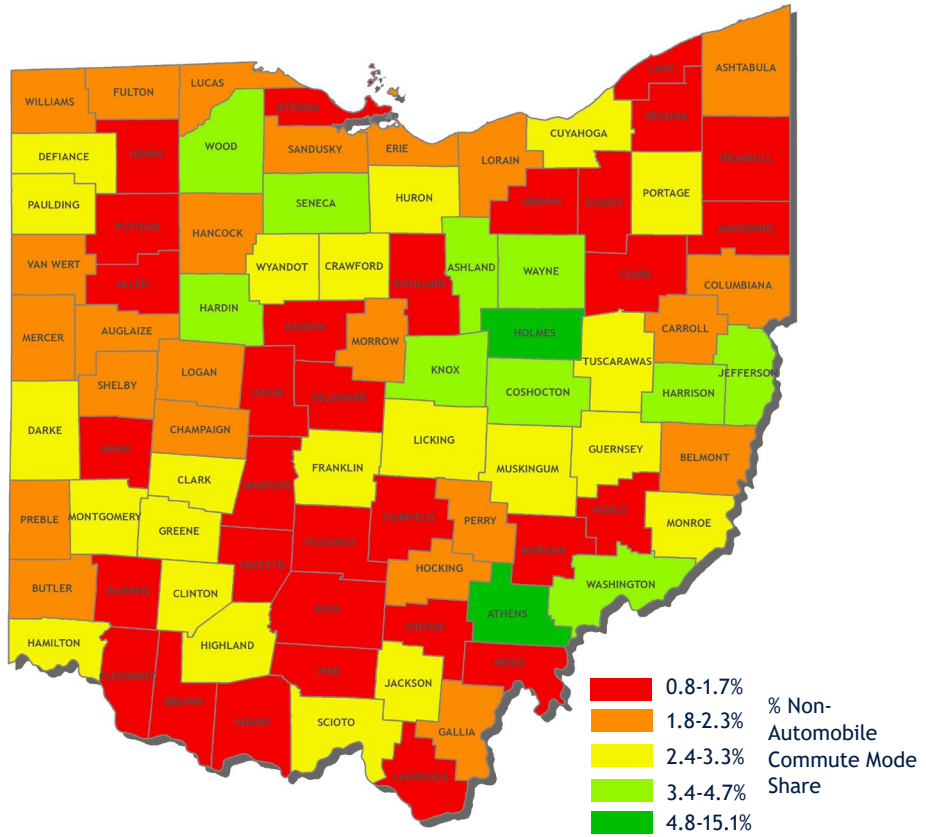
One key strategy to reducing congestion is to encourage the use of carpooling, transit and non-motorized modes of transportation. For example, every participant in a carpool removes one additional car from a community's roadways. Transit further leverages this congestion reduction strategy, as one bus can remove more than 40 cars from the roadways. Using non-motorized means of transportation not only helps to alleviate congestion, they result in additional health and environmental benefits as well.

The U.S. Census Bureau's American Community Survey (ACS) provides a wealth of data on the use of various transportation modes used by Americans for their daily commutes to work.

According to the ACS, most Ohioans (83.2%) drive to work alone in their personal vehicles. However, the data also indicates that nearly one in five use alternative means in their daily commute. The Census Bureau treats "telecommuting/working from home" as a mode of daily commute. This is a trend that is likely to increase significantly as employers rethink their staffing arrangements in a post COVID-19 world. The map shows the range of active transportation used per county.

Non-Automobile Mode Share (% of Ohio Commuters)





Top Counties

In 2019, the following six counties had the highest rate of bike and pedestrian commuters to work totaling over 46.7%. Below are their respective totals:

1. Athens 15.1%
2. Holmes 13.3%
3. Knox 4.7%
4. Ashland 4.6%
5. Hardin 4.5%
6. Wood 4.5%

Chapter 5

System Reliability

Overview

System reliability represents the concept of trip predictability, or conversely, the removal of variability from a vehicle trip. It is essentially being able to depend on the same trip, occurring at the same time each day, under the same conditions taking the same amount of time. When a traffic incident or a special event turns a standard one hour commute into a two hour commute, employees are late for work, the elderly miss medical appointments and truck drivers fail to meet delivery deadlines.

ODOT uses a number of strategies to improve the reliability of Ohio's transportation system. Examples include a fleet of traffic incident response vehicles, prompt snow and ice removal, interstate message boards and increasing implementation of Smart Lane technology. In addition to ODOT's in-house strategies to improve system reliability, the introduction of sophisticated national data sets assists in measuring system reliability. Technologies now exist to track cell phone locational data or on-board automobile systems to anonymously track vehicle movement and calculate trip duration. Looking at these massive data sets, transportation planners can identify spikes in trip delay, which can in turn be used to address specific problem areas.

This section highlights the specific measures that ODOT uses to calculate system reliability, and how we are progressing in meeting their related targets.

System Reliability Measures & Targets

Performance Measures	2019 Performance	4-Year Targets	Target Met?	Trend
Highway Measures				
Travel Time Reliability (TTR) - Interstates	89.3%	> 85.0%	✓	~
Travel Time Reliability (TTR) - Non-Interstates	90.0%	> 80.0%	✓	↑

