

Appendix M:

Performance Measures

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Performance Measures Overview

The Moving Ahead for Progress in the 21st Century Act (MAP-21) required State DOTs and MPOs to conduct performance-based planning and programming (PBPP) by tracking performance measures, setting data-driven targets for each measure, and selecting projects to help meet those targets. These PBPP requirements were continued and strengthened in the Fixing America’s Surface Transportation (FAST) Act. PBPP supports effective and efficient investment of federal transportation funds by increasing accountability and transparency and providing for better investment decisions that focus on key outcomes related to seven national goals:

- Safety
- Infrastructure preservation
- Congestion reduction
- System reliability
- Freight movement and economic vitality
- Environmental sustainability
- Reduced project delivery delays

The performance measures are grouped based on funding program and performance area.

<i>Funding Program</i>	<i>Performance Area</i>
Highway Safety Improvement Program (HSIP)	Roadway Safety
Transit Safety & Oversight (49 U.S. Code § 5329)	Transit Safety
Transit Asset Management (49 U.S. Code § 5326)	Transit Asset Management
National Highway Performance Program (NHPP)	National Highway System (NHS) Asset (Pavement and Bridge) Management
	NHS Travel Time Reliability
National Highway Freight Program (NHFP)	Freight
Congestion Mitigation and Air Quality (CMAQ)	CMAQ Traffic Congestion
	CMAQ Emissions Reduction

Performance measure requirements are addressed by state departments of transportation, public transit providers, and MPOs in a cooperative process. For the NJTPA region, this involves the NJTPA working among a host of agencies, including the NJDOT, NJ TRANSIT, PANYNJ, neighboring MPOs, and neighboring state transportation departments. This appendix describes how this TIP is anticipated to help meet established state, regional and urbanized area performance measure targets. Each of the sections, arrayed below by performance area, describes background on the priority and definition of the national measures; the most recent and current targets applicable to the NJTPA region; and how this TIP will help to meet those targets.

In terms of setting targets, MPOs may either establish quantitative targets for their metropolitan planning area or agree to plan and program projects that contribute toward the accomplishment of the statewide targets. MPOs must report their targets to the state DOT and include a discussion of progress toward meeting the targets in their long-range transportation plans and transportation improvement programs.

The investment priorities of the NJTPA are reflected in the NJTPA's long-range plan, [*Plan 2050: Transportation, People, Opportunity*](#), which is scheduled to be adopted in September 2021. These investment priorities are implemented through projects and programs in this TIP.

The latest targets can be found on the NJTPA website at <https://www.njtpa.org/PerformanceMeasures.aspx>.

Roadway Safety

Background

Safety is the first national goal identified in the FAST Act. In March 2016, the Highway Safety Improvement Program and Safety Performance Management Measures Rule (Safety PM Rule) was finalized and published in the Federal Register. The rule requires State DOTs and MPOs to set targets for five safety-related performance measures on an annual basis, beginning with targets for calendar year (CY) 2018. The safety measures are assessed as five-year averages, so, for example, the targets for 2018 reflected data collected during calendar years 2014 through 2018.

State DOTs report baseline values, targets, and progress toward meeting the targets to the Federal Highway Administration (FHWA) in an annual safety report (e.g., the 2020 ASR set targets for CY 2021). MPOs must report their safety targets (either separate quantitative targets or support for the statewide targets, as discussed above) to the State DOT, and include a discussion of progress toward meeting them in any TIP or Long Range Plan amendments after May 27, 2018.

The federal roadway safety performance measures are five-year rolling averages of:

- **Number of fatalities**
- **Rate of fatalities per 100 million vehicle miles traveled (MVMT)**
- **Number of serious injuries**
- **Rate of Serious Injuries per 100M VMT**
- **Number of non-motorized fatalities and serious injuries (combined)**

NJDOT Statewide Targets and Goals

NJDOT's annual safety report (ASR) includes statewide targets for the following calendar year's performance (e.g., the 2020 ASR set targets for CY 2021).

NJDOT updated the [New Jersey Strategic Highway Safety Plan](#) (SHSP) in August 2020. This document adopts the national vision for highway safety – *Toward Zero Deaths: A National Strategy on Highway Safety*, which sets a national goal of reducing the number of traffic fatalities by half by the year 2030. The New Jersey SHSP also sets a statewide goal to reduce fatalities, serious injuries, and total injuries each by 3 percent annually. The SHSP was prepared in collaboration with the New Jersey Division of Highway Traffic Safety (NJDOTS) and all three New Jersey MPOs, New Jersey's county engineers and planners and safety advocates. The statewide targets referenced above were developed to help further the SHSP goals (but note that targets developed prior to the August 2020 SHSP were developed based on the previous SHSP's goal to reduce combined fatalities and serious injuries by 2.5 percent annually).

The NJTPA Board has approved resolutions supporting the NJDOT's statewide roadway safety targets on an annual basis since the CY 2018 targets were set in 2017.

Progress Toward Targets

The NJTPA uses safety conscious planning, which integrates safety into all phases of transportation improvement planning and development. A major emphasis of the NJTPA TIP is on safety initiatives, and

the TIP was developed to focus on safety issues where possible. These priorities are closely aligned with addressing the established New Jersey safety performance targets referenced above.

Additionally, revised Project Prioritization criteria were adopted in May 2018 for the NJTPA region, emphasizing *Plan 2045's* new goal category of safety and incorporating the latest crash data, pedestrian safety, and the SHSP. Safety receives 251 points of the 1,000 maximum points.

The focus of the NJTPA's roadway safety investments include hotspot and corridor-wide intersection, pedestrian, and lane departure safety improvement projects, through the annual [Local Safety Program \(LSP\)](#) and [High Risk Rural Roads Program \(HRRRP\)](#).

Examples of roadway safety projects being [advanced by the NJTPA through the LSP and HRRRP](#) include:

- Local Safety Program:
 - \$17 million for traffic and pedestrian signal upgrades at 25 intersections throughout Essex County, including leading pedestrian intervals, four new traffic signals, and curb-extensions and pedestrian refuge islands where feasible. The intersections are in South Orange Township, West Orange Township, Orange Township, Verona Township, Millburn Township, Bloomfield Township, Nutley Township, Newark City, Belleville Township, Montclair Township and Glen Ridge Township.
 - \$6.65 million for 20 intersections along three corridors in the Town of Harrison, Jersey City, Union City, North Bergen Township and Town of Secaucus (Hudson County). The improvements to Frank E. Rodgers Boulevard include leading pedestrian intervals, curb extensions, and a road diet feasibility analysis. Improvements to Secaucus Road include installation of signals, application of a surface treatment that creates friction to prevent crashes, and centerline and in-road rumble strips. This project also includes signal upgrades, road striping and drainage improvements along Paterson Plank Road.
 - \$1.8 million for signal upgrades and installation of an additional right turn lane at the intersection of Hooper Avenue and Church Road/Kettle Creek Road in Toms River Township (Ocean County).
 - \$423,660 for traffic and pedestrian signal upgrades, including audible pedestrian signals; installation of a dedicated left turn lane and high visibility crosswalks; and ADA improvements at the intersection of Morris Street and Ridgedale Avenue in Town of Morristown (Morris County).
- High Risk Rural Roads Program:
 - \$18.52 million for Stagecoach Road in Millstone and Upper Freehold townships (Monmouth County) including three modern roundabouts, application of a surface treatment that creates friction to prevent crashes, centerline rumble trips, installation of a safety edge, road markings, signs, breakaway road fixtures and removal of brush.
 - \$6.47 million for Siloam Road in Freehold Township (Monmouth County) including centerline and edge line rumble strips, mounted posts at curves in the road, edge line and other road markings, breakaway road fixtures, signs, surface treatments and lighting.

