

CHAPTER 4:

PERFORMANCE-BASED PLANNING AND PROGRAMMING (PBPP)

MAP-21 and the subsequent FAST Act require state DOTs and MPOs to establish and use performance-based planning and programming in transportation decision making. This includes tracking performance measures, setting data-driven targets for each measure, and selecting projects to help meet those targets. The FAST Act also requires that the TIP include a description of its anticipated effect toward achieving the established performance targets, linking investment priorities to those performance targets.

The goal of PBPP is to ensure targeted 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; and
- reduced project delivery delays.

Regulations required by FHWA have established final rules on performance measures that address the seven goals, accordingly:

- fatalities and serious injuries, both number and rate per VMT, on all public roads;
- pavement condition on the Interstate system and on the remainder of the NHS;
- performance (system reliability) of the Interstate system and the remainder of the NHS;
- bridge condition on the NHS;
- traffic congestion;
- freight movement on the Interstate system; and
- on-road mobile source emissions.

The regulations required by FTA have established a strategic and systematic process of operating, maintaining, and improving public capital assets effectively through their lifecycle. The performance management requirements are a minimum standard for transit operators and involve measuring and monitoring the following:

- transit safety;
- transit rolling stock;
- transit equipment;
- transit infrastructure; and
- transit facilities.

For more information about the development and implementation of Transportation Performance Management (TPM) policy and rulemaking, see www.fhwa.dot.gov/tpm for Highway and www.transit.dot.gov/performance-based-planning for Transit. For the TPM implementation timeline for all performance measures, see www.fhwa.dot.gov/tpm/rule/timeline.pdf for Highway and www.transit.dot.gov/regulations-and-guidance/transportation-planning/timeframes-performance-based-planning for Transit.

4.1 Highway Safety Performance Measures (“PM1”)

Highway safety is the first national goal identified in the FAST Act and has the earliest deadline for addressing progress toward meeting targets in the TIP. In March 2016, the FHWA HSIP 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 annual targets for five safety-related performance measures with the understanding that reaching zero fatalities on all public roads will require time and significant effort. A *target* is defined in 23 CFR 490.101 as a quantifiable level of performance or condition, expressed as a value for the measure, to be achieved within a time period required by FHWA. The federal safety performance measures are consecutive five-year rolling averages for:

- number of fatalities;
- rate of fatalities per 100 million VMT ;
- number of serious injuries;
- rate of serious injuries per 100 million VMT; and
- number of non-motorized fatalities and non-motorized serious injuries (combined).

State DOTs report baseline values, targets, and progress toward meeting the targets to FHWA in an annual safety report. MPOs may either establish quantitative targets for their metropolitan planning area or agree to adopt the statewide targets. FHWA requires DOTs and MPOs to establish safety targets on an annual basis, beginning with targets for calendar year (CY) 2018. The DVRPC Board adopted a resolution on January 25, 2018, supporting NJDOT’s statewide safety targets for CY2018.

FHWA will determine whether a state has met or made significant progress toward its safety performance targets. A state is considered to have met or made significant progress when at least four out of the five safety performance targets are met or the actual outcome for the safety performance target is better than baseline performance.

Statewide Safety Targets and Goals

In 2015, NJDOT published its SHSP (www.state.nj.us/transportation/about/safety/sshsp.shtm). The SHSP was developed in collaboration with the New Jersey Division of Highway Traffic Safety (NJDOTS) and New Jersey’s three MPOs to focus on activities that will be most effective in reducing fatalities and serious injuries. This document adopted a goal to support the national vision for highway safety— *Toward Zero Deaths: A National Strategy on Highway Safety*. The SHSP is data driven, sets long-term goals, and is a coordinated statewide plan that identifies the most significant infrastructure and behavioral safety issues on New Jersey’s public roads. It identifies 16 key safety emphasis areas, including Lane Departure, Drowsy and Distracted Driving, Aggressive Driving, Intersections, Pedestrians and Bicyclists, and Mature Drivers, and the supporting strategies that are likely to have the largest impact on improving safety on public roadways. The SHSP also guides the allocation of safety funding and resources to reduce highway fatalities and serious injuries on New Jersey’s public roadways. Development of a new SHSP has started and is expected to complete in the summer of 2020 at the time of this publication.

The SHSP sets a statewide goal to reduce serious injuries and fatalities by 2.5 percent annually. Various agencies, including FHWA, NJDOT, NJDOTS, and the MPOs, recognize that reaching zero fatalities will require time and significant effort by many different partner agencies. Therefore, annual targets must be data driven, realistic, and achievable. Targets are important for agencies to make interim progress toward the long-term goal of Toward Zero Deaths in the SHSP. The goal of setting data-driven, realistic, and achievable performance targets each year will help agencies better utilize their safety resources in ways that can result in the greatest reduction in fatalities and serious injuries over time.

NJDOT and the MPOs in New Jersey adopted targets legislated as part of the previous MAP-21 federal transportation authorization, which has involved a great deal of coordination and analysis among these agencies. These agencies aim to reduce the number of fatalities, serious injuries, and non-motorized fatalities in New Jersey. Table 13 details New Jersey’s statewide safety targets for FY2019. At the time of writing, target setting for FY2020 safety targets are under development.

Table 13: New Jersey’s FY2019 Statewide Safety Targets

SAFETY PERFORMANCE MEASURE	FIVE-YEAR ROLLING AVERAGE	
	BASELINE CY2013–2017	TARGET CY2015–2019
Number of Fatalities	577.6	605.0
Fatality Rate per 100 million VMT	0.761	0.780
Number of Serious Injuries	1,092.5	1,101.4
Serious Injury Rate per 100 million VMT	1.439	1.422
Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries	379.1	393.9

Source: DVRPC, 2019

FY2019 targets were established after careful consideration of previous trends, recently constructed projects, and the current socioeconomic environment. The targets are based on five-year rolling average of fatalities and serious injuries and are reported to satisfy federal requirements with the understanding that New Jersey’s safety vision is to achieve zero deaths on all public roads over time. This long-term safety vision requires time to change attitudes and behaviors and to construct infrastructure improvements to reduce the frequency and severity of crashes.

Using a five-year rolling average and projected numbers in the target calculation, as required, can result in a higher target number than baseline number in the short term. As a result of these uncertainties, NJDOT and other states took a cautious approach to setting targets, and DVRPC supported the state targets to align regional efforts with state goals. DVRPC is open to establishing regional targets in the future, if it is particularly helpful for the region.

NJDOT and the MPOs are committed to directing resources to infrastructure-related safety strategies as we diligently strive to drive down fatalities and serious injuries with an ultimate safety vision of zero deaths. There are various federal funding flavors (e.g., Surface Transportation Block Grant Program–Philadelphia [STBGP-PHILA]) besides HSIP funds that can also support safety goals, but HSIP-funded projects must adhere to performance-based goals focusing resources on areas of greatest need and potential for the highest rate of return on the investment of HSIP funds on all public roads.

Coordination on Highway Safety Targets Setting

To strengthen communication and coordination efforts, various technical safety experts and planning staff from the MPOs and NJDOT meet regularly to discuss HSIP project advancement and performance measure targets and goals.

Progress toward Highway Safety Targets

NJDOT develops an annual safety investment strategy for all HSIP-funded activities and projects. The annual investment strategy demonstrates the linkage between the objectives of the SHSP and the projects being implemented to focus on the most effective safety improvements. For this reason, the DVRPC FY2020 TIP for

New Jersey aims to make progress toward target achievement that will ultimately result in zero fatalities. At the NJDOT statewide and DVRPC regional levels, projects and programs are selected for HSIP funding in New Jersey to help achieve a significant reduction of traffic fatalities and serious injuries on all public roads to support achieving safety targets. The DVRPC FY2020 TIP includes various HSIP-funded safety projects and programs in the DVRPC Regional Highway Program and the Statewide Program that total close to \$95 million HSIP funds over the TIP's First Four Years (FY20–FY23) and approximately \$149 million in the LFYs (FY24 – FY29).

HSIP funds are set aside every federal FY in the DVRPC TIP and New Jersey's STIP to advance projects that are evaluated and ranked based on Benefit/Cost analysis, *Highway Safety Manual* analysis, fatal and injury crashes, application of systemic improvements, improvements on local roads, and deliverability. In the TIP, the DVRPC region is allocated \$3 million of HSIP funds annually as part of the state's Financial Guidance for locally sponsored, HSIP-eligible projects on New Jersey HSIP-eligible High Risk Rural Roads (see DB #04314). The list of locations results from a data-driven analysis prepared by NJDOT that prioritizes fatal and serious injury crash concentrations in four categories: intersections, high risk rural roads, pedestrian corridors, and pedestrian intersections. Appropriate design and construction projects at these roadway locations are eligible for HSIP.