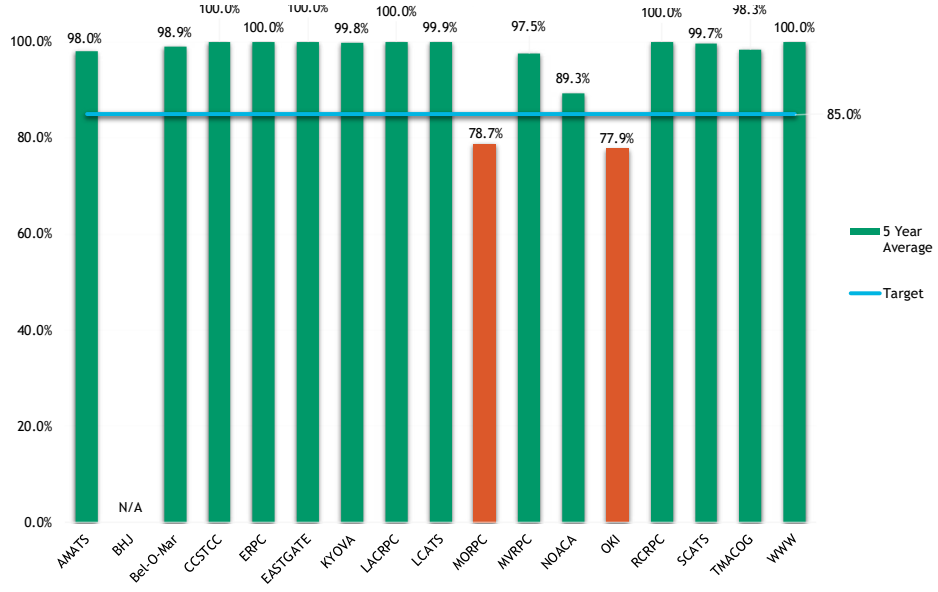
Trending Upward – Positive ↑
Inconsistent ~
Target Met ✓

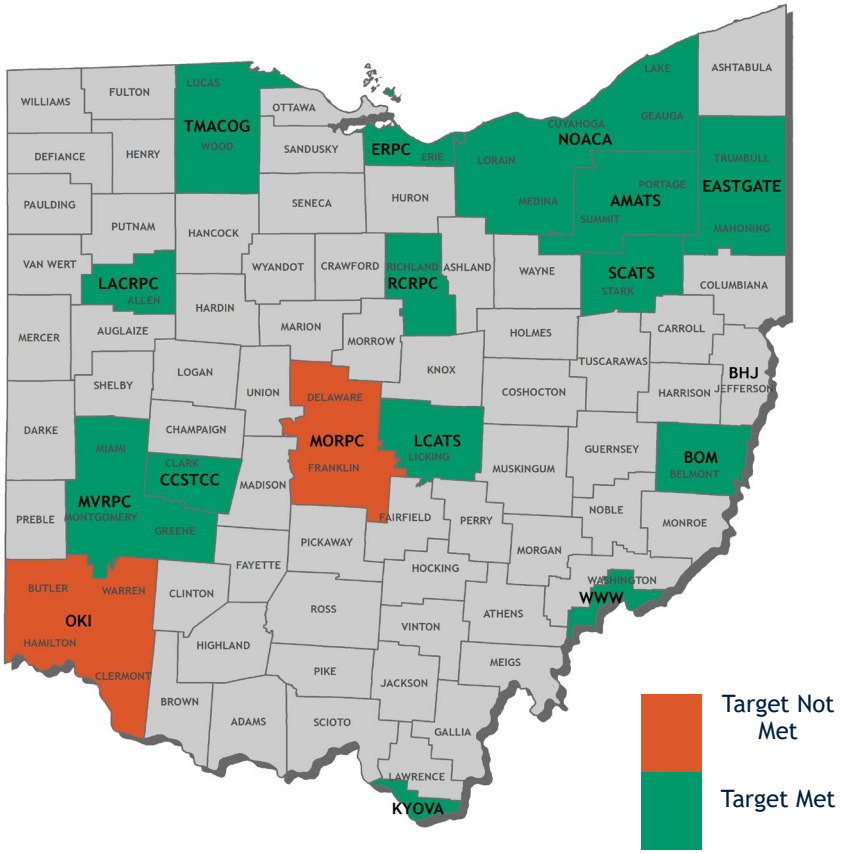
Travel Time Reliability - Interstate

Ohio's interstate travel time reliability has hovered around 90% over the last five years. There was a slight reduction in reliability between 2018 and 2019, dropping from 91.2% to 89.3%. Regardless, Ohio's interstates have continually outperformed their 85.0% target during the 5-year reporting period.

With the significant investment the state and its local partners are making in interstate improvement and congestion management strategies, this positive trend is expected to continue into the foreseeable future.

Travel Time Reliability by MPO: Interstate 5-Year Average (2015-2019)





Key Points

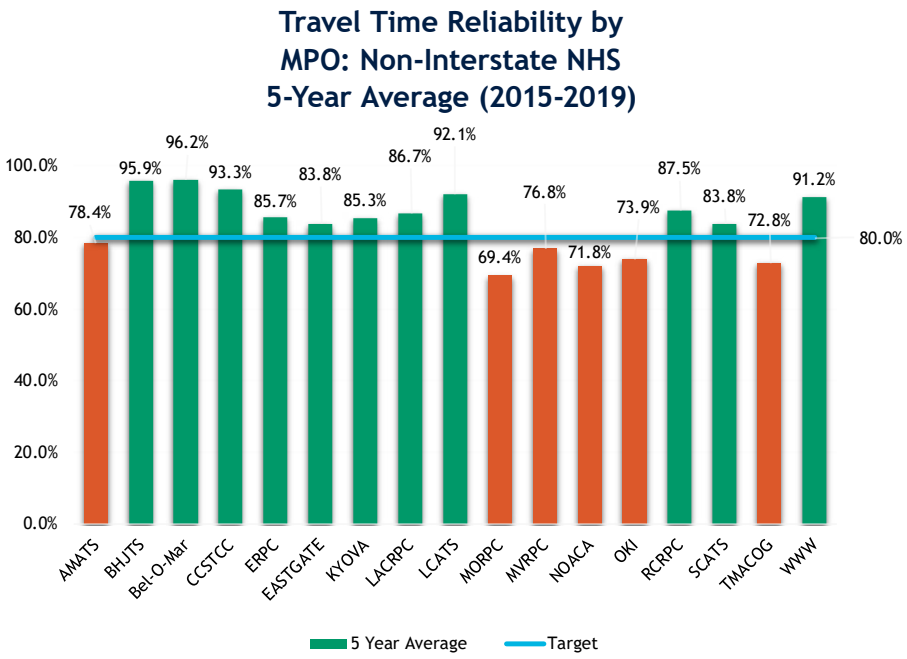
- MORPC and OKI have programmed 16 key projects, with a total cost of $428 million, in their fiscal year 2021-2024 Transportation Improvement Programs to address interstate travel time reliability.

