

SUMMER 2022

DATA STATUS UPDATE

Stay up to date on Delaware's transportation data!

Brought to you by the Integration of Operations and Planning Advisory Committee

The Integration of Operations and Planning (Int Ops) Advisory Committee was founded in 2009 with the goal of streamlining statewide processes, improving efficiency, and enhancing the reliability and accessibility of Delaware's transportation system data.

With over 50 members, this multi-agency collaboration organizes input into key decisions, provides guidance, and takes action to meet transportation goals throughout the state. The chart to the right shows the current organizational representation of the group.



Organizational representation of Int Ops Advisory Committee members.

Focus Areas

The group's current focus areas are highlighted throughout this edition of the Data Status Update and cover:

- New Technologies
- Data Collection and Accessibility
- Data Applications
- Public Education

FEATURED TOPICS

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Traffic Pattern Group
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Transportation Operations Management Plan (TOMP)
- 4 - **Public Education**
Geo-based Narrowcasting



Announcements

- A working group for Data Applications in Delaware’s Travel Demand Model is currently being formed. Please contact andrea.trabelsi@delaware.gov if you are interested in joining the working group or for other information about the overall Advisory Committee.
- The Local Systems Improvement group is now the Active Transportation and Community Connections group and Int Ops Advisory Committee members from that group include Paul Moser.
- The Transportation Resiliency and Sustainability group is new at DelDOT and Int Ops Advisory Committee members from that group include Stephanie Johnson.
- Congratulations and best wishes to Bill Brockenbrough on his retirement after 42 years of service!
- Guests and new members always welcome. Please pass on your suggestions for new group members or just forward our information. Any questions can be directed to Andrea Trabelsi (andrea.trabelsi@delaware.gov)
- Next meeting: Monday, October 17, 2022, 1:30pm (DelDOT Main Campus, Dover or via Microsoft Teams)

New Technologies

MACHINE VISION: A TRANSPORTATION SECTOR SUPERPOWER

Gene Donaldson (DelDOT)

Machine vision, in a broad sense of the term, is a technology which automatically extracts information from image-based raw data. Machine vision takes camera footage as the raw input data and uses an image/video processing software to analyze what the camera “sees”. Often machine vision is coupled with an artificial intelligence (AI) system that applies machine learning techniques to evaluate inputs, draw conclusions, predict, and/or act. Advancements in cameras, software, data transmission, and processor technologies in recent years evolved into a consistent, accurate, efficient, and non-intrusive data collection source providing traffic data on vehicles, bikes, and pedestrians.

Delawareans stand to benefit from expansion and application of machine vision for various transportation-related needs. Currently, DelDOT is assessing **novel applications** of machine vision as part of its Integrated Transportation Management System (ITMS), including:

- **Enhancing the computerized traffic signal system:** Under a 3-year grant from the Federal Highway Administration (FHWA), DelDOT is finding opportunities to integrate AI into many areas of operation. Machine vision is one component being applied in specific testing areas, including Exit 119 on SR 1, US 13 at Paddock Road, and US 13 at SR 300.
- **Monitoring truck parking:** DelDOT’s Planning team is partaking in a **Volpe** Institute study of machine vision for monitoring truck parking in Smyrna. The image at right is an example of how the technology can scan for and identify parking usage. Such information can then be used to notify a driver of capacity, helping to guide them to a lot where parking is available.
- **Monitoring and adapting to flooding:** The **US Geological Service** (USGS) uses camera imagery and machine learning to detect the presence of water, delineate boundaries, measure flooding and changes to the coastline, and establish trends. DelDOT has an opportunity to build on its ITMS network and existing collaboration with USGS, detecting and predicting water on roadways to increase safety and efficiency for Delaware travelers.



Example of how machine vision identifies occupancy and capacity of truck parking. The space highlighted in red with a truck in it reflects the system’s detection that the space is occupied.

Other transportation-related applications of machine vision technology, which could be beneficial to Delaware, include:

- Providing accurate data at bottlenecks during rush-hour to enhance the Travel Demand Model
- Filling in gaps in vehicle classification data collection, required by FHWA, primarily for the southern part of the state where segments are not fully equipped with Wavetronix detectors
- Enhancing understanding of bicycles, pedestrians, and other emerging modes (e.g. E-bikes or scooters) in Delaware