Table 14: HSIP-Funded Projects in the TIP

SPONSOR	DB #	PROJECT TITLE AND MUNICIPALITY	SHSP EMPHASIS AREA	PHASE	Fiscal Year	COST (\$000)	FUND CODE
BURLINGTON COUNTY							
County	04314	Systemic Roundabout at CR 541 (Stokes Road) & CR 648 (Willow Grove Rd) in Shamong Township	Intersections	DES	20	0.199	HSIP
				CON	21	2.652	HSIP
CAMDEN COUNTY							
NJDOT	16319	Route 30, Gibbsboro Road (CR 686) in Clementon and Lindenwold Boroughs	Intersections	CON	26	6.500	HSIP
County	D1913	Sicklerville Road (CR 705) and Erial Road (CR 706) Systemic Roundabout in Winslow Township	Intersections	DES	20	0.101	HSIP
				CON	21	1.349	STBGP-PHILA
County	D1914	Mount Ephraim Avenue Safety Improvements, Ferry Avenue (CR 603) to Haddon Avenue (CR 561) in the City of Camden	Pedestrians and Bicyclists	PE	20	1.721	STBGP-PHILA
				DES	21	0.738	STBGP-PHILA
				CON	22	9.835	STBGP-PHILA
MERCER COUNTY							
County	04314	CR 583, US 206 (Princeton Ave) and Brunswick Circle extension in Lawrence Township	Intersections	DES	20	0.122	HSIP
				CON	22	1.632	HSIP
County	D1910	Parkway Avenue (CR 634), Scotch Road (CR 611) to Route 31 (Pennington Road) in Ewing Township	Pedestrians and Bicyclists	PE	20	1.613	HSIP
				DES	22	0.691	HSIP
				CON	23-26	\$9.219	HSIP

Source: DVRPC, 2019

DVRPC, county and city partners, and NJDOT staff work together to develop safety projects at these locations. These projects are noted in Table 14 on the previous page. Potential projects are evaluated by using the *Highway Safety Manual* to ensure the identified safety improvement will have a positive benefit/cost ratio that meets NJDOT standards. In July 2015, NJDOT provided a Systemic Pilot Program for Roundabouts to provide counties an opportunity to implement at least one modern roundabout on local roadways in each county. Counties in the DVRPC region have taken this opportunity.

The Statewide Program includes the following programs to improve safety throughout the State of New Jersey, such as but not limited to, the following:

- **Highway Safety Improvement Program Planning (DB #09388)** is a \$4 million annual statewide program for Safety Management System and Rail-Highway safety improvement projects across New Jersey. Through the guidance of the HSIP (23 CFR 924), it identifies, prioritizes and implements safety programs and projects associated with safe corridors and intersection improvement programs in an effort to reduce crashes and crash severity on New Jersey's roadways.
- **Motor Vehicle Crash Record Processing (DB #X233)** is a \$2.5 million annual statewide program that provides the in-house Crash Records unit with upgraded equipment and new methodology. The comprehensive crash record database will include driver/crash correlation, crash location, data for driver updates, and database cleaning (correction) process.
- NJDOT's **Rail-Highway Grade Crossing Program, Federal (DB #X35A1)** and **Rail-Highway Grade Crossing Program, State (DB #X35A)** are statewide programs to eliminate rail-highway grade crossings, rehabilitate grade crossing surfaces, and install protective warning devices for roadways both on and off the federal-aid system.
- **Safety Programs (DB #19370)** is an annual \$14.25 million statewide program to support HSIP eligible Safety Engineering Projects and pedestrian safety improvement projects, including engineering, ROW and Construction activities intended to reduce fatalities and serious injuries on New Jersey roadways.
- **Utility Pole Mitigation (DB #15344)** is a \$175,000 annual statewide program that seeks to identify and mitigate locations with incidents of high recurring utility pole accidents throughout New Jersey.

DVRPC has the TIP Project Benefit Criteria, a set of criteria based on regional priorities that DVRPC staff use to evaluate new projects that are added to the TIP. The criteria were developed with New Jersey and Pennsylvania members of a working subcommittee of the DVRPC RTC and were designed to align directly with the multimodal goals of the Long-Range Plan and to reflect the increasingly multimodal nature of projects in the TIP. After defining the criteria, the working subcommittee weighted them, with higher weights equaling higher priorities for the DVRPC region.

In the TIP Project Benefit Criteria, safety is rated as the second-highest priority, following only facility/asset condition. Facility/asset condition considers whether a project will bring a facility or asset (e.g., bridge) into an State of Good Repair (SGR), extend its useful life, or remove a functionally obsolete bridge rating. Each project is evaluated for how it impacts safety-critical elements for transit projects and high-crash road locations, or whether it incorporates one or more FHWA-proven safety countermeasures. See Appendix F of this document for further information about the TIP Project Benefit Criteria.

Many other TIP projects funded with federal non-HSIP funds will provide safety benefits to the roadway system, such as Mount Ephraim Avenue Safety Improvements, Ferry Avenue (CR 603) to Haddon Avenue (CR 561) (DB #D1914) in the City of Camden where Concept Development was funded with local HSIP funds and

originated from DVRPC’s Local Safety Program (recall Section 2.8 Special Programs); and subsequent phases (because No-Build was not selected as the Preliminary Preferred Alternative at the end of Concept Development) are advanced with HSIP or local STBGP-PHILA or STBGP-TRENTON funds (whichever appropriate). Resurfacing, guiderail and vegetation maintenance, and bridge improvement projects are all expected to provide safety improvements and help decrease fatality and serious injury crashes.

4.2 Infrastructure (Pavement and Bridge) Performance Management Measures Rule (“PM2”)

The FHWA final rule for the National Performance Management Measures: Assessing Pavement Condition for the National Highway Performance Program and Bridge was published in the *Federal Register* (82 FR 5886) on January 18, 2017, and became effective on February 17, 2017. It established performance measures for all state DOTs to use to carry out the National Highway Performance Program (NHPP) and to assess the condition of pavements on the Interstate system, pavements on the NHS (excluding the Interstate system), and bridges carrying the NHS that include on- and off-ramps connected to the NHS. The NHPP is a core federal-aid highway program that provides support for the condition and performance of the NHS and the construction of new facilities on the NHS. The NHPP also ensures that investments of federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets as established in a state’s Transportation Asset Management Plan for the NHS. This final rule establishes regulations for the new performance aspects of the NHPP that address measures, targets, and reporting.

The pavement and bridge performance measures include:

- percentage of Interstate pavements in good condition;
- percentage of Non-Interstate NHS pavements in good condition;
- percentage of Non-Interstate NHS pavements in poor condition;
- percentage of NHS bridges by deck area classified in good condition; and
- percentage of NHS bridges by deck area classified in poor condition.

Like PM1 (Highway Safety), MPOs must establish targets by either agreeing to support the state targets or establishing their own quantifiable targets no later than 180 days after a state DOT establishes (or amends) its targets. On October 23, 2018, the DVRPC Board agreed to support NJDOT’s statewide Pavement and Bridge Infrastructure Performance targets and NJDOT’s efforts at achieving those targets shown in Table 15 and Table 16 below. Note that two-year targets (FY18–FY19) for the Interstate are not required for the first performance period (hence “n/a”). The “Baseline” in the tables is based on CY2017 of data.

Pavement Performance Targets

The PM2 rule requires the state DOT to report and manage performance of the NHS, regardless of ownership or maintenance responsibility, for the full extent of the Interstate and Non-Interstate NHS. In New Jersey, almost 40 percent of the NHS is owned by 83 other owners, including authorities, counties, and municipalities.

Federal rulemaking 23 U.S.C. 119 requires that all distress component information be collected for one-tenth-mile increments. Pavement condition is measured by four distress components (International Roughness Index [IRI], Cracking, Rutting, and Faulting), which are then translated to good, fair, or poor condition scores per FHWA criteria and then broken out into separate values for the Interstate and Non-Interstate NHS.

- **International Roughness Index**—quantifies how rough the bituminous and concrete pavement is by measuring the longitudinal profile of a traveled wheel track and generating a standardized roughness value in inches per mile;
- **Cracking**—measures the percentage of bituminous and concrete pavement surface that is cracked;
- **Rutting**—measures the depth of ruts (surface depression) in bituminous pavement in inches; and
- **Faulting**—quantifies the difference in elevation across transverse concrete pavement joints in inches.

NJDOT used information from the 2016 Highway Performance Monitoring System supplement report card and preliminary data for 2017 to approximate the baselines (estimated current conditions) and develop targets (the desired SGR) by the May 2018 deadline. NJDOT then used its own pavement management system and its own measures, metrics, and budget information to predict performance on the State Highway System. A correlation analysis was developed and then applied to the State Highway System performance, which showed a gradually declining trend on both the Interstate and Non-Interstate NHS pavements at current funding levels. NJDOT also sent a survey to all NHS owners requesting past and future expenditures on NHS routes and qualitative information regarding future funding and pavement performance to help validate results of the correlation analysis. This analysis led to the baseline and targets in Table 15 that the DVRPC Board unanimously supported on October 23, 2018.

