DelDOT's Congestion Mitigation and Air Quality (CMAQ) FHWA Annual Reporting Process

April 25, 2025

DelDOT

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BE DELAWARE

2025 Delaware Total Fatalities
as of 4/23/2025

	2025	2024 YTD			2024 Totals	2023 YTD			2023 Totals
Fatalities	**23**	**36**	↓	-36%	130	50	↓	-54%	137
Delaware Residents	**17**	**32**	↓	-47%	110	39	↓	-56%	110
Person Types									
Vehicle Occupant	**13**	**22**	↓	-41%	65	35	↓	-63%	89
Pedestrian	**8**	**9**	↓	-11%	34	9	↓	-11%	28
Bicyclist	**1**	**2**	↓	-50%	5	2	↓	-50%	5
Motorcyclist	**0**	**2**	↓	-100%	21	4	↓	-100%	14
Other Person Type	**1**	**1**		0%	5	0	↑	100%	1
Crash Types									
Curve Related	**2**	**4**	↓	-50%	23	10	↓	-80%	28
Roadway Departure	**9**	**13**	↓	-31%	42	24	↓	-63%	69
Intersection Related	**5**	**11**	↓	-55%	48	14	↓	-64%	37
Median Crossover	**0**	**0**		N/A	0	3	↓	-100%	8
Wrong Way	**2**	**1**	↑	100%	4	0	↑	100%	1
Work Zone	**1**	**2**	↓	-50%	5	3	↓	-67%	9

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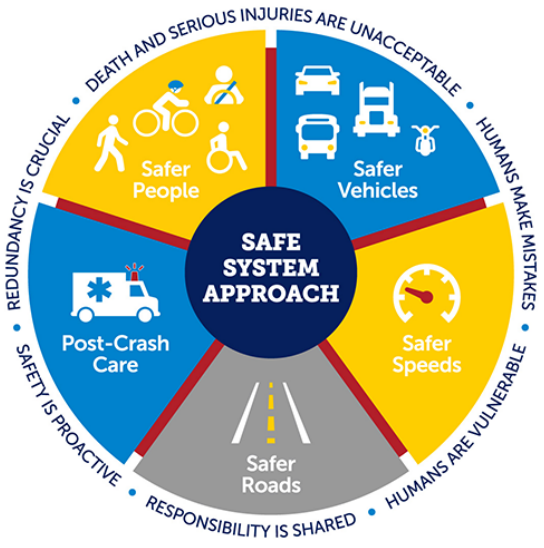

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Agenda

1. Background - Federal Guidelines
2. Mission – DelDOT's Program & Strategy
2. Methods – Project Screening and Performance Assessment Processes
3. Programming – Project Selection and Reporting Processes

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Background

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Background // Project Team

DelDOT

Austin Gray
Assistant Director of Planning

DelDOT Project Manager

Jacobs

Rachel McGuire, PTP
Senior Transportation Planner

Jacobs Project Manager

Will Tardy, AICP
Senior Environmental Planner

Technical Lead

Elizabeth Coffey
Transportation Planner

Program Support

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Background // Regulatory Framework

- Origin - Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991.
- The Fixing America's Surface Transportation (FAST) Act of 2015 (23 USC §149) lists of eligible projects
- A State's ability to use CMAQ funds is dependent on each county's Clean Air Act status

Examples of CMAQ Eligible Projects & Programs

- Diesel Engine Retrofits & Advanced Truck Technologies
  Idle Reduction
  Intermodal Freight Operations
- Bike & Ped Facilities and Programs
- Congestion Reduction and Traffic Flow Improvements
  Travel Demand Management and ITS
  Transportation Control Measures
- Transit Improvements
- Public Education & Outreach
  Training
  Inspection and Maintenance Programs
- Alternate Fuels and Vehicles
  Innovative Projects
  Rideshare & Carpooling

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Background // Regulatory Framework

Moving Ahead for Progress in the 21st Century (MAP-21) Act created a CMAQ performance measure.

- Measure = Total Daily Emissions Reductions (kg/day) generated by projects funded during the performance period.
- Annual Reporting through FHWA's Public Access System
- Two- and Four-year performance target set and tracked through the Transportation Performance Management (TPM) program
- Projects are evaluated in the first fiscal year that CMAQ funds are spent.

