

APPENDIX H

Performance Measure Targets and Reporting

Transportation Performance Measure1: Safety Performance Target Setting

In compliance with the FHWA's 23 CFR Part 490, Subpart B - National Performance Management Measures for the Highway Safety Improvement Program (HSIP), the following is a summary of WILMAPCO, DelDOT and Maryland targets to meet or make significant progress toward the five required safety performance goals. The targets were set by the DOTs in August 2017 and WILMAPCO has opted to adopt and support the statewide targets set both DOTs.

Methodology: Both states have adopted the Toward Zero Deaths (TZD) approach. TZD is a data-driven effort to reduce fatalities and serious injuries by developing strong leadership in organizations that directly impact highway safety. For consistency with the 2015 Strategic Highway Safety Plan (SHSP), DelDOT and Office of Highway Safety (OHS) agreed to use the SHSP annual targets as the basis for developing Delaware's 2018 targets for each safety measure. Annually, Delaware's an additional reduction of at least 3 fatalities and 15 serious injuries over the previous year to achieve a 50% reduction by 2035. In Maryland the annual targets for each of the measures are set using an exponential trend line connecting the historical data to the 2030 goal found in their SHSP.

The chart shows the Delaware and Maryland established statewide targets (2014-2018, 5 year rolling averages) for each of the five measures. Once 2018 Fatality Analysis Reporting System (FARS), Highway Performance Monitoring System (HPMS), and FARS Annual Report File (ARF) data becomes finalized (December 2019) it will be compared to these targets to determine whether Delaware, Maryland, and WILMAPCO and MPOs have met or made significant progress toward our crash reduction targets.

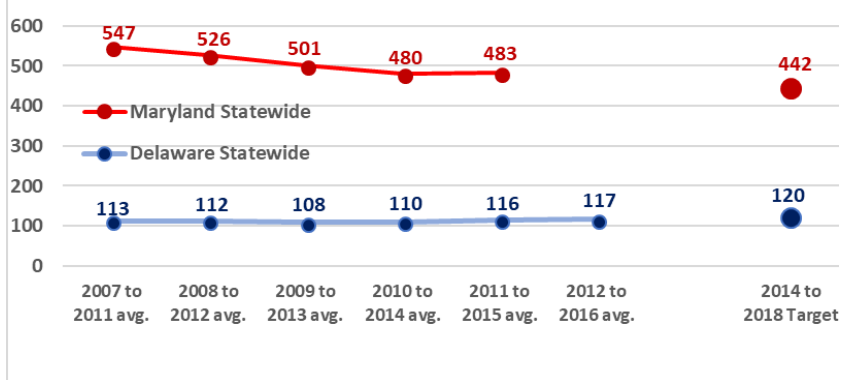
Details on the HSIP projects can be found in the New Castle County section of the TIP.

State/MPO Established Safety Targets*	Maryland	Delaware
Number of Fatalities	442.0	120.2
Rate of Fatalities per 100 million VMT	0.72	1.208
Number of Serious Injuries	3,422.0	578.6
Rate of Serious Injuries per 100 million VMT	6.08	5.822
Number of Non-motorized Fatalities and Non-motorized Serious Injuries	488.0	94.2

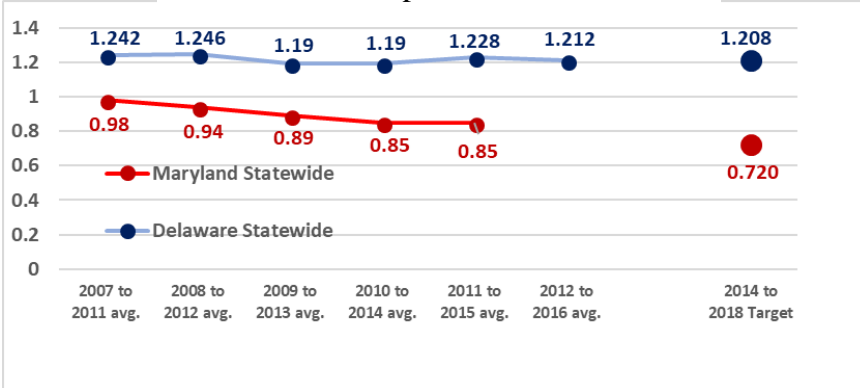
* Projected 2014-2018 5-year rolling averages

The following charts show the historical trends composed of 5-year rolling averages, 2018 HSIP baseline figures and 2014-2018 targets for all five safety performance measures. Figures include all injuries and fatalities which occurred on all public roads.