Table 15: State Pavement Infrastructure Performance Targets

PAVEMENT INFRASTRUCTURE	CONDITION	BASELINE	2-YEAR TARGET	4-YEAR TARGET
Interstate Pavement Lane Miles	Good	61.25%	n/a	50.00%
	Poor	1.01%	n/a	2.50%
Non-Interstate NHS Pavement Lane Miles	Good	32.45%	25.00%	25.00%
	Poor	2.38%	2.50%	2.50%

Source: DVRPC, 2019

Although the two-year and four-year targets assume pavement condition worsening, NJDOT and DVRPC are committed to a long-term goal of improving pavement conditions, achieving a sustainable SGR. Further, less than 5 percent of the NHS Interstate pavements are rated in poor condition, per federal requirement.

Bridge Performance Targets

Similar to pavement, the PM2 rule requires the state DOT to report and manage performance of all bridges on the NHS, regardless of ownership or maintenance responsibility, including bridges on ramps connecting to the NHS and NHS bridges that span a state border. Statewide, NHS bridges are owned and maintained by various entities, including NJDOT (52 percent by deck area); transportation authorities and commissions (38 percent); and counties, municipalities, NJ TRANSIT, various other agencies, and private owners (10 percent). FHWA’s performance measures aim to assess bridge condition by deriving the percentage of NHS bridges rated in good and poor condition by deck area on the NHS. A structure’s overall condition rating is determined by the lowest rating of its deck, superstructure, substructure, and/or culvert. If any of the components of a structure qualify as poor, the structure is deemed poor. 23 CRF 490.411(a) requires that no more than 10 percent of a state’s total NHS bridges by deck area be in poor condition. It is important to note that poor does not correlate to the safety rating of the bridge. The bridge condition performance measures are calculated by summing the deck area of bridges in “good” and “poor” condition and dividing by the total deck area of all NHS bridges.

As with the pavement condition measures, DVRPC relied upon NJDOT for calculation of bridge condition metrics and supported NJDOT’s statewide targets (the desired SGR) in Table 16. Due to potential tool enhancements and limited available information, NJDOT has established conservative targets. In some respects, these may be more appropriately referred to as benchmarks.

Table 16: State National Highway System Bridge Infrastructure Performance Targets

BRIDGE INFRASTRUCTURE	CONDITION	BASELINE	2-YEAR TARGET	4-YEAR TARGET
NHS Bridge Deck Area	Good	21.70%	19.40%	18.60%
	Poor	6.50%	6.50%	6.50%

Source: DVRPC, 2019

The *poor* condition inventory is flat because the New Jersey Turnpike Authority is responsible for two-thirds of remaining NHS bridges in *poor* condition, and they have recently completed a major upgrade to their system and increased funding for bridge maintenance. Additionally, there was a recent increase of funding, from \$25 million to \$44+ million per year, for county bridge owners for local aid projects, where the distribution formula favors *poor* condition bridges. NJDOT projects a gradual decrease of bridges in *good* condition.

NJDOT established the state-maintained National Bridge Inspection Standards (NBIS) Bridge targets based on available National Bridge Inventory (NBI) data, current project delivery process, project pipeline capacity, and current practices adopted by NJDOT, including available financial information, lifecycle planning strategies, and capital investment strategies. Then NBI historical data from calendar year (CY) 2012 to CY2018 was analyzed to develop trends on the NHS bridge conditions. Targets were adjusted to incorporate data on other owners’ NHS bridges, federally owned NBIS bridges, and border NBIS bridges reported by neighboring states. NJDOT assumed that bridges owned by others will remain stable. Moving forward, NJDOT intends to collect more information and implement AASHTOWare’s BrM as their main data analysis tool to develop better targets for the population of NHS bridges rated as *good* and *poor*.

Coordination on Pavement and Bridge Performance Targets Setting

NJDOT held a series of stakeholder meetings and workshops that included the assessment and analyses of the state NHS network pavement and bridges, as well as the State Highway System pavement and bridges; and discussions related to performance measures, targets and target setting approach, SGR objectives, issues, and challenges. Since a significant amount of the NHS in the state is owned by other jurisdictions, stakeholders included these non-NJDOT NHS owners. The MPOs in New Jersey assisted NJDOT with the collection and dissemination of data to the non-NJDOT NHS owners. The MPOs also agreed to use the infrastructure targets that NJDOT established and adopt the statewide federal TPM infrastructure targets.

Progress towards Pavement and Bridge Performance Targets

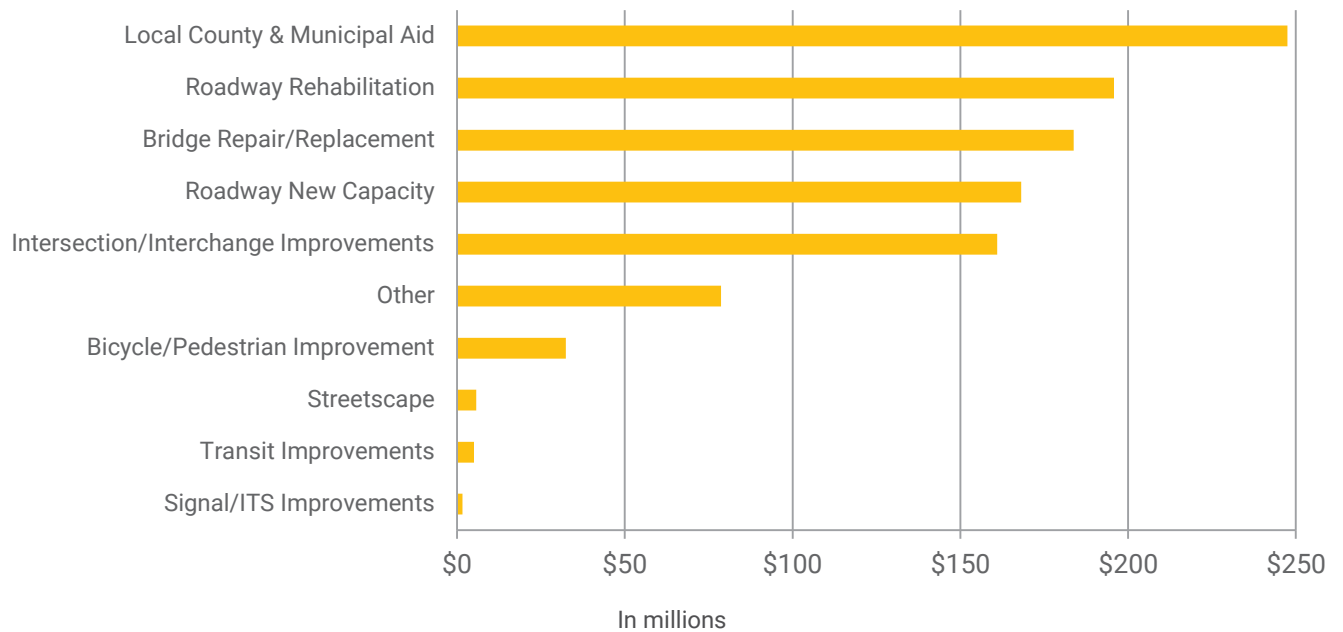
DVRPC is dedicated to system preservation for pavement and bridges. The [DVRPC Long-Range Plan](#) places an increased emphasis on analysis related to transportation system preservation needs and funding, which in turn informs the fiscally constrained list of projects included in the Long-Range Plan and TIP. In the DVRPC New Jersey region, the Long-Range Plan identified \$11.3 billion needed for pavement and bridge preservation projects. Of this total need, \$10.1 billion is programmed in the TIP for system preservation, but there is also \$1.2 billion of need that is currently unfunded unless there is additional revenue.

Per Table 12 in the Long-Range Plan, system preservation is funded the most of all highway project types. Of the entire \$13.7 billion allocated to all roadway improvements in the Long-Range Plan, 48.5 percent or \$6.7 billion is allocated to roadway preservation, followed by 25 percent or \$3.4 billion for bridge preservation. Table 13 in the Long-Range Plan lists all major regional system preservation projects needed to maintain the existing system. The two major regional system preservation projects funded in the TIP are as follows:

- Route 70 from Route 38 to Cropwell Road (DB #11338); and
- Route 130, Bridge over Big Timber Creek (DB #14426).

In the First Four Years of the DVRPC FY2020 TIP for New Jersey, 35 percent of the funding programmed (excluding STATE-DVRPC funds) are primarily roadway or bridge repair/replacement/rehabilitation projects (see Figure 7). Further, the state funded Local County and Municipal Aid category in Figure 7 below are programs managed by NJDOT for local municipal and county bridge or roadway projects. System preservation was and continues to stay one of the top priorities in the DVRPC TIP Project Benefit Criteria.

