NC MOVES 2050

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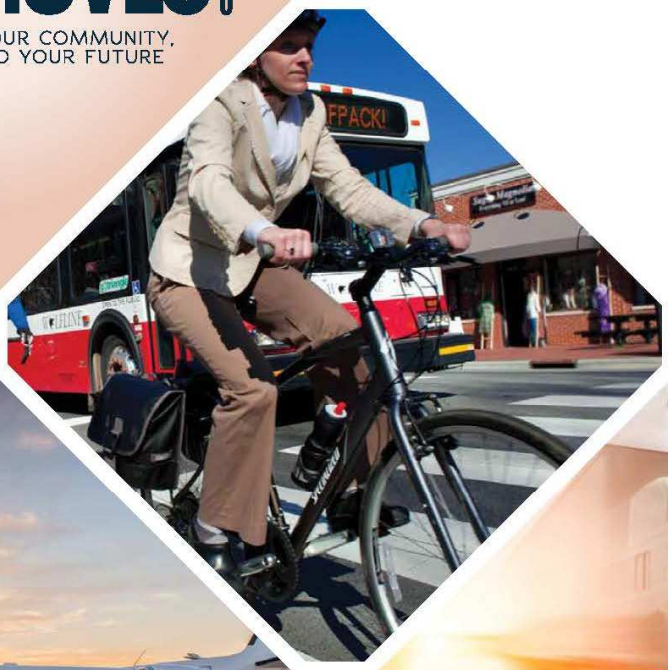

NC MOVES 2050 SYSTEM PERFORMANCE REPORT

October 2020

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1. INTRODUCTION

1.1 TRANSPORTATION PERFORMANCE MANAGEMENT BACKGROUND

NCDOT's mission is to connect people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina. To meet this mission, the Department must provide a safe, well-maintained and reliable transportation system that continues to address ongoing safety, asset management, system reliability and performance target setting. NCDOT is responsible for a total of 79,956 miles with 7 percent route mile share on the National Highway System (NHS).

The federal transportation planning process requires state Departments of Transportation (DOT), Metropolitan Planning Organizations (MPO), and public transportation providers to apply a transportation performance management (TPM) approach in carrying out their transportation planning and programming activities. The TPM process requires agencies to use a coordinated performance-based approach to make transportation decisions that support national goals of the federal-aid highway and public transportation programs. These national goals are:

- **Safety:** To achieve a significant reduction in traffic fatalities and serious injuries on all public roads and public transportation systems.
- **Infrastructure Condition:** To maintain the highway infrastructure and transit capital asset systems in a state of good repair.
- **Congestion Reduction:** To achieve a significant reduction in congestion on the National Highway System (NHS).
- **System Reliability:** To improve the efficiency of the surface transportation system.
- **Freight Movement and Economic Vitality:** To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- **Environmental Sustainability:** To enhance the performance of the transportation system while protecting and enhancing the natural environment.
- **Reduced Project Delivery Delays:** To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practice.

One of the federal TPM requirements NCDOT must meet is to include a description of federal transportation performance measures and targets and a system performance report in its statewide long-range transportation plan. The system performance report evaluates the condition and performance of the transportation system with respect to the federal performance targets, including progress achieved by the MPOs in meeting those targets in comparison with system performance recorded in previous reports. This system performance report addresses the following federal performance measure categories and associated statewide performance targets:

- Highway Safety (PM1)

- Pavement and Bridge Condition (PM2)
- System Performance, Freight, and Congestion Mitigation and Air Quality (PM3)
- Transit Assets

Although NC Moves 2050 was not designed to foresee the impacts caused by a global pandemic, the system performance report is even more relevant and important as a result of COVID-19. The unpredictable disruption associated with the pandemic and other drivers of change are altering the way people value mobility and make transportation choices. As the reported data and analysis was conducted prior to the pandemic, some targets and future rolling averages in this report will be impacted by short term factors including reduced traffic, vehicle miles travelled (VMT) and other travel patterns due to COVID-19.

1.2 TPM AND EXISTING PLANS AND PROGRAMS

NCDOT recognizes the importance of linking its transportation goals, objectives and investment priorities to national goals. As such, the NC Moves 2050 planning process directly reflects the goals, objectives, performance measures and targets as they are available and described in other state and public transportation plans and processes; specifically, the North Carolina Strategic Highway Safety Plan (SHSP), the Highway Safety Improvement Program (HSIP), the Transportation Asset Management Plan (TAMP), the North Carolina Multimodal Statewide Freight Plan and the NCDOT Group Transit Asset Management Plan.