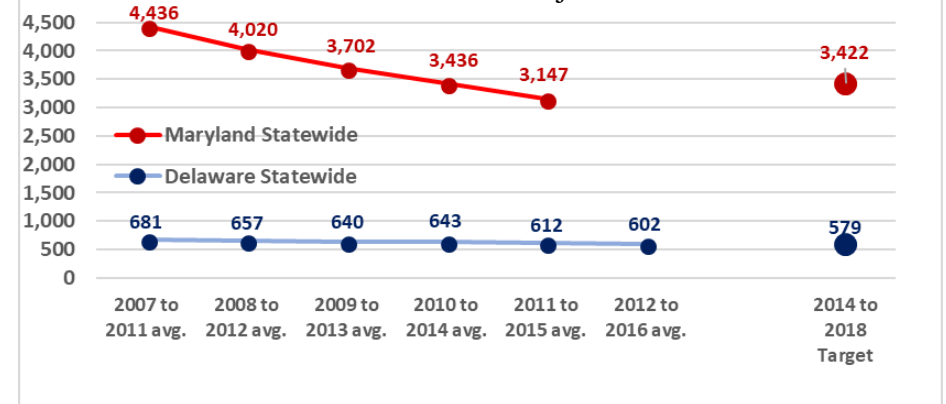
Total Number of Fatalities



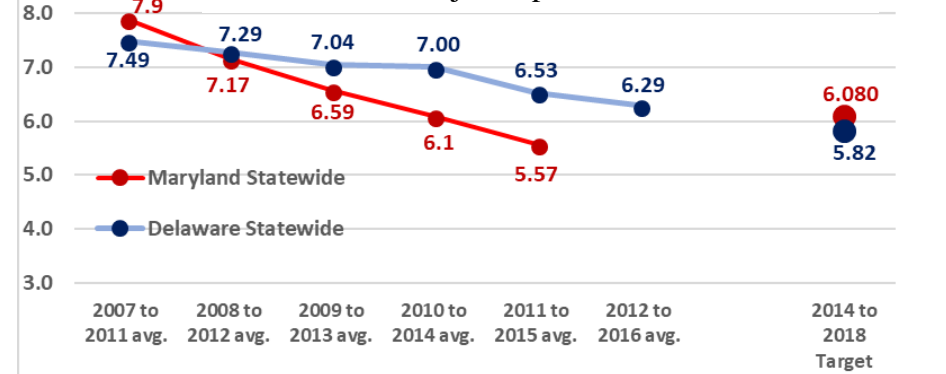
Rate of Fatalities per 100 million VMT



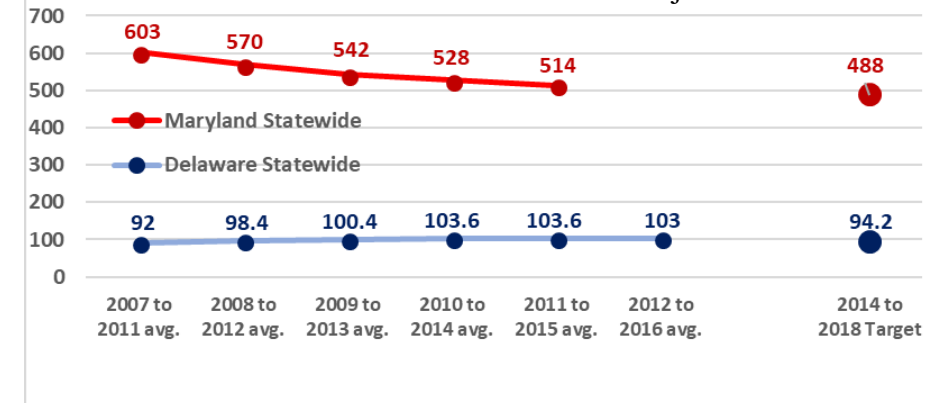
Number of Serious Injuries



Rate of Serious Injuries per 100 million VMT



Non-Motorized Fatal and Serious Injuries



Transportation Performance Measure 2: Infrastructure condition targets for the National Highway System (NHS) – Pavement Conditions

Pavement conditions are reported to FHWA by States through the HPMS for Federal-aid highways. The reporting agency uses the International Roughness Index (IRI) to measure the smoothness of pavement and ride quality. The following performance measures are used in assessing the condition of the NHS. Minimum pavement condition for the Interstate System is no more than 5% in Poor condition

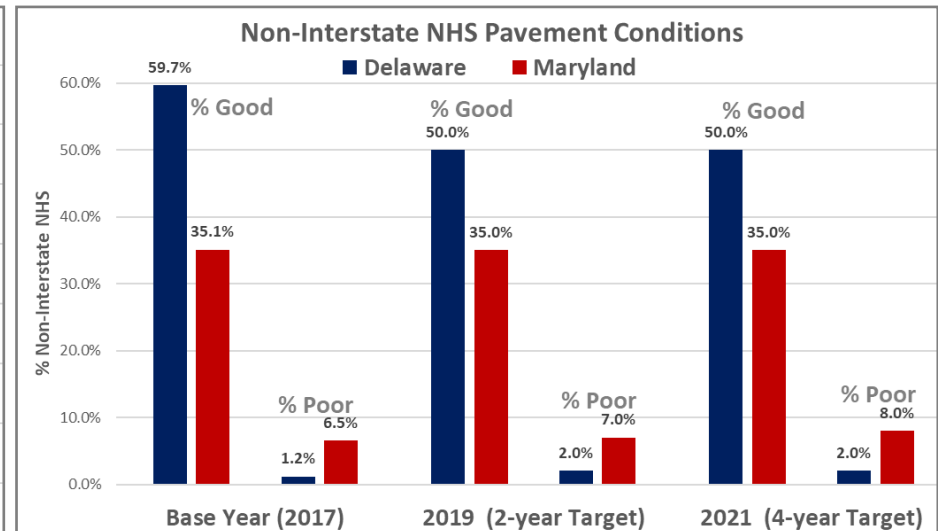
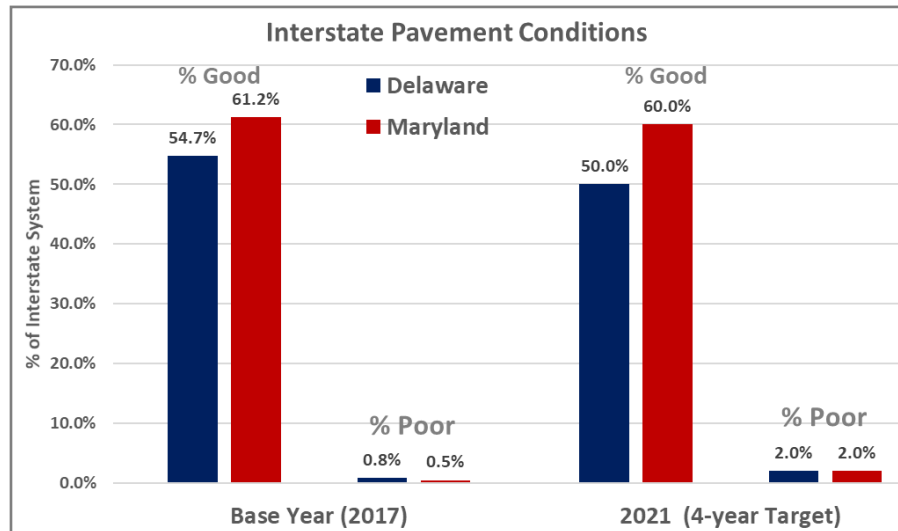
Performance Measures: Pavement Condition*	
% of Interstate pavement in GOOD condition (4-year target only)	
% of Interstate pavement in POOR condition (4-year target only)	
% of non-Interstate NHS pavements in GOOD condition (2 and 4 year target)	
% of non-Interstate NHS pavements in POOR condition (2 and 4 year target)	

*Good condition: Suggests no major investment is needed.