Figure 7: Four-Year (FY20-23) Highway Program by Primary Project Category



Source: DVRPC, 2019

Roadway maintenance is a major focus area of NJDOT’s Capital Investment Strategy. According to NJDOT’s Statewide Capital Investment Strategy FY2013–2022, more than \$260 million (approximately 8 percent) of the annual investments go toward road assets. The New Jersey Transportation Trust Fund (TTF) provides \$400 million annually to all local governments in New Jersey for the funding of road, bridge, and other transportation projects. Some of these programs include the following below.

In the TIP, the **Local Municipal Aid, DVRPC (DB #X98C1)** is an annual program for municipal road improvement projects, such as resurfacing, rehabilitation or reconstruction, and signalization. Projects involving bridge improvements, pedestrian safety improvements and bikeway improvements are also eligible to receive funds under Municipal Aid. Annual funds increased slightly from almost \$27 million to \$29 million in the TIP.

NJDOT's **County Aid (DB #X41C1)** program covers roads and bridges under county jurisdiction. Public transportation and other transportation projects are also included. In the TIP, the level slightly increased from \$30 million to almost \$33 million per year.

The NJDOT **Local Bridges, Future Needs Fund (DB #08387)** is an annual \$47.3 million statewide program for the entire state. This program provides funding for improvements on county bridges. Currently, the state focuses on preventive maintenance, rehabilitation, and selective replacement of bridges.

The NJDOT **Local Aid Infrastructure Fund (DB #X186)** provides for various emergency and regional needs throughout the state at the county or municipal level, which includes the replacement or rehabilitation of orphan bridges. In the STIP, this program is programmed at \$7.5 million per year for the entire state.

The STIP will continue the annual **Local Freight Impact Fund (LFIF) (DB #17390)** in the amount of \$30.1 million to assist counties and municipalities throughout the state with the impacts associated with the freight industry's use of infrastructure. Pavement and bridge preservation projects are LFIF eligible.

Finally, the recently established **NJDOT Transportation Infrastructure Bank (DB #X186B)** appears in the Statewide Program for the first time at an annual level of \$22.6 million. It will provide financial loans to public or private entities for the planning, acquisition, engineering, construction, reconstruction, repair, and rehabilitation of a transportation project or for any other purpose at a low interest rate. Camden County was the first in the State of New Jersey to receive financing from the NJDOT Transportation Infrastructure Bank for the Westfield Avenue (CR 610) milling and overlay road reconstruction project that costs approximately 2.1 million.

4.3 System (NHS, Freight, CMAQ) Performance Management Measures ("PM3")

The FHWA final rule for the National Performance Management Measures; Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program was published in the Federal Register (82 FR 5970) on January 18, 2017, and became effective on May 20, 2017.

This final rule is the third in a series of three related rulemakings that together establish a set of performance measures for state DOTs and MPOs to use as required by MAP-21 and the FAST Act. The measures in this third final rule will be used by state DOTs and MPOs to assess the performance of the Interstate and Non-Interstate NHS for the purpose of carrying out the NHPP, to assess freight movement on the Interstate system; and to assess traffic congestion and on-road mobile source emissions for the purpose of carrying out the CMAQ Program. These system performance measures are collectively referred to as PM3 measures.

PM3 system performance measures include the following listed below that are divided into three categories: Travel Time Reliability (TTR), Congestion, and Emissions Reduction. Each category has its own measures.

TTR

- Percentage of Person-Miles Traveled (PMT) on the Interstate system that are Reliable;
- Percentage of PMT on the Non-Interstate NHS that are Reliable; and
- Interstate system Truck TTR Index.

CMAQ Congestion

- Annual Hours of Peak-Hour Excessive Delay (PHED) per Capita; and

- Percentage of Non-SOV Travel.

CMAQ Emissions Reduction

- On-Road Mobile Source Emissions Reduction for CMAQ-Funded Projects.

Like PM1 and PM2, MPOs must establish targets by either agreeing to support the state targets or establishing their own quantifiable targets no later than 180 days after a state DOT establishes (or amends) its targets. On October 23, 2018, the DVRPC Board agreed to support NJDOT’s statewide NHS System Performance and Freight System Performance targets and NJDOT’s efforts at achieving those targets shown in Table 17 and Table 18. The DVRPC Board agreed to support NJDOT’s CMAQ Congestion targets on May 24, 2018, and the CMAQ Emissions Reductions targets on September 27, 2018. These are not annual targets unlike PM1 (Highway Safety).

TTR Targets

The first major performance area under system performance is TTR. Reliability refers to the variability of travel times on road segments experienced by travelers. The less variability there is for any given set of roadway segments, the more reliable those segments are. TTR does not mean eliminating traffic congestion but reducing its extremes to maintain consistent traveler expectations.

The measures for TTR are the percentage of PMT on the Interstate on the NHS with reliable travel times, and the percentage of PMT on the Non-Interstate NHS with reliable travel times. The measures are calculated by using the Level of TTR metric, defined as the ratio of the longer travel times (80th percentile) to a “normal” travel time (50th percentile).

TTR is assessed by using archived real-time vehicle probe data contained in the National Performance Management Research Data Set (NPMRDS) and then calculated with the assistance of the Probe Data Analytics Suite. The Probe Data Analytics Suite was created and maintained by the University of Maryland Center for Advanced Transportation Technology Laboratory (UMD CATT Lab), following FHWA guidance. Only current and some historical data is available through the Probe Data Analytics Suite; forecasts for these measures are not. The NJDOT Complete Team, which consists of planning and operations staff from NJDOT, all New Jersey MPOs, NJ TRANSIT, Port Authority of New York and New Jersey, New Jersey Turnpike Authority, and FHWA-NJ, had several meetings to discuss the underlying data, calculation tools and methods, baseline results, and target-setting approaches.

Long-term policies for the agencies support improvements to reliability. Given traffic growth and near-term projects and programs, the consensus was to have the required targets represent maintenance of current values for each TTR measure, as shown in Table 17.

Table 17: State TTR Targets

NHS SYSTEM	CONDITION	BASELINE	2-YEAR TARGET	4-YEAR TARGET
PMT on Interstate with Reliable Travel Times (%)	Good	82.00%	82.00%	82.00%
PMT on Non-Interstate NHS with Reliable Travel Times (%)	Good	84.10%	n/a	84.10%

Source: DVRPC, 2019

In order to observe future trends going forward and to revisit and adjust targets appropriately as a result of a more reliable NPMRDS v2 database that is expected to be available over the next four to six years, NJDOT and the MPOs have collaboratively decided to keep the future two-year and four-year TTR targets for Interstate and Non-Interstate the same as the 2017 baseline values.

Freight/Truck TTR Targets

The national system performance measure for freight is the Truck TTR Index and is required for Interstate highways on the NHS only. This measure is like the TTR measure and metric described above, but it is focused primarily on truck traffic. Truck TTR is the ratio between the “congested” (95th percentile) and “average” (50th percentile) truck travel times. This metric is averaged for all Interstate road segments in the state, weighted by distance, resulting in the Truck TTR Index for the state. Unlike the TTR measures, there is no “threshold” that determines whether a segment is reliable or unreliable for trucks.

As with the TTR measures, the Truck TTR Reliability performance measure was based on the NPMRDS data source and calculated by using the UMD CATT Lab NPMRDS Analytics Suite tool but uses travel times specifically reported from trucks (where available). As with the previous TTR measures, the NJDOT Complete Team met several times to discuss and agree on the underlying data, calculation tools and methods, baseline results, and target-setting approaches. Again, long-term policies for the agencies support improvements to freight travel time reliability.

Table 18: State Freight Performance Targets on the NHS Interstate System

FREIGHT	CONDITION	BASELINE	2-YEAR TARGET	4-YEAR TARGET
Truck TTR	Good	1.82%	1.90%	1.95%

Source: DVRPC, 2019

As Table 18 shows, the identified targets for freight performance on the NHS Interstate system represent a slightly worsening value in both the two-year and four-year targets compared to baseline (2017) due to anticipated increase in traffic (both overall and trucks specifically) and near-term projects and programs in the DVRPC FY2020 TIP for New Jersey.

Coordination on TTR and Freight/Truck TTR Targets

DVRPC is committed to improving reliability on roadways within its region in New Jersey, as well as working with its county, city, and transit partners, and NJDOT staff to develop projects that will inevitably improve TTR and help meet state targets. As mentioned before, DVRPC proactively seeks to include freight as a primary planning factor through its Long-Range Plan, TIP development, and the conduct of technical studies. DVRPC’s goal is to serve the region’s freight stakeholders and maintain the Philadelphia-Camden-Trenton region as an international freight center. At the forefront of DVRPC’s Freight Planning Program is the Delaware Valley Goods Movement Task Force, a broad-based freight advisory committee that provides a forum for the private- and public-sector freight community to interject its unique perspectives on regional plans and specific projects.