The local safety projects are in addition to several HSIP-funded TIP projects being developed on state highways, such as:

- Route 7, Mill Street to Park Avenue in Essex County, which will implement pedestrian safety improvements while reconstructing the pavement (Project ID: 12408B)
- Route 46, Pequannock Street to CR 513 in Morris County, which will provide improvements to signalized intersections following the proposed road diet design (Project ID: 16318)
- Route 66, Jumping Brook Road to Bowne Road/Wayside Road in Monmouth County (Project ID: 14357)

Other roadway [safety strategies](#) being advanced by the NJTPA include:

- Support for and promotion of [StreetSmart NJ](#), the NJTPA's pedestrian safety education and enforcement campaign, partnering with NJTPA subregions; local, county and state agencies; the state's Transportation Management Associations (TMAs); safety and public health organizations; academic institutions; and other entities.
- Partnership with the Vorhees Transportation Center at Rutgers University and Sustainable New Jersey on the [Complete Streets Technical Assistance program](#), a competitive program to provide expert assistance to municipalities seeking to implement complete streets. This program has assisted 17 municipalities in seven counties over the past five years, including walkable communities workshops, bicycle network plans, and a pedestrian safety demonstration project.
- Identification of suitable locations for [Road Safety Audits](#) (RSAs).
- Support for New Jersey's eight [Transportation Management Associations](#) (TMAs) to promote pedestrian and bicycle safety, senior driver safety, and related safety efforts.
- Consideration of safety in goods movement including studying hazards involving truck parking and rail grade crossings.
- Continued work with subregions (where feasible) to: incorporate curb extensions and/or pedestrian refuge islands in safety projects; implement FHWA proven safety countermeasures; and share experiences with what systemic improvements have been implemented.
- Participation with the Governor's Highway Traffic Safety Policy Advisory Council (HTSPAC).

Overall, these and the other programs and projects within this TIP are anticipated to significantly contribute to addressing the established New Jersey roadway safety performance targets.

Public Transit Safety

Background

As noted above, safety is the first national goal set forth in the FAST Act. The Federal Transit Authority's Public Transportation Agency Safety Plan (PTASP) regulation requires that a public transit agency's PTASP must include performance targets based on the safety performance measures established under the National Public Transportation Safety Plan. USDOT's statewide and nonmetropolitan and metropolitan transportation rule further requires that MPOs develop targets for the PTASP performance measures, coordinating with the transit agencies.

The PTASP performance measures are organized in six sets:

- Fatalities
 - **The total number of fatalities reported to the National Transit Database (NTD), by mode.**
 - **The rate of fatalities, per revenue vehicle mile (RVM), by mode.**
- Injuries
 - **The total number of injuries reported to the NTD, by mode.**
 - **The rate of injuries, per RVM, by mode.**
- Collision Events
 - **The total number of collision events reported to the NTD, by mode.**
 - **The rate of collision events, per RVM, by mode.**
- Employee Injuries
 - **The total number of employee injuries reported to the NTD, by mode.**
 - **The rate of employee injuries, either per RVM (for the light rail systems), or per 200,000 hours (for the bus operations), by mode.**
- Fire Events
 - **The total number of fire events reported to the NTD, by mode.**
 - **The rate of fire events, per RVM, by mode.**
- System Reliability
 - **The mean distance between major service failures, by mode.**

The first five sets of performance measures (fatalities, injuries, collisions, employee injuries, and fires) relate to "reportable events" as defined by FTA (in the *NTD Safety and Security Reporting Manual*). These include any events (either planned or unplanned) occurring on a transit right-of-way, in a transit revenue facility, in a transit maintenance facility, or involving a transit revenue vehicle that meets NTD reporting thresholds provided below. (Occupational safety events occurring in administrative buildings are excluded from NTD reportable events.)

- Fatalities involving passengers, others (people waiting or leaving), transit vehicle operators, bicyclists, pedestrians, and occupants of other vehicles.
- Injuries requiring transportation away from the scene for medical attention.
- Substantial property damage.

- Towaways of any motor vehicle.
- Smoke, fire evacuations for life safety reasons, fire (suppression).

The “rates” for the first five sets of performance measures are per vehicle revenue mile, except for the rate of employee injuries for the NJ TRANSIT bus system, which is reported per 200,000 hours worked (an OSHA standard representing the number of hours that 100 employees working 40 hours a week for 50 weeks would accumulate).

The last performance measure (system reliability) is the average distance between major mechanical failures, particularly those failures that inhibit vehicle movement or prevent the start or completion of a scheduled revenue trip due to safety concerns. Examples of factors and/or components impacting system reliability include tires, brakes, doors, engine/transmission, cooling systems, steering, axles, and suspension.

NJ TRANSIT has oversight of four PTASPs—one for the NJ TRANSIT bus operations (systemwide), and one for each of the three NJ TRANSIT light rail operations: Newark Light Rail, Hudson Bergen Light Rail, and River Line. The PTASPs contain targets for each of the performance measures described above. Targets pertinent to the NJTPA region apply to the following three systems (the River Line is outside the NJTPA region):

Non-Rail Mode

- 1) Systemwide bus operations

Rail Modes

- 2) Newark Light Rail
- 3) Hudson Bergen Light Rail

PTASPs are not required for the NJ TRANSIT commuter rail system and the Port Authority of New York & New Jersey’s Port Authority Trans Hudson (PATH) rail system. Those systems are regulated by the Federal Rail Authority (FRA) and not by FTA. FRA requires different safety planning and monitoring procedures, and USDOT regulations do not require MPOs to be involved in that planning. However, NJ TRANSIT has indicated that it will share the FRA System Safety Program (SSP) Plan with the NJTPA, once the FRA has reviewed and approved it (likely to be some time in 2021).

NJ TRANSIT Targets and Goals

NJ TRANSIT’s 10-year strategic plan, [NJT 2030](#), states that NJ TRANSIT’s mission is to “move New Jersey and the region by providing safe, reliable and affordable public transportation that connects people to their everyday lives, one trip at a time,” and the first of its five goals is to “ensure the reliability and continued safety of our transit system.” One of the ways that the plan sets forth to measure success for this goal, is to “strive for zero preventable injuries and fatalities across all modes by 2025, with an annual decrease of 20 percent.”

NJ TRANSIT’s initial set of targets were developed as part of the PTASPs approved by NJ TRANSIT in 2020. These are short-term targets; NJ TRANSIT’s long-term goal is to reduce all of these performance measures to zero. The NJTPA Board approved a resolution supporting NJ TRANSIT targets in January

2021. These targets may be updated annually in the various PTASPs that NJ TRANSIT oversees, but the NJTPA is not required to officially act on any target updates. However, any updates provided by NJ TRANSIT will be monitored and considered in the NJTPA planning and programming process.

Progress Toward Targets

NJ TRANSIT takes every precaution to ensure both passenger and public safety on their bus, rail and light rail systems. NJ TRANSIT operates a risk-based safety management system (SMS), a data-driven process to proactively manage public transportation system risks. The SMS is intended to change the safety culture to reduce safety-related events by making safety everyone's responsibility, empowering employees to play a role in safety, and encouraging employees and contractors to report safety concerns to senior management.

A major safety initiative underway at NJ TRANSIT is the successful implementation of positive train control (PTC), which uses Global Positioning System (GPS) technology, Wi-Fi, and high-frequency radio transmission to automatically control train speeds. PTC is capable of automatically controlling train speeds and movements, thereby reducing the risk of accidents due to human error. PTC will make train accidents, already rare, even less likely. Implementation of PTC enhances the safety NJ TRANSIT rail customers and employees, and is required by federal law. Details of NJ TRANSIT's PTC program can be found at <https://www.njtransit.com/ptc>.