- NC Moves 2050 is North Carolina's strategic transportation plan that is focused on creating a more responsive, diverse and inclusive transportation system within the state. To develop the plan, NCDOT conducted a two-year study that analyzed all aspects of the transportation system including collecting data on network performance and highlighting drivers of change that will potentially shape and impact the future of transportation. The study also provides an implementation plan that aligns future needs and opportunities with infrastructure recommendations and transportation policies.
- The North Carolina SHSP is intended to reduce the number of crashes, injuries and fatalities on the state's roadways. The SHSP's vision, mission and goals guide the development and implementation of strategies and actions focused on nine critical safety emphasis areas representing the 4 E's of safety (engineering, education, enforcement, and emergency medical services). These were selected through a data driven, performance approach and a collaborative process among North Carolina's safety partners to achieve Vision Zero, where one fatality is too many on North Carolina roads.
- The HSIP annual report provides for a continuous and systematic process that identifies and reviews traffic safety issues across the state including locations with potential for improvement. The goal of the HSIP process is to eliminate certain predominant types of crashes through the implementation of engineering solutions, thereby reducing the number of fatalities and injuries.
- The Moving Ahead for Progress in the 21st Century Act (MAP-21) requires states to develop a TAMP for all NHS pavements and bridges within the state. North Carolina's TAMP outlines the practices employed at NCDOT to match data-driven analysis to the challenges of lifecycle management, risk management and financial planning. The TAMP is essential to limiting long-term costs while extending the overall lifecycle and boosting the system-wide performance of the transportation network.

- The North Carolina Multimodal Statewide Freight Plan defines the conditions and performance of the state freight system and identifies the policies and investments that will enhance highway freight mobility well into the future. The Plan identifies freight needs and the criteria used to determine investments in freight and prioritizes freight investments across modes.

The sections that follow detail the federally required performance measures and NCDOT's associated targets, as well as baseline and recent performance. It is important to note that this system performance report does not address transit safety, the remaining federal performance measure category. Under this measure, transit providers must establish transit safety targets by December 31, 2020. States must include the transit safety measures and targets in the statewide long-range transportation plan on or after July 20, 2021.

2. HIGHWAY SAFETY (PM1)

In April 2016, the Federal Highway Administration (FHWA) established five highway safety performance measures to carry out the HSIP. The HSIP is a federal-aid funding program intended to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. These performance measures are:

1. Number of fatalities
2. Rate of fatalities per 100 million vehicle miles traveled
3. Number of serious injuries
4. Rate of serious injuries per 100 million vehicle miles traveled
5. Number of combined non-motorized fatalities and non-motorized serious injuries

Safety performance targets are established annually by the State DOTs for each safety performance measure and reported to FHWA in the HSIP Annual Report. MPOs then establish annual targets for each measure by either agreeing to program projects that will support the statewide targets or setting quantifiable targets for the metropolitan planning area.

Current statewide safety targets address calendar year 2021 and are based on a five-year rolling average of historical data and anticipated trends. North Carolina statewide safety performance targets for 2021 are included in Table 1~~Table 1~~, along with statewide safety performance for the three most recent reporting periods (2013-2017, 2014-2018, and 2015-2019). NCDOT established the 2021 PM1 targets in August 2020. By February 27, 2021, MPOs must either support the state targets or adopt their own targets for the MPO area. In 2020, each MPO in North Carolina agreed to support the 2020 statewide safety targets.

TABLE 1: HIGHWAY SAFETY (PM1) SYSTEM CONDITIONS AND PERFORMANCE

Performance Measures	Statewide Five-Year Rolling Average (2013-2017)	Statewide Five-Year Rolling Average (2014-2018)	Statewide Five-Year Rolling Average (2015-2019)	Statewide Five-Year Rolling Average Calendar Year 2021 Targets
Number of Fatalities	1,359.0	1392.4	1427.2	≤1,309.9
Rate of Fatalities per 100 Million Vehicle Miles Traveled	1.214	1.206	1.208	≤1.105
Number of Serious Injuries	2,860.8	3,537.6	3,905.0	≤3,656.1
Rate of Serious Injuries per 100 Million Vehicle Miles Traveled	2.524	3.028	3.281	≤3.065
Number of Combined Non-Motorized Fatalities and Non- Motorized Serious Injuries	431.4	473.6	543.4	≤504.4

As shown in Table 1~~Table 1~~, the five-year rolling average of four of the five measures, with the exception of fatality rate, increased from 2013-2017 to 2015-2020. The 2021 targets are based on a goal of reducing fatalities and serious injuries by a certain percentage by December 31, 2021.

In early 2020, FHWA completed an assessment of target achievement for NCDOT's 2018 safety targets based on the 5-year averages for 2014-2018 for each measure. Per FHWA's PM1 rule, a state has met or made significant progress toward its safety targets when at least four of the targets have been met or the actual outcome is better than the baseline performance. Based on FHWA's review, North Carolina did not make significant progress toward achieving its safety targets. As a result, NCDOT must ensure that all HSIP safety funds are obligated and must develop an HSIP Implementation Plan that describes actions the state will take to meet or make significant progress toward achieving its targets.

Safety conditions are updated annually and reported to FHWA on a rolling 5-year average basis and will be reflected within each subsequent system performance report to track performance over time in relation to baseline conditions and established targets.

2.1 PLANNING ACTIVITIES TO ADDRESS PM1

Similar to many states, North Carolina has seen an increase in motorized and non-motorized traffic fatalities and serious injuries in recent years. In an effort to reduce collisions that end in fatalities and serious injuries, North Carolina created a HSIP to provide a continuous systematic procedure that identifies statewide safety concerns and potentially hazardous locations. North Carolina's Strategic Highway Safety Plan (SHSP) directly supports the HSIP and is the product of collaborative efforts to improve the safety of the transportation network by using the 4 E's (engineering, education, enforcement, and emergency medical services).