Poor condition: Suggests major reconstruction investment is needed.

Pavement Condition Determination Method

Overall Section Condition Rating	Pavement Type		Measures
	Asphalt and Jointed Concrete	Continuous Concrete	
	3 metric ratings (IRI, cracking and rutting/faulting)	2 metric ratings (IRI and cracking)	
Good	All three metrics rated "Good"	Both metrics rated "Good"	percentage of lane-miles in "Good" condition
Poor	≥ 2 metrics rated "Poor"	Both metrics rated "Poor"	percentage of lane-miles in "Poor" condition
Fair	All other combinations	All other combinations	



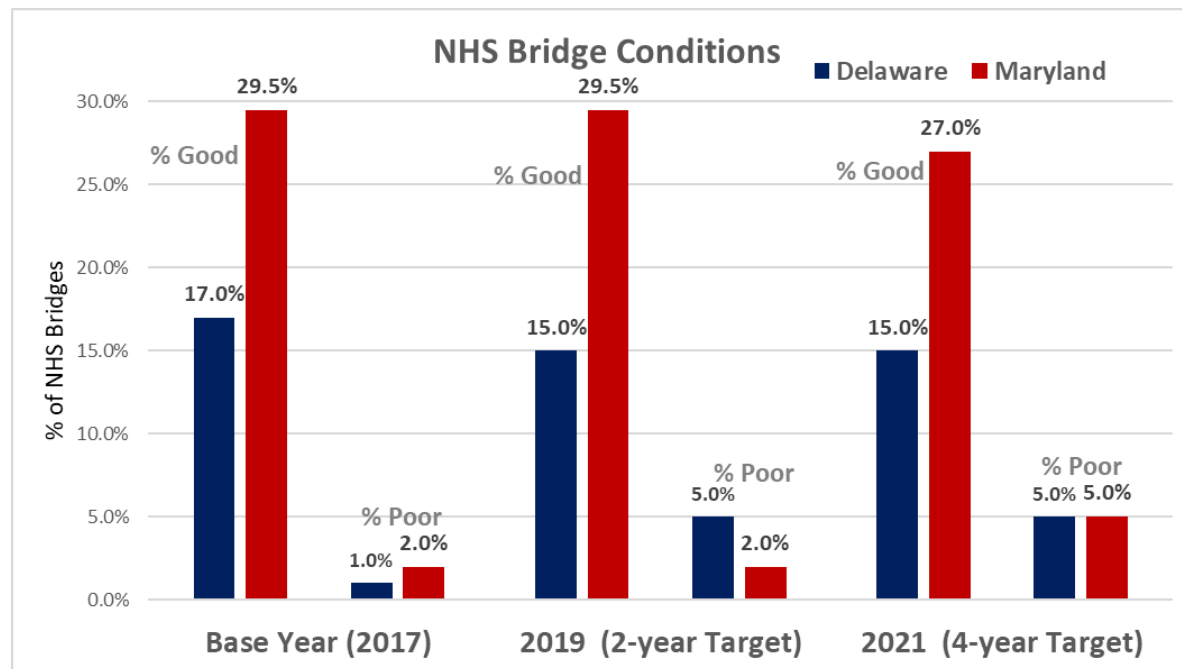
Transportation Performance Measure 3: Infrastructure condition targets for the National Highway System (NHS) – Bridge Conditions

States and MPOs must establish two and four targets for all bridges carrying the NHS, which includes on-and off-ramps connected to the NHS within a State, and bridges carrying the NHS that cross a State border, regardless of ownership. States must maintain NHS bridges at less than 10.0% of deck area as structurally deficient.

Bridge Condition Performance Measures	
% of NHS bridges classified as in GOOD condition	
% of NHS bridges classified as in POOR condition	

Measure: Based on deck area based on National Bridge Inventory (NBI) condition ratings for the bridge deck, Superstructure, Substructure and/or Culvert. Condition is determined by the lowest rating of the four ratings.

NBI Rating Scale (from 0 – 9)		9	8	7	6	5	4	3	2	1	0
		Good			Fair		Poor				
Bridge	Deck (Item 58)	≥ 7			5 or 6		≤ 4				
	Superstructure (Item 59)	≥ 7			5 or 6		≤ 4				
	Substructure (Item 60)	≥ 7			5 or 6		≤ 4				
	Culvert (Item 62)	≥ 7			5 or 6		≤ 4				



Transportation Performance Measure 4: Travel Time Reliability Measures - Level of Travel Time Reliability

Level of Travel Time Reliability (LOTTR) is defined as the ratio of the longer travel times (80th percentile) to a “normal” travel time (50th percentile), using data from FHWA’s National Performance Management Research Data Set (NPMRDS). Reliability is measured during the full calendar year broken down into 4 time periods: AM Peak, Midday, PM Peak and Weekends. If any of these segments have a LOTTR above 1.50, the segment is determined not reliable. All non-reliable segments are then calculated in combination with daily traffic volumes and average vehicle occupancy to produce the total number of person-miles impacted by each unreliable segment.