Photo Credit: Transportation Performance Management Program Logo, FHWA, retrieved from https://www.fhwa.dot.gov/tpm/ on April 20, 2025

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Background // Regulatory Framework

- The toxins targeted by the CMAQ program are derived from the Clean Air Act
  - Particulate Matter, 2.5 micrometers ($PM_{2.5}$)
  - Ozone Precursors
    - Volatile Organic Compounds (VOC)
    - Nitrogen Oxides (NO_X)
  - Particulate Matter, 10 micrometers (PM_{10})
  - Carbon Monoxide (CO)

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Mission

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Mission // Core Values

- CMAQ is a performance-driven program, which emphasizes transparency
- Built in reporting requirements designed to foster accountability
- Funding can be used for planning, engineering, and construction
- Most projects which address reoccurring congestion capacity are eligible
- Traffic operations statistics are important to estimate emission reduction.

Photo Credit: J. Paniati, Operational Solutions to Traffic Congestion, Public Roads, FHWA, November 2004, retrieved from https://www.fhwa.dot.gov/publications/publicroads/04nov/01.cfm

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Mission // DelDOT's Strategy

- Provide a stable source of funding for active transportation facilities
- Fund the expansion of the State's ITS network
- Provide supplemental funding for traffic flow improvements
- Subsidize the State's Travel Demand Management Program

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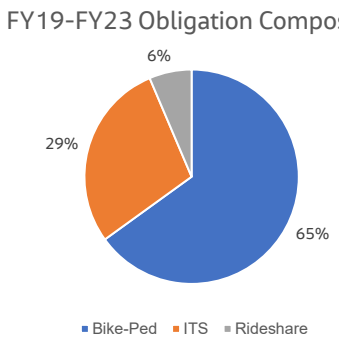
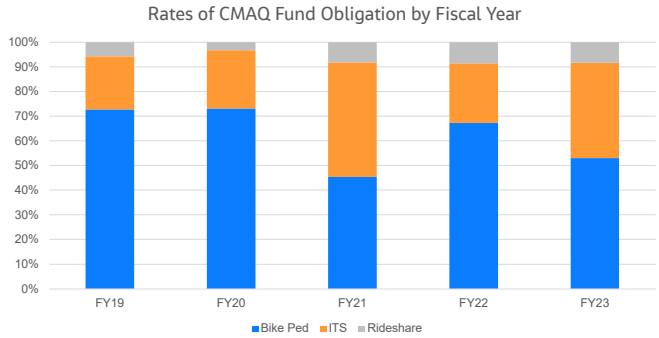
Mission // Historical Funding Rates





- $13 million obligated next FY
- Large projects may be processed in phases and emission reduction estimates may be revised to reflect changes in project scope.

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Mission // Priority Toxins

Name	Source	Health Impacts
Particulate Matter ($PM_{2.5}$)	Reactions between sulfur dioxide and nitrogen oxides emitted from internal combustion engines	Fine particles become lodged deep in lung tissue. Pulmonary and respiratory stress leading to aggravated asthma, and increased risk of heart and lung disease and heart attacks.
Nitrogen Oxides (NO_x)	Combustion of transportation fuels	Airway irritation and difficulty breathing Acute and chronic asthma Increased susceptibility to respiratory infections
Volatile Organic Compounds (VOCs)	Transportation fuels, hydraulic fluids, and solvents	Eye, nose, and throat irritation Liver, kidney, and nervous system damage
Ground Level Ozone	Reactions between NO_x and VOCs in the atmosphere	Airway irritation and difficulty breathing Aggravated asthma, emphysema, and chronic bronchitis Increased susceptibility to respiratory infections

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Methods

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Methods // Core Concepts

- Most emissions reduction estimates are based heavily on predicted changes in traffic operations statistics, including:
  - Traffic volumes (AADT or peak/off peak volumes)
  - Free flow travel time
  - Average travel time delay (peak hour or daily average)
- The geographic scope of traffic operations analysis typically matches the project limits
- Emission reduction estimates reflect only the proposed project, other proposed actions may not be included.
- All emissions reduction estimate are generated using either the EPA Motor Vehicle Emission Simulator (MOVES) or one of FHWA's CMAQ toolkits.

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Methods // Evaluation Types

Active Transportation	• Land use and transportation network characteristics determines mode-shift rate.
Rideshare	• Participants' commute logs describe trip reduction
ITS	• Traffic operational characteristics and device type determine potential for delay reduction
Traffic Flow Improvements	• Traffic simulations determine changes in operational conditions

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Methods // Active Transportation

- Eligible Improvements
  - Sidewalks and crosswalks
  - Shared use paths and bridges
  - Bike lanes
  - Bike parking
- All improvements must provide new or expanded system capacity. Facility replacement in kind is not permitted.
- Data needed for evaluation
  - Project scope
  - Project limits
  - Opening year

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Methods // Active Transportation

- Based on Trust for Public Lands' Methodology as related to bike and ped projects
- Uses combination of transportation and land use factors to estimate mode-shift rates.