In addition to NJDOT’s statewide projects and programs, DVRPC had programmed a local, county-sponsored intersection and operational CMAQ-funded congestion relief project in Hamilton Township via the FY2018 Competitive CMAQ Program (see DB #X065). These projects are described in more detail in the subsequent section, “Progress toward CMAQ Congestion and Emissions Reductions Targets”; and Table 3 shows a sampling of TIP projects that support freight mobility and TTR as part of promoting goods movements and

economic development. In the FY2020 TIP for NJ, there are projects programmed within a DVRPC-designated Freight Center that supports Truck TTR, such as Route 130, Plant Street to High Hill Road (CR 662) (DB #11414).

The FAST Act established the NHFP to improve the efficient movement of freight on the NHFN. NHFP's eligibility criteria require that a project contribute to the efficient movement of freight and be identified in the state's freight investment plan. States may use up to 10 percent of NHFP funding each year for public or private freight rail, water facilities (including ports), and/or intermodal facilities. In the TIP, projects programmed with federal NHFP funds in the DVRPC New Jersey region are as follows:

- **Route 295/42/I-76, Direct Connection (DB #s 355A and 355E)** to relieve an existing bottleneck at interchange and improve safety by providing direct connections among multiple highways;
- **Route 42 SB, Leaf Avenue Extension to Creek Road (CR 753) (DB #18313)** is a new project in the TIP that may relocate access to NJ 42 ramps further down CR 753 and provide sufficient lane configurations to accommodate freight movement.

Further, the **New Jersey Rail Freight Assistance Program (DB #X34)** in the Statewide Program provides State TTF funding for the rehabilitation and improvement of key elements of the New Jersey rail freight network. The DVRPC TIP Project Benefit Criteria (Appendix F) also prioritizes congestion reduction, investing in Centers (including Freight), and facility/asset use (including truck volume) for new project candidates. NJDOT and NJ TRANSIT sponsor numerous statewide programs that improve TTR. Many of these are funded through the CMAQ Program further detailed in this document's section 4.3 System (NHS, Freight, CMAQ) Performance Management Measures ("PM3"), under Progress toward CMAQ Congestion and Emissions Reductions Targets.

NJDOT's Statewide Freight Plan (published in 2017) identifies improving reliability and efficiency as one of its goals. This plan provides a well-defined blueprint for NJDOT investment, identifying discrete projects that immediately address critical freight system improvements. It also includes a fiscally constrained freight investment plan that identifies and prioritizes freight-related transportation projects. The Truck TTR Index was one of four factors that were used for project prioritization.

In addition to the Statewide Freight Plan cited above, NJDOT continues to spearhead various initiatives with the specific intent of improving infrastructure conditions for goods movement in New Jersey. These include:

- Freight Management System;
- Freight Performance Measures; and
- Truck Monitoring Program.

NJDOT is also developing an internal Freight Management System that would be used to advance freight-specific concerns into NJDOT's capital programming process.

DVRPC is an active participant in NJDOT's Freight Advisory Committee and the I-95 Corridor Coalition and served on the stakeholder group for the development of the 2017 NJDOT Statewide Freight Plan. The I-95 Corridor Coalition provides a forum for state, local, and regional transportation agencies and organizations from Maine to Florida to work together to improve transportation mobility, safety, efficiency, and system performance. Coalition members facilitate more efficient network operations through regional incident management planning, coordination, communication, and improved information management across jurisdictions and modes. DVRPC and the other two MPOs in New Jersey are also involved in the Metropolitan

Area Planning Forum of the Greater New York Metropolitan Transportation Management Area, which identified regional freight initiatives as one of the key items to work on.

Finally, there are also several grant programs (outside of DVRPC) administered by the state and federal governments specifically targeting freight. NJDOT's Local Freight Impact Fund assists counties and local municipalities with the mitigation of impacts on the local transportation system associated with the State's freight industry. USDOT's Better Utilizing Investments to Leverage Development (BUILD) grant program (formerly known as TIGER) and the INFRA grant program (formerly known as the FASTLANE program) provide for major investments in roads, rail, transit, and port infrastructure. The projects awarded with NJDOT's Local Freight Impact Fund, USDOT's BUILD, or USDOT's INFRA grants in the DVRPC New Jersey region that directly support TTR, including freight, are:

- \$18.5 million from the 2011 USDOT TIGER round for the South Jersey Port Corporation's South Jersey Port Rail Improvements to repair the DelAir Bridge, a critical link to rail networks in Pennsylvania and New Jersey, and upgrade the rail network from the bridge to the Ports of Salem, Paulsboro, and Camden to accommodate anticipated demand in rail/port traffic; the DelAir Bridge is currently completed and open to traffic;
- \$2.1 million from the 2018 NJDOT Local Freight Impact Fund for the Rising Sun Road-Dunns Mill Road Connector Road in Bordentown Township, Burlington County;
- \$850,000 from the 2018 NJDOT Local Freight Impact Fund for Charles Street Roadway Improvements in Gloucester City, Camden County;
- \$4 million from the 2018 NJDOT Local Freight Impact Fund for Route 44 Truck Bypass and Du-Pont Port Access Road in Gloucester County;
- \$2 million from the 2018 NJDOT Local Freight Impact Fund for the Paulsboro Marine Terminal Spine Road Grading, Paving and Striping Project in Gloucester County;
- \$300,000 from the 2018 NJDOT Local Freight Impact Fund for the reconstruction of Commerce Boulevard in Logan Township, Gloucester County; and
- \$740,000 from the 2018 NJDOT Local Freight Impact Fund for the Paulsboro-Greenwich Township Truck Route Improvements in Paulsboro Borough, Gloucester County.

CMAQ Congestion Targets

Federal CMAQ Program funds projects that reduce congestion and improve air quality. The CMAQ Congestion and Emissions Reduction Targets are specifically intended to reduce congestion, directly related to attributes of CMAQ-funded projects, and unlike other federally required performance measures, they specifically apply to urbanized areas with a population over one million. Note that traffic congestion occurs when the amount of traffic far exceeds the physical capacity of the system, generally measured by the number of travel lanes on the roadway, the number of intersections, access points, and numerous other factors. Reliability is used in reference to the level of consistency in the transportation service provided by a roadway. For example, a roadway can be heavily congested, but if the amount and time of day when the congestion occurs on it is consistent, then it is considered reliable. USDOT established performance measures pertaining to reliability because empirical evidence exists to suggest that the traveling public values reliability more than straight travel times. *Traffic Congestion and Reliability: Linking Solutions to Problems* is available on the FHWA website at ops.fhwa.dot.gov/congestion_report_04/chapter2.

CMAQ Congestion has two measures for the applicable urbanized area, which are:

- **PHED Per Capita on the NHS:** The threshold for excessive delay is based on the travel time at 20 miles per hour or 60 percent of the posted speed limit travel time, whatever is greater, and is

measured in 15-minute intervals. The actual rule containing all the details is found in 23 CFR 490.707(a). The “excessive” part of the PHED name indicates that some level of congestion is recognized as not possible or desirable to eliminate and thus not counted. For example, some congestion can accompany economic activity in thriving places. The “per capita” implies that the total delay is shared by all residents, so some trips can be avoided or shifted to non-vehicular modes out of the peak period. This measure sums up the delay experienced by travelers throughout an entire year on NHS roads, specifically during peak periods.

- **Non- SOV travel on the NHS:** Non-SOV travel may include travel via carpool, vanpool, public transportation, commuter rail, walking, or bicycling, as well as telecommuting. The actual rule containing all the details is found in 23 CFR 490.707(b).

For the PHED per capita measure, only a four-year target is required at this time, while both two- and four-year targets are required from the base year for the Percentage of Non-SOV measure. The CMAQ Congestion Performance Targets that are established by NJDOT and supported by the DVRPC Board are shown in Table 19.

Table 19: CMAQ Congestion Measures Targets on the NHS

DVRPC URBANIZED AREAS	CMAQ CONGESTION MEASURES	BASELINE	2-YEAR TARGET	4-YEAR TARGET
Philadelphia PA-NJ-DE-MD	Non-SOV Travel	27.90% ¹	28.00%	28.10%
	PHED per Capita	16.8	n/a	17.2 Hours per Capita
New York-Newark NY-NJ-CT	Non-SOV Travel	51.60% ¹	51.60%	51.70%
	PHED per Capita	20.0	n/a	22.0 Hours per Capita

Notes:

1. Baseline for Non-SOV Travel is based on 2012–2016 American Community Survey (ACS).
2. PHED per Capita Four-Year Target assumes a growth of +0.6 percent per year.
3. See DVRPC’s CMAQ Performance Plan for 2018–2021 (Publication #TM19003).