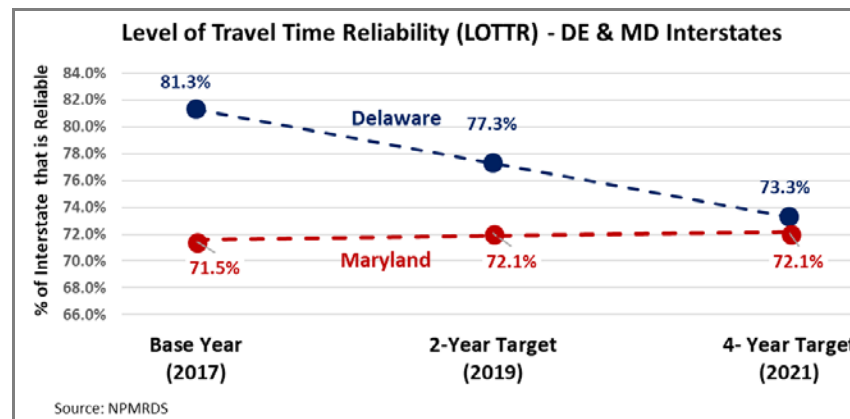
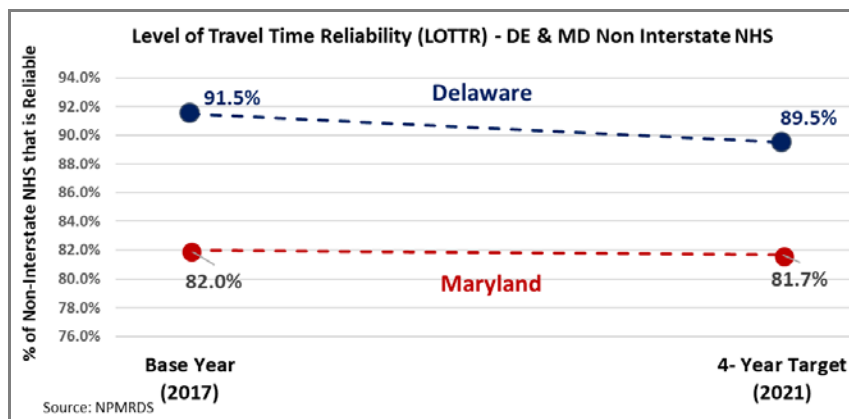
Travel time reliability performance measures

Interstate Travel Time Reliability Measure: % of person-miles traveled on the Interstate that are reliable

Non-Interstate Travel Time Reliability Measure: % of person -miles traveled on the non-Interstate NHS that are reliable

Illustration of Reliability Determination

Monday – Friday	6am – 10am	$LOTTR = \frac{44 \text{ sec}}{35 \text{ sec}} = 1.26$
	10am – 4pm	LOTTR = 1.39
	4pm – 8pm	LOTTR = 1.54
Weekends	6am – 8pm	LOTTR = 1.31
Must exhibit LOTTR below 1.50 during all of the time periods		Segment IS NOT reliable



Data Sources:

Travel times - Travel Time Data Set (NPMRDS)

Travel volumes - Annual volume calculated as: AADT x 365 days.

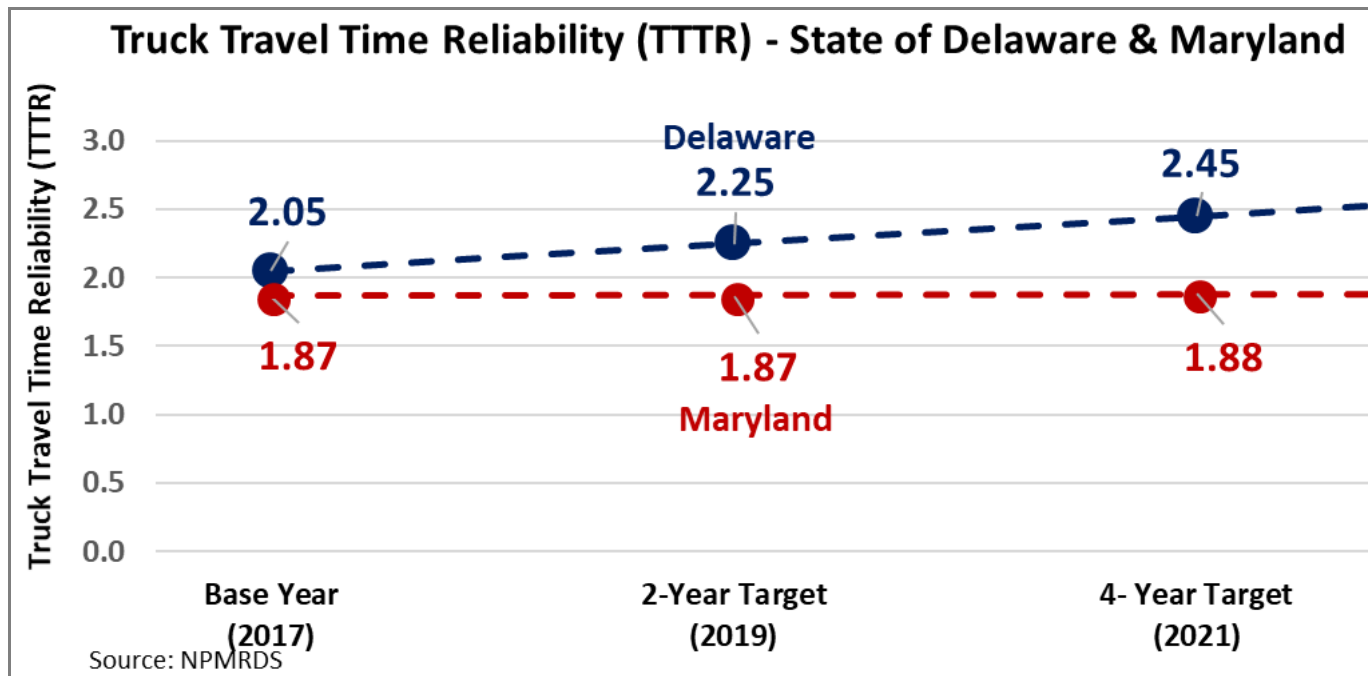
Average vehicle occupancies (AVO) data tables published by FHWA.