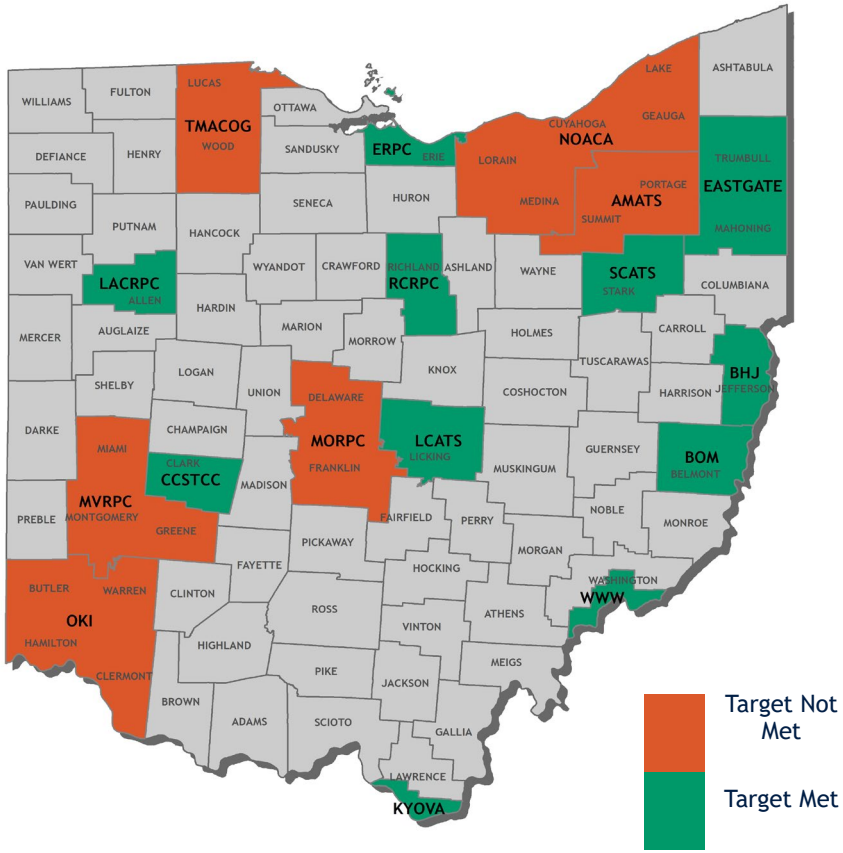
Travel Time Reliability - Non-Interstate

Ohio Department of Transportation

Ohio's non-interstate NHS roadways have seen a drastic improvement in reliability in the past two calendar years. The state has set a roadway reliability target of 80% or greater. In 2015 through 2017, Ohio's non-interstate assets fell well short of that mark, averaging in the mid to upper 60% range.

However, in 2018 and 2019, non-interstate reliability skyrocketed nearly 25% to approximately the 90% reliability range. Through continued targeted investment in its non-interstate NHS roadway assets, Ohio should expect this trend of highly reliable travel times to continue going forward.





Key Points

- The six MPOs not currently meeting the target have programmed a total of 61 projects, with a total cost of $253.6 million, in their fiscal year 2021-2024 Transportation Improvement Programs to address non-interstate travel time reliability.

Chapter 6

Freight Movement and Economic Vitality

Overview

Ohio has one of the largest freight systems in the nation, from its vast interstate highway network to its maritime ports and multi-modal terminals. Manufacturing, warehousing, distribution and logistics companies comprise a large portion of the state's economy. In order to continue to facilitate this driver of Ohio's overall economy, ODOT carefully analyzes the effectiveness of the state's freight infrastructure and makes improvements as necessary.

In today's just-in-time economy, it is critical to keep freight moving on schedule. In attempting to make freight improvements, one of the most important factors is to eliminate various impediments. Removing bottlenecks on our interstate highway system, particularly in Ohio's larger cities, is perhaps the greatest challenge to improving freight movement. Other areas of focus include the grade separation of roadways from railroads, improving roadway geometries and controlling access for improved traffic flow.

ODOT is keenly aware of the importance of freight to the state's overall economy and engages in statewide and corridor-specific planning to keep the freight network running at optimal levels. The monitoring of system performance and comparing it to established targets is vital to this effort.

Freight Movement & Economic Vitality Measures & Targets

Performance Measures	2019 Performance[1]	4-Year Targets[1]	Target Met?	Trend
Highway Measures				
Truck Travel Time Reliability (TTTR) - Index	1.36	< 1.50	✓	↓

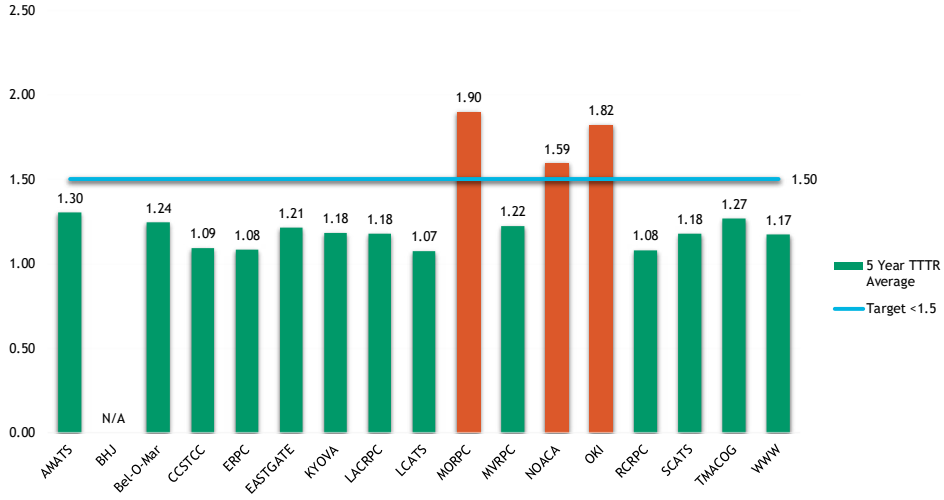
[1]Index Expressed as Level of Travel Time Reliability (LOTTR)