Factors	Influence on Mode-Shift Rates
Proximity to activity centers	*Positive* The mode-shift rate increases as the number of nearby activity centers goes up.
Proximity to university campuses	*Positive* The presence of a university nearby increases the mode-shift rate
Traffic volumes on adjacent route	*Negative* The mode-shift rate decreases as the traffic volume goes up
Length of proposed facility	*Positive* The mode-shift rate increase as the length of the proposed facility goes up

- Separate estimates for bikes and pedestrians

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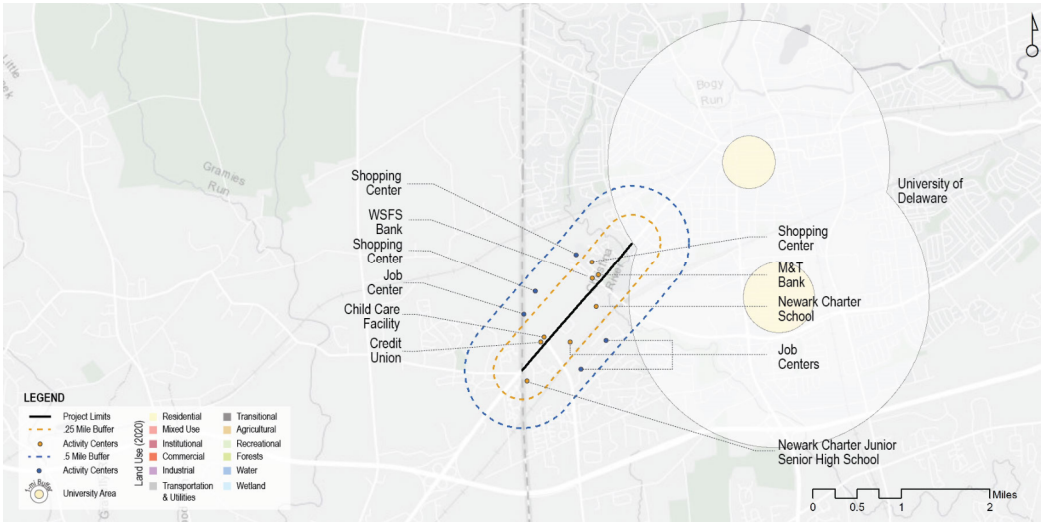
Methods // Active Transportation



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Methods // Rideshare

- Eligible Improvements
  - Program Development and Administration
  - Public Outreach and Education
- Data needed for evaluation
  - Rideshare Log

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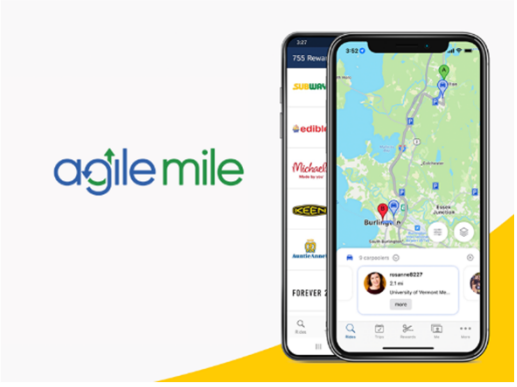
Methods // Rideshare

- Emissions estimates based on vehicle trips eliminated through ridesharing program
- Program information collected from AgileMile application
- Only the rideshare trips from each fiscal year's new members are included in the emissions reduction estimate



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Methods // ITS

- Eligible Improvements:
  - Adaptive Traffic Control Systems
  - Congestion and traffic flow improvements
  - VMS Signs
  - AI-TOMS Program
  - Signal Timing
  - Fiber and Bluetooth Systems
  - Managed Lanes
- Data Requirements
  - Existing delay (daily average or peak and off peak)
  - AADT
  - Corridor length
  - Truck percentage
  - Projected delay reduction

Methods // ITS

- Performance is assessed per installation location for each direction of travel.
- Proposed installations are scored based on projected device function and traffic operational factors, including..