Transportation Performance Measure 3: Travel Time Reliability Measures – Truck Level of Travel Time Reliability (TTTR)

Measure: The sum of maximum TTTR for each reporting segment, divided by the total miles of Interstate system ONLY. Reporting is divided into five periods: morning peak (6-10 a.m.), midday (10 a.m.-4 p.m.) and afternoon peak (4-8 p.m.) Mondays through Fridays; weekends (6 a.m.-8 p.m.); and overnights for all days (8 p.m.-6 a.m.). The TTTR ratio is generated by dividing the 95th percentile time by the normal time (50th percentile) for each segment. The measure is based on the worst performing time period for each segment, averaged together to create a single figure.

Illustration of Truck Reliability Determination

Monday – Friday	6 – 10 a.m.	$TTTR = \frac{63 \text{ sec}}{42 \text{ sec}} = 1.50$
	10 a.m. – 4 p.m.	$TTTR = \frac{62 \text{ sec}}{45 \text{ sec}} = 1.38$
	4 – 8 p.m.	$TTTR = \frac{85 \text{ sec}}{50 \text{ sec}} = 1.70$
Weekends	6 a.m. – 8 p.m.	$TTTR = \frac{52 \text{ sec}}{40 \text{ sec}} = 1.30$
Overnight	8 p.m. – 6 a.m.	$TTTR = \frac{46 \text{ sec}}{38 \text{ sec}} = 1.21$
Maximum TTTR		1.70



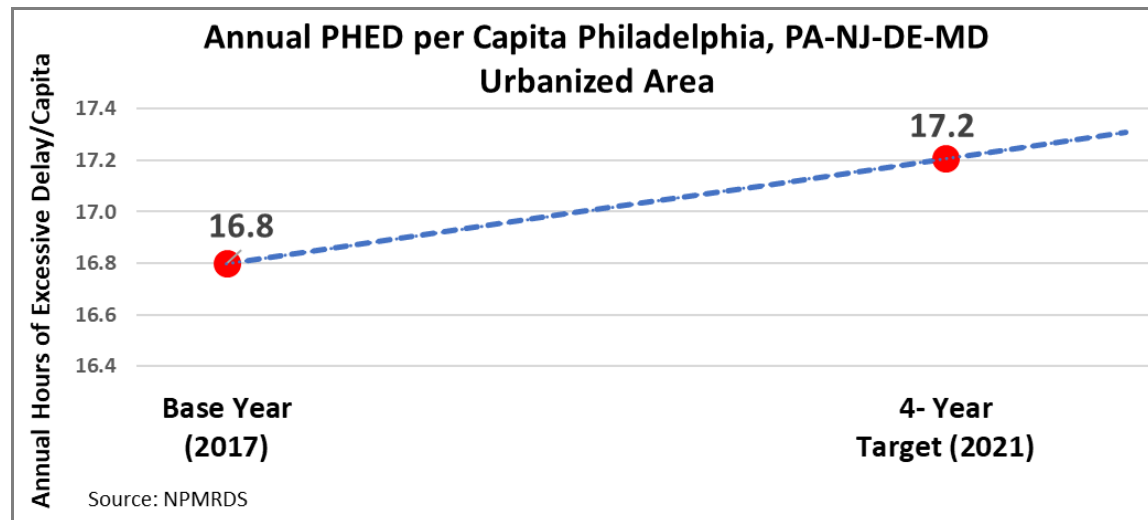
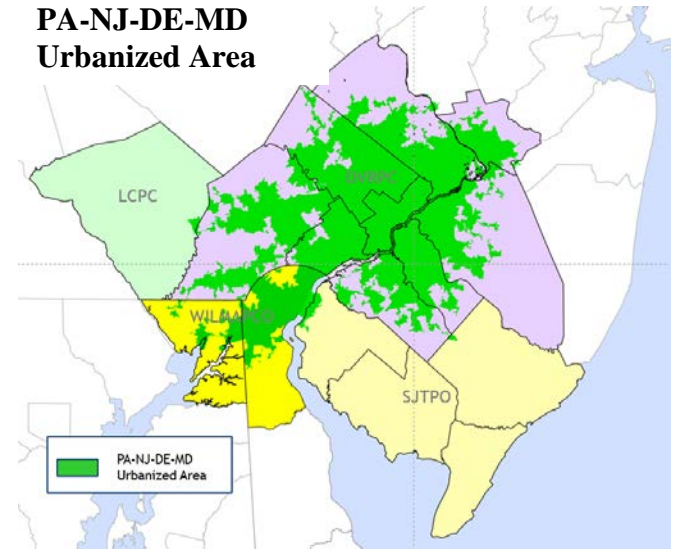
Transportation Performance Measure 3: Annual hours of peak-hour excessive delay per capita (PHED) – Philadelphia, PA/DE/MD/NJ Urbanized Area

Excessive Delay Definition: The extra amount of time spent in congested conditions defined by speed thresholds that are lower than a normal delay threshold (20 miles per hour (mph) or 60% of the posted speed limit, whichever is greater)

Measure: The annual hours of peak hour excessive delay (PHED) per capita on the National Highway System (NHS). The threshold for excessive delay will be based on the travel time at 20 miles per hour or 60% of the posted speed limit travel time, whichever is greater, and will be measured in 15-minute intervals. Peak travel hours are defined as 6-10 a.m. local time on weekday mornings; the weekday afternoon period is 3-7 p.m. or 4-8 p.m. local time, providing flexibility to State DOTs and MPOs. The total excessive delay metric will be weighted by vehicle volumes and occupancy.