Other major NJ TRANSIT safety initiatives include:

- Established in May 2014, the Office of System Safety (OSS) consolidated all agency safety functions, across all transit modes and in the workplace. OSS focuses on promoting the health and safety of the agency's customers and employees and preventing accidents and injuries. The OSS also coordinates and manages incident prevention efforts and develops a more rigorous safety culture. The OSS is an important organizational structure that complements already existing operational protocols and technologies.
- The School Safety Education Program created its first ever virtual program for railroad safety in FY 2020 due to COVID-19 and was presented in FY 2021. This program covers important topics, such as no trespassing, staying alert, obeying signs and signals, crossing at designated areas and standing behind the safety line on station platforms. All programs are age appropriate to fit the curriculum from Pre-K through high school.
- The Rail Operations Center (ROC) in Kearny controls train movements, signals and switches and monitors the location and status of every locomotive throughout the system.
- NJ TRANSIT trains employ operator safety devices including "alerters" and the so-called "dead man's switch." Both tools require the train engineer to stay engaged and alert; any failure to respond automatically triggers the brake, resulting in a complete vehicle stop.

- Starting with the Federal Railroad Administration's (FRA) initial roll-out in 2009, NJ TRANSIT has participated in the Confidential Close Call Reporting System (C3RS). Under the program, employees can confidentially report unsafe events or conditions to federal authorities.
- To maintain a State of Good Repair for the rail system, a specialized track geometry inspection vehicle examines every inch of our tracks once per month—a schedule that exceeds the quarterly federal requirements. NJ TRANSIT also conducts manual track inspections once per week.
- For the bus network, NJ TRANSIT continues working to prevent pedestrian and other collisions. They are installing more cameras on buses to reduce blind spots and assessing route modifications to reduce the number of left turns. Together, these initiatives will provide bus operators with information they need to drive safely to avoid future collisions.
- Realizing that using public transportation does not end at the bus stop or train station, NJ TRANSIT partners with municipalities to design safer routes for customers to walk or ride bicycles to and from public transportation stops (e.g., through the Transportation Trust Fund supported Safe Routes to Transit program).

In the NJTPA TIP, transit safety projects and programs are funded through the NJ TRANSIT Safety Improvement Program (Project ID: T509). This program provides funding for safety improvement initiatives system wide addressing bus, rail, light rail, Access Link and other identified safety needs. Funding includes investment in equipment, passenger and maintenance facilities, right of way improvements, and other initiatives that improve the safe provision of transportation services. Funding supports planning, engineering, design, construction, acquisitions and other associated costs.

Overall, these and other programs and projects within this TIP and funded separately by NJ TRANSIT are anticipated to significantly contribute to addressing the established NJ TRANSIT safety performance targets.

Public Transit Assets

Background

Critical to the safety and performance of a public transportation system is the condition of its capital assets—most notably, its equipment, rolling stock, infrastructure, and facilities. When transit assets are not in a state of good repair, the consequences include increased safety risks, decreased system reliability, higher maintenance costs, and lower system performance.

Transit asset management (TAM) is the strategic and systematic practice of procuring, operating, inspecting, maintaining, rehabilitating, and replacing transit capital assets to manage their performance, risks, and costs over their life cycles to provide safe, cost-effective, and reliable public transportation. TAM uses transit asset condition to guide how to manage capital assets and prioritize funding to improve or maintain a state of good repair. Based on the mandate in MAP-21 (and continued in the FAST Act), FTA developed a rule establishing a strategic and systematic process of operating, maintaining, and improving public capital assets effectively through their entire life cycle. The TAM Final Rule 49 USC 625 became effective Oct. 1, 2016. The TAM rule develops a framework for transit agencies to monitor and manage public transportation assets, improve safety, increase reliability and performance, and establish performance measures. Transit agencies are required to develop TAM plans and submit their performance measures and targets to the National Transit Database. TAM plans must be updated at least every four years. MPOs are required to either set specific MPO targets or support the transit agency targets.

The TAM rule established the following national transit asset management performance measures (49 CFR Part 625 Subpart D):

- ***Rolling stock: The percentage of revenue vehicles (by type) that meet or exceed the useful life benchmark (ULB)***¹
- ***Equipment: The percentage of non-revenue service vehicles (by type) that meet or exceed the ULB***
- ***Facilities: The percentage of facilities (by group) that are rated less than 3.0 on the Transit Economic Requirements Model (TERM) scale***²
- ***Infrastructure: The percentage of track segments (by mode) that have performance restrictions***

Within the NJTPA planning area, there are two Tier 1 transit agencies providing public transit service, and subject to the FTA TAM performance management rules. These agencies are the New Jersey Transit Corporation (NJ TRANSIT) and the Port Authority of New York and New Jersey (PANYNJ) Port Authority

¹ Useful life benchmark (ULB) is the yardstick that agencies will use to track the performance of revenue vehicles (rolling stock) and service vehicles (equipment) to set their performance measure targets. Each vehicle type's ULB estimates how many years that vehicle can be in service and still be in a state of good repair. The ULB considers how long it is cost effective to operate an asset before ongoing maintenance costs outweigh replacement costs.

² Under the TERM scale, an asset in need of immediate repair or replacement is scored as one (1), whereas a new asset with no visible defects is scored as five (5).

Trans-Hudson (PATH). In addition, there are several Tier 2 transit providers. NJ TRANSIT is sponsoring a Tier 2 Group TAM Plan for these providers.

NJ TRANSIT Asset Management Targets and Goals

NJ TRANSIT maintains a large fleet of buses, railroad cars, locomotives, and light rail vehicles. The fleet is in a state of good repair and meets FTA guidelines for useful equipment life. To continue in this pattern, NJ TRANSIT has budgeted funds to permit regular ongoing replacement of equipment as it approaches the end of its useful life. This approach also permits NJ TRANSIT to procure newer propulsion and fuel systems for vehicles and railroad equipment as they are proven to be feasible, reliable, and cost effective. This maintenance strategy creates a sustainable financial replacement program and is expected to continue in the future.

NJ TRANSIT prepared an Enterprise Asset Management Program Transit Asset Management (TAM) Plan, dated October 1, 2018. In this plan, NJ TRANSIT sets forth its blueprint to identify, describe, and improve asset management practices, with the vision to maintain the agency's assets in a state of good repair. The plan presents a summary inventory of assets, describes the current condition of the assets, sets near-term targets for the required performance measures, and explains how NJ TRANSIT managers develop and present requests for operating/maintenance budgets and capital asset replacements. The plan also identifies NJ TRANSIT programs and projects aimed at helping to achieve its TAM targets.

Plan 2050 calls for continuing strategic investment to make transit a viable alternative for an increasing share of residents. The current funding priorities are maintaining the system in a state of good repair and operating it in a safe and secure manner. This includes replacing buses, railcars, and locomotives as they age, as well as attending to more than 600 rail bridges, 500-plus miles of track, signal systems, stations, and other infrastructure.

NJ TRANSIT has committed to improving the resiliency of its systems to prevent future damage and to prepare for possible future extreme weather events and security threats. This includes significant new investments in a series of hardening projects such as new rail vehicle storage, upgraded power systems, maintenance facilities, emergency control centers, security improvements and signal and communications systems resilience upgrades.