North Carolina's SHSP identifies 15 emphasis areas or factors that consistently contribute to severe crashes. They are alcohol impairment, distracted driving, drugged driving, heavy trucks, intersections, lane departures, motorcycles, older drivers, pedestrians, rear-ends, sideswipe, speeding, young drivers, unbelted drivers and work zones. In addition to providing strategies that address and improve these emphasis areas, the state is committed to Vision Zero: the notion that everyone has the right to be safe on the roadways and that even one fatality is too many.

The SHSP for North Carolina has set a goal of reducing fatalities and serious injuries by half by 2035 and approaching zero by 2050. As such, North Carolina set performance targets to meet those goals. This results in very aggressive targets that will be challenging to meet and would require substantive cultural, legislative and infrastructural efforts that are beyond what the HSIP is able to implement or deliver. However, many counties and some states have made progress in reducing fatalities and serious injuries and it is an achievable vision.

In the near term, the HSIP program will focus on the following three program areas that align with the SHSP: Roadway Departure, Intersection and Pedestrian. Each of these program areas require data driven and focused approaches to achieve a reduction in crashes, or risk that leads to fatal and serious injury collisions in those emphasis areas.

The Roadway Departure Program will further emphasize a focus on systemic program delivery of proven countermeasures that can be broadly implemented on many miles of roadway. Improved signing, markings,

rumble strips and guardrails will be significant areas of focus of these systemic efforts. This approach will be monitored and evaluated for effectiveness.

The focus on intersections will be to identify locations with strong frontal impact crash patterns for treatment. Countermeasures will vary across the state. In rural areas an emphasis will be locations where all-way stop traffic control can be established with minimal impacts to operations. All-way stops have been proven to be low cost and have some of the highest fatal and serious injury crash reductions of any feasible intersection design. Additional efforts to signal modification (phasing changes), signing and back plate improvements will also be considered.

Pedestrian crashes that lead to fatal and serious injuries are more complex. The Pedestrian Safety Improvement Program will continue to develop risk and crash data screening tools to improve the locations that are identified for further review and investigations. Corridors and areas where risk is high will receive additional attention. In addition, systemic programs will be further emphasized that can address broad areas with countermeasures that can align with common pedestrian crash types, such as ped-vehicle left turning crashes at signalized intersections or mid-block crashes along corridors.

Transportation safety is imperative to providing a high quality of life for North Carolina residents. Safety is one of five key plan objectives to highlight strategies, actions and implementation efforts to promote more multimodal safety and behavioral-based programs, policies and assessment tools statewide.

To ensure safety and security, NCDOT and its partners have fostered an approach that includes the 4 E’s and new technologies. As stated in the NC Moves 2050 Plan, this will be realized by a set of actions that include: enhance collaboration and partnerships with agencies and stakeholders that foster safety awareness and law enforcement; develop and implement new multimodal safety policies and standards that focus on public safety; research and invest in technology that can be used to reduce crashes; enhance crash data; monitor risky driver behaviors and promote safety for all users; and develop a network of statewide safety corridors to address over-represented crashes and deploy educational, enforcement and infrastructure treatments.

3. PAVEMENT AND BRIDGE CONDITION (PM2)

In May 2017, FHWA established performance measures to assess pavement condition and bridge condition for the National Highway Performance Program. This second FHWA performance measure rule (PM2) established six performance measures:

1. Percent of Interstate pavements in good condition
2. Percent of Interstate pavements in poor condition
3. Percent of non-Interstate National Highway System (NHS) pavements in good condition
4. Percent of non-Interstate National Highway System (NHS) pavements in poor condition
5. Percent of NHS bridges by deck area classified as in good condition
6. Percent of NHS bridges by deck area classified as in poor condition

3.1 PAVEMENT CONDITION MEASURES

The pavement condition measures represent the percentage of lane-miles on the Interstate or non-Interstate NHS that are in good condition or poor condition. FHWA established five metrics to assess pavement condition. For each metric, a threshold is used to establish good, fair or poor condition. Each 0.1 mile section of pavement is evaluated and rated. The section is in good condition if two or three (depending on pavement type) of the metric ratings are good and in poor condition if two or more metric ratings are poor. Sections that are not good or poor are rated as fair and not included in either metric.

The measures are expressed as the percentage of all roads on the Interstate or non-Interstate NHS that are in good condition and in poor condition. Pavement in good condition suggests that no major investment is currently needed. Pavement in poor condition suggests major reconstruction investment is needed due to either ride quality or a structural deficiency.

3.2 BRIDGE CONDITION MEASURES

The bridge condition measures represent the percentage of bridges, by deck area, on the NHS that are in good condition or poor condition. The condition of each bridge is evaluated by assessing four bridge components: deck, superstructure, substructure and culverts. The four components are rated separately on a numerical score from zero to nine and the bridge is then classified as good, fair or poor condition based on the lowest rating of any one component. Good condition suggests that no major investment is needed. Bridges in poor condition are safe to drive on; however, they are nearing a point where substantial reconstruction or replacement is needed.