Source: DVRPC, 2019

The DVRPC region is part of the Philadelphia PA-NJ-DE-MD Urbanized Area with a population of almost 5.6 million (per the 2016 one-year ACS and includes a small portion of the New York-Newark NY-NJ-CT Urbanized Area in Mercer County, New Jersey. The New York-Newark Urbanized Area has a population of almost 19 million, according to the 2016 one-year ACS.

Coordination on CMAQ Congestion Targets

Pursuant to the FAST Act and MAP-21, and the ensuing requirements of 23 CFR Part 490, the National Performance Management Measures Final Rule, all state DOTs and MPOs that contain, within their respective boundaries, any portion of the NHS network within the urbanized area must establish a single unified target for the congestion measures. In other words, all performance areas require single statewide targets or their own regional target, except for the two CMAQ congestion measures (PHED per Capita and Percentage of Non-SOV), where requirements apply to urbanized areas with a population over one million. DVRPC staff collaborated with multiple agencies in developing and agreed on a single realistic target for each of the two measures.

In the case of the Philadelphia PA-NJ-DE-MD Urbanized Area (“Philadelphia Urbanized Area”), this means that DVRPC collaborated with the Lancaster County Transportation Coordinating Committee, NJTPA, SJTPO, Wilmington Area Planning Council, Pennsylvania Department of Transportation (PennDOT), NJDOT, Delaware

Department of Transportation (DelDOT), and Maryland Department of Transportation in developing and agreeing on a common congestion measure baseline and targets for the Philadelphia Urbanized Area. Since there is a portion of the New York-Newark NY-NJ-CT Urbanized Area (“New York Urbanized Area”) in Mercer County, New Jersey, within the DVRPC region, DVRPC also collaborated with the NJTPA, the New York Metropolitan Transportation Council, NJDOT, the New York State Department of Transportation, and others to adopt a common congestion measure baseline and targets for that urbanized area.

On May 24, 2018, the DVRPC Board agreed to support CMAQ Congestion performance measure targets for PHED per Capita and Percentage of Non-SOV travel for the Philadelphia and New York urbanized areas.

DVRPC is an MPO that serves a Transportation Management Area with a population greater than one million that includes a non-attainment or maintenance area. As such, DVRPC was required to develop a CMAQ Performance Plan for 2018–2021 to support the implementation of these CMAQ congestion measures. In the CMAQ Performance Plan, which is required to be updated biennially through the performance period, the MPO must describe how they plan to meet the targets, detail their progress toward achieving the targets over the course of the Performance Plan, and include a description of projects identified for funding that will contribute to achieving targets. The DVRPC Board approved the submission of the DVRPC’s CMAQ Performance Plan for 2018–2021 (Publication #TM19003) to NJDOT for submission to FHWA on September 27, 2018. The other MPOs in New Jersey (SJTPA and NJTPA) were also required to submit a CMAQ Performance Plan for the same period.

CMAQ Emissions Reduction Targets

DVRPC coordinated efforts with NJDOT and other MPOs in the state to develop cumulative On-Road Mobile Source Emissions two-year and four-year targets as daily kilograms. MPO regional targets in Table 20 were used to develop NJDOT’s statewide on-road mobile emissions reductions targets displayed in Table 21. Page 15 of DVRPC’s CMAQ Performance Plan for 2018–2021 (Publication #TM19003) describes the process in developing the regional targets.

Table 20: CMAQ On-Road Emissions Reductions Targets (in Daily Kilograms) in the DVRPC New Jersey Region

CMAQ EMISSION REDUCTION	2-YEAR TARGET	4-YEAR TARGET
VOC	1.45	2.864
NOX	7.453	14.861
PM2.5	2.627	5.253
CO	n/a	n/a

Source: DVRPC, 2019

Table 21: NJDOT Statewide CMAQ On-Road Emissions Reductions Targets (in Daily Kilograms)

CMAQ EMISSION REDUCTION	2-YEAR TARGET	4-YEAR TARGET
VOC	17.682	36.324
NO _x	114.401	231.850
PM _{2.5}	4.29	8.52
CO	31.927	63.010

Source: DVRPC, 2019

Coordination on CMAQ Emissions Reduction Targets

DVRPC has coordinated emissions reduction target setting with both PennDOT and NJDOT to establish emissions reduction targets from CMAQ-funded projects in the relevant portions of the DVRPC planning areas. Each state has developed state-level emissions reductions targets that account for emissions reductions at the MPO level. On September 27, 2018, the DVRPC Board agreed to support NJDOT’s statewide CMAQ Emission Reduction Targets and NJDOT’s efforts at achieving those targets mentioned above, as well as to adopt the MPO regional targets, and approve DVRPC to submit the CMAQ Baseline Report and Performance Plan for 2018–2021 (Publication #TM19003) to NJDOT for submission to FHWA.

Progress toward CMAQ Congestion and Emissions Reductions Targets

There are projects in the TIP that will help the MPO and state meet two- and four-year targets for traffic congestion and on-road mobile source emissions. Table 10 in DVRPC’s CMAQ Performance Plan for 2018–2021 (Publication #TM19003) identifies all TIP projects in the New Jersey portion of the DVRPC region from FY18 to FY21. In addition, the most recent Competitive CMAQ Program that DVRPC administered throughout CY2018 to utilize CMAQ funds included various projects that will support the CMAQ Congestion and Emissions Reductions Targets (see Table 7 in this document for a full list of projects). The projects selected were approved by the DVRPC Board on December 5, 2018 (after publication and submission of the DVRPC CMAQ Performance Plan), are expected to be authorized by or before FY2021, and like all CMAQ-funded projects, will have congestion mitigation and air quality/emission reduction benefits. DVRPC will continue to select projects and programs that have a positive air quality benefit in terms of reducing mobile source emissions.

DVRPC will also continue to promote and develop projects and programs with air quality benefits to its counties and planning partners. As part of the DVRPC CMP, DVRPC facilitates a CMP Planning Advisory Committee and generates a list of the top 10 bottlenecked locations for both State and Authority roadways, and County and Local roadways. The objectives for DVRPC’s CMP are to (1) minimize growth in recurring congestion and improve reliability of the transportation system; (2) provide transit where it is most needed for accessibility; (3) maintain the existing core transportation network; (4) improve safety and reduce non-recurring congestion by reducing crashes; (5) maintain movement of goods by truck; (6) maintain transportation preparedness for major events, especially ones that call for inter-regional movements far beyond normal and serve routine needs; and (7) at the end of the day, ensure that all transportation investments support DVRPC Long-Range Plan principles. Section 2.4 of this document explains more about the CMP. Lastly, DVRPC works with its counties, cities, and NJDOT to develop problem statements for future congestion relief projects that will hopefully also result in improved TTR, congestion mitigation, and improved air quality.

Besides the DVRPC local CMAQ Program, NJDOT and NJ TRANSIT have several statewide programs that help reduce emissions (as well as congestion), throughout the state. These are listed below.

Active Traffic Management System (DB #13303) will continue to provide funding for the deployment program for the first Active Traffic Management System throughout the state, including all phases of design. This program will include funding for the complete delivery of the Final Design document for the Active Traffic Management System for a candidate highway (I-80, I-295, or I-78). The design document will be used to deploy and carry out the actual construction of this technology for automatic operation and handling of traffic. Funding is provided in the amount of \$3 million CMAQ in FY2020 and \$1 million CMAQ in FY2021.

Bicycle and Pedestrian Facilities/Accommodations (DB #X185) continues to be a comprehensive statewide program to insure the broad implementation of the Statewide Bicycle and Pedestrian Master Plan, Complete Streets Policy, and the implementation of federal and state policies and procedures pertaining to bicycle, pedestrian, transit, and ADA access and safety. This program includes addressing bicycle, pedestrian, transit, and ADA travel needs through the development of improvements on state, county, and local systems either by independent capital projects or through grants to counties and municipalities. Projects must make full consideration for the needs of all users. Funding is provided annually from three sources: CMAQ, State, and TA-FLEX.

Intelligent Traffic Signal Systems (DB #15343) will continue to improve mobility on New Jersey's arterial highways. Arterials contribute almost 70 percent of total congestion that occurs in New Jersey. This statewide program will focus on dynamically managing New Jersey's arterials from NJDOT's Arterial Management Center. Existing traffic signals will be strategically, systematically, and programmatically upgraded from stand-alone signals to highly sophisticated, coordinated, real-time traffic response traffic signals. This upgrade will consist of installing new controllers, intelligent software and algorithms, robust detection, and communication. This is a plan to upgrade most of the signals on NJDOT-owned highways only. CMAQ funding is provided annually between \$10 and \$15 million CMAQ.

Transportation Demand Management Program Support (DB #X43) will continue the management of the Owned and Leased Park and Ride Program and the remaining efforts as they relate to the 1-800-CARPOOL program, which also includes maintaining the RidePro ride-matching software program. This statewide program is allocated \$250,000 CMAQ annually.