NJ TRANSIT established TAM targets in 2018 and submitted them to FTA. The NJTPA Board approved a resolution supporting NJ TRANSIT targets in May 2019. NJ TRANSIT updates TAM targets, annually, and provides them to NJTPA when they have been finalized and approved by FTA. Based on regulations, the NJTPA Board is not required to support the updated targets, but NJTPA does post the latest targets on our web page, which is referenced in any TIP or LRTP update.

PATH Asset Management Targets and Goals

PATH is an interstate heavy rail rapid transit system that serves as the primary transit link between Manhattan and the neighboring New Jersey urban communities, as well as suburban commuter railroads. The PATH system connects terminals in Newark, Jersey City, and Hoboken in New Jersey to lower and mid-town Manhattan in New York City, using two pairs of tunnels beneath the Hudson River.

The system has four service lines: Newark to World Trade Center (WTC), Journal Square to 33rd Street, Hoboken to WTC, and Hoboken to 33rd Street.

The PATH system includes:

- Approximately 45 miles of revenue and storage/yard tracks
- 350 revenue vehicles
- 13 passenger stations
- Service buildings, and numerous other equipment and systems, including fare collection, elevators and escalators, power substations, signals, communications, and electrical.

Similar to NJ TRANSIT, PATH prepared a TAM Plan, dated October 2018. In addition to providing a summary inventory of assets and their current condition, the PATH TAM Plan examines the current TAMP practices at PANYNJ and PATH and recommends a set of action plans that will help ensure that the PATH system continues to provide a safe, reliable, and high-quality service.

In its TAM Plan, PATH committed to implementing a strategic process to maintaining its assets in a state of good repair through transparent financial stewardship and reinvestment, by focusing on high quality asset condition and performance information with a risk-based approach as the basis for decision-making. PATH's asset management program is designed to support and lead to the timely implementation of projects and programs which maintain PATH's infrastructure, systems, equipment, and facilities in a state of good repair.

PATH also committed to improving the resiliency of its system to prepare for possible future extreme weather events. This includes investments in several systems, including substations, maintenance facilities, and rail rolling stock.

PATH established TAM targets in 2018. The NJTPA Board approved a resolution supporting PATH targets in May 2019. PATH updates TAM targets annually and provides them to NJTPA when they have been finalized and approved by FTA. Based on regulations, the NJTPA Board is not required to support the updated targets, but NJTPA does post the latest targets on our web page, which is referenced in any TIP or LRTP update.

Progress Toward Targets

The NJTPA Regional Capital Investment Strategy targets the largest portion of funding, more than 35 percent, to transit maintenance and preservation. The NJTPA FY 2022-2025 TIP dedicates nearly \$5 billion over the four-year period toward NJ TRANSIT preservation projects and programs. This represents approximately 30 percent of the total four-year program. An additional \$6 billion has been assigned to these projects for the "unconstrained" period of FY 2026 – FY 2031.

Some of the transit preservation projects and programs allocated the most resources in the TIP include the following:

- More than \$1 billion is allocated toward replacing rail cars and locomotives that have reached the end of their useful life (Project ID: T112), and more than \$400 million for replacing buses (Project ID: T111).
- Over \$860 million is programmed for the rail preventive maintenance program (Project ID: T39), which is used for overhaul of rail cars and locomotives, and other preventive maintenance costs. An additional \$360 million is allocated toward preventive maintenance of the bus system (Project ID: T135).
- More than \$400 million is dedicated to maintaining the Northeast Corridor, including projects like the Midline Loop in North Brunswick and various yard improvements (Project ID: T44).
- Projects to modernize and improve the signal and communication systems receive \$69 million over the four years (Project ID: T50).

Most of PATH's funding for TAM projects comes from PANYNJ funding sources and are thus not in the NJTPA's TIP. As such, the NJTPA will rely on PANYNJ to provide information on projects and programs that will help meet PATH's TAM targets.

These projects and programs, along with others in the TIP and other programs will assist in addressing the established NJ TRANSIT and PATH transit asset management targets.

NHS Asset (Pavement and Bridge) Condition

Background

In October 2016, the FHWA Transportation Asset Management Plan Rule (TAMP Rule) was finalized and published in the Federal Register (effective October 2, 2017). In January 2017, the FHWA Bridge and Pavement Condition Performance Measures Rule was finalized and published (effective February 17, 2017). The TAMP Rule sets forth requirements for State DOTs in their preparation of TAMPs and bridge/pavement management systems, while the Bridge and Pavement Condition Performance Measures Rule (aka PM2) describes the performance measures required to assess performance of the NHS assets.

PM2 requires State DOTs and MPOs to set 2- and 4-year targets for six pavement and bridge condition performance measures (listed below) every four years (with the option to modify the 4-year targets midway through the four-year performance period). State DOTs report baseline values, targets, and progress toward meeting the targets to the Federal Highway Administration (FHWA) in a biennial performance report. MPOs may either establish quantitative targets for their metropolitan planning area or agree to plan and program projects that contribute toward the accomplishment of the statewide targets. MPOs must report their pavement and bridge condition targets to the State DOT and include a discussion of progress toward meeting them in any TIP or Long-Range Plan amendments after May 20, 2019.

The federal asset (pavement and bridge) management measures are:

- **Percent Interstate pavement lane-miles in Good condition**
- **Percent Interstate pavement lane-miles in Poor condition**
- **Percent non-Interstate NHS pavement lane-miles in Good condition**
- **Percent non-Interstate NHS pavement lane-miles in Poor condition**
- **Percent NHS bridge deck area in Good condition**
- **Percent NHS bridge deck area in Poor condition**

NJDOT measures the condition of pavement on the NHS for each tenth-mile segment, using a defined set of metrics. These metrics, which differ based on the type of pavement, include ride quality (using the International Roughness Index, or IRI), rutting, cracking, and faulting. The metrics are used to classify each segment's pavement condition as either Good, Fair, or Poor, using criteria established by FHWA.

NJDOT also collects bridge inspection data for all NHS bridges covered by the National Bridge Inspection Standards (NBIS). The bridge inspection data includes ratings for each bridge component (bridge deck, superstructure, substructure, and culvert (where applicable)). These ratings are used to classify each bridge as either Good, Fair, or Poor, using criteria established by FHWA.

NJDOT Statewide Targets and Goals

NJDOT establishes 2- and 4- year targets for the NHS pavement and bridge condition national performance measures within the New Jersey Transportation Asset Management Plan (TAMP). The first TAMP included targets for 2019 and 2021 referencing baseline data for 2016/2017. More broadly, the

TAMP defines New Jersey's overall policy, state of good repair (SOGR) objectives and plans for infrastructure preservation.

The TAMP addresses the first goal, "Maintain and Renew Transportation Infrastructure", of *Transportation Choices 2030*, the current New Jersey Long Range Transportation Plan. This goal calls for bringing the state's transportation physical assets (including pavement and bridges) into a state of good repair and maintaining the state of good repair.

Development of the TAMP included NJDOT asset management experts along with other NHS owners and stakeholders. All three New Jersey MPOs and NHS-owning local governments and authorities were engaged in the process. This continued for a mid-period adjustment of 4-year targets in 2021 for the non-Interstate NHS pavement and both bridge condition measures.

Development of the TAMP included NJDOT asset management experts along with other NHS owners and stakeholders. All three New Jersey MPOs and NHS-owning local governments and authorities were engaged in the process. This continued for a mid-period adjustment of 4-year targets in 2021 for the non-Interstate NHS pavement and both bridge condition measures.