Data Collection and Accessibility

TRAFFIC PATTERN GROUP: CONSOLIDATION IS KEY

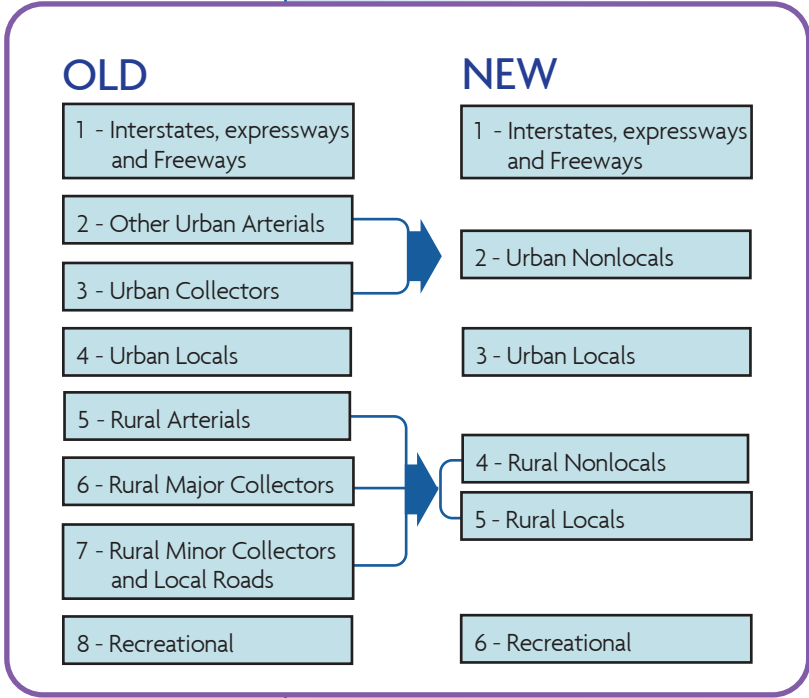
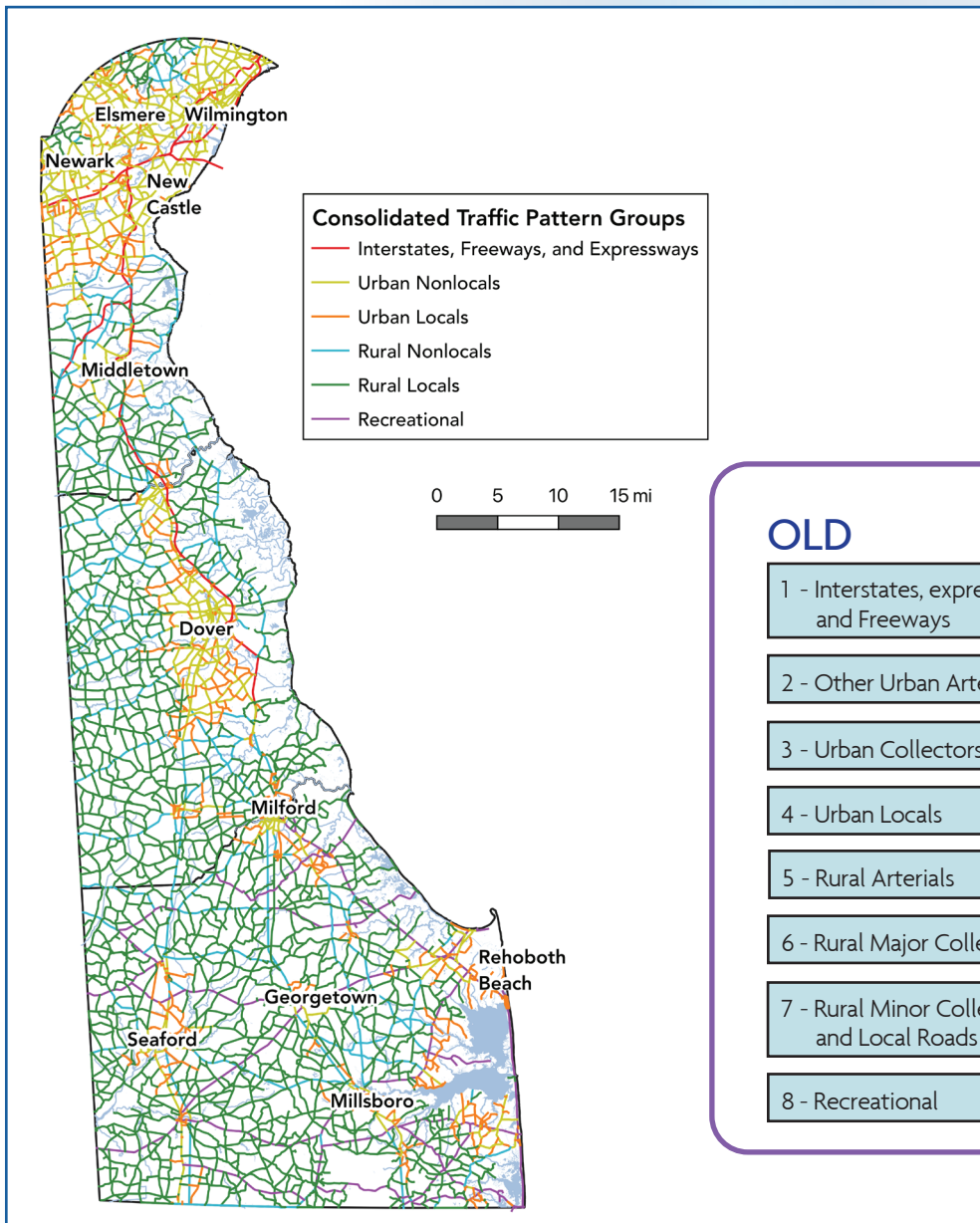
Luis Rios-Fontanez (DelDOT)

In the [Winter 2021 Data Status Update](#), we heard about DelDOT Planning’s traffic pattern group (TPG*) analysis. At that time, DelDOT aimed to consolidate its eight TPGs down to six in 2022. So, it’s 2022, where do things stand? DelDOT and data management firm High Desert have completed their analysis and DelDOT now has six TPGs!