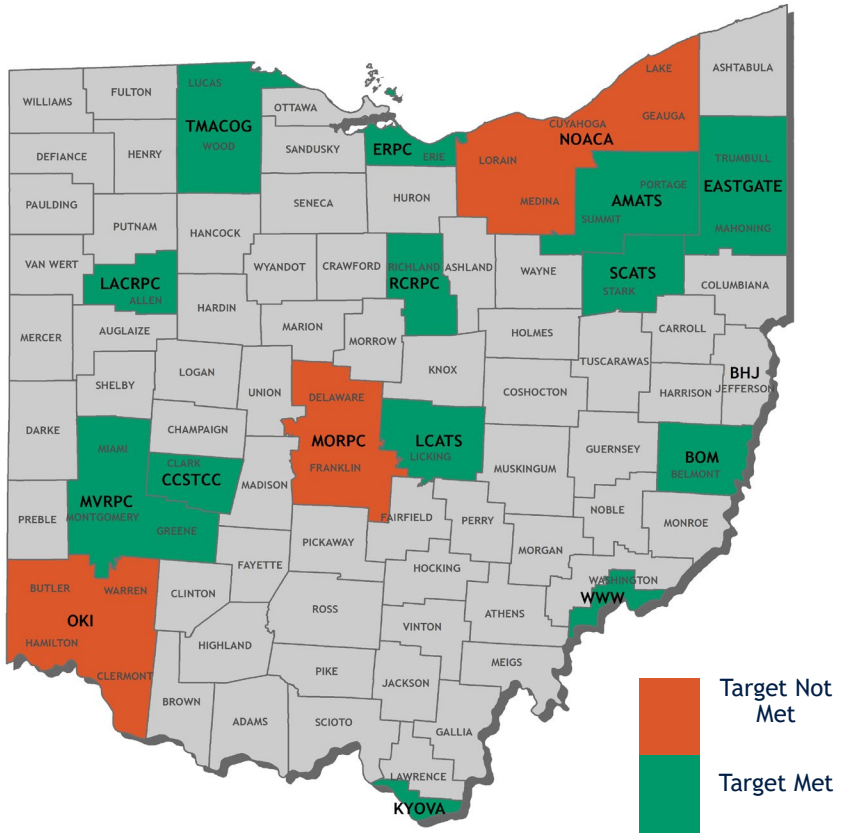
Trending Downward – Positive ↓
Target Met ✓

Truck Travel Time Reliability Index

Ohio is a national hub for the truck-based freight industry, and the increasing reliability of its vast interstate highway network is key to its continued growth and success. Ohio has set a performance target of a 1.50 (or less) Level of Travel Time Reliability (LOTTR) for truck freight. LOTTR is an index in which a 1.00 level would result in perfectly reliable truck travel, i.e. a specific trip would take precisely the same amount of time each time it was taken. Therefore, Ohio's 1.50 target allows for 50% variability in trip travel time. Overall, truck travel time reliability has steadily improved in Ohio, dropping from a 5-year high of 1.46 in 2015 to 1.36 in 2019. Ohio is well-poised to continue to beat its established target for years to come.

Truck Travel Time/Freight Reliability by MPO 5 Year Average (2015-2019)





Key Points

- Ohio's "Three Cs" have programmed 27 projects, with a total cost of $453 million, in their fiscal year 2021-2024 Transportation Improvement Programs to address truck travel time reliability.

Chapter 7

Environmental Sustainability

Overview

Ohio is a state rich in natural resources, plant life and wildlife. ODOT strives to strike the delicate balance between maintaining the transportation system so important to our daily lives and economy, while preserving these precious limited resources.

There are two primary ways that the transportation system can have a negative impact on the environment. The first is the reduction in, or destruction of, natural resources by developing farmland, forests or wetlands into transportation assets such as roadways, airports or rail yards. Fortunately, there are numerous federal, state and local agencies and processes in place to ensure the optimal preservation of these natural resources.

The second type of environmental impact resulting from the transportation system is pollution. Today, most vehicles burn fossil fuels, which in turn release a number of pollutants into the atmosphere, negatively affecting surrounding air and water quality. Thankfully, ODOT, the federal and Ohio EPA and other agencies work hard to minimize or eliminate these pollutants. In addition to improvements making traditional fuel-burning vehicles cleaner than ever, vehicles incorporating new technologies, such as electric and clean-fuels, are increasing their modal share of Ohio's transportation system.

Ohio is on the leading edge in the development of these new transportation technologies and is poised to make tremendous improvements in air quality and the preservation of natural resources. Ohio has set aggressive performance targets to ensure the continued livability of our beautiful state.

Environmental Sustainability Measures & Targets

Performance Measures	2019 Performance[1]	4-Year Targets	Target Met?	Trend
Highway Measures				
Total Emissions Reduction - VOC (kg/day)	58.209	> 69.000	○	∿
Total Emissions Reduction - NOx (kg/day)	93.779	> 537.00	○	∿
Total Emissions Reduction - PM 2.5 (kg/day)	53.592	> 36.000	✓	↑

[1]Performance period for CMAQ emissions reduction measures follows the federal fiscal year: 10/1 through 9/30. Annual emissions data is not available until September and therefore lags behind most other PM data.