The TAMP's 10-year investment strategy was integral to setting performance targets, along with existing pavement and bridge conditions and projected conditions after planned projects/improvements. The TAMP pavement targets were intended to be realistic, considering a longer-term objective to reach 80 percent SOGR on all NHS pavements (using NJDOT's "condition status" metric) by 2021, regulations for Interstate lane-miles in Poor condition cannot exceed 5 percent, and uncertainty related to the multiple agencies owning and maintaining the NHS in the state. (NJDOT only owns about three-fifths of New Jersey's NHS pavement lane-miles, with 15 percent owned by counties, two percent by municipalities, and about a quarter by other transportation agencies and authorities.) Importantly, the non-Interstate NHS pavement poor condition 4-year target was adjusted mid-period as the original was discovered to be flawed due to data limitations and lack of experience with the new pavement metrics.

The TAMP bridge targets were also set to be realistic, similarly recognizing that NJDOT owns only half of the state's NHS bridges (by bridge deck area). The remaining bridges are owned by the New Jersey Turnpike Authority (about a one-third), other toll authorities (about one-sixth), and others (about 2 percent). Mid-period, trends and data corrections motivated an adjustment to a more optimistic 4-year target for good condition NHS bridges and a slight adjustment to the poor condition target as well.

Overall, NJDOT's target-setting considerations pointed to gradually declining conditions at the current funding level, as would be expected due to the state's aging infrastructure. Thus, the short-term targets were intended to allow for a slight worsening of asset conditions. The NJTPA Board approved resolutions supporting the NJDOT's statewide NHS pavement and bridge condition targets in September 2018 and supported the NJDOT's adjusted targets in March 2021.

The NJTPA Board approved a resolution supporting the NJDOT's initial 2- and 4-year statewide pavement and bridge condition targets in September 2018. In November 2021 the NJTPA Board adopted

a resolution supporting NJDOT's adjusted 4-year targets for three of the condition performance measures:

- percent of the non-Interstate NHS pavement lane-miles in poor condition
- percent of the NHS bridges (by deck area) in good condition
- percent of the NHS bridges (by deck area) in poor condition

Progress Toward Targets

The TIP places a major emphasis on projects that maintain and rehabilitate the region's pavement and bridges. Pavement and bridge state-of-good repair criteria are significant elements of the NJTPA's project prioritization process, aligned with supporting the pavement and bridge condition performance targets. Approximately 33 percent of the funding over the four years of the TIP is dedicated to maintaining bridges and preserving roadways in the NJTPA region. This is in keeping with the 37 percent allocated to these two categories in the NJTPA Regional Capital Investment Strategy (RCIS).

Examples of NHS asset (pavement and bridge) projects and programs in the Transportation Improvement Program include:

Pavement projects and programs

- Route 34, CR 537 to Washington Avenue, Pavement in Monmouth County (Project ID: [11307](#))
- Route 18 East Brunswick, Drainage and Pavement Rehabilitation in Middlesex County (Project ID: [10354](#))
- Route 7, Mill Street (CR 672) to Park Avenue (CR 646) in Essex County (Project ID: [12408B](#))
- Route 27, Alexauken Creek Road to Washington Street in Hunterdon County (Project ID: [11413C](#))
- Route 94, Pleasant Valley Drive to Maple Grange Road in Sussex County (Project ID: [15391](#))
- Statewide & NJTPA Pavement Preservation Programs (Project ID: [X51B](#))
- Restriping Program & Line Reflectivity Management System (Project ID: [X03A](#))
- Statewide Resurfacing Programs (Project IDs: [99327A](#) and [X03E](#))

Bridge projects and programs

- Route 80 WB, McBride Avenue to Polify Road in Bergen and Passaic Counties (Project ID: [11415](#))
- Route 4 Bridges in Bergen County (Project IDs: [02346](#), [065C](#), [08410](#), [93134](#), and [94064](#))
- Route 22 Bridge over NJ TRANSIT Raritan Valley Line in Hunterdon County (Project ID: [14425](#))
- Monmouth County Bridges, W7, W8, W9 over Glimmer Glass and Debbie's Creek (Project ID: [NS9306](#))
- Route 31 Bridge over Furnace Brook in Warren County (Project ID: [09325](#))
- Statewide Bridge Deck/Superstructure Replacement Program (Project ID: [03304](#))
- Statewide Bridge Emergency Repair Program (Project ID: [98315](#))
- Statewide Bridge Inspection Programs (Project IDs: [X07A](#) and [17341](#))
- Statewide Bridge Maintenance and Repair Program, Movable Bridges (Project ID: [14404](#))

- Statewide Bridge Preventive Maintenance Program (Project ID: [13323](#))
- Statewide Bridge Replacement Program, Future Projects (Project ID: [08381](#))

Overall, these and other programs and projects in this TIP will significantly contribute to addressing the established New Jersey pavement and bridge performance targets for the NHS.

NHS Travel Time and Freight Reliability

Background

Traffic congestion is common in the NJTPA region, and many drivers are accustomed to it. They expect and plan for some delay, particularly during peak driving times. In addition, the NJTPA region experiences unexpected travel delay which can be even more burdensome. These drivers often adjust their schedules or budget extra time to allow for “usual” traffic delays. But what happens when traffic delays are much worse than expected? Most travelers are less tolerant of unexpected delays because they cause them to be late for work or important meetings, miss appointments, or incur extra childcare fees. Shippers that face unexpected delay may lose money and experience disruption of just-in-time delivery and manufacturing processes. Travel time reliability measures the extent of such unexpected delay. A formal definition for travel time reliability is *the consistency or dependability in travel times, as measured from day-to-day and/or across different times of the day*. Importantly, unexpected delays impact all roadway users, including those in automobiles, buses, trucks, and other vehicles.

Freight is critical to North Jersey’s economy, with about a third of the region’s three million jobs highly dependent on goods movement. The freight sector’s strength is based on the region’s location in the center of a major consumer market; its extensive marine, rail, and highway infrastructure; and its extensive warehouse and distribution facilities—over 800 million square feet in the region.

Nearly all goods moved in the region travel by truck for at least part of their journey, especially short-haul and time-sensitive deliveries. In all, more than 80 percent of domestic freight traveling to, from or within North Jersey moves by truck. Congestion over key highways and at ports and terminals hampers timely freight movements. This warrants particular attention to the reliability of travel times for trucks.

The national travel time and freight reliability performance measures are:

- **Percent of person-miles traveled (PMT) on the Interstate system with reliable travel times**
- **Percent of PMT on the non-Interstate NHS roadways with reliable travel times**
- **Truck Travel Time Reliability (TTTR) Index on the Interstate System**

“Reliable” travel times are based on how “longer” travel times (but that still occur as frequently as one out of five days)³ compare to expected (median) travel times. If the longer travel time for a segment is less than one and a half times as long as the median travel time, then that road segment is considered to have reliable travel times (for general traffic). For truck travel time reliability on Interstate highways, a more stringent standard of what is acceptable is used (travel times that occur as frequently as one out of 20 days). The TTTR metric for a segment is the ratio between rare “very long” truck travel times for a segment⁴ and the median truck travel time for that segment. The TTTR Index is computed by averaging

³ The “longer” travel time is defined as the 80th percentile travel time, which is the time such that 80% of travel times are shorter.

⁴ The “very long” travel time is defined as the 95th percentile travel time, which is the time such that 95% of travel times are shorter.

the TTTR metric on all Interstate segments in the state, weighted by the segment distance. (Note that higher values for the TTTR index indicate lower travel time reliability.)

These performance measures are calculated using archived real-time vehicle probe data contained in the National Performance Management Research Data Set (NPMRDS). The NPMRDS is a dataset used to monitor system performance, procured and sponsored by FHWA. The NPMRDS is a network of roadway segments, called Traffic Message Channels (TMCs). The calculations in New Jersey are done by the NPMRDS Analytics Suite, created and maintained by the University of Maryland Center for Advanced Transportation Technology Laboratory (CATT Lab), following FHWA guidance.