Measure covers the entire Philadelphia, PA/DE/MD/NJ urbanized area, with the targets selected in coordination with all four DOTs and associated MPOs.

**PA-NJ-DE-MD
Urbanized Area**

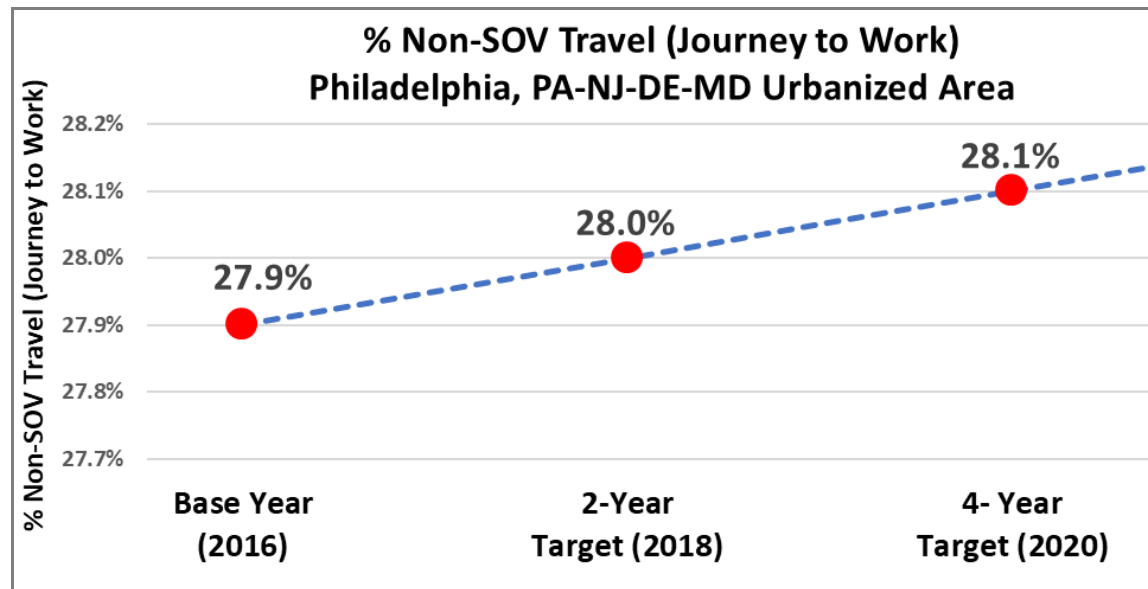
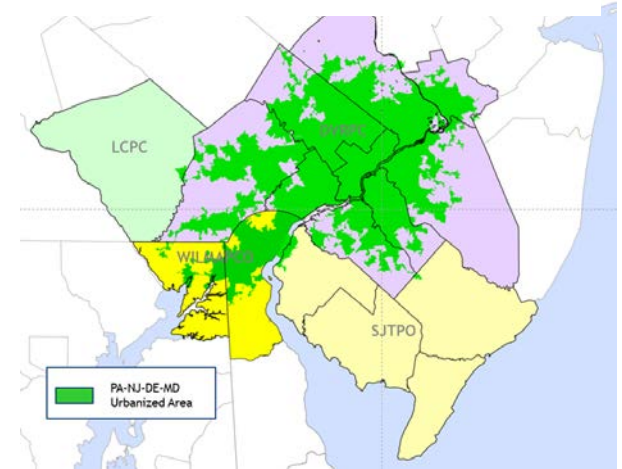


Transportation Performance Measure 3: Percent of non-single occupancy vehicle travel – Philadelphia, PA/DE/MJ/NJ Urbanized Area

Measure: Percentage of travel that is not occurring by driving alone in a motorized vehicle according to the American Community Survey or a local survey of travel mode. The intent is to calculate the amount of non-SOV travel in specific urbanized areas. This may include travel via carpool, van, public transportation, commuter rail, walking, or bicycling as well as telecommuting.

Data: The American Community Survey (ACS) Commuting (Journey to Work) data from the U.S. Census Bureau 5-year average (2012-2016) was used. The measure covers the entire Philadelphia, PA/DE/MJ/NJ urbanized area, with the targets selected in coordination with all four DOTs and associated MPOs.

PA-NJ-DE-MD Urbanized Area



Source: US Census American Community Survey

Transportation Performance Measure 3: On-road mobile source emissions reduction

The figures below display both baseline conditions and 2 and 4-year targets for on-road mobile source emissions stemming from CMAQ projects. Data here are broken up between Cecil County and New Castle County and are presented for NO_x, VOCs, and PM_{2.5}. We do not present PM_{2.5} data for Cecil County based on guidance from the FHWA.

In Cecil County, we adopt MDOT's baseline measure, but elect to set our own 2 and 4-year emissions targets. The baseline figure is based on summed emissions reductions from Cecil County's CMAQ projects from 2014 through 2017 placed in the FHWA CMAQ Public Access System database. MDOT's targets are based on these previously-funded CMAQ projects, several roundabouts.