Rail Rolling Stock Procurement (DB #T112) provides Section 5307, Section 5337, and state funds for the replacement of rail rolling stock, including engineering assistance and project management, to replace over-aged equipment, including rail cars, revenue service locomotives, and expansion of NJ TRANSIT rolling stock fleet (cars and locomotives) to accommodate projected ridership growth and other system enhancements over the next 10 years in the DVRPC region. Funding is provided to support vehicles/equipment (for rail operations). Annual funds are provided for Comet V single-level car lease payments, electric locomotive lease payments, diesel locomotive lease payments, dual power locomotives and multilevel rail car lease payments, and other upcoming rolling stock lease payments. Pay-as-you-go funding is also programmed for multilevel vehicles and other rolling stock.

Small/Special Services Program (DB # T120) is allocated \$416,000 state funds annually for NJ TRANSIT efforts in the DVRPC region that initiate or promote transit solutions to reduce congestion, manage transportation demand, and improve air quality. Included are state funds for the Vanpool Sponsorship Program and Transportation Management Association Program, and federal funds for the East Windsor Community Shuttle operating support. Funding is also provided for capital acquisition/operating expenses for

the Community Shuttle Program, Bike/Transit facilitation, and other activities that improve air quality and help reduce congestion.

Much of the congestion within the DVRPC region occurs on state-owned and maintained highways, which are part of the NHS. Therefore, NJDOT has invested a significant amount of resources in congestion relief programs statewide. Congestion relief is also one of the focus areas in NJDOT's Capital Investment Strategy. Per the Statewide Capital Investment Strategy FY13–FY22, almost \$480 million (approximately 15 percent), of annual capital investments goes toward congestion relief projects. Progress is being made toward meeting the congestion relief and on-road mobile emissions reductions targets.

4.4 Transit Asset Management (TAM) Rule

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 lifecycles 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 an SGR. In short, TAM uses asset condition to guide the optimal prioritization of funding at transit properties.

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 transit capital assets effectively through their entire lifecycles. 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, 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.

The TAM rule established the following national TAM 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). ULB is the measure agencies will use to track the performance of revenue vehicles (rolling stock) and service vehicles (equipment) to set their performance measure targets. ULB means either the expected lifecycle of a capital asset or the acceptable period of use in service determined by FTA. Each vehicle type's ULB estimates how many years that vehicle can be in service and still be in an SGR. The ULB considers how long it is cost effective to operate an asset before ongoing maintenance costs outweigh replacement costs;
- **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. 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); and
- **Infrastructure:** The percentage of track segments (by mode) that have performance restrictions.

Under the provisions of the Transit Asset Transportation Performance Management rulemaking, transit operators are required to set performance targets for their transit asset portfolio. MPOs are then required to set their own targets or adopt the transit operators targets for the transit asset portfolio in their region, beginning in CY2017, based on measures mandated by the rule. The performance measures were selected by FTA and include:

- average revenue fleet age;
- average non-revenue fleet age;
- percentage of facilities that are below a condition rating of 3 on the TERM scale; and
- percentage of the track system under a performance restriction.

Transit agencies are required to upload their performance targets, as well as a supporting narrative, in their annual National Transit Database submission, and report progress against these targets. They are also required to develop a TAM Plan that adheres to the following nine elements to ensure assets are in an SGR:

- Inventory of Capital Assets;
- Condition Assessment;
- Decision Support Tools;

- Investment Prioritization;
- TAM and SGR Policy;
- Implementation Strategy;
- List of Key Annual Activities;
- Identification of Resources; and
- Evaluation Plan.

There are two Tier 1 agencies providing public transit service and subject to this FTA TAM performance management rule in the DVRPC New Jersey region. The agencies are NJ TRANSIT and DRPA/PATCO.

TAM Coordination, Targets, and Goals

The MPOs have 180 days after the transit agencies set their targets, to decide either to adopt the transit operators' targets or to develop their own metropolitan targets. In January 2019, DVRPC took formal action to adopt the same set of targets as NJ TRANSIT and DRPA/PATCO. DVRPC has also worked with NJ TRANSIT, DRPA/PATCO, and NJDOT to develop a set of written procedures that outline the coordination process for TAM. At the time of writing, the FTA has not approved both agencies' FY2019 targets, and target setting for FY2020 is expected to occur later in CY2019 with potential DVRPC Board adoption.

DVRPC's Long-Range Plan prioritizes the preservation and maintenance of the existing transportation infrastructure. This includes maintaining the transit system in an SGR and operating it in a safe and secure manner by replacing buses, railcars, and locomotives as they age, as well as attending to rail bridges, track, signal systems, stations, and other infrastructure. An asset is in an SGR if: (1) it is able to perform its designed function; (2) it does not pose a known unacceptable safety risk; and (3) its lifecycle investments have been met or recovered.

NJ TRANSIT TAM Targets and Goals

NJ TRANSIT operates and maintains a large fleet of buses, railroad cars, locomotives, and light rail vehicles (LRVs) in the DVRPC New Jersey region. To ensure these assets are in an SGR, 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 into the future.

NJ TRANSIT has prepared an Enterprise Asset Management Program 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 an SGR. 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 their TAM targets. Tables 3.9 to 3.14 in the NJ TRANSIT TAM Plan provide details for the following TAM performance targets for the State of New Jersey.

(1) Rolling Stock (Percentage of revenue vehicles that have met or exceeded their useful life benchmark)

NJ TRANSIT owns and maintains a fleet of 200 locomotives, 160 self-propelled cars, and 953 locomotive-hauled cars to serve the State of New Jersey. In addition, the agency maintains and operates 15 diesel locomotives and 65 single-level passenger cars owned by the Metro-North Railroad that are configured to operate with NJ TRANSIT's fleet. All locomotives and loco-hauled cars are operated in push-pull service. NJ TRANSIT's commuter rail ULB for locomotives, passenger cars, and self-propelled passenger cars is 30 years,

which is lower than FTA's ULB of 39 years. By 2023, the entire self-propelled passenger car fleet is expected to be retired and replaced by new multilevel vehicles. In the DVRPC New Jersey region, the heavy commuter rail lines include the Northeast Corridor from the City of Trenton to Hamilton Township, Princeton Junction, and to New York City's Penn Station; and the Atlantic City line between Philadelphia's 30th Street Station and Atlantic City, New Jersey.

The RiverLINE is the only light rail system in the DVRPC New Jersey region. Its 20 LRVs are diesel powered, built in 2003, and are maintained by Bombardier at the 36th Street facility in the City of Camden. NJ TRANSIT has established 31 years as the ULB for LRVs, which is the FTA default value.

NJ TRANSIT owns a fleet of over 3,000 buses consisting of two types: (1) over-the-road for longer-haul commuting services and (2) transit. The active bus fleet in daily service is considered to be in an SGR. NJ TRANSIT has determined that the ULB for buses should be 12 years for those in transit service. These include articulated buses, transit buses, and suburban buses. NJ TRANSIT's ULB for over-the-road for commuter service is 14 years. See percentage targets per measure for 2019 in Table 22.

(2) Equipment (Percentage of service vehicles that have met or exceeded their useful life benchmark)

NJ TRANSIT's non-revenue service vehicle inventory includes ordinary automobiles and locomotives that also include police cruisers and specialized track machinery (e.g., light duty trucks, heavy duty trucks, and rubber tire construction equipment and trailers). The current work train locomotive fleet includes five MP-20 locomotives and four GP-40 locomotives. The fleet of work train freight cars totals 81 cars. Of these 81 cars, 68 of them are able to be interchanged with freight railroads. There are also 80 pieces of steel-wheel maintenance-of-way equipment and 158 pieces of construction equipment that include trailers and back hoes, loaders, or similar, not driven on highways. There are 68 automobiles for management and supervisory use, 275 light trucks for maintenance, and 106 heavy duty trucks. The bus non-revenue vehicle inventory consists of 58 automobiles for management and supervisory use, 75 light trucks for service calls, and 34 trucks to retrieve buses back to the maintenance garage. Further, NJ TRANSIT has a fleet of corporate non-revenue service vehicles (police, technology, maintenance, and administration); and Information Systems equipment, such as radio towers, radio repeater equipment, ticket vending machines, and a drone. The 2019 targets for automobiles, trucks, and other rubber tire vehicles, as well as steel wheel vehicles, are listed in Table 23.

(3) Facility (Percentage of facilities rated below 3 on the condition scale)

NJ TRANSIT takes a geographic approach (north, central, and south regions) to condition of all facilities over a three-year period: North in FY2018, Central in FY2019, and South in FY2020. For 2019, it is estimated that no passenger stations facilities and parking lots, and no administration and maintenance facilities will have a performance rating of less than 3 on the TERM scale (Table 24).

(4) Infrastructure (Percentage of track segments with performance restrictions)

NJ TRANSIT will implement the principles of its TAM policy by adopting an SGR policy to maintain capital assets to the level where the asset operates at full performance, in order to provide a safe, reliable, convenient, and cost-effective transit service to its customers. 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. Table 25 shows that for 2019, less than 1 percent of the RiverLINE's track segments and 1 percent of NJ TRANSIT's statewide commuter rail track segment are expected to experience performance restrictions (Table 25).