FHWA requires states and MPOs to establish 2- and 4-year travel time reliability and freight targets every four years (with the option to modify the 4-year targets midway through the 4-year performance period).

NJDOT Statewide Targets and Goals

NJDOT's current Long Range Transportation Plan, *Transportation Choices 2030* includes goals to "improve mobility, accessibility, and reliability," and to optimize freight movement. These goals intend to counter traffic congestion with a multifaceted approach, including strategies such as spot congestion improvement, improved public transit, transportation demand management, and improved facilities for bicycling and walking. The NJDOT Plan also recommends continued investment in facilities to move more freight by rail, and policies that support moving freight during non-rush hours. Another goal is to "operate efficiently," which focuses on using transportation systems management and operations (TSMO) strategies to use existing capacity most efficiently. All these goals point toward improving reliability on New Jersey's roadways for the movement of people and goods.

In setting statewide targets for the travel time reliability measures, New Jersey subject matter experts considered a number of factors, including:

- Dependable, consistent travel time long-term goal for all stakeholders
- Limited stakeholder experience with measuring travel time reliability, and techniques to forecast future reliability are evolving.
- Available funding constraints, particularly considering other priorities such as improving infrastructure condition and improving safety.
- Travel time reliability impact of new technologies, including connected and autonomous vehicles and transportation network companies (e.g., Uber and Lyft), is unknown.
- Increased VMT, which puts additional stress on the Interstate highways for all users, including trucks.
- Increased port activity and e-commerce, leading to increased truck activity.
- Limited road capacity.

NJDOT and the New Jersey MPOs collaboratively developed 2-year and 4-year travel time reliability targets, deciding for both to aim toward maintaining the existing (2017) values while leaving open the opportunity to adjust the 4-year targets at the 2-year mid-period point (based on 2019 data). For truck

travel time reliability, worsening congestion and reliability supported targets for the TTR Index measure that moderate the amount of increase over time. NJDOT established the required travel time and freight reliability targets for New Jersey in May 2018 and submitted them to FHWA in October 2018.

The NJTPA Board approved a resolution supporting the NJDOT's statewide travel time and freight reliability targets in September 2018.

Progress Toward Targets

One of the goals of *Plan 2050* is to “maintain a safe, secure and reliable transportation system in a state of good repair.” *Plan 2050* includes a map of unreliable road segments. The updated RCIS includes using the following guidelines:

- NJTPA congestion management process and context-sensitive criteria to target roadway investments that improve travel time reliability and address bottlenecks and hotspots.
- Invest in technologies that deliver environmental benefits, improve reliability, manage congestion, and streamline traffic flow.

Freight planning activities at the NJTPA are guided by the Freight Initiatives Committee, which serves as a forum for discussion of regional freight issues.

One of the criteria in the NJTPA project prioritization process addresses travel time reliability, giving additional priority to projects that help to improve travel time reliability by either reducing non-recurring incident delays or by providing alternative transportation modes or routes. Another project prioritization criterion focuses on projects that enhance the movement of freight.

NJDOT TSMO strategies are employed to support travel time reliability on interstate and non-interstate NHS roadways. Such TSMO strategies focus on safety and mobility, congestion relief and air quality mitigation along arterial corridors, addressing recurring and non-recurring congestion, and providing real-time traveler information. Examples of TIP program and project investments include:

- New Jersey's Traffic Incident Management (TIM) Program to detect, respond to, and remove traffic incidents and restore traffic capacity as safely and quickly as possible (NJTIM.org)
- New Jersey Statewide Traffic Operations and Support program comprised of Safety Service Patrols (SSP), two Traffic Operations Centers, 511 real-time traveler information system (Project ID: [13308](#))
- New Jersey Mobility and Systems Engineering (MSE) program focused on arterial management with intelligent traffic signal systems (Project ID: [13306](#))
- “Smart Moves” – New Jersey's Intelligent Transportation Systems (ITS), a centrally managed system of CCTV's, electronic message signs, sensors, and fiber optic communications network (Project ID: [02379](#))
- New Jersey ITS Resource Center focused on research and delivery of TSMO strategies in association with NJ academic institutions (Project ID: [13304](#))
- Operational improvements to the intersection of US Route 202 and First Avenue in Raritan Borough, Somerset County, to address chronic congestion problems (Project ID: [02372B](#))

- Improvements to the interchange between I-80 and NJ 15 by adding the missing ramp and making other operational improvements to increase travel time reliability (Project ID: 93139)

The [Statewide Freight Plan](#) identifies several projects that are being advanced in priority freight locations in the NJTPA region (in particular, see [Table 53: STIP Projects along Freight Project Areas](#), NJTPA). In addition to these priority projects in the Statewide Freight Plan, the NJDOT and the NJTPA spearhead numerous initiatives with the specific intent of improving infrastructure conditions for safe, efficient multimodal goods movement in New Jersey. A FY 2021 funded consultant activity will complete two concept development studies for the Berkshire Valley Road Truck Circulation Project in Roxbury, Morris County; and the Port Reading Secondary South Main Street Grade Crossing Elimination Project in Bound Brook, Somerset County. The studies are scheduled for completion in June of 2023.

Examples of freight projects and programs in the Transportation Improvement Program include:

- Delancy Street, Avenue I to Avenue P in Essex County (Project ID: [NS0504](#))
- Kapkowski Road – North Avenue East Improvement Project (Project ID: [17339](#))
- Portway, Fish House Road/Pennsylvania Avenue, CR 659 in Hudson County (Project ID: [97005B](#))
- Local Freight Impact Fund Program (Project ID: [17390](#))
- Maritime Transportation System (Project ID: [01309](#))
- New Jersey Rail Freight Assistance Program (Project ID: [X34](#))

These and other programs and projects in this TIP should significantly contribute to addressing the established New Jersey reliability performance targets (for both people and goods). As the NJTPA and transportation planning and programming partners improve understanding of this measure (particularly how various types of projects impact travel time reliability), the agencies will continue to strive to program projects that help to improve travel time reliability for the traveling public.

CMAQ Traffic Congestion

Background

FHWA's Congestion Mitigation and Air Quality Improvement (CMAQ) program provides states and MPOs with funds for transportation investments that contribute to air quality improvements and provide congestion relief. Examples of CMAQ-funded projects include roadway and intersection improvements that address congestion chokepoints and help reduce vehicle idling, and bicycle and pedestrian paths that enhance travel for non-motorized modes. FHWA has divided the performance measures related to the CMAQ program into two portions: traffic congestion (addressed in this section), and emissions reduction (addressed in the next section).

Traffic congestion is complex to address. While widening roadways at a bottleneck may help manage or reduce localized congestion, widening long stretches of roadways may add a level of additional capacity that can lead to overall increased vehicle volumes, and even more traffic congestion and air pollution over time. Also, many vibrant commercial districts, urbanized areas and important major roadway arteries experience daily recurring "routine" traffic congestion that cannot realistically be eliminated due to potential costs, limited land availability and/or potential quality of life impacts to communities.

Many of the region's roadways are subject to high levels of recurring congestion. Daily, large numbers of travelers face recurring morning and afternoon/evening peak congestion due to capacity issues on major corridors, particularly those leading to bridge and tunnel crossings into New York City. Most of these high-capacity routes traverse the region's most densely populated areas, where increasing capacity may be neither locally desirable nor cost-effective. Although routine congestion on these routes presents challenges to the reliability of travel, it is largely an expected occurrence that businesses and individuals attempt to factor into their travel and location decisions.