3.3 PAVEMENT AND BRIDGE CONDITION PERFORMANCE TARGETS

Pavement and bridge condition performance is assessed and reported over a four-year performance period. The first performance period began on January 1, 2018 and runs through December 31, 2021. NCDOT reported baseline (2017) pavement and bridge condition to FHWA on October 1, 2018 and will report updated condition and performance information at the midpoint and end of the performance period. The second four-year

performance period will cover January 1, 2022 to December 31, 2025, with additional performance periods following every four years.

States and MPOs must establish two-year and/or four-year performance targets for each PM2 measure. The two-year targets represent expected pavement and bridge condition at the end of calendar year 2019, while the current four-year targets represent expected condition at the end of calendar year 2021.

States establish the following targets:

- Percent of Interstate pavements in good and poor condition – four-year targets
- Percent of non-Interstate NHS pavements in good and poor condition – two-year and four-year targets
- Percent of NHS bridges by deck area in good and poor condition – two-year and four-year targets

MPOs establish four-year targets for each measure by either agreeing to program projects that will support the statewide targets or setting quantifiable targets for the metropolitan planning area.

NCDOT established current statewide two-year and four-year PM2 targets on May 16, 2018. Subsequently, each MPO in North Carolina agreed to support the state's targets. Table 2~~Table 2~~ presents 2017 baseline performance and 2018 and 2019 actual performance for each PM2 measure as well as the current two-year and four-year statewide targets established by NCDOT.

TABLE 2: STATEWIDE PAVEMENT AND BRIDGE CONDITION (PM2) PERFORMANCE AND TARGETS

Performance Measures	Statewide Performance			2-Year Target	4-Year Target
	2017 (Baseline)	2018	2019	(2019)	(2021)
Percent of Interstate pavements in good condition	63.6%	69.6%	70.3%	Not required	≥37.0%
Percent of Interstate pavements in poor condition	0.15%	0.2%	0.1%	Not required	≤2.2%
Percent of non-Interstate NHS pavements in good condition	36.1%	35.8%	36.6%	≥27.0%	≥21.0%
Percent of non-Interstate NHS pavements in poor condition	1.2%	2.8%	1.0%	≤4.2%	≤4.7%
Percent of NHS bridges (by deck area) in good condition	38.2%	38.1%	40.1%	≥33.0%	≥30.0%
Percent of NHS bridges (by deck area) in poor condition	6.6%	6.4%	4.2%	≤8.0%	≤9.0%

As shown in Table 2~~Table 2~~, pavement and bridge condition have improved from 2017 to 2019. The percentage of pavement and bridges in good condition is higher, and the percentage in poor condition is slightly below the 2017 baseline condition. The 2019 performance targets for non-Interstate NHS pavement and bridges have been met.

NCDOT reports pavement and bridge condition annually to FHWA. Beginning in late 2020, and every two years after, FHWA will determine if NCDOT is making significant progress toward its PM2 targets. This performance

data will also be reflected in subsequent system performance reports to track performance over time in relation to baseline conditions and established targets.

3.4 PLANNING ACTIVITIES TO ADDRESS PM2

As the nation's infrastructure ages, transportation agencies across the country must find new and innovative maintenance and operations processes to extend the life cycle of critical assets and utilize budgets more efficiently. This is realized through a set of Statewide plans and programs including North Carolina's Transportation Asset Management Plan (TAMP), the Maintenance Operations and Performance Analysis Report (MOPAR) and the Highway Maintenance Improvement Program (HMIP).

North Carolina's TAMP was created to address all highway assets, pavement and bridge conditions within the state. The TAMP includes investment strategies leading to a program that would make progress toward achievement of the state's pavement and bridge condition targets. This includes but is not limited to future maintenance levels, conducting a risk assessment, projecting future asset conditions and addressing investment strategies consistent with capital programs and operating expenditures. In addition, the MOPAR and the HMIP focus on preserving, rehabilitating and resurfacing major assets including pavement and bridges by determining production levels and investment requirements to meet statewide goals.

Furthermore, NC Moves 2050 summarizes transportation deficiencies across the state and is supportive of activities to maintain, preserve and prolong the life of roadways, bridges and other infrastructure. This process considers 2050 transportation needs across a variety of "what if" scenarios in comparison to future revenue highway asset forecasts. Using these forecasts, NC Moves 2050 highlights strategies and actions needed for the up-keep of pavement and bridges to create a system that works for North Carolina's economy by providing connections to new industry clusters and transportation terminals. The plan also addresses air, sea and inland port capacity to handle freight demand and develop and mainstream risk/resiliency practices that work together to create a high-quality system.