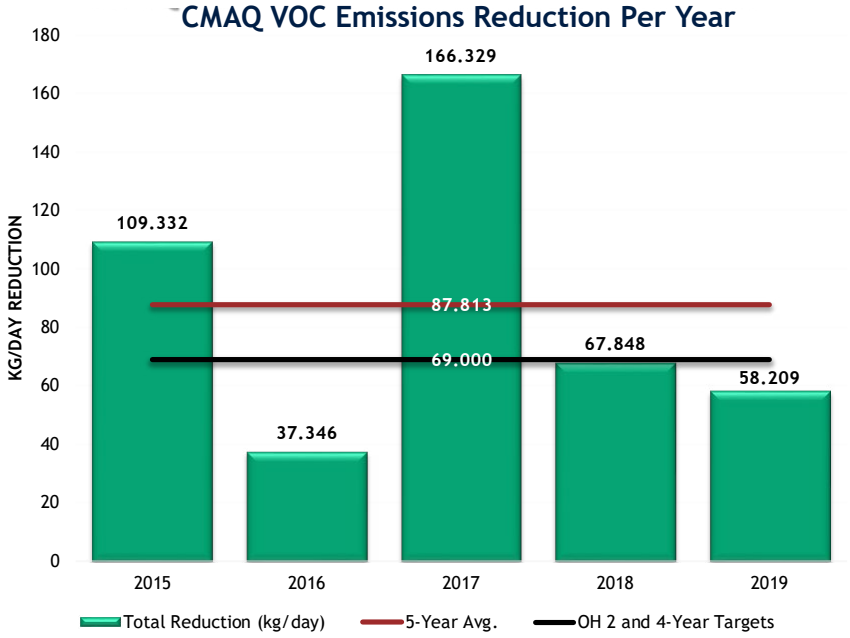
Trending Upward – Positive ↑
Inconsistent ∿
Target Not Met ○
Target Met ✓

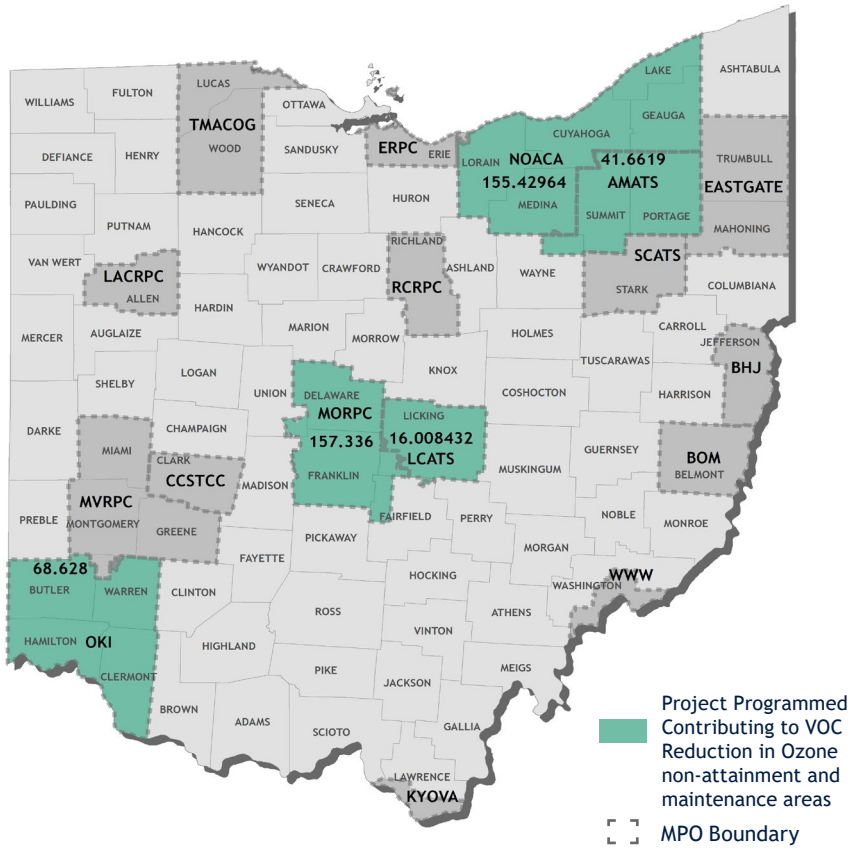
Total Emissions Reduction of VOC

Ohio Department of Transportation

Volatile organic compounds (VOCs) are gases that are released from fuel as it goes through the combustion process. When released into the air, VOCs combine with nitrous oxides (NOx) to form ground level ozone (O3). The newly formed ozone gases are dangerous to the health and wellbeing of not only humans, but to the environment. To abate the harmful effects of ozone, EPA enacted several standards to reduce levels of ozone in the air. Ohio has 33 counties that are either in maintenance or non-attainment for the 1997, 2008, and 2015 ozone standards.

In 2019, 24 CMAQ funded projects were implemented that were expected to result in a reduction of the state's overall VOC emissions in Ozone non-attainment and maintenance areas. The total statewide VOC reduction is expected to be 58.209 kg/per day, a 14% decrease from 2018. Ohio is currently exceeding its 4-year target for this measure.