Congestion is most problematic when it hinders accessibility, a key contributor to the region's economic and community well-being. Transportation works well when it puts travelers' desired destinations (jobs, shopping, schools, parks, etc.) within reach, making them accessible. It works well when the transportation system is reliable and trips are therefore predictable, with reasonable expected travel times and actual travel times matching those expectations. Overall, the northern New Jersey transportation system provides enormous accessibility to the region but addressing the challenges of a growing and changing region requires understanding congestion in these broader contexts. The NJTPA's Congestion Management Process (CMP) contributes to this understanding.

The CMP addresses not only the roadway system, but also rail and bus transit, ridesharing, walking and bicycling, and freight transportation. The CMP points to mobility strategies that complement roadway investments to minimize the need for capacity expansions, realize greater system efficiency and protect the environment.

The traffic congestion performance measures are applicable to all urbanized areas (UZAs) that include National Highway System (NHS) mileage and with a population over one million⁵ with designated air quality nonattainment or maintenance areas for ozone (O₃), carbon monoxide (CO), or particulate matter (PM₁₀ and PM_{2.5}). The NJTPA Planning Area overlaps two such UZAs: the New York—Newark, NY—NJ—CT (“New York-Newark”) and the Philadelphia, PA—NJ—DE—MD (“Philadelphia”) UZAs.

For each UZA, all state departments of transportation and MPOs with jurisdiction within them must coordinate with one another to set single, unified targets for the entire area—as opposed to targets for portions covered by individual states and MPOs—and they must report those single, unified targets consistently to FHWA.

The federal traffic congestion performance measures (reported for entire large multi-state urbanized areas) are:

- **Annual person-hours of peak hour excessive delay (PHED) per capita**
- **Percent non-SOV (single-occupancy vehicle) travel**

Elements of the PHED per capita measure⁶ (assessed only for National Highway System facilities) include the following:

- Annual – delay accumulated over the entire calendar year
- Person-hours – delay experienced by people not vehicles
- Peak hour – 6–10 am and 3–7 pm weekdays (any “excessive” delay outside these periods is not included)
- Excessive delay – time traveling below 60 percent of posted speed limit (or 20 mph, whichever is greater)⁷. For example, if the speed limit is:
 - 65 mph, the extra time spent by traveling slower than 39 mph
 - 40 mph, the extra time spent traveling slower than 24 mph
 - 30 mph (or lower), the extra time spent traveling slower than 20 mph

As an illustration, consider a two-mile segment with a speed limit of 60 mph. Traveling along this segment at the speed limit takes 2 minutes. However, the “excessive delay” threshold for this segment is 36 mph (60 percent of 60 mph). At this speed, it takes 3.33 minutes. So, any time above 3.33 minutes on that segment counts toward “excessive” delay. If travel on this segment on a particular day takes 5 minutes, then 1.67 minutes (5 minus 3.33) counts as excessive delay.

⁵ During the initial performance period (2018-2021), the requirement only applies to urbanized areas with populations above 1 million. For subsequent performance periods (i.e., starting in 2022), the requirement expands to UZAs with populations above 200,000.

⁶ More detail on this measure, including a video with an example on how PHED is calculated, can be found on the NJTPA website, at <https://www.njtpa.org/planning/performance-analysis>.

⁷ Only the “extra” time is counted toward excessive delay, not the entire travel time.

- Per capita – divides by entire population, not just drivers. Thus, areas that have more transit/carpool use get “credit” for those people who are not contributing to congestion⁸.

This percent non-SOV travel performance measure recognizes the role that single-occupant vehicles play in contributing to traffic congestion and pollutant emissions. The measure is calculated using U.S. Census American Community Survey (ACS) data about journey-to-work trips. Non-SOV includes carpool, train, bus, walk, bike, taxi, rideshare, working at home, etc.—anything other than driving alone.

Urbanized Area Targets and Goals

Established NJTPA goals point to user-responsive, affordable, accessible, and dynamic transportation systems; environmental protection; system coordination; efficiency; and connectivity. All of these goals relate to managing congestion and improving air quality. The NJTPA’s congestion management process includes targeting congestion bottlenecks and hotspots and specifically aims to minimize single-occupant vehicle travel through multimodal, travel demand, and operational strategies.

NJDOT’s long-range plan includes a goal to counter traffic congestion with a multifaceted approach and support for alternate modes, including strategies such as spot congestion improvements, improved public transit, transportation demand management, and improved facilities for bicycling and walking.

For the New York-Newark urbanized area, partner agencies agreed that the effects of expected economic growth, especially in New York City, would exceed the impacts of investments to reduce traffic congestion. Continued increase in non-SOV travel was expected to mitigate the growth in traffic delay to some extent. However, the ability of the existing public transit systems to accommodate increased ridership is limited over the time frame for these targets (i.e., the next four years). Additionally, only data for 2017 PHED was available as targets were identified, and there was no historical trend data. However, related measures of congestion and delay showed recent increases, and a long-term forecast of similar measures suggested modest increases over time. The 2-year target for the non-SOV measure was to maintain the current percentage, and the 4-year target represented a slight increase in the percentage of non-SOV travel. For the PHED measure, the 4-year target was set to represent an increase of 2 percent per year in excessive delay per capita.

For the Philadelphia urbanized area, the partner agencies were cognizant of travel demand model-based forecasts of annual growth in vehicle miles of travel (VMT) 0.7 percent for the 2015–2020 time period. On that basis, a 4-year target was set to reflect an increase in the PHED measure of 0.6 percent per year. For the non-SOV measure, the partners agreed that the 2-year target would be a slight increase, and the 4-year target would be an additional slight increase in the percentage of non-SOV travel within the urbanized area.

⁸ In the New York-Newark urbanized area, the Census American Community Survey reports that for every four residents, there is approximately one vehicle used for commuting to work. The other residents either do not commute to work (e.g., work at home, children, unemployed or not in work force) or commute in carpools, buses, trains, subway, ferry, walk, or bike.

The state departments of transportation and MPOs in the New York-Newark and Philadelphia urbanized areas set traffic congestion targets as required in May 2018 and reported them to FHWA in October 2018. This included, in July 2018, the NJTPA Board approval of a resolution establishing the urbanized area traffic congestion targets for both the New York-Newark and Philadelphia urbanized areas. The NJTPA also prepared the required CMAQ Performance Plan to accompany NJDOT's 2018 baseline performance report (submitted to FHWA on October 1, 2018). Given the conditions assessed in 2020 (shown below) and the ongoing uncertainty due to the COVID-19 pandemic, no adjustment of the 4-year congestion targets was considered necessary.

Progress Toward Targets

As indicated in previous sections, transportation investment resources in the NJTPA region (and through the urbanized areas) are largely directed toward preserving the existing system. Thus, the plans and programs for the various agencies are anticipated to have relatively small impact on NHS traffic congestion overall. There is an understanding that expanding or adding new roads is a limited option due to high costs, environmental impacts, and the likelihood that capacity expansion may provide only temporary congestion relief and is likely to induce even more traffic over the long term.

However, there are still ways to reduce traffic congestion and increase non-SOV travel. There are specific criteria in the NJTPA project prioritization process that emphasize projects that address traffic congestion. Considerable resources, including as guided by the RCIS, are devoted to maintaining and enhancing the region's public transit system. Transportation system management and operations (TSMO) are anticipated to moderate some of the expected increase in roadway delay. Transportation demand management (TDM) programs can help to change travel behaviors in ways that meet travel needs while minimizing the impacts to delay. Changes in pricing (e.g., congestion pricing, fuel costs, transit fares) could also have impacts on excessive delay and non-SOV travel. Land use (e.g., transit-oriented development, or TOD) will continue to affect trip making and the traffic on NHS roads. The impacts of transportation network companies (TNCs, e.g., Uber and Lyft) and emerging advanced transportation technology are still being understood. These may lead to increases or decreases in these measures. Finally, while there is little expectation that public transit opportunities will be significantly expanded in the near term (as noted above), there are plans and proposals for expansions for the longer term.