Table 22: NJ TRANSIT Rolling Stock Performance Targets

PERFORMANCE MEASURE	2019 TARGET (%)
Articulated Bus	100.00
Automobile	28.89
Over-the-road Bus	26.80
Bus	44.83
Cutaway	13.19
LRV	0.00
Minivan	4.35
Commuter Rail Locomotive	11.70
Commuter Rail Passenger Coach	16.97
Commuter Rail Self-Propelled Passenger Car	100.00
Van	1.53

Source: NJ TRANSIT, 2019

Table 23: NJ TRANSIT Equipment Performance Targets

PERFORMANCE MEASURE	2019 TARGET (%)
Automobiles	39.00
Trucks and Other Rubber Tire Vehicles	47.00
Steel Wheel Vehicles	25.00

Source: NJ TRANSIT, 2019

Table 24: NJ TRANSIT Facility Performance Targets

PERFORMANCE MEASURE	2019 TARGET (%)
Passenger/Parking Facilities	0.00
Administrative/Maintenance Facilities	0.00

Source: NJ TRANSIT, 2019

Table 25: NJ TRANSIT Infrastructure Performance Targets

PERFORMANCE MEASURE	2019 TARGET (%)
Commuter Rail	1.00
RiverLINE Light Rail	0.42

Source: NJ TRANSIT, 2019

DRPA/PATCO TAM Targets and Goals

The DRPA is a bistate corporation that owns and operates four major toll bridge crossings of the Delaware River. Its transit subsidiary, PATCO, operates and maintains a 14.2-mile rapid public transit line between Philadelphia and southern New Jersey, including an administrative and maintenance facility at Lindenwold, New Jersey. The DRPA owns nine stations in DVRPC's New Jersey region and leases four stations in Philadelphia from the City of Philadelphia.

DRPA/PATCO's TAM Plan was published on October 1, 2018. Similar to NJ TRANSIT, DRPA/PATCO's TAM Plan adheres to the nine federally required elements to ensure assets are in an SGR. It also sets forth its blueprint to identify, describe, and improve asset management practices, with the vision to maintain the agency's assets in an SGR. The plan also identifies their programs and projects aimed at helping to achieve their TAM targets.

(1) Rolling Stock (Percentage of revenue vehicles that have met or exceeded their useful life benchmark)

DRPA/PATCO's rolling stock includes all revenue vehicles. The ULB of a self-propelled heavy rail car is 39 years. The DRPA/PATCO had 75 Budd rail cars installed in 1969 (50 years old) and 45 Vickers cars installed in 1980 (39 years old). PATCO completed a car overhaul project in April 2019 (Table 26). The transit car overhaul project for the PATCO High Speed Line will result in a 25-year ULB, which is stricter than FTA's ULB of 39 years; therefore, the target is zero percent for FY2019 as Table 26 displays.

(2) Equipment (Percentage of service vehicles that have met or exceeded their useful life benchmark)

For 2019, it is estimated that 24 percent of non-revenue service vehicles will be over their ULB (Table 27). Most of the non-revenue service vehicles over their ULB pertain to maintenance, such as trailers or loaders.

(3) Facility (Percentage of facilities rated below 3 on the condition scale)

For 2019, it is estimated that no passenger stations facilities and parking lots, and no administration and maintenance facilities, will have a performance rating of less than 3 (Table 28).

(4) Infrastructure (Percentage of track segments with performance restrictions)

The slow zone restrictions are calculated over the 14.2-mile (74,976 feet) track of the PATCO High Speed Line. Projects that impact track (either through slow zone or track outages) are considered. The percentage of track miles in slow zone restrictions is calculated out over 365 days (Table 29). For 2019, there are Capital Projects scheduled, such as the Ben Franklin Bridge Bike Ramp, PATCO Interlocking Rehabilitation, PATCO Elevator Installation, Fourth Street Garage Cathodic Protection, and PATCO Track Resurfacing, in addition to routine maintenance and inspections and resurfacing and maintenance projects that are expected to impact 1.44 percent, or 1,080 feet, of track outages and/or slow zone restrictions over the year (Table 29).

Table 26: DRPA/PATCO Rolling Stock Performance Target

PERFORMANCE MEASURE	2019 TARGET (%)
Rolling stock cars over their ULB	0.00

Source: DRPA/PATCO, 2019

Table 27: DRPA/PATCO Equipment Performance Target

PERFORMANCE MEASURE	2019 TARGET (%)
Non-revenue service vehicles over their ULB	24.00

Source: DRPA/PATCO, 2019

Table 28: DRPA/PATCO Facility Performance Targets

PERFORMANCE MEASURE	2019 TARGET (%)
Passenger stations facilities and parking lots with a performance rating <3	0.00
Administration and maintenance facilities with a performance rating <3	0.00

Source: DRPA/PATCO, 2019

Table 29: DRPA/PATCO Infrastructure Performance Target

PERFORMANCE MEASURE	2019 TARGET (%)
Track miles in slow zone restrictions	1.44

Source: DRPA/PATCO, 2019

NJ TRANSIT'S Progress toward TAM Targets

The Transit Asset Transportation Performance Management rule requires MPOs to describe how the region's TIP will help to achieve the TAM targets. The TIP was developed to ensure progress toward target achievement. Transit operators have taken steps to ensure that projects selected for TIP funding help to achieve the TAM targets.

A few of NJ TRANSIT's projects and programs that have been allocated resources over the First Four Years of the TIP to help achieve TAM Targets include the following:

- preventive maintenance of the bus system (DB #T135);
- rail preventive maintenance program (DB #T39), which is used for the overhaul of rail cars and locomotives, and other preventive maintenance costs; and
- replacement of rail cars and locomotives that have reached the end of their useful life (DB #T112), and the Bus Acquisition Program to replace buses (DB #T111).

NJ TRANSIT's State Capital Program calls for continued investment in the state's transit infrastructure to maintain an SGR and provide reliable transit service. An emphasis on better preparing NJ TRANSIT to withstand, and recover from, future extreme weather events through building a more resilient system remains a key focus of the Capital Program, which invests in railroad bridge rehabilitation, track replacement, signal upgrades, repairs to overhead power lines and electric substations, improvements to rail stations, and bus shelter upgrades.

DRPA/PATCO'S Progress toward TAM Targets

DRPA/PATCO has programmed most of their funding for system preservation and maintenance over the First Four Years of the DVRPC FY2020 TIP for New Jersey. DRPA/PATCO's system preservation projects include the following:

- Complete the rebuilding of all existing PATCO cars. There are 120 rail cars in PATCO's fleet that were refurbished to include new interiors, better communications, security, and mechanical improvements. The project is the largest rolling stock capital expenditure since PATCO's inception in 1969 and one of the largest capital improvement projects in DRPA's history. As of April 2019, the entire fleet, or 120 cars out of a fleet of 120, have been refurbished (DB #DR046);
- Preventive maintenance on vehicles and facilities (DB #DR034);
- Rehabilitate and replace interlockings, rail bed, and other rail improvements to ensure overall system safety, reliability, and minimal service disruptions (DB #DR1501);
- Replace electric cables throughout the PATCO High Speed Line System (DB #DR008);
- Renovate subway structures, such as pedestrian bridges, tunnels, subway stations, pump rooms, and tunnel leakage mitigation (DB #DR1802);
- Rehabilitate or replace embankment (e.g., fencing, retaining wall) for erosion and drainage control (DB #DR015); and
- Rehabilitate platforms at various PATCO stations (DB #DR1803).

DRPA/PATCO has adopted the TAM policy to support and complement their Five-Year Strategic Plan "Roadmap to World-Class Stewardship: 2018–2022," Five-Year Capital Program, and the Annual Budget Process in order to realize the agency's vision as a "World-Class Stewardship" organization. Further, the operator will continue to utilize biennial inspections (that serve as the basis of the agency's budget program), an integrated budget and strategic plan process, and solutions derived from the asset management to continuously evaluate and update the asset management plan.

4.5 Public Transportation Agency Safety Plans (PTASP)

On July 19, 2018, the FTA published the PTASP Final Rule, which requires certain operators of public transportation systems that receive federal funds under FTA's Urbanized Area Formula Grants to develop safety plans that include the processes and procedures to implement Safety Management Systems (SMS). The PTASP rule is effective July 19, 2019. The plan must include safety performance targets, and transit operators, such as NJ TRANSIT and the DRPA/PATCO, must also certify they have a safety plan in place meeting the requirements of the rule by July 20, 2020. The transit agency must update and certify this plan each year. At this time, the PTASPs for NJ TRANSIT and the DRPA/PATCO are under development and will be included in the final, printing of the TIP document when available.