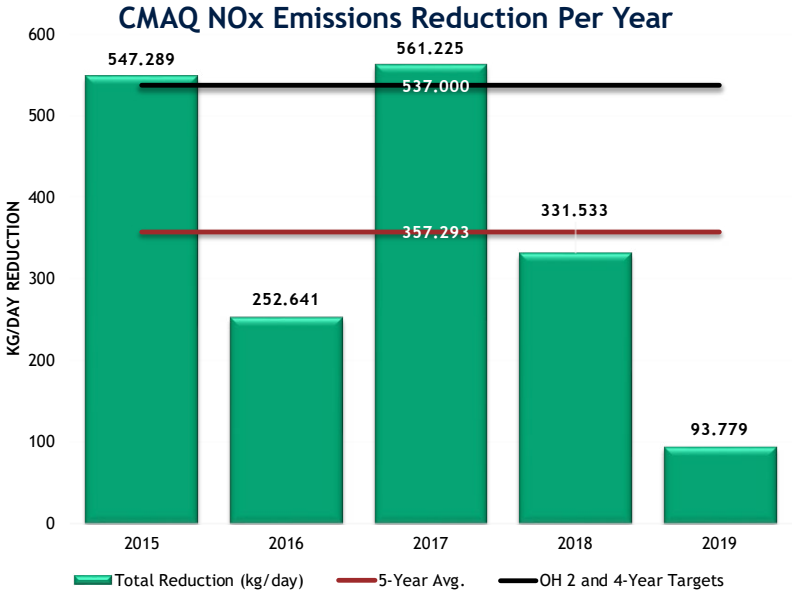
Key Points

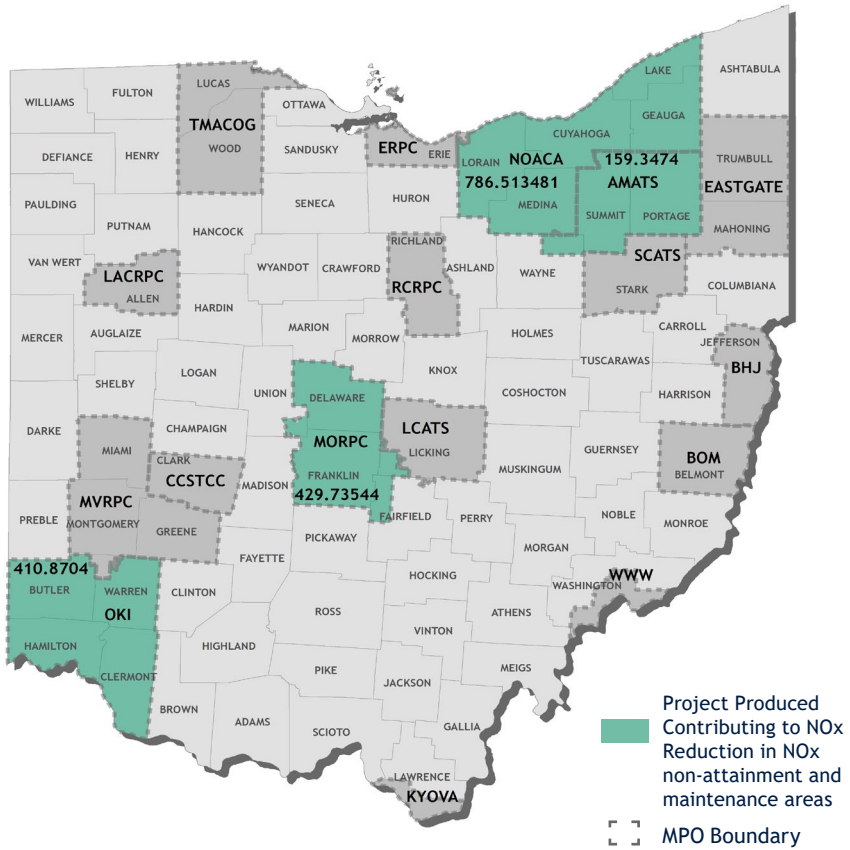
- Ohio implemented 123 CMAQ funded projects between 2015 and 2019 that reduced statewide VOC emissions by 439.064 kg/day in Ozone non-attainment and maintenance areas.

Total Emissions Reduction of NOx

Nitrous Oxides (NOx) are gases that are released from fuel as it goes through the combustion process. When released into the air, NOx gases can combine with volatile organic compounds to form ground level ozone. NOx also poses a threat itself since it contributes to things such as acid rain and smog. To abate the harmful effects of NOx, EPA enacted several standards to reduce levels of the gases in the air. Although Ohio is not in violation of any NOx standards, the state will continue take measures to make sure NOx levels remain within acceptable standards/limits.

In calendar year 2019, Ohio implemented 34 CMAQ funded projects that are expected to reduce NOx levels by a total of 93.779 kg/day in NOx non-attainment and maintenance areas.