Examples of projects and programs in the Transportation Improvement Program that address traffic congestion (peak hour excessive delay and non-SOV travel) include:

- Route 46, Route 287 to Route 23 (Pompton Avenue), ITS (Project ID: [06366B](#))
- Intelligent Traffic Signal Systems program (Project ID: [15343](#))
- NJ TRANSIT Light Rail Infrastructure Improvements (Project ID: [T95](#))
- NJ TRANSIT Small/Special Services Program, promoting transit solutions to reduce congestion, management transportation demand, and improve air quality through services such as shuttles and facilitating bike/transit use (Project ID: [T120](#))
- Bicycle and pedestrian facilities and accommodations, implementing elements of the Statewide Bicycle and Pedestrian Master Plan (Project ID: [X185](#))

- Support for transportation demand management (TDM) programs, including the Park and Ride System management and the RidePro ride matching program (Project ID: [X28B](#))
- NJTPA [local mobility \(shuttle\) initiatives](#) (Project ID: [X065](#))
- Additional NJTPA [Transportation Clean Air Measures](#) (TCAMs) (Project ID: [X065](#))

These and other programs and projects in this TIP are expected to contribute to addressing the established urbanized area traffic congestion (peak hour excessive delay and non-SOV travel) targets.

CMAQ Emissions Reduction

Background

As discussed in the previous section, FHWA's CMAQ program provides funding for transportation investments that contribute to air quality improvements and provide congestion relief. While that section discussed performance measures relating to traffic congestion, this section discusses the emissions reduction performance measures. The CMAQ emissions reduction performance measures focus specifically on the impacts of CMAQ investments in areas that do not meet air quality standards (nonattainment areas) or that have not met them in the past (maintenance areas). These measures examine the total daily kilograms of emissions reduction of mobile source pollutants or precursors—including carbon monoxide (CO), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and fine particulate matter (PM_{2.5})—for CMAQ-funded projects in nonattainment and maintenance areas.

States and MPOs are responsible for setting targets for the emissions reduction measures if they contain or overlap nonattainment or maintenance areas. State DOTs and MPOs are required to set 2- and 4-year emissions reduction targets that represent estimated daily emissions reduction for anticipated CMAQ-funded transportation projects in nonattainment or maintenance areas. These targets focus on the pollutants or precursors for which designated areas are in nonattainment or maintenance status.

The federal emissions reduction performance measures are:

- **Total emissions reduction for the following pollutants and precursors for CMAQ-funded projects** within the corresponding nonattainment and maintenance areas:
 - **Fine particulate matter (PM_{2.5})**
 - **Carbon monoxide (CO)**
 - Ozone precursors:
 - **Volatile organic compounds (VOC)**
 - **Nitrogen oxides (NO_x)**

NJTPA Air Quality Areas Targets and Goals

NJDOT's *Transportation Choices 2030* includes several goals which support the reduction of on-road mobile source emissions, including: 1) integrating transportation and land use planning; 2) improving mobility, accessibility, and reliability; 3) operating efficiently; and 4) respecting the environment.

The NJTPA's goal to protect and improve natural ecosystems, the built environment and quality of life is supported by the [Transportation Clean Air Measures](#) (TCAM) program, which funds innovative projects to reduce transportation-related emissions. Supported by CMAQ funds, with guidance from the NJTPA Board and a Technical Advisory Committee, and working closely with regional and local partners, the NJTPA has advanced many priority TCAMs. Targets for emissions reduction by CMAQ projects were developed to combine the NJDOT and MPO approaches and goals for air quality, with the NJDOT engaging MPO partners throughout the process. Because New Jersey is completely covered by MPO planning areas, targets for each MPO's planning area were identified, and then added together to arrive at statewide targets. All three MPOs in New Jersey agreed on the data and the process to arrive at the

targets. NJDOT established the New Jersey statewide targets in May 2018 and reported to FHWA in October 2018. The NJTPA Board approved a resolution establishing the emissions reduction targets in September 2018.

As a baseline, the partners examined emissions reductions from CMAQ projects authorized during the prior four fiscal years (FY 2014 – FY 2017). The baseline used required data from the FHWA CMAQ Public Access System (PAS) with corrections including eliminating duplicate projects and adding projects not counted in the system.

For target setting, the group considered the baseline and the partner agencies' commitment to sustaining the level of effort with CMAQ program pollutant reductions. Looking at the entire 4-year baseline period was appropriate because of variations in specific projects from year to year. (The 4-year sum also helps to address an accounting complexity for this measure—emission reductions are assigned to the first year that projects are authorized, even if the benefits are spread over longer periods.) The target setting also considered that vehicles are becoming cleaner (less polluting) over time, making it more challenging to achieve pollutant reductions by reducing vehicle miles traveled.

Given the conditions assessed in 2020 (described below) and ongoing uncertainty due to the COVID-19 pandemic and Buy America policies among other factors, no adjustment of the 4-year congestion targets was considered appropriate.

Progress Toward Targets

Targets for the emissions reduction measures specifically reflect the anticipated impacts of CMAQ-funded projects that are currently funded in the Transportation Improvement Program (TIP). The NJTPA, working with its partner agencies, will continue to identify and develop CMAQ projects based on a performance-driven planning and programming process, and will assess data and progress reports for the final performance period milestones in 2022. This progress report will also inform decision makers overseeing the planning process, offering opportunities to reassess and re-align investment priorities. These can be incorporated into updates of the NJTPA's TIP and the NJTPA's Long Range Transportation Plan.

Examples of CMAQ projects and programs in the TIP that contribute to meeting the established emissions reduction targets (in addition to the CMAQ projects listed in the traffic congestion section above, all of which have emissions reduction benefits) include the following. Note that these projects are all implemented through the NJTPA [TCAM](#) program:

- Electric Monmouth, Monmouth County. Electric charging stations on publicly accessible county properties.
- Emergency Vehicle Idle Reduction Project, NJDEP. Installation of auxiliary power units in emergency vehicles to reduce idling.
- EZ Electric- Meadowlink Electric Shuttles program, EZ Ride.
- Highlands Rail Trail (Phase II), Passaic County. Extension of the Highlands Rail Trail for bicycle and pedestrian traffic.

- IMF Zero Emission Goods Movement Project, PANYNJ. Replacement of drayage trucks with zero-emissions electric trucks.
- It Pay\$ to Plug In, NJDEP. Electric vehicle charging station installation program.
- JFK Boulevard– Armstrong Avenue to Clinton Avenue Traffic Signal Optimization, Hudson County.
- Paterson Traffic Circulation and Signal Optimization Project, City of Paterson.
- Patriots’ Path-Morristown/Hanover Shared-Use Path, Morris County.
- Traffic Signal Optimization / Adaptive Traffic Signals along Central Avenue, Essex County.
- Union City and Weehawken Traffic Signal Optimization, Township of Weehawken and City of Union City.

Afterword

The projects and programs identified in Appendix M, along with others in the NJTPA TIP and other agency programs, will assist in addressing the established asset management targets. Appendix M will be periodically updated to reflect changed targets, new measures identified through federal legislation, and help ensure an efficient investment of federal funds through better investment decisions and outcomes.