4. SYSTEM PERFORMANCE, FREIGHT, AND CONGESTION MITIGATION & AIR QUALITY IMPROVEMENT PROGRAM (PM3)

In May 2017, FHWA established six measures to assess National Highway System (NHS) performance, freight movement on the Interstate system and the Congestion Mitigation and Air Quality Improvement (CMAQ) Program:

National Highway System Performance

1. Percent of person-miles on the Interstate system that are reliable
2. Percent of person-miles on the non-Interstate NHS that are reliable

Freight Movement on the Interstate

3. Truck Travel Time Reliability Index (TTTR)

Congestion Mitigation and Air Quality Improvement (CMAQ) Program

4. Annual hours of peak hour excessive delay per capita (PHED)
5. Percent of non-single occupant vehicle travel (non-SOV)
6. Cumulative two-year and four-year reduction of on-road mobile source emissions for CMAQ funded projects (CMAQ Emission Reduction)

4.1 SYSTEM PERFORMANCE MEASURES

The two System Performance measures assess the reliability of travel times on the Interstate or non-Interstate NHS system. The performance metric used to calculate reliability is the Level of Travel Time Reliability (LOTTR). LOTTR is the ratio of longer travel times (80th percentile) to normal travel times (50th percentile) over all applicable roads during four time periods that cover the hours of 6 AM to 8 PM each day. LOTTR is calculated for each segment (as defined by DOTs and MPOs) of roadway, essentially comparing the segment with itself. A segment is reliable if its LOTTR is less than 1.5 during all four time periods. If one or more time periods has a LOTTR of 1.5 or above, that segment is unreliable.

The measures are expressed as the percent of person-miles traveled on the Interstate or non-Interstate NHS system that are reliable. Person-miles take into account the number of people traveling in buses, cars, and trucks over these roadway segments.

4.2 FREIGHT MOVEMENT PERFORMANCE MEASURE

The Freight Movement Performance Measure assesses reliability for trucks traveling on the Interstate. A TTTR ratio is generated by dividing the 95th percentile truck travel time by a normal travel time (50th percentile) for each segment of the Interstate system over five time periods that cover all hours of the day throughout weekdays and weekends. For each segment, the highest TTTR value among the five time periods is multiplied by the length of the segment. The sum of these length-weighted segments is then divided by the total length of Interstate to generate the TTTR Index.

4.3 CMAQ PERFORMANCE MEASURES

The PHED measure assesses the hours of delay resulting from traffic congestion on the NHS during morning and afternoon weekday peak travel times. Peak travel hours are defined as 6 AM to 10 AM on weekday mornings, and either 3 PM to 7 PM or 4 PM to 8 PM on weekday afternoons. The threshold for excessive delay is based on the travel time at 20 miles per hour or 60% of the posted speed limit travel time, whichever is greater, and is measured for each 15-minute interval. Total excessive delay is weighted by vehicle volumes and occupancy and is expressed as the annual hours of excessive delay during the peak hours on a per capita basis. Thus, PHED is a measure of person-hours of delay, rather than vehicle-hours.

The non-SOV measure assesses the percent of vehicle travel that occurs with more than one occupant in the vehicle. This measure is based on person travel within the region. Non-SOV travel includes travel via carpool, van, public transportation, commuter rail, walking, bicycling and telecommuting.

The CMAQ Emission Reduction measure assesses performance of the CMAQ Program through reductions of on-road mobile source emissions. This is calculated by summing two-year and four-year totals of emission reductions of applicable pollutants, in kilograms per day, resulting from all CMAQ funded projects.

4.3.1 APPLICABILITY OF THE CMAQ MEASURES

The CMAQ Emission Reduction performance measures apply to states and MPOs with projects financed with CMAQ funds whose boundary contains any part of a nonattainment or maintenance area for ozone, carbon monoxide or particulate matter.

The PHED and non-SOV measures apply only within the boundaries of each U.S. Census Bureau-designated urbanized area (UZA) that contains a NHS road, has a population of more than one million, and contains any part of a nonattainment or maintenance area for ozone, carbon monoxide or particulate matter. States and MPOs within an applicable UZA must coordinate to set a single, unified four-year target for the entire UZA for PHED, and single, unified two- and four-year targets for non-SOV travel.

In North Carolina, the PHED and non-SOV measures currently apply only to the Charlotte, NC-SC UZA. The Charlotte Regional Transportation Planning Organization (CRTPO), Cabarrus Rowan Metropolitan Planning Organization (CRMPO), Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO) and Rock Hill-Fort Mill Area Transportation Study (RFATS) (which is reporting in SC only) have planning area boundaries that overlap with the Charlotte, NC-SC UZA, thus the three North Carolina MPOs, NCDOT, RFATS and SCDOT coordinated to establish a single, unified PHED and non-SOV travel performance targets.

The CMAQ Emission Reduction measure is applicable to any state and MPO with projects financed with CMAQ funds whose boundary contains any part of a nonattainment or maintenance area for ozone, carbon monoxide or particulate matter. In North Carolina, the CMAQ Emission Reduction measure applies statewide and individually for CRTPO, CRMPO and GCLMPO.

4.4 PM3 PERFORMANCE TARGETS

The PM3 measures are assessed and reported over a four-year performance period. For all PM3 measures except the CMAQ Emission Reduction measure, the first performance period began on January 1, 2018 and will end on December 31, 2021. For the CMAQ Emission Reduction measure, the first performance period began

on October 1, 2017 and will end on September 30, 2021. North Carolina reported baseline (2017) PM3 performance to FHWA on October 1, 2018 and will report updated performance information at the midpoint (October 1, 2020) and end of the performance period.