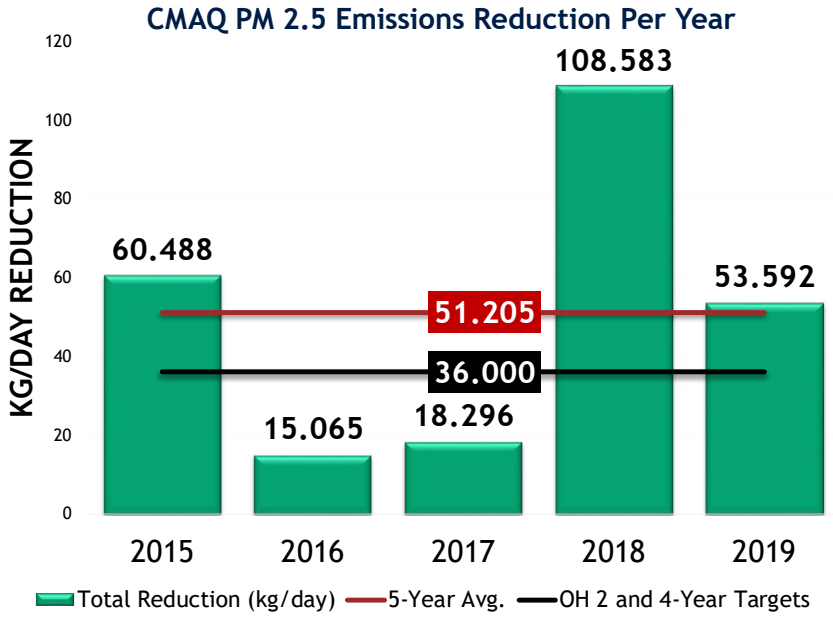
Key Points

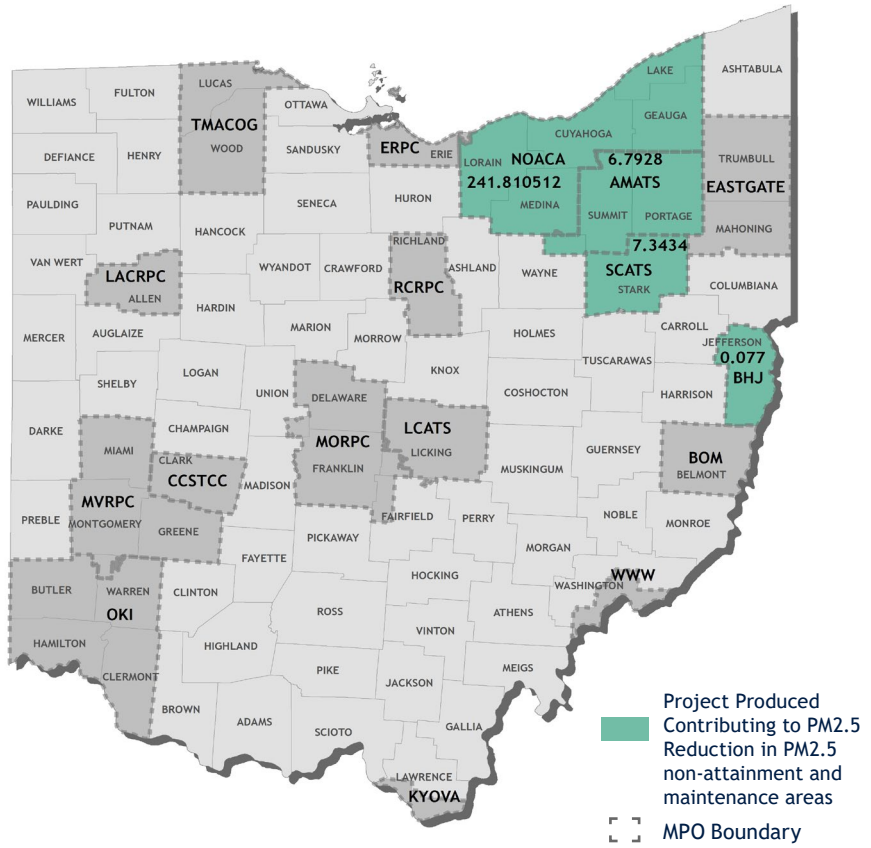
- Between 2015 and 2019, Ohio implemented 154 projects that reduced statewide NOx emissions by 1786.467 kg/day in NOx non-attainment and maintenance areas.

Total Emissions Reduction of PM2.5

Particulate matter 2.5 or PM2.5 is defined as any fine particles 2.5 micrometers or smaller and are inhalable. PM2.5 is primarily created in mobile sources through the combustion of fuels. EPA enacted several standards to reduce levels of PM2.5 in the air. Over the years, Ohio has succeeded at maintaining the output of mobile sources of PM2.5. Currently there are only 8 counties that are either in a maintenance or non-attainment for the 2006 and 2012 standards.

In 2019, Ohio implemented 7 CMAQ funded projects that contributed to a reduction of 53.592 kg/day in PM2.5 non-attainment and maintenance areas.





Key Points

- Ohio implemented 92 projects to reduce statewide PM2.5 emissions by 256.024 kg/day between 2015-2019 in PM2.5 non-attainment and maintenance areas.

Chapter 8

Livability

The vast majority of Ohio's transportation assets are publicly funded, and therefore, every resident, visitor, or consumer in Ohio should have access to them, regardless of their background or financial circumstances. Gone are the days when transportation decisions were made without input from those who would be the most impacted – those with no voice and little political power. All recipients of federal funds are now required to incorporate Environmental Justice into their transportation planning and development processes. Environmental Justice requires that low-income and minority areas are to enjoy equal benefits from publicly funded transportation projects, and shall not bear a disparate share of any negative impacts.

ODOT and its local and regional transportation partners engage in robust public involvement activities to ensure that the opinions and concerns of all citizens and stakeholders are heard. In addition to income and different racial and linguistic backgrounds, transportation planners must ensure that older citizens and those with disabilities share equal access to transportation planning and improvements.

In the future, ODOT will adopt specific performance measures and targets to ensure that transportation funding and assets are developed in the most equitable manner possible.

Livability Measures & Targets

Performance Measures	2019 Performance	Target	Target Met?	Trend
Bike and Pedestrian Measures				
Physical Activity[1]	18.3%[3]	TBD	○	TBD
Funds Spent in Disadvantaged Communities[2]	23%	TBD	○	TBD

Target Not Met ○

[1] Expressed as percentage of adults meeting physical activity guidelines

[2] Expressed as percentage of projects ODOT's 4 year plan investing in high-demand, disadvantaged communities

[3] 2017 data (https://odh.ohio.gov/static/SHIP/2020-2022/2020-2022-SHIP.pdf

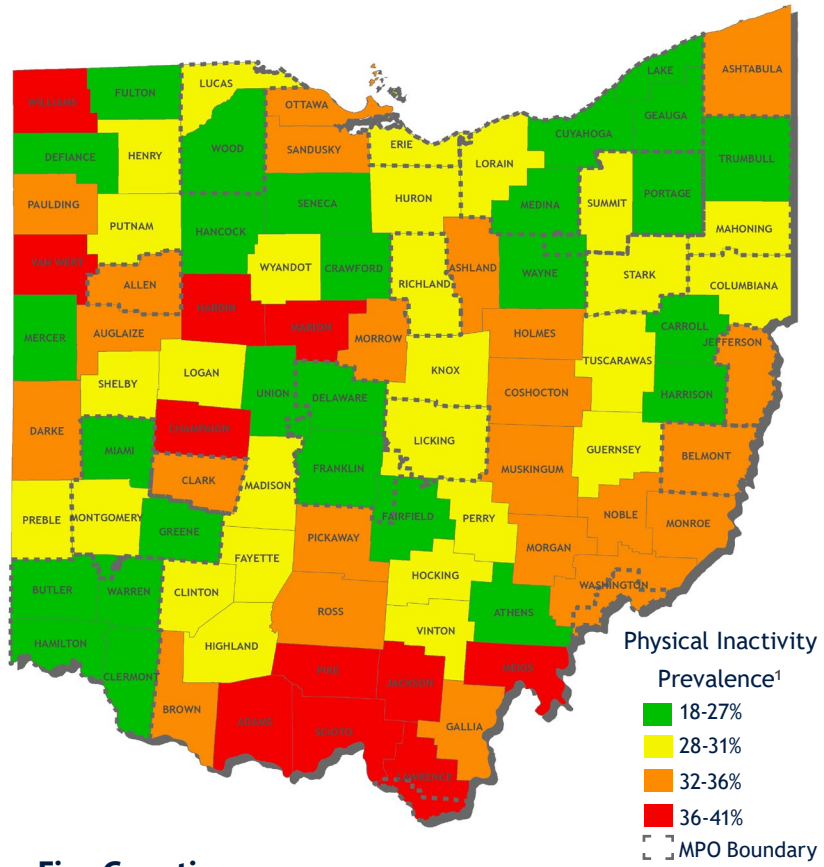
Physical Activity

When residents have access to connected and safe places to walk and bicycle, it is easier to access critical goods and services, expand social connections, address mental health, and engage in more physical activity. In turn, increased physical activity – including even small shifts from sedentary behavior to lower levels of activity – can help reduce the risk of various diseases and health conditions.