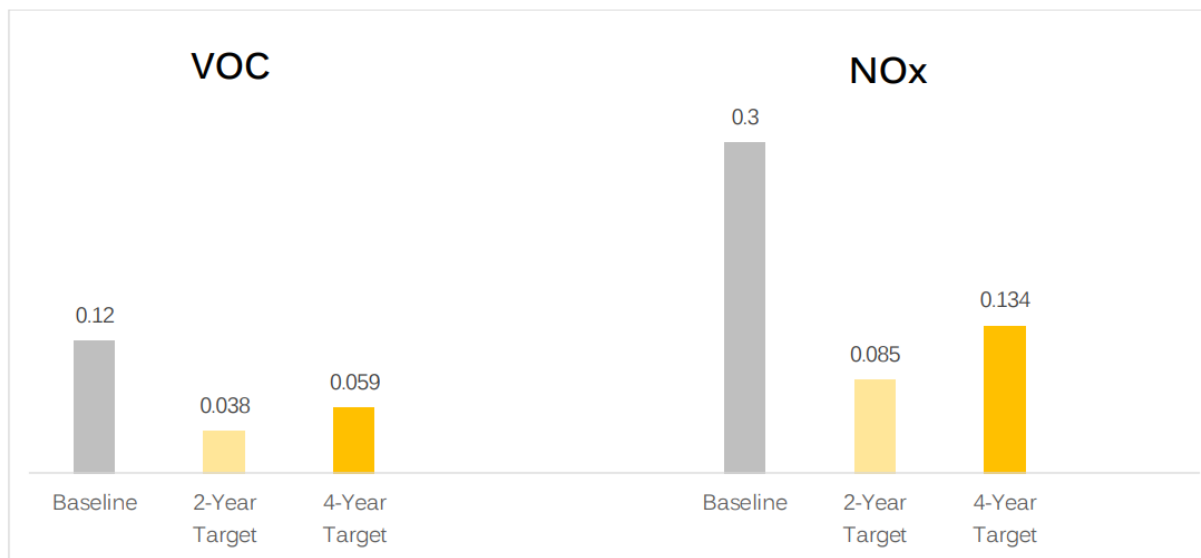
WILMAPCO proposes targets based on ten cost-beneficial bicycle and pedestrian projects listed in various Cecil County and municipal priority letters. Using the Atlanta Regional Commission's CMAQ calculator, WILMAPCO determined the median emissions benefits for these projects for the years 2018 and 2020. We extrapolated benefits for the year 2022, based on those figures. The 2020 results became the 2-year target. The sum of the 2020 results and the 2022 results became the 4-year target.

In New Castle County, we adopt the emissions targets set by DelDOT for the State of Delaware. These are presented on the following page.

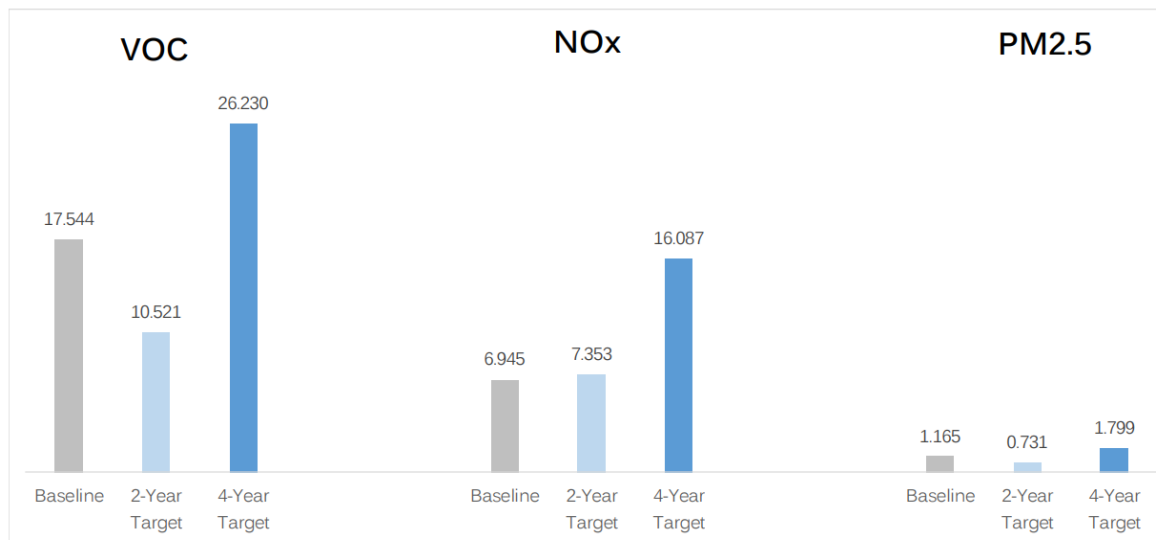
DelDOT's methodology for developing these targets for VOC and NO_x emissions is described in their "Performance Management 3" submission to FHWA in May 2018. First, a listing of potential CMAQ projects through 2021 was compiled. Next, projects which could, quantitatively, have their emissions reductions estimated were identified. These projects were run through a DelDOT Planning emission reduction spreadsheet tool. Estimates for emissions reductions were developed for each year, by project, between the years 2017 and 2021. The sum of emissions reductions for all projects for the years 2018 and 2019 became the 2-year target. The sum of emission reductions for all projects between the years 2018 and 2021 became the 4-year target. DelDOT also provided WILMAPCO with estimates for PM_{2.5} emission reductions that we include here.

WILMAPCO sets the baseline figures for VOC, NO_x, and PM_{2.5} reductions based on the potential reductions for all Delaware statewide projects in year 2017 provided by DelDOT. Historic CMAQ emissions benefit data were unavailable.

**CMAQ ON-ROAD MOBILE SOURCE EMISSION REDUCTIONS
IN CECIL COUNTY, MD (KG/DAY)**



**CMAQ ON-ROAD MOBILE SOURCE EMISSION REDUCTIONS
IN DELAWARE (KG/DAY)**



Transit Asset Management Plans (TAMP)

On October 1, 2016 the Federal Transit Administration (FTA) published its Final Rule (49 CFR 625 and 630) on the Federal Requirements for the development of Transit Asset Management Plans (TAMP) by all transit agencies that receive federal funding. The TAM plan involves an inventory and assessment of all assets used in the provision of public transportation. The term “asset” refers to physical equipment including rolling stock, equipment and facilities. The goal of asset management is to ensure that an agency’s assets are maintained and operated in a consistent State of Good Repair (SGR).