Factors	Influence on Scoring Protocol
Traffic Volumes	*Positive* Installation score increases as the AADT goes up
Duration of Congestion	*Positive* Installation score increases as the annual number of hours spent under congested condition goes up
Frequency of Congestion	*Positive* Installation score increases as the average daily PTI and TTI values go up
Traffic Operations Impact	*Positive* Installation score increases as it's ability to augment traffic operations goes up.

Method // Traffic Flow Improvements

- Eligible Improvements
  - Intersection Improvements
  - Roundabouts
- Data Requirements
  - Existing delay (daily average or peak and off peak)
  - AADT
  - Corridor length
  - Truck percentage
  - Projected delay reduction
- The build year is typically used as the assessment year, but a more immediate period can be used.

Methods // Traffic Flow Improvements

- Emissions Reductions Estimates are based on travel delay reductions predicted through micro-simulations.
- Holding other variables constant, emission reductions increase as the travel delay decreases.

Programming

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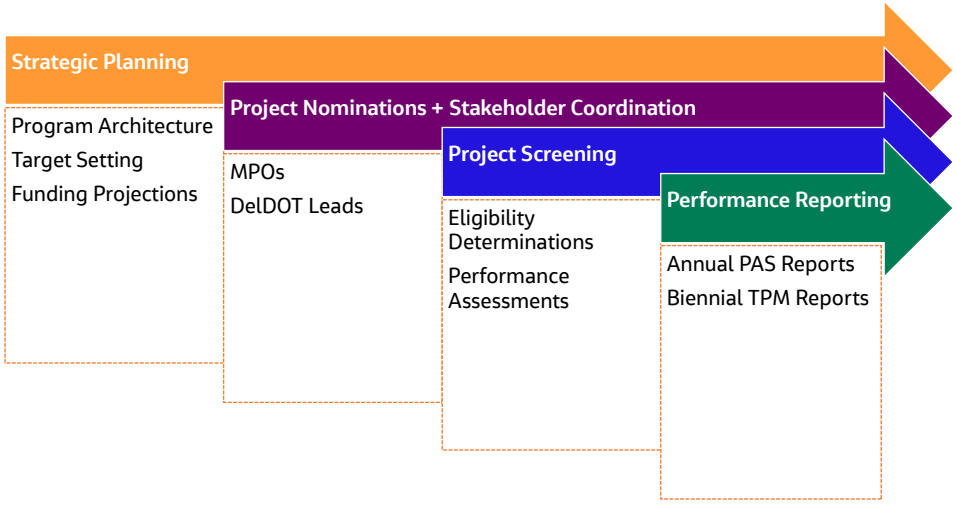
Programming // Phases



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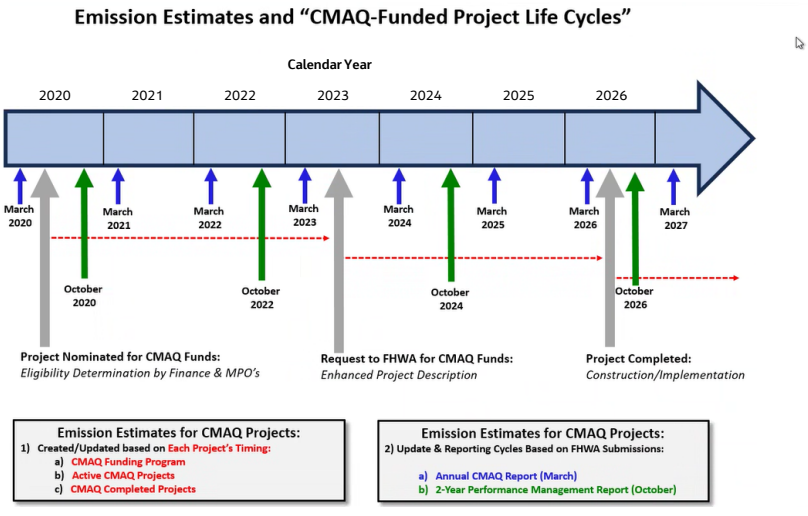
Programming // Screening

- Projects seeking CMAQ funding are reviewed twice
- Review 1 - Eligibility Screening
  - Completed **before** FHWA approval is requested
    - Project's typically fail based on ineligible project components, not low levels of performance
    - Identification of alternate funding mechanisms
- Review 2 - Annual Obligation Reporting
  - Completed **after** obligations are finalized by DelDOT Finance
  - Reported to FHWA through Public Access System

Programming // Timeline



Any Questions?