The 2008 Physical Activity Guidelines for Americans from the U.S. Department of Health and Human Services recommends that adults aged 18 to 64 engage in at least 150 minutes of moderate intensity aerobic physical activity each week. Currently only 18.3% of adult Ohioans meet these guidelines (BRFSS).

More information on the relationship between active transportation and Ohio's health outcomes can be found on Walk.Bike.Ohio's website.

[1] Data Source: Ohio BRFSS, 2013-2017. Represents among adults, the proportion of those who reported that they did not participate in regular physical activities or exercise during the past month other than their regular job.



Top Five Counties

During 2019, the five counties that had the highest inactivity prevalence are listed below:

1. Williams (District 2)
2. Adams (District 9)
3. Meigs (District 10)
4. Hardin (District 1)
5. Marion (District 6)

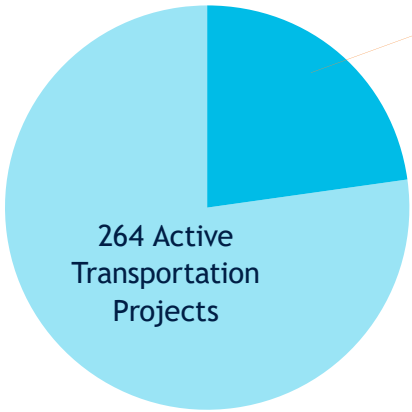
AT Funds Spent in Disadvantaged Communities

Ohio Department of Transportation

Many communities rely on multiple modes to connect to basic services that are necessary to live productive, fulfilling, and healthy lives. Building bicycling and walking facilities in areas of high need can help provide multiple transportation options and decrease some of the economic disparities experienced by residents.

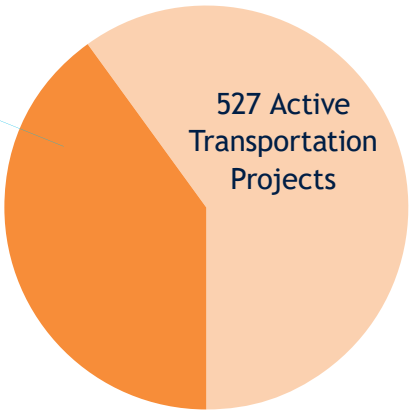
While financial data is currently unavailable for all active transportation (AT) related improvements, over the next four years, at least $272 million dollars will be invested in standalone active transportation projects specifically in high-need-high demand areas of the state (i.e. households that do not have cars, etc).

Previous 4 Fiscal Years

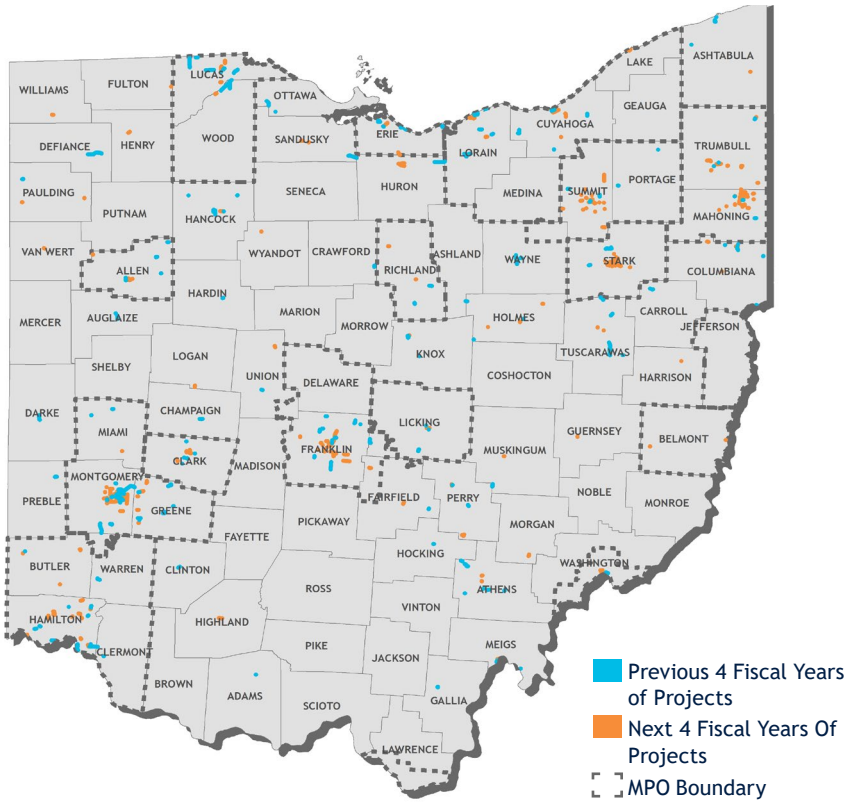


23% of projects intersected an area of high demand and need.

Next 4 Fiscal Years



40% of projects intersected an area of high demand and need.



Key Points

Previous 4 Fiscal Years		Next 4 Fiscal Years
54 Miles (39% of total)	Active Transportation Project Miles in High Demand and High Need Aress	**58 Miles** (44% of total)
$111M (51% of total)	Active Transportation Spending in High Demand and High Need Aress	**$272M** (47% of total)

*Totals include only projects that could be mapped to the ODOT LRS system.

OHIO DEPARTMENT OF
TRANSPORTATION