The PM3 rule requires state DOTs and MPOs to establish two-year and/or four-year performance targets for each PM3 measure. For all measures except CMAQ Emission Reduction, the current two-year and four-year targets represent expected performance at the end of calendar years 2019 and 2021, respectively.

For the current CMAQ Emission Reduction measure, the two-year and four-year targets represent cumulative volatile organic compound (VOC) and nitrogen oxide (NOx) emission reductions from CMAQ-funded projects during the periods of October 1, 2017 to September 30, 2019 (for the two-year target) and October 1, 2017 to September 30, 2021 (for the four-year target).

States establish the following PM3 targets:

- Percent of person-miles on the Interstate system that are reliable – two-year and four-year targets
- Percent of person-miles on the non-Interstate NHS that are reliable – four-year targets
- Truck Travel Time Reliability (TTTR) – two-year and four-year targets
- Annual hours of peak hour excessive delay per capita (PHED) – four-year targets
- Percent of non-single occupant vehicle travel (non-SOV) – two-year and four-year targets
- Congestion Mitigation and Air Quality (CMAQ) Emission Reductions – two-year and four-year targets

MPOs establish four-year targets for the System Performance, Freight Movement, and PHED measures and two-year and four-year targets for the non-SOV and CMAQ Emission Reduction measures. MPOs establish targets by either agreeing to program projects that will support the statewide targets or setting quantifiable targets specific to the MPO's planning area.

NCDOT established statewide PM3 targets on May 16, 2018. Subsequently, each MPO in North Carolina agreed to support the statewide targets. Table 3~~Table 3~~ presents statewide baseline performance and 2018 and 2019 actual performance for each PM3 measure as well as the current two-year and four-year statewide targets established by NCDOT.

TABLE 3: SYSTEM PERFORMANCE / FREIGHT MOVEMENT / CMAQ (PM3) PERFORMANCE AND TARGETS

Performance Measures	Statewide Performance			2-Year Target	4-Year Target
	2017 (Baseline)	2018	2019	(2019)	(2021)
Percent of person-miles on the Interstate system that are reliable	88.1%	88.9%	88.7%	≥80.0%	≥75.0%
Percent of person-miles on the non-Interstate NHS that are reliable	88.4%	91.3%	91.8%	Not required	≥70.0%
Truck Travel Time Reliability Index (TTTR)	1.39	1.41	1.43	≤1.65	≤1.70
Annual hours of peak hour excessive delay per capita (PHED)	15.2 hrs	17.5 hrs	14.8 hrs	Not required	≤34.0 hrs
Percent non-SOV travel	21.7%	21.4%	21.6%	≥21.0%	≥21.0%
CMAQ VOC Cumulative Emission Reductions (kg/day)[1]	11.135	Does not apply	133.747	≥0.252	≥0.505
CMAQ NOx Cumulative Emission Reductions (kg/day)[2]	32.907	Does not apply	429.415	≥2.360	≥4.720

As shown in Table 3, the percent of person miles that are reliable in 2018 and 2019 have increased slightly over the 2017 baseline, and the 2019 (2-year) target for Interstates has been met. TTTR increased slightly in 2018 and 2019 but is still below the 2019 (2-year) target. PHED rose from 2017 to 2018 but declined in 2019 to below the 2017 baseline value. The percent of non-SOV travel decreased very slightly from 2017 to 2018. Emission reductions from CMAQ projects are higher than the baseline and above the 2-year targets.

NCDOT reports reliability and CMAQ data annually to FHWA. Beginning in late 2020, and every two years after, FHWA will determine if NCDOT is making significant progress toward the system performance and freight movement targets. The data will also be reflected in subsequent reports to track performance over time in relation to baseline conditions and established targets.

4.5 PLANNING ACTIVITIES TO ADDRESS PM3

North Carolina's transportation network includes truck, rail, air, water, pipeline transportation, as well as interchange points between the modes, such as airport terminals, seaports, rail terminals and warehouse/distribution centers. System performance targets are put in place to ensure residents and businesses can continue to conduct every day operations as changes in the network occur due to factors such as freight travel, development patterns, significant population growth, increasing demand for same-day deliveries, adoption of new technologies and the rise of domestic manufacturing.

[1] CMAQ VOC cumulative emissions data will be available in August/September.
[2] CMAQ NOx cumulative emissions data will be available in August/September.

North Carolina has identified a series of corridors or networks of mobility and operational significance which are vital to statewide and regional transportation movement. The process to develop master plans associated with Strategic Transportation Corridors (STCs) can ultimately link statewide and local long-term planning, project development and programming to performance targets in an effort to identify needs which enhance reliable travel times in each corridor. The STC framework facilitates system connectivity to economic clusters, mobility in relation to the movement of people and goods, and economic development.