The TAM Final Rule distinguishes requirements between larger and smaller or rural transit agencies:

- Tier I provider: “owns, operates, or manages either (1) one hundred and one (101) or more vehicles in revenue service during peak regular service or in any one non-fixed route mode, or (2) rail transit.”
- Tier II provider: “owns, operates, or manages (1) one hundred (100) or fewer vehicles in revenue service during peak regular service across all non-rail fixed route modes or in any one non-fixed route mode, (2) a subrecipient under the 5311 Rural Area Formula Program, (3) or any American Indian tribe.”

In the WILMAPCO region, DTC DelDOT is considered a Tier I provider, and Cecil County Transit (CCT) is considered a Tier II provider. As statewide transit agencies, DTC DelDOT and MDOT MTA have completed their TAMPs in 2018. Per federal regulations, MDOT MTA created a group TAMP plan on behalf of the Tier II Locally Operated Transit Systems (LOTS) in the state of Maryland will support their implementation of asset management practice and the federal requirements. This group TAMP applies only to the 23 LOTS in Maryland that are recipients of 5311 funding, operate less than 100 vehicles, or serve an American Indian tribe.

Measures: The TAM Rule requires that transit agencies establish state of good repair (SGR) performance measures and targets for each asset class. Tier I providers must report on the SGR measures for the following asset categories:

- Rolling stock (revenue vehicles): Percent of vehicles that have either met or exceeded their Useful Life Benchmark (ULB)
- Equipment (including non-revenue service vehicles): Percent of vehicles that have either met or exceeded their ULB
- Infrastructure (rail fixed-guideway, track, signals, and systems): Percent of track segments with performance restrictions
- Facilities: Percent of facilities rated below condition 3 on the FTA TERM scale

DTC DelDOT is not responsible for Infrastructure, as they are not a grantee that directly operates, maintains or stores rail cars, and has no associated rail infrastructure in its asset portfolio.

As Tier I providers, DTC DelDOT must develop its own TAM Plan, or TAMP, with all the elements listed below. As required by the TAM Final Rule, Tier I Provider TAMPs must:

- Include the capital asset inventory;
- Provide asset condition assessment information;
- Describe the decision support tools used to prioritize capital investment needs;
- Identify project-based prioritization of investments;
- Define the TAM and SGR policy;
- Discuss the TAMP implementation strategy;
- Describe the key TAM activities to be undertaken during the plan's four-year horizon period;
- List resources needed to carry out the TAMP; and
- Outline how the TAMP will be monitored and updated to support continuous TAM improvement.

As a Tier II providers, CCT was included in MDOT MTA's group TAMP with 22 other LOTS. As required by the TAM Final Rule, Tier II Provider TAMPs must:

- Maintain an Asset Inventory that includes all vehicles, facilities, and equipment used in the delivery of transit service;
- Identify all Safety-Critical assets within the Asset Inventory and prioritize efforts to maintain those Safety-Critical assets in a SGR;
- Clearly define ownership, control, accountability, and reporting requirements for assets, including leased and third-party assets;
- Set annual asset performance targets and measure, monitor, and report on progress towards meeting those targets;
- Consider asset criticality, condition, performance, available funding, safety considerations, and the evaluation of alternatives that consider full lifecycle benefits, costs, and risks in capital project prioritization and other asset management decisions; and
- Maintain a group asset management plan, in coordination with MDOT MTA and LOTS safety policies and plans, as a means of delivering this policy.

Data: In this initial Tier I TAMP, DTC will use FTA ULB measures for transit assets and rolling stock. Targets for revenue/non-revenue vehicles are expressed as a percentage of the assets that are at or the ULB. Targets for equipment are expressed as a percentage of the assets that are at or beyond the ULB. Facility targets are based on the overall condition score in terms of a percentage of facilities failing to meet the target score.

DTC ASSET PERFORMANCE TARGETS – ROLLING STOCK AND EQUIPMENT

ASSET CLASS	ASSET USE	DTC UL	FTA ULB	TARGET PERCENTAGE	RATIONALE
Rolling Stock - Revenue Vehicles					
Commuter Rail Car (RP)	Rail	-	39	<10%	DTC's policy is to replace at end of UL. Less than 10% is acceptable.
Over-the-Road Bus (BR)	Commuter	12	14	<10%	
40ft/30ft Buses (BU)	Fixed-route	12	14	<10%	
Cutaway Bus (CU)	Paratransit	5	10	<10%	
Equipment - Non-Revenue Vehicles					
Car (AO)	Support Services	8	8	<20%	With current funding levels DTC will meet target goal within 4 years.
SUV (SV)	Support Services	8	8		
Truck/Van (VN)	Support Services	10	8		

DTC ASSET PERFORMANCE TARGETS – FACILITIES

ASSET CLASS	CONDITION BENCHMARK	TARGET PERCENTAGE	RATIONAL
Facilities	3	20%	With DTC's Facility Preventative Maintenance plan goals, a 20% target is reasonable

For Cecil County Transit (CCT), based on the reported asset condition, targets have been set for each asset class taking the projected funding levels into consideration. The table below summarizes the FY 2017 performance and FY 2019 targets for Tier II LOTS assets. Targets have been set based on the anticipated funding availability and the priorities of both the LOTS and MDOT MTA.

FY19 TARGET ASSET PERFORMANCE FOR ALL ASSETS

NTD Vehicle Type	FY 2017 Performance	FY 2019 Target
Revenue Vehicles		
Bus	17.30%	13.30%
Cutaway Bus	14.80%	10.80%
Automobile	42.90%	38.90%
Van	39.40%	35.40%
Equipment		
Trucks and Other Rubber Tire Vehicles (Non-Revenue Vehicles)	14.60%	14.60%
Facilities		
Administrative*	10.00%	5.00%
Administrative/Maintenance	30.80%	25.80%
Maintenance	40.00%	35.00%
Passenger	25.00%	25.00%