This analysis began last year using 2018 volume data to group automatic traffic recorder (ATR) sites together based on similar seasonal trends and functional classification. This spring, seasonal volume data from 2021 validated and confirmed DelDOT’s expectations that existing TPGs 2 and 3 can be consolidated into one group, “Urban Nonlocals,” while existing TPGs 5, 6, and 7 will be consolidated into two rural groups, “Rural Locals” and “Rural Nonlocals.” These new traffic pattern groups will be reflected next year in the 2022 Vehicle Volume Summary. By consolidating, DelDOT can reduce the overall number of in-pavement ATRs it needs to meet federal traffic reporting requirements. Fewer in-pavement devices means maintenance is safer and more efficient!

*WHAT IS A TPG?

Groupings are based on roadway functional classifications and seasonal volume trends. Each year DelDOT reports on data like truck percentages and yearly growth for each of its TPGs based on both short-term and permanent counts. Reporting on this is a requirement by the federal government—they use this data to understand how many vehicle miles are traveled on different types of roadways and make decisions about federal funding. This data is also used by DelDOT to supplement and enhance the state’s travel data count program to better understand the average annual daily traffic (AADT) and travel patterns on Delaware’s roads. You can see a roadway’s TPG in DelDOT’s [Vehicle Volume Summary!](#)



Data Applications

TRANSPORTATION OPERATIONS MANAGEMENT PLAN (TOMP): COMPREHENSIVELY TRACKING MOBILITY

Gene Donaldson (DelDOT), Beth Hermansader (DelDOT)

TOMP is DelDOT's comprehensive approach to understanding traffic mobility statewide and planning for improvements in the state's traffic hotspots. TOMP is produced with data and expertise from across DelDOT Operations, Planning, and local Metropolitan Planning Organizations to identify motor vehicle congestion hotspots by layering traffic volumes and travel times. The uniform process is conducted for each county every three to five years, producing a consistent and comparable look at mobility that supports project tracking, data-driven project prioritization, and identification of near-term improvements that benefit multiple modes.

As the TOMP gets updated on a more regular basis for the three counties, the increased consistency will help with understanding change in traveler mobility and tracking progress and effectiveness as DelDOT implements recommendations. The Integration of Operations and Planning Advisory Committee should discuss the progress of TOMP in its regular meetings. What thoughts do you have about tracking progress? How can it help the work you are doing?

Public Education

GEO-BASED NARROWCASTING: A NEW APPROACH FOR PUBLIC INFORMATION AND OUTREACH

Holly Rybinski (Rybinski Engineering)



Example of the simple message that appears on the target traveler's device. From there, the user clicks to get to a landing page with additional traveler information.

Transportation agencies often need to reach a specific group of travelers to inform them about work zone restrictions and safety measures. Geo-based narrowcasting is a recently developed yet widely used technology that can serve as a powerful tool for public information and outreach to travelers.

Broadcasting methods such as traditional media or, more recently, social media have a wide reach but do not precisely tailor and target the important information to those who need to receive it. Geo-based narrowcasting is excellent at tailoring site-specific information to site-specific travelers. Just as importantly, it is excellent at not sending too much information to travelers who do not need it.

Geo-based narrowcasting can convey pre-trip information to reach the road users who have the most to benefit from the message. The group of travelers to be messaged is identified based on the location information that is anonymously collectable through smartphones. No subscription process or hardware installation is required. Then the technology delivers a simple, relevant message through online platforms such as social media, mobile

UPDATES

The new TOMP webpages on DelDOT's website are nearly ready. Watch the [ITMS homepage](#) for this in the coming weeks!



The New Castle County TOMP report is set to be published in late 2022 (last published in 2010). In the meantime, check out the most recent TOMP reports on DelDOT's [ITMS Publications page](#).

apps, and websites, prior to the expected trip, to inform travelers about traffic restrictions or to promote a safety campaign.

Possible applications of transportation-oriented narrowcast messaging in Delaware include:

- Safety advisory to those who travel through a safety hotspot
- Notifying travelers that have a viable alternate route
- Notifying travelers that have a viable multimodal alternative
- Notifying truckers of freight route closures and detours in the weeks leading up to the roadwork
- Conveying pre-trip information to travelers who do not primarily communicate in English

Let's continue the brainstorm! Email andrea.trabelsi@delaware.gov with your ideas and stay tuned for updates on applications of narrowcasting in Delaware.