The NC Moves 2050 Plan recognizes the importance of system performance in relation to freight and people movement. The Plan promotes a series of strategies and actions – such as maintaining the capacity and operations of (STCs) to enable statewide multimodal mobility for passenger and freight travel. Implementing the strategies and actions would connect communities to statewide opportunities; improve quality of life and multimodal access to regional jobs and services; enable smart and innovative statewide technology solutions; promote more multimodal safety and behavioral-based programs, policies and tools; provide connections to new industry clusters and transportation terminals; address air, sea and inland port capacity to handle freight demand; identify future transportation workforce supply and demand; and develop and mainstream risk/resiliency practices. In addition to connectivity, the Plan highlights the importance of investing in infrastructure redundancy and capacity needs to relieve freight bottlenecks and increase performance on state freight networks, while being environmentally sensitive.

5. TRANSIT ASSET MANAGEMENT PERFORMANCE

In July 2016, FTA published the final Transit Asset Management (TAM) rule. This rule applies to all recipients and subrecipients of federal transit funding that own, operate or manage public transportation capital assets. The rule defines the term "state of good repair," requires that public transportation providers develop and implement (TAM) plans and establishes state of good repair standards and performance measures for four asset categories: transit equipment, rolling stock, transit infrastructure and facilities. The rule became effective on October 1, 2018.

Table 4~~Table 4~~ identifies performance measures outlined in the final rule for transit asset management. For equipment and rolling stock asset categories, useful life benchmark (ULB) is defined as the expected lifecycle of a capital asset, or the acceptable period of use in service, for a particular transit provider's operating environment. ULB considers a provider's unique operating environment such as geography and service frequency and is not the same as an asset's useful life.

TABLE 4: FEDERAL TRANSIT ADMINISTRATION TAM PERFORMANCE MEASURES

Asset Category	Performance Measure and Asset Class
Equipment	Percentage of non-revenue, support-service and maintenance vehicles that have met or exceeded their ULB
Rolling Stock	Percentage of revenue vehicles within a particular asset class that have either met or exceeded their ULB
Infrastructure	Percentage of track segments with performance restrictions
Facilities	Percentage of facilities within an asset class rated below condition 3 on the TERM scale

5.1 STATE, MPO, AND PUBLIC TRANSPORTATION PROVIDER COORDINATION FOR TAM TARGETS

Following are key TAM considerations for NCDOT, MPOs, and transit providers:

- Public transportation providers are required to establish and report transit asset management targets annually for the following fiscal year.
- To the maximum extent practicable, transit providers, states, and MPOs must coordinate with each other in the selection of performance targets.
- Each provider or its sponsors must share its targets, TAM plan, and asset condition information with each MPO in which the provider's projects and services are programmed in the MPO's TIP.
- MPOs are required to establish initial transit asset management targets within 180 days of the date that public transportation providers establish initial targets. However, MPOs are not required to establish transit asset management targets annually each time the transit provider establishes targets. Instead, subsequent MPO targets must be established when the MPO updates the TIP or MTP.

- When establishing transit asset management targets, the MPO can either agree to program projects that will support the provider targets or establish its own regional transit asset management targets for the MPO planning area.
- In cases where two or more providers operate in an MPO planning area and the providers establish different targets for the same measure and asset class, the MPO has the option of coordinating with the providers to establish a single asset class target for the MPO planning area, or establishing a set of targets for the MPO planning area that reflects the differing transit provider targets.
- MPOs and states must reference the transit asset targets in their long-range transportation plans and describe the anticipated effect of their respective transportation improvement programs toward achieving their targets.

5.2 GROUP TAM PLANS AND TIER I AND TIER II PROVIDERS

The TAM rule defines two tiers of public transportation providers based on size parameters. Tier I providers are those that operate rail service or more than 100 vehicles in all fixed route modes, or more than 100 vehicles in one non-fixed route mode. Tier II providers are those that are a subrecipient of FTA 5311 funds, or an American Indian Tribe, or have 100 or less vehicles across all fixed route modes or have 100 vehicles or less in one non-fixed route mode.

A Tier I provider must establish its own TAM plan and transit asset targets, as well as report performance and other data to FTA. A Tier II provider has the option to establish its own TAM plan and targets, or to participate in a group TAM plan with other Tier II providers whereby the TAM plan and annual targets are established by a plan sponsor, typically a state DOT, for the entire group.

NCDOT adopted a Group TAM Plan on October 17, 2017. The participating providers in the Group TAM Plan are listed in Appendix A, pages 6 and 7 of the NCDOT Transit Asset Management Plan Performance Targets and Measures and can be found in Appendix A of this report.

5.3 TRANSIT ASSET TARGETS

The 2020 targets for the Group TAM Plan participants are shown in Table 5~~Table 5~~. The statewide Group TAM Plan targets are based on the condition of existing transit assets and planned investments in equipment, rolling stock, infrastructure and facilities over the next year. The targets reflect the most recent data available on the number, age, condition of transit assets, and capital investment plans for improving these assets during the next fiscal year, using the asset inventory and investment prioritization process incorporated in the Group TAM Plan.

A performance target of 20 percent was set for all asset categories, meaning that 80 percent of the assets in each category meet or exceed the asset management performance measure. Twenty percent was selected to account for possible delays that may result from acquiring the local match, the grant cycle, the procurement process, or delivery of capital assets.

As required by FTA, NCDOT will update the Group TAM Plan at least once every four years. NCDOT will update the performance targets on an annual basis and will notify the participating transit agencies and the MPOs in which they operate when the targets are updated.

5.4 TAM PERFORMANCE

TABLE 5: GROUP TAM TARGETS FOR TIER II PROVIDERS PARTICIPATING IN NCDOT'S GROUP TAM PLAN

Asset Category – Performance Measure	Asset Class	Useful Life Benchmark (Years)	2020 Target
Revenue Vehicles			
Age - % of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	Automobile	8	≤20%
	Bus	14	≤20%
	Cutaway Bus	10	≤20%
	Mini-Bus	10	≤20%
	Mini-Van	8	≤20%
	SUV	8	≤20%
	Van	8	≤20%
	Other	8	≤20%
Equipment			
Age - % of equipment or non-revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	Non-Revenue/Service Automobile	8	≤20%
	Steel Wheel Vehicles	8	≤20%
	Trucks and other Rubber Tire Vehicles	8	≤20%
	Maintenance Equipment	Agency determined	≤20%
	Computer Software	Agency determined	≤20%
	Custom 1	Agency determined	≤20%
Facilities			
Condition - % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	Administration	n/a	≤20%
	Maintenance	n/a	≤20%
	Parking Structures	n/a	≤20%
	Passenger Facilities	n/a	≤20%
	Shelter	n/a	≤20%
	Storage	n/a	≤20%
	Custom 1	n/a	≤20%

5.5 PLANNING ACTIVITIES TO ADDRESS TAM

North Carolina's public transportation system continues to shape all communities by providing adequate and reliable mobility options that improve quality of life and provide connections to statewide opportunities. Public transportation is provided in major urban centers, small towns and rural areas by either fixed route or deviated fixed route bus services, light-rail, streetcar, demand response and community transit services. Investments in public transportation has a significant relationship to where residents choose to live, work and play within the state.

The NCDOT Integrated Mobility Division recognizes the import role of transit in building healthy communities, supporting job creation and economic development, and providing equal opportunities so all people can thrive. National trends including emerging autonomous and connected vehicle technology, Mobility-as-a-Service and micro-transit continue to shape the development of the public transportation network, which often leads to an ongoing challenge of how to plan for future infrastructure and operational growth. North Carolina has a vision to expand alternative modes of transportation, including passenger rail service, as a means to increase transit ridership, revenue and performance.

The NC Moves 2050 Plan supports this vision through multiple strategies and actions. In an effort to create a multimodal, inclusive and connected system, NC Moves 2050 identified the need to improve quality of life and multimodal access to regional jobs and services, connect communities to statewide opportunities and enable smart and innovative technology solutions. Supporting actions include considering accessibility and affordability when expanding multimodal operations and connections; conducting a statewide vulnerability assessment to identify transportation users with mobility challenges; improving multimodal access and service to core regional activity centers and destinations; and accelerating multimodal strategies to meet the needs of an aging population, those with disabilities, and those without access to a motor vehicle.

APPENDIX A: SYSTEMS PARTICIPATING IN GROUP PLAN

Systems Participating in Group Plan (Reporting October 12th, 2017)			
Alleghany County	Columbus County	Lee County	Rowan County
Aging, Disability and Transit Services of Rockingham Co. (Inc.)	Community & Senior Serv. of Johnston County, Inc.	Lenoir County	Rutherford County
Alamance County Transportation Authority	Craven County	Lincoln County	Sampson County
Albemarle Regional Health Services (dba ICPTA)	Cumberland County	Macon County	Scotland County
Anson County	Dare County	Madison County Transportation Authority	Stanly County
AppalCART	Davidson County	Martin County	Swain County Focal Point on Aging, Inc.
Ashe County Transportation Authority, Inc.	Duplin County	McDowell County Transportation Planning Board, Inc.	Tar River Transit/ City of Rocky Mount
Avery County Transportation Authority	Durham County	Mecklenburg County	Transportation Administration of Cleveland Co., Inc.
Beaufort County Developmental Center, Inc.	Gaston County	Mitchell County Transportation Authority	Transylvania County
Bladen County	Gates County	Moore County	Union County
Brunswick Transit System, Inc.	Goldsboro-Wayne Transportation Authority	Mountain Projects, Inc./ Haywood County	Wake County
Buncombe County	Graham County	Onslow United Transit System, Inc.	Washington County
Cabarrus County	Greene County	Orange County	Western Carolina Community Action, Inc.
Carteret County	Guilford County	Pender Adult Services, Inc	Western Piedmont Regional Transit Authority
Caswell County	Harnett County	Person County	Wilkes Transportation Authority
Chatham Transit Network (Inc.)	Hoke County	Pitt County	Wilson City / County
Cherokee County	Hyde County Non-Profit Private Transportation Corp. / Tyrrell County	Polk County Transportation Authority	Yadkin Valley Economic Development District, Inc.
Choanoke Public Transportation Authority	Iredell County	Randolph County Senior Adult Association, Inc	Yancey County Transportation Authority
Clay County	Jackson County	Richmond Interagency Transportation, Inc.	
Columbus County	Kerr Area Transportation Authority	Robeson County	